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The SHORT WAVE Magazine

VOL. XXVIII

APRIL, 1970

NUMBER 2

TRIO

Stand-by to receive



important announcement: Trio TS-510 and PS-510 price reduction to £180 the pair



Full information on these and all other Trio models including: VFO-5D (Variable Frequency Oscillator for TS-510) £32; JR-500SE receiver £69. 10. 0; 9R-59DE receiver £42. 10. 0; JR-310 receiver (illustrated right) £77. 10. 0; SP-5D speaker £4. 7. 6 and HS-4 headphones £5. 19. 6 are available from your local Trio dealer or direct from us.

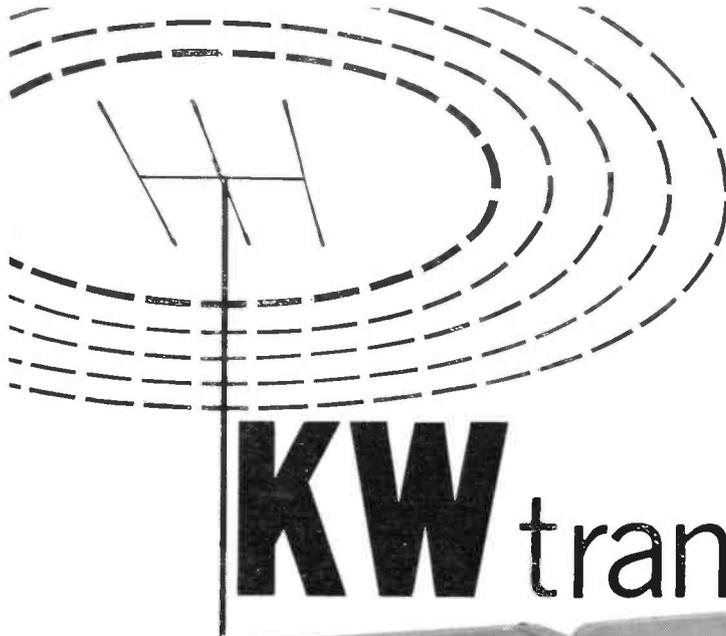


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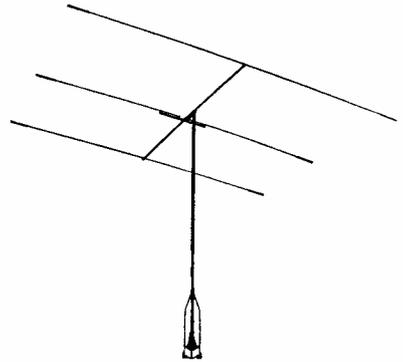
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EMSAC 2 Metre Converter

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PS1 The matching power supply for CNI and CN3 gives 25ma at 150V, and 1 amp. at 6-3V. This is a separate item and may therefore be used with other equipment. It is connected to the CNI or CN3 by a three-pin connector and lead (supplied). **60/-**. P. & P. 4/6

CN2 2 metre Converter as above with a power supply mounted in a cabinet, 8½" x 7" x 4½" (high), complete. **260/-**. P. & P. 6/6

For the CNI and CN2 the standard IF is 28-30MHz to tune between 144-146MHz signal frequency. A selection of other I.F.s available is given below. These converters can usually be despatched between 2 and 4 weeks after receipt of order.

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4-6MHz 9-11MHz 12-14MHz 24-26MHz 70MHz 45MHz 44MHz 40MHz

Crystals may be purchased separately price 30/- post free. Other I.F.s are available outside this list for which the crystals have to be specially ground. These cost 25/- extra on the price of any converter and the delivery time is usually between 2 and 4 weeks.

XL38666 2 metre converter crystal as used in the EMSAC converter. These are brand new and especially made for us by Cathodeon. Type MMW, wire ends, spacing -192". Plenty in stock. **30/-**. Post free

6CW4 RCA Nuvistors. **10/6** plus 1/6 P. & P. any quantity

EMSAC Tuning Unit for Receivers

TU2 The TU2 is designed with the short wave listener especially in mind. Its useful range is from 1.5MHz to 30MHz continuous, including six amateur radio bands and all short wave broadcast bands. The improvement in performance will depend on how well your existing antenna matches your receiver.

The TU2 controls consist of 2 tuning capacitors, a switched inductor and a system switch. The system has positions giving a straight through position (so that you can instantaneously switch the thing in and out), a calibrate position (in this position the receiver input is earthed so that you can hear your crystal calibrator pips or zero your "S" meter) and an "in circuit" position. The circuit is a pi-network. **90/-**. P. & P. 4/6

Also in stock TAVASU mobile antennas. The TTC standing wave indication previously advertised are available for 50 ohm or 75 ohm impedances. SAE will bring complete and up-to-date lists. Enquiries welcome. The EMSAC range together with other stock lines are also available from—

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EMSAC 4 Metre Converter

CN3 Low noise 4 metre converter with two 6CW4 Nuvistors in the front end. 12A77 triode mixer and cathode follower for low impedance output. 6AK5 crystal oscillator uses 42MHz crystal. The I.F. (output) is 28-100 to 28-700MHz to tune between 70-1 and 70-7MHz. Complete with crystal and valves. Overall dimensions 6" x 4" x 4". **170/-**

CN4 4 metre converter as above in an attractive case with built-in power supply, overall dimensions 8½" wide, 7" deep, 4½" high. **260/-** Input and output connections on EMSAC converters are being standardised to BL types. SO239 will be available to special order only.

EMSAC Basic Antenna Systems

GVI All-band Vertical. The GVI is a general purpose vertical antenna, which when properly excited, will cover frequencies from 1.8MHz to 28MHz. It is constructed of aluminium alloy tube sections nesting one inside the other, providing continuous adjustment from 7' to 23'. Apart from its role as a multi-band vertical it may be adjusted to a single band quarter-wave vertical for either 14MHz, 21MHz, or 28MHz. For portability, when dismantled, no individual element is greater than 6' 6". The antenna is mounted on two glass-fibre insulators (SO1), which may be screwed to a suitable piece of timber or mast. No guying is provided or required.

Optimum multi-band performance will usually be obtained by mounting the GVI as high as possible driven by a single wire feeder. A tuning unit (transmatch) is required to match the feeder to the transmitter. A suitable circuit is given in the comprehensive instructions which accompany each antenna. Alternatively, the EMSAC TU4 may be used.

Optimum mono-band performance (14, 21 or 28MHz) using the GVI will be obtained by using it as a ground plane antenna, in which case coaxial cable feed should be employed. The EMSAC tuning unit TU1 provides a perfect match to 50 ohms or 72 ohms coaxial cable. Alternatively, details of a suitable matching unit will be found in the instructions. **92/-**. P. & P. 7/6

GD1 Multi-band Dipole. Multi-band dipole, 5RV type. 102ft. horizontal length of 18 swg Polyanite-covered copper wire. 30ft. 300 ohm ribbon matching section and 80ft. twin 75 ohm feeder. Glass-fibre mouldings used for all joints. Ready to go! **80/-**. P. & P. 4/6

GD2 Multi-band Dipole. Half-size version of GD1. Matching section plus feeder length supplied is 90ft. **60/-**. P. & P. 4/6

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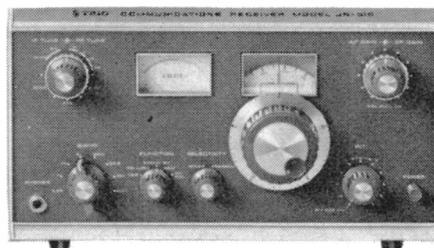
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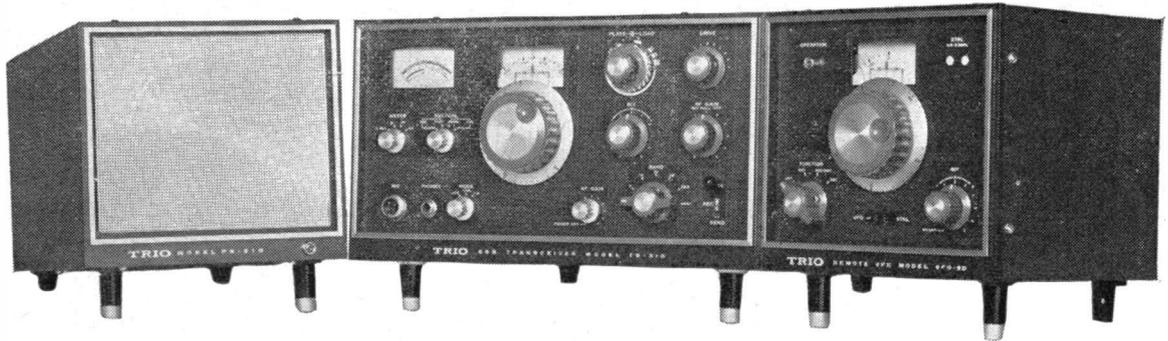
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GREAT NEWS FROM TRIO !

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The reason for our enthusiasm is the announcement that the superb TS-510 TRANSCEIVER has now been reduced in price to £180 *inclusive* of its companion PS-510 Power Supply/Speaker which makes it the finest transceiver buy on the market today. Remember, this is still the same high quality, top specification rig as ever with the standard twelve months Guarantee backed by a first-class after sales service !

This most significant price reduction is the direct result of increasing world-wide sales and gives the British amateur the opportunity of owning the finest value-for-money transceiver on the market today bar none. The problem of building power supplies to use in conjunction with a commercial transceiver in an effort to keep costs down is now overcome and the man who had previously budgeted for the TS-510 at the old price will now find that he can afford the optionally extra VFO-5D which is priced at £32.

Send today for fully comprehensive literature on the TS-510 or better still call and let us demonstrate to you without obligation !

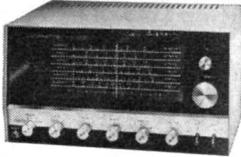
Our own reconstruction programme is now nearing completion and we shall soon be in the position to offer the most complete demonstration and display facilities ever provided for the amateur be he SWL or licensed transmitter. As ever, our main line will be the ever-growing TRIO range but we shall carry our usual large stocks of top-grade used equipment which will be available for demonstration without obligation.

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R209 Mk. II COMMUNICATION RECEIVER

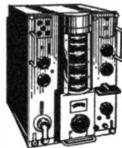


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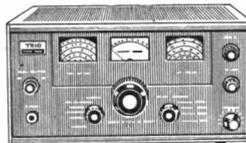


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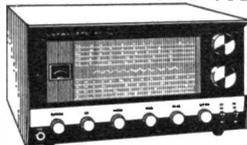
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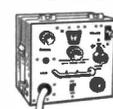
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5mA	27/6	300mA	27/6	50v AC	27/6
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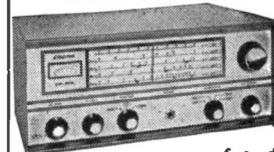
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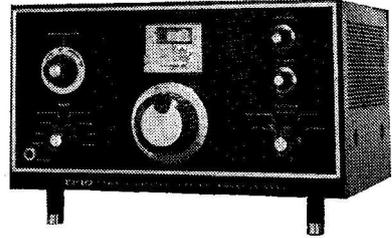
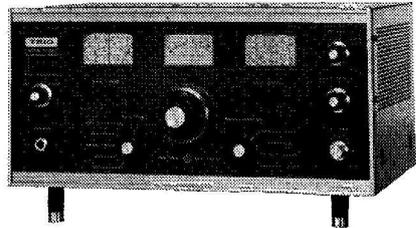
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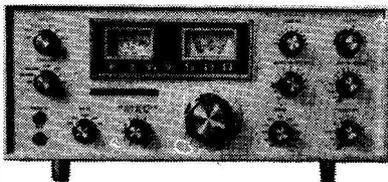
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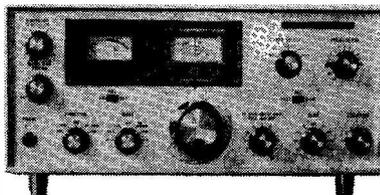
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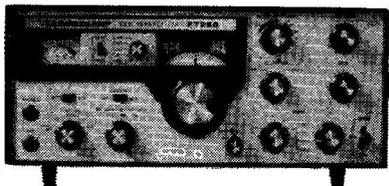
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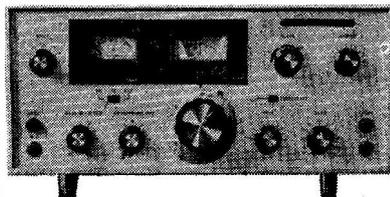
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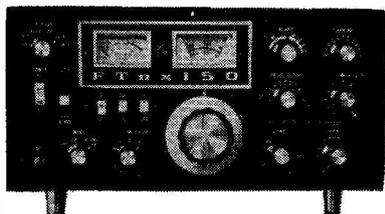
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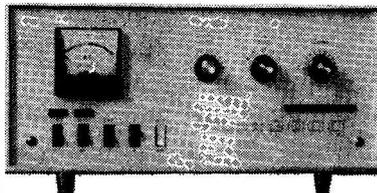
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SHORT WAVE MAGAZINE

(GB3SWM)

Vol. XXVIII

APRIL, 1970

No. 318

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The SHORT-WAVE Magazine

E D I T O R I A L

807 *Given that the intention and the chief purpose of the amateur is to get into communication with his fellows—either across the town or over the ocean—it does not really much matter how the RF is actually generated, so long as he has a good aerial system and an effective receiver. A superlatively good RF generator, or transmitter, is of little practical use without an aerial capable of radiating at the maximum effectiveness the site conditions allow, while without a reasonable receiver the AT-station operator is at a disadvantage under present-day conditions on the amateur bands. A small amount of RF into a good aerial system will go very much further than a high-power transmitter with an inefficient one.*

Which brings us back to the transmitter. Given the aerial and the receiver and disregarding for the moment the more advanced techniques and the use of high power, in looking at this matter of getting the RF, immediately we are confronted with the 807—used for years at AT-stations throughout the world because it is at once the cheapest while being one of the most versatile and efficient valves of its rating ever produced. It is still a standard fit in much commercial equipment and is in the current lists. So far as the amateur operator is concerned, the 807 will function in all RF stages of an HF-band transmitter, and in drive and output positions in the modulator; it will work well at any input from 5 to 50 watts, and it can also be pressed into service as a half-wave HV rectifier. In fact, at its price on the amateur market, it is difficult to find anything to bracket with the 807 when one starts to add up all that it can do. Of course, there are other valves that go higher in frequency, or give more output for less drive, or are rated more favourably, or are smaller in size—but none of these can compete for price.

Since it is of no material importance how or using what valves we generate our RF so long as it is under control, the question could now be: Can we at long last dispense with the ubiquitous 807?—Well, can we?

*Austin Forster,
G6FO.*

A MONITOR FOR TVI

CONTINUOUS CHECK ON THE TRANSMITTER AT VULNERABLE FREQUENCIES

I. E. HILL (G6HL)

This is an interesting and valuable contribution on the general problem of TVI control. Our contributor dealt with harmonic suppression in his article on low-pass filters in the February issue. Here he discusses an auxiliary Rx system for continuous monitoring, with its logical development. It will not be until TV Bands IV and V are in general use that any diminution of TVI difficulties can be expected. In the meantime, much can be done as regards proofing the gear against Band I TV transmissions.—Editor.

IN the years between the two World Wars most neighbours were reasonably tolerant of Amateur Radio activity and even interested in successful results. Any need for planning consent for aerials was virtually unknown and BCI, the most likely menace to good relations, was relatively easily cured permanently by simple remedies.

Since World War II, the goggle box, first in monochrome and now tinted, has gradually become a household god to be interfered with at peril. Worldwide communication is no longer an interesting novelty but a potential hazard to operation of the one-eyed monster and necessitating aerials which can be defined as "eyesores" when planning permission is involved. TVI is interference with television, never to be identified by the public as failure of the TV receiver to reject unwanted signals in favour of the wanted.

This is a situation which the amateur must accept but plan to minimise by ensuring that any signal radiated on frequencies used for TV reception is adequately below the level of TV signals received in the local area. Much has been written about how to achieve this desirable situation by careful design of the transmitter, effective screening, use of low-pass filters in the PA output and correctly

matched aerial systems. Most of this information is valid for one application or another but success or failure is generally related to effect on the TV receiver. This gives a conclusive final result but is difficult to utilise as a direct measurement during interference investigation, and for subsequent monitoring.

During preliminary investigation a simple tuned circuit with diode detector and microammeter (Fig. 1) can be coupled to the PA output and will assist initial adjustment—but it quickly runs out of sensitivity and provides no means of comparing the level of radiated harmonic with the received TV signal. That is always the practical problem.

Sensitive Detection Apparatus

A much better approach is to have a calibrated receiver capable of tuning the TV frequencies and provided with its own audio and S-meter outputs. To obviate spurious response it is advisable to avoid any frequency mixing process—in fact, the answer is a simple straight receiver with quite loose aerial and interstage coupling. This Rx must have enough gain so that when coupled to a dipole it will give full scale S-meter reading and adequate audio output from the local TV station.

The writer has built a number of different receivers for this very purpose and used them in different locations involving varied TV signal levels from different Band I transmitters. One early model covered the frequency range 35 to 70 mHz and had two RF stages with three tuned circuits but it was a brute to track. The present model used in the fringe of Band I, Ch. 1 and 3, service areas has two bands: 40-46 mHz, and 50-60 mHz. This is much easier to track and has proved quite adequate for harmonic checking.

This monitor is connected to a Channel 1 dipole in the roof and operated continuously whenever the transmitter is in use. Ch. 1 sound at 41.5 mHz normally takes the S-meter needle to scale maximum while vision varies between half and three-quarter scale at 45 mHz. At 42 mHz the sound signal can still be heard but the S-meter indication is down to about 3% of full scale; at 42.25 mHz there is no signal. Selectivity could be improved by adding another RF stage or tuned circuit but this is not really necessary as most troublesome harmonics in this range will be between 42 and 43 mHz. Audio output from a separate detector is fed via a selector switch to the input of a common-purpose AF amplifier, which feeds a speaker and telephones. In this way the throw of the selector switch will permit listening to the TV channel at will.

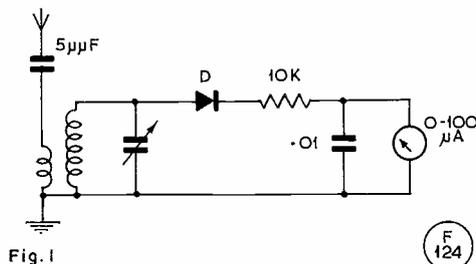


Fig. 1

Fig. 1. Simple Harmonic Checker.

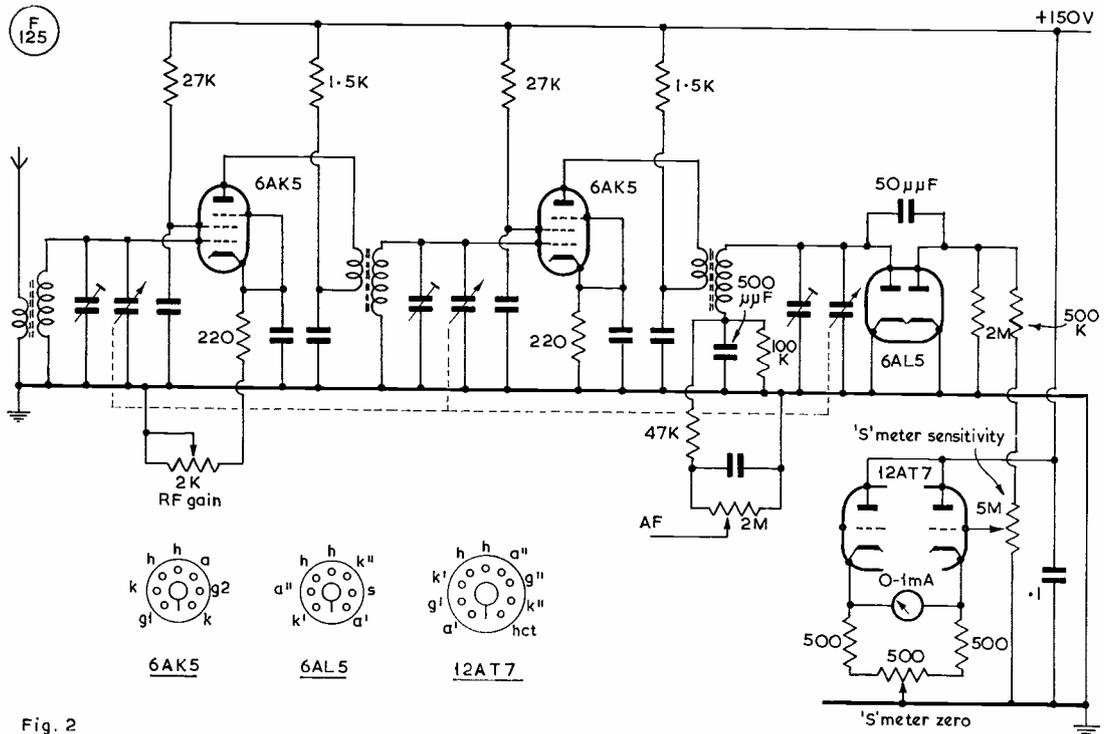


Fig. 2

Fig. 2. Sensitive TVI Monitor-receiver.

Installation and Operation

During transmission periods the monitor is tuned to the 42-43 mHz or 56-60 mHz harmonic of the band in use. The S-meter is immediately in front of the operator position and just above eye level, so any harmonic indication does not long pass unnoticed. Out of TV hours 150 watts input on 21 mHz to a ground-plane about 100ft. from the monitor dipole will produce less than 1% deflection of the S-meter with the monitor tuned to 42 mHz. During TV hours the story is somewhat different and variable.

As explained earlier, the monitor selectivity does not completely reject Channel 1 sound at 42 mHz and a 2% to 3% reading is recorded; 150 watts on 21 mHz will then normally increase the reading by less than another 1% of full scale. Some transistorised TV receivers, others for unexplained reasons and perhaps some TV aerials which have become corroded will present a non-linear condition to the 21 mHz or other transmitted signal overload, generate and reradiate a harmonic on the TV channel which shows up in the monitor as an inconsistent harmonic indication but which really is no defect in the transmitter. The same effect is noticeable when a SWR indicator is in use even if it is well screened. In the latter case it is advisable to have an off-position between "Forward" and "Reverse" and ensure that no diodes then have a completed path.

With the monitor tuned to the appropriate frequency and the S-meter showing a few per cent scale reading for harmonics against full scale for the TV signal, all further TVI cures must be at the receiver—screening, earthing, high-pass filter and/or coaxial braid filter.

The basic circuit diagram of the monitor is shown at Fig. 2. The model actually in use comprises two separate RF chains including separate valves, RF input and output being switched. All tuning capacitors are ganged to one shaft operated by a vernier dial calibrated for two bands, each on opposite sectors of an ivorine scale. Coils are provided with small slugs and parallel preset capacitors to facilitate tracking. No constructional details are given because so many variations of frequency range and assembly are possible, and may be necessary, to meet local conditions. Anyhow, a reader needing more details for so simple a unit has not much hope of being able to cope with TVI, anyway!

Just two points of advice—use a well-sited dipole aerial cut for mid-band in the local Band I channel. When winding coils make coupling as loose as possible consistent with ability to get a full scale S-meter deflection on local channel sound, as the criterion for sensitivity. This may necessitate some cut-and-try. Calibrate from a signal generator, TV signals or even transmitter harmonics (!).

[cont'd. over

Making the Impression

A monitor in continuous operation giving audio and visual presentation of TV signals but non-existent (or very low) harmonics is always well received by visiting inspectors, and even irate neighbours can be impressed. It is also a valuable warning signal if something does go wrong during operating periods.

The logical follow-up is to make a transistorised battery-operated version of the same device. This could

be invaluable for chasing "rusty joint" rectification and harmonic generation.

Finally, it is relevant to comment that although the general introduction of Band IV and V TV should lessen TVI complaints considerably, amateur transmitters must still be harmonic free. Probably the easiest way to check HF transmitters is by monitoring harmonics in Band I. If these are within acceptable limits there is a fair prospect that the higher-order harmonics will not be troublesome.

Some Useful Circuits

FOR YOUR NOTEBOOK

APPLICATIONS, VALUES AND ESSENTIAL DATA

AT Fig. 1 is the arrangement for a Continuously Adjustable Fully Regulated PSU, over-load and thermally protected, such as would be suitable for a bench supply for transistor equipment. The controllable output is a nominal zero to 15 volts, at a maximum current load of 1 amp. The ripple voltage is so low, 20 mV at full load, as to be negligible for all practical purposes.

The output voltage is set by R10. It is also possible to limit the output current by the setting of R8—but the demand on the unit should not be such as to leave Tr3 to dissipate maximum power, as when high current is being taken at low voltage. With this exception, the protective circuit is automatic. The thermistor R7 is made the protective element for Tr3,

by mounting it on the same heat-sink, and in such a position that any excessive heat generated by Tr3 affects R7, which then changes its value and causes Tr1 to conduct before the setting of R8 becomes effective. C4 is to prevent parasitic oscillation.

Tr3 should in any case be given a generous heat-sink—say, 4in. square by $\frac{1}{4}$ in. thick, with plenty of air circulation. D1 should also be on a heat-sink, isolated from chassis. The other semi-conductor items can be mounted with clip-type sinks.

After ZSSHF, from "Radio ZS."

At Fig. 2 is an Audio Peak Limiter, a circuit arrangement to prevent over-modulation and the condition known as "flat-topping." By proper use, it can allow up to 10 dB more Tx output. It is connected between the microphone and mic. input circuit of the Tx to be controlled. It should be built into an effective screening box, including the battery—otherwise there may be trouble with hum pick-up. The circuitry allows for high-impedance input and output, as required with a crystal microphone.

To set up the Limiter, first adjust the Tx audio gain for operation under normal speech conditions.

