

The SHORT WAVE Magazine

VOL. XXIII

DECEMBER, 1965

NUMBER 10

KW ELECTRONICS

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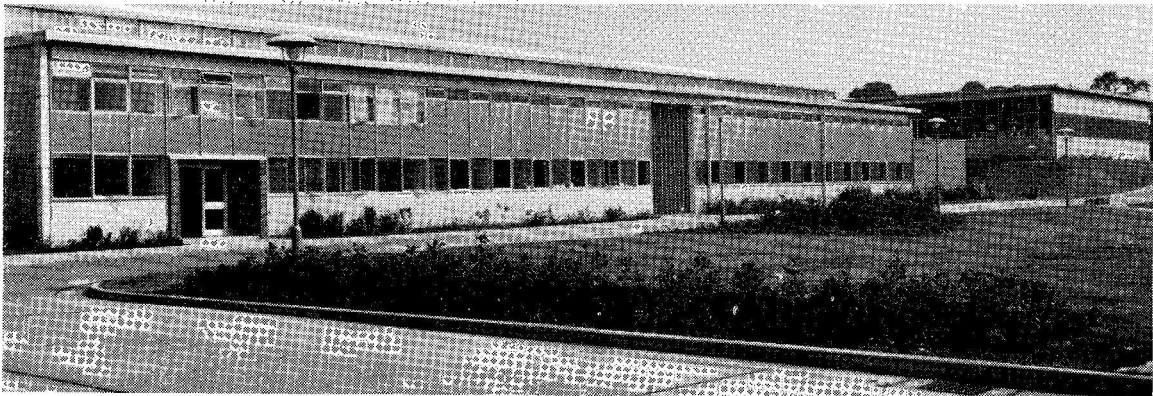
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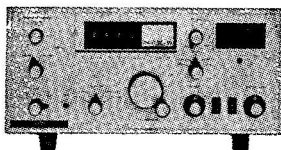
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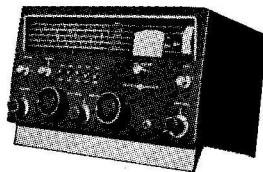
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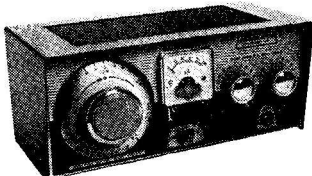
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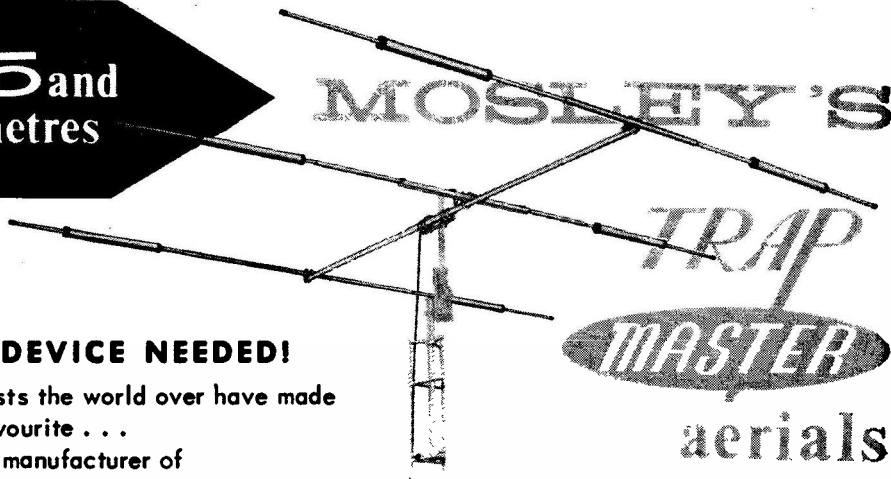
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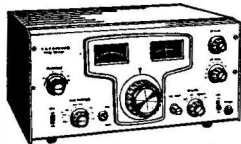
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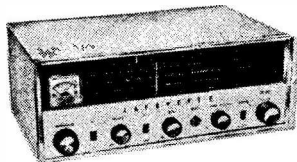
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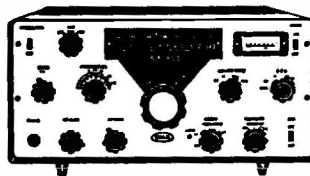
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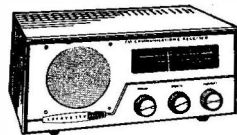
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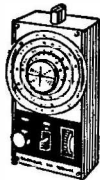
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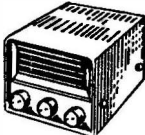
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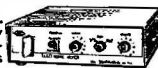
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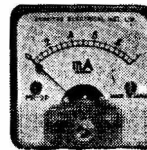
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500µA	25/-	5mA	22/6	500mA	22/6	50v DC	22/6	50v AC	22/6
50-0-50µA	29/6	10mA	22/6	750mA	22/6	100v DC	22/6	150v AC	22/6
100-0-100µA	27/6	50mA	22/6	1A	DC 22/6	150v DC	22/6	300v AC	22/6
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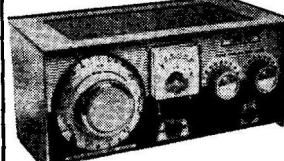
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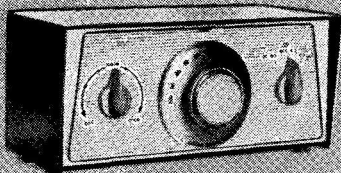
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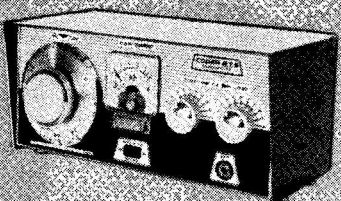


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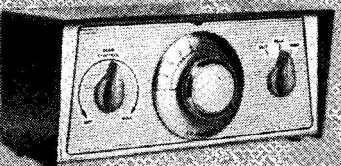
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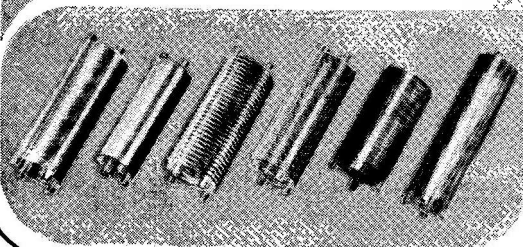


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Managing Editor: AUSTIN FORSYTH, O.B.E. (G6FO/G3SWM)

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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT WAVE *Magazine*

E D I T O R I A L

Christmas *It has long been our custom at this time of year to take space to offer Season's Greetings to all who, at home and abroad, are readers and supporters of SHORT WAVE MAGAZINE.*

Though, needless to say, we once again offer our good wishes for Christmas and the New Year to all who may read these lines, the truth is that over the world the outlook is bleak, sombre and unhappy. There will be very little of the spirit of Christmas in the torn land of Vietnam. Our own people in Rhodesia will be sick and bewildered. The problems of Kashmir are now more difficult and insoluble than they have been for many years. There is a state of war in Malaysia and the threat of war in the Near East. Everywhere, the menacing face of the heathen is raised.

And what (you may quite reasonably be inclined at this point to ask) the heck has all this to do with Amateur Radio — supposed to be untainted by politics, the influences of race, colour, class or creed, and the fruits of material advantage?

The answer, as always, is simple. There are radio amateurs in every part of the world, at every level of society, and exposed to all sorts of pressures — though luckily for many of them (like us in the U.K.), these influences are so slight as to be unimportant.

But because that does not go for all the world of Amateur Radio is why this year our message is more specially for readers in the troubled parts of the world, who have to face the difficulties, the tribulations and the uncertainties of some local situation over which they have no personal control.

We hope that their Christmas will be Happy, and that the New Year will begin to see them through their difficulties.

From the Editor, Management and Staff

of SHORT WAVE MAGAZINE

WORLD-WIDE COMMUNICATION

PANORAMIC MONITOR-ALARM UNIT

FOR VHF BAND-WATCHING—
DESIGN AND CONSTRUCTION

J. B. TUKE (GM3BST)

Once again, our contributor has come up with an ingenious practical solution to an ever-present problem—that of band monitoring on VHF. Though his design applies to his own particular interest of Satellite watching in the 136 mc band, it could equally well be applied to two metres, with suitable modifications. It would obviously be desirable to arrange for a rather wider frequency sweep, for one thing. But any such modifications could easily be worked out from the detailed information given here.—
Editor.

SHORTLY after the writer started listening on the VHF bands (in his particular case the Satellite band of 136-137 mc) it became evident that a marked difference exists in the technique required compared with that used in the HF area of the frequency spectrum. On the HF bands there is always some activity (often far too much!) whereas on the VHF's there may be nothing but silence. At the same time it is unusual to have to listen over any large range of frequencies in the HF sector, whereas on VHF it may be necessary to cover a complete megacycle or even more. This means there is every likelihood that while searching one end of the band in vain, furious activity may be taking place at the other end, which has disappeared by the time one is tuning over that portion.

Searching for satellite signals is rather like looking for DX on two metres—many hours of monitoring are required, which may or may not produce results.

In these days of automation it seems a complete waste of time to have to sit in front of a receiver and tune wearily from one end of the band to the other for long periods (frequently with nothing to show for it), and being an idle type the writer decided that "electronics" should be made to do the donkey work instead. The outcome is the panoramic monitor alarm described here, which alerts one if there is any activity at all and at the same time indicates on a CR tube whereabouts in the band being watched the activity is taking place.

Basic Factors

As most people know, panoramic reception is a system whereby an oscilloscope is used to display a given frequency band on its X-axis, activity within that band being indicated by a "pip" in the vertical direction. A sketch is shown at Fig. 1. The panoramic receiver is sweeping the band many times a second and one can therefore see at a glance what activity is taking place.

Full-scale panoramic receivers tend to be rather expensive items, but as in this case only a monitor function is required, some simplification can be accepted in the design without reducing the usefulness of the equipment. To start with, the "pip" produced by the signal need not be exceptionally narrow—one is not expecting to see whether the signal is modulated or not, so the IF response of the panoramic unit need not be highly selective. The particular unit described here will not discriminate between carriers less than 6 kc apart, and cannot show individual sidebands on modulated signals. The idea is simply that once you see a "pip" on the 'scope, you investigate it on the station receiver in the ordinary way. Again, ideally, the sensitivity of a panoramic unit should be level over the entire range covered—but here no serious attempt has been made to achieve this. Sensitivity is adequate over the range of one megacycle, though it may vary somewhat between one band edge and the other—this is of little importance.

The alarm circuit works by closing a relay (which can be arranged to ring a bell or a buzzer) indicating that *some* activity is taking place. This means that the band can be monitored entirely automatically, the drill being that when the buzzer sounds (or the lamp lights up) the visual indication on the 'scope will show in what part of the frequency band activity has started and, from then on, you leap into your operating chair and deal with the signal on the station receiver.

Because of the low cost of the unit, and the simplification made to the circuit, it would be foolish to pretend that the device as described will give clear indications on a signal which, on a full-size station receiver using a crystal filter, produces about an S2 signal, well down in the noise level. With careful alarm setting, and in a quiet location, the alarm will sound on a signal which could conventionally be called S3-4. Visual indication on the 'scope is quite plain as soon as the signal-to-noise ratio is about 6 dB—in this context it is *noise ratio* rather than actual signal strength that counts. The writer has found that signals which do not provoke a response from the unit are of little value—certainly, from an amateur communication angle they would be useless for Phone communication, though they

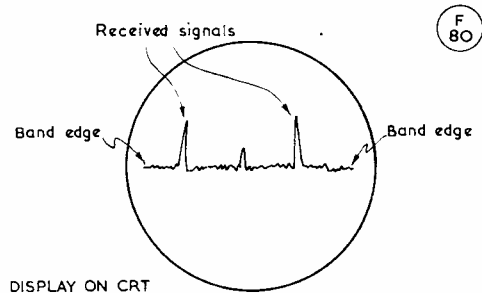
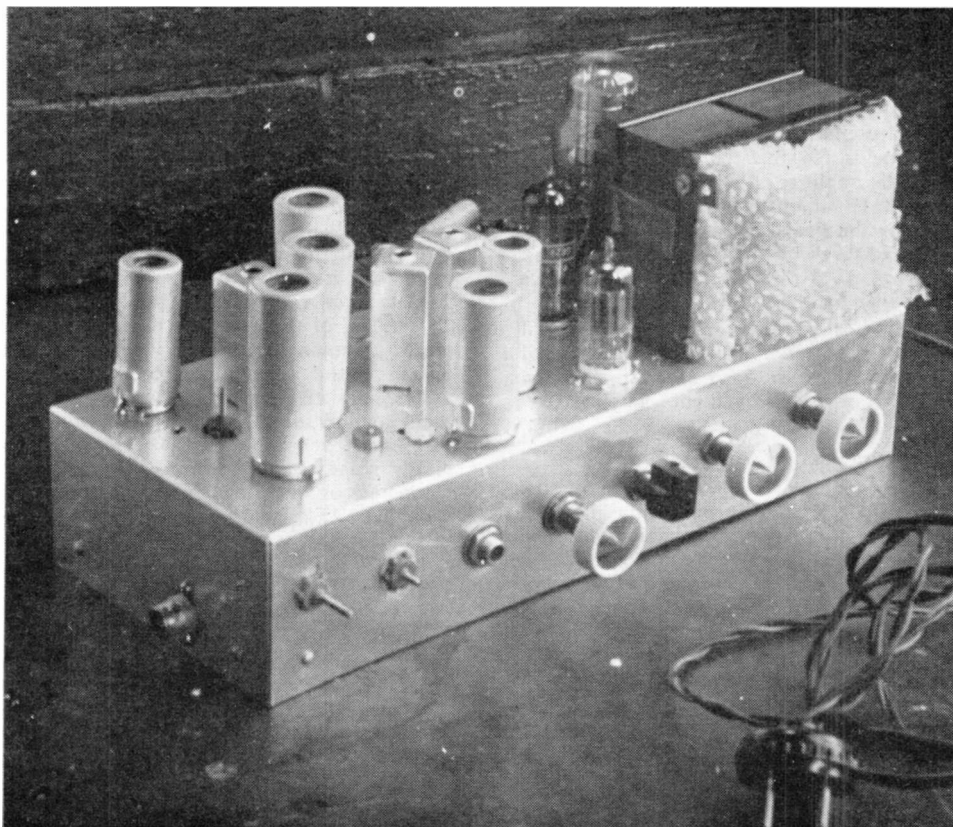


Fig. 1. General appearance of the trace on the CRT when using the panoramic monitor receiver described by GM3BST. An alarm circuit can also be incorporated—see text.



The panadaptor unit for VHF as designed and constructed by GM3BST and fully described in his article. This incorporates the circuit of Fig. 2, with the controls (see text) along the front chassis drop. As he explains, any other convenient form of construction could be adopted.

might be effective on CW.

Circuit Description

The unit as described here operates at the output frequency of the writer's VHF converter, which is 20-21 mc. All details and circuit values refer to this frequency range, but it would be difficult to adapt the circuit for any other intermediate frequency, providing it is not *too* low. If a sweep coverage of one megacycle is intended, obviously the converter could not have an output at, say 3 mc. as broadbanding on this low frequency would be very difficult, quite apart from the fact that obtaining the 1 mc sweep in the panoramic unit would be difficult if not impossible without major modification. Alternatively, if a sweep greater than 1500 kc is required, the converter output would probably be better in the 28-30 mc region.

The panoramic unit is simply a superhet receiver covering the range 20-21 mc. and the display is provided by sweeping its oscillator over a range of 1000 kc. The intermediate frequency has been chosen as 1.6 mc. and the oscillator can be above or below this. The choice is determined to some extent by the fact that the oscillator may produce a "birdie" in

the VHF band being covered, and in the writer's case it was decided to have the oscillator running below the input frequency. It therefore sweeps over the band 18.4 mc to 19.4 mc (20-1.6 and 21-1.6). The circuit arrangement is such that as the oscillator sweeps over the band, the spot on the 'scope forming the X-axis is likewise travelling across the screen (they are in fact driven by the same time-base). If an incoming signal lies in some part of the band, a short burst of 1.6 mc IF will be produced during the oscillator sweep, and this burst is, after detection and amplification, applied to the Y-plates of the tube, so that the spot is momentarily deflected vertically, thus producing a "pip" on the trace. Since the position of the spot on the X-axis is a function of the oscillator frequency, it follows that the position of the "pip" on the tube trace indicates the active frequency at which the signal is being received.

Circuit Details

Output from the converter is fed by coax to the primary winding of the RF coil (*Denco* Range 5 Blue), at "RF In" in Fig. 2. This coil is tuned by

fixed capacitor C2, adjustment being carried out to the iron-dust core. The secondary feeds the grid of an EF183 RF stage, V1, the output of this valve being coupled to the mixer via L2, a *Denco* coil (Range 5 Yellow). The mixer is an ECH81 and (passing by the oscillator portion at the moment) the IF of 1.6 mc is fed through a *Denco* IFT to the EF85 first IF amplifier. A further identical IFT feeds the second IF amplifier, and EF92, and the detector following the final IFT is a small germanium diode. The detected signal is passed to the coax output socket via a .01 μ F capacitor, C21. (This could be any value up to .05 μ F or so.)

A Q-multiplier is used to provide additional selectivity and gain, and follows conventional circuitry. The coil is from *Electroniques*, and the circuit used is that provided by them—see Fig. 2.

Oscillator Configuration

Returning now to the oscillator section of the mixer circuit, V2—it is in this part only that the circuit differs from the conventional superhet. The actual components are conventional enough—a *Denco* Range 4 (red) coil L3 is used, and this was chosen as it tunes to the required frequency with the minimum of capacity. This is important, and if a home-made, or other type, of coil is used, it is necessary to arrange that it tunes with little more than stray capacity to the wanted frequency. The required sweep over the one-megacycle range is achieved by using a capacitor diode D1 as a tuning capacitor. The diode behaves as a variable condenser, the value of which depends upon the applied voltage. In effect, it is placed across the oscillator tuned circuit and has the oscilloscope X-voltage applied to it, via C22, VR2. This means that the capacity across the oscillator tuned circuit, and therefore its frequency, will be controlled by the voltage-operating the X time-base, which is what is required to produce the panoramic display.

It is not quite sufficient to connect all this up directly—two refinements are necessary. First of all, the level of X-voltage is controlled by a potentiometer, VR2, this providing a sweep-width control. Secondly, the capacity diode requires a steady positive DC voltage, over which the X-voltage must be applied. This is arranged by feeding the diode from a fixed potentiometer network consisting of R25, R26, and feeding the X-voltage via a cathode follower V9 and capacitor C9. The object of the cathode follower is mainly protection for the capacity diode D1—most oscilloscopes deliver quite large X-voltages which might damage the diode if the sweep-width control were advanced too far. But the cathode follower cannot possibly deliver more than its HT voltage, and this is kept at 150v. which is within the rating of the diode. The value of the coupling capacitor C22 between the sweep-width control and the grid of V9 is of some importance and may depend upon the linearity of the X-sweep given by the 'scope.

The capacity diode is not linear in operation, and as the X-voltage is increased, the capacity increases at a greater rate. This means that one end of the

frequency scale is very open (at the commencement of the scan) while the other is excessively cramped. Were this condenser C22 omitted, it will be found that the left-hand half of the display will be about 100 kc wide, while the other half will cover the remaining 900 kc at an increasingly cramped rate! The object of C22 is to differentiate the X-signal to some extent, thus slowing down the incremental voltage and counteracting the non-linearity of the diode. The value chosen for the model (C22, 0.3 μ F) has been found to give a very good linear frequency scale, but it may require some modification if the X-plate scan voltage is, in itself, non-linear.

The use of the capacitor diode D1 in place of the more common reactance valve makes for easy operation and adjustment. Most valve circuits place variable resistive loading as well as reactance on the oscillator circuit, resulting in variable oscillator amplitude over the sweep. The diode is free of this disadvantage, has a very high "Q" and is stable in operation. The small adjustment necessary to the waveshape to offset the non-linearity is a small price to pay for such simplicity.

Alarm Circuit

The alarm circuit is simplicity itself. The two sections of V6 form a simple DC amplifier, the variable cathode resistor VR3 in the second section controlling the standing relay current. When a signal

C1, C4	=	.01 μ F, cer.
C5, C6	=	33 μ F, s/m
C7, C10	=	100 μ F, s/m
C8, C12	=	0.5 μ F
C11, C14	=	0.3 μ F (see text)
C13, C17	=	16 + 8 μ F, elect.
C15, C18	=	220 ohms
C17, C18	=	3,900 ohms
C21, C22	=	33,000 ohms
C21, C22	=	22,000 ohms
C21, C22	=	180 ohms

R6, R14	=	47,000 ohms
R5, R16	=	3,300 ohms
R7, R19	=	470,000 ohms
R9, R20	=	120,000 ohms
R21	=	4,700 ohms
R11, R13	=	1 megohm
R12	=	10,000 ohms, 1w.
R24	=	80,000 ohms, 1w.
R25	=	10,000 ohms, 3w.
R27, R28	=	5,000 ohms, 3w.
R30	=	0.5 megohm
R31	=	10,000 ohms, 3w.
VR1	=	25,000 ohms, 3w.
VR2	=	IKG-BSC-20
VR3	=	(Intermittent)
D1	=	(Intermittent)

NOTE: All resistors are rated $\frac{1}{2}$ -watt unless otherwise stated.

D2	=	CG61, or similar
L1	=	Blue Range 5
L2	=	(Denco) Range 5
L3	=	(Denco) Range 4
IFT's	=	1.6 mc IFT
T1	=	(Denco) 300-0-300v. 80 mA, 6-3v. L.T's
Ch	=	Smoothing choke
FL	=	Relay (see text)
V1	=	EF183
V2	=	ECH81
V3	=	EF85
V4	=	EF92
V5	=	EA50
V6	=	EA07
V7	=	EZ81
V8	=	VR150
V9	=	6AT6

Fig. 2. Circuit of Panoramic Unit

Table of Values

appears across the detector load R20 it passes through the diode V5 and builds a steady negative charge across C23. This causes the second section anode current to increase, and the relay operates. It is necessary to use a thermionic diode to feed this circuit from the detector, and the voltage build-up on the grid of the alarm amplifier is to some extent an integrating action, and a germanium diode has too low a reverse resistance. The relay in the equipment at GM3BST is the 2000-ohm *Siemens* high speed type, and a standing current of about 5 mA does not quite close this until a signal is received. Any reasonably sensitive relay could be used instead, and the standing current increased or decreased to a suitable value.

The writer's unit is built on an aluminium chassis 9in. x 6in. Controls brought out to the front are: Gain, Alarm sensitivity, Q-multiplier gain, and sweep-width. Screwdriver adjustments are used for RF. mixer and oscillator coils, and Q-multiplier tuning. A conventional mains power unit is incorporated. Co-axial sockets are used to feed in the RF from a converter, the sweep signal from the oscilloscope, and to take off the signal for the 'scope amplifier. Construction techniques follow normal practice using short leads and returning all decoupling capacitors relevant to a particular stage to one point. The photograph gives a general idea of the physical construction—but there is nothing critical about this and no doubt a completely different shape would work just as well!

Setting Up and Alignment

The oscilloscope to be used with the panoramic unit should have an "X" output terminal, and it is assumed that the voltage derived from the time-base is positive going. The video amplifier in the 'scope may require the addition of a diode from grid to earth on the final amplifier, since the panoramic unit will deliver quite large signals from powerful stations, and yet the gain must be kept up to enable weak stations to be seen. Some 'scope amplifiers, when subjected to overloading, show a tendency to overshoot, *i.e.*, a very large upward "pip" is followed by a deflection of the scan downwards. This effect can be removed by the addition of a diode which will short-circuit the unwanted overshoot portion. If this is fitted, it must be remembered that the 'scope will be unsuitable for normal purposes, as it will be incapable of deflecting equally in positive and negative directions.

The VHF converter will now have to supply an output to both the station receiver and to the panoramic monitor—and it is not generally satisfactory simply to tie these two together as severe interaction will take place between the input circuits. The best solution is to use a 12AT7 as a double cathode follower, feeding both panoramic and station receivers from the individual cathode outputs, as shown in Fig. 3. The interaction is then negligible.

When testing a new piece of equipment, the writer always sets the RF and mixer coils to the required frequency by GDO, and it can be recommended in this particular case. This saves wasted

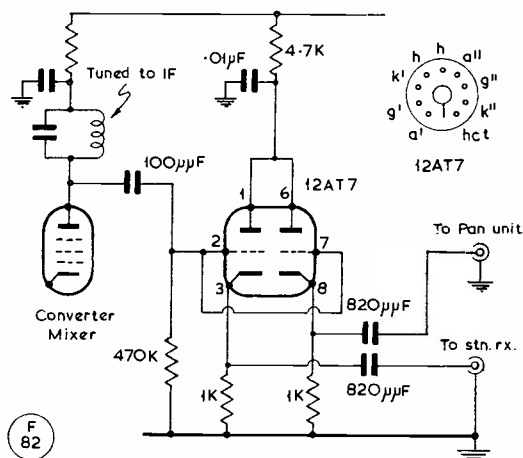


Fig. 3. For correct operation of the panoramic unit, the VHF converter output has to be slightly modified, as shown here — and see text.

hours while one is carefully aligning everything on the unwanted image signal! Providing that mixer, RF and oscillator coils can be set reasonably near the required frequencies by GDO or other reliable means, the rest of the work is straightforward, and may be carried out as follows:

The 1.6 mc IF should be aligned first, and this can be done quite conventionally with a modulated oscillator, a pair of phones being connected at the output point of the receiver. There is no need to spend a long time over this. All IFT's should be peaked, and the Q-multiplier roughly adjusted to give the loudest signal, with its gain control well backed down. The IF stages should show no tendency to oscillate. Having done this, the unit should be connected to the 'scope as indicated in the diagram, Fig. 4, and the sweep-width control advanced about one-quarter of its travel. A signal should now be injected into the front of the unit, at 20.5 mc, and a "pip" should appear somewhere on the screen. If it does not, swing the signal generator until the "pip" is found, and then by adjusting the panoramic unit oscillator coil, bring it into the *centre* of the screen when the signal generator is on 20.5 mc.

At this time, the "pip" is probably a horrible shape, and may even be double-humped since it was only aligned by audible means, but this is of no importance, as the unit is now going to be used as its own alignment device. With the signal generator left on 20.5 mc, the IF transformers should now be trimmed, and it will be found that the "pip" on the tube face can be nicely narrowed up and made quite symmetrical. Adjustment of the Q-multiplier will improve this even further and in less time than it takes to tell an unshapely hump can be transformed into a thin vertical line.

The signal generator should now be swung over the range 20-21 mc, and the sweep-width control, together with the iron dust core in the oscillator circuit V2, L3, adjusted so that the complete range

is adequately covered. At this time the amplitude of the "pip" probably varies widely from one end to the other. This can be remedied by setting the signal generator on 20.5 mc and peaking both RF and mixer coils for maximum deflection. The signal should now be moved to 20 mc, and the RF coil adjusted for peak; following this it should be set at 21 mc and the mixer coil peaked. At this point the amplitude of the "pip" will be greatest at the band edges and lowest in the middle.

