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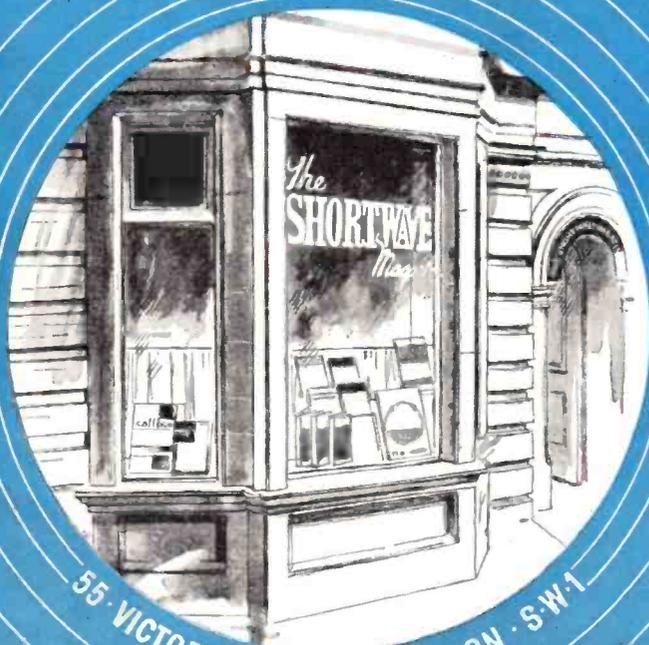
# *The* SHORT WAVE *Magazine*

VOL. XXXI

AUGUST, 1973

NUMBER 6

for  
the  
radio  
amateur  
and  
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#### LINER 2 NEWS

May we respectfully point out that we are the Sole Agents in this country, our price is £120 plus V.A.T., and our Liner 2's are on the popular (145.25 to 145.48) segment of 2m. If anyone wishes to be a lone voice crying in the wilderness, we can supply the necessary crystal and dial for 144.10 to 144.33. The price of £4 includes realignment and unless you have a good spectrum analyser, please don't attempt realignment—don't even think about it!

By the time you read this we should have matching A.C. power supplies in stock at £15 including V.A.T.

#### HINTS AND TIPS

We are often asked if we can recommend a pre-amp for 2m. use—a simple enough request on the face of it, but not so easy to answer in practice. Most equipment is a compromise between sensitivity and signal handling and you can't have one without degrading the other. In the case of Japanese 2m. equipment it is instructive to consider Japanese band conditions to form some idea of what the designer is trying to achieve. 2m. in Japan is packed solid, the use of amplifiers widespread and a high gain beam mandatory. The net result is that the problem of I.M., cross modulation etc. rears its ugly head and the designer is forced to make signal handling his first consideration rather than absolute sensitivity. Hence the adoption of a double tuned input coil on the Liner 2 and the beautifully designed band pass filter on the FT2FB. In this country, on the other hand, signal handling has not been much of a problem due to the comparative sparseness of hefty signals, but I would like to suggest that with increased activity on 2m., this is an aspect of design which must receive more and more consideration.

However, if you are relatively free of strong local signals, by all means try a pre-amp—it could well make the difference between hearing someone and working him, but you must accept that you cannot have your cake and eat it—you may bump up the weak signal only to find that you still can't work him because of I.M. products or cross modulation. However, human nature being what it is, the average chap will convince himself that his modified front end makes a vast improvement all round. Who are we to argue—if you want to shove in a pre-amp, go ahead, you can't do any damage, and if you yourself are happy with the result, then that is the main thing.

Experience has shown that many of the troubles which beset the 2m. man are due to ill-advised tweaking. May we suggest that if you suspect that your rig is not up to snuff—take it back to your Dealer and get him to actually measure the performance.

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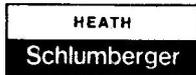
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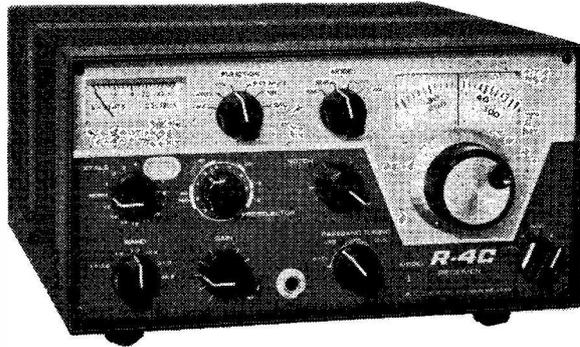
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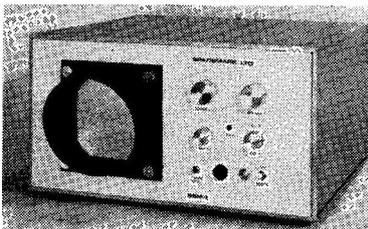
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Complete and ready-to-go for send-receive RTTY with TX, RX and teleprinter.

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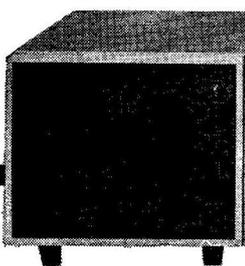


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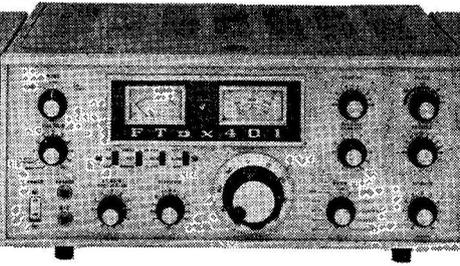
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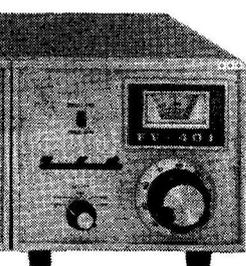
**YD-844**



**SP-401**



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Come and try it at Totton! We DO have a demonstration model. We have a demonstration unit in stock and a consignment arrives on June 13th at Southampton Docks and should be at Totton about 7-14 days later. However, we cannot guarantee that there will be any remaining unsold but at least we'll give you an honest delivery date.

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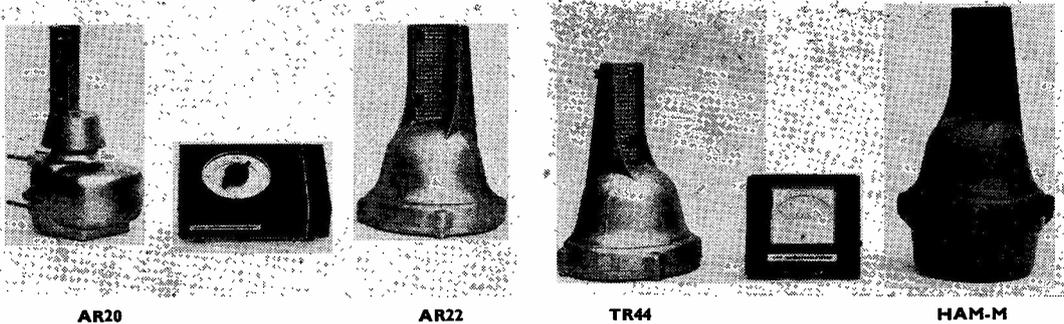
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Hallcrafters HT32B, 10-80m. Tx.	£80.00	Swan 500C	£160.00	Yaesu PR400SDX, As new	£195.00
Hammarlund HX50, 10-160m. Good	£79.00	Sommerkamp FL500, V. good	£105.00	Yaesu DC-200, Unused	£40.00
Heath SB303, New + CWF assembled.	£230.00	Sommerkamp FT500, O.K.	£130.00	Yaesu FV-400S VFO for FT series	£30.00
No V.A.T.		Sommerkamp FL200B, Good	£80.00	Yaesu FT-2AUTO fitted AM Rx. As new	£129.00
Heath HW101	£90.00	Sommerkamp FL200B, Good	£80.00	Yaesu FL50	£65.00

## ROBOT SLOW-SCAN TV

All you need to add to your SSB Transmitter/Receiver is the mode 70 Monitor £257 and model 80 camera £262 in order to send and receive SSTV signals from around the world. Please send s.a.e. for full details (VAT extra).

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- ★ Largest stock range in the U.K. ★ Money-saving packaged deals.

### ROTATORS CDE and HY-GAIN



**AR20**



**AR22**



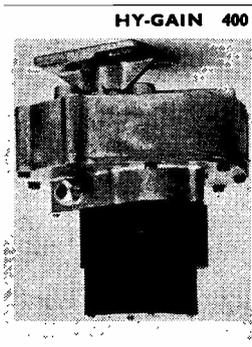
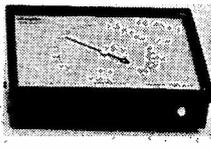
**TR44**



**HAM-M**



**HY-GAIN 400**

### ALL ROTATORS Ex-stock

#### 24/48 Hour Securicor delivery £1 + VAT

We stock the best range of rotators, CDE and HY-GAIN and spares. Our stocks are good so you'll get fast delivery plus the after-sales service which counts.

**AR20** This model replaces the old AR10 and is ideal for VHF beams, £20 (40p).

**AR22R** This model will turn HF antennas of TA33 Jnr. size and can be mounted on the top of masts up to 2 1/16" diameter or onto a flat plate. It can carry a deadweight of 150 lbs. Requires a 4-wire cable, £25 (65p).

**TR44** This model is also for HF beams as the AR22R but carries a 500 lbs. load and has better braking. The control unit requires a 7-wire cable, £45 (75p).

**HAM-M** The best of the CDE range. Carries 1,000 lbs. deadweight for large HF beams and employs a solenoid operated brake. Requires an 8-wire cable, £70 (80p).

**HY-GAIN 400.** It's a brute but takes masts up to 3" dia. and automatically rotates to the desired direction by setting the compass control knob pointer as required. Mounts to standard tower plate on Versatower, £115.00

Note—All above rotators are ex-stock and delivery is normally EX-STOCK. All orders are despatched the same day as received.

### BANTEX FIBREGLASS MOBILE ANTENNAS (Carr.50p) including base (Ex-Stock) + VAT

70/3, 70 MHz, 1/2 wave	£3.00	BGA, 144 MHz, 1/2 wave	£6.15	Magnetic mount	£6.15	Note. Deduct 50p from price of aerial if base is not required.
144/2, 144 MHz, 1/2 wave	£2.85	B5, 144 MHz, 1/2 wave	£4.35	All aeriels complete with base.		

### G WHIPS (Carr. 50p Coils, 20p) THE FINEST MOBILES (Ex-Stock) + VAT

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LF80 80m. coil	£4.00	160/80m. Duobander	£9.00	40m. coil	£4.00	Basemount for all coils	£1.45
Extendarod	£4.75	Flexiwhip 10m.	£8.60	Flexiwhip Coils	£4.25		

### GEM-QUAD. The best FIBREGLASS 10-15-20m. QUAD + VAT

2 ele.	£74.50	3 ele.	£109.80	4 ele.	£144.00	Conversion kits ex-stock.
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### J BEAM ANTENNAS. Most types (Ex-Stock)

### MOSLEY (Carr. pd.) (Ex-Stock) from us for fast delivery + VAT

Mustang, 10-20m. 3 ele.	£45.50	TA33 Jnr., 10-20m. 3 ele.	£36.50	TA32 Jnr. 'E' for 2" mast	£26.50	SWL Listeners dipole	£12.50
TA33 Jnr. 'E' for 2" mast	£37.00	TA32 Jnr. 1-20m. 2 ele.	£29.00	TA31 Jnr. Rotary dipole	£17.00		

# PUNCH A HOLE IN THE BAND! with WILSON QUALITY MONO & DUO-BAND BEAMS

## NEW REINFORCED WIDE SPACED 40, 20, 15 and 10 METRE BEAMS

All W7GVA beam elements are constructed of the finest aluminium available, 6063T832 and 6061-T6 both top quality alloys.

All Wilson Electronics beams have a 3" O.D. boom made of top grade aluminium 6063-T6.

All our beams come complete with adjustable reactance tuned gamma match network which can handle 4 KW plus on CW and SSB.

Prices include carriage (exclude V.A.T.). All models are ex-stock at the time of going to press and all 20 and 40m. models have re-inforcing kits for maximum strength.

### WILSON MONO BAND BEAMS

Model No.	Description	Gain	Price
M340	3 ELE. 40 METRE BEAM.	Gain 8.5 dB	£249
M240	2 ELE. 40 METRE BEAM.	Gain 5.5 dB	£129
M720	7 ELE. 20 METRE BEAM.	Gain 14 dB	£238
M620	6 ELE. 20 METRE BEAM.	Gain 13 dB	£184
M520	5 ELE. 20 METRE BEAM.	Gain 12 dB	£99
M320	3 ELE. 20 METRE BEAM.	Gain 8.5 dB	£54
M715	7 ELE. 15 METRE BEAM.	Gain 14 dB	£91
M615	6 ELE. 15 METRE BEAM.	Gain 13 dB	£76
N415	4 ELE. 15 METRE BEAM.	Gain 10 dB	£49
M810	8 ELE. 10 METRE BEAM.	Gain 14.5 dB	£90
M510	5 ELE. 10 METRE BEAM.	Gain 12 dB	£49

### WILSON DUO BAND BEAMS

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DB43	4 ELE. 20 and 3 ELE. 15 INTERLACED BEAM	Gain 10 dB—20 8.5 dB—15. Boom length 30ft.	£105
DB32	3 ELE. 20 and 2 ELE. 15 INTERLACED BEAM	Gain 8.5 dB—20 6 dB—15. Boom length 20ft.	£64
DB76	7 ELE. 15 and 6 ELE. 10 INTERLACED BEAM	Gain 14 dB—15 13 dB—10. Boom length 40ft.	£130
DB65	6 ELE. 15 and 5 ELE. 10 INTERLACED BEAM	Gain 13 dB—15 12 dB—10. Boom length 32ft.	£118
DB44	4 ELE. 15 and 3 ELE. 10 INTERLACED BEAM	Gain 10 dB—15 8.5 dB—10. Boom length 20ft.	£59
DB67	7 ELE. 20 and 6 ELE. 15 INTERLACED BEAM	Gain 14 dB—20. 13 dB—15.	£295

### HY-GAIN (Carr. pd.) + VAT. All ex-stock

Hy tower, 10-80m. (self-sup) £110.00	LC80Q, 80m. coil for 14 AVO	TH3 Jr., 10-20m. 3 ele. 600W.	203BA, 20m. 3 ele. beam
18V, 10-80m. vertical ... £12.85	TH6DXX, 10-20m. 6 ele. beam ... £97.00	Hy-Quad, 10-20m. 2 ele. ... £74.50	183BA, 15m. 3 ele. beam ... £36.50
12AVQ, 10-20m. vert. ... £16.50	TH3MK3, 10-20m. 3 ele. 2 kW ... £75.00	DB10-15 10-15m. 3 ele. ... £57.00	103BA, 10m. 3 ele. beam ... £28.50
14AVT, 10-40m. vert. ... £24.50		204BA, 20m. 4 ele. beam ... £80.00	LAI Lightning arrester ... £14.50
18AVT, 10-80m. vert. ... £35.50			LA2 Lightning arrester ... £2.50

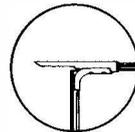
### ATTENTION H.F. MOBILE OPERATORS !