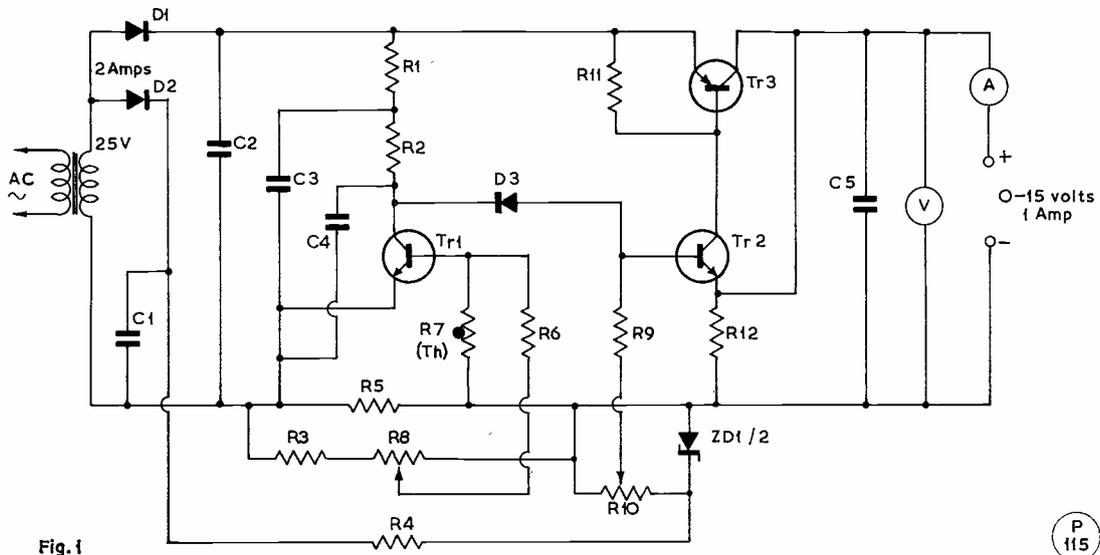


Fig. 1

Fig. 1. Continuously Adjustable Fully Regulated Power Supply Unit.

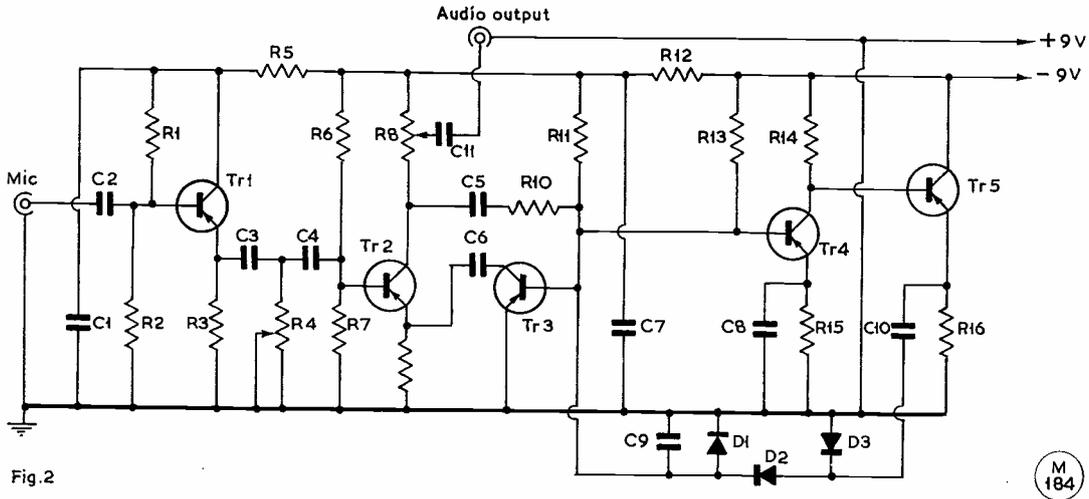


Fig. 2

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Fig. 2. Audio Peak Limiter for AM/SSB.

Leave this setting alone for the moment. Then, with the Limiter brought in, turn R4 to maximum. Speak normally to the microphone and find an adjustment on R8 for correct transmitter operation. Then adjust R4, which is the limiting control. Final adjustment for maximum output from the transmitter is then controlled by (a) R4, and (b) the Tx audio gain control. The best adjustment is when (a) and (b) can be balanced to give a clean, well modulated signal. An Audio Peak Limiter of this kind is effective on either AM or SSB transmitters, as the same speech input principles apply in both cases.

ZLIUI, in "Break-In."

A Two-Tone Test Oscillator is obviously an essential piece of bench equipment for anyone running a Sideband Tx and wanting to set up the transmitter correctly. At Fig. 3 p.82 we have a transistorised version of the same,

Table of Values

Fig. 2. Circuit of Audio Peak Limiter

C1, C7 = 100 μ F, 10v.	R4 = 10K pot'meter, audio limiting control (see text)
C2 = .01 μ F, 50v.	R5, R12, R15 = 1,000 ohms
C3, C4 = 10 μ F, 6v.	R8 = 10K pot'meter, level control (see text)
C5 = 10 μ F, 12v.	R10 = 15,000 ohms
C6, C8 = 20 μ F, 6v.	R11 = 100,000 ohms
C9 = 25 μ F, 6v.	R14 = 3,900 ohms
C10 = 100 μ F, 6v.	D1, D2, D3 = OA85
C11 = 0.1 μ F, 10v.	Tr1, Tr2, Tr3, Tr4, Tr5 = OC71
R1, R6, R13 = 180,000 ohms	
R2, R7 = 56,000 ohms	
R3, R9, R16 = 4,700 ohms	

Note: Resistors rated half-watt.

Table of Values

Fig. 1. Adjustable Regulated Power Supply

C1, C5 = 680 μ F	R8 = 300-ohm pot'meter
C2 = 4,000 μ F	R10 = 4.7K pot'meter
C3 = 220 μ F	R11 = 150 ohms, $\frac{1}{2}$ w.
C4 = .001 μ F, 500v. ceramic	R12 = 110 ohms, 2w.
R1, R9 = 1,000 ohms, $\frac{1}{2}$ w.	D1 = BY118
R2 = 2,200 ohms, $\frac{1}{2}$ w.	D2 = BY126
R3 = 15 ohms, $\frac{1}{2}$ w.	ZD1, ZD2 = BZY88
R4 = 1,500 ohms, 1w.	Tr1, Tr2 = BC107
R5 = 5 ohms, 10w.	Tr3 = AD149
R6 = 270 ohms, $\frac{1}{2}$ w.	
R7 = 4,700-ohm NTC thermistor (see text)	

NOTES: Mains transformer to give 20-25v. at 1.5-2.0 amps. on the secondary, such as Radiospares types. Capacitors, except C4, can be 50v. electrolytics. High wattage resistors can be made up by series-parallel arrangement of lower wattages. Ammeter should read 0-1.5 amp., and voltmeter 0-20v. Fuse to 0.5 amp. on primary side, 250v. mains.

which has one or two interesting features. The output frequencies across R13 are either 1000 Hz or 2000 Hz, selected by Sw1, both together being obtained at posn. 4 of this switch. Adjustment of R5 balances the 1 kHz/2 kHz outputs in terms of amplitude. This can be done by listening to what happens as R5 is varied, or watching the trace on an oscilloscope (anyway a requirement at a station running SSB).

The output level is controlled by R13, and for practical purposes the T/T Test Osc. is connected into the microphone socket of the SSB transmitter. Construction should be "miniaturised," on a small piece of Veroboard fitted, with the batteries, into a metal box. An on-off switch and controls R5, R13 are exterior, with a coax socket for the output.

ZLIAU, in "Break-In."

It is always useful to have, as a piece of bench test equipment, a small noise generator. The circuit

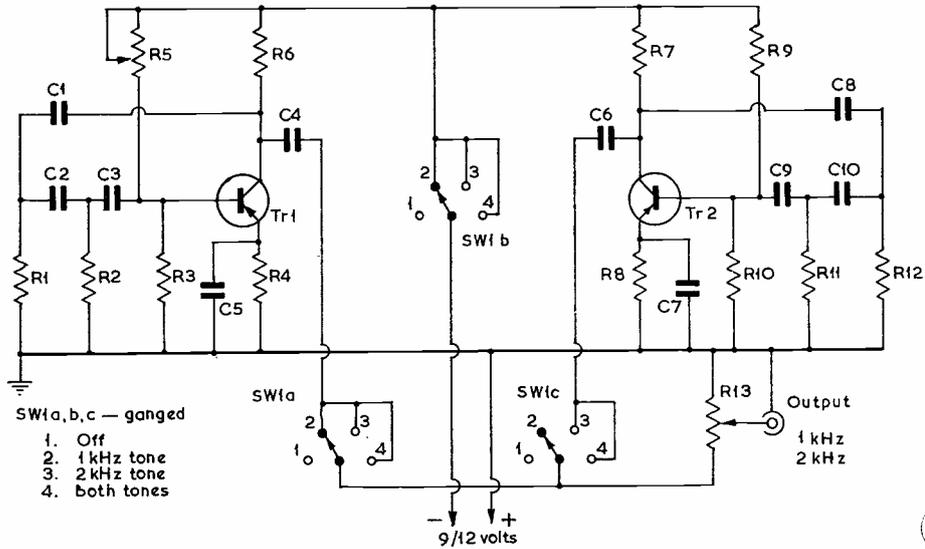


Fig. 3

Fig. 3. Two-Tone Test Oscillator.

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Table of Values

Fig. 3. The Two-Tone Test Oscillator

C1, C2,	R5 = 100K pot'meter,
C3 = .005 μ F	balance control
C4, C6 = 50 μ F	R6, R7 = 5,100 ohms
C5, C7 = 4-7 μ F	R9 = 82,000 ohms
C8, C9,	R11, R12 = 6,800 ohms
C10 = .01 μ F	R13 = 100K pot'meter
R1, R2 = 6,300 ohms	gain control
R3, R10 = 10,000 ohms	Tr1, Tr2,
R4, R8 = 1,000 ohms	Tr3 = 2N404, or similar
	audio type

Basically, the device is a pulsed multivibrator, with a periodicity of about 7 microseconds. Such a noise source is very useful for the stage-by-stage testing, starting from the output end, of almost any sort of receiver. As you work towards the aerial, the signal should get louder and louder; any marked drop in the level of the Rx output will be evident as you pass across an inoperative stage. Like an RF sniffer, this is the sort of tester you would not be without after you have first used one successfully.

Build it on a slip of Veroboard, and mount it in a torch case, with a short probe for the output end.

ZL2ALC, in "Break-In."

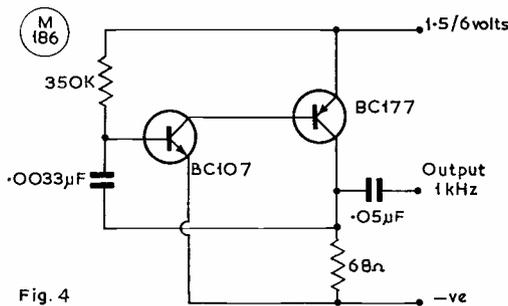


Fig. 4

Fig. 4. Wide-band Signal Injector.

of Fig. 4 can be dignified by the description of Signal Injector. It will make a loud noise with a fundamental of about 1 kHz but has an enormously rich harmonic content, giving a coverage up to something like 30 mHz. The intensity of the harmonics at the higher frequencies is somewhat controlled by the input voltage—this should be set to produce healthy oscillation.

Fig. 5 shows a simple arrangement for converting a high-power two-metre Tx to FM. In a particular case, the 8 mHz CO had a decoupled, reduced DC supply through a resistor. This was disconnected at the screen pin, leaving the .01 μ F decoupling condenser in place. The audio output valves, modulation transformer and associated power supply then become redundant, and

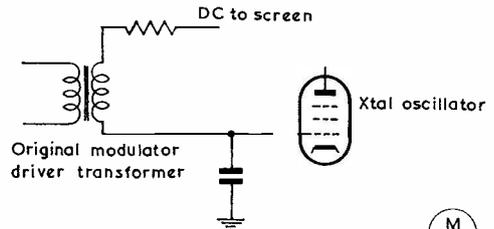


Fig. 5

Fig. 5. Conversion to FM on a CO.

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can be extracted. The secondary of the driver transformer is now connected in series with the oscillator screen resistor and the screen pin of the CO valve.

The available AF from the existing speech amplifier up to the driver transformer—perhaps 30v. or so with the audio gain right up—now modulates the oscillator screen voltage, and can produce far more than the permissible deviation! The gain is, of course, turned down to an acceptable level. One other result is that, in a fringe area, the change to FM on two metres can effect a total cure of TVI. Any AM Tx can be similarly modified for FM operation.

By GM8APX, Rannock.

THE MOBILE SCENE

It looks like being another busy and interesting season for mobileers, with so many Rallies already arranged or projected. As in previous years, we shall be printing essential details of each (as supplied to us) in the issue before the due date for the event. It is for organisers to make sure we get the required information—see p.23, March—in good time, which means about six weeks before the Rally date.

April 19: North Midlands Mobile Rally at Drayton Manor Park, Drayton Bassett, near Tamworth, Staffs., on the A.4091. This is always the first Rally of the season and is also one of its biggest and most important, with an interesting programme as well as a large trade show. There are exceptional facilities at Drayton Manor, indoor and out, with a licensed restaurant and plenty of parking space. Talk-in stations operating 2-4-160m. will be on the air from 12 noon. The Rally is organised jointly by the Midland and Stoke-on-Trent Amateur Radio Societies. Details: R. Warrender, G8ASW, 102 Turnberry Road, Birmingham, 22A.

May 3: Spalding & District Amateur Radio Society's Tulip Time Rally, at the picnic site at Surfleet, four miles north of Spalding, Lincs., on the A.16. Talk-in will be given on Top Band and two metres. Further details, with maps and information on the famous tulip fields, from: R. Harrison, G3VPR, 38 Park Avenue, Spalding, Lincs., PE11-1QX.

May 3: Thanet Radio Society Mobile Rally at King George VI Park, Ramsgate, Kent.

May 10: Rally and exhibition at Hanwell Community Centre, Westcott Crescent, London, W.7, opening at 1.0 p.m. by the Mayor of Ealing. Talk-in on 2-4-160m. by GB3EAL, of the Ealing District Amateur Radio Society, organisers of the event. Attractions will include trade stands, raffles and surplus equipment sales. Refreshments will be available on site, there are no parking problems, and the locality will be sign-posted by the AA and RAC. A lot of effort is going into the planning of this event and it should be a good day out for

/M's and their families. Information: A. P. Teale, G3SGT, 16 Whitestile Road, Brentford, Middlesex.

May 17: The annual Northern Amateur Radio Mobile Society Rally.

June 14: First Elvaston Castle Mobile Rally, to be arranged by the Nunsfield House (Derby) Amateur Radio Group.

June 14: R.N. Amateur Radio Society's tenth anniversary Rally at the R.N. Signal School, H.M.S. *Mercury*, Leydene, Nr. Petersfield, Hants.

June 20-21: Anglian Mobile Rally, at the Show Ground, Ipswich, Suffolk.

June 21: Rally at Singleton Park, Swansea, organised by the Univ. Coll. of Swansea Amateur Radio Society.

June 28: Thirteenth South-West of England Mobile Rally, at Longleat Park, Nr. Warminster, Wilts., organisation as in previous years.

July 5: Eleventh Mobile Rally to be put on by the South Shields & District Amateur Radio Society.

July 5: Amateur Radio Mobile Society Carnival Rally at R.A.F. Station Alconbury, Hunts. This year's A.R.M.S. event will again be one of their large-scale affairs—fuller details later. Advance information from: N. A. S. Fitch, G3FPK, Hon. secretary, A.R.M.S., 40 Eskdale Gardens, Purley, Surrey, CR2-1EZ.

July 5: Cornish Radio Amateur Club annual Mobile Rally—site and details to be confirmed.

July 19: Rally to be organised by the Scarborough Amateur Radio Society, at Burmston Road Barracks.

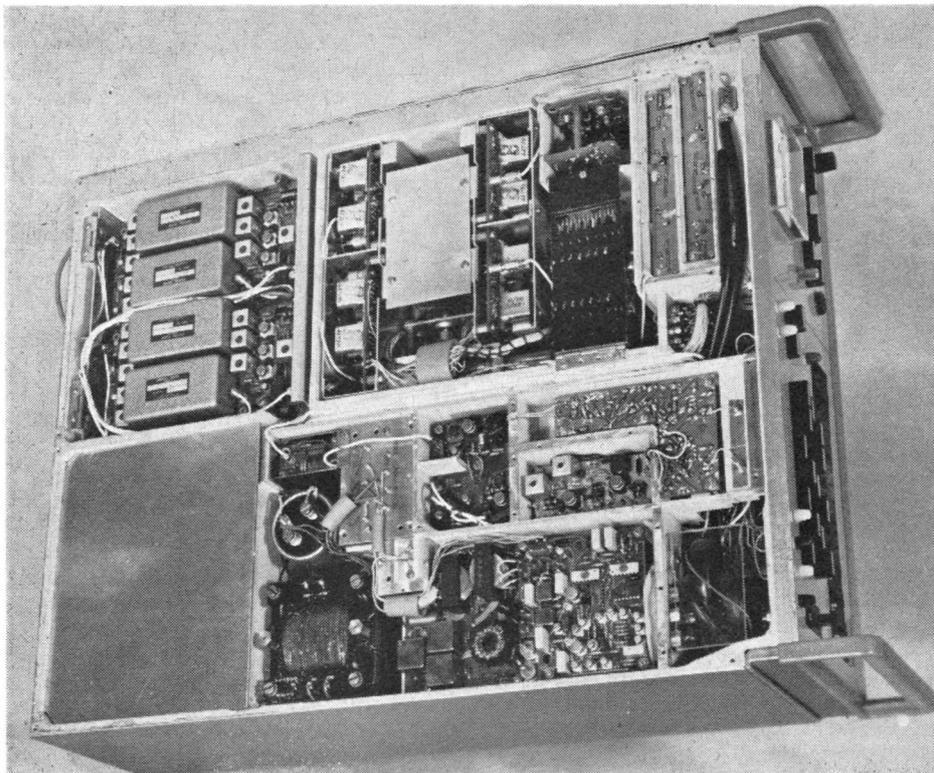
September 20: Peterborough Mobile Rally.

All items for inclusion under the Mobile heading should be sent, at least six weeks before they are to appear in print, to: "Mobile Scene," SHORT WAVE MAGAZINE, BUCKINGHAM.

AX/VK NEW ISSUES

As many readers—and all DX operators on the HF bands—know by now, the VK's can use the prefix AX during the Cook Bi-Centenary Celebration. (It is a matter of personal choice.) From a recent issue of the Australian *Amateur Radio*, it is of interest to find that during the four months June-September 1969, some 220 new calls were issued in the VK1-VK9 Districts, the *nett* gain (allowing for cancellations and non-renewals) being 180 licences. For the U.K. in a comparable period, a *nett* gain of 420 is shown in our AT-station licence total.

To become a D/S costs only 45s.—or for first-class posting, 48s.



Inside the H2900, showing the modular construction, in a strong aluminium casting. Inter-connection between the many sub-units is by wrapped or soldered joints. The circuitry is solid-state throughout, with correspondingly low internal heating and power consumption—either mains or battery power supply can be used. Remote control operation is also possible.

THE NEW MARCONI H2900

SOPHISTICATED PROFESSIONAL RECEIVER—NOTES AND GENERAL DETAILS

It is not to be supposed that a receiver like the H2900 will be found at many AT-stations, though most amateurs would probably aspire to one. This short article merely outlines, as a matter of interest to all who operate on the HF bands, a new Rx designed for the exacting demands of modern commercial communication.

—Editor.

THE H2900 is described by its manufacturers, the Radio Communication Division of The Marconi Company, as a "break-through in HF receiver design."

It is solid-state throughout, the frequency coverage is 1.5 to 30 mHz, with read-out as close as 1 Hz, controlled by a frequency synthesiser. Tuning stability—that is, the facility to stay on a frequency for long periods—is very high. In fact, within 0.5 Hz, anywhere in the frequency coverage.

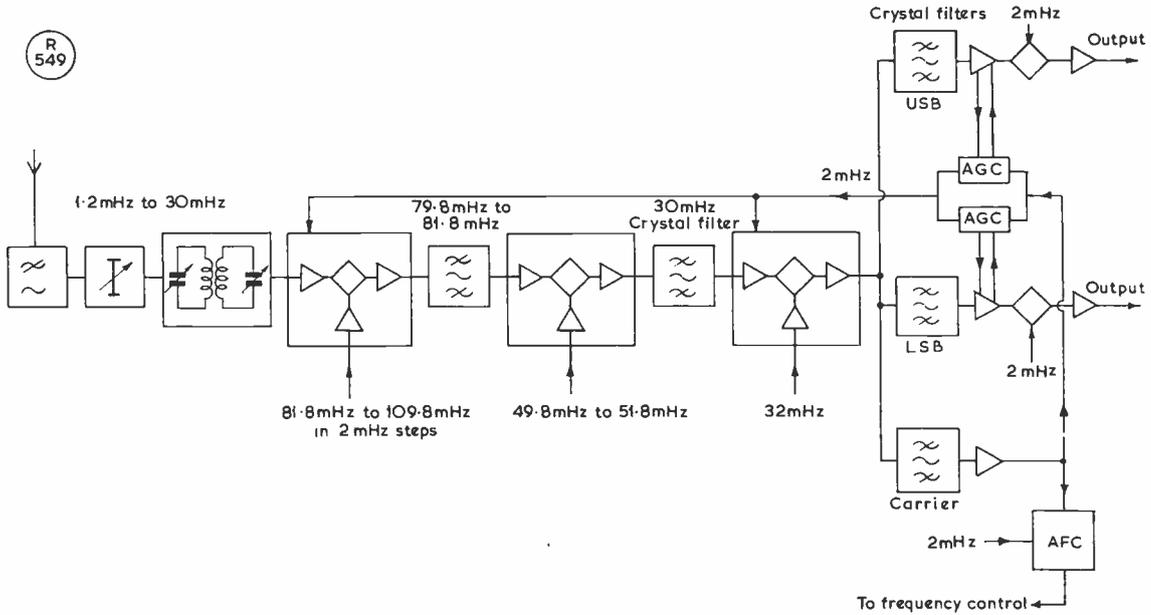
General circuit arrangement is outlined in the block

diagram. This shows that essentially the H2900 is a triple-conversion superhet, using IF's analysed by computer to minimise spurious responses. The three frequency changes—78.8-81.8 mHz controllable, 30 mHz and 2.0 mHz—are selected by a frequency synthesiser. This in turn relies upon a high-stability crystal oscillator and produces a train of pulses to control the frequency of an L-C oscillator, itself specially designed as a separate unit. The L-C osc. frequency is compared with the pulse train by a "pulse subtractor," with subsequent conversion of the digital signal to an analogue correction applied to the L-C oscillator. The result is stable locking on to frequencies that can be selected in steps of only one cycle—near enough for any known purpose!

General Points

The H2900 is assembled in a cast-aluminium frame, designed to give not only rigidity but also almost perfect screening between sub-units. Modular construction is used throughout and sub-units can easily be localised. Inter-connection between units is by soldered or wrapped joints, rather than by plug-and-socket, as this is found to give better protection against contact faults. Hermetically-sealed micro-circuits are used throughout.

As regards performance, selectivity is equal to the best designs currently available for an HF receiver. Inter-

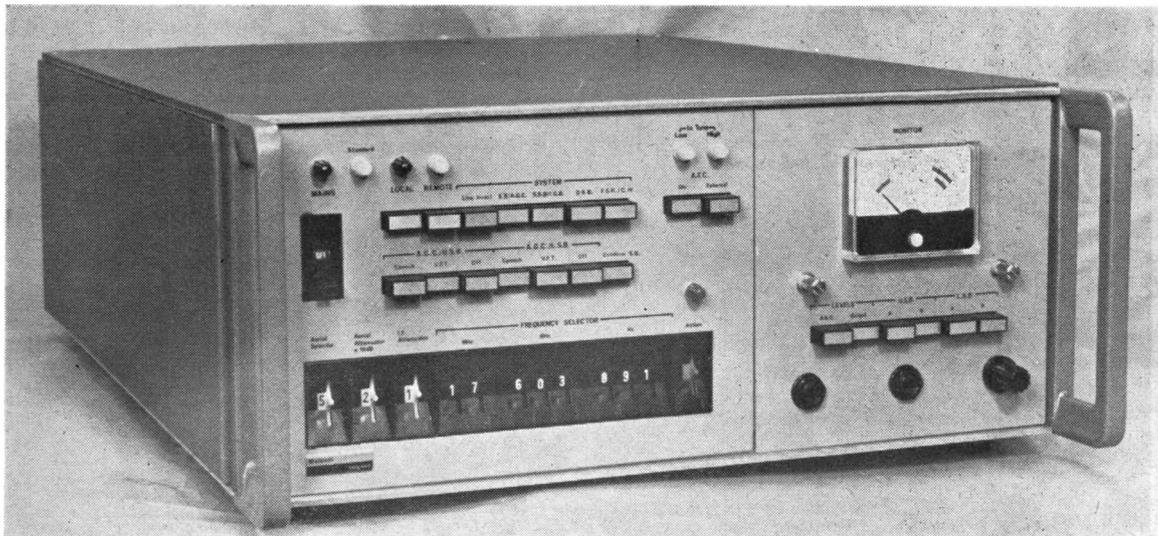


modulation products are better than 85 dB; cross-modulation -105 dB; and blocking -100 dB, referred to 1 μ V. In that part of the design specification dealing with cross-modulation, the requirement laid down was: "Without the use of aerial attenuation, with a wanted signal of 40 dB relative to 1 μ V and an unwanted signal of +105 dB, 15 kHz off-tune and modulated 30%, cross-modulation of only -20 dB relative to wanted output is permitted."

In a short description of this sort, it is obviously

not possible to go into all the details of circuit design involved in bringing about a result such as the H2900. But perhaps enough has been said to make it clear that it is a receiver of exceptional interest in the commercial context.

The applications of the H2900 are envisaged as being for point-to-point working; naval and military service; ship-borne use and, indeed, any duty demanding reliability, ease of operation and a highly competitive performance.



General appearance of the new Marconi H2900 receiver, covering 1.5 to 30 MHz, with a tuning accuracy to one cycle (1 Hz). The read-out as set in this picture shows that the Rx is tuned to a frequency of 17,603 kHz and 891 cycles (Hz). The applications of the H2900, a highly sophisticated design, are mainly military and commercial. In size it is only 22 x 17½ x 7in. high, and its weight is 91 lb.

GETTING OUT ON TOP BAND

AERIAL ARRANGEMENTS, AND THE FREQUENCY AREAS TO USE

D. BUCKLEY (G3VLX)

THERE are so many facets to this subject that it is difficult to know where to start. However, assuming that your shack is equipped with a reasonably selective and sensitive receiver, let us first consider the aerial system. Ideas about DX differ but it can be said that we are really interested in stations more than 1,000 miles distant so that it is essential to radiate as much as possible of the energy at angles less, or preferably much less, than 45 degrees to the horizontal plane.