Finally the VHF converter should be connected to the unit, and a signal of 136.5 mc applied—if the Satellite band is being covered. This will produce a "pip" in the centre of the screen, and the final output tuned circuit of the converter should be adjusted for maximum deflection. If the VHF signal is now swung over the complete megacycle range, sensitivity will be found to be reasonably level over the entire range. Slight adjustments to any of the three circuits will iron out any small discrepancies.

The alarm circuit is best adjusted in the first case by replacing the relay coil with a meter. Using a VHF signal which produces a "pip" clear of the noise level, the signal should be switched on and off, using different settings of the alarm control. Whichever setting provides the maximum *change* of current is the best one. The spring tension on the relay should then be adjusted so that with no-signal, the relay is just not closing. Small day-to-day variations may be applied by the alarm control, as sensitivity is constant over a small range either side of the optimum.

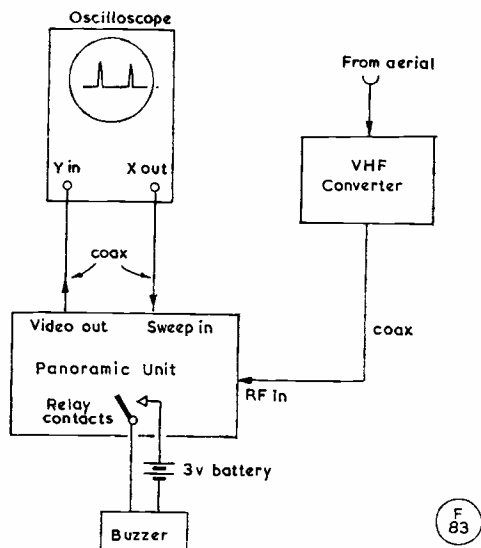


Fig. 4. General layout of the equipment when using the GM3BST panoramic monitoring receiver on VHF. As he suggests, it is not necessary to tie up a good working CRO permanently—a simpler type of oscilloscope, requiring only a time-base (mains frequency) and an EHT supply would do just as well. A VCR-97 surplus type of CRT would serve admirably, or the old "Mullard" basic CRO having a 2½-in. tube.

Using the Unit

When using the unit for long periods of automatic monitoring, there is no need to keep the trace visible on the CR tube, and either the brightness control can be turned right down, or the EHT removed by means of a switch.

While any oscilloscope can be used with the panoramic alarm, if it is to be in continuous operation, it seems rather a waste of a good test instrument, and it is worth while building a "scope" specially for this purpose. Only a very simple CRT indicating device is required. Time-base speed can be constant (about 30-40 c/s is a good value), and there is no need for shift controls to be mounted on the front panel. Only a small amount of video gain is required, a twin triode being ample. The writer uses either a proper oscilloscope, or an old VCR-97 indicating unit and there is really nothing to choose between them for this particular purpose. A VCR-97 gives a nice big trace and there is so much spare room on the indicator unit that in spite of a mains power pack, time-base and amplifier being built on to it, it is still three-quarters empty! It has also occurred to the writer that even an old TV Rx might be adapted for the purpose—"Big Screen Panoramic Reception."

Since building the panoramic alarm, most of the drudgery has gone out of keeping an eye on the Satellite band. It is even possible to keep a good watch and live with the family, just like a normal human being. Perhaps this article will enable some others to do the same!

LET US KNOW IF IT WORKS

We are *always* interested in hearing from readers who build and get results with the various constructional designs described in every issue of *SHORT WAVE MAGAZINE*—whether or not the final version incorporates some modification of their own, or takes a constructional form different from that suggested by the author. In fact, in very few cases are our constructional articles intended to provide the detailed data for Chinese copies—rather, it is intended that the constructional articles we publish should provide the information (and the inspiration) for constructors who have in mind some similar piece of apparatus.

INTERESTING BBC APPOINTMENT

The new head of the department responsible for the recruiting and training of engineers for the BBC is Mr. J. D. Esler, AMIEE, AMJERE, who will be looking for suitable candidates from the Universities, the Colleges of Advanced Technology, and similar educational establishments at which education and training are given in the field of radio communication and engineering. The BBC offers a very attractive career, with good promotion prospects, to those interested in broadcast radio transmission. Over the years, many distinguished amateur call signs have figured on the BBC engineering side—and now the chances for new recruits are even better.

COMMUNICATION TESTS ON EIGHTY METRES

SHORT-RANGE RESULTS WITH VARIOUS AERIAL SYSTEMS

F. G. RAYER, Assoc. I.E.R.E. (G3OGR)

A LITTLE activity on the 80-metre band shows that generally contacts are possible, in one direction or another, to distances usually covering the whole of the British Isles. Spasmodic activity will always produce occasional contacts with whatever stations chance to be heard.

A different picture is always obtained by making contact with a particular station at a specified time. The band is then a communication medium required to provide contact regularly. A brief account of a series of QSO's of this kind is given here, covering about 70 once-weekly schedules extending over some 18 months.

These contacts were originally at 7.15 a.m. BST on Fridays—an excellent time for 80 metres, when the band is relatively quiet. After about four months 10.30 a.m. on Sundays was adopted, when the band is extremely busy. Contacts were usually for 15 to 45 minutes, depending on what there was to talk about.

The station keeping the schedule was GW3OCD, Aberdare, Glamorgan, about 60 miles in a straight line from G3OGR. Results were often confirmed by contact at the same time with GW3OXE, Merthyr Tydfil, 6 miles or so from GW3OCD.

At GW3OCD, the aerial was originally a 126ft. dipole fed through about 250ft. of co-axial cable, as at (A) Fig. 1. (Location of the house and supports made the feeder length necessary.) For the last 25 contacts this aerial was replaced by one consisting of 102ft. cut in the centre, to which was attached 34ft. of 300-ohms twin ribbon, in turn connected to the co-axial feeder (B) in Fig. 2. (An arrangement permitting operation on other bands.) The GW3OCD transmitter was initially a Heathkit DX-40U, later changed to a home-built DX-100U and contacts were always on Phone. An HRO receiver was used by GW3OCD.

The Other End

At G3OGR 90 watts was the usual power, with a CR-100 receiver. For 24 contacts, the aerial was two half-waves in phase, as (A) in Fig. 2. That is, 252ft. with open-wire line. On 20 occasions signals were 9+. One contact was S8, two S9, and one failed due to a local station starting to CQ on the frequency. Most contacts were 6 dB over 9, with some rising to 20 dB over 9.

The next six contacts were with a 136ft. Zepp, (B) in Fig. 2. at G3OGR. Five were 9+, the strongest recorded being 10 dB over S9. One contact was S7.

Eighteen contacts were with 136ft. + 136ft., as at

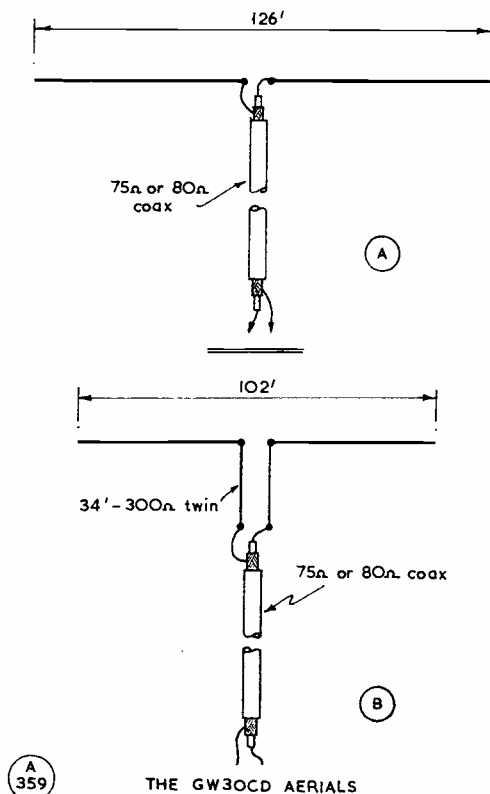


Fig. 1. The aerial configurations for 80m. as used by GW3OCD (Aberdare, Glam.) for a regular series of test contacts with G3OGR (Upton-on-Severn, Worcs.) their QRB being about 60 miles.

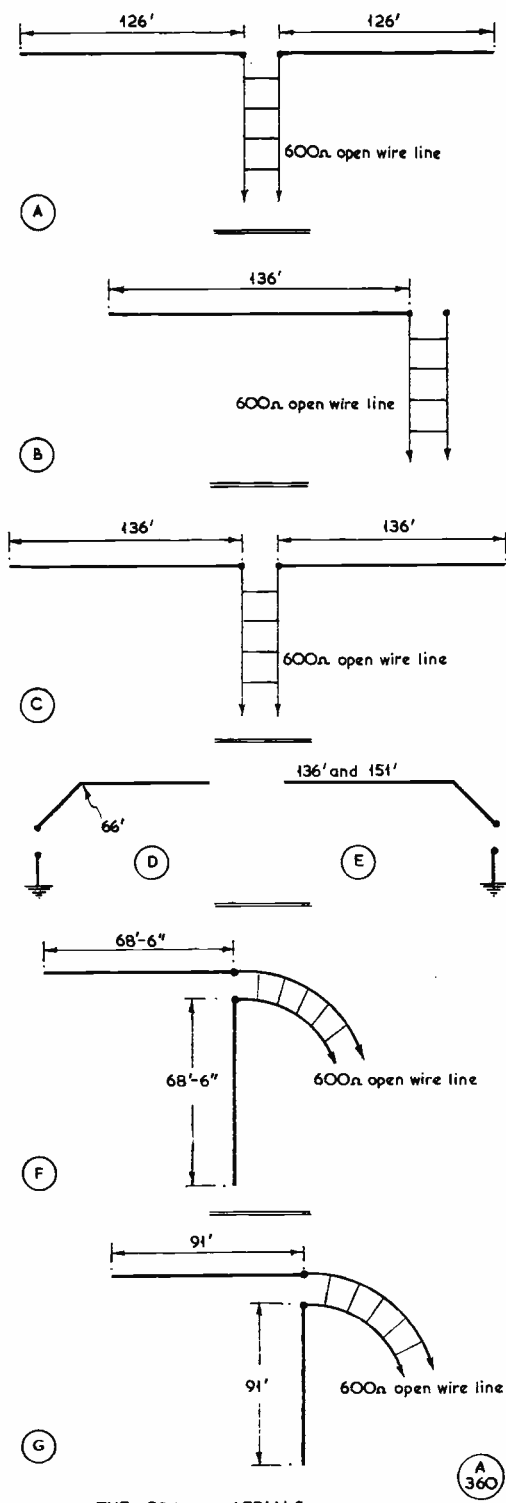
(C) in Fig. 2 (really intended for harmonic operation on 14 mc). These were all successful and similar strengths to those with the two half-waves in phase were recorded. One contact with a quarter-wave Marconi, (D) in Fig. 2, resulted in an S5 report.

At this point the GW3OCD aerial was changed to the multi-band arrangement (B) of Fig. 1. Six contacts were then S8, S9 and 9+.

For the remaining QSO's, aeriels at G3OGR were 151ft. end-fed, (E) Fig. 2, and 136ft. end-fed, also (E) Fig. 2; and two centre-fed all-band aeriels with 68½ft. elements, (F) Fig. 2, and 91ft. elements, (G) Fig. 2. About half these contacts were around S8 to S9, with most of the remainder 9+, the strongest recorded being 10 dB over 9; two contacts failed completely.

Conclusions

Out of about 70 attempts, only 3 failed to result in a QSO. So it followed that at the distance 80m. could be used with considerable success as a communications medium at a pre-arranged time. The most likely cause of failure is not the aerial but the QRM—Sunday morning is probably the worst



THE G3OGR AERIALS

Fig. 2. The 80-metre aerial arrangements tried by G3OGR (Upton-on-Severn, Worcs.) with the results discussed in his article.

possible time to adopt on this score.

It was apparent that a wide variety of aerials would give similar results. Best signal strengths were with the 80m. dipole at GW3OCD and aerials (A) Fig. 2 and (C) Fig. 2, closely followed by the Zepp and aerials (F) and (G) Fig. 2. The (E) configuration was also satisfactory.

It is also hoped that these notes will perhaps suggest an aerial to anyone wishing to get started on 80 metres. The layout at (A) Fig. 1, is for this band only; (B) of Fig. 1 can be used on 80-40-20 and 15m. Both these aerials are frequently operated directly from a transmitter *pi*-tank co-axial output.

All the aerials in Fig. 2 are multi-band (80 to 10m). (A) and (C) also gave good results on 160 metres. With aerials to the configurations of A, B, C, F and G, an aerial tuner is required. (D) and (E) may or may not need an ATU; the tuner is generally preferable. All the aerials in Fig. 2 have worked DX on the HF bands.



Though the new Heathkit Model OS-2 Oscilloscope is small and compact, it has a very complete specification, and is suitable for general servicing and home workshop applications. The tube is a 3in. medium persistence, showing a green trace, and features include a broadband Y-amplifier, external horizontal input and synchronisation by an automatic lock-in circuit. As is usual with all the excellent range of Heathkit apparatus, the OS-2 is available either factory-built or in kit form.

DISCUSSING SINGLE SIDEBAND

TECHNIQUE OF SSB—ADVANTAGES
OVER AM—POWER COMPARISON
AND RATING—RECEIVING SSB
SIGNALS

Part I

B. A. WATLING (G3RNL)

It is hoped that this new series of articles on SSB will lead many AT-station operators still content with AM into the realm of Single Sideband working before the state of our communication bands forces them to make the change. The superiority of SSB in comparison with AM as a mode of transmission has been emphasised in these pages for years, and is nowadays accepted as fact in radio amateur circles—though often without any clear understanding as to why the difference should exist. Unfortunately, SSB has all along been wrapped in a sort of mystique of its own, where no mystery or misunderstanding need be. The aim of our contributor is to reduce the technique of Single Sideband operation to understandable proportions, within the grasp of any radio amateur accustomed to AM phone working.—
Editor.

THIS is not aimed directly at converting you to SSB—that is up to you. The sole object is to try to introduce to you some of the techniques involved in this mode of transmission. The methods and procedures used are not any more difficult than AM or CW, but the *are* different and far more critical. Stability of VFO's become a prime consideration. Small degrees of drift and/or frequency modulation can go almost unnoticed with an AM transmitter: on SSB you just will not put out an intelligible signal.

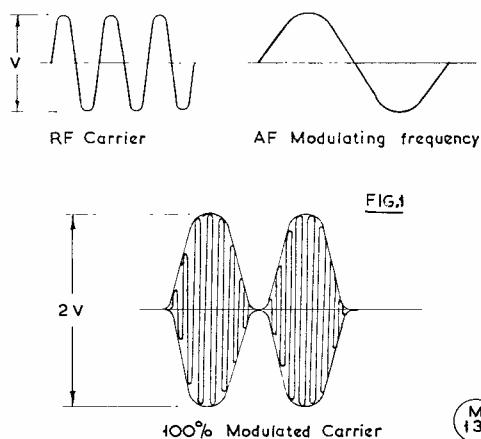
If you already work AM Phone then SSB will open a completely new aspect of Amateur Radio. Stations you work that you consider rather in the DX category will become locals. More stations become available to work. Have you ever called CQ on 80 metres in the evening on AM after listening round to find nobody strong enough to call? If nobody comes back to your CQ next time just switch in the BFO, turn down your RF gain, open up the audio and listen between 3700 and 3800 kc. You'll be amazed!

But what about 20 metres? It is not exceptional to find nothing on the AM section while the SSB area is packed solid with DX.

PART I—THEORETICAL CONSIDERATIONS

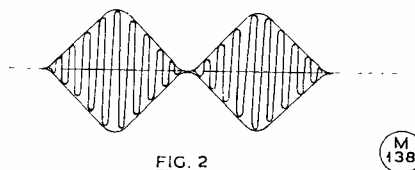
The Concept of Sideband

Amplitude Modulation. The name doesn't help in the understanding of sidebands. But it is difficult to think of a suitable replacement. Unfortunately, a lot of students of radio were taught that an RF amplifier is modulated by varying the HT at audio rate (OK so far) thereby varying the amplitude of the output in sympathy with the audio. That's it, they say! It must be all. Let's look at the make up of a 100 per cent modulated carrier, as shown in Fig 1.



(Yes, but what about these sideband things?) No such thing! Nothing to do with it! (In other words, he doesn't know.) Let's see how a receiver detects this modulated carrier. It appears at the detector, as in Fig. 2. Half of it is chopped off (Fig. 3), the RF is filtered out and the DC component is lost, as in Fig. 4, leaving us with the original AF that we started with! Nothing to do with sidebands! Just one frequency the amplitude of which varies in sympathy with the modulating signal.

This sort of explanation sounds convincing enough, but if that was all, SSB communication just wouldn't be possible!



Sidebands. How can we prove that they exist? This can be done quite easily with a modulated signal generator and a selective receiver.

Tuning over the signal generator frequency with the receiver, its selectivity set at maximum, *i.e.*, minimum bandwidth—say 100 c.p.s., an S-meter

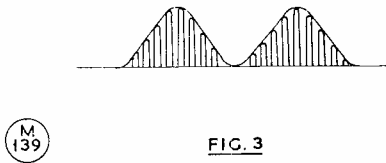


FIG. 3

will reveal three peaks (or more if the modulating frequency isn't a sine wave). The centre peak will be the largest. The other two will be of the same amplitude, and if the signal generator is modulated 100 per cent the two frequencies will be 6 dB down from the centre one. If the receiver has enough calibrated bandspread such that the frequency separation can be measured it will be found that the two side frequencies are separated from the centre frequency by an amount equal to the modulating frequency. If we call the centre frequency f_c and the modulating frequency f_m , then the three frequencies are: f_c , $f_c + f_m$ and $f_c - f_m$. (That looks familiar!)

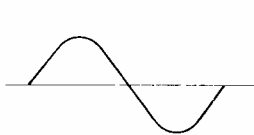


FIG. 4

A spectrum type diagram shows this quite clearly, as in Fig. 5. Note that f_c being 6 dB greater than the side frequencies means that f_c is twice the voltage of these. If f_c is the carrier frequency then $f_c + f_m$ is termed the Upper Sideband (USB) and $f_c - f_m$ is the lower Sideband (LSB).

These three frequencies remind us a little of our early learning of superhet mixers. And so it should! The PA stage is just a mixer. It mixes the carrier frequency with the modulating frequency. Remember back when you were first taught about mixers? Well, to refresh your memory a mixer must be a non-linear device. That is one of the reasons why we use a Class-C PA.

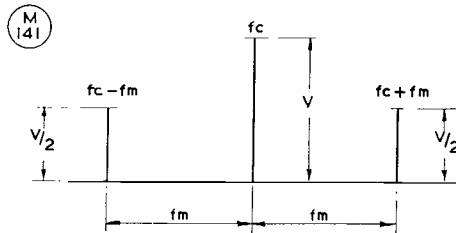


FIG. 5

An AM transmission would be more accurately described as Double Sideband Full Carrier. How do we arrive at that 100 per cent modu-

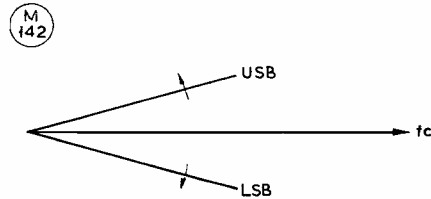


FIG. 6

lated envelope? Easy, but we have to get a little complicated here and discuss this in terms of vectors. A vector is a line representing a sine wave. Its length represents the amplitude; its speed of rotation (anti-clockwise) represents the frequency. A carrier frequency modulated 100 per cent by a sine wave produces three sine waves in the RF spectrum. If we take the carrier f_c as the reference and draw that as being stationary, then the two sideband frequencies are drawn one faster than f_c (the USB) and the other slower (LSB), as indicated by Fig. 6.

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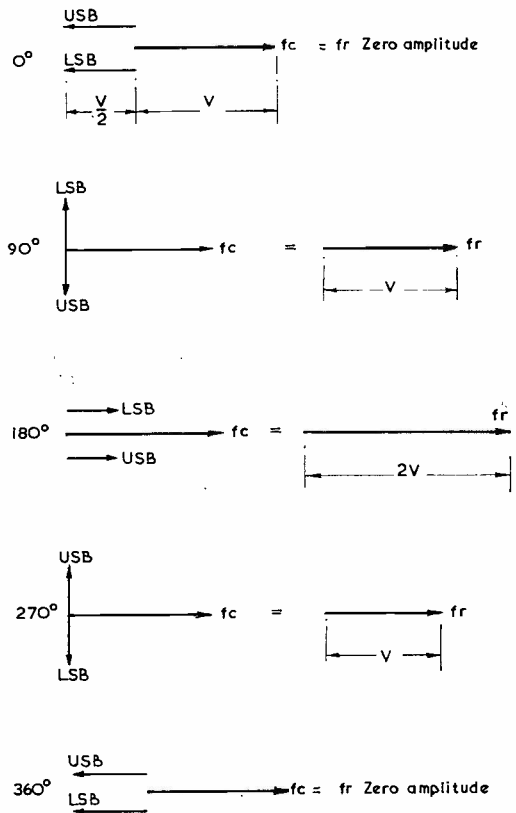


FIG. 7

(M 143)

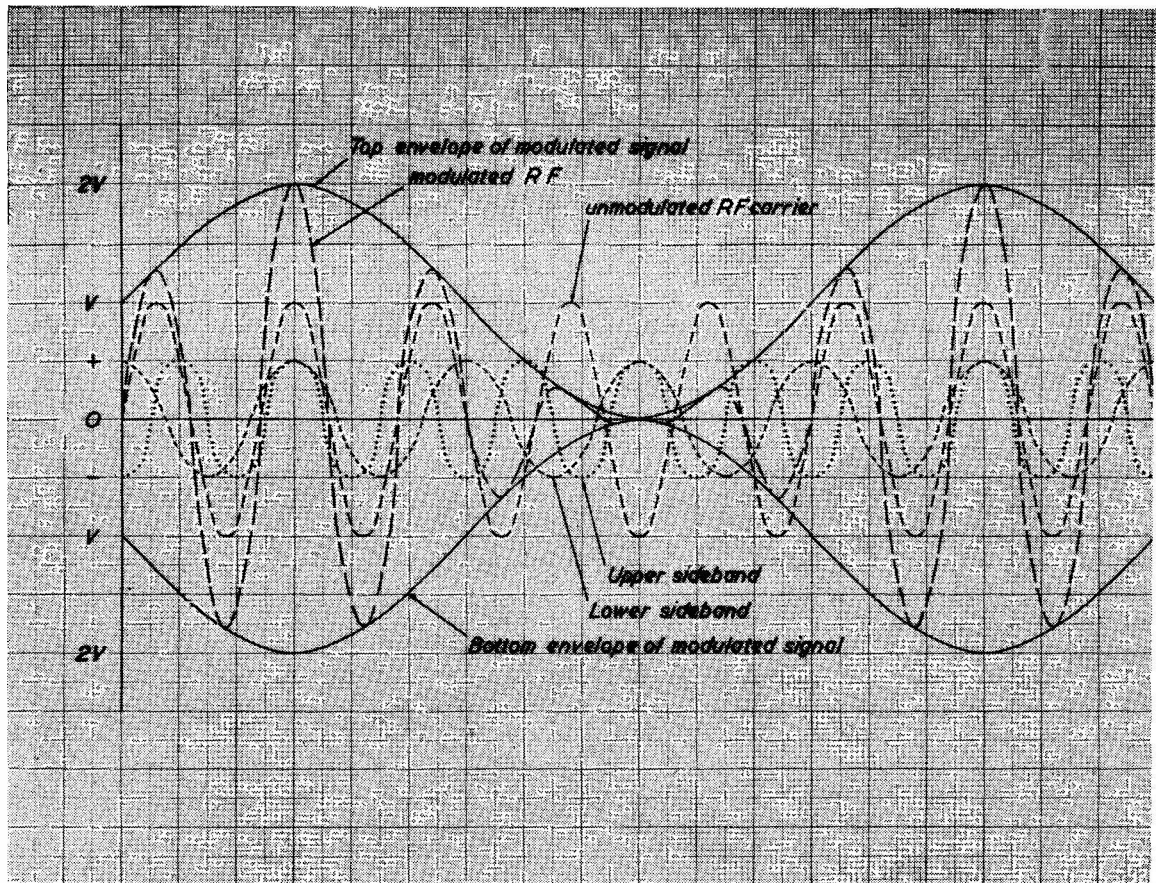


Fig. 8. Careful study of this sketch, with what has been discussed in the text up to this point, should enable the sideband and carrier relationships to be unravelled, essential to a clear understanding of the operation of a Sideband transmitter.

The vectors representing the USB and LSB are half the length of f_c . The angle between the vectors represents the phase difference at that instant.

If instantaneous positions of the vectors are resolved and plotted through 360° rotation of the sideband vectors, then we can plot the resultant amplitude at that instant, as in Fig. 7.

At 0° the resultant signal (f_r) is zero amplitude; at 90° it is the same amplitude as the original carrier; at 180° twice the carrier amplitude and so on. Compare this with a 100 per cent modulated envelope diagram. The same! If the vectors are plotted at smaller increments then that representation will follow exactly the envelope diagram.

To prove that vectors are easy let's look at a diagram of 100 per cent modulated AM signal drawn as sine waves, as in Fig. 8.

With speech modulation the two sidebands stretch out either side of the carrier frequency. These sidebands are mirror images of each other. *Only the sidebands carry information.* The carrier

is there purely as a reference vehicle, just like the paper this is printed on. Only the inking carries the information.

Let's see, then, the theoretical gain of SSB over AM. One says "theoretical" because in practice things do not usually work out quite the same. In fact, with SSB the gain in practice appears to be more than the theoretical figure!

Just re-capping, the peak voltage of a 100 per cent modulated AM signal is twice the unmodulated carrier voltage or four times the unmodulated carrier power ($P \times V^2$). If your unmodulated output is 10 watts then, when you 100 per cent modulate, your maximum instantaneous peak envelope power (p.e.p) output is 400 watts. In terms of input, 100 watts output can be supplied by a PA in Class-C at $66\frac{2}{3}$ per cent efficiency running 150 watts DC input. The extra input power to provide 400 watts p.e.p. output (600 watts p.e.p. input) is provided by the modulator which doubles the PA anode voltage on peaks. This does not necessarily mean that we can use the same valve

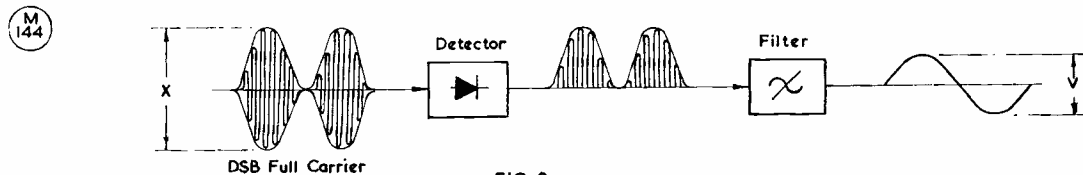


FIG. 9

with twice the anode voltage; some will not stand it.