**Fed-up with having to disconnect resonators/whips before garaging?  
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Then here's the answer . . . the "HUSTLER."**

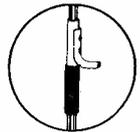
Hustler and only Hustler gives you 12 years of proven performance, mechanically and electrically superior to all others. You get exceptional reports on every band, lowest SWR and broadest bandwidth. Matching devices are not required. Use any convenient length of 52 OHM feed line. Convenience of fold-over mast for rapid band change or easy garaging, optimized performance on each band and a time proven concept in mobile communications, a concept verified by the overwhelming majority of amateurs, are yours only with the Hustler !

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Rotates 360° in horizontal plane



The original hinge and sleeve clutch mechanism.



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BMI Bumper mount ... £5.00	RM10 ... £4.97	RM20 ... £6.12	RM75 Carr. 50p ... £8.12
MO2 Mast ... £8.35	RM15 ... £6.12	RM40 ... £8.12	

### W.E. QUAD. 10-20m. "boomless" type. Cast aluminium centre, bamboos, etc. £27 (Carr. pd.) add VAT

W.E. Trapped dipoles for 10-80m. All are fitted with resin encapsulated traps and a high quality commercial grade centre assembly with cable strain relief.

Type S.500 watts, £14. Type HP for 1 kw p.e.p., £15.25. Type P with a special copper/terylene braid element for ease of coiling up. Supplied with winding spools and 70' co-ax, £17.50.

### WIGHTRAPS. Carr. 20p. VAT extra

Standard 500w. p.e.p. ... £2.60	High Power 1 kW p.e.p. ... £3.75	160/8,,Traps ... £3.75
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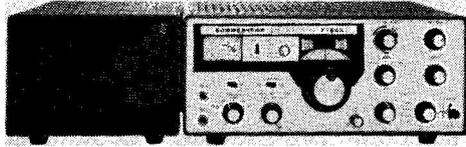
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**SOMMERKAMP FT-250**

Without doubt the SOMMERKAMP FT-250 is the best buy on the U.K. market at the present time and at £190 plus VAT it represents phenomenal value when compared with the current range of amateur equipment available. To anyone seriously thinking of re-equipping or to the man who has just got his licence this is a rig which will give you every desirable feature including a first-class receiver section and a very respectable 240 W. PEP input.

Sad to say, for reasons which are perhaps largely political, the Pound Sterling is once again under pressure and unless the situation corrects itself we could see another increase in the price of imported equipment, so the moral is if you are seriously considering a new rig don't procrastinate!

An S.A.E. will bring you the latest SOMMERKAMP brochure showing the whole range of ex stock items which includes the FT-250 along with all the other excellent SOMMERKAMP equipments together with the fabulous new SOMMERKAMP FT-501E Digital Read-out Transceiver.

This month we have another entirely new selection of used equipment but as our stock changes literally daily an S.A.E. will bring you the latest stocklist. On this point however may we be permitted a small cry from the heart. When you are in process of sending your stamped addressed envelope to Amateur Electronics, please remember that thirty or forty people up and down the country are contemplating doing the same thing and for some reason which escapes us 95% of the total send us an envelope which is possibly the smallest one manufactured and how we are expected to include lists, catalogues and illustrations etc., etc. is beyond our comprehension. PLEASE Gentlemen, send us a reasonably sized envelope with your enquiries or if you don't have one just include stamps and whilst we are on this subject we shall shortly reach a point, we regret to say, when enquiries which do not include S.A.E. or stamps will not be replied to. We are very sorry about this but our postbag is pretty enormous and the costs of dealing with this problem are becoming inordinate.

NOW AVAILABLE FROM STOCK — THE FABULOUS LINER 2 (145.25 — 145.48 MHz)

PLEASE NOTE ALL PRICES SHOWN BELOW INCLUDE CARRIAGE BUT NOT VAT.

- NATIONAL NCX-5 Mk. II TRANSCEIVER. Superb ... £150.00
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- EDDYSTONE EA12 RECEIVER. Extremely good condition ... £145.00
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- EDDYSTONE 840C RECEIVER. Exceptional condition ... £51.00
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- TRIO 9R59DS RECEIVER. A few weeks old with full guarantee ... £43.00
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- YAESU MUSEN FR50B RECEIVER. Mint with full guarantee ... £60.00
- CODAR AT5 Mk. II TRANSMITTER. With AC PSU ... £25.50

Please don't forget to add 10% VAT on all prices shown.

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- Amphenol PL259 Connectors ... ea. 30p
- Belling Coaxial Connectors ... ea. 10p
- 50 ohm Heavy Duty Coax ... 22p (Carriage extra)
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- G-Whip Antennas all ex stock. Catalogue by return.
- Shure Microphones Model 201 Hand ... £5.75
- Model 444 Desk ... £13.25
- Mosley Antennas TA31 Jnr. ... £15.50
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- Hy-Gain Antennas 12-AVQ Vertical ... £16.50
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We much regret that owing to pressure of other commitments Jeff Harris, G3LWM, is unable to continue representing us as our Southern Agent. However, John Rowley, G3KAE, Castle Rise, West Ayton, Scarborough, Tel.: West Ayton 3039 will be pleased to deal with all local enquiries and as John works for us on a full time basis you may be assured of prompt service.

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### THE SENTINEL 2 METRE OR 4 METRE OR SATELLITE BAND DUAL GATE MOSFET CONVERTER

These have been slowly modified over the years, as new techniques have become available. All the most popular IF's, 28-30 MHz, 27-29.7 MHz, 4-6 MHz and 2-4 MHz use fundamental frequency (high overtone) crystals with no frequency multiplication. This is done to overcome the problem of spurious signal reception from unwanted crystal harmonics. In addition the low IF's 2-4 and 4-6 MHz use double conversion techniques to reduce the image problem. Specification—see below. Stock IF's for 2 metres: 2-4 MHz, 4-6 MHz, 9-11 MHz, 14-16 MHz, 18-20 MHz, 23-25 MHz, 24-26 MHz, 27-29.7 MHz, 28-30 MHz. 4 metre IF: 28-28.7 MHz. Satellite Band IF's: 6-8 MHz, 10-12 MHz, 16-18 MHz, 20-22 MHz, 26-28 MHz. New IF for use with KWV and Collins equipment with restricted 28-30 MHz coverage gives 145.3 to 145.5 for SSB and 145.7 to 146.1 MHz. Size: 2½" x 3" x 1½" except the 2-4 MHz and 4-6 MHz which being double conversion are 2½" x 4" x 1½". Price: £15.12.

### NEW! PA3 DUAL GATE MOSFET PRE-AMPLIFIER

We have again been pressed by demand into producing another new module. This is a completely new pre-amplifier, based on the proved performance of our converters. It has been produced with a very small volume (about 1 cubic inch) to fit into the receive aerial lead of transceivers. Its noise figure is the same as our Sentinel converters (2dB) and the gain 18dB. Supply 9-18v, 5mA. -ve earth. Supplied with fitting instructions. Price: £5.50.

### SPECIFICATION COVERING THE SENTINEL, SENTINEL X AND SENTINEL M.F. CONVERTERS

- ★ Noise figure —2 dB. Gain —30 dB.
- ★ Protected dual gate MOSFET in RF and mixers for excellent overload and cross modulation characteristics.
- ★ All housed in aluminium cases, stove enamelled silver hammer with black trim.
- ★ Every one carefully adjusted for bandwidth and noise figure on our spectrum analyser.

### OUR EXTREMELY POPULAR SENTINEL FET 2 METRE PRE-AMPLIFIER

This amplifier is designed for optimum noise figure and sensitivity and selectivity performance.

- ★ Low noise figure—2 dB.
- ★ High gain—18 dB.
- ★ Supply—nominal 12v. at 5 mA, with isolated supply lines. Price: £7.15.

### S.S.M. EUROPA 10 TO 2 METRE SSB TRANSVERTER

We have now managed to complete the backlog of orders on the Europa and at the moment can supply from stock—how long this will be we cannot predict.

#### SPECIFICATION :

- ★ 200W. P.E.P. Maximum input.
  - ★ Receive noise figure 2dB.
  - ★ Plugs straight into YAESU/SOMMERKAMP equipment.
  - ★ Size : 9" x 4½" front panel 4½" deep.
- Further information on request.

### THE SENTINEL X DUAL GATE MOSFET 2 METRE CONVERTER

This 2 metre converter is a de luxe version of our well established Sentinel converter. Contains internal mains power supplier but can be used with external batteries. It features an RF gain control to reduce cross modulation and overload of the main receiver. Size: 5" x 1½" front panel, 4" deep. It uses fundamental crystals on the required frequency, i.e. no multiplication. IF's from stock: 27-29.7 MHz, 28-30 MHz. Price: £21.45.

### THE SENTINEL M.F. Becoming a very popular unit.

Receives 2 metres on a conventional M.W. B.C. receiver, particularly useful for use with a car radio. IF output 0.5 to 1.5 MHz for 144-145 and 145-146 MHz in two switched bands. Double conversion design with two switched crystal oscillators. No frequency multiplication. "OFF" position switches M.W. aerial straight through to receiver. Size: 5" x 1½" front panel, 4" deep. Price: £20.62.

### SM70 70 cms. CONVERTER

- ★ Low noise figure 4.5 dB.
- ★ IF output 144-146 MHz. By using the 70 cm. converter with a 2 metre converter, you can have a high performance 70 cm. unit at a low price, £15.12.

All units advertised should be ex-stock, but you can always ring for confirmation. Call in any time to have a look at the stuff. G3MXG. All export orders less 10% VAT.

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- P. & P. 16p on any item
- UK345 Superhet Radio Control Rx. £5.08
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  - UK165 RIAA Equ. Stereo Preamp £5.19
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  - UK220 Signal Injector £2.15
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  - UK92 Telephone Amp £4.88
  - UK160 I.C. Amp. 8w. £8.60
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- ### NUMERICAL INDICATORS
- P. & P. 5p each
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  - Minitron 3015F (7 seg.) £2.00
  - Til 209 35p
  - 50 PIV. 3A bridge rect. 40p
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  - 35000K (5V 7SEG) with holder £1.50

We stock a comprehensive range of R.S. components, J-Beam aerials and fittings.

- ### YAESU MUSEN
- FT101 transceiver 160-10M £280.00
  - FR50B receiver, 80-10M with cal. £69.00
  - FT2FB 2M transceiver with tone burst £98.00
- ### TRIO
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  - JR310 receiver, 80-10M £75.00
  - SP5D speaker £4.50
  - TR7200 2M transceiver £129.00
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- 2000E transceiver, 160-10M with A.C. P.S.U. £265.00
  - 202 receiver, 160-10M £140.00
  - Speaker for above £8.00
  - 204 transmitter, 160-10M £160.00

- ### EDDYSTONE
- EC10 Mk. II receiver, 5-30 MHz £86.00
  - P.S.U. 924 £8.94

- ### TEST EQUIPMENT
- Osker power meter Carr. £18.50, 25p
  - SWR 200 52/75 Ω £13.50, 25p
  - Tech TE-15 GDO -44 280 MHz £46.00, 29p
  - KW 107 ATU/SWR meter £8.25, 25p
  - KW 101 SWR meter £12.50, 25p
  - KW 103 SWR/power meter

- ### CRYSTAL MARKER GENERATOR.
- FX2000 100K-50 MHz. Will accept FT243/HCGU/HCI3U. No crystal supplied £6.00

TMK	TEST METERS	Carr.
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	700B 50K/V	£29.96, 25p
Sanwa	P2B 2K/V	£6.35, 21p
	JP5D 2K/V	£7.62, 21p
	U50DX 20K/V	£10.89, 21p
	A303TRD 20K/V	£14.33, 21p
	380CE 33.3K/V	£20.81, 21p
Tech.	ITI 20K/V	£5.25, 21p
Reace	T-1K 1K/V	£2.40, 16p

- ### BOOKS
- "Mullard Data Book" 1973/4 30p
  - "Making a Radio" 15p, 8p
  - "How to make Walkie Talkies for Licensed Operation" 40p, 16p
  - "Radio Teach Yourself" 75p, 21p
  - "Surplus Equipment Manual" £3.25, 25p
  - "Pre Fix Maps" 65p, 6p

- ### NO V.A.T. ON BOOKS
- ### AERIALS & DCCS
- Bantex fibreglass 2M ½ wave £4.35
  - Bantex fibreglass 2M ¼ wave £2.85
  - Halsion 160M whip £7.40
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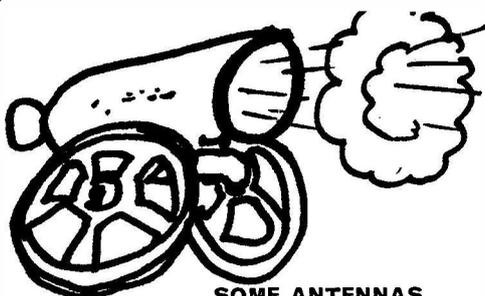
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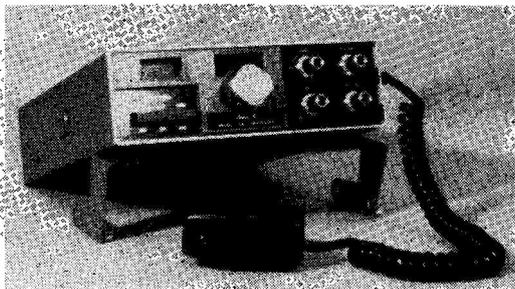
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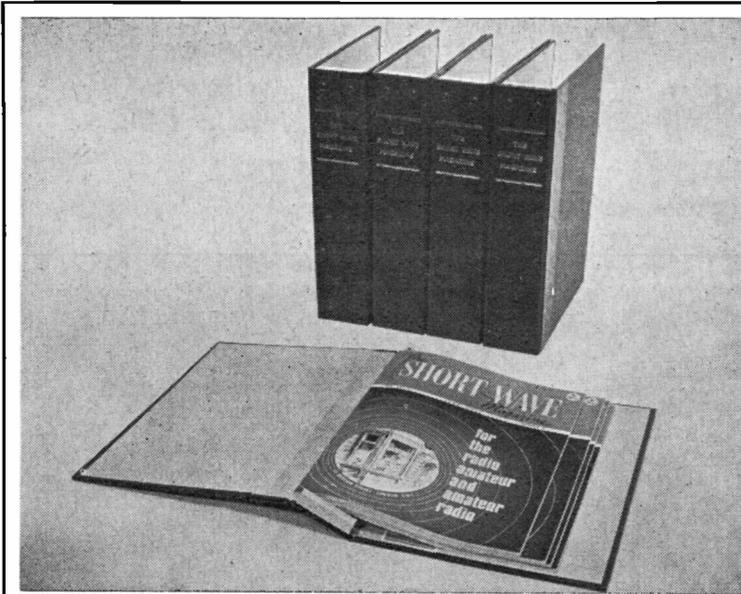
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AUGUST, 1973

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# The SHORT-WAVE Magazine

## EDITORIAL

### **Background**

That piece in the last issue—"What Some Readers Say"—may have got a few thinking a bit, if only for the moment—but it keeps us thinking all the time!