To obtain such a characteristic from a horizontal antenna it must be at least half a wavelength above ground. This, for most of us, is a non-starter since trees or poles 250ft. high are hard to come by. However, it is surprising what can be done with a dipole at a reasonable height (say 60ft.): even a quarter wave with a good earth is of some use provided conditions are very good, though it will not normally perform too well.

For those who cannot put up a high dipole the vertical is probably the best. Even here there are snags because a quarter-wave Marconi is 132ft. high. If you can put up such a pole all well and good but much smaller efforts down to about 40ft. can be made to work by loading the system at the base, or near the top. Top-loading is to be

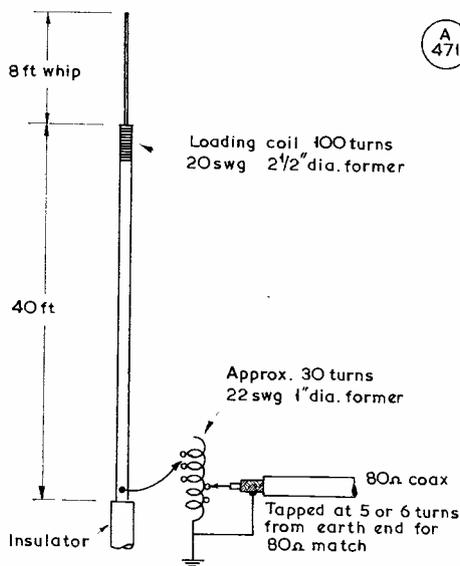


Fig. 1

Fig. 1. Configuration for a top-loaded vertical system—see text.

This article could be described as general guidance on "Top Band DX—and How to Work It." A large proportion of the active AT-station fraternity of the U.K. is interested in this subject, as a few listening sessions in the CW area of 160 metres would disclose. Within the normal amateur limitations, there is really no "best" aerial system for the purpose—it is just that the antenna should be made as good as possible, always with the main principle in mind—to get the current antinode into the clear, however that may be contrived. This will usually mean tailoring any arrangement of wires to the site. Much interesting and instructive work can be done to achieve the final "best possible result." Here our contributor has some useful practical suggestions to make about the popular and effective vertical antenna system.—Editor.

preferred because it raises the radiation resistance and hence the efficiency, as well as getting the high-current carrying (current antinode) part of the antenna up high.

The Approach

A suitable arrangement is shown in Fig. 1. With this sort of aerial a good earth system is essential and the best is a number of radials, like the spokes of a wheel, radiating from the base. A dozen radials each 30ft. long would be a start but the aim should be to make them longer and as numerous as possible. If you have only a small garden but you haven't done much in the way of cultivating it, try increasing the conductivity as shown in Fig. 2. This won't produce super plants but it should reduce your earth resistance.

Another way is to put out 200ft. or so of wire but to get the high-current carrying portion vertical (132ft. from the end remote from the transmitter). There are many possible configurations: Fig. 3 gives one. If you live at the bottom of a steep hill and can get a wire sloping up the hill this is yet another way of getting low-angle radiation—and if you can put up a half-wave (270ft.) you don't need to worry so much about the earth connection.

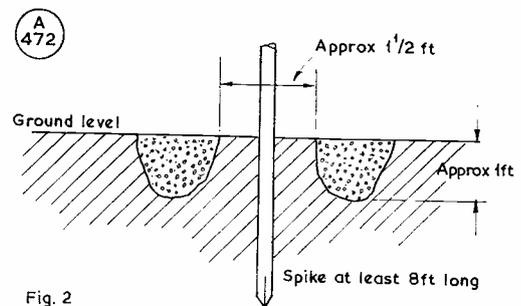


Fig. 2

Fig. 2. To improve earth conductivity—of vital importance in installing an effective ground connection for a Top Band radiating system—fill the trench with rock salt or magnesium sulphate, then flood with water and cover with soil. Such an earth connection should be good for two or three years at least.

Resonating the System

Getting a vertical system to resonance can be a bit tricky. It is best to adjust the extra loading at the base so that a grid dip oscillator shows a deflection at about 2.2 mHz (or 1.9 if you don't intend to work above that frequency). When this has been done the input tap from the transmitter should be chosen for maximum antenna current. A meter of the diode-rectifier type (commonly called an SWR meter) between the transmitter and feed point is useful and much quicker.

Getting Results

Now we have our antenna—how do we find the real DX? It can be found—and worked—at almost any time of the year during darkness but there is no doubt that the best period is between September and April, and you should listen on about 1801 kHz when conditions are good. If you can hear *distant* Loran below 1900 kHz (usually on about 1850 kHz) this is a good sign; there are also “beacon” stations WCC (East) on 2036 and KPH (West) on 2045 kHz. These give a good indication of band conditions for the real DX.

But don't make the mistake of calling the DX on 1801 kHz. The U.K. calling frequency area is 1824-1830 and 1851-1861 kHz is also worth trying. The areas of Top Band normally used by various countries for DX are indicated in the diagram at Fig. 4, below.

As to time of day (well, night really) W stations are audible in good conditions as early as 2100 or 2200 GMT in mid-winter but reception is easier after midnight with less QRM. There is usually a peak in conditions when it is dusk or dawn at *one end* of the path while the path itself is otherwise in darkness.

So far as the receiver is concerned, the considerations are pretty much the same as for any other band. Needless

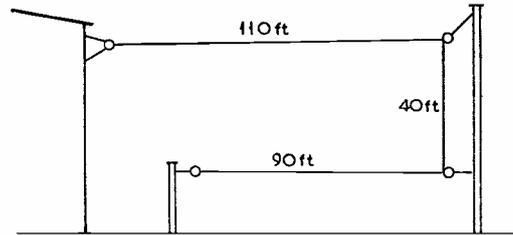


Fig. 3

Fig. 3. Aerial configuration to get the high-current portion (the current antinode) into the vertical.

to say it must be stable, sensitive, not subject to cross-modulation and very selective, if possible to 50 Hz. A Q-multiplier will be a help if you are short of selectivity.

It is important to get as much of your ten watts as you can into the antenna. For efficient operation the PA must work in Class-C, which is bound to produce harmonics—and excess harmonics waste power as well as causing QRM if they reach the aerial. The answer is of course a compromise—keep the Q of the tank circuit at about 12; this will restrict harmonic generation and minimise losses. Keying should be well rounded—square waves not only bother the locals, they waste power.

The author would like to thank G3IGW, G3SED and G6HD for their very kind assistance in the compilation of this article. For further information on aerials and propagation, readers should consult *Radio Communication Handbook*, Chapter 13, and the *ARRL Antenna Handbook*, Chapters 2 and 7.

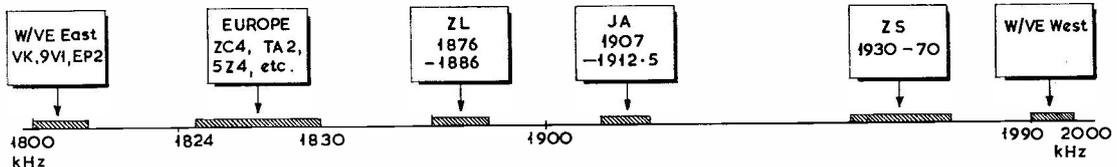


Fig. 4

Fig. 4. The 160-metre band (Top Band) gives us a frequency coverage of 1,800-2,000 kHz. This diagram shows in which sectors of the Band signals from DX areas can be expected. See article for the propagation factors involved.

TROUBLE IN SPACE

It is reported that the *Instelstat III* satellite in synchronous (or “stationary”) orbit 22,300 miles out above the Indian Ocean has developed a fault in its tunnel-amplifier diode. The result is that the overall gain of the TV transponder has gone down by about 10 dB. As this is the satellite used by Goonhilly to run TV with Australia (Ceduna, 350 miles NW of Adelaide) some urgent work has been done on the Goonhilly Tx to push the power up to 4 kW—which is about ten times the input normally necessary to work the satellite.

NOTE ON ZS REGULATIONS

We were interested to see, from a recent issue of *Radio ZS*, that under their current regulations, neither portable nor mobile ZS amateurs may run more than 30w. DC input (80 watts p.e.p. output). This is a useful and sensible provision. And another ruling “An amateur shall not use *nor be in possession of* equipment capable of exceeding the limitations imposed on amateur stations,” *i.e.*, more than 150w. DC input under any conditions of operation, and in the case of SSB transmitters 400w. p.e.p., with linearity preserved.

EASY TOP BAND TRANSMITTER

CIRCUITRY, CONSTRUCTION, CALIBRATION AND OPERATION FOR PHONE/CW WORKING

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

This is a practical-constructional article for the beginner-constructor, anxious to get going on our most popular band for local and semi-GDX working. It is based on well-tried principles, breaks no new ground from the point of view of design and is in no way profound—so it cannot be faulted by the pundits. In fact, it might do some of them good to build it and get it going on the air! It will give entirely satisfactory results as a first Tx constructional project for anyone with a new ticket.—Editor.

THOUGH it can scarcely be said that there is a dearth of constructional details for 160m. transmitters, it is felt that yet one more might be of interest. This is an absolutely straightforward, well-tried circuit which gives full RF output at the maximum allowed input of 10w. Building it is easier than building a receiver. It has been used in various forms and modifications, it can readily be put on 80m. if you wish, and everything is easily obtained.

As a bonus, the transmitter incorporates a switch which gives complete change-over from transmission to reception. This avoids a relay or external connections, and has been found well worthwhile.

Circuit Notes

V1 is an EF91 Clapp VFO, the adjustable core of L1 and the trimmer T1 being used to set band coverage. This stage is built in an aluminium box above the chassis. Anode and screen are supplied by the OA2 stabiliser.

Output from the VFO is via C6 to the buffer V2. The anode circuit of this stage is broadly tuned to about 1900 kHz by L2. The 5763 PA is driven to obtain about 2 mA grid current, or about 44v. bias across R8. R9 is merely placed in series so that a meter can be clipped from the chassis to point G to check grid current when first testing the transmitter, and without having to unsolder the lower end of R8. Maximum DC input for the 5763 is 50 mA at 300v., or 15 watts, and this valve performs very well at 8-10w. input. VC2 and VC3 are the usual anode tuning and aerial loading capacitors for the tank coil L3.

The audio section is equally straightforward, having a 12AX7 as 2-stage amplifier, followed by the single 6BW6 modulator. In use, this is found to put plenty of audio on the carrier. Ch. is the primary of a speaker matching transformer, the secondary being unused. An audio gain control was not found necessary—its absence may help in the (correct) habit of speaking at a certain distance from the microphone.

A 4-pole 2-way switch gives complete change-over

from "transmit" to "receive." Section S1 connects the aerial to the tank L3, or to the receiver. Section S2 shorts the receiver aerial circuit on "transmit" to help keep down stray RF at the receiver. S3 is put in series with the speaker, by fitting plugs to leads, and silences the speaker when transmitting. S4 applies HT to the whole transmitter.

[cont'd. p.90]

Table of Values

Fig. 1. Circuit of the Top Band Tx

C1 = 56 μ F, 1% silver mica	R4 = 27,000 ohms, 1w.
C2 = .01 μ F, 250v.	R5 = 10,000 ohms, 3w.
C3 = .002 μ F, disc ceramic	R6 = 100,000 ohms, $\frac{1}{2}$ w.
C4, C5 = .001 μ F, 1% s/m mica	R7 = 47,000 ohms, $\frac{1}{2}$ w.
C6, C9 = 100 μ F, mica	R8 = 22,000 ohms, $\frac{1}{2}$ w.
C7 = .002 μ F, 350v.	R9 = 1,000 ohms, $\frac{1}{2}$ w.
C8 = .01 μ F, 350v.	R10 = 5,600 ohms, 2w.
C10 = .001 μ F, 500v.	R11, R13 = 1 megohm, $\frac{1}{2}$ w.
C11, C12 = .001 μ F, 750v.	R12 = 220,000 ohms, $\frac{1}{2}$ w.
C13 = .002 μ F, 250v.	R14 = 100,000 ohms, $\frac{1}{2}$ w.
C14 = 2 μ F, 350v.	R15 = 33,000 ohms, $\frac{1}{2}$ w.
C15 = .005 μ F, 250v.	R16 = 3,300 ohms, $\frac{1}{2}$ w.
C16 = 25 μ F, 25v.	R17 = 270,000 ohms, $\frac{1}{2}$ w.
C17 = .004 μ F, 750v.	R18 = 270 ohms, 2w.
T1 = 50 μ F, ceramic trimmer	RFC1 = Midget 2.5 mH cored RF choke
VC1 = 50 μ F, air-spaced variable	RFC2 = Pi-section 60 mA 2.5 mH RF xmitting choke
VC2 = 500 μ F, air-spaced variable	Ch. = Audio choke—primary of 80 mA pentode speaker xformer
VC3 = Two-gang, 500 μ F per section	V1, V2 = EF91
R1 = 68,000 ohms, $\frac{1}{2}$ w.	V3 = 5763
R2 = 47,000 ohms, 1w.	V4 = 12AX7
R3 = 3,300 ohms, $\frac{1}{2}$ w.	V5 = 6BW6

TABLE OF COIL DATA

For 160 metres:

- L1—95 turns 34g. enam. close-wound on $\frac{1}{2}$ in. dia. cored former—or Denco coil "Yellow Range 3," conn. 1 to grid, 6-8 joined, 9 to VC1.
 L2—120 turns 34g. silk-covered wire, pile-wound on $\frac{1}{2}$ in. dia. cored former—or Denco coil "Blue Range 2" with small winding removed.
 L3—65 turns 22g. enam. wire, close-wound on 1in. dia. paxolin tube.

For 80 metres:

- L2—68 turns 32g. enam. wire pile-wound on $\frac{1}{2}$ in. dia. cored former—or Denco coil "Red Range 2," with small winding taken off and 28 turns removed from main winding.
 L3—One-half of 160m., obtained by shorting centre-tap to VC3 end of coil (see text).

NOTES: L1 is same winding for both bands. Construction on chassis 10 \times 7 \times 2 $\frac{1}{2}$ ins., and universal chassis member 12 \times 3ins. Panel to suit; also 3 \times 3in. plate. (Home Radio.) Parts required include: Three skirted B7G holders, two cans; three B9A holders, one can; 0-100 mA panel meter. Knobs and ball-drive for VFO control. Switches: 4-pole, 2-way rotary; 1-pole, 2-way.

Front panel appearance of the Top Band Tx. The mic. socket is under the VFO control. The large knobs are for PA tuning and loading, VC2 and VC3. Smaller knobs are for tune-up and transmit-receive. The meter reads PA anode current.

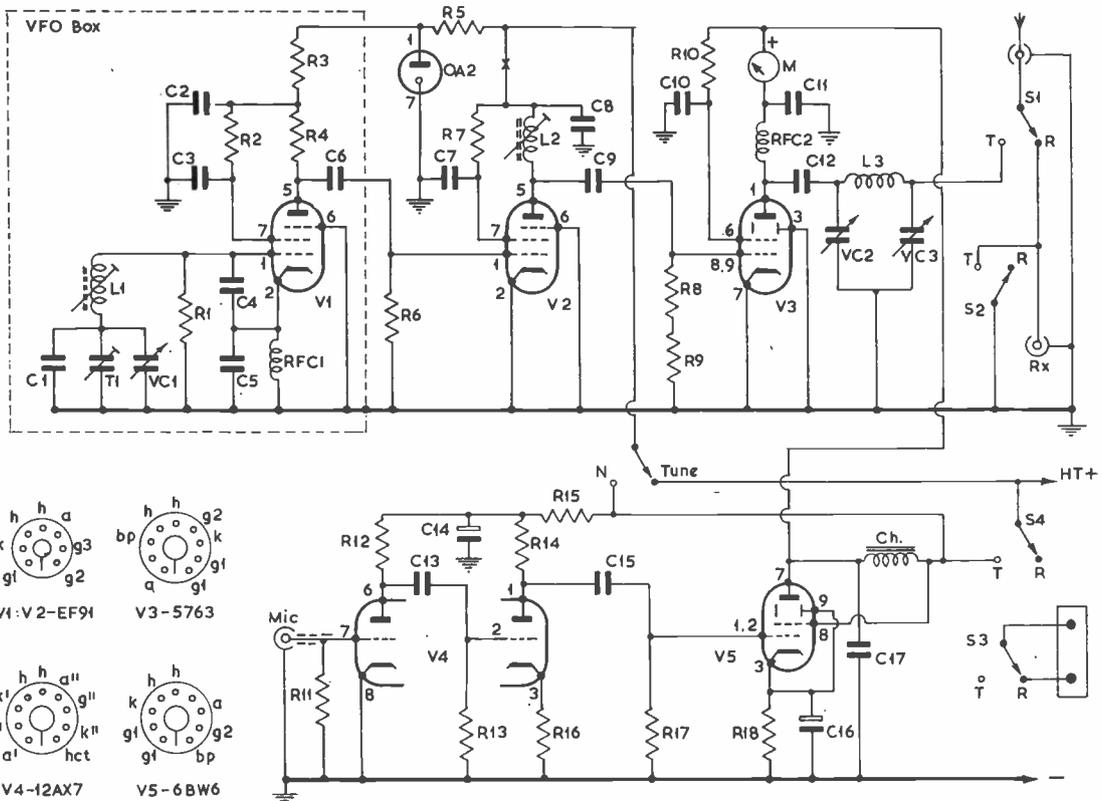
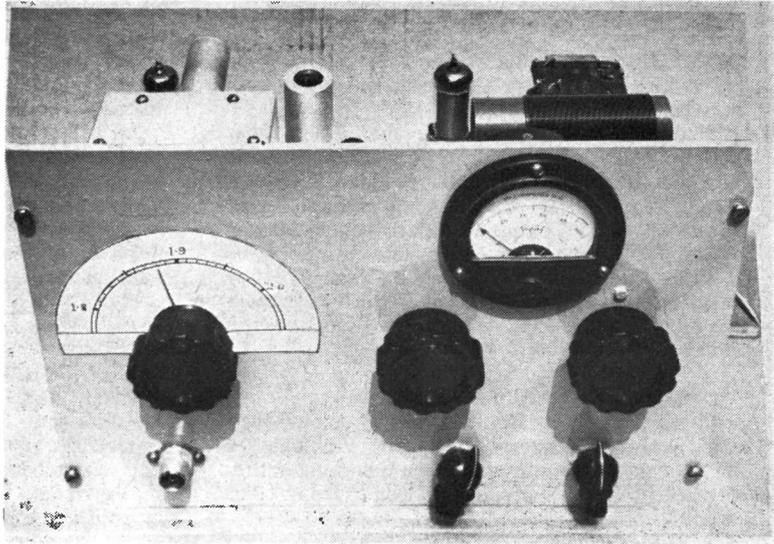


Fig. 1

Fig. 1. Circuit of the Easy Top Band Tx.

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The "tune" switch is left at N (normal) for ordinary use, but when placed at "tune" applies HT to the VFO and buffer. This allows the VFO setting to be found with the receiver, or permits adjusting the VFO to net on a signal.

Actual power input to the PA may depend somewhat on the PSU available, and is not very critical. The heaters require 6.3v. at 2.1A, so a 6.3v. 3A secondary does well.

The most suitable HT supply should give about 275-300v. on load. Total HT consumption is about 80-90 mA, so a 300/0/300v. 100 mA, or similar, transformer can be used, either with silicon rectifiers, or a 5U4G, EZ81, or other valve rectifier. The transmitter can be operated with a 250v. supply, and in this case 40 mA input to the PA will be 10 watts ($250 \times .04 = 10$).

VFO Box

This is 3in. x 3in. x 3in. and is readily made from a "universal chassis" member 12in. x 3in. V-notches are cut in the flanges at 3in. from each end, and the centre. Right-angled bends then produce an open-ended box 3in. square.

The VFO is completely wired before fixing it to the chassis. V1 projects at the back. Fig. 1 shows the components which are inside the box. Three flying leads are arranged to pass through the chassis. One is from R3, for HT; the second is from C6; the remaining lead is for V1

heater. Assembly and wiring in the box must be rigid, with tag strips supporting the fixed capacitors and other small items. L1 is fitted to one side, so that its core can be adjusted, and a hole in the cover plate allows T1 to be reached.

A ball-drive is fixed to VC1, and comes opposite a clearance hole in the panel. The finished VFO is bolted to the chassis, and the 3in. x 3in. top plate is then secured with self-tapping screws.

Final calibration is left until all construction is finished. A pointer fitted to the ball drive travels over a scale on the panel. Coverage is adjusted by T1 and the core of L1, to give 1,800-2,000 kHz, with a little to spare at the extreme settings of VC1. Final markings are best made with the aid of a 100 kHz crystal marker, and receiver. This will give the 1,800, 1,900, and 2,000 kHz readings. The 1,850 kHz mark can be found by tuning the receiver to 3,700 kHz with the aid of the 100 kHz crystal, and adjusting the VFO so that its 2nd harmonic falls to zero beat. Repeat for 1,950 kHz, this time tuning the receiver to 3,900 kHz. Intermediate markings can then be estimated with a reasonable degree of accuracy.

Other Construction

Fig. 2 shows layout above the chassis, and Fig. 3 the underside. Run heater and other leads along the chassis, but keep RF circuits (such as to tags 1 and 5 of V2) about

[cont'd. p.92

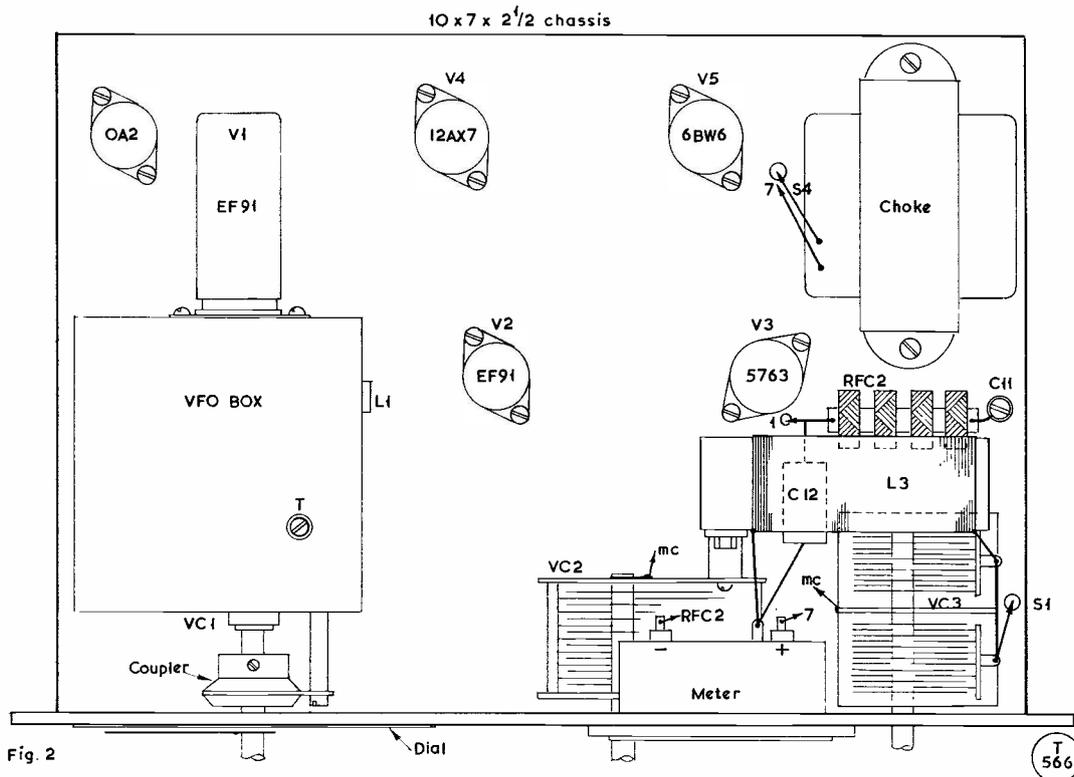


Fig. 2. Layout of the parts above chassis.

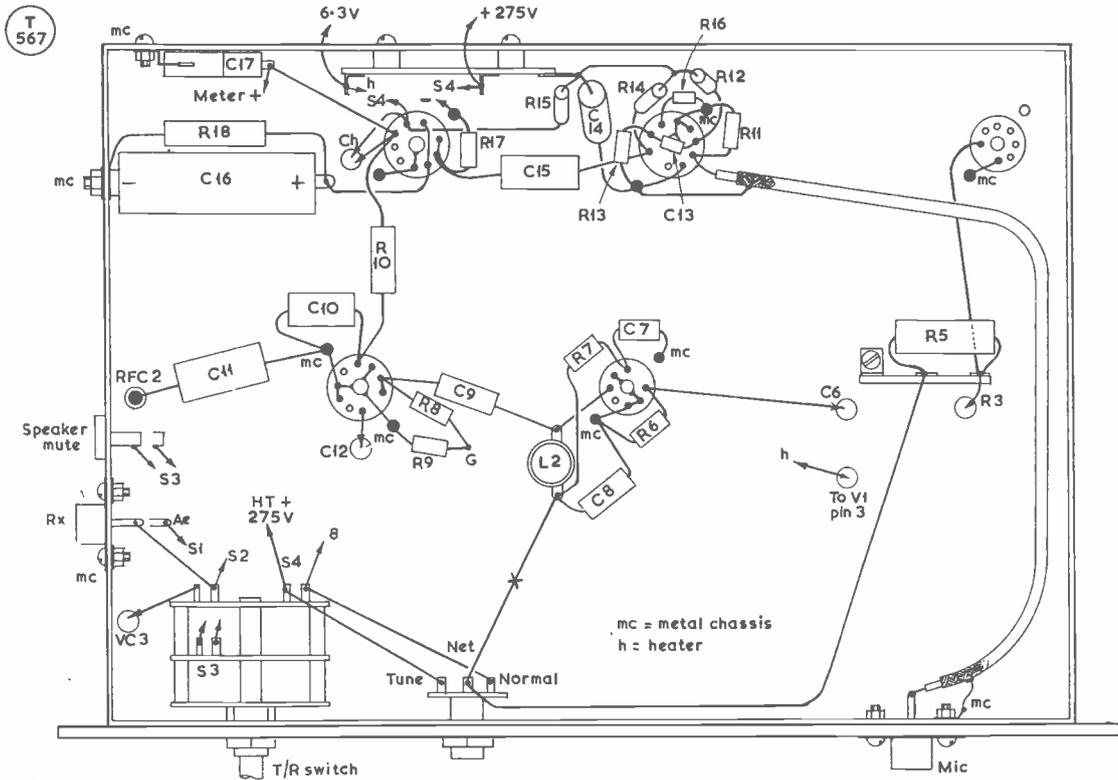
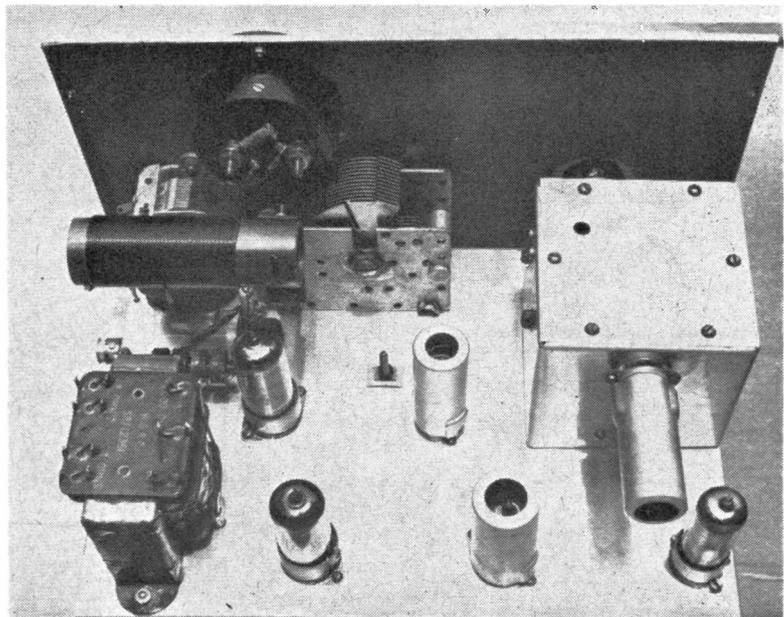


Fig. 3

Fig. 3. Component layout and connections under-chassis.