One other point, PA's for SSB must be linear amplifiers, *i.e.*, they must reproduce exactly at their output an enlarged version of the input signal with no distortion. Class-C is out! Class-AB₁ is popular for relatively low power; this class needs no driving power, *i.e.*, no grid current. There's one TVI stopper! You could run to the legal limit with a PA in AB₁ with only an EF80 driving it! Class-B however is generally used for the higher powers because it is more efficient than AB₁, such an amplifier being driven by a lower power AB₁ linear. The efficiencies of AB₁ and B operation, however, are less than Class-C used for AM. Don't let this deter you, though. We in the U.K. are licensed for SSB on *output*! The G.P.O. tell us to do it this way:

Take one Class-C PA running 66½ per cent efficient and load this to 150 watts DC input (100 watts output). Using a 'scope on the output, note the deflection. Now when on SSB, voice peaks must not kick up the 'scope to more than twice what it was.

This is, of course, exactly the same as would happen in AM working. The regulations are saying, in effect, that our legal limit is 400 watts p.e.p. *output*, irrespective of what the input is; we could run 15 kW input if that were required to produce the 400w. p.e.p. output.

The gain of SSB over AM is worked out as follows: Consider first what a DSB full carrier (AM) signal will produce into the audio amplifier section of your Rx, as shown in Fig. 9 above.

If we remove one sideband then the other must be doubled in order to modulate the carrier 100 per cent with the same p.e.p.—*see* Fig. 10.

If now the carrier is removed then the remaining sideband can be doubled in voltage for the same p.e.p. At the Rx carrier must be re-inserted. If we do this in the final IF amplifier, then a standard AM detector will suffice. The re-inserted carrier level must be at least as big as the incoming sideband signal, as in Fig. 11. The voltage output from the detector is twice as much as from the original 100 per cent modulated AM. Twice the voltage means a gain of 6 dB.

The spectrum space taken up by this single sideband signal is only half that of DSB. Therefore, a further theoretical 3 dB of gain can be achieved by the improvement in signal-to-noise ratio. (This, of course, is only evident if the receiver bandwidth can be reduced.) This extra 3 dB becomes debatable because you could receive a DSB signal with this

increase by decreasing your receiver bandwidth. Generally, the filters in SSB rigs are arranged so that the audio spectrum is from about 300 c/s to 3 kc. Some even reduce the upper limit to about 2 kc. This is all that is needed to provide good communication quality. (We're not after hi-fi in this context.)

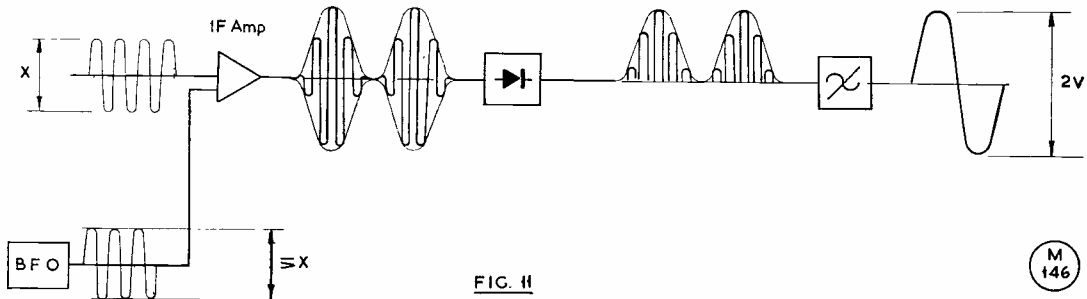
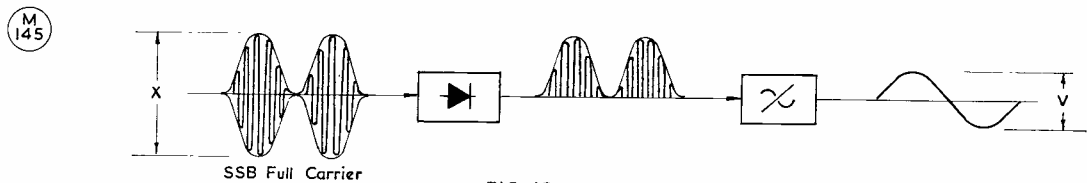
Receiver Considerations

Now we're transmitting an SSB signal (you'll see *how* later) what does it sound like on a receiver? Well, if you try to tune it in the same as an AM signal it won't sound very good. A lot of quacking and gurgling! We must put the carrier back in. That's what your BFO does. If it is inserted where the suppressed carrier was—in fact, mix it with the remaining sideband, then an ordinary AM detector will resolve it—and this, of course, is how many people take Sideband. However, the ratio between the received sideband voltage and the re-inserted carrier voltage is important—in other words, the level of BFO injection. With a 100 per cent modulated carrier the sideband is half the voltage of the carrier. If it is more than half, distortion will result. Well, the same holds true when we re-insert carrier at the receiver. The *least* distortion occurs when the carrier is *several times* greater. But receivers do not usually have the facility for varying the level of BFO injection. It is necessary, therefore, to adjust the RF gain control to reduce the received sideband to the correct level—alternatively, to have some method of increasing, or controlling, BFO injection.

The other important and fairly critical point is the *frequency* of the inserted carrier. If an upper sideband (USB) signal is being received with the carrier too high in frequency, everything will sound low pitched. To resolve your first SSB signal on an ordinary communications Rx not having a product detector, the following procedure should be adopted:

- (1) Tune the receiver over an SSB signal until you get maximum deflection on the S-meter,
- (2) Turn down the RF gain and the AF gain up to maximum; adjust the RF gain until you can just hear the signal,
- (3) Switch on the BFO and vary its frequency until a natural sounding voice emerges. Use the RF gain as the *volume* control—thus, you will automatically adjust the received signal to your BFO injection level.

If you did that on 20, 15 or 10 metres then if you tune your receiver HF the voice will get



progressively deeper—because the international convention is that USB is transmitted on these three bands and therefore that BFO setting will be OK for all of them. All you need to do to get other stations is to tune your receiver over the signal (with the BFO still on) until the voice sounds natural.

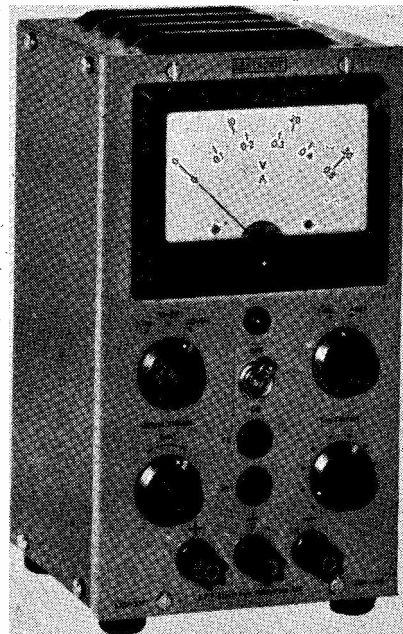
SSB transmitters on 160, 80 and 40 metres transmit LSB. The BFO must be switched off again and a signal tuned in for maximum S-meter reading, thereby centring it in the passband of the receiver. The BFO can then be switched in and adjusted until the voice once again sounds natural. It is as well to mark the two positions of the BFO. This facilitates quicker band hopping.

Receiver stability is of prime importance. Drift will show up as a change of voice pitch. More than 50 c/s of frequency change could make the signal unintelligible.

Most communications receivers will give perfectly adequate performance when properly used for SSB reception. For more serious listening the least that should be done is that the BFO injection should be increased, with slow-motion on the variable pitch control. More drastic modifications could include a product detector in place of the standard AM detector. The product detector introduces far less distortion, making an outstanding difference to the received signal—see *SHORT WAVE MAGAZINE*, January 1964.

More of this later. How about some circuits. We'll see next time how an SSB signal is generated.

(To be continued)



This is the new "Lektrokit" LKU-331 variable power supply unit, which gives output over the range 0-30 volts DC, at a maximum current loading of 0.5 amp., with overload protection. The output is floating, which means that either pole can be taken to earth.

POWER MEASUREMENT ON AMATEUR SSB TRANSMITTERS

POST OFFICE RULINGS DEFINED

Engineering Dept., G.P.O.

Ever since the advent of SSB on the amateur bands, there has been misunderstanding and confusion as to how a Sideband transmitter should be operated to meet the U.K. regulations as regards power used by an AT-station. This article is based on a Post Office paper intended to make the position quite clear. It will in due course be written into the terms by which all U.K. amateurs hold their licences. In the meantime, it can be said that the definition as given here is both fair and easy to understand.—Editor.

ONE condition of the Amateur Sound Licences "A" and "B" effectively limits the maximum power that may be radiated, the permitted power level being dependent on the frequency used. The power **output** level has not hitherto been specified but the licence has stated the maximum permitted DC power input to the final amplifier stage of the transmitter, i.e. the stage feeding the aerial. For instance, in the 3.5-3.8 mc (80-metre) amateur band the maximum permitted DC input is 150 watts. Assuming that the conversion efficiency of the transmitter final stage is 66 $\frac{2}{3}$ per cent the mean RF power delivered to the aerial with 150 watts input would be 100 watts, giving a *peak envelope power* of 400 watts under 100 per cent amplitude modulation conditions. (Peak envelope power, p.e.p., is the average power supplied to the aerial during one radio frequency cycle at the highest crest of the modulation envelope.)

Measurement on SSB

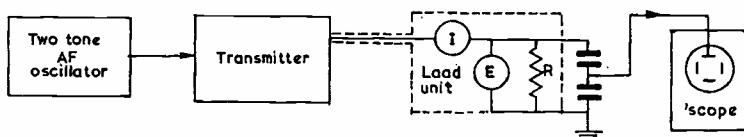
In most transmitters it is a simple matter to measure the current and voltage in order to determine the DC power supplied to the PA, and this process is generally satisfactory for telegraphy (A1 and A2) and double-sideband telephony (A3), or AM Phone. In single-sideband working (A3A, A3H, A3J), however, the Tx output stage operates (or should be) in a linear condition, where the 66 $\frac{2}{3}$ per cent efficiency factor no longer applies and DC power is supplied even when there is no RF output.

The most satisfactory method of assessing the power rating of a linear amplifier is based on measurement of RF *output* power instead of DC *input*, and it is output power rating that is now generally used in the commercial transmitter field. Accordingly, the Post Office has now specified a method of power assessment for amateur Sideband transmitters in which the permitted p.e.p. output from an SSB transmitter does not exceed that from a CW or AM Phone transmitter using the maximum permitted DC power input. This method, which should be used wherever appropriate in preference to the DC *input* method, can be set up as shown in the diagram, but licensees may find the following comments helpful.

Method of Measurement

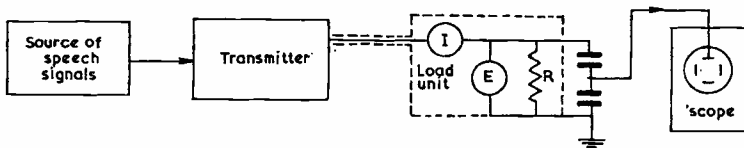
The sketch below shows how the various items of equipment are connected during power measurements. The transmitter output is terminated in a resistive load of the appropriate impedance value and provided with an RF ammeter or rectifier/voltmeter to enable the power in the load to be calculated. The load should have low reactance at whatever frequency is used (say, a non-inductive carbon resistor) and should be surrounded by an earthed screen. A cathode-ray oscilloscope is set up to observe the output waveform in the load; with most oscilloscopes the necessary high-frequency response and high-impedance input can be obtained

Amateur SSB Transmitters - Power Measurement:



CONDITION 1 : $E^2 + R$ or $I^2 \times R =$ mean RF power output.
(RF ammeter or RF voltmeter may be used).

V represents peak envelope power
= (2 x mean power).



CONDITION 2: Speech peaks should not exceed p.e.p. level represented by V

C.R.T. Display

only by making a connection direct to one of the vertical deflection plates. A capacity potential-divider may be used for controlling the input to the oscilloscope, as shown.

The first step in the measurement procedure is to adjust the SSB Tx for suppressed carrier operation and to connect two audio-frequency tones of equal amplitude to the transmitter input. The Tx is then adjusted to give a mean RF power output, as measured in the load, of the value appropriate to the frequency band involved (for instance, 200 watts at 3.5 mc—see Appendix). If the time-base is correctly adjusted the oscilloscope will display the RF envelope waveform resulting from the combination of the two tones. Provided that the input tones are sinusoidal and that the transmitter is not overloaded the peak envelope power (p.e.p.) output will be twice the mean power measured in the load, and the maximum deflection on the CRO display will represent this p.e.p. level. By this process the oscilloscope can be calibrated to indicate the maximum permitted p.e.p. for any frequency band.

The second step is to adjust the transmitter for A3A, A3H or A3J (SSB) operation and to replace the two-tone input by speech, the level being adjusted so that the CRO deflection on speech peaks does not exceed the calibration level. The transmitter is then providing the maximum permitted p.e.p. output and line-up conditions should not subsequently be altered in such a way as to increase this output.

Inspection of Amateur Stations

Post Office engineers inspecting amateur stations will use the method described above to measure the power output of SSB transmitters, and will be provided with the necessary test equipment.

Here it should be noted that a licensee is not obliged to provide himself with a two-tone oscillator, dummy load and oscilloscope—but this equipment is most useful not only for power measurements but also for checking the general performance of his transmitter.

As soon as possible, the Post Office proposes to amplify the schedules to Amateur Licences to include the new specification. Meanwhile the G.P.O. will have no objections where licensees operate their SSB transmitters within the power limitations of the new specification, as described here.

APPENDIX

Power Measurement of SSB Transmitters

The method now specified for power measurement of SSB transmitters is as follows:

Suppressed or reduced carrier, single sideband operation. The radio frequency output peak envelope power (RF p.e.p.) must not exceed that from an A3 transmitter working at an overall efficiency of 66 per cent when supplied with the appropriate maximum permitted DC input power. The output power shall be measured, using a

resistive dummy load, RF ammeter or voltmeter and oscilloscope, by the following method:

(i) Apply two non-harmonically related sinusoidal tones of equal amplitude to the SSB transmitter, with the carrier fully suppressed and adjust the input power to give a mean radio frequency output power under linear operation of 200 watts (see Note 1) when measured into a resistive load by means of an RF ammeter or voltmeter (see Note 2) or equivalent method. Under this condition note the peak-to-peak deflection on the cathode-ray oscilloscope (see Note 3).

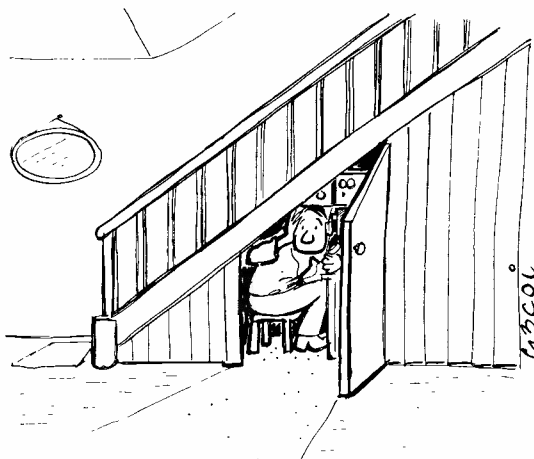
(ii) Replace the tone by speech; the maximum vertical deflection on the cathode-ray oscilloscope shall not be greater than the previously recorded deflection obtained with the two-tone input.

Note (1) 200 watts mean radio frequency output power in the case of those bands limited to a maximum DC input power of 150 watts; 66½ and 13½ watts for those bands limited to a maximum DC input power of 50 watts and 10 watts respectively.

(Note 2) In the case of VHF and UHF measurements the RF ammeter or voltmeter may be replaced by a crystal rectifier and calibrated meter; for SHF measurements a bolometer may be used.

(Note 3) In the case of VHF, UHF and SHF measurements this use of an oscilloscope may not be practicable. In this case the test may be limited to a measurement of the mean radio frequency output power as outlined in Part 1 of the procedure.

P.O. Engineering Department, W1 3/3,
2-12 Gresham Street,
LONDON, E.C.2. October, 1965.



“... Sounds as if you might be a bit too far from the mike, OM...”

RTTY Topics

ON SHOW AT THE
EXHIBITION—B.A.R.T.G.
AFFAIRS—TOURING THE
CLUBS—IDEAS, INFORMATION,
NOTES AND NEWS

W. M. Brennan (G3CQE)

A QUICK look back over the past twelve months is sufficient to show that Amateur RTTY has made great strides during this period. Apart from the hundreds of recruits that the mode has gained and the many new countries that have appeared on the air with RTTY, there has also been some technical progress with new receiving techniques, and more and more recognition of RTTY as a normal mode of amateur communication not only by amateur organisations but also by the various licensing authorities throughout the world. As far as this country is concerned, there has also been much more RTTY gear available to amateurs at prices which are reasonable. 1966 promises to be even better and this, with the improvement in HF propagation, should make it an interesting year from every angle.

RTTY At The Show

This year's Radio Communications Exhibition at the Seymour Hall had its fair share of RTTY attractions, with T/P equipment appearing on three of the stands. The Royal Navy had a full blown station in operation with their printers keying a transmitter "somewhere in the north of England." The very compact Creed Model 75 T/P's in use were the envy of almost all the keyboard pounders who visited the stand. The receiving set-up consisted of three

Navy B.40 receivers feeding a U.S.N. CV-89/URA-8A twin terminal Unit. Each of these T.U.'s has a built-in 'scope tuning indicator of the "flipping line" type, the T.U.'s themselves being of the AF Discriminator variety. The stand was manned by R.N.R. personnel and the Wren T/P operators showed that they were able to type out the copy at the same rate as the Auto-TX with apparently very little effort—but then they do use all ten fingers!

The British Amateur Teleprinter Group provided a stand for the first time this year, thanks mainly to the efforts of G2HIO and his XYL. The day before he was due to drive from Stoke-on-Trent to deliver the stand material and equipment to the show at London, G2HIO was involved in an accident in which he unfortunately lost the first two joints of one of his fingers. In spite of this and with his wife driving he delivered the gear at the Hall on time where a willing band of helpers quickly got to work erecting it.

Those who manned the stand were kept very busy answering the thousand-and-one questions that puzzle strangers to RTTY—including the usual one about how a T/P works in one easy (?) lesson. The pace was rather hard on both the feet and the vocal chords but very worthwhile according to all concerned. Due to a number of factors, it was not possible to provide an on-the-air station this year but very good use was made of various tapes including some of RTTY "Artwork" pictures and at least one young visitor stood with his mouth open for the whole of the 20 odd minutes that it took the T/P to print out a picture of a very shapely female! By the end of the show a goodly number of new members had been enrolled and the RTTY poison injected into many more.

The RSGB's HF and VHF stations were both equipped for RTTY QSO's in addition to the usual CW and phone working, and both stations made use of their printers from time to time.

The Show itself had some stands devoted to the sale of surplus gear and at least one of these was offering both T/P's and T.U.'s for sale. As usual, of

Who's blinding who with RTTY science! Among the stalwarts who helped to look after the B.A.R.T.G. stand at the International Radio Communication Exhibition (all same Amateur Radio exhibition) were, left to right, G3PED, G3LJB, G3GNR and G2FUD—all call signs well known in the RTTY field.



course, the Saturday afternoon saw the Hall completely packed with visitors and anyone who wanted to move quickly needed either a helicopter or a very sharp toasting fork!

The B.A.R.T.G. Meeting

The annual general meeting of this group took place in a hostelry adjacent to the Show on the Saturday evening. It was attended by approximately 40 members (it was difficult to count heads) and among these were some of the regular visitors from Holland, PA0FB, PA0XW and PA0HJK. The Dutch Amateur Society, VERON, were having their 20th anniversary celebrations and this accounted for the absence of some of the operators from the VERON Hq. station, PA0AA. Much of the evening was of course given over to the normal business of an AGM, but at the end of this came the opportunity for personal QSO's which are so much enjoyed by everyone. With the aid of a napkin left over from the buffet, PA0XW gave a run down and some of the circuitry of a selective dialling system which he has developed for use on VHF RTTY. This is an extension of the "autostart system" widely used in the large cities in the U.S.A. By means of this system, one station can come on the air and activate the T/P of one or more stations when their owners are absent. The printer is started up, a message is passed to it and it is then switched off. Its owner may then read the message whenever he happens to be in the shack. The system developed by PA0XW takes this piece of automation one stage further by enabling the transmitting operator actually to select which stations should receive the message, therefore passing it only to those stations for whom it is not intended. The system makes use of selective tones transmitted prior to the message and the apparatus involved uses several transistors and diodes *plus* a standard telephone dial.

The meeting elected the new Group officers for the coming year and these are: G8LT (chairman), G6NZ (vice-chairman), G2HIO (hon. secretary), SWL A. T. Morton (treasurer), G2FUD as the compiler of the excellent B.A.R.T.G. *Newsletter*—and as a committee, members G3CQE, G3IIR, G3MBQ, G3PED and G8DD. These officials serve a group membership of some 250 including quite a fair proportion in countries overseas.

Club Secretaries Please Note!

As interest in Radio T/P operation grows in this country, there is more and more demand for lectures on the subject by various Clubs up and down the country. A number of RTTY enthusiasts have been spreading the good word and during the winter season even more bookings have been made. G3FLG gave a RTTY demonstration to the Chester A.R.S. with both G2FUD and G3MWI providing RF links from their respective shacks. G6CW has given talks on RTTY operation to the Newark and Loughborough Societies, whilst G2HIO visited the Slade A.R.S. and gave another talk illustrated by slides, with a RTTY demonstration. On October 10 at the

Northern Amateur Radio Societies Association Convention at Belle Vue, Manchester, G3MBQ put on an RTTY stand, aided by G2FUD and SWL Stephen Ward. The gear used included a Creed Model 54 T/P and the stand attracted a great deal of attention.

In an endeavour to recruit some new members for their local club (The Heanow & District A.R.S.) G3OVZ and G3RVB have been handling the RTTY side of an almost travelling radio amateur exhibition. In recent months they have given RTTY demonstrations at no less than eight carnivals and open days, to two schools and have also played at home to their own club—at well spaced intervals! This enterprising group have even more ambitious plans for the future. They have acquired very cheaply, a caravan and intend to convert this into a complete mobile exhibition station that can easily be towed to the various venues! Such a set-up will greatly reduce the problems of transporting and setting up bulky and complex equipment at each function—and no less the problem of dismantling it all again, since G3OVB reports that sometimes they have almost to boot enthusiasts off the stand in order to get their gear taken down in time for them to arrive home at some reasonable hour of the night! It will be interesting to see a picture of the completed caravan, in due course.

Drool Department

In the commercial world, where accuracy in communication is of the utmost importance, a vast amount of complex equipment is used to ensure that a T/P actually prints exactly what is being transmitted. It is not often that gear of this calibre falls into amateur hands but at least one such fortunate individual is G3PED (Ilford, Essex). He has recently acquired a complete triple-diversity receiving set-up that has performance figures which read like something out of the future. The gear has the title of "Marconi CRD150/20B and HSR1" and it is capable of operating up to a maximum keying speed of 280 bauds. The complete assembly is housed in two 7ft. bays and weighs some 1,430lbs.

There are three receivers type CRD150, each of these being double-conversion, and they are all driven from a common local oscillator on both conversions. Each Rx has two stages of signal frequency amplification and covers from 1.5 to 30 mc, in five switched bands. The first IF is at 1.2 mc and the second conversion is down to 465 kc, with two IF amplifiers at this frequency; the three separate channels are then passed on to the HSR1 unit, which contains yet again three separate stages of conversion bringing the IF down to 100 kc. Following this the three channels each pass through a xtal filter and on to a "path selector" stage which automatically selects the strongest channel for use. This signal is detected and passed to an AF stage and on to a limiter and discriminator in accordance with normal T.U. practice. The discriminator output is then converted into the usual DC keying signal required by the T/P. Both AGC and AFC are provided and the

General view of the British Amateur Radio Teleprinter Group stand at the Amateur Radio Exhibition, showing left to right, an FSR1. 1X Terminal unit (under tea-cup!), a Creed Type 7TR Repeater, a Creed 7B Teleprinter, local loop control unit for running demonstration tapes, and a Creed Type 1B auto-sender. Those on the stand when this was taken were G3PED and G3LJB.



latter will handle a drift of ± 4 kc.

The receivers have variable selectivity giving bandwidths of 8, 2.5, 2.0 kc or 1000 c/s. With the addition of the audio filter provided, a bandwidth of 100 c/s is also available. All figures quoted are bandwidths for 60 dB points. The receiver sensitivity is 0.3 to 0.6 microvolt for a 10 dB signal-to-noise ratio when the 2 kc bandwidth is in use. Second channel (image) rejection is 70 dB between 1.5 and 9 mc, 50 dB between 9 and 16 mc, and 25 dB between 16 and 30 mc. The common receiving local oscillator is a highly sophisticated piece of circuitry and in addition to giving an extremely stable continuously variable freq. oscillator, also provides the operator with nine xtal controlled frequencies.

Such an exotic piece of gear, of course, costs an equally exotic price, and this was originally in the region of £3,800! The arrival of this "little stranger" in the G3PED household happily coincided with a move of the shack from an upper floor down to the ground floor! G3PED hopes quickly to gain the confidence of his latest find and soon to get it into training for copying the proverbial "two bits of wire scratched together in Siberia!"

Do You Need Asia For RTTY WAC?

G6UF reports that KR6UD wishes to arrange skeds with any U.K. station needing an Asian QSO with either KR6UD, KR6UL or KR6DB. All three stations will be looking in this direction between 1000 and 1300 GMT on 14090 kc and will be pleased to contact anyone who cares to fire some bauds towards Okinawa. Apparently, KR6UL runs the full gallon on FSK but KR6DB is QRP (a relative term!) but nevertheless puts a potent signal into Europe. Another station also active on RTTY from the Island of Okinawa, is KR6BQ.

The B.A.R.T.G. QCA Award

This certificate is now available to anyone who can submit proof of having completed two-way RTTY QSO's with stations in 25 different countries.

It is entitled the "Quarter Century Award (QCA)" and there are stickers for each batch of additional 25 countries up to the 100 mark. Applicants should send the cards, together with the equivalent of one dollar (which covers only the cost of return registered postage of cards and certificate) to the BARTG Certificate Manager, G3CQE (QTHR). This is a worthwhile sheepskin to have on the shack wall and it is hoped that a further award will be available for those who qualify for the three extra stickers, to bring their score up to the 100 point.

RTTY on VHF

There is increasing use of RTTY on VHF these days and a start has been made on four metres as well as the more usual two-metre band. Those active on 70 mc include G2AFD (Malvern), G3PLX (Liverpool), G3SZN (Rickmansworth) and G3TTV (Cheshunt). On two metres, a new "First" was chalked up when PAØFB worked GM3NZI (Bathgate). Later, GM3NZI collected both PAØLB and PAØYZ to make a nice hat trick. The Dutch stations have a 2m. T/P net most evenings with a calling frequency of exactly 145.8 mc and stations contacting on this channel then move off to some agreed spot in order to leave the calling channel clear for others. Some of the G stations recently active on 2m. RTTY have been G2FUD, G2AFD, G3MWI, G3NES, G3PLX, G3LAY, G3GGR, G3SZN and G6CW.

Other News

A number of New Zealand stations are now regularly operating on the DX bands and these are ZL1ADL, ZL1JT, ZL1WB, ZL2AKH, ZL2ALW, ZL2AQT, ZL3HJ and ZL3VP—according to ZL1WB, who for years held the ZL RTTY fort single handed. The ZL lads are always anxious to get in some printing with the U.K. stations and always have their ears to the ground on 14090 kc—particularly at weekends. Between 0700 and 0900 GMT is probably a good time for this exercise.