It is an interesting fact that whatever the subject discussed in this Magazine, on whatever aspect of radio technology or practice, whether amateur or professional, somewhere at the back of the class sits, figuratively speaking, the greatest living expert on that particular subject. Sometimes he makes us aware of it, very often he does not make his existence known at all. But always we are conscious that he is there. This dictates the utmost care in the processing of material for publication.

Then we have to remember, nearer the middle of the class, the highly intelligent reader—a qualified man in one of the professions, say—who knows next to nothing about Amateur Radio, and just wishes to be instructed. This also involves very careful attention to what we publish.

For the great body of our regular readers—who, between them, know a great deal about every aspect of radio amateur technique and practice—anything we put out has to be most carefully worked over before being committed to print.

Interlarded with these more or less definable categories are the professionals, at various levels, with specialised knowledge of some branch of electronics having no connection with radio communication. There are also those who are either very young or are getting on in years. Some are well qualified in the radio amateur sense, others regard themselves as beginners. Individually, either they want it all in simple language—or prefer technical articles to be technical, with mathematical proofs—or never could cope even with simple arithmetic—or expect every article appearing each month to be just right for them. These conflicting requirements also demand great care in the selection of material for publication.

Broadly speaking that is the background against which we work, and have done for so many years. What makes it possible is that all our readers are united in one common interest, that of Amateur Radio. It is the theme and essence of the whole undertaking, the single factor drawing all together.

But it is also the reason why, in our sort of ambience, we could never please everybody all the time—indeed, it would be folly to try. We never have tried!

Austin Forsyth  
G6FO

# COMMUNICATION and DX NEWS

*E. P. Essery, G3KFE*

**S**UMMER-TIME it most certainly has been since last G3KFE put paper to typewriter, hot and humid—at least until a couple of days ago—and, as a result, one found the bands engulfed in static crashes if they were alive, and if they were quiet they were dead! It is quite noticeable that this sort of thing is made worse by a vertical aerial, just as they seem also to respond more to rain static, putting their owners at a disadvantage that sometimes more than outweighs the polar diagram advantage of lower angle of radiation.

Conditions generally have been fair to middling, taking into account that we have high summer upon us, and also allowing for the solar activity level.

## The Bands

Let us look first at Ten. GW4BLE (Newport, Mon.) worked DT2AFO, HB9EW, WA4WRW/TF and 9Y4EH. Although the previous month G3NOF (Yeovil) had found short-skip quite prevalent, and occasionally an opening to the U.S., this time he failed to connect with any good openings there might have been, and made no QSO's at all on 10m.

G3JXE (Hull) wrote primarily on behalf of our old friend ZS6ZE, but found a corner of the letter to note his own results for the month under review—so far as 28 MHz went it was just a case of short-skip European contacts, DX being conspicuous by its absence.

Right on the last minute, in came a letter from G3ZGC/MM; Richard is normally a Top-Band and Eighty operator, but the terms of his /MM ticket confine him to 7050, 7060, 7070, 14200, 21350, and 28550 kHz, with 15 watts from a Yaesu FT-75. The low power has been found pretty useless on Twenty and Fifteen, but Forty and, in particular Ten have been a different tale altogether. Now the first priority is Ten; conditions have varied enormously, of course partly

due to the fact that the ship is moving. From the Persian Gulf all Europe—bar the U.K.!—was workable, and RA's were queuing for a contact with G3ZGC/MM, but just 100 miles away in the Gulf of Oman, the band was hopeless. Down the East Coast of Africa all that was worked were JA's and some weak Europeans; but near ZS the Persian Gulf stations began to be heard. Overall, the best DX was reckoned to be a JA from Ascension Island area. G3ZGC/MM is doing his thing from the *Alva Bay* (GSAU) and Richard joined her—all 120,697 tons of it—on the maiden voyage.

## Fifteen

Conditions tolerable, with short skip quite noticeable at many times. GM5AXO opens the account, he being now returned to WA4UAZ, his home call. Steve kicks off by saying all his QSL's should be sent to his U.S.A. QTH, via the WA4 bureau; he is well on the way now to clearing his QSL card backlog. It is understood his next posting will be as KZ5NG for about 18 months. However, let us look at Steve's last spell on 21 MHz as GM5AXO: CW was used to hook WNØFEO, WN9KCK, UAØAN, VS6AW, WA7OML, WA6COS, UW9XS, numerous other W/K stations and JA's. There was perhaps more variety in the SSB listing, which includes contacts with 9J2WR, ET3USD, VP2VAM, PJ2ECB, LU1EY, WA7ISL, WA1DOB/KP4, ZB2CJ, M1B, 9H1AB, PY3APH, many W/K's and a crop of JA's.

This time, G3RFG (Henlow) has been far too QRL to play with his wireless set but he did listen to and record his results on 5T5SOL, the Eclipse station—see p.237 June and p.279, July. On Fifteen, starting at 0900z, the beacon was S3, falling away to S2 and fading out to nothing by 0930. However, the band itself was still "trying" to do its stuff; a spin from 21000 up to 21100 kHz every five minutes showed Europeans much of the time, 5V3

at 1005z, ZS2GJ at 1035, ZS2AG at 1045, ZS6ME at 1100z, ZS1RU five minutes later, CN8BO at 1135 and again at 1150, and 5Z4JE at 1200z. All these were on CW, the SSB part of the band not being searched.

CW was the preferred mode at G3JXE; Ron worked all W call areas in 39 states, also CR7IZ, UA9's, UAØYT (in Zone 23), UL7QB, XW8BP, and JA1, JA2, JA3. Among the W's, it is notable that 14 of them were W7's.

G3NOF on the other hand stuck as usual to SSB. He found the Far East stations none too good in the mornings, but some Africans were heard around 0800z; QSO's with ZD8RR, ZS1KZ, ZS1YM and ZS6ZE were logged.

## Twenty Metres

Quite a long list from GM5AXO /WA4UAZ, like UK9AAV, OY1R, LU7DZ, W2NSZ, K4NE, JH1WIX, W1APL, W3NOK, WA2SBO, W9ELG, VO1CA, K1TEV, JA8JAT, JA9JBJ, JA7WC, JA2XW, JA3BG, JH1CXQ, K4MZU, W3GBF, W3TUB and 9M2LN, who fell under the hammer blows from his key; his SSB attracted the notice of VK2RU, VK5FD, HV3SJ, 4Z25MV, W6ICJ, W6LPM, WA7ISC, XW8ET, 9V1QQ, 9M2TR, JAØOE, ZB2AZ, CI1EO, VS6AS, ZD7FT, 9H1B, UA2EC, LAØAR, UK9CAE, JA6SP, UK9AAO, WA9EZV/AM and loads of JA, W and K stations.

G3JXE used his CW to some effect on 20m., working CH1ATJ, DL1RK /KL7, EA6AU, KG6AAY, KL7BIA, W67SV, VK6CH, VP9DL, UA9 and UAØ, UL7LBL, UJ8BQ, UH8CS, all W call areas, including 24 of those elusive chaps in the Seventh call area.

Beaconry again on Twenty from G3RFG. To match his listening watch on 21 MHz, already mentioned, Stan also checked 14050 kHz every five minutes from 0900z through to 1200z. 5T5SOL was on this frequency, consistently at S3-S5,

The Italian station IT9SEZ, who will be heard as IE9SEZ (Utica Island) during August and until about September 10. He will be working SSB on all HF bands and we are informed that the IE prefix falls into the category of the rare ones.



right through to 1030z when it dropped to S2, at totality for the Eclipse. It remained at S2-S3 till 1100-1105z, by which time it was inaudible. By 1110z it was back at S2, and stayed readable at S2 till 1155, when it rose to S3, and at 1200z the beacon was up to S4 when the watch was closed. In the way of other stuff on the band, it was only Europeans logged. For both bands, the aerial was the quarter-wave vertical, the receiver the FT-DX500, which was switched on an hour before the observations started to give it plenty of time to settle down. (Till all the reports have been analysed, it is difficult to say whether this Eclipse test was in any way significant).

G3NOF speaks of short-skip U.K. QSO's during the last couple of months. Over the period in review, VK/ZL has been none too good in the mornings, but on the other hand Pacific and West Coast U.S.A. have been available around 0700z. Also, 1600-1800z has been a good time, over the short path, for contacts with such as YA, VU, VS6, 9M2, 9V1 and HS, while Africans have been audible both in the mornings and again in the early evenings. Don rang the bell with A6XF, CR6GA, EA6BP, EA6CC, ET3USE, HR1RSP, HS4AJF, JY6GT, K5LTH/KH6 (Kure Is.), K7OAK, KH6CBS, KH6GHZ, KH6IAB, KH6IDI, KL7EAN, KZ5CL,

OD5CU, OJ0AM, OH0AM, OX3EA, TG9MP, TI4AO, TU2BX, VE7SV, VQ9BP, VS6GA, VU2ABV, VU2AIK, VU2MX, W7AZG, W0AW/VK9 (Christmas Is.), WA8RGJ/VE8 (Baffin Is.), YA1ED, DZ8RW, ZE1AW, ZE2JE, ZK1TA (Tongareva), 5T5ES, 5W1AR, 5W1AU, 5Z4JD, 5Z5NR, 9G1FF, 9G1HE, 9M2CJ and 9M2DQ—pretty nice!

G4BVS (Amersham) and his QRP come next. Sean rigged up a Cubical Quad for the QRP contest, heard many QRO W/K stations, and managed 15 countries during the contest, including W9GDT and W2BBQ on Twenty. Gotaways included HA5KH/MM off the Azores, UA9OBG, UA9VK and a 4Z4.

Another chap who stuck to QRP and Twenty was G3DNF (Leeds), who has now cleared out most of Europe with his two watts. Highlights of the month included LX1CF, UL7IH, UD6BZ, 9H1DP, 9H1R, EA8GU, W1BFA and F0AHY/FC, the last-mentioned being a new one not even worked on the big rig! The QRP Contest itself was also worked, but only 13 contacts were made in 15 hours, the best being UK9AAN and IS0ATZ. Gordon comments bitterly on the mess which has become the CW end of Twenty, with the jingle-bell thing which fills the top half of the band like an electronic banyan-tree,

while down below it, everyone shouts CQ DX, a mere CQ never achieving an answer. Yes, and that "thing" seems to spread all over Europe, going on for days at a time without a break, although the W's do not seem to be much affected by it.

On the topic of QRM on Twenty CW G3UZ (Goring-by-Sea) makes the point that unless you grab a bit of DX just as soon as he shows up, you have lost the QSO under the hordes of EU's calling-in. As for the UA9's, G3UZ reckons they are getting to know him, and they come back with his-name-and-details instantly! He made CW contacts with LA1H/X (a "special" in connection with a Festival at Harstad), UK0SAL, UK0AAS, UV0AA, UA0PY, UA9's by the bucketful, UH8HAB, UI8OK, UH8HAI, UI8NC, UJ8AC, UJ8CA, UL7JAC, UK7GAE, UL7QF, UF6FA, UF6VAA, UF6AS, UF6CQ, UG6AW, UF6FAX, UD6DG, UD6BZ, UD6FDY, EA9EX, EA9AQ, HV3SJ, ZB2AZ, 4X4VE, 4X4GD, 7X0RW, JA6AGS, LU5AQ, CT2AO, VO1AW, FP8DG, VK7CH, VE7BRY/4X4, SV0WC, VE3DMC, JA3KM, PY4BVL, PY1FT, TA2EA and G3RSP/MM when Alan was in the Arabian Gulf.

Things have been rather busy for G3DCS (Ipswich) of late, what between his boat needing to be loved, changing his car (which

involved transferring "all the rubbish" as Enver puts it, to the new one) and most difficult task of all being, as usual, re-fitting the car radio! Only eight contacts were made all month, CW fetching in GM3LWS, UB5EAD, W1TW and W3QBK, while the RTTY accounted for W2LFL, UK3DAA, IIDNA and LU2ESB.

G2HKU, still above tide-mark on Sheppey, remarks on the increase of late in the UJ8 and UI8 callsigns and wonders why this should be. His SSB made contact with VE6MP, W7GYP, UJ8SAJ (for a new one on SSB), VP2SBH (St. Vincent, for an all-time new one) plus CW with W7QMW, OA4AHO, UJ8AC, KH6IJ and UK9MAA.

On the QRP front G2NJ (Peterborough) is still at it, and had a nice solid QSO with DK1LW, who had just the one watt to a crystal-controlled transmitter using a single BCL6 valve. His friend G5NX/LA /MM mentioned one of the hazards

of /MM operation when the ship—see p.294, July—ran into a sudden hurricane, and the transmitter and receiver crashed on to an armchair from the desk, wrecking the chair, but breaking the fall of the gear enough for it to be undamaged!

Talking about his planning application for a tower, GW4BLE (Newport, Mon.) still has to keep hoping, although the planning committee meeting has been held and Stephen was "represented" at it. However, the 18-AVT has to suffice meantime, and it put out RF successfully to ET3USF, OH0AM, 8P6AZ, 9J2DT, 9Y4EH, VP2AX, VP2VS, ZP5AN, CR4BS, EA8IX, 5T5ES, 5U7AS but unsuccessfully to ZK1TA. The 5T5 Eclipse Beacon was not heard at all.