Inside rear view of the Tx, showing neat arrangement of the parts. PA tank coil L3 is at left and the VFO box on the right. The modulator choke is a speaker transformer—see text.



$\frac{1}{2}$ in. from the chassis. The by-pass capacitors, *e.g.* C7, C8 and C10 go directly from the points concerned to the chassis.

Drill a hole immediately beside tag 1 of V3, and take a lead up through it to RFC2 and C12. The VFO circuits are in the box, the circuits associated with V2 and the grid of V3 are under the chassis, and L3 and other anode components are above chassis.

The microphone lead is screened, as shown in Fig. 3. Ordinary coaxial sockets are provided for the mike, aerial, and receiver connections. Twin socket strip takes plugs to the speaker circuit.

A flexible cord or coloured flex power lead is run to the supply—red for HT, green for heaters, and black for the common chassis return.

It is probable that some changes in dimensions, or the layout of components, would have little or no effect on results. However, the layout and wiring shown are readily followed, and gave a completely docile transmitter, free from unwanted stray feedback or other undesirable effects.

The cabinet is $7\frac{1}{2}$ in. high, $10\frac{1}{2}$ in. wide, and $7\frac{1}{2}$ in. from back to front, clear dimensions inside. A cut-out in the right side matches up with the sockets. Four self-tapping screws hold the panel (and transmitter) in position.

Testing

The first need is to calibrate the VFO as described, and this is done with the switch at "Tune." Then, with the VFO set to about 1,900 kHz, and a meter clipped across R9 (positive to chassis), rotate the core of L2 for maximum grid current. When testing the circuit with an RF output meter, and 300v. supply, it was found that with 10 watts input, RF output began to fall off if grid current was under 1.8 mA, or over 4 mA. So about 2-3 mA does very well. If grid current is too high, R7 can be increased in value or a resistor placed at X. On the other hand, if grid current is rather low (due to the use of a smaller HT supply) R7 can be reduced in value.

With a supply of under 250v., check that the OA2 operates. If not, reduce R5 to 5-6K.

RF output is most readily checked by clipping a 15-watt 240v. lamp across VC3, or fitting it to a plug which can be put in the aerial socket. Begin with VC2 and VC3 closed. Switch to "transmit" and dip VC2 for lowest anode current—probably about 15 mA. Open VC3 to increase the input, meanwhile re-adjusting VC2 for the tuning dip, and continue until the input is about 10 watts, which should result in the lamp lighting up well.

Speaking into the microphone should alter the lamp brightness. The signal should sound clear and well modulated on a receiver. To avoid overloading the latter, remove the aerial from it and set the RF gain at or near zero. Also remember that sounds from the loudspeaker will cause feedback howling if volume is too great, or the microphone near.

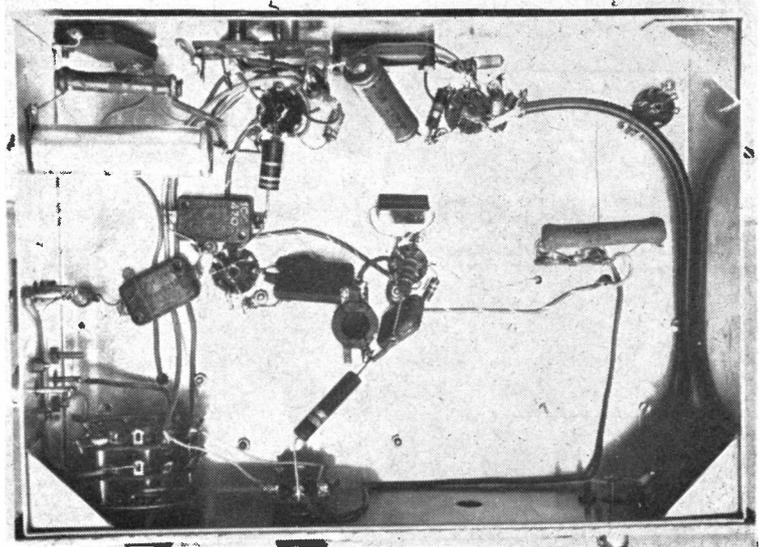
Operation

One loudspeaker lead is cut or extended, so that plugs can be put in the speaker muting sockets. A coax lead is prepared, to run from the transmitter to the receiver aerial socket.

The simplest method is probably to use a 160m. aerial tuner, with a coaxial lead which can be plugged into the transmitter. Any of the numerous 160m. aerials can then be employed.

With a random length end-fed wire, suitable loading may, or may not, be possible. This depends on the impedance and other factors. If such an aerial is used without a tuner, and the PA cannot be properly tuned, or loaded to the wanted input, the simplest quick solution is to put a loading coil in series with the aerial lead, at the transmitter. A coil similar to L3 (or whatever is to hand with somewhat similar inductance) will do. It should have a number of tappings. Introduce a few turns at a time, until the transmitter can be loaded to the correct input. Though stations *can* be worked with a short wire, a properly planned 160m. aerial, or at least 100ft. to 150ft.

Underneath the chassis, showing general layout and construction.



of end-fed wire, should be provided for good signal strength.

For CW Working

CW is satisfactory, by keying the 5763 cathode. A .005 μF capacitor is connected directly from tag 7 to the chassis, and the cathode lead extended to go to a key jack. Wire a click filter, consisting of a 470-ohm resistor in series with a .005 μF capacitor, across the jack.

It is necessary to short Ch. on CW, or put it out of circuit. A shorting switch is easiest to fit. Current drawn by the 6BW6 will help to prevent the HT supply soaring when the PA is not taking current. The filament lamp load already mentioned is *not* a satisfactory RF load when making keying tests. However, four 330 ohm 1-watt carbon resistors in parallel will give a load of around 80 ohms, and will take the 6 watts or so of RF expected with intermittent operation.

For 80m. Operation

An end-fed wire suitable for 160m. can usually be employed readily on 80m. In addition, a few watts of RF on 80 metres will bring results which are often quite astonishing, when band conditions are reasonable. So the temptation to put the small transmitter on this band can be quite strong.

For 80m. only, replace L2 by a coil which peaks around 3.7 mHz, and use one-half the turns given for L3. Calibrate the VFO from 1.75 to 1.9 mHz, marking its scale at twice the actual frequency, for 3.5-3.8 mHz.

For both 160m. and 80m., calibrate the VFO for 1.75 to 2.0 mHz. Use 1.75-1.9 for 80m., and 1.8-2.0 mHz for 160 metres. Put a switch under the chassis to select L2, or the 80m. coil, so that V2 can double. Fit a separate switch near L3 above the chassis, to short one half of L3 for 80m. operation.

TRANSISTOR BUG KEY

CIRCUIT AND OPERATING NOTES

D. J. SUMNER (G3PVH)

For the keen CW operator, rhythmic and steady sending is a matter of personal pride and satisfaction. It also makes his signal distinctive on the air. Some can do it with a straight, or "pump-handle," key, others use more sophisticated types. But no key can be more than semi-automatic, meaning that in the end it is the operator who controls the result. Herewith a transistorised bug key that will be of interest to many wanting to send good Morse easily.—

Editor.

MANY designs for electronic bug keys have been published, and recently some of these have been, perhaps, rather too sophisticated. The key built by the author is very simple, well behaved, and easy to get going correctly.

A multivibrator circuit was tried first but although apparently easy, all manner of difficulties were met with—including the dashes decreasing in speed if the paddle were held on, and not being completed if it was released early.

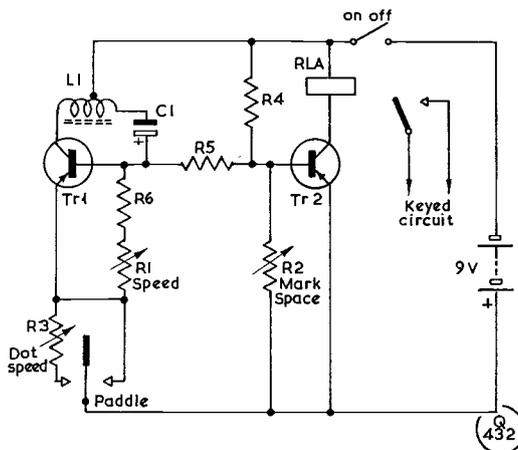
To get over this last problem a blocking oscillator was tried, which would deliver a large standard "spike" of voltage immediately the key was operated. The repetition rate of the spike could be easily controlled to give dots or dashes. The spike would charge a capacitor which would slowly discharge giving a sawtooth output. This could be limited to give a square wave to operate the keying relay.

The circuit is shown in the diagram. Tr1 is the blocking oscillator. The feedback component is a valve-type push-pull output transformer, which also gives the

assembly some weight to prevent it sliding about the table. The frequency of oscillation is in the audio range but only persists very briefly as C1 is charging. Tr1 then cuts off due to the large positive bias built up by C1 on its base. The charge leaks away through R1 (speed control) and eventually oscillation re-starts, repeating the cycle, provided that the key is held on. The oscillator is sensitive to collector voltage and a variable resistor is used to adjust this and so obtain the correct dot speed. The dash speed does not require a separate control.

The voltage on R1 is then applied to the base of the limiter Tr2, which clips the sawtooth down to a roughly rectangular waveform by conducting only when the sawtooth is below a certain amplitude. By adjusting the bias with R2 the clipping point can be altered, and hence the mark/space ratio.

[cont'd. p.94



Circuit of the bug key described by G3PVH. The values he gives are: C1, 6 μF , 70v. working; R1, 100K variable; R2, R3, 5K variable; R4, 47K; R5, 10K; R6, 1.5K; Tr1, OC71; Tr2, OC72; relay, 4K coil resistance, to operate on about 2 mA. The feedback winding L1 is a valve-type output transformer, using only the centre-tapped primary.

Construction

The unit was put together on a heavy wooden base-board. The paddle was a piece of *Perspex* bolted to a Junior hacksaw blade which moved between contacts taken from car contact breakers.

Setting up is fairly straightforward but unlike most bug keys the dot speed can be varied independently from dash speed. In practice, any error in setting sounds very obvious. The mark/space ratio is set by observing a damped meter in the keyed circuit. If a row of dashes is sent, the mark/space ratio should be adjusted until the meter shows 75% of the "all mark" reading. If a row of dots is sent the meter should read 50%. If these figures are not obtainable simultaneously the relay spring tension should be altered and R2 readjusted. No difficulty

was actually found with this adjustment.

Results

The current taken is about 10 mA and this is continuous as the relay releases when pulsed. This has been found to give smooth control of mark/space ratio because the relay operate-release time is not added to the time between elements.

On-the-air reports have been very favourable, apart from the operator occasionally inserting a spurious dot or two! It is a good idea to practise on an oscillator before trying the key on the air—and don't forget to filter the keyed leads and use an effective key click suppressor, because keying relays can play havoc with broadcast reception if not treated correctly.

B.A.T.C. ANNIVERSARY CONVENTION

We are informed that this year's B.A.T.C. Convention—to mark the 21st anniversary of the British Amateur Television Club—is being arranged as a two-day event over July 25-26. It is to be held at Churchill College, Cambridge, where there are excellent facilities for out-of-term gatherings of this kind. For many years now, the B.A.T.C. has represented the A/TV interest—meaning the transmission and reception of television in the strictly Amateur Radio context. Though their following is not large (there were about 180 G5/3/T licences in issue at the last count) the Club has solid and enthusiastic support, and over the years members have made great progress. Some noteworthy A/TV contacts (both-way television) have been recorded and numerous live-practical demonstrations given to show what can be done in this highly specialised field of amateur activity. There are many interesting events planned for the Anniversary Convention, which is open to anyone who would like to know more about A/TV. Non-members can obtain full details, with reservation forms, from: D. S. Reid, 71A Rose Valley, Brentwood, Essex.

NEW PREFIX LIST

Shortly available will be our new Prefix List, a revision of that which appeared in the October 1968 issue of *SHORT WAVE MAGAZINE*, and itself the most accurate and complete ever published. It has been available in leaflet form since then, and 1,000's have been sold or given free with our *DX Zone Map*.

The new Prefix List—which is alphabetically (a) by Countries showing Zones, and (b) by Prefixes/Countries with Zones, and including all those strange numerical prefixes which crop on the bands from time to time—is a complete revision and reprint of the old List. The astonishing fact is that for less than two years, more than 100 additions and amendments have become necessary. Corrections are to February 1970, and it can be said that this new Prefix List is now the most complete and accurate available in print, anywhere in the world.

The Prefix List (which is actually an 8-page leaflet in *Magazine* format) has always been included free with our *DX Zone Map*, for which it is the current amendment list. This will still obtain (the *DX Zone*

Map costs 14s. 9d. post free) but the price of the New Prefix List by itself is 1s. 6d. If you are at all interested in DX—either as an AT-station operator, a serious SWL or just as a listener round the amateur bands—you cannot be without the Prefix List or (if you want to know the whereabouts of the amateur stations you hear or work on the face of the earth) the *DX Zone Map*. Together, they give you all you can want to know. Orders, with remittance, to: Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

PROPOSED R.A.E. COURSE FOR OXFORD

We are asked to say that it is planned to run a course of instruction for the R.A.E. at the Oxford Technical College, if a sufficient number of candidates come forward. Those in the neighbourhood interested, who would be prepared to attend regularly, are invited to get in touch with: F. A. Blake, Fourfield, Lashford Lane, Dry Sandford, Abingdon, Berks. If a course can be started it would be the first such ever to be held at the Oxford Tech.—which seems rather extraordinary.

SPECIAL-ACTIVITY STATIONS

Once again, the time is coming round when amateur stations will be on the air for some special occasion or local event open to the public. The P. & T. Dept. will always issue, on request, an appropriate callign "for duration only" to cover such an occasion—of course, only to a responsible amateur already holding a transmitting licence.

As in previous years, we shall be glad to publish details of these events, and the first such to be notified is:

GB3BS, May 10: For the Scout Rally Camp in Ampthill Park, Beds., to be attended by Sir Charles MacLean, Bt., the Chief Scout. The station will be operated on 3525 and 7025 kHz CW; 3.7+ and 7.025 MHz SSB; and 144.79 MHz for VHF. A special QSL card will confirm all contacts, and the address is: J. Bennett, G3FWA, hon. secretary, Beds. & District Amateur Radio Club, 47 Ibbet Close, Kempston, Bedford.

Notices should be set out in the form shown here, giving all essential details, and addressed to: "Special Activity," *SHORT WAVE MAGAZINE*, BUCKINGHAM.

SIMPLE F.E.T. VOLTMETER

READING 250 mV TO 500v. IN EIGHT RANGES—CIRCUIT AND VALUES

This article is based upon a Mullard design for a practical working instrument, capable of a reasonable degree of accuracy for knock-about bench measurements. The construction of a voltmeter of this kind would be a very useful Club Project. The pamphlet issued by the Educational Service, Mullard Ltd., Mullard House, Torrington Place, London, W.C.1, gives some further details.—Editor.

A DISADVANTAGE of conventional transistors (referred to as "bipolar" transistors) is their low input resistance. Even when connected in common-collector mode their input resistance is too low for many applications. Field effect devices on the other hand have input resistances of the order of hundreds of megohms and are therefore ideal for use in voltmeters.

The input resistance of this voltmeter on all ranges is at least 10 megohms and it is therefore suitable for measuring DC levels in transistor and valve circuits. It has eight DC voltage ranges: 0-250 mV, 0-500 mV, 0-1V, 0-10V, 0-50V, 0-100V, 0-250V, and 0-500V.

It must be emphasised that this simple meter is not intended as a sophisticated piece of test gear. The use of close-tolerance resistors has been avoided and the least expensive junction-type field effect transistor employed. Under practical conditions, the accuracy will depend to a large extent on the quality of the 50 μ A indicating meter, which is the most expensive component in the circuit.

Circuit Description

The basic circuit is that of a source follower. This configuration gives a higher effective gate input resistance than other modes of connection.

Owing to the inherently high gate-source resistance of the BFW61 and the large percentage of negative feedback resulting from the configuration, the effective resistance between the gate and the zero-voltage line is so high that its shunting effect on shunt-resistor network is negligible, even on the lowest range (0-250 mV) when looking at 40 megohms.

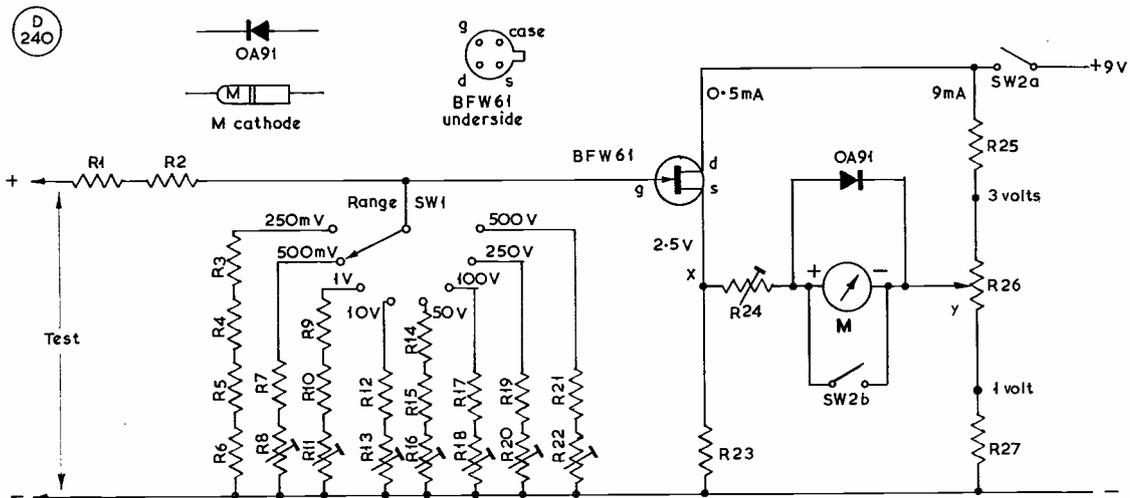
Under zero input conditions ($V_{in} = 0v.$) a current of about 0.5 mA flows between the drain and source

Table of Values

The Mullard F.E.T. Voltmeter

R1, R2 = 5 megohm, 250v. DC wkng.	R21 = 3,300 ohms
R3, R4, R5, R6 = 10 megohms	R22 = 1,000 ohms, adj. pre-set
R7 = 5.6 megohms	R23 = 4,700 ohms
R8 = 2.2 megohm, adj. pre-set	R24 = 2,200 ohms, adj. pre-set
R9 = 2.2 megohms	R25 = 680 ohms
R10 = 68,000 ohms	R26 = 250-ohm 3-watt w/wound pre-set
R11 = 470,000 ohms, adj. pre-set	R27 = 120 ohms
R12 = 180,000 ohms	Sw1 = Single-pole 8-way rotary
R13 = 47,000 ohms, adj. pre-set	Sw2 = DPDT, toggle
R14 = 33,000 ohms	M = Large 0-50 μ A meter, scaled 0-50 (see text)
R15 = 3,300 ohms	BFW61 = Mullard N-channel field effect transistor
R16 = 10,000 ohms, adj. pre-set	OA91 = Mullard germanium diode (or OA81)
R17 = 18,000 ohms	
R18 = 4,700 ohms, adj. pre-set	
R19 = 6,800 ohms	
R20 = 2,200 ohms, adj. pre-set	

NOTES: R1, R2 can be a single 10-megohm 500v. DC working resistor. For the chain R3-R6, any series combination giving a total of 40 megohms may be used. Resistors rated quarter-watt, 10% tolerance, throughout. Resistors marked "adj. pre-set" are the adjustable type. The meter should be a large-face type, with an open, clearly graduated scale.



Circuit of the F.E.T. Voltmeter

of the BFW61, establishing a voltage of perhaps +2.5 at point X, setting up an initial gate-source bias of about -2.5v. (In practice, owing to F.E.T. parameter spreads, this voltage could be anywhere between +1 and +3 volts.) For zero deflection on the indicating meter M, R26 is adjusted to the point which makes V_Y (the voltage at point Y) equal to V_X (nominally +2.5v.). As V_{in} increases to 100%, the voltage across the resistor network below Sw1 increases to 200 mV and V_X at R24 rises sufficiently above V_Y to give full scale deflection on M.

In setting up the instrument R26 is adjusted to give zero deflection when V_{in} = 0v. and any of the "adj. pre-set" resistors below Sw1 are set to give full scale deflection when V_{in} = 100%. For inputs between these extremes good linearity is assured because the large amount of negative feedback limits the working range to a tiny section of the I_D/V_{Gs} curve.

Circuit Design

The practical circuit is as shown on p.95. In order to ensure successful calibration using the wide-tolerance components specified it has been necessary to employ resistors of fairly large value for R8, R11, R13, R16, R18, R20, R22 and R26. F.S.D. and zero adjustments are therefore rather coarse. However, it is anticipated that the constructor may wish to obtain finer adjustments by selecting fixed resistors and reducing the values of the pre-set resistors, so the following design data may prove useful. (Sample calculations are given for the 10-volt range.)

For the 10-volt range the input is applied across the potential divider network R1, R2, R12 and R13. The total value of R12 + R13, which gives 200 mV gate input when V_{in} = 10 volt, is given by:

$$0.2 = \frac{(R12 + R13)}{(R12 + R13) + (2 \times 5 \times 10^6)} \times 10$$

hence R12 + R13 = 240K.

For the finest f.s.d. adjustment R13 must be as small as possible and R12 as large as it can be made. The "preferred" resistors available from *Mullard* and most other manufacturers are in their E12 range (10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82 and 100 ohms and multiples of 10, e.g. 10K, 22 megohm, etc.). The largest possible preferred value for R12 is therefore 180K. However, if a ±10% tolerance resistor is used, this could have an actual value anywhere between 162K and 198K and so, to ensure a total value of 204K for R12 + R13, R13 must be 47K. If desired the constructor may select a series chain of resistors for R12 to bring its actual total value near to 204K and employ a smaller pre-set for R13 to achieve a finer f.s.d. adjustment.

Similar calculations to the foregoing have been made for all ranges and the results are given in the accompanying Table, above.

On the 250 mV range an f.s.d. adjustment is not employed. For this range R24 is used to obtain full-scale deflection. R24 ensures calibration for a wide range of BFW61 "gain" spreads (strictly speaking we should

TABLE OF RESISTOR VALUES

Range V in "Test"	Calculated Value of Divider Resistors	Maximum Nominal Value of Fixed Resistor	Minimum Nominal Value of Pre-set Resistor
250mV	40.0 megohms	4 × 10 megohms	<i>NH</i>
500mV	6.66 megohms	5.6 megohms	2.2 megohms
1v.	2.50 megohms	2.2M + 68K	470,000 ohms
10v.	204,000 ohms	180,000 ohms	47,000 ohms
50v.	40,000 ohms	33K + 3.3K	10,000 ohms
100v.	20,000 ohms	18,000 ohms	4,700 ohms
250v.	8,000 ohms	6,800 ohms	2,200 ohms
500v.	4,000 ohms	3,300 ohms	1,000 ohms

refer to the "transfer conductance" rather than the "gain"). If desired R24 may be replaced by fixed resistors the total value of which can be determined by trial and error.

In a typical case, when V_{in} is zero the drain-source current is 0.5 mA and the source voltage about 2.5 volts. Owing to parameter spreads this voltage may be anywhere between 1 and 3 volts. Therefore, to ensure zero deflection on the meter the voltage at the top of R26 must be at least +3 volts and at the bottom of R26 it must be 1 volt or less. If R26 is made too small an excessive current will be required to obtain the required two-volt drop across it. This would result in shortened battery life and frequent re-zeroing would be necessary to compensate for the falling battery voltage. The values for R25, R26 and R27 given in the Table of Values with the circuit on p.95 result in a current down the chain of about 9 mA. A finer zero adjustment and lower current drain can be achieved for a given BFW61 by employing a lower resistor for R26 and far higher values for R25 and R27. The values can be calculated easily once the approximate source voltage is known.

Calibration

The accuracy of the calibration source, the quality of the meter and the care taken in calibration will of course determine the ultimate accuracy of the instrument. A suggested general procedure is as follows:

- (1) Switch Sw1 to the 250 mV range and set R24 to its minimum. Remove the calibration source, short circuit the input terminals and adjust R26 for zero meter deflection. Remove the short circuit.
- (2) Apply a known 250 mV input to the terminals (observing polarity) and adjust R24 to obtain f.s.d. on the meter.
- (3) Repeat steps 1 and 2 until the meter reads correctly at both zero and f.s.d. R24 should not be adjusted for steps 4 and 5.
- (4) Switch to the 500 mV range. Check that with the calibration source disconnected and the input terminals short circuited zero deflection is obtained on the meter. If it is not, repeat steps 1 to 3. Remove the short circuit, apply 500 mV input and adjust R8 to obtain f.s.d. *Do not adjust R24.*
- (5) Switch to the other ranges and repeat step 4, applying 100% inputs and adjusting R11, R13, R16, R18, R20 and R22 (as appropriate) to obtain f.s.d. for each range.