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One of the French newcomers to RTTY is F3PI, who happens to be the great grandson of Baudot, the man who invented the code named after him. This code is, of course, the one from which the present T/P code was developed by the addition of the stop-and-start pulses.

On Guadaloupe, FG7XT has been joined in his RTTY activities by FG7XX, and in Liberia EL8B is being supported by EL8X, according to a report (with some copy) from SWL Colin Jones of Plymouth; Colin also mentions that DJ6ZBA was heard calling (or seen calling?) MP4BBA, and that 5A5TR has now left North Africa; but this still leaves 5A3TX active from that part of the world.

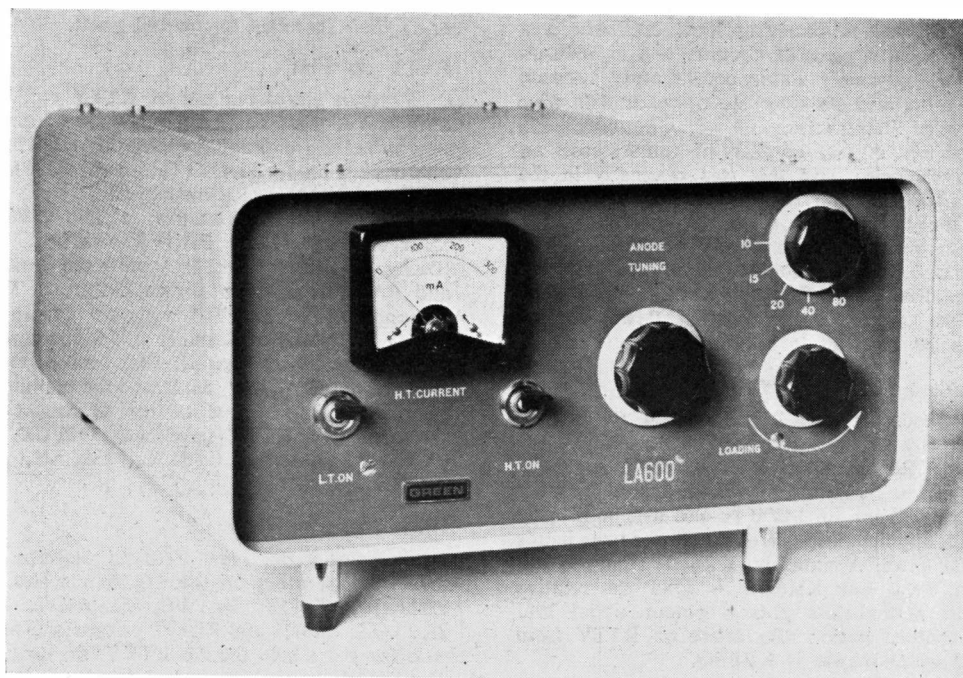
G3LLV is now settling in nicely with his new job in Malawi and has already been allocated his new callsign, 7Q7JO. The crate of RTTY gear should be arriving in early December . . .

The November issue of *RTTY Magazine* carries a short item about the DL6EQ T.U., by WA6ASU, who recently built it and set it up as per the method suggested in "RTTY Topics" in the August, 1965 issue of *SHORT WAVE MAGAZINE*. He comments that he has yet to hear a signal on the receiver that he cannot get good copy from, and goes on to say that the T.U. is remarkably tolerant of QRM. This confirms the findings of several owners of this type of T.U. who have written in about it. If you have

not yet tried a two-tone T.U., you might just be missing something!

There is not time this month to comment fully on the RTTY SS Contest but conditions were quite favourable for almost all the Contest period. All six continents were available and 15m. was very active indeed as far as QSO's with the States were concerned. On 20m. the West Coast U.S. stations were pounding in during the late afternoons of both days and signal reports of 599 were exchanged between Europe and W6 and W7. The Contest was very well supported indeed and a full report will be given in the next "RTTY Topics" (February 1966). During the Contest, G3MWI put in a total of 47 hours' operating out of the full 48—it is to be hoped that he will have recovered by the time you read this! G3MWI clocked up a very high score for this marathon effort and we look forward to seeing the final placings.

Finally, it is a privilege to be able to wish all interested in RTTY a Very Merry Christmas and a Prosperous New Year *via* these columns—with thanks to all who have helped to make these bi-monthly offerings possible during the past year. May you never run out of RTTY paper and if you don't find a Model 75 in your stocking—*waal*, look under the tree, he probably left it there! Cheers and BCNU, *de* G3CQE.



The LA600 is the latest linear amplifier from Green Electronics, for CW/SSB operation and running the maximum legal power. Well designed and finished and robustly constructed, it is band-switched for 10 to 80 metres and self-contained for power. The manufacturer's address, with effect from early in the New Year, will be Green Electronics & Communications Equipment, Ltd., 79-91 Braemar Road, London, N.15 (Tel: STAmford Hill 1387).

DUAL SPEED GOVERNOR FOR TELEPRINTER MACHINES

MODIFICATION FOR 45 TO 50
BAUD OPERATION

R. W. ADDIE, M.A. (G8LT)

(Chairman, British Amateur Radio Teleprinter Group)

MOST RTTY operators will have encountered the problem of working stations who may use either 45 or 50 bauds, unless their activities have been confined to the DX bands. There are two schools of thought—the one advocating the use of 45 bauds for all RTTY amateurs, while the other recognises that 50 bauds has been the European telecommunications standard for years and is so recognised by the C.C.I.R.

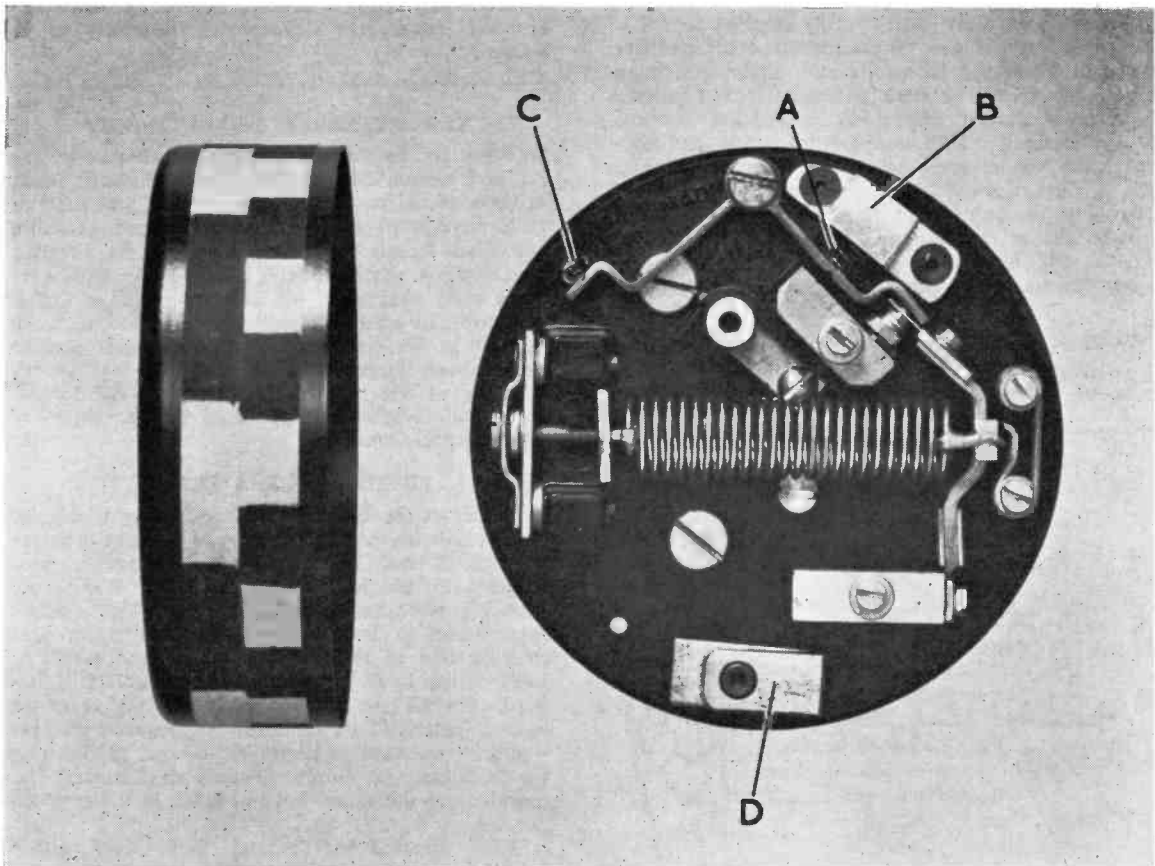
In terms of maximum words per minute the respective speeds give figures of 61.33 w.p.m. for 45 bauds and 66.67 w.p.m. for 50 bauds. Not much difference, one may think, but experience shows it to be significant where auto-senders are in use. The writer believes that until a common speed of, say, 75 or 100 bauds is permissible, there is merit in European stations having the facility for both the present speeds and using 50 bauds where possible.

In May, 1963, D. F. Wadsworth published a solution in the *Radio Constructor*, his approach being to employ two standard Creed governors mounted axially with a method of switching between them electrically. The limitations were the application to DC-motor driven machines only, and the physical problem of fitting a governor twice the size of the original.

Another Approach

The solution described here is entirely mechanical, can be used on all Creed machines normally encountered, and is housed in the case of a single governor.

[over



The governor unit modification as described by G8LT, and applicable to most types of Creed teleprinter. As he explains, it enables the speed to be adjusted for either 45 bauds (61.33 w.p.m.) or 50 bauds (66.67 w.p.m.), there being these "two standards" in general use. The modification is simple to construct and apply, and with it speed can be changed in less than five seconds.

In action, the normal governor spring is adjusted to give the lower speed while the higher is obtained by putting additional spring pressure on the moving contact assembly. The only restriction is the necessity to stop the machine when speed changing, which can be done in less than five seconds—and, indeed, a whole RTTY station of printer auto-sender and reperforator can be changed while the distant station goes through its CW identification procedure.

The photograph on p.605 shows the governor with its cover removed and it will be seen that the modification has the merit of simplicity in construction and operation. The additional spring (A) is housed in a light alloy block (B) and is backed by an Allen machine screw by which the spring pressure is set. The spring bears on one arm of a Vee-shaped crank pivoted at its apex and so shaped that the centrifugal force exerted on each arm is equal and balances out, so leaving the spring as the sole speed-determining component.

A small cam (C) under the other arm of the crank serves to lift the spring pressure on the moving contact assembly when the lower speed is used. Finally, a counterweight (D), the mass of which roughly equals the other parts added to the original governor, is mounted diametrically opposite to them. The exact weight can be determined experimentally by adding or subtracting washers under the fixing screw, determined by static balancing tests. Dynamic balance is almost impossible to achieve without special equipment but the writer has found that careful static balance gives good results—no worse than the original, anyway! In use the new governor has proved stable and trouble free and, while improvements will at once suggest themselves, the details above may help some RTTY operators to overcome the frustration of changing whole governors.

Making It Work

Setting up is carried out as follows: With the cam set to hold the arm off the contact set the

normal speed adjustment to give 45 bauds. Next engage the arm and twist the Allen screw till the 50 baud speed is attained. Check between the two speeds to ensure correct registration. Care must be taken to reduce friction to a minimum in the Vee-crank bearing and at the point where the arm presses on the moving contact. The additional spring is light; only a few ounces. The cover requires an additional hole to reach the Allen screw and it is often convenient to put strobe markings round the circumference; half the width for each speed, as shown in the picture. The number of white stripes required is given by:

$$N = \frac{2f \times 60}{S}$$

where N = the number of white segments

S = speed in r.p.m.

f = fork frequency in cycles.

Using a 125-cycle fork the 50 speed (3000 r.p.m.) requires 5 segments while the 45 speed (2730 r.p.m.) involves 11 segments (actually $5\frac{1}{2} \times 2$). Once set, however, subsequent adjustment is unlikely to be needed.

NEW RESEARCH APPOINTMENT

What for so many years we have known as the Radio Research Station, Slough—at which so much original work has been done on the problems of radio wave propagation—has been renamed the Radio and Space Research Station, now under the direction of Dr. J. A. Ratcliffe, CB, CBE, FRS, who is to retire early next year. His successor will be Dr. J. A. Saxton, at present in charge of the U.K. scientific mission in Washington, and scientific counsellor to our Embassy there. John Saxton will be well known to many of our readers interested in VHF for his lively and informative approach on the subject of VHF propagation.

PRESENT FOR A FRIEND

At about the time this appears, thoughts will be vaguely stirring as to what to do about Christmas presents. If one of the objects of your concern happens to be interested in Amateur Radio, the answer is almost too easy: Either buy him a year's subscription to SHORT WAVE MAGAZINE (42s. post free) or one of the books advertised on p.578 or p.632 of this issue. In this context, the *ARRL Handbook* (42s. 6d.) is sure-fire, and over the years we have despatched 100's of copies as Christmas presents—and if you want to be stylish, we can supply it in the buckram (or library) binding at 52s. 6d. The contents are the same, but the finish is rather more durable.

When ordering for despatch to a friend, either home or overseas (prices quoted are the same in either case) please enclose remittance and make it all quite clear, to: Book Gift Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.



“... We're rebuilding here at the moment ...”

Miscellany

SUNDRY HAPPENINGS IN THE STRANGE WORLD AROUND US

The UKAEA (United Kingdom Atomic Energy Authority) is obviously the kind of body that employs a high percentage of scientists and technicians. Nice to know, though, that its staff includes at least 58 radio amateurs, spread around its various installations from Dounreay to Harwell. (Dounreay, in the far north, has nine GM's on the staff.)

(AERE, Harwell, "Newsletter")



One amateur who realised his schoolboy ambition (perhaps!) was GM6TF, a locomotive-driver who used to be on main-line express trains, but a year or so ago found himself "handcuffed to a 350 h.p. diesel engine in the Alloa marshalling yard" till his retirement day comes round. He is an old timer in radio dating from the days of "wireless," cats-whiskers and Schenectady (explain that to the new 'uns to whom the magic words mean nothing). Now at the age of 64, with all those track miles behind him, he is still keen enough about Amateur Radio to creep out in the middle of the night after rare DX.



This very same great old character GM6TF contributed the following item to the *GM Magazine* (Radio Club of Scotland): "Well, OM, I have an LPF and an SWR and an ATU, and have no TVI even with the TV in the next room. I have never had any complaints of TVI during all the years I have been on the air. I must admit that I don't work during TV hours . . . !" (This, of course, was Heard on the Air.)



Two newly-elected members of the First-Class Operators' Club are W4ZM, who started in radio in 1912 and was licensed as 8AQM in 1915—and W1ZW, who was licensed as 1OP (no prefix) in 1916 and has been active ever since. And a third new member, W1BB of Top Band fame, is no newcomer to our game . . . way back in 1912 he had a ½in. spark coil and all that went with it!



"I have followed with some interest the various arguments on CW vs. SSB, Phone vs. CW, AM vs. SSB, Them vs. Us, and so on, and therefore make a suggestion for a new feature in the *Magazine*. How about a nice 'Poison Pen Corner'? (but in the true Amateur Spirit, of course.)"

(Letter from V. Sayer, Southampton)

An important breakthrough in the design of crystals for filters has been announced. By careful design of the size and weight of the plating to which the electrodes are fastened, unwanted modes of response may be reduced by as much as 40 dB.

("Collector and Emitter," Oklahoma)



Two ways to get a dipole to the top of an oak tree—you can either climb the tree, or you can fasten the wire to an acorn and sit back.



"My callsign, G13USS, has just been issued to me some 15½ years after passing the R.A.E. Is this a record for slowness?"



Soviet newspapers recently reported that the death of a mountain climber could be attributed to "radio hams." A male nurse, trying to save the injured man, was being directed by a doctor's instructions over the radio, and it is reported that these were blotted out by "five students broadcasting to one another on pocket transmitters." The operation had to be stopped and the patient died.



Adapted from the definition of a snatch telephone (in the U.S.A.), a "snatch-patch" is a phone-patch that has absolute priority on a given frequency, whether anyone else wants it or not. (And it would be interesting to see how this is enforced.)



Auto-Call (Washington, D.C.), elaborating on the theme of "Ain't Science Wonderful," mentions an instance of a young lady who sent a message with no wires, no radio apparatus, no antenna or suchlike. Impossible, in the present state of the art? No—she just put it in an envelope and mailed it. (And *that* method is unreliable enough, in some parts!)



"In other fields, where a need has existed, a device has come. How far away are we now from a rugged solid-state unit which could provide 5 watts fully amplitude-modulated VHF, or, say, 30 watts HF, from a 12-volt supply with a drive of 1 watt, and priced at not so much more than the few shillings paid for a valve of comparable rating?"

("Electronics Weekly")

COMMUNICATION and DX NEWS

L. H. Thomas (G6QB)

CHRISTMAS Greetings to all readers from your Conductor, for the *twentieth* time! This seems quite incredible, but it's true. For nearly two cycles of the sunspots your L.H.T. has been observing and commenting on the amateur bands, and it only seems like yesterday that he first took over the job. Ah, well . . .

However, to resume—Christmas wishes to one and all, from the top DX'ers to the aspiring New Boys. From the Top Band natters to the Ten-Metre hopefuls. To the Big Boys, whose Christmas will be full to overflowing only if two new countries are invented and made active by Christmas Day. To Boris and Vlad, who follow us all round the bands and land on any DX QSO with their cheerful "char-chip-char-chip, char-char-chip-char" (and what should we do without them?).

To all those wonderful people who still treat Amateur Radio as a hobby and don't go to excess in any way . . . to those who bend over their work benches day and night and, it seems, are never heard on the air at all . . . to all SSB operators who keep the wick turned down (and, in a much lesser degree, to those who turn it up!).

To all users of phoney phonetics—may their crazy inventions continue to make us all laugh while losing them many QSO's. In fact, to everyone who keeps the amateur bands full of amateur signals.

Finally, *no* greetings or goodwill whatsoever to the commercial pirates who invade our exclusive bands, or to the owners of the prehistoric (though commercial) signals with whom we are supposed to share our "shared" bands. And we are thinking especially of high-powered transmitters that rain parasites upon us for weeks before being detected; to Charlie's Cops across the Channel; and to all perpetrators of Jammers and the other ghastly noises. Our stock of Good Will

has been so generously spread among fellow-amateurs that there is nothing left for these horrors except the wish that some disaster shall descend upon them, and fast.

State of the Bands

No one can complain about the varied fare that has been available this month. All bands open most of the time—even Ten—and a wide assortment of DX to choose from. The only shortcoming has been the lengthening of the hours of darkness, to the extent that people are beginning to wonder what to do with their evenings!

Once *Fifteen* and *Twenty* have faded (and this is getting to be

pretty early) one has the grim choice of *Forty* and *Eighty*, unless one is a Top Band addict. And it has been our experience that 160-metre operators are mostly those with little interest in the HF bands—they stay up there all the time. Maybe some of the fugitives from dead bands will liven up *One-Sixty* with their presence (but not all at once, please!).

To be able really to enjoy *Forty* and *Eighty* one must have a special kind of mentality, enormous patience and the particular ability to read signals through QRM, much of which is of the non-amateur variety. If you have these attributes it is actually

FIVE-BAND DX TABLE

Station	7 mc	14 mc	21 mc	28 mc	3.5 mc	Countries Worked
G2DC	169	312	289	170	112	325
G6QB	119	300	211	145	67	322
G3PEK	119	142	88	18	75	175
G3IGW	115	153	129	123	67	189
G13IVJ	102	317	263	180	83	324
G3KMQ	101	212	99	10	55	237
G3DO	86	316	223	183	83	322
GW3AHN	71	324	301	151	21	333
G3FTQ	58	118	91	46	27	144
G3PQF	56	39	24	7	40	82
G3TJD	51	65	40	15	30	109
G3RJB	46	113	26	11	1	120
GM3RFR	35	81	53	6	10	100
G3NOF	33	265	190	132	39	283
G3UML	31	168	84	31	20	182
G3IDG	27	54	70	60	17	101
VP8HJ	22	148	46	5	11	152
G3UBI	8	67	18	10	23	89
G3MDW	8	51	46	43	8	82
G3UDR	4	90	41	17	18	122

possible to enjoy settling down to one of these bands. But with the early closing of Twenty and Fifteen one must expect much, much more amateur invasion of the LF bands, so that their eventual state will have to be heard to be believed.

To quote a snide remark recently passed about DX on *Forty*: "To call a luscious piece of DX on *Forty* is like serenading the lady-love with a guitar under her balcony. As soon as you stop playing, and listen, you have a bucket of slops emptied over you." (Those who don't appreciate the terrible apness of this description have never got down to studying 40 metres seriously!)

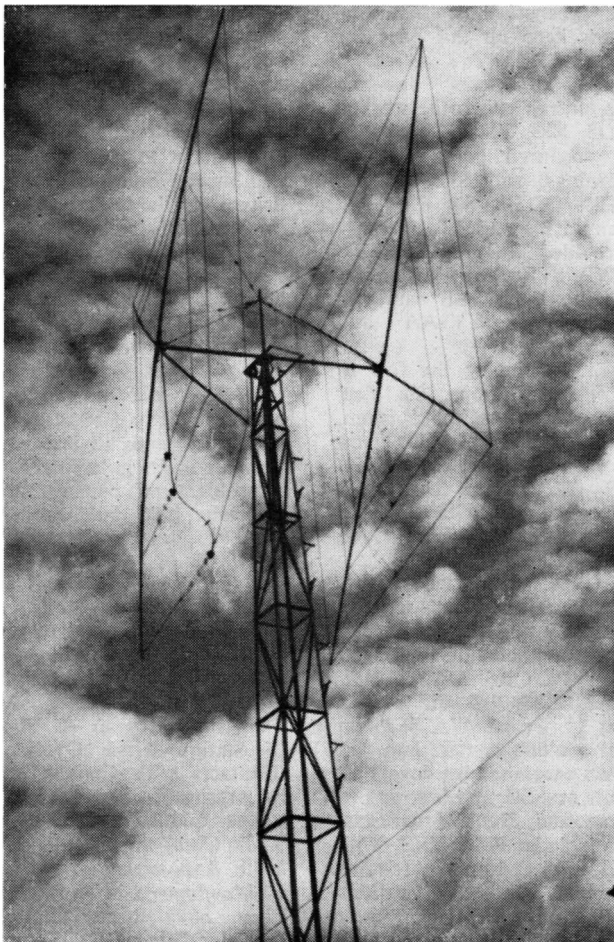
Still, let's be cheerful and laugh it all off—month after month we receive long lists of DX worked on *all* bands, despite the adversities.

DX of the Month

G2DC's "State of the Bands" message runs as follows: *Eighty*, very little DX, owing to the commercials and also the good conditions prevailing on *Forty*, where both the morning session (0700-0830) and the evening (1900-2300) have given an excellent assortment. In the mornings Jack has been able to raise VP5AR, VK1-4, W5-7, VE8, 5V4, 7G1. In the evenings "if one ignores the W and EU stations" quite a lot of rarer stuff can be worked, such as CM, KZ5, PZ1, ZD7, VK, ZD8 and others.

Twenty has also provided good all-round DX during the 0700-0930 period, and Jack says that with a good beam, all continents can be worked at this time. Those without one will miss a lot of the DX. VK, ZL, JA and KR6 are all very strong over the long path, but KC6, KG6, KX6, VR2 and VR4 can only be heard with the beam on the short path. Two new ones were 1S9WNV and K7LMU /TI9. *Fifteen* has been open from daylight until long after dark with all-round DX and no overcrowding. The Pacific has been scarce, but KC6SZ, KX6SZ and 1S9WNV were worked, along with VK1-5, ZL1-4 and all U.S. districts.

Ten is "still erratic but improving rapidly," with several



That some people can construct, erect and keep airborne a Cubical Quad is proved by this picture of the 10-15-20m. array, 40ft. high, at G3MWV, Clare House, Clare Road, Cromer, Norfolk — which can be a pretty windy location. The beam is carried on a steel tower mounted in a 2½-ton concrete base, 8ft. into the ground, and rotation is by a CDR-TR44 assembly. It is interesting to add that no difficulty was experienced in getting local planning permission for this erection.

openings to VK, and VK4EL among the best of them. Others worked included ZS's, ZE, 7Q7, 7X2 and ZS9G, the latter S9 on AM Phone.

G13IVJ has found it quite embarrassing to have three bands wide open. What to do—look for W9WNV and K7LMU for "new ones" on *Twenty*; chase W4BPD and VQ8BFA around *Fifteen*; or rotate the beam over a seemingly dead Ten-metre band until sunset? He remarks "How easy the DX'ing has been in the past few years, with only *Twenty* to justify much

attention . . . on my rig and antenna selector the band-switches have been overworked lately." New ones for him on 10 metres were MP4TBO, VP2KJ (both SSB) and KV4CI (CW); others included ZD7IP, CR7, YV5, CX, ET3, OD5, EL8 and ZS9.

On *Fifteen*, he had three new ones—FP8CQ, VQ8BFA and 5VZ8CM, plus HM5BZ, CE6EQ, VP1AB, VP2AA, XE3MF, KR6 and JA. And finally, on *Twenty*, all the new DX-peditions, VQ8BFA, YK1AA, FL8AA, 5VZ8CM and WA4QKY/lwojima.

G13IVJ signs off thus: "Can the HF bands keep up this pace for long? *Can I?*"

G3NOF comments on the opening on *Ten*, where he worked CX, OD5, VS9, ZS, 9J2 and YV. *Fifteen* produced good VK's in the mornings, and SSB contacts with ET3, OD5, VS9, 6O6, 9J2 and many PY's and W's. *Twenty* SSB provided KG6, KA, VE8, VS9, YV9, 5VZ8CM, 9M2 and 4. And finally, *Forty* SSB came up with ET3USA, YV9AA and ZD8AR.

G3MBL is one of the few to report on AM Phone. On *Ten*, with a new home-built 2-el. beam, he raised 9H1AF and 9J2DT; on *Fifteen* with a similar beam, 9G1, PY, ZS, CR7 and a UA9. (All these, by the way, with 25 watts of AM to a 2E26 PA in a home-brew Tx.)

G3UML is another who covers three bands, and he seems to have done specially well on *Ten*, where the better contacts included YV, CX, LU, VP6, CR6, ZE, PY, PJ2, ET3, 5A3, ZD8, 9J2 and a load of ZS's; he heard WA2SFP on sked but couldn't contact him. On *Fifteen* an enormous list covers all continents on SSB, and is strong in Caribbean and South Americans, but also includes 9M4, VK9, VS6, YA, 5R8, ZD8 and many Africans. On *Twenty* the two rarities (W9WNV and K7LMU on their travels) plus a load of mixed DX, including the curiosity U21WRW

(whoever that may be). G3UML sums up by saying that *Ten* has been open to somewhere every weekend; *Fifteen* has been tremendous; and *Twenty* good on weekdays but a mess at weekends. (He puts it that just as Saturday and Sunday bring out the weekend drivers, so they seem to bring out the weekend operators.)

G3OAD, still specialising on *Ten*, heard and worked a long list of W's as well as KP4, KV4, PJ2, YV, OA, CX, CR7 and ZD8—and these were all booked in over two days, October 23 and 24.