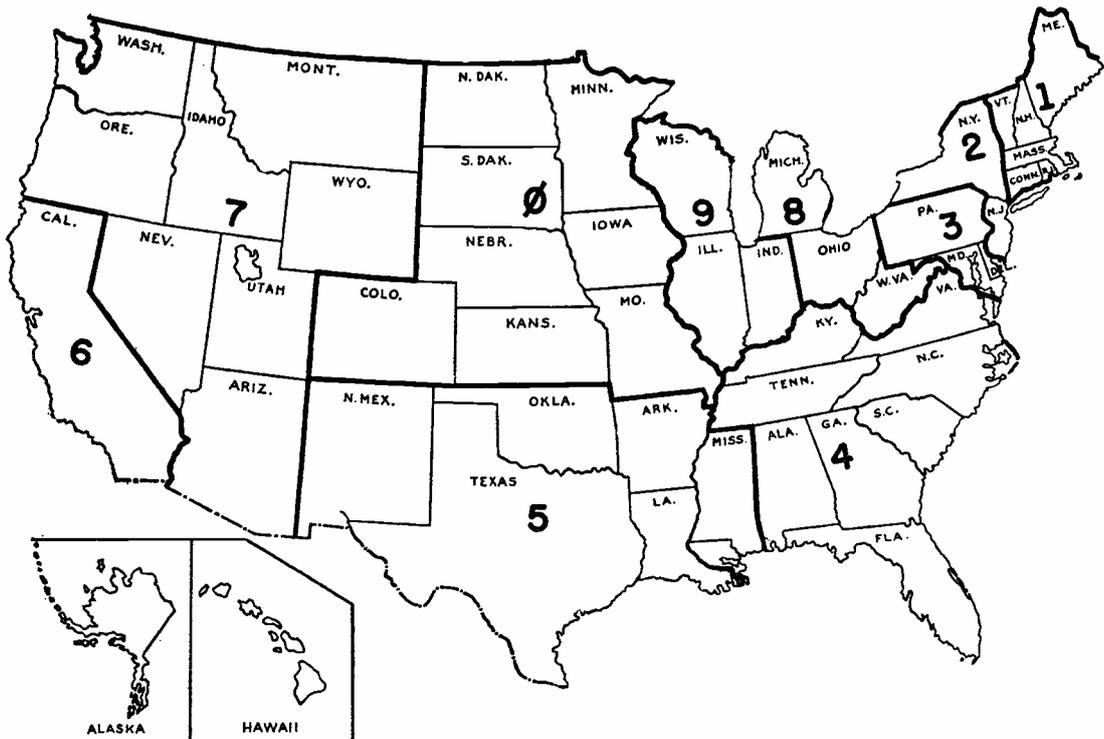
G3VLX has been pretty well tied up, but still manages to show MP4BJP, KV4AD and VP2VBU as among those worked. Twenty was also tried by GM3YOR/P on NFD weekend, and it yielded them QSO's

with W2NZ, TI2PZ, 9J5LA/P and UF6DG.

Miscellany

Quite a lot of odds and ends fall to be mentioned here. The top of the pile is a letter from Arthur, G3NGF, of WAMRAC, who took the opportunity on the way back from the Newcastle Methodist Conference to drop in to Scorton R.C. Hospital to see Peter Odell, G3MUM, who was once christened "Twinkletoes" for his use of those limb members for operating. Peter, as his friends will be aware, has been off the air for some time, but from August 11 he will be in Fleetwood on holiday, and so as there is a station available, he plans to come on Eighty from August 13.

Back to that talk about "lots of amateurs in a small area": A letter from G3VFI, who points out that in the Fareham district, about a mile by a mile-and-a-half, they have 24 callsigns, with more around the



Flat map of the United States, showing call boundaries taking in the states. The W5/W7 call area is perhaps more difficult to work from the U.K. than W6 which, though more distant from us across continental America, is the most heavily populated in the Amateur Radio context, with a high proportion of QRO stations.

edges—and fifteen of the twenty-four are very active!

An odd coincidence is mentioned by Patricia, G4AYL, who recently came across a December 1965 copy of the *Magazine*, which had a note about the youngest GI amateur at the time, G13UKS, and also a paragraph concerning the Radio and Space Research Station changing its name and director—a coincidence, because she is married now to G3UKS, who is on the staff of the Station.

The recent upsurge in interest in QRP working in the U.K., shown by the number of letters from QRP stations, prompts us to mention the QRP Amateur Radio Club Contest from 2000z on August 18 to 2359z August 19. Exchange RST(T), give state, province or country, QRP Club number (or NM if not a member) and power input. Each QSO with a member counts three points, or with a non-member 2 points. Multiplier determined by the sum of the states, provinces and countries worked on each band. There is also a power multiplier, as follows: Over 100 watts, none; 25-100 watts, 1.5; 5-25 watts, *times* two; 1-5 watts, *times* three; and less than one watt *times* four (p.e.p. double). Final score is QSO points *times* the multiplier on each band, *times* the power multiplier. The frequencies to be used are, for CW, 3540, 7040, 14065, 21040 and 28040 kHz, and for SSB, 3980, 7280, 14330, 21430 and 28600 kHz—which makes things rather difficult for non-U.S.A. SSB entrants! Logs to be mailed before September 25, to K7JRE, QRP ARC Contest, 3701 S. W. Morgan Street, Seattle, Washington 98126, U.S.A. With the log should go a summary sheet with equipment description and the usual signed declaration.

B.A.R.T.G. have some results for their recent RTTY Contest. The first three places went (as usual) to Italian stations, but G3OZF came fourth (congratulations, Don!) and VP2KH made sixth position. Conditions in general were pretty awful, and many operators made such low scores as deterred them from putting in an entry—there were very few entrants who recorded QSO's with all continents.

OK2QF writes to let us know that OK3CBY is back in business as YK1OK, for all bands 1.8-28 MHz

—which should gladden the hearts of the Top Band DX-ers! Till about August 15, he will be on on Saturdays and Sundays only, 1200-1900z on *Forty*; 1900-2200 on *Eighty*; 2200-2400 on *Top Band*; 0001-0200 again on *Eighty*, and 0200-0430z *Forty*, all CW. After this, and until October-end, all bands will be worked daily, both CW and SSB. QSL's should be sent, with s.a.e. and an IRC, to OK2QF, Fr. Dolezal, 594 41 Baliny 26, Czechoslovakia.

Portsmouth, New Hampshire, is celebrating its 350th Anniversary this year, and will have a special-event station on the air during August 1-19, working all bands and modes including Slow-Scan TV. WA1PEL, William A. Dodge, 32 Elm Avenue, Pease AFB, NH 03801, U.S.A. is doing the dogsbodying over there, and Bill is keen to work any stations in the Portsmouth, *England*, area—so anyone who can oblige should airmail him for a sked, which will please the chaps over there no end.

G5MY (Leicester) writes to tell of his recent trip to Brandon, Manitoba, in VE4-land. He had a reciprocal license, granted with no difficulty whatever, and met the locals, who rapidly whipped him off to the Brandon Club meeting, operating his new call /M on the way. The welcome was quite tremendous, and after the members had all been introduced to their visitor, the meeting was continued; after it was over the members retired with the visitor for a spot of "good old elbow-raising," only releasing him to go with VE4DQ and VE4OP for a session at the latter's home until the small hours. Operating-wise, G5MY/VE4 found from the other end that skip from VE4 to England is rare—it seems to go from the East Coast and change straight away to the West Coast; so no U.K. stations were worked, although a few were heard very weakly. In conclusion, G5MY wonders whether any U.K. operator reading this has established a suitable time for consistent G-VE4 working, so that he can keep in better contact with the good friends he made in Brandon, which he reckons lives right up to its slogan of "32,000 Friendly People."

G3JXE fulfilled an ambition recently, by working the last county

of New Jersey (WA2TBA did the honours) to give him the complete set, 21 worked and 20 confirmed—Ron had had the twenty counties confirmed years ago, but the last one took nearly four years to find; when this last QSL is in, G3JXE will have worked all the counties in four of the American States!

In his earlier letter, G3NOF mentioned that he was again in trouble, this time with a bout of TVI—one is intermittent and never shows up when the Post Office inspector is there (Murphy's Law again!) while the other is a Japanese UHF TV set which takes him at S9 without an aerial on it! Don's gear has been exonerated by the G.P.O. but he is off for a month

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#### BRIEF DX DATA

- |       |   |
|-------|---|
| FO8   | Try around 0700, 14139 kHz. FO8BU is QSL via Box 959, Papeete. FO8DY is Box 85 Papeete; FO8DZ, Box 433, Papeete.                      |
| FS7   | St. Martin. 14104 kHz, around 2200, working to a list taken by PJ2ARI. QSL to F6AEV.  |
| JY    | "Arabian Knights Net" now meets 14250 kHz, Mondays at 1400. Royal Jordanian Award is for working six JY prefixes since April 1, 1971. |
| VR1AC | British Phoenix Is. Is also KH6BU. All QSL's via WB6IKI.  |
| XU1AA | Try 14195 kHz around 1815, working from a list taken by 5U7AZ. Alternatively, try SEANET, 14320 kHz, 1200z.                           |
| HV3SJ | Brother Ed. is often QRV from 0500 on Sunday morning on 7 MHz, CW or SSB.   |
| SV1FT | Crete. Try around 28550 kHz, around 1500z. QSL via 15 Chania, Crete.  |
| VP5DD | Around 14202 kHz SSB, 1545z, or 14210 kHz, 0145z. (Also believed to work <i>Oscar VI</i> ) QSL via his K8PKN call).                   |
| XV5   | Only XV5AC is legitimate. All other "XV5" calls are phoney.   |
| 5U7AZ | Try 14250-14265 kHz, 0600-0700z; he is often active.  |
-

while the TV set's deficiencies are sorted out. In a different context, G3NOF mentions that A4XAA will be coming on shortly, the operator being none other than the Sultan of Oman. (A competitor for JY1?)

G4BVS says he will be camping in Europe on holiday between August 19 and September 14; Sean has G4BVS/OE, ON8KU and G4BVS/DL organised, and has a QRP rig on 7 and 14 MHz. Anyone wanting a sked for these countries on QRP should drop him a line at 22 Highland Road, Amersham, Bucks.

The lengths these chaps go to! G2HKU writes that he has heard that K6UA has a beam with 128-foot elements, spaced 32 feet, atop a 140 foot tower—Ted reckons it must cost the W more to insure than G2HKU could afford to spend on an aerial!

In the opposite sense G2NJ mentions G3KPT, who has already collected 40 prefixes with his HW-7 fleapower rig, and an aerial, inverted L, of sixty-six feet sloping down from 26 feet high at the near end to six feet—and an electric railway at the bottom of the garden to add a bit of difficulty and spice to operations! He's done well, with such a set-up.

Murphy's Law again, this time enveloping G3VLX. Deryck was going to Italy, and wanted to find an Italian station to visit near Venice, without luck. When he got back the first thing he saw on the mat was a QSL card from IICRW in—you've guessed it!—Venice.

### Forty Metres

It is hardly surprising that at this time of year Forty is not made to carry much DX traffic—but there is no doubt that the DX is there and can be worked, subject to both ends of the path wishing to co-operate! For example, during NFD, GM3YOR/P and GM3OLK/P were on the band from the top of Bishop Hill, for the Glenrothes Club. GM3OLK/P was the 7 MHz station, and during their session on 40m. they worked K1RQE, W3ZTE, K3LCX, WA2HIN, WB2VYA, W2AXZ and VP8KF—and, of course, the NFD stations are, as compared with the home station operators, running fleapower, with the PA stage dissipation the controlling factor.

G2HKU offers SSB with YV4AGP, and CW to OA4MS and "9H3RUM"—a "funny" one?

On to G3JXE, who seems to have spent plenty of time on the band, working CW to CIIATJ, CM2AF, CTIEN, CX4LO, EA6CB, FC0AHY, HK4AJF, KP4DJE, KZ5VV, a gaggle of LU's, OH0AB, OH0MAS, loads of PY's, PJ2VD, SV1DB/A, TI2WX, UA9, UA0, UD6, UG6, UF6, UH8, UI8, UL7, UM8MAU, UJ8SAC, VK6HD, VE1-VE4, all W call areas, five YV's, ZP3CA, 4W1AE, 4X4, 9H1, 9L1GC, 9L1JT—but only, he complains, two W7's! All this on *Forty*!

### QSL Addresses

Quite a few, between two selections from G3NOF and one from GM5AXO/WA4UAZ. Taking the latter's selection first, we notice *VP2VAM*, via VE3GMT; *MIB*, via WA3HUP; *VS6AW*, via WB6ZUC; *9A1AB*, via ON8YF; and *OY1R*, via W2KF.

G3NOF mentions, *WB6VGI/VQ9*, home call or bureau; *JY3BZ*, to P.O. Box 1352, Amman; *JX6CZ*, Jonas Lies 6, 3250 Larvik, Norway; *JX9TM* to LA9TM; *ET3USC* to WA1HAA; *9X5JC*, P.O. Box 198, Kigali; *VP2VBG* to P.O. Box 84, Roadtown, Tortola, B.V.I.; *6Y5GB* to VE3GMT; *6Y5ED*, Dr. E. Depass, 28 Elizabeth Avenue, Kingston, 10; *A2CAX* to K2YLM; *FO8DO*, P.O. Box 2018, Papeete; *OH0MAS* to *OH0MA* or bureau; *VP2GI* to P.O. Box 421, St. George's; *HP1XIS*, to Box 905, Albrook AFB, Panama CZ; *VE3RCMP* to bureau. Then he gives *EA6CC* to DL9YB; *5W1AR* to WA7LFD; *5W1AU* to W6KNH; *ET3USE* to WA4AGT; *WOAW/VK9*, home QTH; *YA1ED*, P.O. Box 5, Kabul; *VQ9BP*, P.O. Box 220, Victoria, Mahé; *JY6GT* to P.O. Box 2353, Amman; *5T5ES* to K5HAY; *VU2ABV*, P.O. 534, New Delhi, 1; *VU2AIK*, P.O. Box 3058, Lodi Road, New Delhi; *EP2DO* to KL7BJW; *TU2BX*, P.O. Box 20647, Abidjan; *K5LTH/KH6* to WA3HUP; *CR6GA* to WA3HUP; *HR1RSP* to W5GTW; *HK0BKX* to WA6AHF; and *ZK1TA* to W6KNH.

### Eighty

A right kettle of fish—the question one tends to ask is "What sort of fish?" There is some real DX being worked by the night-owls on

the key, and a lot more by the chaps up in the DX segment; but why they bother to sweat their way through the obnoxious 'erbs who persist in whistling all over them, swearing at them, and so on, quite baffles this scribe. It must be like banging your head against a brick wall—nice when you stop!

G3JXE tackled the CW end of the band, and came out with UA9, UD6 and UL7—and doubtless some Europeans as QRM. As for the NFD effort by GM3OLK/P, after their good DX on *Forty*, they were maybe a bit disappointed to be able to work Europeans only—but such is life!

### Expeditions

Advance information from GM3YOR that he and his buddy, GM3OLK, will be going DX-*peditioning* in the rarer Scottish counties for a week around the end of September; they have no route settled as yet, but would welcome suggestions and sked arrangements—GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife. Gear will cover all bands 1.8 to 28 MHz, and maybe VHF too.

A letter which seems to have gone adrift somewhere "in the system" is from the Chester Club, to say they are on Orkney at the time this is being written, signing GM3GIZ/P on all bands 1.8 to 21 MHz.

During August 8—22, G3ZXZ and G4AAQ will be out portable in Scotland; the first days are in *Inverness*, the rest of the time nominally in *Skye*, activating Top Band, Eighty and Twenty, mainly using WAB hunters' preferred frequencies. Some possibilities exist of operation from other Scottish counties if demand is enough—write to G4AAQ, *QTHR*.