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

AS far as G3KFE was concerned, the month was mainly memorable in the weather context rather than on the communications side. This was partly an attack of the Dreaded Bug, attributable to an excess of snow-shifting, and, more directly, to finding, when at last he staggered out into the world again, that the snow had finally demolished his 28g. long-wire. Upon closer investigation, the actual aerial was found to be still up in the air—you have to *look* for it!—but the lead-in had become embedded in frozen snow on the roof, which, when it slid down to earth carried away the lower end of the lead-in at the point where it comes over the side of the roof and down the wall. However, those who say a 28-gauge wire won't *stay* up should note that it has lasted all but two years of wind-and-weather, and the majority of the local residents still don't realise it is there!

Here and There

From several sources we have news of a station in Taganrog near the Black Sea under the call UK6LA, or possibly UK6LAZ. Frequencies

will be 3630, 7040, 7070, 14180, 14240 (mainly for QSO's with U.S.A.), 21300, and 28600 kHz. They will be on for the *CQ WW WPX* affair (April 11-12, *see* p.39, March), and possibly for a little longer. The operators will be UA6LO, UY5LK and UB5KIW.

In QSO with G3VSD (Accrington) and G3UP (Louth), WØDIA let it be known that G3SVW is now operational as VP8LK, and was worked on 14020 kHz, CW. To these correspondents thanks are due for passing on the messages.

Back on the historical tack, G5BB recalls the KDKA days, and goes on to remark that when he was first licensed in 1934, he ran a PX4 in the PA off 240-volt DC mains, and an O-V-2 receiver. Nowadays, the G5BB rig is a little more sophisticated, with a TT21 at 1000 volts and an EA-12. Until the advent of the EA-12 all the gear in the station had been home-built, and even now there is a SSB rig on the stocks with a linear to go with it, albeit G5BB works 98% CW. Another one for whom memories stirred was G3EKN of Birmingham, who recalls not only KDKA, but others: The Polar ships

WAP and WNP, Peary and Baudoin, and the Hamilton-Rice expedition up the Amazon. NERK was the call of the U.S. Airship *Shenandoah*. Much midnight oil was burned by SWL's in those days!

In the same context, G2FWA remembers W2ALP, then chief engineer of G.E.'s station at Schenectady, coming on the air personally to answer SWL reports, and Edgar's own efforts to be the first U.K. reporter—foiled because even then there was air-mail, and Shannon was a later stop than London on the route!

So there it all is; delightful memories of spacious days; but, sad to say, hardly relevant to the subject of DX and Communications in 1970, so we must call a halt before the whole column disappears into the 1920's!

Top Band Scene

This, of course, is the time of year when one expects to have a summation of the season's DX on 160 to report, as well as the run-of-the-mill stuff; and, with the arrival of W1BB's latest bulletin, that is just how it turns out—there is so

This is Karl Kallema, UR2BU, of Tartu, Estonia—his is a well-known call on the DX bands. In pre-war years, when Estonia was an independent republic, Karl was signing ES3YY and ES5D—this was during the period 1934-1940.



much that one despairs of picking out the important bits! As far as the Trans-Atlantics were concerned, December 14 and 28 were poor, though oddly enough DHJ was getting across at up to 57 on the former date; but the latter was an absolute stinker. The best date was *not* one of the tests—December 21, when, as far as the W's were concerned, things just could not have been better.

About April 15 is the date set for the YNØ DX-pedition, with some 80-10 metre operation, but main attention to Top Band. This is being operated by WB9BUV and W5QPX. KL7IR is known to be on the band. VP9GJ is now back in the U.K., after having stirred up 160m. to some considerable effect; John returned *via* U.S.A. and was able to visit several of the top W9, W1 and W2 Top Band merchants.

TOP BAND COUNTIES LADDER

Station	Confirmed	Worked
<i>Phone and CW</i>		
G2NJ	98	98
G3HDO	98	98
G2HKU	96	96
G3WPO	94	96
GI3WSS	92	92
G3VLX	81	97
G3XDY	79	91
G3XTJ	79	90
G8HX	76	83
G3XTL	62	78
G3KFE	52	67
G3LXD	44	67
<i>Phone only</i>		
G2NJ	98	98
G3TSL	94	97
G3WPO	90	91
G3VGB	90	95
G3PQF	81	92
G3XTJ	60	79
GI3WSS	47	63
G3XDY	44	75
G3NPB	17	62

(Failure to report for three months entails removal from the Table. Claims may be made at any time. Six months of "Nil" reports will also result in deletion.)

It is nice to see people dovetailing their arrangements in with known plans; and particularly when it involves county-chasing activities. A slight amendment to the plans of Fred, G3SVK, means that he will be remaining in East Lothian over April 18 and 19, thus scrubbing West Lothian out of his tour. West Lothian will then be dealt with by the GM3OGJ/GM3FSV team, during May 29-31. They will be on from 1800 to 0100z, using 1830 (approximate) kHz for CW and either 1865 or 1875 kHz for the SSB part of the works. There is some hope of a spot of 80/40 metre operation on the Sunday.

G3LQI (Lancing) comes into the picture at this point—his first letter having contrived to go astray in the post—to say that his planned tour of Scottish counties for April will go as follows: April 12, *Selkirk*; April 13, *Bute*; April 14, *Wigtown*; April 15, *Kirkcudbrightshire*; April 16, *Dumfries*; and April 17, *Roxburgh*. Here, the frequencies to watch are 1834 kHz CW, from 2000 to 2100 clock, and around 1890 from 2100-2200 clock for the SSB types. During the day there will be some portable and mobile working on other bands at odd times to suit—but it is essentially a holiday trip rather than an all-out DX-pedition.

What used to be a rare English county—Rutland—has taken such a pounding of late years that it must be well and truly off the list now for a while. G3YMH did it over the weekend of February 28, then G3YXM, and, of course, G3SVK, which should have given the majority of the newcomers this county.

G3VPS (Wartling) threatens further trails on Top Band, and to that end has raised about 110 feet of wire in an inverted-V shape with the apex at around 30 feet, fed through an old 19 Set variometer, to work OK and the more Northerly G's and GM's at quite encouraging levels.

Now to G2HKU (Sheppey) who is a rare one in his own right, in particular for the WAB hunters and IOTA merchants, but who, with no comment, offers 4U1ITU (worked on the key at 2242z one evening), GI3JEX, GM3JGS and PAØNF in the same mode, and GM3OGJ/A plus PAØPN on SSB.

G3YMH we have already

mentioned in connection with Rutland; but the home-brew SSB gear has not been idle either on CW or Phone, with QSO's of interest including GM3IZD, GM3TKV/A, G3XAR/A (near Lands End), GM3YCB, GM3LIB, GI3TLT, GM3UKG, GM3YEH and GC3GS, all SSB, a similar scattering on CW, and ZB2BO by way of a sked QSO which resulted in 449 reports both ways under very bad conditions. Another Rutlandeer previously mentioned was G3YXM, who went out with G3YKS, who provided the car, and had quite a ball—until the battery went flat, when they had to run-start to get going for the return journey.

One of the real rare ones in Top Band counties is Caithness. So it is nice to hear from GM3JDR, who has now moved up to the Wick area, and has plans to get on Top Band as well as his usual 21 mHz; indeed the transmitter is well on the way and ready for the key to be plugged in.

And when it gets to Sunday, April 12, don't forget MDT—the "Magazine Daylight Test" on Top Band, 1000-1700 BST. To make it clear you are after daylight-DX, call "CQ Daylight Test" on Phone, or "CQ MDT" on CW. Please report your results, for distances greater than 100 miles, as soon as possible—they could be very interesting.

Contests, Awards, and DX-Peditions

Grafton Radio Society have been running their annual contest for as long as your conductor can recall; this year there are three separate parts: AM is the only mode on April 11; CW on April 18, and SSB the only mode on April 25. One point per contact, one contact only with a given station in each section of the contest. Call "CQ GRS" on CW, and "CQ Grafton SSB (or AM) Contest" in the telephony sections. Exchange RS(T) plus a serial number, starting from anywhere between 001 and 100, and going on up serially. G3KEB has a supply of blank log sheets and rules which he will be pleased to dispense in return for an s.a.e. Logs go to him; C. E. Haywood, G3KEB, 23 Richmond House, East Street, London, S.E.17, and should

be postmarked not later than May 6, 1970. As usual, Grafton encourages versatility, with certificates to the two highest scorers over the whole contest, and parchments to the winners of each section.

SWL Ward at his Forest Hotel, Guernsey, has been host to many a DX-pedition, and many an amateur has had a pleasant time in the Ward shack. It is back in business once again between April 8 and 13, with the main doings concentrated on the *CQ WW WPX* weekend. All bands will be in use, with Drake, Heath and Hy-gain tackle, signing GC3UML, and open for skeds for 5BDXCC or WAE as necessary. Sadly, the letter from G3UML took ten days to reach its target, and so missed last month's piece—which does not leave a lot of time for tee'ing anything up. On the QSL side, the cards should go to G3UML, *QTHR*. Replies will be *via* Bureaux, unless an IRC is enclosed, with s.a.e.

Back on Awards: *The Cook Bicentenary Award* looks to be of interest. It involves, between January 1 and December 31 this year, working fifty stations using the AX prefix. No cross-band, maritime-mobile, or aeronautical-mobile QSO will be acceptable, though land mobile or portables will be OK—provided they give the location and it is clearly shown in the checklog. Each AX can be worked once only for the purposes of the award, and VK contacts do not count *at all*. Send a list of AX calls worked, in order of call-signs by call areas, plus date, time in GMT, band, mode and report. The list should be certified by two other amateurs who must *say* they have sighted the log entries. This counter-signed check list, plus a note of the postal address to which the award is to be sent, should go to the Awards Manager, WIA, P.O. Box 67, East Melbourne, Vic., 3002, Australia. (Certificates free of charge by surface mail, but if you want yours air-mailed, then send 8 IRC's with your application).

W1WY, as always, has quite a crop of Contest items. This time he reminds us particularly of the *WAE RITTY Contest*—which has already been covered—over the weekend April 25-26, and, of course, the *CQ WW WPX SSB Contest*, from 0001 GMT April 11 to 2359



Neat layout at G5BB, station of Alfred Bruce, at 67 Cambridge Drive, Potters Bar, Herts., who was licensed in 1934 and is still mainly interested in CW operation on the HF bands. His SWL experiences go back to 1922 and over the years much gear, Rx and Tx, has been built. An SSB rig is in hand at the moment and G5BB's enthusiasm for Amateur Radio is as keen as ever.

GMT on April 12. Note for this year the double points incentive, for contacts on the lower frequencies, in the rules, which we gave on p.39 in the March issue.

As late news, it has just been learned that the OZ-CCA affair will be played off over the weekend May 2-3, with rules unchanged from last year. Incidentally, this letter, from W1WY reminds us to mention that he is now retired from his job as a broadcast technician, which will give him a bit more time for amateur-band DX. We wish him a long and happy retirement.

The Canadians offer a *Manitoba Centennial Award*, for contacts made after December 31 1969 with stations in Manitoba. Five points per con-

tact, make 100 points. Any band, any mode with the single exception that cross-mode QSO's are not acceptable. Logs, with two IRC's, to J. N. Knowles, VE4JK, P.O. Box 365, Carman, Manitoba, Canada.

A different end of the stick now, from SM3VE, who has for long been chasing the districts for Worked All London Town. Bert is on 14130-14160 kHz every Sunday morning, 0930-1100z, and in particular the first Sunday in the month. CW skeds will also be welcome. In exchange, SM3VE can help with skeds for most call areas needed for WASM. He is *QTHR*.

Eighty and Forty

As always, sadly neglected for

DX by correspondents and many others. Particularly 7 mHz is a DX band in the classic mould for those who care to give it a good run; but it seems that the noises which assault the ears on a quick spin-round the band are more off-putting to most people than the prospect of TVI-free DX operating! Eighty can be as good, although it has to be said here that it only seems to come into its own at unearthly hours, quite apart from the fact that it seems more likely to produce TVI than Forty, for some reason.

Seat of honour to G2HLU (Reading) who used to be a "regular" way back when G6QB conducted this piece; Harold has an inverted-V version of a trap-dipole arrangement up at the moment, and thinks aerials are the most important part of the whole station—with the single exception of the operator! His is reckoned as a good compromise for all bands, although the VSWR rises a bit as you go on to the higher frequencies. In the *ARRL DX Contest*, G2HLU had a little dabble on CW, just for kicks, and came out with W on Eighty, and all W call areas except the elusive W7 picked up on Forty.

G3XAP (Stowmarket) stuck strictly to Forty during this month, most of his activity being in the way of a 6½-hour session during the *ARRL DX CW Contest*. The result of this effort was 185 W's spread over all call areas, seven VE's, three Canadian Provinces and 39 States. The vertical, fed against lots of radials, seems to be a winner. Eleven W6 contacts were worked on the run at one stage in the contest, all at 579 or better. Phil is no believer in ATU's for decoration, and has discovered that by discarding his, he can make the aerial resonant at reasonable SWR at the Phone end of the band—so watch out for some SSB next time around.

As for G3YDX (Newquay), he has been having a last fling before moving into an area where aerials are forbidden(!). On Eighty, 9H1CB was worked on CW, but, sad to say, KC6EJ was not raised, for the title of 'YDX's gotaway-of-the-month. Forty was much better, in the way of QSO's, with KV4CI, UM8FM, PY's, CX3AN, M1I, AP5HQ, VP9BK, AX2EO, VK5NO,

VK3MR, ZM3GQ, 9J2RQ, 9H1CB, ZC4CB and 5H3LV. Ron claims that this list proves the optimum height for a ground-plane to be two feet—because when it was at zero feet he could only work into W7!

G3YTS (Kippax) had been on the air for about two months when he wrote in, and is using a DX-100U transmitter into a 14AVQ trap vertical, which are fired up on—at the moment—7 mHz CW only. So far 34 of the States have been raised, all W call areas during the *ARRL Contest*, as well as KV4CI, HP1IE, PY2EXD, PY4BQO, FP8AP, CT2AO, UF6's, EA8DV, EA8FO, ZL2BCO, ZL3JC, ZM3GQ, TF5TP and EA6BH; in the gotaway classification were CP1GN, HC2GG/1, AX3APN, AX2EO and AX3MR. Rob clearly deserves a commendation for such a good start—obviously from an SWL background!

Old-timer G3NOF (Yeovil) has looked at both Forty and Eighty, but found them somewhat wanting. He made SSB contact with HK3WO and KZ5NR on Forty, and KG4AS, OA8V, YV5BTS and ZL's on Eighty.

A new correspondent is G3XZB (Southampton) who is only able to operate at weekends because he is studying for the PMG sea-going ticket for the rest of the time (another /MM coming up?). Main activity is on 21 mHz, for which he has a dipole, but listening on Eighty in the mornings produces ZL's, and QSO's have been made with W and VE outside Europe.

Ron of G3YMH (Staines) has been building a 120-watt linear using 807's, and this has been turned to good account on Forty. A dipole yielded lots of EU contacts, but the Top Band end-fed seemed to be doing its stuff better in terms of Trans-Atlantic results. A start was made by working numerous EU countries, also W2LXK, VE3BLU, W3MLW, K2LTX and others—all on CW.

SSB from the Isle of Sheppey gave G2HKU a bit of a waker

"FIRST-YEAR-OF-OPERATION" LADDER

Callsign	Date Licensed	Countries	
		Counties	Countries
<i>Phone and CW</i>			
G3YMH	3/6/69	65	15
GM3YOR	30/7/69	62	10
G3YXM	1/12/69	53	10
<i>CW Only</i>			
G3YMH	3/6/69	34	15
G3YXM	1/12/69	13	8

A first entry for this ladder must contain a statement of the date of first licensing or of commencing operations, whichever is later.

one morning when it yielded him a QSO with XEICE, at 0723z. On 7 mHz, KZ5NR was worked at 0707z, also HK3WO.

Twenty Metres

As ever, the band on which the pay-dirt can almost invariably be panned; but it has to be admitted that around the time of the eclipse things seemed to go somewhat wonky—wonder if there is any connection?

Some sweeping claims of "green-fingers" appear in the note from G3VPS, who has thawed a lot since the days when he was an SWL. Peter claims that he is one of the chaps who can put a potato in the ground wrong-way up and still make it grow; furthermore, his knack extends to aerials, as for instance when he put an LF-band balun at the top of his 14 mHz dipole to try and get the RF to go inside the coax—and found it worked! SSB winkled out VK3AOD and AX3FZ, both around 1930z, plus ISILMN, JA's, YA1RG, YS1AG, 9L1RP and 9M2AW, while the key was being used for contacts with JA, UI8, UL7, PJ9VR, YS1AG, W and VE, plus VO2AB for a new Zone.

Activity for G2HKU has been somewhat spasmodic because of his promise to dish out WAB contacts for the 'chasers—nice to hear of someone recalling his duties when faced with a suddenly DX'y situation at the home QTH—but nevertheless raised a new country in ZP5AA on Twenty CW. The

Reporting the HF Bands

skeds with ZL3JQ, ZL2KP and ZL3SE have become practical once again, as the days get longer.

The possession of a beam is always a good thing on the HF bands—and indeed Forty—if only as a means of avoiding reception of unwanted signals. G3NOF makes note of the direction from which the openings come, and found that in the mornings the “dawn chorus” comes mainly from the U.S.S.R., with a few W6’s around 0800 near the end of the period. After the U stuff come the ZL’s, with the VK’s a little later, peaking from 0830 to 1100. In the afternoons, around 1600, there have been W6, W7 and sometimes KL7, with short path openings to VK6, KR6, JA and ZL about the same time. The evenings yielded good signals from North and South America. It adds up to SUJMA at 0648z and TI9CF around 2301, both got-aways, although Don rang the bell with AP5HQ, an assortment of AX’s, JA’s, JW7UH, KL7BZO (1634), KR6JV (1706), OJØMI, PJ8AA, VP2MY, VP2GLE, 5H3LV/A in Zanzibar, W7GKB, W7HQC, W9FIU/KS4 (Serrana Bank) and 7Z3AB.

A very terse report from G3YDX—TVI! Ron is quite justifiably sore about this, as he had set himself a target of 100 countries in his first year, and received the TVI complaint that laid him low when 98 had been pulled in—and he was averaging about two new ones a week! Hard luck indeed, particularly with the “no aerials” location looming up so closely.

Only one station is considered worth a mention by G3DO (Four Oaks) as far as Twenty goes, and that is VKØHM (Heard Is.). Nice one, too.

Bits and Pieces

Aerials are ever a fascinating subject. G2HLU brings up to notice one of the odder tricks of the things. As a check to his W3DZZ-type trap aerial, Harold put a 28 mHz “ZL Special” up in the loft, and was very pleased when it out-performed the trapped device. So much so was the success of it, that, having plenty more loft space, another one, this time cut for *Fifteen*, was erected in another corner. However, the 21 mHz version was



Ian Poole, 14 Linton Rise, Leeds 17, is just 16 years old and operates G3YWX. Licensed last November, he had a long induction as an SWL, standing at 719 prefixes in the HPX ladder in our “SWL” feature. The gear in view includes an SSB Tx, with external VFO; a Minimitter receiver; separate 80-metre transmitter; and various ancillary items. Aerials at G3YWX are a 132ft. wire and a 14AVQ, which between them can work most bands. Still at the A-Level stage in his studies, Ian hopes to make his career in electronics.

very much down on the W3DZZ aerial—and G2HLU is still puzzling this one out. At a guess, G3KFE would suggest that the electrical height of the “ZL Special” on each band has some connection, as the polar diagram and angle of radiation varies markedly with height in fractions of a wavelength at the operating frequency.

Having worked the stations, it is nice to know where to send the cards. CR8AI is *QTHR* but advises that post addressed by way of Djakarta surface mail has been arriving opened and empty, and hence his cards should always be addressed to go *via* Darwin or Lisbon.

G3DO offers as QSL addresses TR8MC, Box 3135, Libreville, Gabon; MP4QBK to MP4BHH; TI9CF to TI2CMF; YA1EXZ, Box 638, Kabul. In addition, from G3NOF come the following: 9Y4MM to VE3CBG; HS4ABS to W7FNY; KG4AS to USNS, Box 25, FPO, NY, 09593; HL9UU to DJ9HQ; 3V8AL to W4WHF; PJ8AA to W2BBK; 9NIRA to Box 81, Katmandu; VP2VJ to VE3ACD; VP2MY to W1IXL;

OJØMI to OH2ER; JW7UH to NRRL; 7Z3AB to Box 2486, Dhahran; W9FIU/KS4 to W9FIU; AX9RY to Box 2073, Konedobu, Papua; PAØWEJ/MM to PJ2HR; PY2PA to W3DJZ; EP2TW to G13HXV; VP2GLE to Box 387, St. Georges; and KZ5NR to WA9PZU.

Have you ever heard a thing called an LDE, or “Long-delayed Echo” on the bands. The sort of thing we are talking about is, for example, to complete a CQ call, and have, maybe two or three seconds later, the tail-end of one’s *own* call come back at about S2 and sounding as if it had come from a tremendous distance. The effect was first reported by Dellinger, way back in 1934; and now tests are being run by W6QYT and colleagues of Stanford University. Reports of the phenomenon are still being looked at, and any amateurs who can come in with fully-documented reports would surely be welcome to file details. However, the problem is defining an LDE—as W6QYT puts it “the field may contain anything from a katydid to a kangaroo” so reports should be on the lines of date, time GMT, band, type of

emission, delay in seconds, the duration in seconds or minutes during which the effect was audible, whether it was on your own or other signals, and what was actually heard—for example, back in 1960, K4OHK got a complete contest call and signal exchange back at 30 w.p.m. If you have any echoes of greater than the 1-or-2 second length logged, either recently or in an old log which has adequate detail, W8QYT and his collaborators would be pleased to hear from you at the Radioscience Laboratory, Stanford University, Stanford, California 94305, U.S.A. But—no hoaxes, please; this is a serious attempt to find out more about the mysteries of radio propagation.

In a letter from G2NJ (Peterborough), Nick mentions that G3RJS has joined a new ship, the *Benarkle*, and is off to the Far East. Paul did not know whether he would in fact be able to get together all the permissions which are required before a /MM ticket could be granted for the trip. G2NJ also reports a G3 on CW calling EP2RG/MM on Top Band—anyone know anything more about this one?

Ten Metres

Make the best of it while you may! After the spring activity, and possibly autumn this year, 28 mHz is going to become more and more erratic until it dies out for the long wait for the rise of the next sunspot cycle.

For G3VPS it seems to have been relatively a good month, a further four new countries having been booked in. As far as Ten is concerned, there was an interesting CW QSO with UAØMX for Zone 19, with various others, such as RA9, JA's and W's also booked in.

G3YDX is obviously biased in favour of Ten—he says “It's not that I don't like Fifteen—I just don't like not getting out!” However, to be fair, it should be remarked that a Quad rather tends to bias things one way. An odd one was a QSO with fellow club member G3XTJ, but more reasonable conditions resulted in CW with all W call areas, EL2CB, CR6AI, HO1IE, JA's, KL7CL, PJ8PM, ZS3YK, UI8KRA, ZD5X, ZD8RC, 5Z4KL, 9H1's and 9J2's. SSB was used to exchange reports with CE3HG,

KP4DHX, HR1EMM, KZ5MS, MP4QBK, VP2VJ, VP8HZ, MP4BBA, TR8DG, 9J2's and ZE1AA/BP—wonder what that odd suffix denotes?

From about 0900 things have been stirring on the band, as far as G3NOF was concerned, with the usual chorus of SE Asia, JA and VK, little from Southern Africa but, oddly enough plenty of the Central African prefixes such as TJ and TR around the time of an early lunch. W's have been in from 1130 till as late as 2100z on occasion. Don seems to have had quite a party and notched up contacts with AX4FH, AX6WX, EP2TW, FL8MB, HL9UU, JA2IRQ, K7FCB, WØVY (in S. Dakota) KL7DTH/KG6, MP4QBK, PJ8AA, TJ1AU, TR8DG, TR8MC, VE4BL, VK3ADR, VP2VJ, XW8BP, all W call areas, W9FIU/KS4, 3V8AL, 4S7PB, 8QAYL, 6W8DY and 9N1RA.

For G3DO finding new countries must be like finding hen's teeth; but every now and then one pops up, and Doug gobbles it up with no effort. VK9XI (Christmas Is.) was

such a one on Ten, but in the meantime “keeping in training” resulted in QSO's with TR8MC, HSSABD, RJ8BJR, MP4QBK, TI9CF, KV4AD, ZD3K, ZD9BM and FL8MB.

Fifteen Metres

A very nice band, this, if you can work it. What a pity there are so many TV sets about—but the world-and-his-wife must have their daily dose of soap-opera. If you wipe out his picture, he displays withdrawal symptoms far worse than he would if he tried to stop smoking.

Back in business again after his move is GM3JDR, up at Wick. Don has the 21 mHz set-up going, and reckons the new place seems to be reasonably easy to work out from; the restart was made on February 15, with the report covering from then till March 5, during which time SSB produced PZ1CU, CR7IC, 9Q5GV, KV4CI, AX5DO, HS1ABO, 4X4HT, UV9OR, 9Q5BS, MP4QBK, UW9EA, M11, SVØWU, AX6NM, UA9OO, ZL3JC, ZM3FK, CR6KB, HS1ABC, CR6MT, along with 64 JA's, all W

SIX-BAND DX TABLE

(All-Time Post War)

Station	Countries	28 mHz	21 mHz	14 mHz	7 mHz	3.5 mHz	1.8 mHz
G2DC	338	172	310	329	167	116	20
G3DO	338	203	243	331	90	83	9
G3NOF	318	195	220	304	38	60	2
G3KMA	249	191	178	187	123	54	11
G3LZQ	259	140	156	208	72	38	8
G3IGW	207	127	156	168	125	101	46
G3XBY	164	108	115	102	70	56	6
9H1BL	163	95	95	123	56	48	—
G3RJB	168	75	54	153	60	37	8
G3PQF	161	105	47	98	84	65	13
G3XAP	95	44	46	43	47	29	13
G3VPS	139	49	44	120	59	38	14
G3WPO	103	35	24	66	49	30	21
G3VLX	34	6	2	4	1	25	17

Note: Placings this month are based on the “21 mHz” Column. Claims must be made at least every three months to retain a place.

call areas and 11 JR1's. The CW list is a wee bit shorter, but includes such as VS6AF, UA0CA, FL8RC, UK0LAB, UK9QAA, ZD9BM, UA0GD, HO0FC/MM, near ZD7-land, UA9GV, VQ8CR and all W and JA call areas.