G3PQF, with a TVI problem, worked mostly *Forty* and *Eighty* and badly needs advice about TVI troubles in fringe areas. These are a problem, of course; the usual solutions help but don't always cure.

News Items

G3TMA will be running an expedition to Huntingdonshire, January 1 and 2, operating on Top Band Phone and CW. Applications for skeds to A. Papworth, 25 Station Road, Over, Cambs. (Contacts with Cambs. can also be arranged, if wanted.)

The G3PRC group (Plymouth Radio Club) will commemorate the 345th Anniversary of the Landing of *Mayflower I* in North America. They have been allotted the special callsign GB2USA and will be operating, December 18-24, on all bands, all modes, but mainly CW looking for DX. QSL via G3UKI, *QTHR*. The club Hq. is a few yards from Mayflower Steps, whence the Pilgrim Fathers sailed in 1620.

GW3UUZ thinks he may be the first AT-operator in the U.K. granted permission to operate from a lighthouse. His QTH is Nash Point Lighthouse, Llantwit Major, Glam. He says that other light keepers hold amateur licences, but up to now have been refused permission to operate from their lighthouses. (Most of them should be pretty good QTH's, too—and think of the possibilities for top-fed verticals!)

G3IDG passes on the information, from SM5DFM/MM, that on Swedish ships only the master's permission is necessary for an amateur to work /MM. This is

doubtless why there are so many of them. Rumour has it, however, that the terms of our own /MM licences will be made more flexible before long.

"All the news from ZB2" is supplied by Mike Matthews, ZB2AM. He himself has been on Top Band, with good reports from as far north as Elgin; 8 countries and 27 counties worked. He will continue to try 160 metres on Friday and Saturday evenings, and asks that those who have already worked him should give the others a chance. From ZB2, the band is open to U.K. from 2000 GMT onwards. On the other bands he has already had 2,500 contacts, including many on the 10-metre band.

ZB2AO has a better beam and is now putting out a good signal on the DX bands . . . ZB2AJ will be on soon with a KW-2000, using SSB and Top Band . . . ZB2AL made 100 contacts during the JOTA weekend and was visited by the local Boy Scout Commissioner during the event. He, too, has aims at Top Band . . . ZB2AP has designs on VHF, but is still clearing up his site, which has not been occupied since the war.

The Gibraltar "Beer, Tapas and Propagation Group" was recently inaugurated at one of the local bars, and the gang are hoping to get a 160-metre station activated for the CQ One-Sixty Contest next year.

Hammarlund "DX-pedition of the Month" are handling the QSL's for OY7ML, 4W2AA and ZD8AR, and the mailing of Gus's JY74 cards should by now be complete. They are awaiting receipt of "lost" logs from VK9DR and VK9KI, and are holding up the cards from 6Y5LK/VP5 (Cayman) while the status situation is being cleared up.

W2GT confirms that a big row has built up concerning the difficulties most of the top-scoring U.S.A. stations had in working 1S9WNV. There seems to have been a terrible shambles, culminating in the suggestion that he was ignoring any American station whose call appeared on the "Honor Roll" in *QST*. (This made it a little easier for Europeans to get a QSO!) As a

TEN-METRE ACTIVITY TABLE

(Starting Date, June 1, 1964)

Station	U.K. Countries Worked	Countries Worked	Total
9J2DT	44	114	158
G3OHP	9	70	79
G2CDI	22	56	78
G3HCU	17	38	55
G3OAD	18	30	48
GM3SKX	27	16	43
G2DC	12	30	42
G3UML	6	31	37
G3IDG	5	24	29
G3EHL	8	9	17
G3SQX	2	2	4

result, more than one prominent W station has already seceded from this wretched "Honor Roll," and there will doubtless be others.

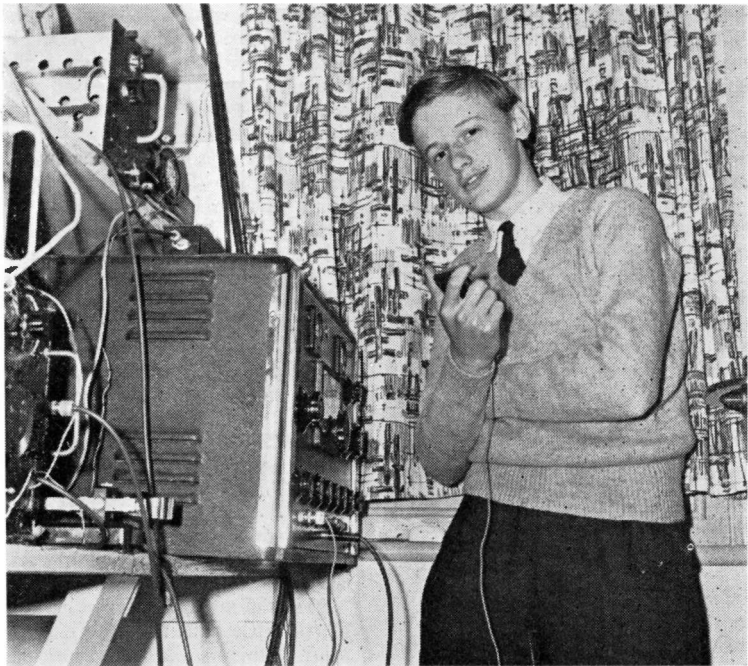
All this raises the eternal question of what the "Honor Roll" really means. If you are one of the select few (not so few, nowadays!) appearing thereon, it can mean either (a) That you are a wonderful operator; or (b) That you use more power than anyone else or have better antennas; or (c) That you have more time or money for Amateur Radio than the rest; or (d) That the peak of your ambition is to appear in print as one of today's "greats," who have worked everything there is to be worked, irrespective of whether they have been there or not.

Perhaps there should be another kind of Roll of Honour (*Note*: In English this time!) for other noteworthy achievements on the amateur bands? Is there really anything more meritorious in making hit-and-run contacts (sometimes lasting less than ten seconds) with over 300 countries than in, for example, having maintained a reliable sked with some part of the world, through thick and thin, over a very long period? Or, for instance, having established a reputation for being an amateur who is always friendly, courteous, helpful and able to use his gear to the best advantage on different bands under various conditions.

All right, we're not really being too tiresome about the "Honor Roll"—just wondering whether now it isn't just restricted to a minority of over-keen types whose ambition is to work the biggest possible country total. And one might add that some of the very best amateurs, in every sense of the word, met in 42 years of Amateur Radio, will never come within 100 countries of achieving this particular sort of glory. (And—this is the important point—they just couldn't care less. They just want to work ordinary DX in the ordinary way.)

That Man Again

The station signing NS1A, making no secret of being on one of the war-time forts off the Kent



The youngest amateur in Northern Ireland is G13UKS, David Vizard, 9 Dillons Avenue, Whiteabbey, Newton Abbey, Co. Antrim — he received his ticket in August, at the ripe old age of 16½ years (the lucky chap!). An SWL for four years previously, during which he had 171 countries confirmed in all 40 zones, since being licensed he has already worked 80C. His rig consists of a Panda PR-120V Tx, with as Rx an R.1155 modified to cope with present-day band conditions. His aerial system is a ground-plane for 20 metres, two 20m. dipoles at right angles for reception, and a 132ft. wire for general-purpose working. G13UKS is also interested in transistory, and is at present busy with CC Tx's for the 7 and 14 mc bands. And he has a bug-key, which he can swing!

Coast (yes—three miles off!) has come in for a lot of publicity, not to say notoriety. But when it comes to the point where other stations broadcast the information that anyone working him is liable to action by the G.P.O., we must admit that we are inclined to de with him. He has his own ticket, he voluntarily obeys the G.P.O. regulations, and G3SCP, who handles his QSL's, says that he has had a definite assurance from the G.P.O. that they cannot and will not do anything to hinder his operation; also that people who work him are *not* committing a breach of the regulations. NS1A runs 10 watts on Top Band to a half-wave aerial which is 100ft. above the sea, and naturally gets out extremely well. This has led some of the Top Band fraternity to suspect that he is QRO. G3SCP suggests that publicity might better be turned on certain types he met at the Woburn Rally who

openly admitted to using fantastic power for working Top Band DX.

Readers' Opinions

"I'm sure if more of us would only sit down and have a long, quiet think occasionally, instead of incessantly chasing after DX, or reeling off CQ after CQ, we could think of many ways of improving the state of the bands" (G3IDG). And he goes on to say that a band of Amateur Radio Vigilantes, whose sworn task is to devote themselves to improving our bands "by example" might not be a bad thing. (Dare we suggest that the F.O.C. might take a hand?)

"Until the professionals stop radiating in the amateur bands, either on the fundamental frequencies or by spurious radiations, I am not going to be so hard in criticising truly amateur transmissions. After all, we are not paid

for transmitting, and a professional should be better at his job than the amateur . . . People paid for the job should be capable of avoiding radiating harmonics and other signals in bands where they are not authorised to transmit" (G3BID).

"Ref. your remark about being able to disintegrate remote transmitters by Laser beam, and enjoying hearing them fall to pieces . . . it would seem that in some cases we can *already* hear this happening. Those in doubt refer to 14 mc under short-skip conditions" (G3IDG).

Oops, Sorry

Last month, in a note about the Tops CW Club Contest, we stated that the U.K. entry numbered only two stations out of 178 (they were G3HZL and G13SKH). In a note written more in sorrow than anger, GM3NXA informs us that he occupied 117th position in the list, so, as he says, either the entry has gone up by 50 per cent, or we don't consider that Scotland is part of the U.K.! Humble apologies. Our mistake, of course. And let us now record that the U.K. entry was *three* out of 178!

Top Band Topics

G3PLQ has correlated the results of his listening while /MM over the period August 1964 to August 1965. The "stations-per-country" analysis is interesting, giving final figures of 180 G's, 38 OK's, 34 W's, 11 GW's, 7 VE's, 6 GM's, 6 DL's, 3 GI's, two each from EI, VO, PA, ZB2 and 9L1, and one each from GD, HB9, JA, HP, ZP, OE, HR, VP2 and VP3. More recently G3PLQ was able to visit DL1FF, and writes enthusiastically about this well-known station, where all the gear except the 75A4 receiver is home-built. A *full-size* ground-plane accounts for the fantastic signals on Top Band; there is also a Vee-beam for 160 and 80m.; rotary beams (Armstrong method) for the other bands, VHF included.

Everything is at finger-tip control; full break-in on CW; pump-handle keys (no bugs or el-bugs!); and a lot of very ingenious home-

brew contrivances. Unfortunately the pictures of the DL1FF antenna farm were not quite good enough for reproduction—but you can take it that it is quite something.

VE2UQ says KV4CI is now on the band (on 1997 kc) and gave many of them a new country. He himself has been working many G's (even back in October) and is working towards his WAC if only someone will get on from ZC4 or 4X4, which seems to be the only Asian hope for Canadians. The JA frequency of 1880 kc is right in the middle of S9 Loran!

VE8ZZ may soon be on from Baffin Land, operated by VE7KC. VE4RO, sad to relate, is a silent key . . . his QSO with G3GRL still holds the record for the most westerly Canadian station to work Europe.

9M6BM made an almost certain "first" in a contact with G3SED; prior to this he had been reported, and confirmed, by an SWL in Yeovil. 9M6BM's permit extends until February—he will be very active.

W1BB has already been worked at nights by a few G stations, in one case as early as 2228 GMT,

when he was 559. In the early mornings conditions seem consistently good.

Thinking back to G3PLQ's list of Top Band stations, it occurs to us that the U.K. may well be the only country in Europe that licences *all* its stations to use One-Sixty—though possibly Czechoslovakia imposes no restrictions. The OK's have always been more numerous on the band than anyone except ourselves. It would be interesting to know. Certainly from countries like HB, DL, PA and so on, only a very few are licensed for the band; and is that because few are trusted to use it, or that few *want* to use it?

W1BB's first Top Band bulletin of the 1965-66 season is cram-full of news, but of course the first real events will be the Trans-Atlantic tests. Just to remind you—**December 5** is the first "normal" test, and **December 19** is the first "First-Timers' morning," to give a chance to those who have not yet got across. Will the Big Boys please restrain themselves on this morning, and give the Little Fellers a chance? It will be interesting to see who are the considerate ones and who aren't. (Credit for the original idea behind



The president of the American Radio Relay League (the national organisation for U.S. amateurs) is Herbert Hoover, Jr., W6ZH, who is a son of that Herbert Hoover who was President of the United States, 1929-1933. This photograph was taken early in November, when W6ZH was over here on a short stay and visited the station of G3SDN, London.

this goes, by the way, to G8PG.)

WIBB states that "a 160-metre station will definitely find a place in the ITU Building in Geneva." G3OOH and HB9CM, who will operate, intend to select a few whole nights when they will look exclusively for North American stations (see also "Late Flashes").

W and VE stations are being asked to refrain from working in the band 1820-1825 kc this year (the upper 5 kc of their band) because that is a favourable sector in which to listen for Europe. But Europeans who operate below 1820 kc will definitely not be popular; at the far end they just won't be heard, and at this end they will probably attract a lot of abusive remarks!

Surprising information re Singapore . . . G3JKU was there with the call VS1EU in 1952, and on 160 (100 watts) he worked VS9AW on Phone several times,



ZB2AM, Gibraltar, is none other than Mike Matthews, G3JFF, well known for his work in connection with Royal Naval A.R.S. affairs. He is running a KW-2000 into a long-wire aerial, and is active on all bands Top to Ten. To the left of the KW-2000 is its PSU, above which is an RF indicating unit.

TOP BAND COUNTRIES LADDER

Station	Confirmed	Worked
<i>Phone and CW</i>		
G2CUZ	98	98
G2NJ	98	98
GM3IKD	98	98
GM3KLA	98	98
G3PLQ	92	95
G3SED	82	92
G3SWH	70	80
G3PPE	67	80
GW3PMR	63	73
d3SVW	55	75
G3IDG	55	59
G3SHY	53	70
GW3TLW	53	65
G3TSS	43	53
G3UBW	42	71
G3TJD	42	53
G3SQX	34	64
G3KPT	30	69
<i>Phone only</i>		
G2NJ	60	60
G3PLQ	55	58
G3MDW	44	64
G3RTU	35	37

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

over the 3,000-mile path. He also had reports from Japan, Australia and Ceylon. Unfortunately in those days it would not have occurred to any G station that a QSO was possible, so no one even tried!

Shorts

G3KMQ joins the select list of those who have worked 100 or more countries on Forty, having just made it with 5VZ8CM, 9G1FQ, UG6KAF and CE1AD. As you will see from the Five-Band Table this month, G2DC is the undoubted champion of Forty, with his amazing total of 169. No one else comes anywhere near it.

G3JRL (Sheffield) sends a long list of DX worked on Fifteen while mobile with a 6ft. centre-loaded whip. It includes countries such as 5Z4, CR6, KV4, KZ5, ZD8, YA, ET3 and so on . . . all on a KW-2000 and this 6ft. whip. One QSO was with KZ5AY, who was using 100 watts to a Joystick leaning against the wall in his shack—"almost mobile-to-mobile," as G3JRL says. He is another of those who are badly screened at home and work mobile so as to get some DX—and it certainly works!

GM3JDR (Golspie) sends his customary long lists of 20-metre DX, both SSB and CW, and says that the band was already fading out with him at 1900 (in early November) but was open to U.S.A. from 1030 onwards.

G2CDI suggests that it would be interesting to add a fourth column to the Ten-Metre Activity Table, showing the mode used. We agree—so will all the Ten-metre reporters please let us have this, next time? G2CDI's own total of 22 U.K. countries and 58 countries has been achieved on AM only. (New ones since his last report include ZS9, VS9, EL, 5A3, ZB2 and OHØ.)

W6AM tells us that his current scores for the DXCC are 335 countries on Phone, and 340 on Phone/CW . . . and those won't put him at the top of the ladder! The number of new countries discovered, added or "invented" during the past ten years totals somewhere between 50 and 100. To the smaller and smaller group of greybeards who remember when the DXCC was founded, and when the "Century"—yes, one hundred—was an almost incredible achievement, this seems fantastic.

We know of cases in which sons have inherited their fathers'

callsigns, but we were really shaken to hear from G3JML (Huddersfield) that he will in future be signing G4MH, which was his *grandfather's* call, now re-issued to him by the G.P.O. (The changeover occurs on December 16, and we wish him happy hunting with the new two-letter call.)

5X5AU tells us that piracy is still rife in Uganda, but that the pirates have now switched back to the old VQ5 prefix. He states positively that the only genuine calls coming out of Uganda at present are 5X5AU, 5JK, 5FS, 5IU, 5KD and 5IH—all others are pirates, whether using the 5X or VQ5 prefixes.

DX in Brief

W9WNV and K7LMU, after operating from Ebon (HC8E) and Comoran (TI9C) went to Hong Kong, spending a weekend with

VS6AJ, after which W9WNV left for Tokelau and was signing ZM7 in mid-November.

But wait—the plot thickens, the mystery deepens! Lloyd of W6KG was heard from Ebon on November 16-17, telling everyone he worked that he was the *first* activator of that island, where no one had “ever heard of Don or Chuck.” What goes on? We shall be glad to know.

EA4URE was a special station operating from the 2nd International Technics and Telecoms. Exhibition in Madrid . . . EI0CSE was on from the Science Exhibition in Cork . . . 5VZ8CM (another of these improbable callsigns that seem so numerous these days) was just our old friend Gus, working from Togo.

The said Gus appeared on November 17 signing TY3ATB from Dahomey, and said his next call, he hoped, would be in XT2, Upper Volta. Very shortly his travels will be over, because he has a firm intention of being home for Christmas.

Harvey, VQ9HB, had another spell operating from Agalega, VQ9BFA, which made him very popular for a few days in mid-November . . . UA1KED seems to be on almost constantly from Franz Josef Land. Some have been known to pass him over as just another UA1 . . . Caribbean activity, mostly SSB, has been coming from VP2AC, 2GLE and 2SY.

From the Far South, VP8IE is on from South Georgia and VP8IP from Adelaide Island. VP8HJ and 8HO are also around—at least stations have been heard calling them.

Two EA's hope to be activating both Ifni and Rio de Oro, at various dates between early December and the end of February. Take a close look at any EA9 or EA0 between those dates . . . FL8AA was HB9AET/4W2AA . . . 5J4RCA was a special contest station in Colombia, but other 5J's have recently been reported. No

change of prefix is suggested, though.

Operating Notes

G2DC (like all of us) is trying to find some way of relieving the overcrowding, and comes up with an interesting idea for a European band-plan on 14 mc. This is to divide the CW part of the band into five 20 kc sections, and the continent of Europe likewise. Each of the five groups of European countries would be allotted a single band of 20 kc *in which to make their CQ calls*—nothing else.

This, as he says, might help to prevent those awful long-winded CQ's breaking up so many good DX contacts; and the countries in the various groups would avoid listening in the one that was giving the worst short-skip QRM at any particular time. His grouping suggests a Western section (U.K., CT, EA, EI, F, PA, ON, OZ, TF, etc.), two Central sections, a Northern section including Scandinavia and UC2, UP, UQ, UR and so on, and an Eastern one with Russia and the Balkan countries.

It's a fascinating idea, but even Jack himself says “Of course, they would never agree, and even if they did, a lot of them couldn't manage to get into their correct section anyhow!” The only improvement we can think of is a complete ban on all CQ's from every European country (including the U.K., of course).

Late Flashes

G3OOH, one of the operators at 4UITU, writes to say that they managed to get up a 160-metre dipole and really opened up on November 13-14. In their first night they made some 50 European contacts as well as W1BB, 1BU, 1HGT, VO1FB and ZB2AM. Gunter (HB9UD) promises regular activity this winter, with Gerald (G3OOH) and Philo (HB9CM) getting on when they

TOP BAND LADDER

(G3E-- and G3T-- stations only)

(Starting Date, January 1, 1965)

Station	U.K. Counties	Countries
G3SED	82	22
G3TBJ	82	16
G3SYS	78	14
G3TTK	77	18
G3TYK	72	14
G3SWH	71	13
G3SJJ	67	11
G3TXS	66	11
G3TIK	62	13
G3TVW	62	9
G3SVW	60	10
G3SHY	60	6
G3TJD	53	11
G3TSS	53	7
G3SVL	50	10
G3SGC	45	12
G3SZA	45	11
G3SQX	41	8
G3TON	41	8
G3TQZ	40	8
G3TZM	36	7

can. Please do not send direct QSL's with IRC's, but use the Bureaux (they say the paperwork is heavy enough, and they prefer operating to admin.). This, of course, is in addition to all 4U1ITU's regular HF- and VHF-band activity.

The Pacific Mystery (see few paragraphs back) is boiling up! All opinions have been heard on the air, from (a) "they were never at any of those spots" to (b) "they were all genuine except Ebon, where the operation was from the ship." Probably we'll know all about it by next month. Meanwhile it simply looks like further discrediting of the Honor Roll, to which we have already referred.

Sign-Off

That was the month, that was . . . and if things go on hotting up like this, there should be plenty of correspondence next time. Please note the deadline, which is Monday, December 13, first post. Address all views, moans, bouquets and anything else on your mind to "Communication and DX News," Editorial Dept., SHORT WAVE MAGAZINE, Buckingham, England. Merry Christmas, best of DX in 1966 . . . 73 and—BCNU.



This is John Firby, G3UOI, of 140 Jesmond Avenue, Toller Lane, Bradford 9, Yorks., who only started as an SWL about two years ago. He took the R.A.E. in May and the Morse Test in August last — so has done pretty well. Much of his gear is home constructed, consisting of a Top Band Tx running an EL91 as Clapp VFO into an EL91 buffer driving a TT11 PA; the speech amplifier-modulator side is basically to the "Mullard 5-10" design, with a lin. CRT monitor built in. The main Rx, still under construction, is to be an amateur-band only double superhet, and is already working on 80/160m.; it can be inter-connected with the Tx to provide automatic muting and monitoring. Also available are an Eddystone S.640, a modified R.1224A, and an RF-24 adapted as a CC converter for the 21/28 mc bands. The station ancillaries are all home built and the future plan envisages an all-band SSB Tx and a general-coverage Rx for VHF converter operation. In fact, the only real problem at G3UOI is space for aerials—and we have no doubt that difficulty will be overcome.

TO GET IT WHEN YOU WANT IT

Though we do a world-wide distribution for SHORT WAVE MAGAZINE through the usual trade channels—from Belfast to Basle and Bangkok, from Alaska to Moscow, and to Calcutta, Capetown and Terre del Fuego, Cape Horn (see Zone Map)—there are always those who write in every month to say "I cannot get it," or "I cannot get it on time." Our answer can only be either "Take out a direct subscription, which will cost you 42s. for a year of twelve issues," or "send in a 4s. postal order (or convertible currency in lieu) for a copy of the issue you want." For years, we have done our best to produce copies where they are wanted—but always we are frustrated by some local news-agent situation over which we have no control, e.g. "We do not know that Magazine," or "That Magazine can only be got by special order," or "That Magazine is special, and we do not stock it except to order," or "Never heard of it, perhaps you mean *Toy-Town Mechanics* or *Woman's Own Sensation*, or something like that?" Well, SHORT WAVE MAGAZINE fits none of these descriptions (we hope)—but the fact still remains that if you want it, you have either got to place a firm order with your

newsagent, or send the money to us at: Circulation Department, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. If you want to take out a regular subscription (for which the cost is 42s. for a year of 12 issues, post free) please state the month from which your subscription is to start. We guarantee that your copy will be despatched the day before the date of publication.

WE ARE ALWAYS IN NEED OF

Good photographs of radio amateur interest—either equipment, stations or personalities. By "good" is meant a clear, sharp print, preferably about post-card size (though this is not important) with the details written up on a separate sheet, *not* on the blank side of the picture itself. Photographs should be identified lightly in pencil on the back, simply by reference number or letter, with the sender's callsign or QTH. The detail on the separate sheet should carry the same identification. In general, we cannot use colour prints, nor do we want to process negatives (particularly those microscopic ones on film!). Payment is made immediately on publication for any that we can use. Send to: Editor, SHORT WAVE MAGAZINE, Buckingham.

REPORT—*Jamboree On The Air*

EIGHTH INTERNATIONAL SCOUT DX EVENT OCTOBER 16-17, 1965

EACH year sees this Scout international DX party widening its scope and extending its influence. Looking at the U.K. participation alone, we have reports covering the results and experiences of some 40 different stations, established to operate over the weekend October 16-17 for the specific purpose of working other Scout stations, either locally or overseas, on whatever bands could be covered.

As regards organisation, for the U.K. this task—becoming heavier and more responsible each year—is in the hands of L. Mitchell, G3BHK (Wareham, Dorset) who in fact originated the whole idea, and has been decorated for it by International Scout Headquarters—as reported on p.309 of the July 1964 issue of *SHORT WAVE MAGAZINE*. Nowadays, the Jamboree may be said to have two main objectives: On the one hand, to enable Scouts throughout the world to communicate among themselves through amateur stations, and on the other, to interest Scouts as individuals in Amateur Radio. There can be no question that—this being the 8th event in the series—over the years both objectives have been attained to an increasing extent every year.

Reports and Results

Some of the stations established for the event had special call signs allotted to them by the Post Office, ever ready to help on these occasions.

For example, *GB3FP*, on Portsdown Hill, Plymouth, operated for the 3rd Porchester and 73rd Portsmouth Scout groups, tried all bands and worked 16 Scout stations, their total of contacts being 89 for an air-time of 34 hours out of the 48 possible—which may have been because, so we are told, their diet consisted of tomato soup, and tomato soup, and tomato soup . . . !

Another special station was *GB3UBS*, operating from a “comfortable site” at Stoke Poges, Bucks., for the Uxbridge Scouts Local Association. Out of their total of 106 stations worked on four bands with four operators, 30 were Scout-station contacts; the “supporting party” consisted of 40 Scouts from neighbouring troops, twelve Scouters and “some radio types.” The boys were split into watches and given various jobs to do in support of the radio crews.

The 70th Birmingham is the Scout group for King Edward's School and, in collaboration with the School's CCF signals platoon, a station was set up signing *GB3KES*. Using 15-20-80m. and running a K.W. Viceroy Mk. III with an AR88D, they had a total of 60 contacts, of which 20 were Scout-station.

Signing *GB3NFE*, a station was located at the Scout Hq., Dibden Purlieu, Southampton, using a 160w. SSB Tx home-built and loaned by G3OZT,

with his AR88LF as Rx; the aerial was a 14 mc Quad, supplied by G3AMO. Working 20m. only, they accounted for 52 stations in 22 countries, of which 17 in eight countries were Scout rigs. Their best DX was VE7BHW (also a Scout station) and they had the pleasure of a QSO with VE3WSB, the international Scout Hq. station in Ottawa.

For the Coventry Association of Boy Scouts, the Coventry A.R.S. put on two stations, signing *GB2ASF*, from the Association's Hq. The A-station ran 20m. CW/SSB only, using a K.W. Viceroy Tx and KW-77 Rx, into a Tri-Band Mosley vertical; taking whatever came, they booked in 121 stations in 22 countries. Their B-station, using a K.W. Vanguard on AM/CW, with a Heathkit RA-1 Rx, made many contacts on 80 metres—where a lot of the Scout-station activity was to be found—with other groups throughout the U.K. This particular aspect of the operation was, of course, of great interest to the many visiting Scouts. And the local organisation extended to getting BBC coverage for *GB2ASF* in their “Midlands News” feature on October 18.