One we nearly missed gave details from GW4BLE about the GW6GW expedition, mentioned earlier in the year in passing. The programme is now settled: On August 4/5 in *Carmarthen*; August 5/6, *Pembroke*; August 6/7, *Cardigan*; August 7/8, *Radnor*; August 8/9, *Montgomery*; August 9/10, *Merioneth*; and *Denbigh* on August 10/11. The HF outfit will run 200 watts on 3760 and 7060 kHz, or near.

### Top Band Matters

It's a long time since last we heard from G3XAP (Stowmarket). Phil

tried his hand at the Trans-Equatorial Tests in June, with some considerable success, working PY1DVG four times, his worst incoming report being 569; also ZP9AY and ELØN/MM. Gotaways were LU5HFI, LU5EVM, CX3BH, 5Z4KL and KV4FZ, so that now his countries-worked score on Top Band stands at 23. In addition, during the month contacts were made with VE1MX W1BB/1, K2GNC and W1HGT, plus 11 European countries. The rig is an unmodified KW-2000A on the "receive" side and a genuine 9 watts input to the PA; the only filtering, apart from the SSB bandwidth one in the 2000A, is that "between the ears"—and his aerial is "nothing to write home about." Phil reckons that anyone wanting to know how to tackle Top Band Dx'ing should sit and listen to PY1DVG operating—Rolf seems to be able to sense the slightest change in conditions, or the skill of his contact, and adjust his speed of sending, pattern, and so on, to suit—great stuff, indeed!

Top Band for G2HKU included his usual SSB contact with PAØPN and GM3ONS/A in Perth, plus a CW QSO with GM3GIZ/A in Inverness.

GM3YOR mentions the stuff he worked on NFD as being just G's and some few OK's—but Drew decided to have a go at the DX on Top Band during the month and made it on CW to EP2BQ on the morning of June 18; others heard but not connected with included PY1DVG, LU5HFI, ZP9AY, and 5Z4KL. During the week before he wrote, GM3YOR put up a different aerial to see if he could hook some of this elusive DX, but since then hasn't heard anything of it, so he is now wondering whether the 550 feet end-fed is working well for him or not. (Broadly speaking, a full-wave does not confer any advantages unless it is about 200ft. high.—*Editor*). Drew has himself a little gripe about the lads with big signals who tend to come on night after night to work the DX and in the process shut out some of the weaker chaps who haven't the advantage of a good site and aerial system—he usually waits till they have all gone and then is left alone to work the DX.

For those who are trying for



The NFD station put on by the Maidenhead group with, left to right, G8CUZ busy with the logging, G3ZPK doing the operating and G3UKS resting his keying hand till his next CW spell comes up.

ZS6ZE, it is understood that John is finding around 0100z to be the best time. Other stations which have been heard in the U.K. include EP2BQ at 0122z; CP1EU and PY1DVG around midnight; W1BB/1 at 0057z; ZP9AY at 0103z; CX3BH, 0053z; LU's around 0100-0200z; ZB2A a good deal earlier at 2303z; 9J2LF at 0026z; ZD9BM at 0038z; and VP8KF around 0130z—the latter being understood to have a crystal for 1806 kHz with which to tackle the, to him, European DX.

There has for long enough been much debate about the merits of various aerials for DX working on Top Band. All those who can put out big signals have something in their favour in the way of terrain—of that there is little doubt. However, for the chap (such as G3KFE) with a postage-stamp-sized garden and facilities only for an end-fed running the wrong way outside that garden, there seems little real doubt that the shortened vertical worked against the *most extensive possible* earth system and with all wire-link fences and such bonded to earth does do as well as anything. However, it is surprising to this old scribe that few if any of the clan using

this type of aerial have considered folding the shortened vertical. If the unipole is folded all-same folded dipole the impedance at the feedpoint naturally goes up cutting earth losses down. But in addition the reactance reverses in sign so that you need capacitance to resonate it rather than a coil of high RF resistance; the effect should be worth a clear S-point over a conventional loaded-whip arrangement on the same ground system. But whatever you do the site is vital—recall GW3UUZ from Nash Point, for example who had a whale of a signal without really trying! Incidentally, talking of GW3UUZ, Andy is now a plain G, he having surfaced at Anvil Point, near Swanage, still in the Trinity House service, but bewailing the fact that his new place has only a short stumpy tower to use as his mast!

#### QRT

We seem to have come to the bottom of the pile of letters for another month. For next month, the deadline will be **August 13** arrival, addressed as always to "CDXN" SHORT WAVE MAGAZINE BUCKINGHAM, MK18 1RQ.

## COURSES FOR THE R.A.E.

*First List*

Following are centres at which courses for the Radio Amateur's Examination (Subject No. 765, City & Guilds) have already been arranged. It is expected that a further listing will appear in the September issue of SHORT WAVE MAGAZINE, as more such courses are notified.

Readers interested should note that (a) These courses involve payment of nominal fees, of varying amounts, for the full session leading up to the May 1974 Examination, (b) All enquiries to the addresses given *must* quote "Radio Amateur's Examination, Subject No. 765, City & Guilds Exam.", (c) In most cases, the instructors are qualified teachers who are themselves licensed radio amateurs, and (d) We are not able to give information about courses not listed here; it is often possible to get details on enquiry to the local office of the Education Authority for the area.

Organisers concerned who wish for publicity in this space should send in their notice (on a *separate* sheet, please) in the form shown here to: R.A.E., SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ, as soon as possible for the September issue.

**Bath:** At the City Technical College, Avon Street, with P. A. Bubb, G3UWJ (*QTHR*) as course instructor.

**Boston (Lincs.):** Science Dept., College of Further Education, Rowley Road, with D. Byrne, G3KPO, in charge. Homa House, Quadring Watergate, Spalding (or ring *Gosberton 485*) for details.

**Bridgnorth:** At the College of Further Education, Stourbridge Road, covering Theory, Practical work and Morse tuition, commencing September 17, with P. Edwards, G3DKJ, and M. Jones, G3JCX, as lecturers. Pamphlet with full details on application to G3JCX, at the College.

**Brighton:** Apply to the Technical College, Faculty of Engineering, Richmond Terrace, for details.

**Cannock Chase (Staffs.):** At the Technical College, Stafford Road, Cannock (*5811*), starting in September. Enquiries to the Principal.

**Canterbury:** To be held at the College of Technology, New Dover Road, with D. J. Bradford, G3LCK, as course lecturer. Enquire at the College for registration details.

**Farnborough (Hants.):** Starting on September 27, Theory and Morse tuition, at the Further Education Centre, Cove Secondary School, St. Johns Road, with J. Hardy, G3KND, as tutor. Apply for details and enrolment form to the Principal, at the Centre.

**Gosforth (Northumbs.):** Starting in September at the Grammar School, on Tuesday and Wednesday evenings each week, course tutor D. R. Loveday, G3FPE. Prospectus and further information from

the Principal, at the School.

**Liverpool:** At the College of Technology, Riversdale Road, commencing on September 17, two evenings a week, 7.0-9.30 p.m., Theory and Morse. Apply for enrolment details to Head, Dept. of Electronic & Radio Engineering.

**London (Beckenham):** At the Adult Education Centre, 28 Beckenham Road, starting on September 24, with R. E. Piper, G3MEH, in charge.

**London (Brooklands):** At the Technical College, Heath Road, Weybridge, on Tuesday evenings, 6.30 to 8.30 p.m., starting in September. Enrol at the College, evenings September 10-12, or by postal application to Head, Dept. of Technology.

**London (Chertsey):** To start at St. Paul's Centre, School Lane, Addlestone, on Tuesday evenings, 7.0-9.0 p.m., from September 25, fee £3 for the term. Apply for details to Area Principal, Institute of Further Education, Old Council Offices, Guildford Street, Chertsey, Surrey.

**London (Chingford):** At the Community Centre, Friday Hill House, Simmons Lane, enrolment September 17-19, 7.30 p.m., fee £2.65 seniors or £1.25 under 18's. Classes start September 24, 7.30-9.30 p.m., instructor E. Johnson, G2HR.

**London (Holloway):** Starting in September at Shelburne Youth Centre, Hornsey Road, N.7, enrolment week beginning September 3—or ring 607-8522 (day), 609-0489 (evenings).

**London (Wembley):** At the Copland Evening Institute, Cecil Avenue, Wembley, enrolment evenings September 10-13, 7.0-9.0 p.m., for class beginning September 17, 7.0-8.0 p.m. Morse and 8.0-10.0 p.m. Theory. Further information from I. J. Bayliss, G8CZQ, 4 Aintree Close, Hillingdon, Middlesex, UB8 3HS (Tel. *West Drayton 47258*).

**Manchester:** To be held at the Adult Evening Centre, Centre, Moorside County High School, Swinton, with P. Whatmough, G8BFP, as instructor. Details from T. Honeyford, 2 Gorsefield Drive, Swinton, Manchester.

**Newport (Mon.):** At the College of Further Education, Nash Road, on Wednesday evenings, commencing September 19, with enrolment during previous week.

**Peterborough:** To be held probably on Tuesday evenings, from 7.0 p.m., at Electronic & Engineering Dept., Peterborough Technical College, Enfield Road, enrolment first week in September. Details from D. Byrne, G3KPO, Homa House, Quadring Watergate, Spalding, Lincs. (Tel. *Gosberton 485*).

**Sheffield:** At King Edward VII School, Darwin Lane, starting October 3, enrolment during week September 24. Details from J. Bell, G3JON, *QTHR*, or ring *Sheffield 732333* (office hours), 367774 (evenings).

## IMPROVING THE EDDYSTONE EC-10 RECEIVER

BETTER OSCILLATOR STABILITY  
— ADDING A PRODUCT DETECTOR  
— MUCH IMPROVED TUNING FOR  
SSB AND RTTY

J. M. OSBORNE, M.A., F.Inst.P. (G3HMO)

*Our contributor is well known for his approach to the practice of Amateur Radio and over the years has offered in our pages many valuable and interesting ideas for the furtherance of the art. Here he discusses the simple matter of desirable modifications to one of his own receivers, of a type widely used in amateur circles.—*

Editor.

THE Eddystone EC-10 was one of the earliest battery-operated transistor receivers the engineering and coverage of which put it beyond a purely domestic market. It is widely used by amateurs in mobile and portable applications; one imagines that it is even more widely used throughout the world for general reception of short wave broadcasting.

However, although it has the right knobs and labels such as BFO marked USB and LSB, its performance alongside its later brethren leaves much to be desired. If the BFO is used, it is immediately apparent that drift is severe and that a tap on the cabinet sets off a noise like a Chinese gong. The reception of SSB is only just

possible on strong signals and then is so difficult to hold that it is hardly worth the effort. On the credit side, it must be said that the writer has used the EC-10 as the heart of his weather satellite station (1), and that in this capacity it has given good service. The shortcomings became really apparent when trying to resolve RTTY FSK on the HF bands. It was decided to attempt to improve the stability and, if this was successful, to fit a product detector.

### Improving Frequency Stability

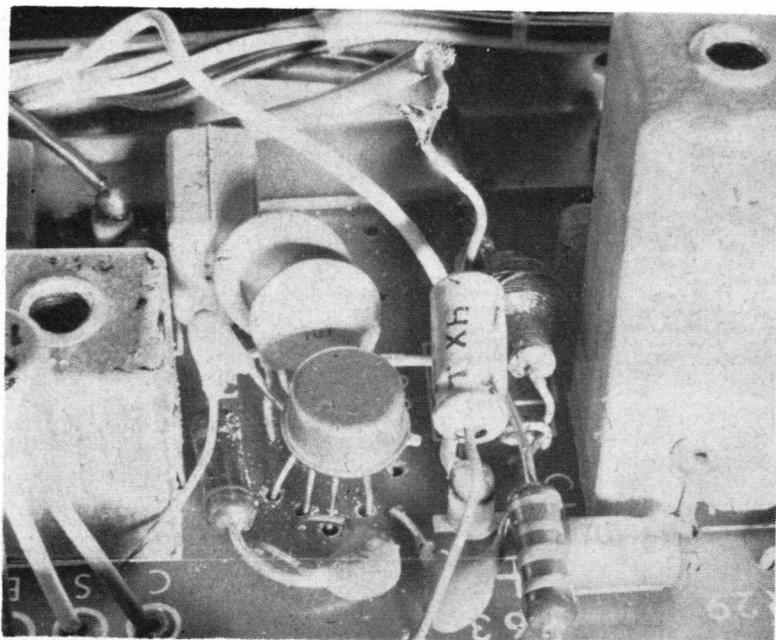
Inspection of the interior reveals a beautifully constructed piece of equipment, with its excellent slow-motion flywheel drive. However, the weakness in the region of the local oscillator makes itself conspicuous whenever anything in the area is touched. The faults come under two headings, mechanical and electrical. The first is responsible for the Chinese gong and the second for drift. A whole lot of mods. were tried and, although it is difficult to assess the effects of each, the overall effect has been a marked improvement.

On the mechanical side, the tuning capacitor is rubber mounted and separate from the main PC board, which is integral with the band switches and supports the coils. Any movement of the three-gang capacitor can alter (as it is a large earth body) the capacity to ground of sensitive points on the board, such as the collector of the local oscillator. Points on the PC board associated with the LO appear on the top side, close to the tuning capacitor and although they are screened sideways, as it were, by the earth section of the board, the large earth bulk vibrating above could be responsible for frequency modulation. Also, the leads between the tuning capacitor and the board are part of the tuned circuit. Prodding anyone of the parallel braid leads

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The product detector lying neatly between the BFO (left) and the last IF stage. C5 leading to the BFO collector is seen over the resistor R3. The larger discs behind are C4 and C6, while the electrolytic to the right of the IC is C7.

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used to common the capacitor earth with the board earth alters substantially the LO frequency. These leads, even in parallel, have some inductance and this is in series with the tuned circuit.

Attempts to improve the situation were twofold: First, the live lead to the LO section of the gang and all the earth braid leads were shortened as much as possible; secondly, a short piece of 18g. was soldered to the earth of the PC board in the vicinity of a very sensitive point under which the varactor fine-tune diode is placed. The wire is bent to lie between this point and the tuning capacitor to screen it off from the latter.

On the underside of the board it was discovered, by prodding with a trim tool, that two thin stranded p.v.c. leads were highly touchy. These run from the front two wafers of the band switch to the LO collector and the LO gang of the tuning capacitor respectively. They were replaced with 18g. tinned copper suitably sleeved, running, for convenience and shortness, on opposite sides of the pair of wafers. It is the impression that this simple mod. produced a greater improvement than all the others suggested here put together!