For G3DO, contacts of interest included TJ1AT, A2CAF, 5R8AX, HL9VV, MP4QBK, AX9AC (TNG) and YA1EXZ, all worked with SSB. G3NOF, also on SSB, missed out on XW8CS, YA1RG, YA2DD and YB3DC—although he did connect with AX2AVT, AX2FA, AX9AC, JA's, JH1IQO, KA9MF, MP4QBK, OJ0MI and YA1EXE.

Even though he is bashing away at the PMG sea-going operator's course, G3XZB (Southampton) can still find some enthusiasm for amateur-band working—enough, indeed to hoist up a 21 mHz dipole and comb the band both in CW

and SSB modes. The former gave CX2XA, KR6GY, KR8GA, PY's, all JA call numbers, TA2AE, VP8KD, VP9AT, VK's, VQ8CR, VS6BC, VS6DL, ZL's, 6W8BL, 6W8GE and 9H1AZ. Sideband came up with CX7BF, HL9VL, KP4DGR, LA2EN/MM, PY's, VP8KD, VP9AT, VK's, all W call areas, ZL's, ZM's and 9H1BL.

As has already been indicated, G3YDX seems to have a problem in radiating on Fifteen, but nevertheless he turned up a couple of interesting ones in HV3SJ and 9Q5RH. As for G3VPS, he fished his old 21 mHz dipole out and strung it up at fifteen feet, where it seems to be doing nicely with TF5TP and OY1R as new countries, plus W, VE and, of course 9H1BL. Odd how an aerial will sometimes appear to do better at a lower height, right against the book.

Conclusion

That's it for another round. By the time you are reading this, the Wx ought to have started to break into Spring again. Don't forget MDT on April 12. Send letters and reports, plus Table claims and entries, to arrive by first post on **April 6**, addressed "CDXN," SHORT WAVE MAGAZINE, BUCKINGHAM. (Closing date for June issue, *May 11*). Till then, keep the DX rolling.

MDT—APRIL 12

Magazine Daylight Test on Top Band. Period 1000-1700 BST. Call "CQ MDT" on CW (or "CQ Daylight Test" on Phone) and look for GDX. Reports as soon as possible after the 12th, to "CDXN."

PLEASE NOTE QTH

The address for all correspondence for our Editorial Departments—which, broadly speaking, means everything that does *not* involve sending in money—is SHORT WAVE MAGAZINE, BUCKINGHAM. If you are remitting money, for whatever it might be (books, subscriptions, small advertisements, back numbers and such) send it to Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. Your business will be dealt with immediately.

GETTING THE MAGAZINE

Any newsagent, anywhere in the U.K., should be able to get you a regular copy of SHORT WAVE MAGAZINE—all that is necessary is that you give him a firm order, which he sends on to us, either direct or through his local wholesaler. Three days before the publication date for each issue, we send out hundreds of trade parcels (varying from a few dozen to 1,000's of copies) to wholesalers and retailers all over the country. Despatch is timed to ensure availability on publication day (the last Friday in the month) or by the Saturday at the latest.

We are well aware that, for many readers wanting their copy through a local newsagent, this does not always happen. In the current jargon, there may be a "failure of communication" when it comes to passing on an order—or a disinclination to be bothered with single-copy orders for a specialist periodical like SHORT WAVE MAGAZINE—or the impression that the customer, having given what seems to be a firm order, may never turn up to collect the copy, it then to be left on the news-

agent's hands—to mention only a few possible blockages in the communication chain. (Newsagents themselves have to be careful about accepting orders because we are one of the periodical publishers not working on the sale-or-return principle—with the expense and waste that it can involve. We expect to sell, within $\pm 1\%$, every copy we print, and that means accepting firm orders only, with no "sale-or-return.")

On the other hand, it is fair to say that, up and down the country, there are 1000's of readers who do get their copy on time through local newsagents, without the slightest quibble or delay, and have done for years. Where there is any difficulty, the only solution is a direct-subscription order, taken out with us. The cost is 45s. post free for a year of 12 issues (starting any month), or 48s. "first-class" posting. Despatch is guaranteed the day before publication. Some 1,000's of readers are direct subscribers, paying either by Banker's Order or on regular annual notification. Send your order to: Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

TT100—NEW POWER TETRODE

The TT21 is, of course, a well-known power tetrode, widely used in radio amateur circles. It now has a larger counterpart, the TT100, also designed for operation as a linear amplifier. It has a rated continuous anode dissipation of 100 watts, so that two in parallel will meet the requirement of 400w. p.e.p., on the HF bands up to 28 mHz, with only 600-800v. on the plates. Manufacturers are the M-O Valve Co., Ltd., Brook Green, Hammersmith, London, W.6.

Always use our Small Advertisement section—see pp.121-128, this issue.

VHF BANDS

A. H. DORMER, G3DAH

THE highlight of the last few weeks was undoubtedly the advent of the Aurora on Sunday, March 8, which was even visible as far South as Kent. Those who heeded the reminder in last month's "VHF Bands" will have been looking North from time to time, and it is to be hoped that they got in on this truly excellent manifestation. Coinciding as it did with the last hour or so of the 144 MHz Open Contest, its appearance should have readily attracted the attention of the many CW operators who were on at the time. Indeed, in the hurly-burly of chasing the DX, your scribe was first alerted to its full-bore appearance when he heard two stations, G3XAC/P and G6GN, actually going auroral.

First indications of some unusual propagation came around 3 p.m. local time in the South, when several burbles were noticed on CW transmissions. These were intermittent and of short duration, and in the past, similar features have been observed as precursors of an aurora, but equally well have also been followed by a return to normal. However, for the little trouble involved in following them up, it is unwise to ignore them. By 4.30 p.m. it became apparent that an aurora was going to develop. DX notes became unstable, and by a little before 5 p.m. the band was full of buzz-saw PAØ's.

A feature of this initial opening was the rarity of SM, OZ and DJ, but a pleasant surprise was the strength of the transmissions from EI, GI and GW. EI6AS, G15SJ, G15AJ, G15ALP, GW2HIY and GW3UCB/A were all very solid signals in the South—EI6AS in particular was really having himself a ball. (Wonder how many readers recall that Albert was QRV on Two from Stevenage, Herts, as G3JLA, until early 1964 when he was QSY on QRL to Dublin?) At this stage no GM were heard, although later, GM3FGJ was a consistently good signal. Those regulars, GM2DRD, GM3EOJ and GM3EGW were sought without success, and GM3GUI appeared strongly much later on. That this was going to be an extensive opening, became a certainty when SM7AED was heard calling LX1SI. By shortly after 5 p.m. auroral signals disappeared, and propagation returned to normal. However, as is well known, there are frequently two phases to an aurora, the second, often the stronger, appearing within an hour or so of the first, and sure enough, such was the case on this occasion.

By 6.30 p.m. the second phase had started to develop, this time with plenty of SM and OZ to be heard, together with DJ and PAØ, and it turned out to be one of the best openings of the *last few years*. Not only was LX1SI at 59A for much of the time, providing a very nice DX contact for such Northerners as G3IOE and G3JYP, but 3Z2RO ("JO53b") and 3Z1JX ("1035g," by *QRA Locator*) and both in Poland, and both heard during previous aurorae using their more usual SP calls, were also worked from this country—a very unusual and welcome piece of DX on two metres, as both are off the *QRA Locator Map*, they provided a new country for many of the lucky ones. 3Z2LV was also on but did not appear to work any G stations. SK6AB in "FR30c" was also contacted by British stations, but as far as the countries-worked list is concerned is, of course, in Sweden. SM7BAE was heard working OH3AZW, although the Finnish station could not be found, and, *rara avis*, HB9QQ and HB9HT were also there! But infrequently

will an aurora extend as far South as Switzerland. It is reported that there was a UQ2 on the band, but he could not be found at Herne Bay.

At 2130 hrs. GMT, "someone pulled the plug out," and very abruptly there was an almost complete silence at the low end of Two! A few diehards were still calling CQ Aurora, but notes had gone T9 again. A last flurry occurred at 2140z when LX1SI came in again at 55A, but he only lasted a few minutes, and thereafter normality reigned once more.

Optimum beam headings did not vary a great deal from North-east, although for working EI/GI, there appeared to be some small advantage in looking North-west.

In the Midlands and the North of the country, the aurora seems to have started and finished earlier. For example, G6CW in Nottingham was working PAØCSL as early as 2.15 p.m.—this is most unusual. He found best results were achieved between 3 p.m. and 5 p.m. after which there was the break already mentioned, and then a recrudescence between 7 p.m. and 7.45 p.m. John also reports hearing LA, which as far as can be learned, was not audible in the South. A curious feature which G6CW observed was that CW notes from Southern stations were varying between T1 and T9 with both tones audible simultaneously but spaced by 400 Hz or so. The most likely explanation of this phenomena is that the auroral note was Doppler shifted, and that the normal tropo. propagation was still in evidence.

A very useful check log was received from G2DCG, Margate, and this, combined with the G6CW report and the G3DAH log, shows the following prefixes heard during the aurora: G, GI, EI, GW, GM, PA, SM, SK, OZ, LX, LA, DJ, DK, DL, 3Z, HB9, OK, UQ2 and ON. This tots up to 16 countries, which is a pretty stupendous total.

Notably strong British auroral signals, apart from the U.K. call-signs mentioned, were G6GN, G3BHW (who reported the G3DAH signal at ten miles range going auroral at times), G2DCG, G3CCH, C3COJ, G3LTF, G3LQR (who got the 3Z2RO fairly early on), G3NEO, G6RH (who made it with LX1SI),

and G5MA. Lets have lots more of this! Reports from stations who were on the band at this time, indicating what they heard and worked, would be very welcome for next month's "VHF Bands." This opening cannot be ignored or forgotten in a hurry.

* * *

Many operators may be asking themselves whether the solar eclipse on March 6 played any part in the advent of the aurora. This seems unlikely, since, although the path of the penumbra will have passed over the magnetic pole, the area covered by it and the short length of time during which the solar wind stream would have been interrupted in any particular locality, are not likely to have produced any significant changes in ionospheric intensities which might account for *Ar* propagation. Further, since the moon is only about a quarter of a million miles from the earth, the period between the eclipse and the disruption of the incident particle stream was far too long. *No*, the most likely cause is an active sun, as was observed at eclipse totality by those who watched the event on TV. The HF bands had been subject to fade-out shortly before the eclipse, and this is another indication of unusual solar activity being the cause.

* * *

For the rest of the period under review it is, again, almost a case of the less said the better. There have been minor lifts on two metres, notably on February 15 and March 1, when the Northern French stations were coming in well, and the last few days of February produced some medium-range DX within the U.K., the best paths being North/South—but by and large, it has been the old, old story of scrappy contacts, marred by deep QSB. The activity on four metres has been so low that it is very difficult to make any accurate assessment of conditions there, and the same is nearly true of 70 cm., if the results obtained during the last two Cumulatives are anything to go by. This is particularly disappointing, since it was with the idea of encouraging activity on this band that the contests were arranged. Man proposes, God disposes it is said, and there is

nothing we can do to alter propagation conditions. Let us hope that the next series will be more productive.

Atmospheric pressures during February were very variable, ranging from 1020 mB at the beginning of the month and falling to just below 990 mB on the 14th. They were well up, around 1030 mB, just before the snow arrived, but it appeared that the atmosphere was too dry for good propagation.

VHFCC Awards

Awards this month go to G8BXX, G8CKV and G8CZQ, to whom congratulations.

G8BXX operates on two metres from a QTH in Morden, Surrey, about 100ft. a.s.l., which has a good take-off in all directions, although slightly screened to the South. Most contacts were made using an HW-17, which ran 25 watts to a four-over-four fixed on a northerly bearing, but recent improvements include the erection of a 35ft. mast with a fully rotatable 10-ele on the top. The HW-17 has been replaced by a 15-watt rig using a QQV03-10 in the PA, which helps a bit with the local TVI! Receiver is a CR70A tuning 4-6 mHz, with a JXK converter. It is pleasing to note that the QSL return rate, largely *via* bureau, is about 70%.

From Peterborough, G8CKV gains also his Certificate for two metres. The site is low, about 50ft. a.s.l., and the antenna is a ten-element Yagi at 28ft. which replaces the old six-over-six slot. The transmitter is a very old BC-625, which for some time was run at an

input of ten watts, but which has now been re-vamped to 15 watts. The receiver on which many of the contacts were made was an RA1, preceded by an FET converter using TIS88's in the RF and mixer stages, but this has now been replaced by a home-built transistorised job tuning an IF of 28-30 mHz.

Ian Bayliss, G3CZQ, gains his two-metre Award for operations from Wembley in Middlesex. He was first licenced in September, 1969, and it is much to his credit that he has qualified for the Award, and got the necessary QSL cards in to prove it, so rapidly. Located as he is on the south-eastern side of Harrow-on-the-Hill, he has a good take-off in all directions except to the North-west, where there is bad screening which cannot be overcome even by a 6/6 slot at 35ft. The transmitter doubles on Two and Four, and was designed by his father, G8PD. Output is twelve watts. It also drives a QQV03-20A tripler for 70 cm, on which band the antenna is an 18-ele *Parabeam* at 40ft. A G3HBW type converter feeds an Eddystone 680X tuning 4-6 mHz. Radio seems to run in the Bayliss family, as apart from G8PD, his brother is G3WKZ, *ex*-G8AJU, and, as the *Call Book* shows them all at the same address, condolences must be offered to Mrs. Bayliss! Professionally, Ian is concerned with logic circuitry as applied to electronic telephone exchanges.

Good Samaritan Award

This rather unusual one goes to G8AMG of London S.E.20, and will take the form of quantities of

THREE BAND ANNUAL VHF TABLE

January to December, 1970

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL pts.
	Counties	Countries	Counties	Countries	Counties	Countries	
G3DAH	7	1	35	7	2	1	53
G2JF	—	—	30	7	11	2	50
G3OHH	8	1	18	2	5	2	36
G8APZ	—	—	13	1	10	1	25
G15ALP	4	1	8	4	—	—	17
G8BKR	—	—	7	2	4	2	15

The Three-Band Annual Tables show total claims to date from the year commencing January 1, 1970. Readers are reminded that claims should be sent to: SHORT WAVE MAGAZINE, BUCKINGHAM. Summaries by bands will be published at regular intervals.

ale at some convenient counter encounter. Returning from the Farnborough Radio Club meeting one evening last month, your scribe was faced with large stretches of apparently uninhabited countryside, and a petrol gauge showing nearly zero. As it was getting on for 1 a.m. at the time, and all the natives appeared to have retired to their virtuous couches, the availability of the odd soul who might have been able to indicate the whereabouts of a filling station was *nil*. A quick call on the two-metre mobile, in case some nearby DX'er was still about, brought an immediate response from Mike Foster, G8AMG. The situation was explained, and with the aid of an Ordinance Survey map of the area, he was able to track the progress of an apprehensive G3DAH. When things began to get really desperate, G8AMG asked for a standby and a standstill, so that he could motor out from the warmth of his London shack with a can of the essential essence. Fortunately, this proved unnecessary, as at that moment, the A.20 and an all-night filling station hove into sight—but the offer was greatly appreciated just the same and is a fine example of amateur comradeship and co-operation. Thanks, Mike. BCNU.

Conventions

As indicated last month, the date for the Sixteenth Annual International UHF/VHF Convention is April 25, and the place is the Winning Post Hotel, at Whitton, near Twickenham. The programme includes talks on Project *Trident*, (the U.K. satellite) by G3GVM of the South-Coast VHF Group, who have already done so much to further the scheme; on SHF communication by that well-known UHF operator Les Sharrock, G3BNL; on VHF NBFM techniques by the team of G3FZL and G30OU; on trans-equatorial scatter at VHF by Don Hayter, G3JHM; and on digital beam rotators by G8AOL, Brian Godwin. Tickets may be obtained from Frank Green, G3GMY, *QTHR*.

Of historical interest is the fact that the original conception of these annual VHF get-togethers came from SHORT WAVE MAGAZINE some twenty-odd years ago. A report in the *Magazine* for January 1950

records that the second such event was held at Slater's Restaurant in the Strand, London, and that some eighty VHF operators were present, including such well-known present-day calls as G2NH, G3BLP, G5MA, G6VX and old man G6FO himself. In those days these conventions, held under *Magazine* auspices were called, "Dinner Meetings" and took place in various parts of the country, including Cheltenham, Nottingham and Manchester, with participation varying from 50 to 140. They were then open to all-comers, "irrespective of affiliation," as are the current London, Midlands and Scottish Conventions.

The first EI VHF Convention is scheduled to take place on Sunday, May 24, at the County Arms Hotel, Birr, Co. Offaly. In the programme are lectures, an auction, trade show and entertainment for lady visitors. Further details from Paul Quast, E15BH, *QTHR*. Visitors on holiday in Eire will be welcome. (The G3BA/G3BHT team plan to be among those present).

Beaconry

If you do not find GB3GEC on 434 mHz as usual, try looking on 433.45 mHz, on which frequency it has been operating recently. This is close to 433.5 mHz, the channel on which the new Sutton Coldfield beacon, GB3SC, is due to operate shortly, and should make comparison checks simple. Although still on dummy-load test, GB3SC has been heard in Sheffield and Wolverhampton (the room in which it is installed faces North) and G3OHH of Mow Cop can receive it at RST 589 on a screwdriver!

Some Continental 70 cm. beacons which may be useful for checking propagation are:—

Call sign	Frequency	QRA	Locator
DJ2LF	432.080 mHz	DL	35h
DL0SZ	432.008 mHz	F1	68
DL1XV	433.000 mHz	GH	25
OK1KCU	432.034 mHz	GK	29j
OZ7IGY	432.018 mHz	GP	23e

DL0SZ is running 35 watts to a fifteen element Yagi, and the Danish beacon has ten watts to a double halo.

VHF Tables

Consideration is being given to the reviving of the All-Time Countries and Counties-Worked Tables. Unfortunately, after the lapse of time since these particular features

appeared, records are inevitably incomplete, and with the best will in the world, a satisfactorily up-to-date Table could not now be produced.

It is also considered that it might be a good thing to modify the original concept in order to bring the G8/3's more into the picture. It is proposed, therefore, that the All-Time Tables should be renamed the "Aggregate Tables," should start as from January 1, 1969, and should include claims for both two metres and 70 cm. Before going into print, it is desired to ascertain just what support this idea might have, and accordingly readers are invited to send in claims with a *starting* figure of *fifteen* counties and *five* countries, with effect from Jan. 1, '69. Depending upon the magnitude of the response, a decision will be taken whether to proceed with the idea or not. Initial lists should show totals of counties and countries by prefix, with subsequent additions annotated in a similar manner.

The original thinking behind the idea of these Tables was to encourage operation on four metres and 70 cm. Obviously, to get a high place in the Tables it was necessary to operate on at least two bands. It can be fairly stated that in this respect, they have to some extent succeeded, but the prevailing situation of great empty spaces on 70 cm. must still be cause for concern, and anything which will ease the position is worth the try.

Thought has also been given to the establishment of separate Tables for G8/3 operators, who are denied the use of four metres for the Three-Band Annuals, and a decision taken that no change is required in the present practice. The Morse Test is not all that difficult!

Distortion In Linears

With all the talk going on these days about reducing spurious products in SSB linear amplifiers, it might be of interest to consider briefly the causes and effects of intermodulation distortion. As far as the *cause* is concerned, intermodulation distortion occurs as a result of non-linearity in amplitude gain, or phase shifts with changes in signal input levels. These effects are only observed when the RF input has a varying amplitude, as a single radio frequency will be

amplified by a fixed amount, and phase also shifted by a fixed amount. The non-linearity of the amplifier in these circumstances will only produce harmonics of the input frequency. However, if the input is varying at an audio rate, the non-linearity of the amplifier will cause intermodulation products to be produced. Hence, among other reasons, the necessity of using a two-tone oscillator for test purposes, so that the amplifier may be checked over the whole of its dynamic range.

As far as effects of this distortion are concerned, both out-of-band and in-band spurious are produced. The former can be serious if impedances in the amplifier output circuits will respond to the frequencies being generated. They may then be radiated, to the detriment of other users in other services. Care must be taken therefore to ensure that the amplifier is operating in as truly a linear condition as possible, and suitable filters used at the output to eliminate, or at least substantially reduce, unwanted radiation. Perhaps even more serious from the constructors point of view, is the in-band spurious situation. Here, filters cannot be effective, and the power radiated on frequencies other than the required one, is completely wasted, as well as causing QRM to other users of the band.

Probably the most common cause of this type of distortion is incorrect operating conditions in the grid circuit of the valve(s), since other considerations are usually beyond the control of the amateur, determined as they mainly are, by the geometry of the valve itself. No grid current may be drawn in a Class-AB1 amplifier under normal operating conditions without introducing some distortion. In amplifiers in Class-AB2 or Class-B, where grid current is drawn, it is essential that the driving source be of low impedance, and desirable that the grid input tuned circuit be resistively loaded to reduce the effects of changing input impedance on the modulated driver.

DX-Expeditions

Final details of the G3BA/G3BHT expedition to EI are not yet to hand, but Tom advises that all preparations are well advanced. One point to be noted is that, although they will be

in Eire over May 24, they will not be operating on the Sunday night or Monday morning, as they will be at the EI/VHF Convention on those days. Apart from their general interest in the Convention *per se*, they hope to be able to persuade other VHF operators over there to come on the band at the same times, and near the same frequencies as they will themselves be using—so it will pay to have a look around the channels with the beam West during activity periods. The anchor man on 80 metres has now been named as G6CW.

Members of the Verulam Radio Club are proposing to mount an expedition to Northern England in August. Counties to be visited will include Westmorland, Cumberland, Durham and Northumberland. Transmission will be on SSB, CW and AM, with fairly high power. Further details will be published later, but meanwhile an s.a.e. to G8BNR, *QTHR*, will produce a sked list.

Club News

The South Bucks VHF Club has an AGM on April 7 at Bassetbury Manor, High Wycombe, Bucks. Time is 8 p.m. They have a field exercise arranged for April 18.

The Midlands Amateur Radio Society meeting, arranged for May 12 next, promises to attract many members and visitors, as the speaker on that occasion is Johnny Stace, G3CCH, who will be talking on Meteor Scatter and Moonbounce techniques. Time is 7.45 p.m. (as always on the second Tuesday of each month) at the Birmingham and Midland Institute, Margaret Street, Birmingham 3. Further details of meetings and membership may be obtained from G8AMD, *QTHR*.

News Items

Bill Jarvis, GM8APX, is still pursuing the possibility of operating from the Rannoch to Kings Cross train. British Rail seem sympathetic enough, but the P. & T. Dept. have some reservations about QRM with signalling equipment—although, as Bill points out, unless one is talking about sensitive receivers on the train itself, there should be no more interference than might be caused by a /M operator located at the side of the track! Did anyone hear him from Schiehallion on Sunday,

March 8 during the contest? He threatened to have 120 watts of NBFM and a ten element beam up there in XQ29j.

Bryan Pickers, G3YUA, who has recently had a couple of two-metre designs published in the *Magazine*, has at last been able to give his pair of 4CX250B's an airing. This at the end of February when he found conditions to the South very good. One CQ call brought back ten South Coast stations. He also managed, after a wait of nineteen years, to have a contact with an old friend, Eric Johnson, G2HR, of Chingford. The Wrotham beacon was peaking S9+ at the time.

Joe Kasser, ex-G8BTB, is now G3ZCZ as well as ON8IK. Good news for four-metre operators: Monday evening is being built up into an activity night in the West Riding. Look out for G3WWF, G3FDW and G3NNO in particular. It is reported that the change to SI Units, foreshadowed in the Editorial for February, 1969, and introduced into SHORT WAVE MAGAZINE last month, has been welcomed by some operators North of the border, who claim that it stands for "Scottish Independent." But then, they also think that Hertz is the Rent-a-cycle firm! *Oh, well...*

Contests

As indicated already, propagation during the recent 70 cm. Cumulative Contests was uniformly poor. Average scores cannot have been much better than a dozen or so contacts per session, and this is not to say that the contest dates coincided with periods of particularly bad conditions. Things have just been pretty poor all round. Best DX at G3DAH has been G8AKE in Leicester, heard but not worked, and ON4HN, who has been heard on two occasions. The fifth and final round on March 23 will have come and gone by the time these notes appear, but it is sincerely to be hoped that it produces something better than we have had to date.

Activity was certainly high during the two-metre event over Saturday/Sunday, March 7-8, with good propagation for much of the time. Many operators were heard passing serial numbers over the ton, and GW3NUE/P went over the two-hundred mark. With the help of the aurora, at the end there must have

been some very high scores for individual contacts. It is pleasing to report that very few instances of poor operating were noted, and there seemed to be a general observance of the new Band Plan—with the notable exception of the operator who not only operated phone below 144.15 MHz, but also was sitting right on top of the Cornish beacon! One way to stop this abuse would be to refuse to work 'phone stations operating in the CW sections of the bands.

As might have been expected, there was a vast number of G8/3 stations active. They accounted for

40% of the contacts in the G3DAH log, in spite of long periods spent on CW, and included quite a number of very new G8D-- calls among their numbers. Later in the evening, after the finish of the Contest, two G8/3 stations were heard in QSO bemoaning the cruel fate which denied them 30-point contacts *via* aurora, and claiming that this was unfair! One could not disagree more. The remedy lies in their own hands, and more CW on Two and 70 cm. would certainly be welcome.

Forthcoming events include the 70 MHz Open on April 11-12 and

the 144 MHz Portable Contest over May 2-3. Note that this latter event is divided into two parts: Section 1 runs from 1800 hrs. GMT on the 2nd to 1800z on the 3rd, to coincide with the IARU Region I event; and Section 2 from 1000 to 1800z on May 3 for those with less time to spare.

Deadline

Deadline for the next issue is **April 4, 1970**. The address for claims, news and views, is: "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM. Cheers for now and 73 de G3DAH.