Other Scout-station activity (reported direct to us) includes *GB3MLA*, for the Maidstone Local Scout Association, organised by the Maidstone YMCA A.R.S. at the Hamlet Wood Training Ground and Camping Site, with six operators available. Their gear included a Viceroy, a Sphinx and an HQ-170A Rx and (making use both of the space and the assistance at their disposal) dipoles for all bands 10-160m., some duplicated and put up at right angles for optimum world coverage (!), all sprung from a 50ft. mast—that's the way to do it! The result was what is described as “an FB weekend.” Some 140 stations were worked all over the world, including VE3WSB. The radio club members, who turned up in force to make the event the success it was, were in turn very well looked after by the Scouts, with one of their seniors in charge.

Other Stations Active

For the Halifax district of Yorkshire, the well known Northern Heights A.R.S. activated *G3MVH*, a call sign actually held by G3MDW on behalf of the local Scout Association. With good equipment and aerials and plenty of help, 170 contacts were made, of which no less than 44 were with other Scout stations, on all bands from 15 to 160 metres: their Scout DX included VE3WSB, W2BEE, LA7JF, OE5FJL (with five Scouts in the shack), EI4Q, LX1JAM, HB9CM, PAØDR, OE3KUG, OE7UD, F9XF, ZS6JK, ZS6NM, ZB2AL, EI8L and OE1XA. The remainder being with Scout stations in the U.K.

Up in Scotland, *GM3OWU/A* was in operation for the 3rd Leith Rovers; *GM3JOA* for the 12th

Portobello Troop, Edinburgh; *GM3PFY* for the 31st Midlothian Group; and *GM3TSZ/A* for the 32nd Midlothian Group. Good Scout contacts were made all round.

The 1st Wandsworth Senior Scouts were represented by four operators—*G3NWG*, *G3TJQ*, *G3TMQ* and *G3TTE*—signing their own calls /A from one station set up at the St. Barnabas Scout Hq. locally. Running a K.W. Vanguard, Heathkit RA-1 and 150ft. wire end-fed through an ATU, all bands 10-80m. were worked, with most of the activity on 3.5 mc. In 35 hours on the air, 96 QSO's were made in nine countries, 53 being with Scout stations.

From the Tolmers Camp Site, near Cuffley, Herts., *G3OJE/A* had a rig for 80/160m., and *G3MEH/A* was on 4 metres. Though 17 Scout stations were worked on these three bands, only one, *G3JKY*, was on 70 mc. As the Camp was occupied for the weekend by many senior Scouts and Rovers—and *G3OJE/G3MEH* have been there several times before—they met many old friends from previous years.

For the 1st Kingswood (Wolverhampton) Scout Troop, *G3JDM* operated /A from Kingswood School, using 80m. only, on which band 10 Scout stations were worked, and five non-Scout, during the Saturday evening and Sunday morning periods.

Himself a Rover Scout, *G3TUX* ran a demonstration station for the 1st Hatch End group, signing /A from their Hq. and using gear loaned by the Radio Society of Harrow. He did a 24-hour stint from noon on the Saturday till lunch-time on Sunday, making 54 contacts, of which nine were with other Scout stations, mainly on the LF bands.

The Oxford University Radio Society put on *G3OUR* for the University Scout and Guide Club. Equipment limitations and aerial difficulties frustrated them somewhat, but contacts were made on 20 and 80 metres by the five Club members available as operators.

Working from the Hq. of the 2nd Woodley Scout group, and the only Jamboree station in the Reading district, *G3UAX/A* (the holder of the call being A.S.M. of the 2nd Woodley) used his own all home-built gear on the LF bands, and worked ten Scout stations out of the 30 QSO's made.

Conclusion

The foregoing summarises the Jamboree reports received in response to the note on p.532 of the November issue of *SHORT WAVE MAGAZINE*—intended only to secure enough factual data for the short Jamboree story you now see, so that readers not *au fait* with Scouting and the amateur-band activity over the October weekend can glean some idea of what it was all about. In other words, we are here concerned only with *Magazine* readers' participation in the event, either as operators or onlookers. The full report, covering the activities of all Scout stations in all countries, will not be out for some time yet, and is issued from the Ottawa Hq. in the proportions almost of a bound volume.

COURSE OF HISTORY

On November 11, 1965, the Prime Minister of Rhodesia declared that henceforth his country would pursue an independent line as regards its own affairs and its relations with the rest of the world. Oddly enough, it was on November 11, 1918, that the Kaiser's War was brought to a conclusion—with what success we do not even yet know. At the moment of writing, the 170 or so ZE's licensed are still operating normally on the amateur bands. We must all hope that it will be possible for them to continue.

HRO ARTICLE—CONTINUATION NOTE

It is intended that Part II of *G3KFE*'s article, "About the HRO Receiver" shall appear in the next (January, 1966) issue of *SHORT WAVE MAGAZINE*. The first part was published in November.

OBITUARY NOTICES

We very much regret to have to record the deaths, recently, of:

Harold James, *G5JM*, at the age of 55 years. He had held his licence since he was sixteen, and until quite recently had been regularly active. In pre-war years, he operated from Muswell Hill, London, then after Hitler's War from Banbury, Oxon., and latterly, in retirement, from Middle Barton in Oxfordshire.

William Jennings, O.B.E., *G6AW*, of Herne Bay, Kent, who served in R.A.F. 60 Group during the last war. He was one of the characters of Amateur Radio, always keen and in touch, though for some years he had been inactive because of continuing ill-health.

Both *G5JM* and *G6AW* were in the old-timer tradition, and in their different ways made a contribution to the history of Amateur Radio.

IMPORTANT RADAR ENGINEERING OPPORTUNITY

Readers interested in Radar as a career may like to know that a short residential course on "The Principles of Radar Engineering" is being offered at Leicester College of Technology (Dept. of Electrical Engineering) for the period January 3-7 next. Because many graduates enter into radar as a career and then find that due to the sheer magnitude of the subject they must specialise, the course will be an intensive treatment of the problems they may have to resolve. The fee is 5 guineas, hostel accommodation is available, the entry standard is graduate level in electrical engineering or physics, and full details can be obtained from the Registrar, Leicester College of Technology, Leicester, quoting "Residential Course—Principles of Radar Engineering."

CALLSIGN ALLOCATION NOTE

To answer some queries and clear up a few misunderstandings: *G3SWM* is a permanent allocation to Short Wave Magazine, Ltd., for such purposes as may be approved by the Post Office, and in agreement with them. It is held by *G6FO* on behalf of the *Magazine*. *G3SWM* is an additional personal callsign on permanent issue to *G6FO*, whose own first licence was obtained in 1928, under which he has been regularly active ever since.

THE ENERGETIC ELECTRON

SOME MATHEMATICAL
MUSINGS

W. FARRAR, B.Sc. (G3ESP)

ONE learns in electrical theory that electrons move through a conductor, causing a current. One also learns, in radio valve theory, that electrons are released from the hot cathode and travel towards the anode, giving rise to anode current. A recent television programme showed electrons being used to cut holes in tough metals. What is an electron? The following notes will perhaps answer that question.

An electron is a sub-atomic particle, carrying a tiny quantity of electricity called a negative charge. It is so small that, when Sir J. J. Thomson at the end of the last century postulated that nearly two thousand electrons would weigh only as much as a single atom of hydrogen, he was not generally believed. After all, everybody knew (then) that the said hydrogen atom was the smallest particle in existence! Subsequent experiments verified Thomson's work, and also measured the charge, or quantity of electricity, associated with it.

Now, how about some figures and vital statistics (concerning the electron, of course)? We are all familiar with the ampere as a unit of current. When 1 ampere flows, it means that in every second of time an electric charge of 1 coulomb passes along the wire. The charge on the electron is so small that, even with this current, electrons in excess of 6 million million million tear down the wire in every second! Since such a current will flow easily down a thin wire, it follows that each of this vast quantity of electrons *must* be small.

How small? Well, an electron weighs so little that, if you had one ounce of them, you would have approximately 3,000 billion billion electrons (this is 3 followed by 27 noughts). Such an enormous number makes the electron seem extremely small. Maybe, but it is certainly not negligible.

Consider one of the smallest types of valve, a diode detector. Here the separation between anode and cathode is of the order of half a millimetre. Say the anode is 10 volts positive with respect to the cathode. The electric field strength between anode and cathode is then said to be 20,000 volts per metre. In such a field, an electron leaving the cathode will be accelerated towards the anode at a rate of about 3,500 billion metres per second per second. Remembering that one G is the acceleration of a body freely falling, and that an acceleration of several G's causes man acute discomfort, this electron has an acceleration of about 350 billion G's! To put it another way, it means that, having left the cathode, by the time it reaches the anode half a millimetre away it will have reached a speed approaching 2 million metres per second, or, in other words, rather more than 4½ million miles per hour! This is *fast*! For

instance, it is thirty thousand times faster than a rifle bullet.

Ever see an anode get red hot? And wonder where the heat comes from? For simplicity, let us assume that the drive to a triode PA has failed, and that with 1,000 volts on the anode a current of 150 mA is flowing. This means that about one million million electrons per second are passing from cathode to anode. The mass of an electron is such that about 1,000 billionths of a gram of electrons hit the anode every second (and a gram is about one-thirtieth of an ounce). This may seem extremely little, rather like battering at the walls of a castle with peashooters. But remember that the electrons are going extremely fast (in this case about one-fifteenth of the speed of light). Since the energy of the moving electrons depends on the *square* of the speed, the energy is considerable. (Try shooting at the aforesaid castle with billions of super-high velocity peas, and you'll see the significance of the statement.) When the electrons hit the anode and stop, the energy is transferred to the anode and causes heat, such that the temperature rises rapidly, and the anode soon starts to blush.

Talk about the mighty atom! What price the energetic electron?

GREAT AMERICAN BLACK-OUT

The power failure that put much of the Eastern United States into total darkness on November 9-10—cutting off every single service in any way dependent on a mains electricity supply of 115v. at 60 c/s—also paralysed the amateur emergency networks, except for those who could operate mobile. The lesson is that, in addition to the organisation, standby power supplies must be immediately available.

LASKY'S RADIO MOVE

In the radio retail business from their Edgware Road address ever since the end of the last war, the head office and mail order departments of Lasky's Radio, Ltd. are now in new premises at 3-15 Cavell Street, Tower Hamlets, London, E.1 (Tel. *STEPney Green 4821*). This is a new building, and the interior layout has been designed by Lasky's themselves to facilitate mail order operations and efficient warehousing.

CATCHING UP ON LICENCE EVASION

The recent BBC Report claims that enormous revenue is being lost because of viewers who backslide on their licence fees. The Post Office are making another onslaught on the problem, because it is estimated that last year more than a quarter of a million TV licences were taken out as a direct result of the G.P.O. anti-evasion drive, in the course of which 22,000 prosecutions were initiated.

This sort of thing is all very well, but while "pirate householders" can be pursued and pilloried, nothing is being (or apparently can be) done about the pirate BC stations, daily spewing out drivel and flouting every rule in the book as regards international frequency allocations and copyright agreements.

VHF BANDS

A. J. DEVON

THE aftermath of the Great October Opening—now seen to have been probably about the best, if not *the* best, we have ever known on VHF—has hardly yet died down, even if conditions since have been pretty putrid.

Many of this month's letters discuss results and experiences when, effectively, all VHF bands were wide open for several weeks until about October 25. For instance, G6RH (Bexley) mentions how peculiarly selective the DX paths were at times—on occasions, the Lerwick beacon GB3LER was coming in strongly, with no GM's at all to be heard (this has been noticed before). When working Scandinavians, Bob found that his long-Yagi, inherently a much narrower beam than the stacked wide-spaced arrays more commonly used, had to be aimed 010° to peak the LA's, whereas normally the heading would be more like 040° for optimum signals.

G2CIW (Birmingham) makes exactly the same point about GM's being conspicuously absent when GB3LER was a good signal. A slight piece of research carried out by your A.J.D. in checking a few longitudes disclosed that there is a clear sea-path from GB3LER to the North Yorkshire coast, Middlesbrough and the Hartlepoons being virtually on the same longitude as Lerwick, at 1° 10' W. This could explain a lot, but it still seems rather odd that active groups of GM's, at less than 3° further west, are not there when

the two-metre band is evidently wide open in that general direction. Here is an opportunity for a keen SWL in the Middlesbrough/Hartlepoons neighbourhood to keep a regular watch on GB3LER, 145-996 mc, so that at the end of each monthly period we could see what correlation, if any, there is between the appearance of GB3LER and the presence of GM's workable on the two-metre band. (But it is a fair certainty that, by the operation of the immutable Murphy's Law, either there will be (a) No VHF listener in that district, or (b) If there is one, he will be unable to hear GB3LER anyway. However, let us see.)

Getting back to G2CIW, what is of particular interest in Jack's report is that during the period October 16-25, he had no less than 28 over-100-mile contacts on 70 centimetres, his EDX including OZ and PA worked and ON heard. For him, a noteworthy QSO

was on two metres, with LASUG, his first LA ever heard.

A crisp note from "John Fox," G2JF of Ashford, Kent, who lists his EDX worked during the great opening as: Ten OK's, seven LA's and eight OZ's—this is almost like having an EU session on 80 metres!

We should have mentioned, last time, that the well-known *Leonids* meteor shower was due about November 14-15—and, indeed, had been forecast as likely to be of more than usual density. Of course, the MS specialists do not need alerting for these manifestations, and always have their skeds laid on. Ivo of OK2WCG (Brno) was ready for UP2KAB, and they made it between 0100 and 0230z on the 16th, with reports of 26-25. Then, at 0320z, he heard ON4FG calling SV1AB on their own MS sked. Ivo quickly wrote out his report for "VHF Bands," and (we rather like this touch!) got his

THREE-BAND ANNUAL VHF TABLE
September 1965 to August 1966

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL pts.
	Counties	Countries	Counties	Countries	Counties	Countries	
G3FIJ	15	2	34	12	19	3	85
G3HRH	15	2	44	12	8	2	83
G3TLB	8	1	50	13	—	—	72
G3AHB	—	—	32	10	19	3	64
G2CIW	—	—	14	9	32	6	61
G3OWA	15	2	22	6	13	1	59
EI6AS	8	5	29	7	4	3	56
G3KQF	—	—	18	7	20	2	47
G3FNM	2	1	33	8	—	—	44
G5UM	7	1	19	5	8	2	42
G2AXI	10	2	22	4	3	1	42
G3UCS	—	—	34	5	—	—	39
G3UFQ	—	—	28	8	—	—	36
G5KF	13	2	6	1	7	1	30
G3UFA	—	—	22	4	—	—	26
G3EKP	2	2	6	3	5	2	20
G3HWR	7	1	7	1	3	1	20

Scores are since September 1st, 1965, and will accrue until August 31st next year. Position is shown by last-column total, as aggregate of all scores. Own county and country score as one each. Entries may be made for a single band, any two, or all three. From time to time, multipliers will be announced (with at least one month's notice) to give a loading in favour of some particular band. Points so earned will be taken into the aggregate and carried right through till the end of the VHF year. Claims should be sent in as often as possible to keep the Table up-to-date.

TWO METRES

COUNTRIES WORKED

Starting Figure, 8

- 28 G5YV (DL, EA, EI, F, G, GC, GD, GI, GM, GW, HB, HG, I, LA, LX, OE, OH, OK, ON, OZ, PA, SM, SP, UA, UP, UQ, UR, YU)
- 26 ON4FG (DL, EA, EI, F, G, GC, GI, GM, GW, HB, HC, LA, LX, LZ, OE, OH, OK, ON, OZ, PA, SM, SP, UA, UP, UR, YU)
- 26 G3LTF (DL, EA, EI, F, G, GC, GD, GI, GM, GW, HB, HG, LA, LX, LZ, OE, OH, OK, ON, OZ, PA, SM, SP, UA, UP, UR)
- 26 UA1DZ (DL, DM, G, HB, HG, LA, LX, LZ, OE, OH, OH0, OK, ON, OZ, PA, SM, SP, UA, UB, UC, UQ, UP, UQ, UR, YO, YU)
- 24 G2JF, OK2WCG, UQ2ON
- 23 G3CCH
- 22 G3LAS
- 21 G3HBW
- 20 G3BLP, OK1VR
- 19 G3EDD, G6RH, PA0FB
- 18 G2CIW, G5MA, G6NB, OKIDE, ON4BZ
- 17 G2XV, G3HRH
- 16 G3AYC, G3BA, G3CO, G3GHO, G3KEQ, G6XM
- 15 G3DKE, G3FIJ, G3FZL, G3KQZ, G3PTM, G3RMB, G4MW, G3EGW, UR2CQ
- 14 G2FJR, G2HDZ, G3AOX, G3FAN, G3HAZ, G3IOO, G3JAM, G3JWQ, G3KPT, G3NUE, G3PBV, G3SAR, G3WS, G4LU, G5BD, G5DS, G6LI, G8OU
- 13 EI2W, G2CDX, G2HIF, G2HOP, G3AOS, G3DMU, G3DVK, G3EHY, G3GPT, G3GWL, G3IIT, G3LHA, G3NNG, G3OHD, G3PSL, G6XX, G8VZ, GC2FZC
- 12 EI2A, F8MX, G2BJY, G3AHB, G3BNC, G3BOC, G3FNM, G3GFD, G3GHI, G3GSO, G3JLA, G3JXN, G3OBD, G3OWA, G3WW, G5CP, G5JU, G5ML, G8DR, GW2HIY, GW3MFY
- 11 G2AJ, G2AXI, G2CZS, G3ABA, G3BDQ, G3IUD, G3JHM/A, G3JYP, G3JZN, G3KUH, G4RO, G4SA, G5UD, G5UM, G6XA, PA0VDZ
- 10 G2AHP, G2DHV, G2FQP, G3BK, G3DLU, G3GSE, G3LAR, G3LRP, G3LTI, G3MED, G3OSA, G3RTF, G3XD/A, G5MR, G5TN, G8IC, GW3ATM, GW5MQ
- 9 G2BHN, G2DVD, G2FCL, G3BY, G3FUR, G3OJY, G3SXX, G4LX, G8GP, G3EBK, G3ONF, G3DIQ, G3LDU
- 8 G2BDX, G2DDD, G2XC, G3AEP, G3AGS, G3CCA, G3EKX, G3GBO, G3HCU, G3HWJ, G3KHA, G3PKT, G3MPS, G3UFQ, G3VM, G5BM, G5BY, G8SB, G3JFG

wife to take it to the post *instantly* so as to be in time for this issue, while he nipped back to the Rx to follow the ON4FG/SV1AB attempt. As SV1AB was not being heard, either at ON4FG or OK2WCG, Ivo slipped in a xtal on SV1AB's freq.—and had an unscheduled contact by MS with ON4FG, completed by 0450z. OK2WCG thinks that this may be the first such QSO ever made in Europe, and he is probably right. Apart from that, it must be much the fastest MS contact ever made because it was completed within 15 minutes. Ivo makes two good points: He confirms that this year's *Leonids* shower was a very effective propagation medium; and that if you know the frequencies of stations operating in the MS mode, it should be possible to work them without a pre-arranged schedule. Of course, the corollary to this is that both ON4FG and OK2WCG are very good operators, experienced in MS procedure, and both happened to be there at the right time, each understanding what the other was doing—indeed, Gaby of ON4FG signed off simply by saying it was time he was off to work. And by MS procedure on two metres, that is quite something!

In sending some claims through, G3BLP (Woldingham, Sy.) takes up the point made here last time, anent the band plan, about shifting the London Area right up the HF end. Johnny agrees that the idea has some merits, but thinks that in the "present unstable state of the philosophy of the band plan," the only result of a further major change would be that people would abandon it altogether. Could well be, particularly as he goes on to say that nowadays on two metres there is not the same spirit of "togetherness" that there used to be a few years ago. This also is very true, and it will only be those who have been on since the earliest days who will appreciate his meaning. There was a time (perhaps ten years or so ago) when it was unthinkable for any two-metre operator to break the rules accepted by all—and if someone happened to be on an unfavourable frequency, it became everyone else's business to help

him with the DX. But if now, in addition to the present general attitude to the band plan, we have a migration from the HF regions and a tendency to operate VFO (which in the present state of the art is entirely feasible, even on two metres) then *any* band plan will disintegrate and there will be the usual chaos whenever there is a DX opening.

Should it be that things do go this way, then, as G3BLP says, there will have to be some material improvements in equipment and operating attitude!

On quite another point thrown out in this space recently—that DX results do not depend so much on power or commercial gear used as on operating know-how—GW3MFY (Bridgend, Glam.) does not agree with the latter point. His contention is that there can be no *mystique* about know-how and that the essential factor for VHF results is *location*. Anyone with a clear take-off in all directions just cannot miss; while not wishing to denigrate those who have the location and are able to use it to the best advantage, GW3MFY's contention is that the operator most deserving of credit is he who can work the stuff, against all the competition, from a relatively poor location, particularly when the bands are not wide open.

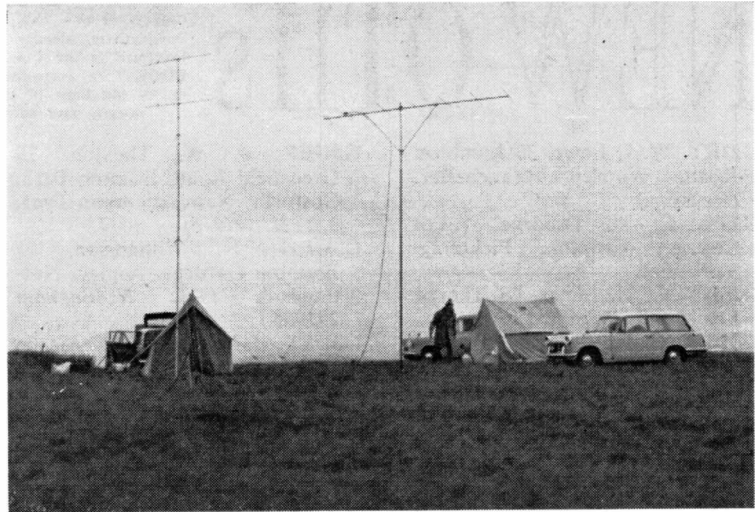
Well, that too is fair comment—and must bring us back to the old saying that "the best amateur is he who makes the best use of whatever advantages he may possess." In other words, a chap who has a good site and is not exploiting it with the proper sort of aerial system, or equipment, or operating approach, could be said to be failing to make the grade as a competent amateur. On the other hand, there is no *compulsion* about any of this and, if he is happy with whatever he's got, wherever he may be . . . you fill in the rest in accordance with whatever opinion you may have!

On the subject of frustration, an unhappy letter from G8AIH (Newent, Glos.) who has been to great trouble to equip himself adequately for the 70-centimetre band. He has a good Rx, plenty of power and one of the best of the commercial beam systems—but

since May he has only been able to work three stations. He says "I think I will chuck it unless there is a sudden rush of 430 mc stations in this area." Well, we can tell him here and now that any startling improvement is most unlikely. Newent, which as it happens your A.J.D. knows, is almost completely hemmed in by high ground all round, and it would be difficult to get out of it on any band, let alone 70 cm. What, then, is the advice to give? Persevere, of course, and the first step is to get some schedules fixed (G8AIH is *QTHR*).

The very next letter on the clip is from G3OWA (Coulsdon, Sy.), who says "Most of my recent activity has been on 70 cm., a band I have only just got going on, but in about a month I have worked 41 stations in 13 counties." (Of course, this is no help to G8AIH, but at least it proves that the 430 mc band is not dead.) The G3OWA Tx runs only 3w. in a tripler, his Rx is a G2DD converter (all-same that being used by G8AIH, and as described in the *Magazine* for March, 1953), and his beam is a 6-over-6 at 18ft., fed through 60ft. of what G3OWA says is rather lossy coax.

We are very glad to register an appearance by G3UFQ (Sutton Coldfield), by the callsign obviously very new on the two-metre air. Nevertheless, since getting going with a T.W. "Communicator"—which we hope to be discussing in detail in an early issue—and a 10-ele Yagi, he has accounted for 28 U.K. counties and eight countries, with OZ9OT (worked during the Big Opening) as best DX. G3UFQ says "I have enjoyed every minute of it" and asks if he can include the Isle of Wight as a county—regretfully, *No*, because under our rather odd rules (which, if now changed, would upset the VHF tabulation of almost two decades) the I.o.W. is in the county of Hants. On the other hand, we do accept Jersey, Guernsey, Alderney, Sark, the Scilly Is., the Isle of Man, the Orkneys and the Shetlands, and any of the provincial departments of the Republic of Eire (like Clare, Cork



The GW3BA/P camp in Montgomeryshire, at 1780ft. a.s.l., when they were out there working portable on two metres. The stacked aerial array on the left is a 5-over-5 Yagi system, and the other erection is an 8-element J-Beam. In duffle coat and warm cap is G3EJO, carrying out morning inspection. G3BA still turned in—says Stan, G4LU, who took the picture.

or Limerick) as separate counties. Were we to take in the Isle of Wight, we would also have to include the Isle of Sheppey, the Isle of Ely and the Isle of Arran. To say nothing of several other difficult problems—like the City and County of Bristol and the Principality of Berwick. Our county designations are strictly to the geographical boundaries, as shown on the latest maps and in *Whitaker's Almanack, 1966*.

Among those on four metres is G3THC (Wolverton, Bucks.), who has a 5-ele array at 30ft. (though we gather that quite recently this might have become a casualty) with which he has worked five counties in the last couple of months. David is also in the Two-Metre Annual with 18C, worked off a pair of 10-ele Yagis at 52ft., running only 24 watts.

Also reporting on four metres is G3TXR (Thornton, Liverpool), who has been making a series of portable trips (supported by G8AHQ) to various sites in South Lancs. Running 10w. and with only a dipole, on one such occasion they worked 16 stations in a few hours, covering seven counties. Towards the end of the

period, when out again, stations in GI, GM and GW were raised. Since the boys have Rx gear for two metres and 70 cm., they found that a CQ call could start a cross-band contact. One of their more interesting 4-metre QSO's was with G13HCG, who would be very glad to hear more from G stations (*QTHR*).

From the remaining correspondence, all other claims have been taken in, and letters are acknowledged from G3TQZ (Worcester), G3TPF (Birkenhead), G3KQF (Barrowash, Derbys.), G4LU (Oswestry), G3MBL (London, N.12), G3RDQ (Cheam, Sy.), EI6AS (Dublin), G3TLB (Tunbridge Wells), and G3AHB (Slough).

New Year Opens—

The next time, all being well, that your A.J.D. should be with you is after the bells have struck out for the New Year. We must never tempt Providence, but always we must pray that Allah will be with us. So, as for many years A.J.D. has been able to say to all who follow this piece—a Happy Christmas. Write again before **December 17** for the January issue. Keep the fire in and a drop in the bottle. *73 de A.J.D.*

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 U.K. section of the "RADIO AMATEUR CALL BOOK" in preparation. QTH's are inserted as they are received, up to the limit of the space allowance each month. Please write clearly and address on a separate slip to QTH Section.