The drift is severe in the first ten minutes or so, but if one is patient it does eventually settle down to tolerable levels. This drift is surprising as in general an all-solid-state receiver does not have thermal problems. (It may be that in this case the germanium OC171 is the culprit). As the LO warms up, leakage currents vary and the collector base capacitance, acting as a varactor diode in parallel with the LO tuned circuit, does the rest. There is no proof of this, but with time one would like to try an FET or a silicon bipolar in this position. (The EC-10 used the OC171 for all positions ahead of the audio, undoubtedly a wise design if one considers such

factors as servicing). An alternative approach might be to have an external VFO for the amateur bands using the existing local oscillator rewired as a harmonic amplifier.

To maintain a sensible performance over a wide range of battery voltage a 6v. zener is used to stabilise the early stages and the BFO. As the load varies, depending on the use of the BFO and on varying drain from AGC controlled stages, further stabilisation of the supply line to the LO has been contrived. This has been achieved by filing a break in the line and putting a dropping resistor in series, together with a 5v. zener across the LO. Again, it is impossible to quote the consequences without time-consuming comparisons having to be carried out. Suffice it to say the modified EC-10 now behaves so much better in terms of LO frequency stability, compared directly with a second unmodified EC-10, that it seemed worth fitting a product detector.

### The Product Detector

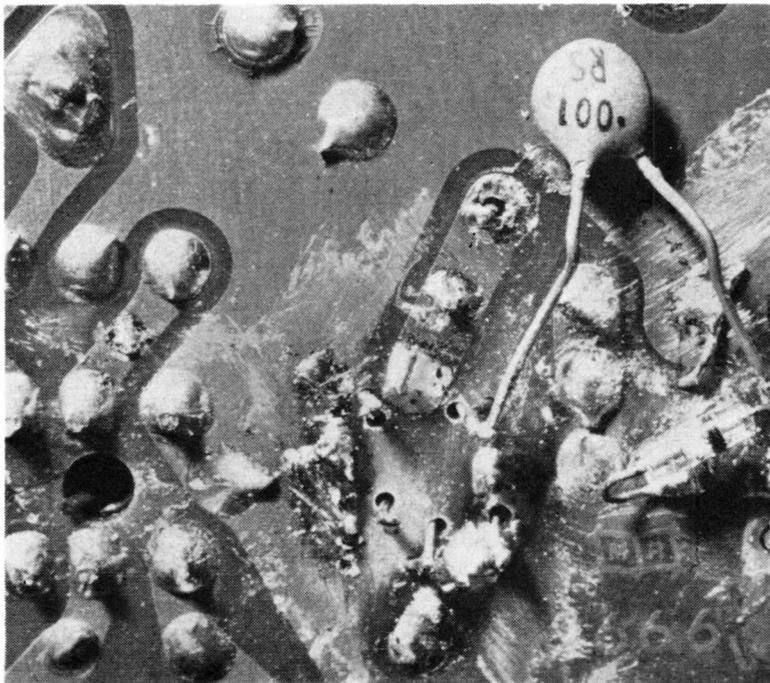
The product detector block is shown in Fig. 1. An IC containing all the necessary transistors is now the obvious way of filling in the block(2). *Birketts* have been advertising untested double balanced modulators for around 30p. Two were obtained—the first one proved a dud and was replaced by return. For the wealthy, there is the full spec. Plessey SL640 at £2.50 to £3.50.

The modification has proved relatively simple, the circuit showing all the changes involved is enclosed within the dotted lines in Fig. 2. The double balanced modulator IC is designed for a positive 6v. supply line. R2 drops 3v. from the negative 9v. line to lead 8, the earthy end of the IC, and is decoupled to ground by

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The printed circuit board after fitting the product detector. The scratch marks show where the lacquer was sandpapered away, preparatory to soldering. The disc ceramic is C1. The diode on the right should normally be inside the adjacent IF transformer. At least one incipient dry joint is embarrassingly conspicuous. The layout is, of course, that shown in Fig. 3.

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**Table of Values**

Fig. 2. Product detector for EC-10

C1 = .001 $\mu$ F	R2 = 300 ohms
C2, C3, C5 = .01 $\mu$ F	R3 = 2,200 ohms
C4, C6 = 0.1 $\mu$ F	IC = Double bal. modulator, Birkett or Plessey SL640C
C7, C8 = 1 $\mu$ F	
R1 = 4,700 ohms	

NOTE: All capacitors should be of the disc ceramic type, except C7, C8, which are 12v. electrolytic.

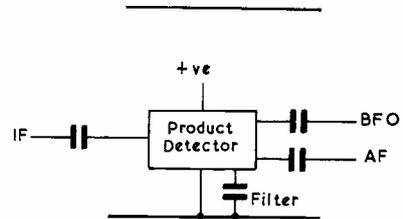


Fig. 1

C6. The IC is designed for single-ended inputs, the other sides of the balanced inputs being brought out through lead 2. This point is tied to lead 8 via C4. The audio is brought out to lead 5 and, after an emitter follower, lead 6. C3 filters off the high frequency components from the audio; R3 is the emitter load. Lead 4, the positive supply to the IC, is connected directly to ground.

The BFO injection is obtained by connecting lead 3 on the IC via C5 to the collector of the BFO transistor. This provides about 200 mV of injection. The BF coil will need retrimming to recalibrate the zero-beat mark on the BFO control. The original printed circuit lead carrying the BFO to an early IF stage is interrupted by filing a break in the lead.

The signal is drawn from the last IF transformer. The output is matched by C1 and C2 to the IC input lead 7. It should be noted that the diode detector is situated inside the IF transformer screen and is kept intact to leave AGC arrangements unmodified and the AM facility available. There is an unused pin on the transformer which gives access to the IF before the diode. C1 is accordingly connected to this pin. A slight retrim of the coil will be necessary to peak up the output.

In the unmodified EC-10 the AF gain control potentiometer serves as diode load. To retain the AM and AGC, the resistor R1 was fitted as a DC load to the diode. The AF signal to the gain control can now be selected by a change over switch from C7 for CW, FSK and SSB, or from C8 for AM reception.

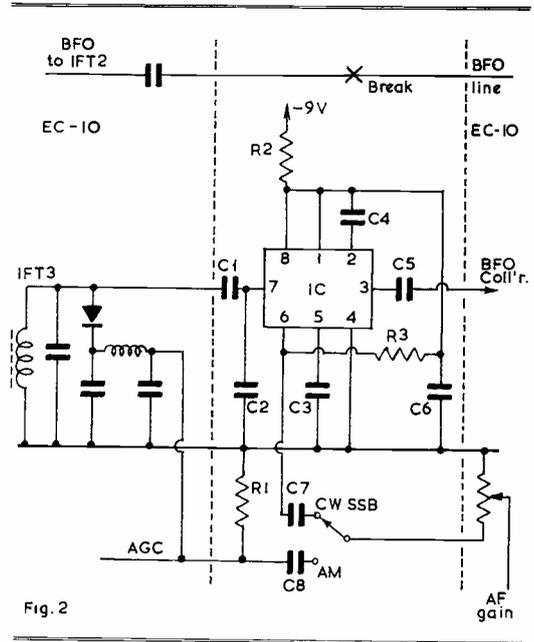


Fig. 2

**Constructional Work**

On the EC-10 the complete IF/AF strip is held on the main chassis by four screws. The cabling is such that the strip can be turned through a right angle after removing the screws; holes are provided for refixing the strip to the main chassis with two screws. In this posture one

Fig. 1. The basic external connections to a product detector.

Fig. 2. Circuit used to provide the EC-10 with a product detector. All wiring and components between the dotted lines new; all outside the dotted lines constitute original circuitry.

Fig. 3. An outline sketch of the EC-10 PC board between the last IF transformer and the BFO, showing how it can be adapted to take the product detector. The shaded portion on the left is earth-copper. The other shaded portions are uncommitted copper strips on the board, now put to use. Most of the holes do not exist and have to be made with a fine drill. The ring of eight holes for the IC is shown in black; the numbers correspond with the leads from the TO-5 IC package. For clarity, most wiring and component detail has been omitted; the information is contained in Fig. 2.

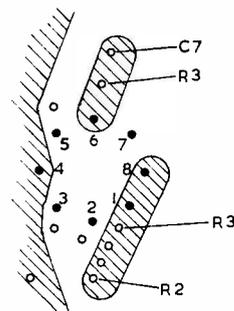


Fig. 3

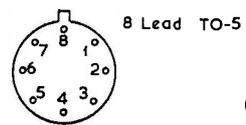


Fig. 4

Fig. 4. The pin numbering on the TO-5 package of the double balanced modulator IC.

has complete accessibility for servicing, aligning and modifying the receiver

There is plenty of room for the product detector in its natural place, between the last IF stage and the BFO. (The original designers may have foreseen the possibility of developments in this area and left room). In the centre of this part of the PC board are two unused copper strips surrounded by earthed copper screening. Fig. 3 shows how this has been exploited. Eight holes are drilled to take the IC. A small drill, about twice the diameter of the wire leads on the IC, held in a watchmaker's hand chuck, enables this to be done in a few minutes. Further holes are then drilled in the vicinity to take the circuitry of Fig. 2. For example, the hole adjacent to lead 2 takes the wire from C4. They are joined by soldering fairly close to the board. The other end of C4 goes to the copper to which the leads 1 and 8 from the IC are soldered and also R2, R3 and C6.

The IC obviously has to be threaded through the holes before any soldering can be done. This proves simple, provided the leads are splayed out and then bent individually towards the right hole. The leads should be held at the roots with tweezers before bending.

The change over switch, AM to CW/SSB, is mounted at the rear of the main chassis. An extra screened lead from C7 is run alongside the existing screened lead bringing the AF from the diode. The components C8 and R1 can be located around the switch. The BFO switch on the front panel could be altered for this purpose; it might also be adapted to switch the 9v. line to the product detector instead of the stabilised line to the BFO. The BFO could then be supplied, using a separate zener, from this 9v., thus doing it all on the one front-panel switch; BFO "On" for CW, SSB and FSK and BFO "Off" for AM.

In operation the improvement afforded by the product detector is dramatic. FSK on 20m. can be resolved and, using the EC-10 as a tuned 10m. IF for the converter, two-metre SSB is "readability five."

#### Reference:

- (1) *SWM*, Feb. '71 page 731, and March '71, page 19.
- (2) *SWM* March '72, page 31, Fig. 3.

## POCKET CRYSTAL CHECKER

### TESTING FOR ACTIVITY

M. J. GORDON (G8CRW)

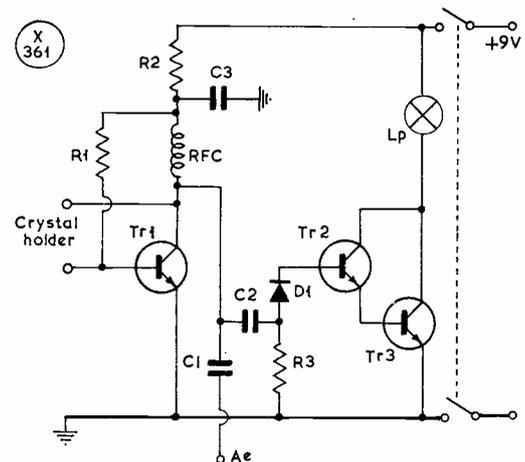
One cannot always be sure that second-hand crystals have been treated with the respect they deserve. Accordingly the test unit described was built by the author prior to a prowl around radio surplus stores for 8, 12 and 35 MHz crystals suitable for 2-metre transmitters and converters. It has also proved useful as a 1 MHz "pipper", and for finding out where, on 2 metres, the twelfth harmonic of a 12 MHz crystal comes. (Not always 12 x 12, as the reader will appreciate.)

The circuit is shown in the diagram. When a good crystal is plugged into the holder, between the base and collector of Tr1, the transistor will oscillate. Part of the RF is rectified by D1 to produce a positive voltage at Tr2. This causes current to flow through the compounded BC184's Tr2 and Tr3, which act effectively as one "super alpha" transistor, causing the bulb to glow. If the crystal is inactive the bulb will not light.

To check that the unit, when built, is working, a crystal of known quality is needed. Alternatively an LC combination can be plugged in instead of a crystal; suitable values are a small RF choke or MW coil with a capacitor of about 30 pF in series.

A terminal is fitted to Tr1 collector through .002  $\mu$ F for use as a "pipper". When the aerial coil of a receiver is connected to the terminal, D1 will be starved of RF and Tr2, Tr3 will turn off. This conserves the battery as the drain should then drop from 55 mA to about 500  $\mu$ A.

The unit can be built into a 2oz. tobacco tin, or smaller if desired; but the tobacco tin does have the advantages of ruggedness, a solderable chassis, and easy



Circuit of the pocket crystal checker, for which values can be: C1, .002  $\mu$ F; C2, .0047  $\mu$ F; C3, .02  $\mu$ F; R1, 1.5 meg.; R2, 9.1K; R3, 470K; RFC, 10 mH; Tr1, BF180; Tr2, Tr3, BC184; D1, OA81; Lp, 6v. 60 mA bulb.

availability. It is also truly pocket-size and a PP3 battery on its side fits into it snugly. An octal base was used for accommodating crystals. An FT241 fits into pins 3 and 5 and the holders at pins 2 and 8 have been squeezed together to accommodate HC/6U types. Pins 3 and 7 will accommodate  $\frac{3}{4}$ in. crystals.

The transistor and its circuitry are soldered directly to the octal holder and the other components fit on a 6-way tag strip. As the bulb is under-run and infrequently used, a holder for it was dispensed with and the bulb connected directly to the switch.

## DISCUSSING DIRECT-CONVERSION FOR SSB RECEIVERS

### SOME THEORETICAL CONSIDERATIONS

**A**N article by Al-Araji and Prof. W. Gosling on this subject appeared in the March, 1973, issue of *The Radio and Electronic Engineer*. In view of the growing interest in amateur circles in receivers of this type for VHF and UHF working, here follows a summary of the findings which may stimulate further experiments in this field.

Direct-conversion single-sideband receivers are of interest because they are less subject to spurious responses than the conventional superheterodyne, do not entail the use of high-gain, narrow-band amplifiers with high centre frequency, and lend themselves better to integration in monolithic form.

Two approaches to the design of receivers of this kind have been described: (1) The phasing technique, in which the local oscillator is tuned to the nominal signal carrier frequency and the unwanted sideband response is eliminated by phase cancellation; (2) Weaver's "Third Method," in which two oscillators are used, the first tuned to the centre of the incoming SSB spectrum, and the second to the centre of the reconstituted AF spectrum.

Analysis of the two approaches shows that, in the AC coupled variant, the Weaver solution is superior. In the conventional superhet receiver for SSB reception the incoming signal is mixed with that from a local oscillator to produce an IF signal, the unwanted upper or lower sideband being removed by a filter. The wanted sideband is then heterodyned to produce the required

audio. The sideband filter specification is severe and even with the crystal filters now in universal use, a high IF is precluded. Thus, double or triple conversion receivers are commonplace, particularly at the higher signal frequencies. While multiple conversion helps to overcome stability problems, the extra conversion processes introduce spurious responses.