"VFO CONTROL ON TWO METRES"

This article, by G3YUA in our February issue, has come in for a certain amount of criticism—broadly, on the grounds that 10-metre injection should be avoided because it can produce spuri in the required band (144-146 MHz) due to the harmonic relationship (*times 5*) with the fundamental VFO coverage (28.8-29.2 MHz). Furthermore, that by the use of a push-pull mixer, with injection in push-pull to give output in push-pull, the result is a perfect quintupler, exaggerating the 10-metre drive into the two-metre band. What it comes to is that though the *principle* of the G3YUA transverter is sound enough (and his own signal on the air is beyond reproach, even when listened to under RS-59+ conditions), the use of 29 MHz as the injection frequency is to be avoided.

SOME "CALL BOOK" STATISTICS

The current (Spring) issues of the *Radio Amateur Call Book* are bigger than ever. The U.S. Section lists over 287,000 radio-amateur call signs, with names, addresses and licence classifications. The DX Section (the world outside the United States) contains nearly 165,000 more listings. The *Call Book* is, of course, indispensable to all who are interested in DX, whether as AT-station operators or SWL's. As sole agents for the U.K. and Europe, we always hold stocks of the latest issues, which are published quarterly and are therefore as up-to-date as any world directory can be.

Price is 69s. 6d. for the U.S. Section (American amateurs only) and 45s. 6d. for the DX Listings (the rest of the world)—or the two together for £5 10s., giving you the call sign/QTH of every known, licensed amateur. It should also be noted that both versions of the *Call Book* contain a great deal of incidental DX information of great value to the DX operator and SWL—such as Zone classification for each country, QSL Bureau addresses, time differences and similar data.

Orders, with remittance, to: Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

R.A.I.B.C.—TRANSPORT CALL

We are asked by the honorary secretary of the Radio Amateur Invalid & Bedfast Club to say that they are in urgent need of help with the transport of receivers to expectant RAIBC members round the country. The position is that while the gear is available at its place of origin—which could be in Kent, London, Gloucestershire, Wiltshire or Somerset—it has to be transferred to the intended recipients (who might be in Lancashire, Cornwall or remote parts of Wales).

In other words, it is purely a matter of transport, which might involve a certain amount of motoring, as a labour of love. Those able to respond to the immediate requirement—or who would be willing to hold themselves in reserve if and when called upon—are asked to get in touch, mentioning approximate radius of action acceptable, with: Mrs. Frances Woolley, G3LWY, hon. secretary, RAIBC, 331 Wigan Lane, Wigan, Lancs. This is the sort of thing that might fill the bill for any keen amateur with a car wanting to do something useful over a weekend. And who knows what interesting and worthwhile personal contacts it could lead to in the Amateur Radio context.

CORRECTING A MISCONCEPTION

It could be that those who follow our regular "SWL" feature might have been misled by the statement, at the foot of p.31, March, to the effect that the valves in old-type HRO's have too high an internal *capacity* to be effective on two metres. In fact, it would have been more correct to have said *lead inductance*. This does not, of course, in any way invalidate the general tenor of the argument—to modify an HRO as it stands to give any sort of acceptable result on two metres would be a monumental job, not to be undertaken by anyone but a real gen. man, who knows exactly what he is doing. With an HRO, or any sort of general-coverage Rx having a normal tuning limit at the 10-metre band, a converter is the right answer for reasonable results. It should be added that our distinguished contributor Justin Cooper was in no way responsible for the error in expression.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for May issue: April 3)

(Please address all reports for this feature to "Club Secretary," SHORT WAVE MAGAZINE, Buckingham.)

HOW many times have the spring-time aerial-erection exercises for the club—or the members, for that matter—been postponed or cancelled, because the lads just did not turn up in enough numbers to tackle the job?

One amateur at least can guarantee that if he is in charge of the task, he will always have more than enough effort at the right place and the right time, and this is how he does it: Very simply, he rates each job to be done, by the can, the six-pack, or the crate, and ensures that adequate supplies of such are at hand (together with openers and glasses) for the moment when the work is completed and all concerned want to take a good look at the result. The operative word here is "completed"—especially when the job needs sharp wits, as in raising a long pole. But where there is no hazard, he has been known to give "progress payments" when the hole for the foundations of a mast were being dug out on a hot day. And, if it saves the Club a claim for damage from a falling aerial, why not charge it to the funds, with the agreement of the other members, of course. In this manner it is often possible to turn a chore into a social event to which all concerned will look forward.

The Reports

Straight down the pile this time, for a change from the regional listings; and, talking of regions reminds that an apology is due to the *Saltash* chaps for that boo-boo in February, in which we set them in the wrong county—Devon instead of Cornwall! For April, they have the 3rd at Hq. for a Junk Sale, while on the 17th there is a ticket-only visit to the ITA transmitters at Caradon Hill.

Every Thursday evening the *Spen Valley* lads foregather at Heckmondwike Grammar School, where visitors and friends are welcome; but we have no information on the programme for April, so there is always the possibility that they may be "playing away" on one of the dates. No doubt the hon. sec.—see Panel—would be delighted to give you the latest information.

A new hand takes over the production of *QTC*, the newsletter of the *Radio Society of East Africa*—and a very good job he made of his first issue, at that. A piece on beam rotators particularly caught the writer's eye, also one on the radio network provided by the Club for the Rift Valley Motor Rally.

Surrey get together at the Swan and Sugarloaf, 1 Brighton Road, South Croydon, on the third Tuesday,

with, it is understood, the AGM to be dealt with. However, as our copy of their *Monthly News* is not quite clear on this, it would be as well to confirm the date with secretary G3KGA—address in Panel on p.111.

Your scribe was quite amused by the *Finchley Newsletter* and its comments on the members and their activities. To meet them, look around the various corners of the "Cherry Tree" in Southgate any Friday evening. No particular programme, just a sociable natter over a pint.

At *Colchester*, the chaps have Room 40 in the North-East Essex Technical College booked for each Wednesday, the routine being alternate weeks of practical work and lectures. Quite a crowd turn up, numbering around thirty-five, which is pretty good going.

It is pleasant to see *RAIBC's Radial* once again; and to note an oddity which seems newsworthy: They have a new, blind member, who is keen to get on the air with his own call—the interest having been sparked off by visiting the station of his old friend, YL Betty Robinson, G3WTI. It is unusual to hear of someone coming into Amateur Radio as a result of a visit to a YL station. This Club exists, of course, to bring together handicapped and blind persons interested in our hobby, and to help them to progress to a licence and a station. Thus, a lot of supporters are needed, to provide the assistance, in all sorts of ways, varying from building and setting up gear, transporting it from A to B, or just visiting for a natter on a topic of mutual interest. For details, contact G3LWY at the address given in the Panel on p.111.

The Peat Pitts Inn, Ogden, Halifax, is the home of *Northern Heights*; in April they have the Annual General Meeting down for the 8th, and on the 23rd a lecture on RAEN by G3MBQ. Incidentally, it is with sorrow and regret that they have to report the passing of G3OMM, Mary Shaw, who appeared on their programme at regular intervals on various topics, and for long was minute secretary of the Club. She will be missed indeed.

* * *

On to *Cray Valley*, where the pattern is one of a formal meeting—the AGM, in fact—on April 2, followed by the Surplus Sale on April 16. All their get-togethers are at the Congregational Church Hall, Court Road, Eltham, S.E.9.

Head for No. 2 Guardroom, Sobraon Barracks, Breedon Drive, Burton Road, if you want to find the

Lincoln lot, on any Tuesday evening. They have a late rehash of the programme to report—giving a lecture on SSB for April 7, followed a week later by a talk on the HKØTU, Malpelo Island, DX-pedition of last year, which is the first showing of the lecture in the U.K. Construction is the order-of-the-day for April 21, and the month is nicely rounded off by an Open Evening.

There is quite a lot to be said for having too *much* to do. Leicester certainly have a crowded month. The main event is to be their stand at Granby Hall for the "Leisure 70" exhibition, where they will be signing GB3LRS for three days, April 22-25. As for the normal meetings, April 6 is down for a tape-talk; Projects evening is April 13; while April 20 is obviously going to be devoted to setting up the Granby Hall stand. As relaxation, the 144 MHz tackle will be fired up and a few QSO's made on April 27. On a different line, Leicester found ways of occupying the juniors for a recent half-term holiday, with a "sponsored listen-in" for them, the idea being rather similar to the popular sponsored charity walks, but the sponsors paying so much per hour of listening (to Club funds, naturally!).

Bishops Stortford have their star meeting of the year in April. Lew Schnurr, G5AAN is possibly the best lecturer around the Amateur Radio circuit. An impeccable technical background combined with the timing of a Bob Hope in the delivery make any G5AAN talk memorable. As always, the British Legion at Bishops Stortford, at the top of Wind Hill, April 20.

At **Acton, Brentford and Chiswick**, the difficult questions of theory, construction, and use of Sweep Generators come up for discussion on April 21, the venue for this one being, as usual the Chiswick Trades and Social Club, 66 High Road, Chiswick, W.4.

Echelford are at The Hall, St. Martins Court, Kingston Crescent, Ashford, Middx., and in March had their AGM. For more detailed information, refer to the hon. sec., at the address in the Panel opposite.

Another group who have just passed their AGM is **Thanet**, who have their being in Hilderstone House, Broadstairs, Kent, each Friday. The highlights for April are on the 3rd, when G2MI gives his talk on his trip to Bermuda, and on the 4th, which is down for the Annual Dinner at the San Clu Hotel, Ramsgate. Forward a bit, there is the Mobile Rally—May 3 at the King George VI Memorial Park in Ramsgate.

Oddly enough the very next letter on the pile gives G2MI for April—this time April 6, at the Victoria Hotel, Latimer Road, Eastbourne, to the lads of **Southdown**. He certainly gets around!

A couple of Service groups next. **Royal Signals** basically is for members and ex-members of that Corps, but it is also open to members of any Commonwealth Signal Corps, past or present, likewise ACF, CCF or OTC and T & AVR chaps. Details from G3DPS, address as in Panel.

The **Royal Navy** group have Hq. at H.M.S. *Mercury*, Leydene, Petersfield, Hants, and mention that they run a regular net on 3720 kHz, Wednesday evenings at 1900 clock. At the time of this coming out they will be getting steam up on their Mobile Rally, slated for June 14. Apart from the trade stands, there will be rides on the steam lorry for the youngsters, radio-controlled boats and aircraft, and other attractions. It

should be a good day out, this one.

What has been previously noted as "Barnstaple and District" is now the **North Devon Amateur Radio Club**, with G3VNM in the chair. Venue is still at G4CG, Crinnis, High Wall, Sticklepath, Barnstaple, Devon, on the second and fourth Wednesdays; the first meeting each month to be formal, and the later one a ragchew session.

Chesterfield have their corporate being at Hunloke Adult Education Centre, off Derby Road, Chesterfield, where they assemble every other week. Sadly, we have no detail on the April doings, albeit the February and March efforts seemed to be quite interesting. This being the case, you can either take it as the second and fourth Wednesday and just go "on spec," as the saying has it, or contact the hon. secretary for the latest details—see our Address Panel.

At **Crystal Palace**, a late change in programme is notified; April 18 is a joint effort, with G3FZL on Amateur Communications Satellites, plus G3OOU and G2FKZ talking about Simple Test Equipment. Your conductor cannot ever remember such an array of talent lined up for one evening at one Club before—so book the date, and the place, Emmanuel Church Hall, Barry Road, S.E.22. Looking ahead, in May they are at home to the "TVI clinic" of G3JGO/G3XIW, and on June 20 will have a post-mortem on their NFD efforts.

A.R.M.S. caters for the /M wallahs; the current issue of *Mobile News* has a rather interesting piece, by G3UML, on the "how" aspect of DX'ing from the car.

Perdiswell Park, Droitwich Road, is the place where the **Worcester** chaps foregather. April 25 is shown in the *News Letter* as a Constructional Contest; this is a Saturday, and so perhaps it would be as well to contact G3TQD for a starting-time if you propose attending.

At **Norfolk**, a new secretary takes over to give his predecessor a well-earned rest; he advises that the lads are still using the Brickmakers Arms, Sprowston Road, Norwich as Hq. Programme for April is as follows: April 6—My Panadaptor, by G8AWZ; April 13, Informal; April 20, Discussion of Field Day plans; and finally, on April 27, a talk on the subject of Digital Clocks.

* * *

The **Mid-Sussex** crew have alternate Thursdays booked up at Marle Place, Leylands Road, Burgess Hill. The final details for April are not to hand, but there is certainly a Home-Construction Contest to be dealt with in the near future. If you want to know more, get in touch with G3RXJ, at the address in the Panel here.

At **Hull** the form is weekly meetings on Fridays, at the Hq., 592 Hessle Road. The first and last of these dates are taken up by Parts II and III of the series on Semiconductors being run by G3SSA and G3AGX. April 10 is a Construction Night while the 17th is down for a Junk Sale. In addition to all this, a visit to Hull Telephone House is arranged for April 8.

Silverthorn also have Fridays each week; but the VHF/UHF members of this group get together on Thursdays as well for constructional work. Amateur TV is another growing interest, with building going on towards a closed-circuit set-up. For premises, they are lucky to have a good spot at Friday Hill House, Simmons Lane, Chingford, E.4.

Every other Friday is the programme at **Greenford**, who meet at the Community Centre, Oldfield Lane,

Greenford, Middx. This gives April 3 to G3EPU, who is booked to talk about Amateur Radio and the Light-house Service, and will illustrate his discourse with slides and film. April 17 is a more directly technical session, with G3MMQ talking about Oscilloscopes—how they work and their many and varied uses in the shack.

Every so often we hear from Skegness, with details of their regular Hamfest-plus-Junk Sale effort. The next such is down for April 17, admission 2s. 6d., including refreshments. Apart from the Junk Sale, there is in addition a trade stand—John Birkett of Lincoln—and the promise of the usual convivial evening. This favourite event is at the Bull Hotel, Halton Road, Spilsby, Lincs.

The Peterborough chaps are still “wintering” with a lecture in the Technical College on the first Friday

in each month, but they are very much looking forward to getting back to their summer haunt on the river.

Oh dear! Fareham are running out of SWL's and G8/3's—they are all getting G3/3 full tickets. Good show! This lively crowd have Sunday evenings at Portchester Community Centre.

Some time now since last Otley reported in; but in the meantime they have been growing a bit and had to look about for a new place. This is now done, and they have moved in and started the essential work of conversions to make it just-so. Although the chaps are in session every Tuesday, as before, it is hoped now they have more space to put on lectures, slide shows and so forth, at regular intervals.

Thornton Cleveleys have their meetings in the St.

Names and Addresses of Club Secretaries reporting in this issue:

- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W.3.
 A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2-1EZ.
 BISHOPS STORTFORD: A. Stanley, G3WUR, 43 Havers Lane, Bishops Stortford (57251), Herts.
 BRISTOL: E. J. Davies, G3SXY, 72 North View, Bristol (33284), BS6-7PZ.
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 CORNISH: J. Farrar, G3UCQ, Elm Cottage, Ventonleague Hayle.
 COVENTRY: C. Jaynes, 20 Belgrave Road, Wyken, Coventry.
 CRAY VALLEY: D. Buckley, G3VLX, 234 Halfway Street, Sidcup, Kent (01-850 6945).
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, S.E.23 (01-699 6940).
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 DERBY (Nunsfield House): N. Gregory, G3LCV, 21 Back Lane, Chellaston (3516), Derby.
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 GOVT. COMMS.: E. A. Fowles, G3PEO, c/o G.C.H.Q., Priors Road, Cheltenham, Glos.
 GREENFORD: F. C. Reid, G3VMD, 34 Carlton Avenue, Harlington, Middx. (01-848 0235).
 HARROW: R. Medcraft, G3JVM, 134 Dulverton Road, Ruislip Manor, Ruislip, Middx., HA4-9AG.
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 NORFOLK: G. Purcell, 29 Seton Road, Taverham, Norwich.
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 PENTLANDS: G. Burt, GM3OXX, 1/5 Essendean Terrace, Clermiston, Edinburgh.
 PETERBOROUGH: D. Byrne, G3KPO, Jersey House, Eye (351), Peterborough.
 PUDSEY: K. Wells, G3WIX, 25 Ashwell Road, Heaton, Bradford, 9.
 R.A.I.B.C.: Mrs. F. Woolley, G3LWY, 331 Wigan Lane, Wigan, Lancs.
 RADIO SOCIETY OF EAST AFRICA: P.O. Box 5681, Nairobi, Kenya.
 READING: G. Addis, G3TEB, 13 Keats Close, Woodley, Reading.
 ROYAL NAVY: RS. A. Walker, H.M.S. Mercury, Leydene, Petersfield, Hants.
 ROYAL SIGNALS: WO1. J. Cooper, G3DPS, 15 Valley Road, Blandford Camp, Blandford Forum, Dorset.
 SALTASH: J. A. Ennis, G3XWA, 19 Coombe Road, Saltash, Cornwall, PL12-4ER.
 SHEFFORD: C. W. Stedman, G3XWS, 10 Wychwood Avenue, Luton, Beds.
 SILVERTHORN: R. J. Lock, 9 Forest Road, Woodford Green, Essex (01-505 2336).
 SKEGNESS: N. Hodgson, G2ABK, 53 Main Road, Hundleby, Spilsby, Lincs.
 SOUTHDOWN: L. E. Tagliaferro, 9 Tugwell Road, Hampden Park, Eastbourne (54244), Sussex.
 SPEN VALLEY: N. Pride, G8BSC, 100 Raikes Lane, Birstall, Nr. Leeds (Batley 3925).
 SURREY: R. Morrison, G3KGA, 33 Sefton Road, Croydon, CR0-7HS, Surrey (01-654 5982).
 THORNTON CLEVELEYS: F. Hill, G3YWH, 11 Goodwood Avenue, Blackpool, FY2-0TT.
 THANET: R. Trull, G3RAD, 1 Approach Road, Broadstairs, Kent.
 TORBAY: Mrs. G. L. Western, G3NQD, 110 Truro Avenue, Hele, Torquay.
 UNIVERSITY COLLEGE, SWANSEA: R. Wilcox, GW3TSH, Room 520, Neuadd Lewis Jones, University College, Singleton Park, Swansea, SA2-8PS.
 VERULAM: W. Dennis, G3NCK, 129 Colney Heath Lane, St. Albans, Herts.
 WIRRAL (DX Association): J. A. Share, G3OKA, Trelawney, 21 Curlender Close, Bidston, Birkenhead, L41-7BN.
 WOLVERHAMPTON: J. P. H. Burden, G3UBX, 28 Coalway Road, Wolverhampton, WV3-7LX.
 WORCESTER: R. L. Avery, G3TQD, 24 Alexander Avenue, Droitwich (3943), Worcs.
 WORTHING SCHOOLS: S. Watson, 43 Clive Avenue, Worthing, Sussex.
 YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset.

John Ambulance Hall, Thornton. Here G8JU takes the stage on April 1 to talk about Radar, while April 14 is given over to a Sale of Surplus Equipment.

The Yeovil chaps have held an AGM, and now are pressing on with the formulation of a new programme for the year. The lads get together at Yeovil Area Youth Centre, Park Lodge, The Park, Yeovil, Somerset.

It is always nice to hear of a Club doing well, particularly if it is old established. Derby is one of the oldest in the country, with a history traceable back to pre-Kaiser's War days, and in 1970 are still able to attract an attendance as high as 77 on an evening of bad weather. Room 4, 119 Green Lane, Derby, is the spot—on April 1 for a Surplus Sale; Contests Discussion on April 8; a D/F practice event on the 15th; followed by a slide lecture on the 22nd, by G3VLF on his recent trip to Canada. Finally, on the 29th, the hon. secretary, G2CVV, himself steps into the picture, with a lecture-demonstration about TVI.

Also in the Derby area is the Nunsfield House group, named so because they are the Amateur Radio Section of the Community Association of that name. Nunsfield House is in Boulton Lane, Alvaston, and here the chaps foregather in Room 7—April 3 for a Surplus Sale; on the 10th for an evening on the air; April 17 for listening to a talk on SSB for Beginners; and finally by a whole session sorting out details for their first Mobile Rally at Elvaston Castle. In addition, the weather being kind, April 5 will be taken up with a practice D/F Hunt.

Back in London, Edgware are "open for business" each month on the second and fourth Monday in the month in St. Georges Hall, 51 Flower Lane, Mill Hill. April 13 is down for a lecture to be given by someone from G.E.C., and in May S. W. Amos will be coming along to talk about transistors.

* * *

Some of the Club reports are always reckoned to be good for a chuckle, and this time the letter from Maidstone YMCA provides one of the best. Discussing the facilities available, the chairman goes on to say that in addition to all the usual ones, they also have Judo and Karate "for those afflicted with severe TVI!" Meetings on Tuesday and Friday evenings, two separate stations, one for HF and t'other for the VHF side and an R.A.E. class with no less than five chaps on the *instructing* roster—no wonder this is a thriving concern. Hq. is at the Maidstone YMCA Sports Centre.

Coventry are these days at the City of Coventry Scout Hq., 121 St. Nicholas Street, Radford Road, meeting weekly on Fridays. The 3rd and 17th are down as nights-on-the-air for most, while the rest will be doing Morse or R.A.E. April 10 will be a good one—Mr. Miles of British Astronomical Association, on Apollo Space Probes. April 24 is a tape lecture—the one on the ARRL Hq., in fact.

Of the two meetings in April at Dorking, one is devoted to fitting-out in the Club shack, and the other to a lecture by G3LBA on his home-brew IC Frequency Counter. The dates are April 4 and 28, at the Wheatshaf.

A bit out of the direct line of Amateur Radio for Maidenhead this time when R. Gilks talks about Audio Effects—in the context of "pop" recording! This one is April 6, and then on April 21 there is an informal

get-together. All Maidenhead meetings are at the Victory Hall, Cox Green, Maidenhead, with tea and light refreshments provided. Details, if more are wanted, from G3FVC—see Panel—who has been secretary since the club was formed.

Lothians have a lecture in their series on R.A.E. organised for April 23, at the YMCA in St. Andrew's Street, and are hoping for a goodly turnout of new members to take advantage of this—as GM8BPL says, they can only help those who will help themselves to the point of putting in an appearance; fair enough! Earlier in the month, on April 9, the lads have an outing, when they go to see the Police Wireless Station.

Another group in Edinburgh is Pentlands, who say that their Hq. is at the Iona Hotel, Strathern Road, with a start time of 7 p.m. However, the date has had to be left open for the moment, which means contacting GM3OXX (see Panel) for the final details.

Tuesdays in the York area is the evening for the Fulford lads to assemble in the Scout Hq. at 31 George Street, York. Incidentally, this group have a separate SWL section with a long-time SWL member available to produce some real know-how.

G3KGM is the speaker at Civil Service on April 21. This meeting is at the Civil Service Sprots Centre, Monck Street, Westminster, starting at 6.30. Facilities are there for a feed before heading for the clubroom, listening to G3KGM talking Aerials, and finally to the bar for a drink after the talk and before setting off for home.

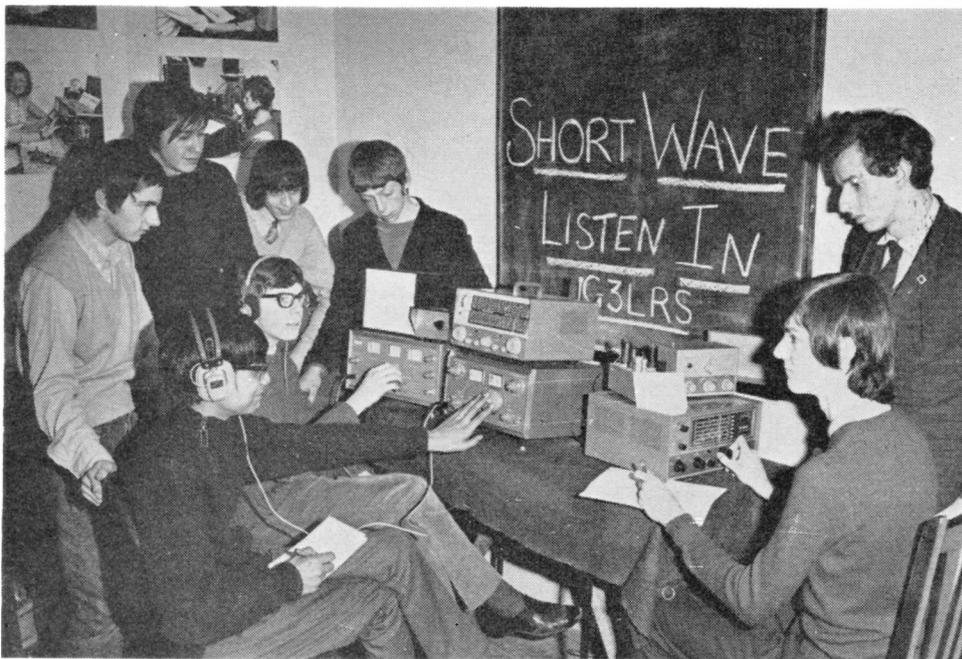
Unfortunately we have not got the latest information on the Torbay situation, as the letter is much more concerned—and rightly—with the illness of G3LKJ, who has served the Club well for so long, and is at the time of writing in a Bristol hospital. However, no doubt G3NQD would be pleased to pass on the details—see Panel.

The report from Wolverhampton covers a period rather earlier than the one we are now considering, as it arrived just too late to catch the deadline for the previous month; however, we can say that there seems to be a pattern of Monday evening meetings at Hq., Neachells Cottage, Stockwell Road, Tettenhall Road, plus the odd "outside" event as well. April 6 will be an interesting one, as the talk will be about the "Talking Book" service for the Blind.

North Kent's lectures for the month are on April 9, when the subject is Electronic Engine Tuning (*what?*), and April 23—Communications in the Port of London, by G3BPT. The *Newsletter* contains an article by Maureen, G3XVC, which makes it quite clear what *she* thinks of these guys who peddle the "other bloke uses too much power" argument as a reason for their own lack of a good signal.

It is quite surprising that a club should pick April 1st for a Junk Sale; or is it just someone with a sense of humour? Pudsey have chosen this date, plus April 8 and 29th for R.A.E. instruction; April 15, a trip out to Tetleys Brewery; and on April 22 a discussion on activity in connection with Field Day.