- G2HIT**, W. J. Lowe, 30 Lambton Road, Worsley, Manchester. (*Re-issue.*)
- G2TS**, E. H. Osborne, Ascot Cottage, Cropton, Pickering, Yorkshire.
- G3SQT**, C. H. James, 68 Thorpe Lea Road, Egham, Surrey.
- G3TVK**, E. W. P. Jones, 20 Scott Close, Ruxley Lane, Ewell West, Surrey.
- G3UES**, Echelford Amateur Radio Society, c/o J. I. Wright, 1 The Avenue, Laleham, Staines, Middlesex.
- GM3UIA**, D. G. Clarke, 3 Bayview Terrace, Links Road, Leven, Fife.
- G3UJT**, A. V. Tomlinson, 44 Fifth Avenue, Port of Goole, Yorkshire.
- G3UJW**, K. W. Hooper, 59 Ford Hill, Stoke, Plymouth, Devon. (*Tel. Plymouth 53045.*)
- G3UKL**, M. F. Bennett, 118 Beach Avenue, Leigh-on-Sea, Essex. (*Tel. Southend 77646.*)
- G3UKM**, M. D. Leighton, 5 Moor Grange View, West Park, Leeds, 16.
- G3ULZ**, K. P. Henry, 3 Elm Grove, Chorley, Lancs.
- G3UMG**, W. Merrick, 7 Conway Close, High Acres, Kingswinford, Staffs.
- G3UOC**, D. R. D. Brown, Rexfield, Wootton Wawen, Solihull, Warks. (*Tel. Henley-in-Arden 2479.*)
- GW3UOO**, D. Rogers, 17 Mountain Street, Rhosllanerchrugog, Wrexham, Denbighshire.
- G3UOT**, A. C. Turner, 96 Chippenham Lane, Slough, Bucks.
- G3UPQ**, A. D. Maynard, 120 Aldwick Road, Bognor Regis, Sussex.
- GM3UPZ**, H. James, 21 Meteor Row, Leuchars, Fife.
- G3UQE**, R. W. White, Ferndale, Troubridge Road, Helston, Cornwall.
- G3UQK**, F. Cummings, 6 Holly Street, Salford, 5, Lancs.
- G3UQV**, D. Cliff, 5 Swinney Bank, Swinney Lane, Belper, Derbyshire.
- G3URE**, J. W. Thexton, 78 Greenfield Road, Brunton Park, Gosforth, Newcastle-upon-Tyne, 3. (*Tel. Wideopen 3044.*)
- G3URG**, N. Williamson, 11 Bramble Gardens, Aspley, Nottingham. (*Tel. Nottingham 291985.*)
- G3URP**, J. Gardner, 71 Ainslie Road, Fulwood, Preston, Lancs.
- G3URU**, R. M. Edworthy, 5 Park Grove, Kedleston Road, Derby. (*Tel. Derby 40938.*)
- G3USB**, R. J. Baker, 5 Mill Road, Cambridge, Cambs.
- G3USE**, S. J. Down, 59 The Crescent, Caddington, Luton, Beds.
- GM3USG**, T. Graham, 91 David Dale Avenue, Stewarton, by Kilmarnock, Ayrshire.
- GM3USL**, Amateur Radio Club, Auchenharvie Community Centre, Stevenston, Ayrshire. *QSL via GM3DJS.*
- G3USO**, C. J. Walker, 4 Painswick Road, Woodhouse Park, Manchester, 22.
- GI3USS**, J. T. Barnes, 95 Crawfordsburn Road, Bangor, Co. Down.
- G3USU**, D. H. Taylor, 9 Doveleat, Chinnor, Oxfordshire. (*Tel. Kingston Blount 689.*)
- G3USV**, 2317 Sqn. A.T.C., R.A.F. Station, North Weald, Essex. *QSL via G3JUJ.*
- G3UTC**, G. Farr, 26 Burstead Drive, Billericay, Essex. (*Tel. Billericay 2707.*)
- GW3UTD**, A. M. Gaskill, Arosfa, Penrhosgarnedd, Bangor, Caerns.
- G3UTE**, N. W. Williams, 9 Willoughby Road, Bridgwater, Somerset. (*Tel. Bridgwater 2554.*)
- G3UTF**, R. Clarke, 33 Church Walk, Old Brinsley, Notts.
- GM3UTJ**, A. L. Thorburn, 9 Portland Road, Kilmarnock, Ayrshire. (*Tel. Kilmarnock 21900.*)
- G3UTO**, P. A. Strand, 8 Brookwell Close, Chippenham, Wilts. (*Tel. Chippenham 3723.*)
- GM3UTQ**, I. A. Balloch (*ex-5A5TY*), 23 Squadron, R.A.F. Station, Leuchars, Fife.
- G3UTS**, T. W. R. Belshaw, 69 Derwent Crescent, Hamsterley Colliery, Newcastle-on-Tyne.
- G3UTT**, D. N. Ballard, 27 Taylor Street, Southborough, Tunbridge Wells, Kent.
- G3UTW**, G. T. Chaplin, 68 Cowper Road, Harpenden, Herts.
- G3UTX**, R. A. Ridley, 39 Lonsdale Avenue, Weston-super-Mare, Somerset.
- G3UUO**, J. W. Dudbridge, Grey Gables, Amberley, Stroud, Glos. (*Tel. Amberley 3101.*)
- G3UUT**, J. F. Wilson, 22 Askham Lane, Acomb, York.
- G6ABN/T**, D. A. Graham, 95 York Road, Tadcaster, Yorkshire.
- G6DK**, F. Boyce, Lotamore, Rookery Road, Staines, Middlesex. (*Re-issue.*) (*Tel. Staines 52063.*)
- G8AFW**, S. Clark, 2 Fairway, Girton, Cambridge. (*Tel. Cambridge 76789.*)
- G8AKY**, R. N. Golding, 7 Belvidere Avenue, Shrewsbury, Salop.
- G8ALA**, D. Ollerhead, 36 Park Drive, Whitby, Ellesmere Port, Wirral, Cheshire.
- G8ALP**, E. Haycock, Two Four, The Comyns, Bushey Heath, Herts. (*Tel. BUShey Heath 3387.*)

CHANGE OF ADDRESS

- G2YS**, J. W. Swinnerton, 29 Beacon Way, Rickmansworth, Herts.
- G3APB**, A. S. C. Mathews, 16 Great Parks, Holt, Trowbridge, Wilts.
- G3BWX**, A. L. Fayerman, 45 Copse Avenue, West Wickham, Kent.
- G3CDE**, Dr. G. Jackson, 12 Oak Tree Close, Burpham, Guildford, Surrey.
- G3EHK**, D. R. Davison, Ianford, Old Hay Lane, Dore, Sheffield.
- G3IVG**, F. Stocks, 44 Fernhill Drive, Stacksteads, Bacup, Lancs.
- G3JFS**, P. C. Cole (*ex-GM3JFS*), 1 Mount Road, Haverhill, Suffolk.

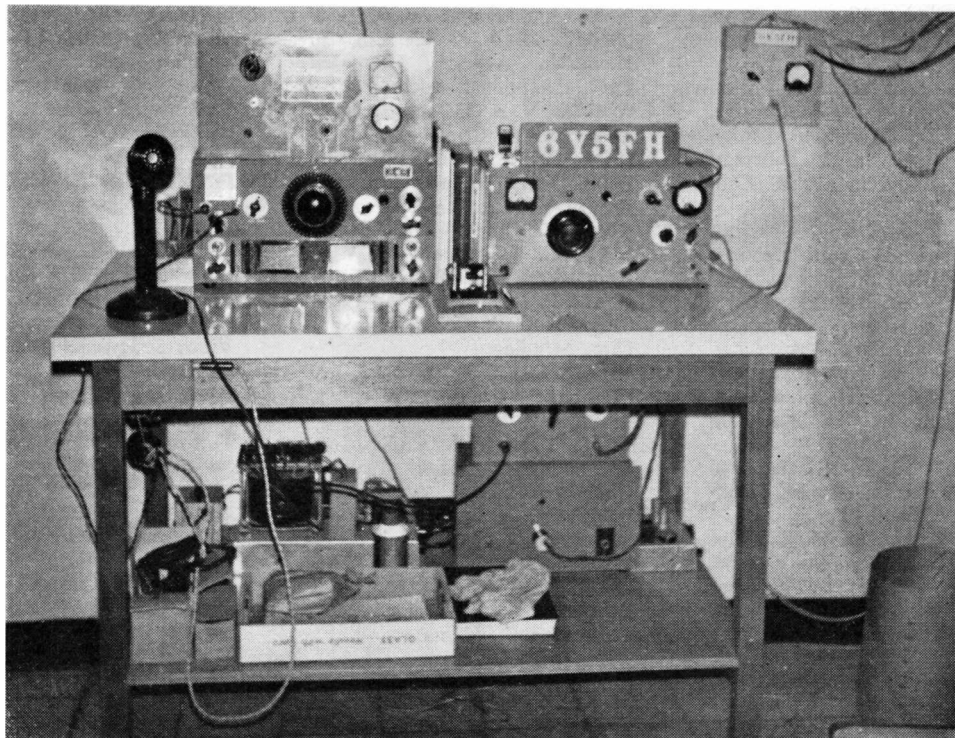
- G3KSK**, J. J. Phillips, 44 Grosvenor Road, Shaftesbury, Dorset.
- G3LQR**, S. J. W. Freeman, West Farm, Cransford, Woodbridge, Suffolk. (Tel. Rendham 493.)
- G3MEA**, S. Harle, 2 Thornsett Terrace, Croydon Road, London, S.E.20.
- G3MUM**, P. S. Odell, St. Cuthberts Hospital, Croft, Darlington, Co. Durham.
- GM3NLO**, R. C. Harvie, No. 1 Janitor's House, Technical College, Dam Park, Ayr.
- G3NOQ**, A. G. P. Boswell, 1 Eastwood Gardens, Newcastle-upon-Tyne, 3. (Tel. Gosforth 55723.)
- GM3NQB**, W. N. Hardie, 10 Moat Crescent, Hawick, Roxburghshire.
- G13NSV**, M. C. Donnelly, Tullykevan, Dungannon, Co. Tyrone.
- G3NUA**, J. Hogg, 76 Thorntree Drive, West Monkseaton, Whitely Bay, Northumberland.
- G3OAZ**, J. Akehurst (ex-DL2VM /5A4TZ/ DL2BC/ GW3OAZ), 30 Hampden Avenue, Hampden Park, Eastbourne, Sussex.
- GW3OCD**, V. A. Davies, 30 Bowham Avenue, Bridgend, Glam.
- G3PDL**, P. F. Linsley, 18 Abbey Drive West, Grimsby, Lincs.
- G3PTD**, A. Jaques, 47 Newstead Road, Urmston, Manchester.
- G3PYP**, G. F. Hibberd, 15 Winston Road, Melksham, Wilts.
- G3RAN**, P. E. Lavender, 14 Farm Close, Hoylake Crescent, Ickenhams, Middlesex.
- G3RIA**, S. G. Spiegler, 90 Christian Fields, Norbury, London, S.W.16.
- G3RUH**, J. R. Miller, B.Sc., Jenkins Farm, Hatfield Peverel, Chelmsford, Essex.
- G3RYY**, N. Penketh, 20 Wolmer Street, Ashton-in-Makerfield, Wigan, Lancs.
- G3RZV**, A. A. Lawrance, 3 Hamilton Road, Boscombe, Bournemouth, Hants.
- G3SQU**, C. S. Clarke, 32 St. Mildreds Avenue, Birchington, Margate, Kent.
- G3TLC**, A. Marcantonio, 10 Helleston Mill Lane, Norwich, Norfolk, NOR.21.L. (Tel. Norwich 45244.)
- G3TVU**, I. D. Brown, 21 Langleys, Kingswood, Basildon, Essex.
- G3TZZ**, M. C. Mead, C.C.S., Block 33, R.A.F. Station, Changi, Singapore, 17.
- G3UEC**, N. Stanley, 9 Castle View, Sedgwick, Kendal, Westmorland.
- G8WN**, A. E. Reeve, 20 Bartley Avenue, Rushington Estate, Totton, Hants.

AMENDMENTS

- G3LSX**, G. M. M. Townsend, 18 Allenswood Road, London, S.E.9.
- G3ODF**, J. E. Clarges, 116 Fordbridge Road, Ashford, Middlesex.



General view of the "Short Wave Magazine" stand at the recent International Radio Communications Exhibition, at the Seymour Hall, London, with G6FO in conversation with G3SDN. Though for this year's Show attendance was somewhat down in comparison with last, business generally is reported as having been quite good — it certainly was so far as we were concerned — and, as usual, it was a great occasion for meetings and personal contacts. The F.O.C., the B.A.R.T.G., and the R.A.F.A.R.S. were among organisations in the field of Amateur Radio who held special meetings, and there was also a get-together for overseas visitors on the Friday evening. However, in spite of the success of the Exhibition from these purely social angles, there is a strong feeling developing, especially among the commercial exhibitors interested in and working for the Amateur Radio market, that the time has now come for our Show to become bi-annual — this, indeed, is the tendency with many trade and commercial exhibitions.



THE OTHER MAN'S STATION

6Y5FH

STARTING as an SWL from Penarth, Glam., in 1934, Frank Hattemore went out to Jamaica in 1963 and now operates as 6Y5FH, at 3 Circle Close, Trafalgar Park, Kingston, 10, and this is his station as in action at the present time.

On the Rx side, he has an HRO incorporating various useful modifications—such as a cascode 1st RF stage using a 6BQ7A; a noise limiter; an improved S-meter circuit; and reception right down to 9 kc at the LF end by use of an adapted coil pack. This Rx works with CC converters for the 50 and 145 mc bands.

His transmitter is a home-built 5-band-switched job, covering 10-80 metres, CW and Phone, and running 50 watts. The main aerial is now a multi-band dipole, where previously he had separate aerials for each band (found impracticable from the point of view of maintenance). In addition, there are arrays for 50 and 145 mc, and for these bands there are separate home-built Tx's. The ancillary equipment includes a CC frequency standard giving beats at the 500-50-5 kc points.

As regards activity, 6Y5FH describes his results as "run of the mill DX on the HF bands," with CW preferred and Europeans worked on 80 metres.

On six metres, contacts are possible with the W's whenever there is sporadic-E about—which is fairly often in those latitudes. But so far the two-metre band has only yielded one QSO and though they have 430 mc in 6Y5, nobody in Jamaica is using it—which is disappointing, because VHF has always been a main interest with 6Y5FH, right back to his SWL days (as we well remember when 5 metres was being opened up in South Wales).

Having heard a good deal of DX on 160 metres, future plans at 6Y5FH include Top Band activity during this winter season, with the 50 watts allowed by the licence. The difficulty is neither aerials nor power, but QRN and the terrific racket from Loran. In view of his enthusiasm for VHF, he hopes also to get some of the locals going on two metres, as there should be opportunities for contact with the W4 district.

We congratulate 6Y5FH on his neat station and the great amount of constructional work he has put into it, and also on his results so far, hoping that he will succeed in making himself heard in the U.K. on the 160-metre band. And we might add that 6Y5FH is yet another who has been with us since No. 1 of SHORT WAVE MAGAZINE made its first shy appearance nearly 30 years ago.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(No Activity Reports wanted for January issue, which will feature full write-up of "MCC." Next deadline, for February issue, January 14.)

CLUBS are fully recovered, we trust, from "MCC." Some are eagerly awaiting the published results, others are licking their wounds. But there is no doubt that this year's contest went off with a swing. One very obvious fact was that the operating was much faster than in previous years—it *had* to be, in order to work all the available stations on the band.

And so to the season of Club Dinners, Christmas parties, and so on . . . and we hope they will all be a great success.

From your "Club Secretary" to all club secretaries, officials, scribes and members, best wishes for a Merry Christmas, and a Happy and Successful New Year. See you again in 1966!

(Please note the sub-heading at the top of this page . . . every year we receive activity reports for the January issue which *can't be published*. Please hold them up until January 14, for coverage in the February issue.)

ACTIVITY REPORTS

Southgate held a mobile event on October 3, and on the 14th they enjoyed G3LTF's "Moonbounce" lecture, illustrated with slides and tapes. The 28th was the date of their Junk Sale, and on December 11 they hold the Annual Barnet Party—7.30 p.m. at Oakmere House, High Street, Potters Bar.

Acton, Brentford & Chiswick will also be running a Junk Sale, after their next meeting, which is on December 21; the sale will be "open to all." **Basingstoke**, too, will be holding a sale on December 11—7 p.m. in the Immanuel Hall, Wote Street.

Wolverhampton will be hearing G2FPR on "How I Started," on December 6, and on the 20th G3KMT will be talking about Moonbounce Communication. Both meetings 8 p.m. at the Hq. (Neachells Cottage, Tettenhall).

Bedford normally meet at Westfield School, Queens Park, Bedford, but on December 14 they will be paying an outside visit (no details as yet) and on the 23rd will be holding a Social Evening. **West Kent** will have a Film Show on December 3, and, on the 17th, a talk by G3NIT on Transistors and their Applications. **Blackpool & Fylde** have an Open Night on December 6; on the 13th a talk on "Puzzles, Games and Computers" by G3OPT; on the 20th, a Question-and-Answer session, and on the 27th an Open Evening. For them, the New Year starts on January 3, with a taped lecture by the late P. P. Eckersley on "The Engineer and Society."

Bromsgrove will have a talk on Antenna Systems

and Coupling Units (by G2CLN) on December 10. They have no less than eight members attending the R.A.E. course at the local college, and Morse classes are held for half an hour before their meetings; winter programme available from the secretary.

Reading have published their first news sheet, which will be a bi-monthly affair, compiled by G8AAG. Recent meetings have been a "mixed bag," but December brings the AGM, which will be held on the 14th—it is hoped that *all* members will attend.

Scarborough held their monthly sale of surplus gear on December 2; on the 9th there will be a demonstration of the SX-111 receiver. G8KU will be talking about Awards and Certificates on the 16th, and the annual Christmas Party is arranged for the 23rd. **Civil Service** continue their meetings at the Science Museum, to which all members of the Civil Service and allied organisations will be welcome. December 7—films on Amateur Radio; 21st, Informal meeting and Christmas Party.

Hasving will hold their December meetings on the 8th and 22nd at 52 Western Road, Romford, when they hope to have a slide-and-tape lecture on Aerials available. **Dorking** recently heard a lecture on Slow-Scan TV, by G3MED, and now look forward to their Christmas Dinner on December 14; this will be followed by an informal pre-Christmas drink at The Wheatsheaf, on December 21.

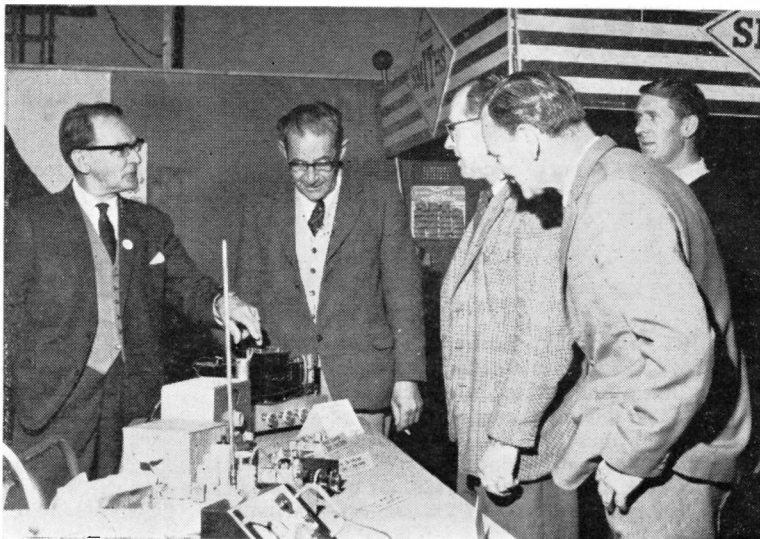
Derby hold their Constructors' Contest on December 8, and the contest for the G5YY Trophy on the 12th. The December 15 meeting will be an Open Evening, the 22nd the Christmas Party, and the 29th is set aside for "The Year in Retrospect," when members are invited to bring along slides and films taken during the year.

Hull report that they are quite active, although they have not reported for a long time. The new QTH is the Railway Institute, Anlaby Road, and meetings are held there on alternate Fridays (8 p.m.). On December 3, G3NIE will talk on Radio Fundamentals; on the 17th, G3TEU on Crystal-Grinding. And the Annual Dinner will be on January 14.

There is a sad casualty to report from **Uxbridge**, where the club is closing down (for the time being) owing to lack of support—the main reason for this being competition from the several other Clubs in the district. There is just a possibility that local activity and enthusiasm may, at a later date, make a re-opening possible. Meanwhile, no more from Uxbridge.

South Shields have for their December meeting

Fareham Amateur Radio Club's stand at the recent Fareham Fair. Their exhibit included no less than 20 items of gear home-built by Club members—not many local groups could mount such a display—and in addition they had stations going on 160-80-20-4 metres. Nearly 1,000 members of the public passed through the Hall while the show was on. At left in this picture is Douglas Briggs, G2QK (ex-G2Q1 of Newport, Mon. and president of F.A.R.C.) with members, left to right, G8ACI, G3HYG, G3SHD and G3PMM of the Fareham Club.



a talk on a subject which should be important to all of us, but is not often discussed: "How Electricity Affects the Human Body," by G3OOR. On January 7 G3RKL will introduce his Top Band Tx, converted to DSB.

Saltash will have a talk on Tape Recorders on December 3, a Film Night on the 17th and their own Festive Night on the 31st. They held their AGM in November, and already report a membership of 40. **Manchester** have meetings booked for December 8, 15, 22 and 29, but apart from the AGM, on the 15th, there is no set programme.

Echelford will gather on December 15 for "a general natter" at the Links Hotel, Fordbridge Road, Ashford, Middx., 8 p.m. There will be no meeting on the 29th. **Purley** report that their recent Junk Sale fetched in a record attendance, including six prospective new members! Their meetings on December 3 and January 7 will be informal, and on December 17 they will hold their Christmas Social.

Leeds will have a Transmitting Evening on December 8, and on the 15th, Part III of "Construction of a Top Band Tx." No further meetings until January 5, when the W1BB tape-and-slide lecture will be presented. **Loughborough** have four meetings during the month, with a Tape Lecture (Basic Valve Circuits) on the 3rd; G3LCG on Operating Procedure on the 10th; Christmas Sale on the 17th and a "Free Night" on the 31st.

Magnus Grammar School have started on practical work for the juniors, and have had a talk on Communication Receivers and QSL procedure. Other recent events have been participation in JOTA and a visit to the Notts. Police Communications Centre. **Melton Mowbray** have a talk on Stereo Reproduction (Mr. R. Huddleston) on December 16, and on January 20 they will visit the shack of their secretary, G3FDF.

Spenn Valley meet only once during December—

on the 9th, to hear W1BB's recorded Top Band lecture. The January meetings are "to be arranged" on the 13th, and a Film Show on the 27th. **Surrey** (Croydon) are running a meeting called "Technical Topics," at which queries sent in to the secretary beforehand will be dealt with by a panel. (We can't give the date, unfortunately, because it is not stated.)

Sutton & Cheam notify us—well in advance!—that their annual Dinner and Dance will be held at the Woodstock Hotel, Stonecot Hill, North Cheam, on Saturday, March 5, 1966. **University College of North Wales** held their last meeting of 1965 on the eve of publication, with G2IG describing a 6-watt Linear Amplifier (transistor) covering 1-30 mc without Tuning. First meetings of the Spring Term will be on January 13 and 27.

Torbay had a talk, at their October meeting, on Colour TV, from G6LYF of S.T.C., Ltd. On November 20 they made a return visit to the Plymouth ARC for a Quiz Match, and were hoping to avenge their recent defeat. **Verulam**, who meet in their clubroom at Hedley Road, St. Albans, hold their AGM on December 15, when they hope to get through the business quickly enough to leave time for a talk. On January 19, G3LXP will be discussing Transmitters for the Beginner.

Dudley have had two well-attended meetings since their AGM, and have been discussing future plans. They have been invited by the Birmingham Tape Recorder Club to give their members a talk on Amateur Radio—probably in January. Meetings are

CLUB SECRETARIES, PSE NOTE !

The January 1966 issue Club space will be devoted, as usual, to our report on "MCC." Hence, individual Club reports cannot be used in the January issue. "Month with the Clubs" will resume in February, for which the deadline is January 14.

fortnightly, at the Art Gallery, 8 p.m. on alternate Fridays.

Wimbledon started a 10-metre Net on November 16 (28.4 mc or thereabouts) and hope that non-members will join them, either on the net or at their meetings. Their CW net on 1820 kc (2100 on Fridays) is not at all well supported, and some brass-pounders would be welcome—it is initiated each week by G3PVA or G3EPU.

Peterborough, at their AGM, decided to increase the sub. from 5s. to 15s., but there were no fireworks, although the date was November 5. The chairman is G3HXR; vice-chairman G2BYI; and hon. secretary, G3KPO, as before. The club Tx, G3DOW, will be on the air every Friday from the Hq. in the Old Mill, London Road, where visitors are always welcome.

Northern Heights made more than 50 contacts with Scout stations during the JOTA event, and followed this activity up with a visit to the Baird TV Works in Bradford. A party also visited Seymour Hall

for the Exhibition. The Annual Dinner will be on December 8; on the 22nd, a Ragchew; and on January 5 G3FDC will be talking about Station Layout.

Plymouth meet every Tuesday, 7.30 p.m. at the clubroom, and are already preparing for their Annual Dinner on February 12. It is interesting to note, from their *Newsletter*, that they now have 31 callsigns among the membership; and also that the G.P.O. have allocated them the call GB2USA for use during the celebrations of the Arrival of the *Mayflower* in the U.S.A. . . . the week beginning December 13.

Bradford, meeting at the Bradford Technical College on Tuesdays at 7.30, have an informal evening on December 7; a Quiz Night devised by G6EKE on the 14th; and no further December meetings. On January 6 there will be a talk on SSB by G3ADQ, and on January 18 a visit to Bradford Telephone Exchange. **South London Mobile Club** will have a talk from G3SRY on

Names and Addresses of Club Secretaries reporting in this issue :

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, London, W.3.
 A.E.R.E. (HARWELL): J. Galpin, Building 347.3, A.E.R.E., Harwell, Didcot, Berks.
 A.R.M.S.: N. A. S. Fitch, G3FPK, 79 Murchison Road, London, E.10.
 BASINGSTOKE: P. Jackson, G3ADV, 11 Oaklands Way, Basingstoke.
 BEDFORD: J. R. Clarke, G3OWQ, 12 Robin Hill, Brickhill, Bedford.
 BLACKPOOL & FYLDE: J. Boulter, G3OCX, 175 West Drive, Cleveleys, Blackpool.
 BRADFORD: J. D. Midgley, G3SAO, 77 Brantwood Road, Bradford 9.
 BROMSGROVE: J. K. Harvey, 22 Elm Grove, Bromsgrove, Worcs.
 BURY & ROSSENDALE: K. Drinkwater, G3RHR, 75 Woodville Drive, Marple, Cheshire.
 CHESHAM: D. Kind, 19 Hollybush Road, Chesham.
 CHESHUNT: B. Robertson, G3TTV, 9 Holbeck Lane, Cheshunt, Waltham Cross.
 CIVIL SERVICE: G. Lloyd-Dalton, 2 Honister Heights, Purley, Surrey.
 CORNISH: M. J. Harvey, Oak Farm, Carnon Downs, Truro.
 CRAWLEY: R. G. B. Vaughan, G3FRV, 5 Filbert Crescent, Gossops Green, Crawley.
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
 DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
 DORKING: J. Greenwell, G3AEZ, Eastfield, Henfold Hill, Beare Green, Dorking.
 DUDLEY: R. W. Fisher, G3PWJ, 63 Swan Crescent, Langley, Oldbury, Worcs.
 ECHELDFORD: A. G. Wheeler, G3RHF, 88 Village Way, Ashford, Middx.
 GRAFTON: A. E. Bristow, 37 Tyndale Mansions, Upper Street, London, N.1.
 HARROW: C. J. Rees, G3TUX, 17 Colburn Avenue, Hatch End, Pinner.
 HAVERING: P. J. Moore, G3TUV, 1 Bonns Farm Cottages, Stapleford Tawney, Romford.
 HULL: A. Sherer, G3TEU, 18 Malham Avenue, Anlaby Road, Hull.
 LEEDS: S. Tomlinson, 31 The Quarry, Alwoodley, Leeds 17.
 LOUGHBOROUGH: D. Winters, G3IPL, 52 Walton Street, Leicester.
 MAGNUS GRAMMAR SCHOOL: R. Wallwork, B.Sc., Magnus Grammar School, Newark on Trent.
 MAIDENHEAD: E. C. Palmer, G3FVC, 37 Headington Road, Maidenhead.
 MANCHESTER: K. Kahn, G3RTU, 12 Cliffdale Drive, Manchester 8.
 MANCHESTER (SOUTH): M. Barnsley, G3HZM, 11 Cemetery Road, Denton, Manchester.
 MELTON MOWBRAY: D. W. Lilley, G3FDF, 23 Melton Road, Asfordby Hill, Melton Mowbray.