Direct conversion implies the use of a heterodyne oscillator at or near the incoming signal frequency so that the output from the conversion process, after filtering to remove the high frequency components, falls within the audio range.

One of the principal difficulties in applying direct conversion lies in second-channel response. To eliminate this the receiver can be designed with two initial mixers in which the signal is mixed with sinusoids of identical frequency but in phase quadrature. Low-pass filtering will then produce two quadrature outputs in the audio spectrum from which the speech modulation can be extracted. There are two different ways in which the signals can be combined to give the required signal response and suppress the unwanted. These are:

(1) One of the IF outputs can be put through a network which phase-shifts all components by  $90^\circ$ . (A network of this type is sometimes referred to as the Hilbert transform). On adding the output from the phase shifted channel to that from the other, one of the receiver responses is reinforced and the other approximately cancelled (Fig. 1A). This is known as the phasing, or out-phasing, method of SSB reception.

(2) The two IF outputs may be passed to a second pair of mixers, in which they combine with quadrature outputs from a second local oscillator. The outputs from the second mixing process are then simply added, as in Fig. 1B. This circuitry is essentially equivalent to a class of bandpass filter. It is known as "Weaver's Third Method" of SSB reception.

In the Weaver configuration the first conversion involves a local oscillator tuned to the centre of the received SSB spectrum. Thus, the SSB centre

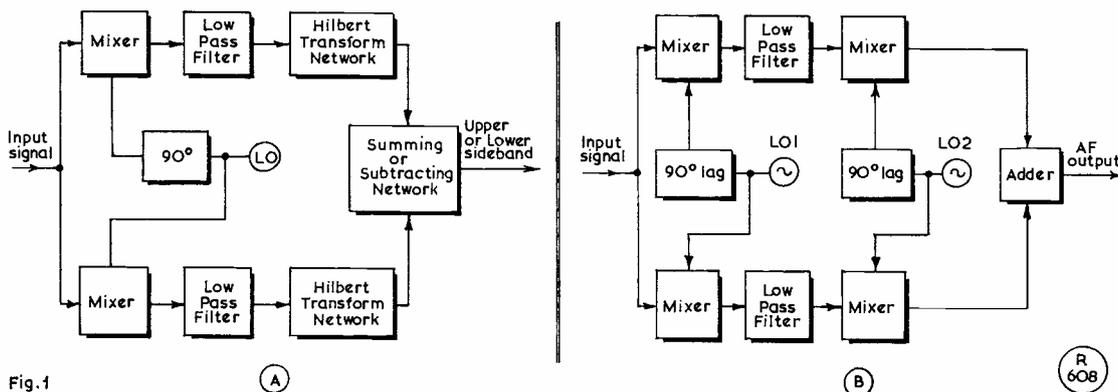


Fig. 1

(A) Block schematic to use phasing method for unwanted sideband suppression. (B) The Weaver configuration for SSB reception.

frequency is translated to zero, and the lower half of the spectrum is "folded over" to fall on the upper in a total IF bandwidth extending from zero to half the total bandwidth of the SSB signal as transmitted.

By the use of two IF channels with the oscillator feed to both first and second conversions in quadrature as between the two channels, two audio outputs are produced with the erect spectrum in phase and the inverted spectrum in anti-phase. Simple addition of the two outputs will then result in the cancellation of the inverted spectrum, provided that the two IF channels are identical. If cancellation is imperfect, the result is heard as distortion but not as adjacent channel interference.

An advantage of the Weaver approach is an inherent improvement in the rejection of adjacent channel interference since the cut-off frequency of the filters used is about one octave lower than in the phasing receiver. A second advantage lies in the nature of the spurious response: When the receiver is correctly tuned the spurious signal in the audio output is simply the inverted spectrum and it has been shown that quite a high level of distortion of this type can be tolerated without loss of intelligibility.

A more serious problem arises when the IF chain is DC coupled. This is necessary if all the transmitted frequencies are to be reproduced, since a component of the received signal which is at the centre of the SSB spectrum and coincident with the first oscillator frequency will give rise to a DC component in the output of the first mixers. Spurious DC output from the IF amplifiers due to drift will, after the second frequency conversion, result in an audio output at the frequency of the second oscillator which may be within the audio range. This defect can be overcome by using AC coupling in the IF channels. A secondary effect of such coupling is to produce a steep notch in the centre of the receiver response curve which has a half-power width of 500 Hz, but this has little effect upon intelligibility.

### Conclusions

The two types of receiver based on the Direct Conversion principle have been compared to the advantage of the AC-coupled Weaver form. However, both share a major advantage over the superheterodyne, in that they give many fewer spurious responses. Image or second channel response (at a frequency removed from the signal frequency by twice the IF) vanishes, because in effect the IF is reduced to zero. Similarly, the pairs of spurious responses observed in the superheterodyne, separated by the magnitude of the IF above and below each of the oscillator harmonics, are reduced to single responses at the harmonics. Higher-order spurious responses are reduced in number for similar reasons, and IF breakthrough does not occur. The interactions between first and subsequent converters which are often troublesome in multiple superheterodyne designs have not been observed in the direct conversion receiver described. This is, as would be expected, because the phasing receiver is of the single-conversion type, and although two conversions occur in the Weaver configuration, the frequency of the second local oscillator is too low for it to interact with the first.

Direct conversion receivers should be cheaper to construct than superheterodynes of similar specification

for a number of reasons. Because of the reduction in spurious responses, pre-mixer RF filter specifications can be less stringent. IF amplification uses low cost AF monolithic circuits and does not require tunable components. Filtering is by fixed and relatively cheap, low pass components. Thus, although the IF channels are duplicated, the overall cost is likely to be less than that of a single conventional IF strip. Multiple conversions are unnecessary. Circuits are non-critical if the DC coupled form is avoided, and only a reasonable degree of gain equalisation between IF channels is required, particularly in the Weaver circuit. For all these reasons, designers of receivers for SSB applications ought to give serious consideration to the use of the direct conversion principle. *A.H.D.*

### SPECIALY ON THE AIR

Most of these events have been worked out since our last appearance. Here are those remaining of which we have been notified. If there are to be any more (during September) please send in details as soon as possible. We shall also be glad to have short reports on what transpired on these occasions, and the results achieved.

**GB3BSI, July 28-August 4:** Operating from Brownsea Island, Poole Harbour, Dorset, running 10-80m. SSB and AM/FM on 2m./4m.—P. Dufield, G3OBD, 16 Talbot Drive, Poole, Dorset.

**GB2SJC, July 28-August 4:** For the Welsh Scout Jamboree at Penryn Castle Park, Bangor, North Wales, for which a large number of Scout campers is expected. A CW/SSB station will be operated on all bands 10-80m., for which some volunteer A-liaison operators and SWL assistance, for logging and QSL card work, would be appreciated.—D. Roberts, GW3UBV, 33 St. Martins Park, Haverfordwest, Pembrokeshire.

**GB2GB, August:** Station to be operated from Brunel's famous old steamship *Great Britain*, now dry-docked, at Bristol, for the City's charter anniversary celebrations. GB2GB will be available for operation by visiting licensed amateurs during the entire month. Contacts will be QSL'd by special card. Information from G. Mather, G3GKA, 8 Hills Close, Keynsham, Bristol.

**GB2YEO, during August:** From the Yeovil Technical College, running all bands 10-80m., also two metres. QSL by special card.—D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset, BA21 3JR.

**GB3RAF, August 10-27:** In conjunction with the R.A.F. Exhibition, Billesley Common, Birmingham, operating on HF and VHF from the exhibition site, 10 a.m. till 8.0 p.m. daily. Operators will be R.A.F. personnel.—Hon. Secretary, R.A.F. Amateur Radio Society, R.A.F. Station Locking, Weston-super-Mare, Somerset. (*GB4CES may also be used*).

**G3CAR, September 1:** For the 27th annual Wycombe Show, at The Rye, High Wycombe, Bucks., organised by the Chiltern Amateur Radio Club, to operate CW/SSB on all bands 10-80m. RTTY skeds would also be welcomed.—A. C. Butcher, G3FSN, 70 Hughenden Avenue, High Wycombe, Bucks.

## QRO LINEAR FOR TWO METRES

### CONSTRUCTIONAL DESIGN AND LAYOUT — TESTING AND SETTING UP

#### Part II

J. D. V. LUDLOW (GW3ZTH) and  
C. J. DUNBAR (GW8EHK)

*The first part of this article appeared on pp. 286-289 of the July issue of SHORT WAVE MAGAZINE, which should be read for continuity.*

—Editor.

The PA neutralising arrangement consists of two p.t.f.e. feedthru' bushings inserted between V1 and V2 valve holders. These feedthrough's are electrically screened from "seeing" the valve screen grids by two 3/4 in. high L-shaped partitions made out of brass shims. They are secured in place by the valve holders and their mounting clips. Attached to these p.t.f.e. bushes in the anode compartment are two small wire flags, Cn, one facing towards each anode, whilst on the grid side TC3 and TC4 are connected between the bushing and the grid terminals on the air system sockets—See Fig. 1, p.287, July.

This novel arrangement (due to G8ABP) has simplified the adjustment of the neutralisation.

#### Alignment

With the valves *in situ* the grid circuit should be

resonated to 146 MHz with VC1 at max. and with TC1 and TC2 at their mid positions, as the grid compartment top cover lowers the circuit resonance when it is in place. The anode lines should resonate at 146 MHz with a separation of approximately 1/4 in. between VC2 discs. This will again take account of the effect of the top cover and Pawsey stub on them.

A preliminary check on the neutralising can be made at this stage by coupling a GDO into the anode lines whilst adjusting VC1. The condition of "no kick" in the GDO reading should be observed when resonance is passed through. If this is not the case adjust TC3 and TC4 one way and repeat until the condition of "no kick" is observed. This indicates little or no coupling between input and output circuits.

Next check the heater voltage on pins 3 of V1 and V2 valve holders. It should be 6.0v. AC and no higher. In fact 5.8v. is enough since some back bombardment of the cathode takes place which increases the cathode temperature and cathode emission as a consequence.

It is advisable to carry out a few checks on the valves before inserting them in their sockets, e.g., ensure that there are no inter-electrode shorts or leaks.

With the grid compartment cover in place, and the blower running, establish the bias supply. Check that no reverse meter readings occur with the meter switch SW1 in the grid current position as this would indicate grid cathode leaks. If all is well apply a little 144 MHz RF drive, with the grid currents running at 3 to 4 mA, then adjust VC1, TC1 and TC2 for balanced grid drive.

Now with the grids driven up to 4 to 5 mA adjust the anode tuning capacitor VC2 through resonance and see that there is no dip in grid current over the anode tuning range. Should there be even the slightest indication of effect on the grid current adjust the neutralising flags Cn until no further reaction is observed. (over

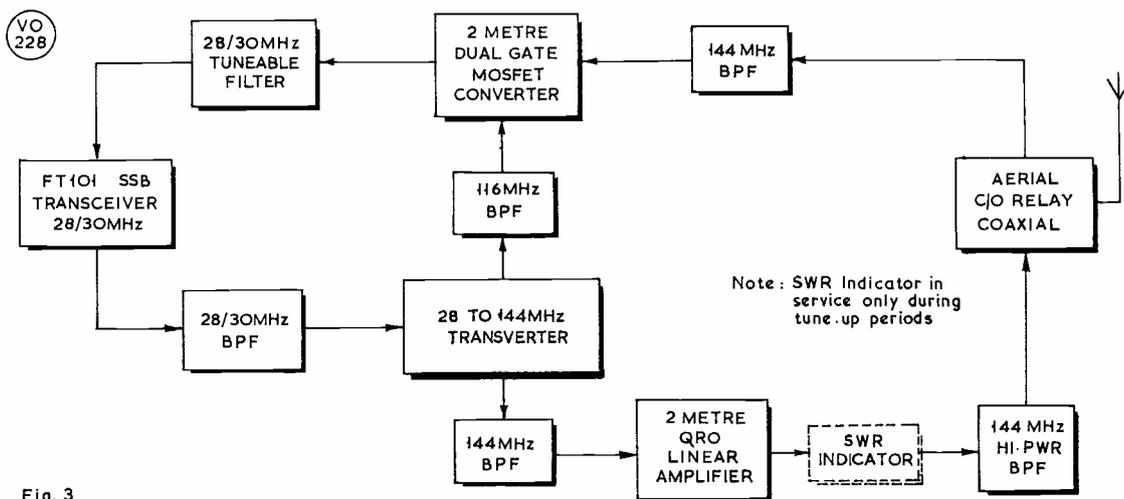


Fig. 3

Fig. 3. Possible inter-connection diagram incorporating the high-power Linear Amplifier