Wirral DX Association have changed their dates to the last Thursday in each month. The April affair, *chez* G3YSM, will be preparation for the DX-pedition to Hilbre Island (*where?*) which they have mounted for June. Incidentally, as meetings are in each other's homes,



Different sort of "sit-in"—the SWL members of Leicester Radio Society had the idea of raising money for the Club equipment fund by organising a "sponsored short-wave listen-in," to last twelve hours on the trot. The result of this worthy and creditable effort was £20 into the kitty—nice work! The Leicester Club's own callsign is G3LRS.

the secretary should be contacted—see Panel—before attending.

At Chippenham there is a D/F practice hunt down for April 14, but on the 28th there is a much more important matter, namely the AGM. Details from the hon. secretary.

No activities in April at University College Swansea, as they will be on vacation; and after that nothing till the June examinations are done with. But on June 21, all are welcome when the chaps let their hair down and relax at the Mobile Rally, which they will be running in Singleton Park. Further details, nearer the date.

April in Cornwall means the Annual General Meeting, which is to be taken at the SWEB Clubroom, Pool, Camborne, on April 2. In addition to this, there are separate groups in Newquay and Falmouth as part of the main Club organisation. For details on any of them, contact G3UCQ at the address on p.111.

At the time of writing, Farnborough were in the throes of working out a programme, so for details we have to refer you to the secretary, G8BVM. There is also a hint of possible change in connection with the venue, so if you want to get in touch with the chaps you will have to check with him anyway—see Panel.

BATC next; the real news here is that the 1970 Convention is set for July 24-26, at Churchill College, Cambridge. This is the big event of the year for the Amateur Television fraternity, and will include, as the part open to members only, the AGM. Details from, and reservations to, the hon. secretary as soon as possible.

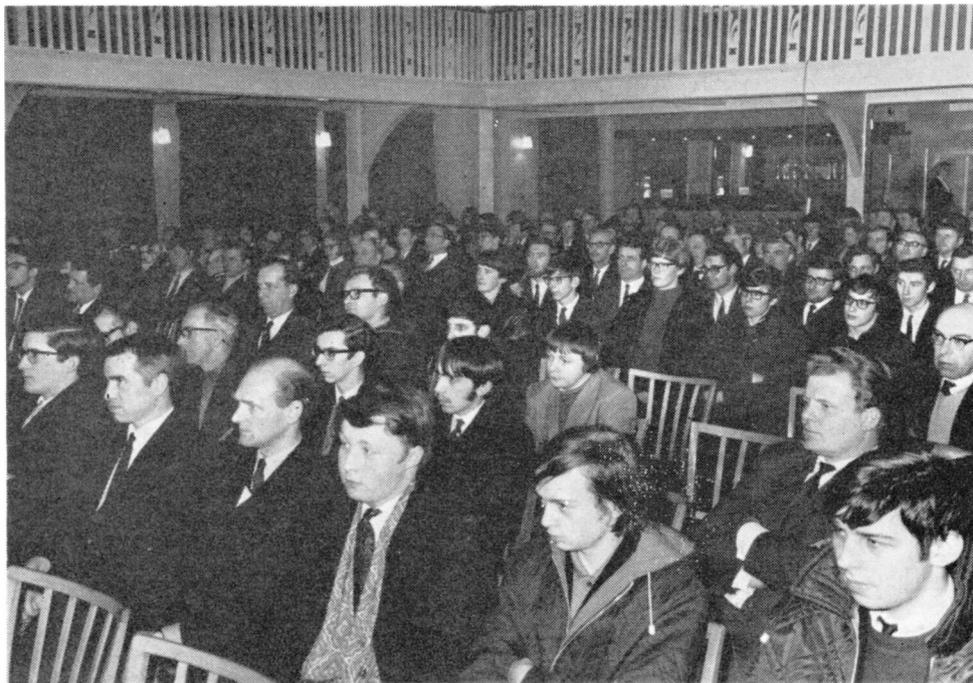
The Bristol chaps have a clubroom at 43 Ducie Road, Barton Hill, Bristol 5, and run a programme which nicely mixes the social side with the more technical stuff. For the details of the April programme, contact G3SXY—see Panel. As he is also connected with Shirehampton you can ask him for their details at the same time!

British Railways is part of a large and international group, covering railwaymen of many countries. The hon. secretary will be glad to give details.

At Nottingham, they are closed for Easter, which puts paid to April 2, but on the 9th there is a Film Show, starting at 8.15, with break for refreshments. April 16 brings the AGM, starting 7.45 prompt, while on the 23rd the committee are in conclave—albeit the rest of the chaps will have an Open Night. As for April 30, G2CVV is coming along to lecture on TVI, so the clubroom will be opened at 7.30 to let the matters have a stint before he starts. Hq. is at Woodthorpe House, Mansfield Road, Nottingham.

A new one next; Worthing Schools Radio Society, who have a Friday session during term-time, starting at 1630 clock in Room 17 at the High School for Boys, Bolsover Road. Dates for April are the 17th, for a Ragchew and Morse class, and April 24, when the tape lecture "World at their Fingertips" will be shown. Let us hope their efforts are crowned with success, and that they can both attract and hold members.

Government Communications A.R.C. have an Open Night, on Friday, April 24, at 8.0 p.m., in their Canteen, Benhall, Gloucester Road, to which all are invited. This



The attentive audience at a recent meeting of the Leeds Radio Society, when the lecturer was Mr. Ian Nicholson of Mullard, Ltd., his subject being "Introducing Integrated Circuits." His talk was preceded by a film going into the detail of integrated-circuit development, design and construction. Altogether, this was a very well prepared and most interesting lecture, closely followed by a large audience, which included trade guests of the Leeds Radio Society.

usually means a display of all sorts of things—new equipment, gadgets, aerials and ideas—and a pleasant natter. For details, and directions, please get in touch with G3PEO, as on p.111.

Midland next: It is unusual to have a separate report from them (though we welcome it) as the information is all in the *Newsletter*. However, they have the big Mobile Rally at Drayton Manor Park, near Tamworth, down for April 19, and in addition the regular session on April 14 will have a star attraction in G5PP talking about Linear Amplifiers.

Verulam have managed to miss the current deadline with their news, so although we know what is on in May and March, we haven't any information on April, which means a contact with the hon. secretary—see Panel. However, at least we can mention the Hq., which is in the Council Chamber, The Town Hall, St. Albans.

Shefford have every Thursday at the Church Hall in Amphill Road; this means April 2 for an R.A.E. refresher conducted by G3VMI; April 9, Portable Power Supplies by G3ROL; and a Junk Sale on the 16th. April 23 is a "Transistor Perambulation" by G3XTQ, and at the end of the month, on the 30th, they will be sitting down and planning for VHF field day activities.

For a trial period, the East Worcs. hon. sec. says, the chaps are going to experiment with a second meeting every month—which means the second and fourth Thursday. For details, contact G3EVT at the address

in the Panel.

If you are a Reading man, your meeting dates are set for the alternate Tuesdays, which gives April 14 and 28, at the "Victory" in Meadway Precinct, Reading.

At Harrow, they have every Friday with the exception of April 3—and already they are planning the projects for the coming Winter; an FET voltmeter, an FET grid-dipper, and an SWR Bridge. G3HBW and G3RZK are spearheading things, and procurement is already under way, as our W friends would have it.

Conclusion—and Deadlines

Seven late, and therefore unusable, Club reports this time—but, allowing for the five overdue from last month, more than 60 did reach us by the due date. If so many can meet the deadline, why cannot the other half-dozen or so? We are not being perverse about this—it is as much a disappointment to us as it must be to them if their reports cannot be included—but the point is that the deadline given is always for a Friday. This is so that the feature can be written up over the ensuing weekend. Therefore, if reports come trickling in on the Monday or Tuesday following, they are too late, as by then the copy has to be ready for the printers.

Deadline for the next issue is April 3. For June it will be May 8, and for July it is June 5. The address is simply: "Club Secretary," SHORT WAVE MAGAZINE, BUCKINGHAM. Don't be late!

GETTING THROUGH THE R.A.E.

GUIDANCE ON HOW TO TACKLE THE EXAMINATION

Candidates for the Radio Amateurs' Examination in May—and there could be as many as two thousand in for it this time—should by now have put in their applications to sit. In the February issue we dealt in some detail with the actual question paper for last year's Examination, which was passed successfully by more than 1,000 candidates. Here we consider examination technique—one's approach to the Exam. and how to set about dealing with the paper methodically and in a logical fashion. Even if a candidate feels he really does know it all, it is no use going in for this or any other Exam. in a cocksure or slap-happy fashion. We hope that the discussion following will enable all candidates to enter the examination room with a feeling of quiet confidence and restrained optimism—for that is the mood in which to pass.—Editor.

There are two facets of the problem of getting a pass in the Radio Amateurs' Examination, only one of which is effectively dealt with by "mugging up" all the required information. The other is equally important; and, what is more important, probably accounts for by far the majority of the failures. This latter can be summed up as "Examination Technique."

It is hardly possible for the writer to prepare R.A.E. students in the technical sense, through the columns of SHORT WAVE MAGAZINE but some brief notes can be given on exam. technique, which in itself breaks down into at least two areas of interest. First comes the preparation for the day itself. Weeks before, this will have started off with the entry application and it will have resulted, somewhere along the line, in a piece of paper which permits the bearer to enter the examination-room—and it needs hardly be commented that this bit of paper *must* be kept until that day, if you are going to get in!

During the weeks before the examination, revision of the syllabus will be going on whenever the student can spare the time, stress being laid on the weak areas, but those in which one feels safe must by no means be neglected. Many candidates will *not* be in the happy position of using a pen to write essays as part of their living, and these people should regard exercise in working questions as an *essential* part of the preparation; it cannot be stressed too highly that candidates *must* practice beforehand the answering of questions as much as possible. Obtain a copy of the *Radio Amateur Examination Manual*, which contains many questions from old papers—or look carefully through that article on the R.A.E. in the February issue of the *Magazine*. If you are studying alone, away from a formal course, spring a copy of G3OGR's book *Amateur Radio*, which covers the syllabus with nothing over to confuse the mind in acquiring just the right information. What is to be done

is to select a question at random, take a sheet of paper and see what can be done to answer it in twenty minutes—no more and no less.

Practising Questions

Working of questions in twenty minutes is a ploy that pays off—after all, twenty minutes is just what you have in the actual exam—but the problem is marking it. Easy—leave it till tomorrow, and then pick up your reference books and with their aid mark your answer. At the same time look at it critically and see if you could re-word it to compress "more answer" into the same number of words, or make clearer just exactly what you are trying to say. Look at it as critically as you can, to make sure every word carries weight, and that you don't contradict yourself anywhere. Practice this time and time again, because it is not just a good way of making sure you can write good English but it also has the power to make what you read stick in your mind.

As for the reading, this can be done at all sorts of odd times. In the bath, on the train to work, in the lunch-hour, during tea-breaks at work, in bed before putting the light out; every minute of time spent reading is valuable in fixing ideas in your brain.

Take It Easy

For most people, swotting-up the night before or even while waiting for the exam-room doors to open is a dead loss. Far better spend the last 48 hours getting as much rest and relaxation as you can, so that you arrive fresh and confident. Make sure you have everything you are likely to want. A check-list could include a watch, pen, rubber and pencil, a spare pen or a bottle of ink, drawing instruments, slide-rule if you are at home with one, decent ruler—the junior op's one is probably useless!—pencil sharpener, glasses if you use them, and of course your entry permit or receipt.

However, do not get so relaxed that you do not make a start in plenty of time for an early arrival at the centre in which the examination is to be taken. You must assume a time-scale which will give you time to be in the room and comfortably seated, ready to go, ten minutes before the off, even though there will be a great mob of students milling around the front door looking for the right place for *their* exams, and one caretaker to answer all the queries. By getting there a bit early you will avoid the worst of the jam. Once in the room and organised, you can sit down and look at the "answer book" provided, and make sure the front page is filled in clearly and correctly—if the examiners can't read it, they can't post you the result!

Now, here comes the invigilator, handing out the question papers. From now on, silence is the order until the papers are collected up at the end of the session. When you have the questions, read them right through, starting from the instructions. Make sure you have read all the questions on the paper—at least one "gift" question has been passed up by the writer who thought it was the caption to a diagram!

Choosing Questions

Now, recheck; you probably will have to answer *both* the questions in Part I, and a proportion of those in Part II. You have to do what is asked for, no more and

no less; there are several reasons for this comment, and perhaps it would be a good idea to look at some of them. In the first place, let us assume you are a bit of a boffin on, say, Aerials. It is no good you spending all the three hours writing a brilliant essay on the subject in answer to the simple "Draw a dipole for 14 mHz with approximate dimensions, and indicate a possible method of feeding it with power." Even if your essay is perfect, you cannot gain more than about one-eighth of the possible marks, and half at least is the figure which will result in a pass. So you have made your own failure certain! On the other hand, there is the chap who thinks that if he answers *more* questions than are called for he will gain more marks. No such luck; this fiddle is dealt with usually by marking from the beginning through until the correct number is reached and then just stopping dead, without even reading the surplus. However, if you have accidentally done one "over the odds" and wish to make sure you get the ones you think are best, marked, then cross out the unwanted answer.

However, the vast majority will make neither of these mistakes, but will be spending the first ten minutes reading through the questions and the instructions, and marking on the question paper which ones they are going to tackle.

As they can be taken in any order, the obvious thing to do is to have a go at the one you think is the easiest for you; do it against the timing of your watch and don't let it run away with more than its allotted time—something that happens all too easily at the beginning of the exams when one is working on the parts of the paper one feels most knowledgeable about.

Getting that first question out of the way, and on time, and without too much of a struggle, gives an enormous boost to morale, and you then press on, at twenty minutes per question maximum until you have done the correct number from each part. You will then have ten minutes left in which to read through your script, putting in the odd comma or altering the odd word here and there before putting it in. *Fine!*

Tackling Difficulties

But what about poor Joe over there, looking all hot and bothered? Joe has hit a bit of a snag with his first question and is already on the point of going over the time allowance. What can he do?

One of two things will have happened. Either Joe has genuinely hit a snag, or, more likely, has been thrown into a state of panic by a simple arithmetical error and his mind has now gone blank. Joe is on the point of sinking without trace. What is needed now is some good old stage professionalism—the Show Must Go On! Just recall that if you answer the right number of questions there are bound to be some you have done quite well and some you have made a mess of; but even the ones you have flunked can hardly fail to yield *some* marks. If you answer the right number of questions you have exposed yourself to the maximum chance of getting marks, and in the end it is the *total* of marks that counts, not the number you picked up off a particular question. So, work against the clock, or your watch, and make sure that at the end of the allowable time on each question you press on to the next. In the last

resort, by adopting this ploy, you may well end up with a bit of time to spare; if this is the case you can always go back and have another stab at the one that "threw" you. If the examiner beats you on points, fair enough, and you can come back for a return bout; but to be knocked out in the first round is unthinkable.

When it is all over, hand your paper in, and quietly pick up all your bits and pieces, plus the question-paper which will have been marked up to show which ones you tackled. When you get home you can then hold a personal inquest on your efforts, by comparison with your learning texts, and get some idea of where you made your mistakes; then all you have to do is to wait for the results!

Some Other Tips

In conclusion, a few minor points of interest. This is not an essay-writing competition, so you are not expected to turn in a gem of English prose. However, what *is* required is a reasoned and sensible answer; and if you realise that your paper may be the bottom of a batch of several hundred that somebody has to mark in a limited time it will be easily understood that if your handwriting is all but indecipherable he may well feel like "giving it the works" with the blue pencil—and who can blame him? A neat and tidy script is essential. Crossings-out should be by means of a single line or a large cross which leaves the material under the crossing-out still readable—there may be a mark or two in the wrong bit! Make sure you answer the question that is asked; a perfect circuit for a Top Band CW transmitter is *not* the correct answer to a requirement to draw the circuit of a 14 mHz AM rig! As for the actual drawing of the circuits, there is no time for perfect sketching, but it can be made clean and tidy; first put in the upper rail—usually HT plus—and the bottom, mark in the locations of the valves and/or transistors, centred on a line parallel to the rails already drawn in, and then go on to the minor components. This should make sure that your circuit does not run out of paper! To indicate wires crossing in a circuit there are two possible conventions. One makes a black dot at all connections, with unconnected wires just crossing. The other makes little loops where the crossing occurs (as in the *Magazine* drawing convention). The latter is to be preferred in the examination, if only for the fact that by its use one is unlikely to lose a mark by accidentally forgetting to put a black blob on a junction somewhere.

Make sure you indicate your formulae when answering a mathematical question; and when you have worked your way through to the answer remember that it is expressed in some unit or other!—and write the correct unit down alongside the answer. If you use an approximation to make the sum easier, mention your approximation in the answer—"Let $\pi^2 = 10$ ", for example.

CITY & GUILDS PAPERS

We are informed that the cost of the R.A.E. Question Papers and Syllabus for Subject No. 55, obtainable from the C. & G. Sales Dept.—see note p.773, February—is now 3s., and not as there stated. The address is: Sales Section, City & Guilds of London Institute, 76 Portland Place, London, W1N-4AA.



THE OTHER MAN'S STATION

G2CVO

G2CVO is the station owned and operated by Frank Osborn, 13 Mount Echo Drive, Chingford, London, E.4. The station today is a far cry from the 1920's when radio interest was satisfied with pieces of World War I surplus and a slider-tuned crystal set for 2MT, Writtle, and then 2LO, London.

The halcyon years of radio construction from one valve shortwave sets and bedspring aerials receiving KDKA Pittsburgh, W2XAD Schenectady, VK2ME Sydney and many other exciting transmissions, culminated in an Artificial Aerial licence prior to World War II and a full call immediately after. The copy of SHORT WAVE MAGAZINE on the desk is dated January 1939, G2CVO having taken every issue since No. 1, and in his opinion a periodical which radio enthusiasts had long awaited and has subsequently never been equalled.

Nowadays, the Trio JR-500S and K.W. Vespa Mk. II

with a G5RV antenna look after SSB/AM on the 10-80m. bands. Above this a Labgear 160 Twin feeds the G5RV strapped, with a 90ft. counterpoise, for Top Band. Adjacent is a Heathkit Two-er, an Eddystone EC-10 with JXK converter, and a 20-watt 2-metre Tx which is out of the picture. A J-Beam Omni-Vee gives good results. AM is the mode used on 160 and two metres, being preferred by G2CVO who considers SSB totally unnecessary on these bands. An enthusiastic mobileer, G2CVO/M and his all-transistor CSE Tx/Rx has made many contacts and personal QSO's. Retired for the past two years, G2CVO spends most of the summer months with this equipment on Mersea Island, where he has a caravan by the sea. And many a mobile holidaymaker has been talked in for a cup of tea and a ragchew. G2CVO enjoys to the full that which is missed by many, the social side of radio.

NORTHERN SOCIETIES ANNUAL CONVENTION—Belle Vue, Manchester, April 26

On Sunday, April 26, the Northern Radio Societies Association will again be holding their annual convention and trade show at Belle Vue, Manchester. The Association takes in ten Radio Clubs covering a wide area in the North-West and its objectives for this convention are to mirror and demonstrate all aspects of Amateur Radio, while providing also facilities for an interesting exhibition—amateur, professional and commercial.

In previous years, both public attendance (about

4,000 people in 1969) and trade support have been very good, so that for this year larger accommodation has been taken. Belle Vue has adequate catering and bar arrangements, there is ample under-cover accommodation and plenty of parking space, and there are various family attractions.

For details, trade-stand bookings and information generally write: R. M. Clarke, G8AYD, Exhibition Manager, Hillside, Quickedge Road, Mossley, Ashton-under-Lyne, Lancs.

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.

- EI9CA**, C. O'Reilly, 23 Idrone Terrace, Blackrock, Co. Dublin.
- G3YVH**, A. C. Boyne, 18 Winwick View, Collins Green, Warrington, Lancs.
- G3YXV**, A. F. Loader, 24 Stroud Park Road, Peverell, Plymouth, Devon.
- G3YYM**, G. H. Oxley, 13 Beech Drive, Ellesmere, Shropshire.
- G3ZBF**, M. J. Matthews (*ex-G8DFH*) 54 Kennedy House, Ramsgate, Kent.
- G3ZBM**, D. Worthington, 2 Hardy Close, Wistaston, Crewe, Cheshire.
- GM3ZBR**, K. J. Melvin, 43 Coxton Place, Garthamlock, Glasgow, E.3. (Tel. 041-774 3539.)
- GM3ZBS**, J. S. McCall, 45 Coxton Place, Garthamlock, Glasgow, E.3.
- G3ZBW**, J. M. Ruscoe (*ex-G8CMH*), 14 Highlands Road, Bamford, Rochdale, Lancs.
- G3ZCB**, R. B. Hall, 14 Wakeman Road, Ripon, Yorkshire.
- G13ZCK**, G. A. Ward, 102 Orange-field Avenue, Bloomfield, Belfast, BT5 6DH. (Tel. Belfast 650605.)
- G3ZCL**, G. E. Hammersley, 10 Avon Close, Addlestone, Weybridge, Surrey.
- G3ZCP**, G. H. Scott, 3 Partridge Drive, Parkstone, Poole, Dorset, BH14 8HJ. (Tel. Canford Cliffs 77997.)
- G3ZCS**, M. W. R. Fabb, 280 Horns Road, Barkingside, Ilford, Essex.
- G3ZCW**, H. J. J. Berridge, Physics Dept., Worth School, Turners Hill, Crawley, Sussex.
- G3ZDD**, D. I. Dewey, Ivordere, Catteshall Lane, Godalming, Surrey.
- GM3ZDH**, R. A. Dixon, 20 Summerfield Cottages, Glasgow, W.4.
- G3ZDJ**, R. G. Judge, 82 Vancouver Road, Edgware, Middlesex, HA8 5DF.
- G3ZDP**, F. Lee (*ex-G8CWA*), 100 Mayswood Road, Solihull, Warks. (Tel. 021-743 8578.)
- G3ZDW**, R. Hyde, 37 Oxford Square, R.A.F. Locking, Weston-super-Mare, Somerset.
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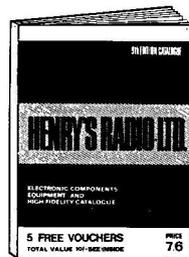
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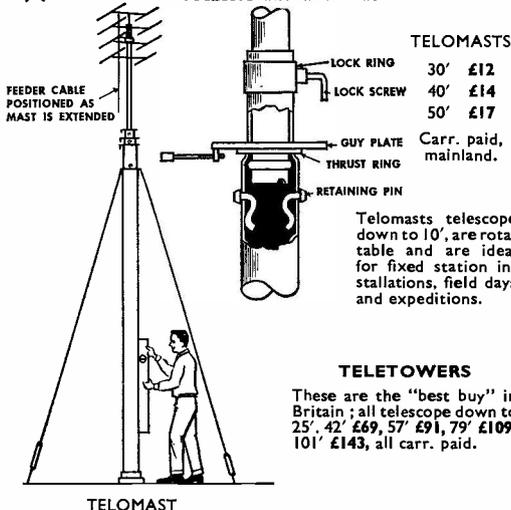
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FOR SALE: National HRO-M receiver, professionally rebuilt, aligned and sprayed; coil packs, in steel box, for 10-20-40-80m bandspread, also 2/160m. range and 100-200 kHz, with PSU. Price £25 or near offer.—Randall-Cook, Balloon Cottage, Winchcombe, (421), Glos.

FOR SALE: R.C.A. AR88D, in good working order, with headphones, speaker and manual, price £30, buyer to collect.—Rew, 82 Seymour Road, Luton, Beds.

SELLING: Superb Naval UHF Rx, with tuning meter and PSU, £50. American VHF Rx tuning 80 to 160 MHz, £10—or with PSU/Speaker, £15. VHF Rx, 170 to 250 MHz, with PSU/Speaker, £15. Marconi valve voltmeter, £10. VHF converter, 60s. Manuals: VHF Crystal Calibrator Type 18, 20s. Rebecca Type TS-31, 40s.; VHF Crystal Calibrator Type 120, 30s. Circuits: BC-1000 (R.31), 5s.; Rebecca Tester Type 102, 20s. All carriage and postage extra; s.a.e. with enquiries. — Hayward, Sunnyfields, Lighthouse Road, St. Margaret's Bay, Nr. Dover, Kent.

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BARGAIN! National Transceiver NCX-3, AM/SSB, with auto-transformer, p-t-t microphone, PSU and speaker (cost £200) selling at £95.—Brand, G2ANB, 78 Broadwalk, Hockley (3278), Essex.

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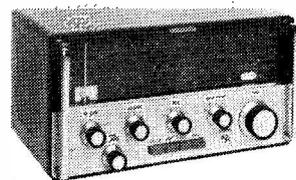
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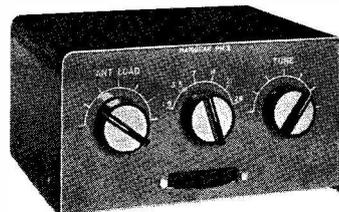
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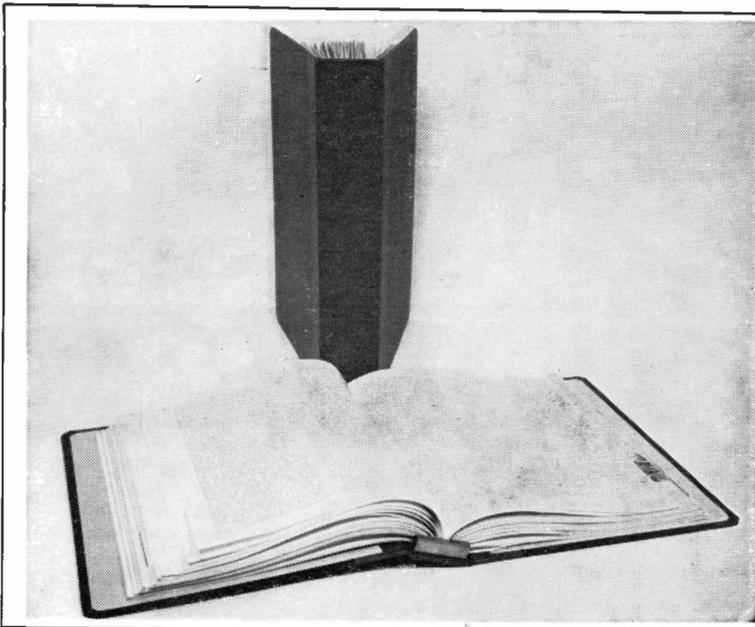
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