NEWARK: G. Francis, G3TWW, 93 Balderton Gate, Newark.
 NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax.
 NORTH KENT: C. Westwood, 25 Knole Road, Bexley, Kent.
 OXFORD UNIVERSITY: A. J. Shepherd, G3RKK, 3 Cearn Way, Coulsdon, Surrey.
 PETERBOROUGH: D. Byrne, G3KPO, Jersey House, Eye, Peterborough.
 PLYMOUTH: B. J. Curnow, G3UKI, 112 Mount Gold Road, Plymouth.
 PURLEY: A. Frost, G3FTQ, 62 Gonville Road, Thornton Heath, Croydon.
 R.A.I.B.C.: Mrs. F. E. Woolley, G3LWY, 331 Wigan Lane, Wigan, Lancs.
 RADIO CLUB OF SCOTLAND: A. Barnes, GM3LTB, 7 South Park Terrace, Glasgow.
 READING: N. C. Taylor, G3TOQ, 83 Stoneham Close, Reading.
 REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill.
 SALTASH: D. Bowers, 95 Grenfell Avenue, Saltash, Cornwall.
 SCARBOROUGH: P. Briscoe, G8KU, Roseacre, Irton, Scarborough.
 SOUTH BIRMINGHAM: A. E. Bishop, 40 Cecil Road, Birmingham 29.
 SOUTHGATE: R. E. Wilkinson, G3TXA, 23 Ashridge Gardens, London, N.13.
 SOUTH LONDON MOBILE: J. R. Doughty, 17 Hookham Court, Patmore Estate, London, S.W.8.
 SOUTH SHIELDS: D. Forster, G3KZZ, 41 Marlborough Street, South Shields.
 SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, Leeds.
 STRATFORD ON AVON: M. Webb, G3OOQ, 14 Townsend Road, Tiddington, Stratford on Avon.
 SURREY (CROYDON): R. Morrison, G3KGA, 33 Sefton Road, Addiscombe, Croydon.
 TORBAY: Mrs. G. Western, 118 Salisbury Avenue, Barton, Torquay.
 UNIVERSITY COLLEGE OF NORTH WALES: P. D. Symes, GW3SWL, c/o Dept. of Electronics Engineering, University College of North Wales, Dean Street, Bangor.
 UXBRIDGE: F. J. P. Offord, 43 Grays Road, R.A.F. Uxbridge.
 VERULAM: G. Slaughter, G3PAO, 5 Leggatts Wood Avenue, Watford.
 WAMRAC: Rev. A. Shepherd, 1 North Street, Crewe, Cheshire.
 WESSEX: W. G. West, 23 Palmer Road, Poole, Dorset.
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 WIMBLEDON: E. N. Hurle, G3RZN, 156 Monkleigh Road, Morden, Surrey.
 WIRRAL: A. Seed, G3FOO, 31 Withert Avenue, Bebington, Wirral.
 WOLVERHAMPTON: J. Rickwood, G3JJR, 852 Stafford Road, Fordhouses, Wolverhampton.
 WORCESTER: B. A. Jones, 12 Woodside Road, Larkhill, Worcester.
 WORTHING: R. J. Tarr, G3PUR, 245 South Farm Road, Worthing.

When recently the Bristol Group put on a station for a local trade exhibition, they were able to sign GB3BRS ("Bristol Radio Show") running this outfit on Top Band and 20 metres. Eighty could not be used because of TVI caused to a video tape recorder. In spite of a high local noise level and poor aerial siting, more than 20 countries were worked on 14 mc, and locals on Top Band.



Printed Circuits on December 4, and on the 18th a general discussion on "Things to Come in 1966."

Manchester (South) report that they are still going strong, despite a long absence from these columns. They will have two talks in December—G3DQU on Aerial Matching on the 3rd, and G3HZM on High and Low-Pass Filters on the 17th—both at 8.15 p.m. The club will be closed on the 24th and 31st, reopening with an Activity Night on January 7.

Stratford-upon-Avon report some interesting meetings, and hope to have two new "tickets" in their midst for Christmas. December 3 is the date for a Heathkit demonstration, and the 17th for the Christmas Party, held jointly in the clubroom and the Mason's Arms (the latter being more comfortable for the XYL's).



"... And a lot of interest is being taken in our stand ..."

Reigate have changed club night to Thursdays, and the next will be on December 16—still at the George and Dragon, Cromwell Road, Redhill. Their seventh AGM will follow, on January 27, and the Annual Dinner will be in February. **Grafton** meet every Friday in Room 35, Montem School, Hornsey Road, London, N.7. On December 3, G4GA will talk on "Bridging the Gap," and on the 10th the Christmas Junk Sale will be held. G3AFT, the club callsign, will be on Top Band again (on Friday evenings) after a lapse of several years.

Cheshunt had to cancel their November talk on Lasers, but G3OLE stepped in with one on his transistorised mobile gear. Note change of secretary—see panel for new QTH. **Bury & Rossendale** hold their AGM on December 14, at the Old Boar's Head, The Rock, Bury, in the private room at 8 p.m.

Maidenhead and District Amateur Radio Club was officially formed on November 9, and their first meeting will be held on December 7 in The Hall, East Berks. College, Boyn Hill Avenue, Maidenhead. Their committee propose to cover a wide range of activity, and report plenty of ideas and talent for future programmes. All they now need is—members!

Oxford University had four interesting lectures in November, covering Radio Control, BBC Outside Broadcasts, Analogue Computers and Transistors. The Michaelmas term having ended, they are now in recess. **South Birmingham** have a new Hq. at the Scout Hut, Pershore Road, Selly Park, where they will meet on December 12 for their Christmas Party and Bring-and-Buy Sale (with free refreshments). Their AGM revealed a healthy situation, both financially and activity-wise.

Wirral were hoping to top the century mark for attendance at their Annual Dinner in November. On December 1 the subject was Propagation, and

WEST HERTS.—NEW CLUB

We are asked to announce that it is proposed to form a Club for all interested in Amateur Radio in the West Hertfordshire district. Prospective members, SWL's as well as licensed amateurs, are invited to get in touch with: "PRG," 13 Little Road, Hemel Hempstead, Herts.

on the 15th there will be a Film Show. January meetings will be on the 5th and 19th. Worcester will have a series of "Potted Lectures" (short talks by members) on December 11, a Junk Sale on January 8 and the Club Dinner on January 28. Their club station G3GJL is on the air most weekends, and sometimes also during the week.

Chesham continue R.A.E. lectures and CW classes on Friday evenings, but the main interest is getting the club Tx going. (MCC caused some excitement too, as a first entry.) It is planned to hold a Junk Sale once a month in future. Worthing report that their extra meeting each month is proving a success, especially the Morse classes. On December 13 they will be discussing "Contests, 1966."

Newark have held discussions on Aerials and Transmitters, and a Film Show. At the December meeting they will have a Jumble Sale. Crystal Palace were given a talk, supported by slides, on a VHF DXpedition, by G3POI. On December 18 they combine their Junk Sale and Christmas Party.

CLUB PUBLICATIONS

We acknowledge, with thanks, the receipt of the following magazines and newsletters: WAMRAC (*Circular Letter*, No. 54); Verulam (*News Sheet*, No. 19); Purley (*News Sheet*, November); Echelford (*Newsletter*, October); Radio Club of Scotland (*GM Magazine*, October); RAIBC (*Radial*, October); ARMS (*Mobile News*, October); South Shields (*Spectrum*, November); West Kent (*QLF*, October); Wolverhampton (*Newsletter*, Oct.-Nov.); Southgate (*Newsletter*, November); Wessex (*QUA*, November); Foundation for Amateur Radio (*Auto-Call*, October); Plymouth (*QUA*, November); Wimbledon (*QRK 5*, Vol. 2, No. 2); Cornish (*The Cornish Link*, November); Saltash (*Tamar Pegasus*, November); North Kent (*Newsletter*, No. 94); Reigate (*Feedback*, October); South Birmingham (*QSP*, November); Wirral (*Newsletter*, October); Worthing (*Ragchew*, November); Crystal Palace (*Newsletter*, No. 120), and AERE, Harwell (*QAV*, No. 48).

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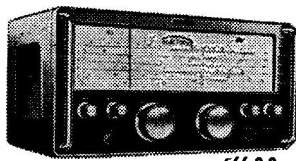
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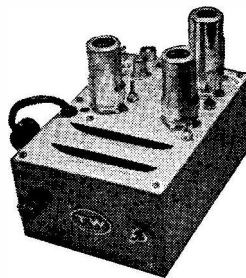
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SHORT WAVE MAGAZINE

55 VICTORIA STREET : LONDON, S.W.1
PUBLICATIONS DEPARTMENT

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SMALL ADVERTISEMENTS, READERS—continued

WANTED: G2DAF Receiver Mk. II (mechanical filter version), either completed, partially built or with all parts, in PART EXCHANGE for Heathkit RA-1 amateur-band receiver, excellent performance, with 100 kc calibrator and Q-multiplier—or sell £37 10s. the lot.—G3RFH, 5 Blakes Crescent, High-bridge, Somerset.

SELLING: A Creed type 7B T/P, 110v. and 250v. DC, with silence cover and manual, in good condition but untested, £12 o.n.o.? Modified TCS-12 transmitter, in very good condition, £5 o.n.o.? QV06-40, new, 30s. (plus 2s. post). Moving-coil meters, 2in. flush round, 50-100-200 mA, 4s. each (plus 1s. 3d. post). Muirhead slow-motion drives, 5s. each (plus 2s. post).—Swinborne, 6 Comberton Road, Clapton, London, E.5.

FOR SALE: Eddystone 940 receiver, with speaker and phones, like brand new, 20 hours use only, £80, carriage paid.—Scott, Aldersey, Tattenhall, Nr. Chester, Cheshire.

WANTED: KW-2000.—H. Reeves, 53 Gorse Farm Road, Great Barr, Birmingham, 22A.

SELLING: Valve 4X150A, new, £3. Acos stick mic., new, 20s. Mains step-down transformer, secondary 100 watts at 110v. Compact 23 mc IF strip, 3 mc bandwidth, using EF91's. **WANTED:** One milliamp panel meter.—133 Station Road, Cropston, Leicester.

FOR SALE: Eddystone EC-10, mains version, still under guarantee, in perfect condition, £35.—Potter, 37 Wykeham Hill, Wembley, Middlesex.

WANTED: R.209 receiver, preferably in good working order, but would consider one needing attention. Southern England. State price to—Box No. 4204, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Transmitter, commercial gear preferred, running 100 watts on HF bands, A1 and A3; must also cover Top Band and have power reduction facility. Offers to—Box No. 4206, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Hammarlund HQ-180A, in as-new condition, with speaker, £100 o.n.o.?—Saxby, 59 Shaftesbury Avenue, London (GERrard 3141), W.1.

WANTED: T.W. Minihalo, also handbook or circuit for R.209 Rx. **SALE:** Command Rx type output transformers, can be used for QRP modulation, as in Minitopper circuit "Short Wave Magazine," August, 1962, 6s. each. 7C7 valves, 5s. each.—G3MBL, 244 Ballards Lane, London, N.12. (Tel. HILLSide 4321.)

SALE: Garrard 4HF Player on plinth, Leak Stereo 20 Amplifier, Leak Point-One Stereo Preamp., 18 months old, £50 The Lot. Or EXCHANGE Eddystone 888A (cash adjustment).—Box No. 4202, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SELLING: A good HRO-MX, grey, with six coils. Phone/CW Tx for 160m, Woden mod. (grey-blue), two PSU's in grey metal case, giving 300v. at 150 mA and 250v. at 80 mA, separate supplies, £35.—G3DCF, QTHR.

WANTED: Vibrator for B.44 Mk. II, Type 12SR7. Also cowl-gill motor for beam rotator.—Harvey, 39 Curliu Road, Oakdale, Poole, Dorset.

SALE: National NCX-3, in excellent condition, with home-built PSU, crystal calibrator, mike, spare PA valves, price £100.—Burchell, 118 College Hill Road, Harrow Weald, Middlesex.

FOR SALE: CR-100 receiver, excellent, with manual, £12. TE-22 Audio Generator, as new, £9. RQ-10X Q-multiplier, £5. PR30 Preselector, 50s. PF-428A valve voltmeter, 30s.—D. Senior, 26 Park Road, Barnet (4218), Herts.

WANTED: Eddystone 680X receiver; QV02-6 valves; 70-centimetre converter. Please state condition.—J. A. Hodgkins, 12 Silverlands Avenue, Warley, Worcestershire.

SMALL ADVERTISEMENTS, READERS—continued

FOR SALE: R.206 Rx, in excellent condition, with PSU, price £15 o.n.o., with free delivery 50 miles.—Smith, 116 Montgomery Street, Hove 3, Sussex.

FOR DISPOSAL: (Ulster) Lafayette HE-30 Rx, 18 months old, complete with external speaker and manual, £20. Also Tape Recorder, Elizabethan LZ29, £25.—Stevens, 36 High Street, Ardglass, Co. Down, Northern Ireland.

SALE: R.1155 Rx, completely new panel, dial and control layout, internal mains PSU and output stage, S-meter, realigned to cover Top Band, FB receiver, £9. Standard Signal Generator Type 106, 5.5-55 mc, mains, modulated, with calibrated attenuator, 50 microamp. o/p meter, instruction and calibration book, £5. Frequency meter based on BC-221 design, with 100 kc xtal and calibration curves, £3. All carriage extra.—GM3LGU, 3 Mount Vernon Road, Edinburgh, 9.

OFFERING: QQV06-40A's, tested on 70 cm. and guaranteed, 45s. each. 2C43's, 25s. each. 6AM4's, brand new and boxed, 15s. each.—L. A. Vance, 6 Salisbury Road, New Brighton, Cheshire.

SALE: Minimitter MR44 Rx, with PR30 preselector, Brown's headphones, speaker and manual, £35. Buyer collects.—GW3LSB, Holcombe, Vicarage Avenue, Llandudno, Caerns.

FOR DISPOSAL: Panda Explorer Tx, £50; and Eddystone S.640 with matching speaker, £27— or would EXCHANGE for recent model KW-77 or Viceroy Tx. Offers considered.—A. Robinson, G3MDW, Candy Cabin, Ogdon, Halifax, Yorkshire. (Ring Halifax 64329 after 7.0 p.m.)

SALE: New SR-600 triple conversion amateur-band Rx, £90. Would consider part-exchange deal.—Box No. 4202, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: RA-1 Rx, with xtal calibrator, Q-multiplier, matching speaker, as new and Heath-kit assembled, with two-metre converter, £45 o.n.o.?—G8AFG, 39 Station Road, Drayton, Portsmouth, Hants. (Tel. Cosham 77559, evenings.)

FOR SALE: Minimitter Top 2-7 Tx, in new condition, with spare valves and handbook, £17 o.n.o.? **WANTED:** Eddystone 750 Rx and B2 Tx/Rx.—G2DFH, 4 Westbourne Terrace, Saltash, Cornwall.

SALE: Eddystone 888A, £65. Twomobile Rx, £20. TW2 Tx with Mod., £17. 12v. transistor PSU/control unit, £8. Londex coax relay, 15s. Halo, 15s.—GW3MFY, 1 Bryntirion Hill, Bridgend, Glam., South Wales.

WANTED: Eddystone 940, BRT-400 or similar Rx, also 240v. petrol generator. **SALE:** Table Model HRO, all coils and PSU, £20. Hallicrafters S.27, 27-144 mc, £20.—Newberry, 3 Hemel Hempstead Road, Redbourn (258), Herts.

SELLING: Eddystone Cat. No. 924 PSU for EC-10 or EB-35 receivers, brand new and unused, £4.—6 Linden Grove, Folkestone Street, Hull, East Yorkshire.

SALE: R.107 Rx, with S-meter, spare valves, vibrator and handbook, rebuilt and professionally realigned, price £12, free delivery Midlands.—Clarke, Roseneath, Badby Road, Daventry (2591), Northants.

WANTED: Mains PSU, or suitable alternative for K.W. Vallant Tx.—Moser, Fernbank, Castle Road, Kendal, Westmorland.

SALE: Marconi HF Amplifier, 3/829's, blower, etc. Offers?—G3MMN, QTHR.

SELLING: A Marconi CR-100/8, bought brand new Sept. '62, rarely used, with manual and speaker, £30.—Grenfell, 14 Pendarves Road, Wimbledon (7638), London, S.W.20.

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SMALL ADVERTISEMENTS, READERS—continued

FOR SALE: Heathkit RG-1, new, £36. Gonset G.43, 540 kc to 30 mc, £35. Both 240v. AC mains models. —Sutcliffe, 103 City Road, Bradford (24144), Yorkshire.

SALE: Heathkit RA-1, £35; HE-30, £25; both new, mint, boxed and with manuals. Codar PR30X, £4 10s. Receivers delivered 40-mile radius.—Walton, 14 James Street, Thornton, Bradford, Yorkshire.

SELLING: Completely rebuilt HRO, with miniature valves throughout; line-up includes 7360 product detector (perfect for SSB), Q-multiplier, aerial trimmer, voltage stab. oscillator, "Electroniques" de-Luxe IF's, calibrated S-meter, 8 coils (three bandspread for 10-20-80m.), with PSU; cabinet sprayed silver-hammer; a snip at £25. No offers. Prefer buyer collects, or carriage extra. (Seller now has transceiver.) Cossor 330 DB 'Scope, with new tube, valves and electrolytics, and manual, in perfect condition, price £10, plus carriage—or would EXCHANGE for good two-metre converter.—Osborne, G4OV, Marshwood, Nr. Bridport, Dorset. (Tel. Hawkchurch 392.)

EXCHANGE or Sell Heathkit Hi-Fi 12-watt Amplifier; Geloso VFO and dial new; Labgear WBC unit; 4-metre Tx Type S.440C, complete with xtal, modulator and PSU. **WANTED:** Bits for G3HTA Rx, "Electroniques" coil pack, metal work, etc. T/P gear, Vibroplex bug, or anything interesting.—Box No. 4207, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Linear Amplifier, 10-80 metres, self-contained with solid-state PSU (1500v. with LP switch), 4/811's in parallel grounded-grid, fully metered and with indicator lights, circuit substantially as p.181 "Sideband Handbook," in Imhof slim-line cabinet, grey hammer finish, with front panel stove enamelled dark grey, price £40, delivered 50 miles.—G3RDG, 40 The Vale, Golders Green, London, N.W.11. (Tel. SPEedwell 8831.)

FOR SALE: BRT-400 Rx, 150 kc to 33 mc, in excellent condition, £40. May be seen and tried at my QTH.—Jesson, 181 Kings Acre Road, Hereford (3237).

SALE: Heathkit Comanche Rx, amateur bands only, in mint condition, with home-built PSU and handbook, £25. Prefer buyer collects.—GM3UIE, 2 Brankholm Lane, Rosyth, Fife, Scotland.

SELLING: Vitavox B.50 Handmic, unused, 39s. 6d. **FT-243 Crystals:** 7050, 7075, 7125, 7150 kc, 10s. the lot. **TF-338B Marconi Audio Attenuator,** £5. **Studio Vidicon** and coils, £10. **AN-APG5 2600 mc radar chassis,** 70s. Four 10-amp. 50 p.i.v. RCA silicon diodes, £1. **Mullard DG7.5 CRT,** 15s. Post extra.—Cedar, 2A Convent Hill, London, S.E.19. Tel. LIVINGstone 8489.)

FOR SALE: Vertical Aerials, 32ft., Mk. I type (see "Short Wave Magazine," June 1964), 3 guineas carriage paid. Transmitter cabinet, 30s. Transmitter PSU: 700v., 375v., 150v., 12v., 6v. 8A, etc., £5. G8KW trap dipole, £4 10s.—G3JFL, 11 St. Edward's Road, Birmingham, 29.

FOR SALE: AR88E receiver, 530 kc to 31 mc, fitted S-meter, with matching speaker, phones, spare valves, manual and trimming tool. In very good condition, price £42. Delivery by arrangement.—Ring Horsham 4743.

SALE: HRO, modified by Tiger Radio, ten coils, four bandspread, £35 (cost £50). Complete two-metre Rx station, with Command receiver, Withers converter 3-6-5-6 mc IF, and 12v. PSU, £12. Complete Top Band mobile or fixed station, Command Rx/Tx, £12. B.44 transceiver converted for four metres, no crystals, £5. Codar AC AT5 PSU, brand new, £7. Eddystone EC-10, £35. Codar CR-66 receiver, £15. Codar PR30 Preselector, £3. All in new condition.—Timmins, G3PUA, 4 Tarnway Avenue, Thornton, Blackpool, Lancs.

SMALL ADVERTISEMENTS, READERS—*continued*

WANTED: SX-42 or SX-43 receiver, also BC-342, preferably not too much modified. **SALE:** Medium-wave Command Rx, as new and unmodified, £5. Q-Fiver, new in carton, £7. Command Rx output xformers, 6s. 6d. each. VHF Signal Generator Type I-130A, 100-156 mc, new, £3 10s., manual for same, 25s. All items plus postage.—Box No. 4210, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: CR-100 receiver, must be in good electrical and mechanical condition, and preferably with manual.—Cummings, 114 Meltham Avenue, Withington, Manchester, 20.

SALE: HRO Senior Rx, with nine general-coverage coils and power pack, £20.—May, 166 Rock Avenue, Gillingham, Kent. (Tel. Medway 52548.)

AMATEUR STATION of the late GM4AN being broken up. Callers only at—3 McKenzie Street, Kirkcaldy, Fife, Scotland.

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SALE: AR88LF, full gain to 30 mc, resprayed, FB Rx, £30 o.n.o.? New SR-600 SSB Rx, triple conversion, 10-80 metres, every refinement, £80 o.n.o.? Going Transceiver here.—G2CVY, Ebberley Dairy, Newport, Barnstaple, North Devon.

WANTED: In good condition, a modern Transceiver, also Heathkit HO-10E 'scope, with manual. Full particulars, please.—Box No. 4208, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Heathkit model OS-1 Oscilloscope, mu-metal screen, little used, perfect, £14 10s.—Thompson, 134 Royal Oak Road, Manchester, 23. (Tel. Wythenshawe 2897.)

SALE: Eddystone S.750 receiver, excellent for SWL, colour calibration for broadcast and amateur bands, in good condition, price £35, buyer collects.—Gillett, 41 Priestley Close, Ravensdale Road, London, N.16. (Tel. STAmford Hill 9347, evenings.)

WANTED: Manual No. 42617 for Radio Set Type 122 (miniature suit-case Tx/Rx). Will pay up to £3.—M. Gee, 11 Whitehorse Lane, Stepney, London, E.1.

SELLING: K.W. Viceroy Mk. IV transmitter and KW-77 receiver, both in excellent condition and only seven months old. Price asked £250.—H. N. Bagby, Clerks Dept., Redditch U.D.C., Council House, Redditch, Worcs.

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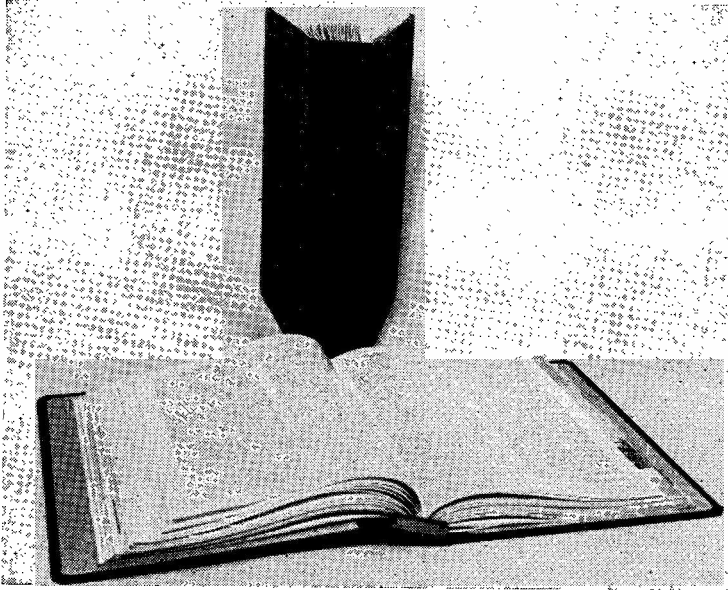
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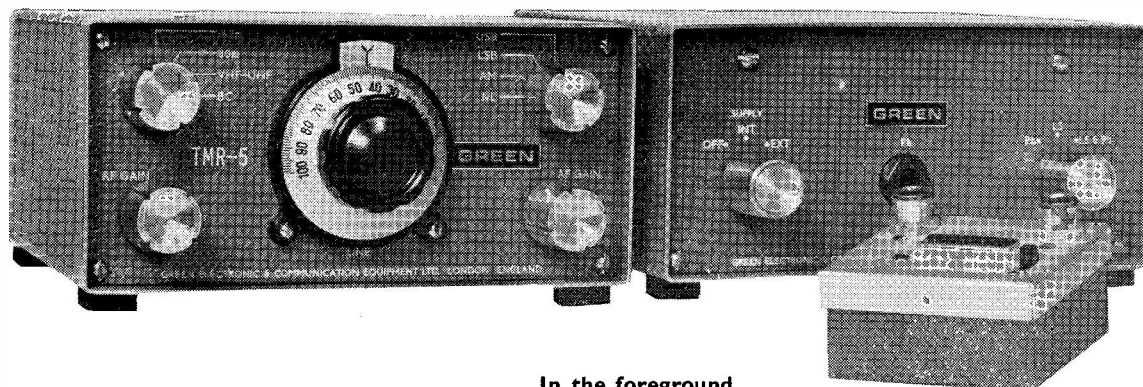
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