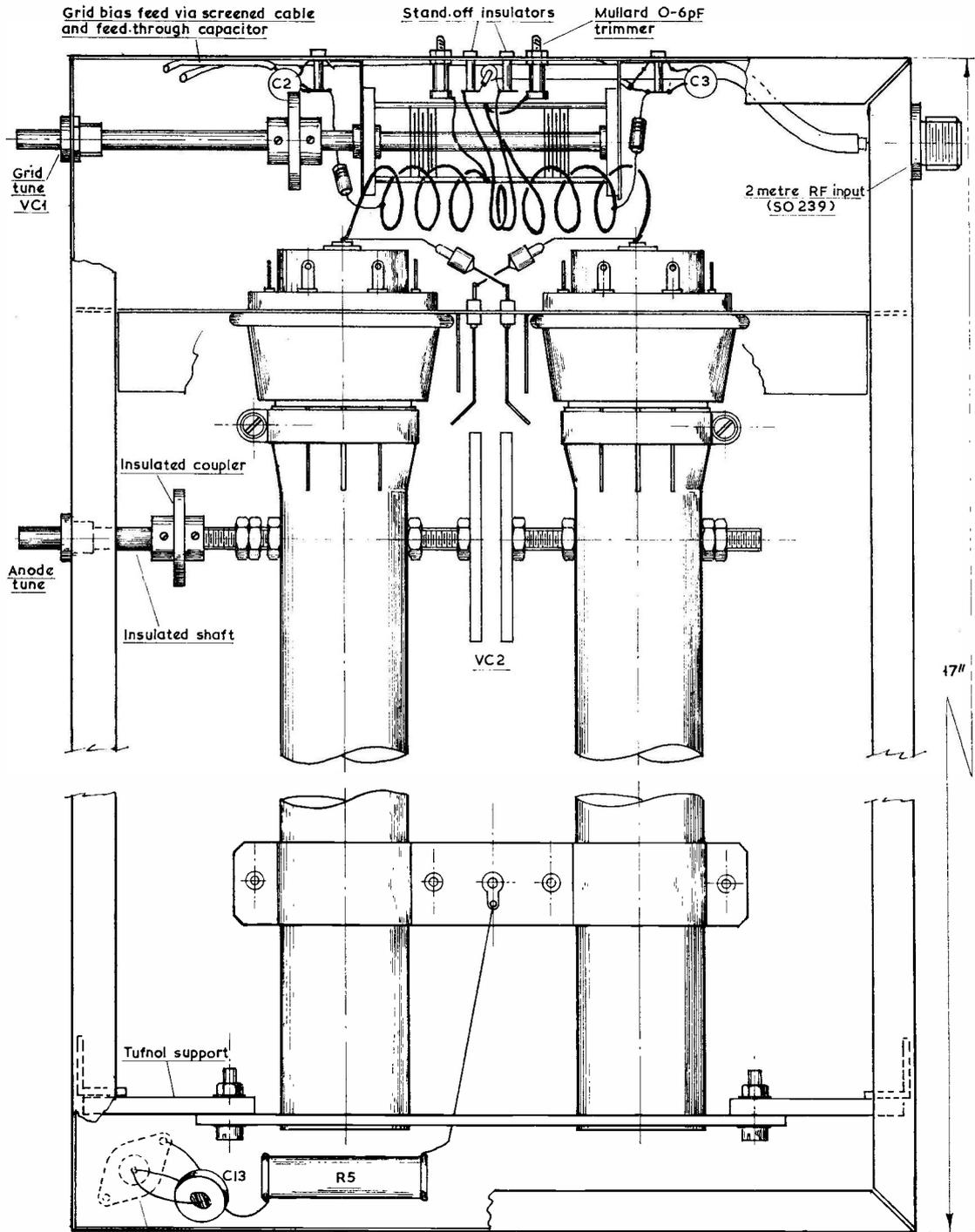
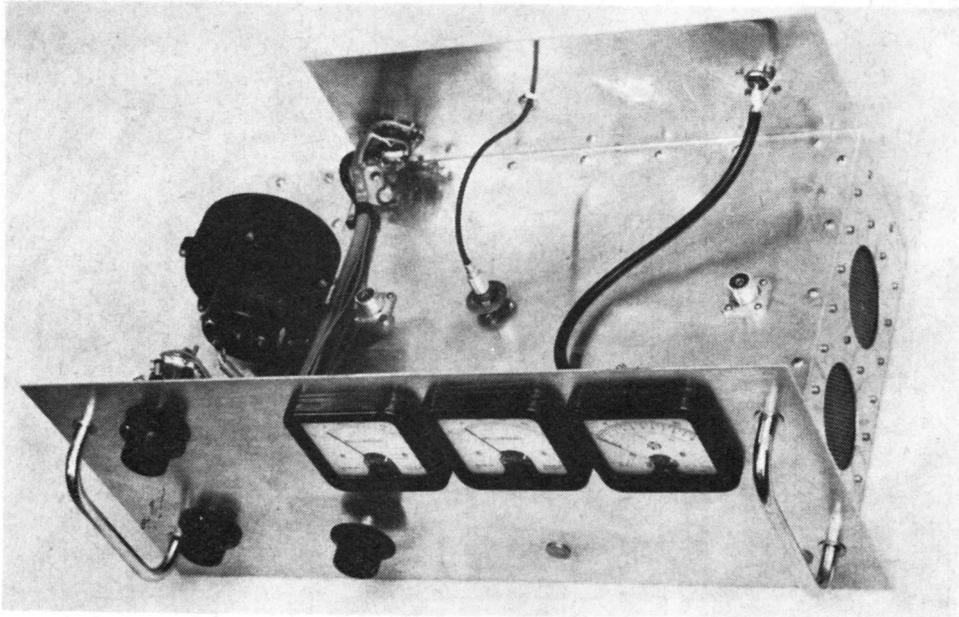


Fig. 4

SCALE: HALF FULL SIZE

VO 229



General appearance of the QRO Linear, showing the blower mounted at left and the hot-air vents in the right-hand chassis drop—compare drawing Fig. 4, which is the under-view. The front panel controls are grid and anode tuning, VC1 and VC2, and the meter switch. The functions of the three meters are explained in the text.

Next, apply the EHT supply but with no screen voltage; the anode current will be at a very low figure (20 mA in the authors' case) and will to some extent be dependent upon the EHT and bias voltages. Apply 144 MHz RF drive until the control grids draw 2 mA apiece. The anode current meter should remain stable and should not rise as VC2 is tuned through resonance. If this is not the case *switch off* and *isolate all supplies* not forgetting to *earth the anode lines* with an earthing wand before touching anything inside the anode compartment!

Make a small adjustment to the neutralising flags and repeat the above test until no further improvement can be made.

The amplifier is now ready to be checked under RF power conditions. Roughly set the Pawsey stub to 145 MHz with a GDO and place it together with the upper cover on top of the anode compartment. The Pawsey stub should be about  $\frac{1}{4}$  in. or slightly more away from the anode lines. Without any drive establish the amplifier bias supply. Set it initially to  $-60v.$ , then switch on the EHT and screen supply. Adjust the bias supply until the total anode current is about 200 mA. Feel the air outlet and see that both valves are at about the same dissipation which they will be if their emission is good. With the amplifier still in this state and a dummy load connected to the RF outlet socket, ensure that the anode current remains stable under all conditions of grid and anode

tuning. If it does not pass this test it is not yet ready to be air tested. If all is well apply a little 144 MHz RF drive and tune the anode circuit for maximum forward power output on the reflectometer. Increase the RF drive up to the point of grid current. Load the anodes between 300 and 450 mA depending on EHT and check the power output and see that it is no more than 400 watts with the amplifier running under linear conditions. If a 'scope is not available for setting up the amplifier over-couple the Pawsey stub by 10 per cent to get a reasonably linear condition. Then, with the aid of a local station experienced enough to know what to look for, ensure that the transmission is free from unwanted products.

#### General Layout of Controls and Metering

The layout of the amplifier controls is not critical and some variation would be possible without adversely affecting performance. In the authors' case the Pawsey stub tuning is brought out on the front panel *via* a flexible coupler, but there are other alternatives. The metering was chosen to provide continuous monitoring of both screen grids simultaneously, in addition to the PA anode current check. Division of the latter into separate anode currents is neither practical nor desirable. The three meters provide adequate monitoring of grid and anode currents when setting up the amplifier. In operation the important factor to watch is the screen dissipation as far as the safety of the valves is concerned, hence individual monitoring of each screen current is a "must," otherwise one may learn too late that one of the valves has been taking too much of the load, while

Fig. 4. General arrangement of the Two-Metre Linear Amplifier—at left.

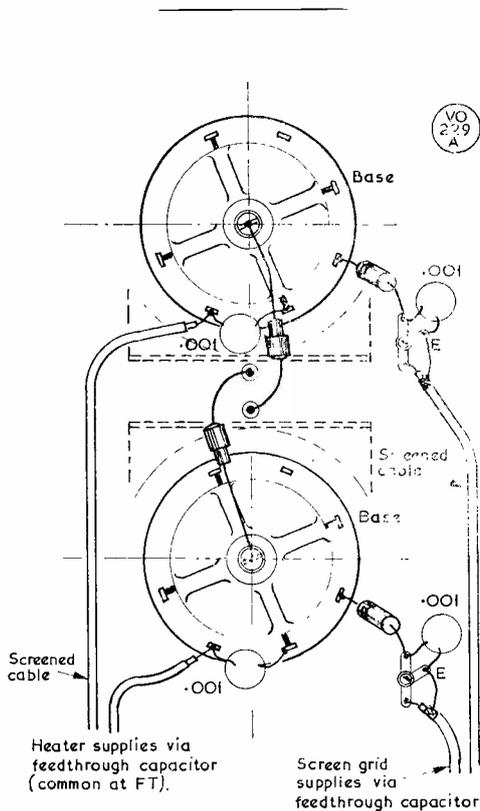


Fig. 4a. Underside view of Bases

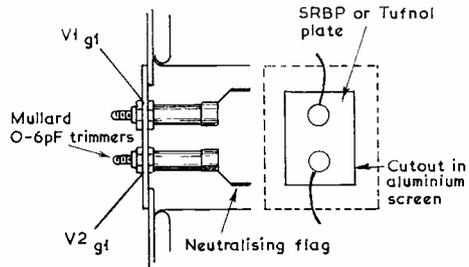
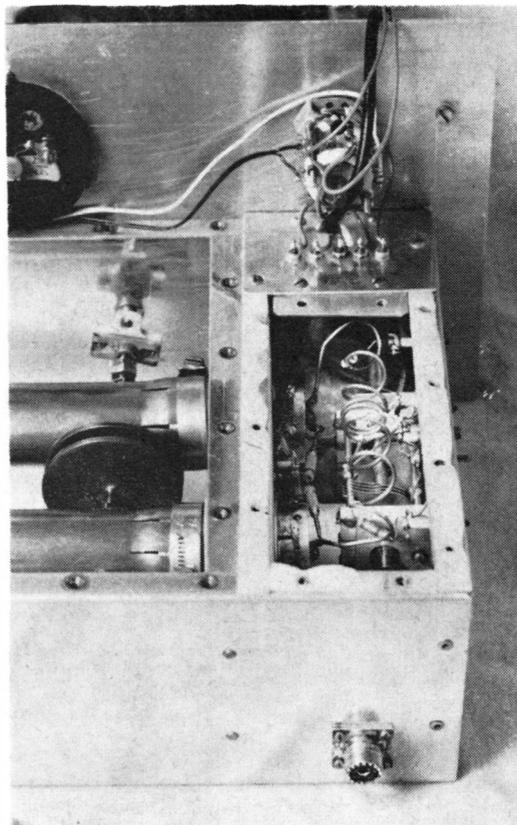


Fig. 4b Alternative arrangement of Neutralising capacitors

Fig. 4B. Detail sketches to illustrate points of layout and construction.



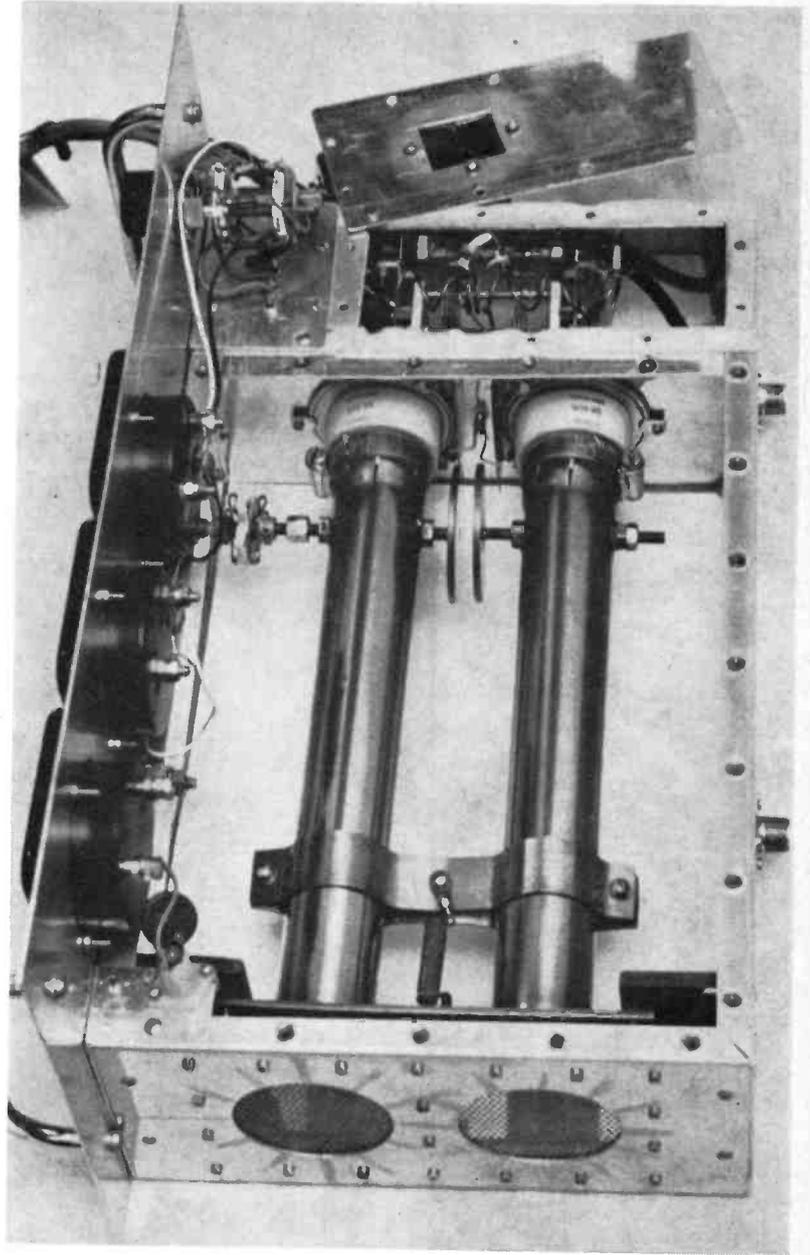
Grid end of the two-metre linear amplifier, showing general arrangement—and see drawing Fig. 4, p.352.

screen current also serves as an indication of loading on the valves.

The layout of the authors' station is shown in Fig. 3 and between the balanced mixer and antenna are nine 144 MHz tuned circuits to prevent unwanted products from being radiated outside the band. It is also advisable to have some form of power control so that no more power than necessary is used to complete each QSO in comfort. High power is used only when needed. Also, at the higher power levels the SWR bridge is removed to prevent any possibility of unwanted products appearing as a result of the bridge diodes being pumped by the high power RF.

The amplifier is extremely docile and gives a good account of itself; no untoward problems have been encountered so far. However TVI can be a problem and here one has to temper one's use of high power with "local social considerations"—for instance, GW3ZTH find that 50 watts out gives adequate results for most contacts with only the occasional need to go to higher power working. Of course, at the lower power levels the linearity is extremely good and on-the-air reports tend to indicate this.

Underside view of the QRO Linear, showing final appearance—compare with drawings p.352. The anode tuning condenser VC2 is clearly visible between the line tubes, with the neutralising flags near it. The grid compartment at the top has the cover off to show detail.



#### Some Possible Variations

Other possibilities exist of achieving the same result, all having their individual merits. The authors would, however, make only one change, and that is to the anode lines. The G3BA design here has much to commend it, inasmuch as valve changing is easier and prefabrication of the lines less of a problem.

The linear will work well with 4X150's or 4X250's

but more air will be needed because of their glass insulation and a figure of 100 c. f. m. is not too much if they are pushed to their limits.

By sharp contrast the 4CX250B requires only 5 cubic feet per minute of air at 200w. anode dissipation, this being due to its ceramic insulation. There are several variants in this range, all with relatively similar characteristics. These are the *Mullard* QV2-250C and

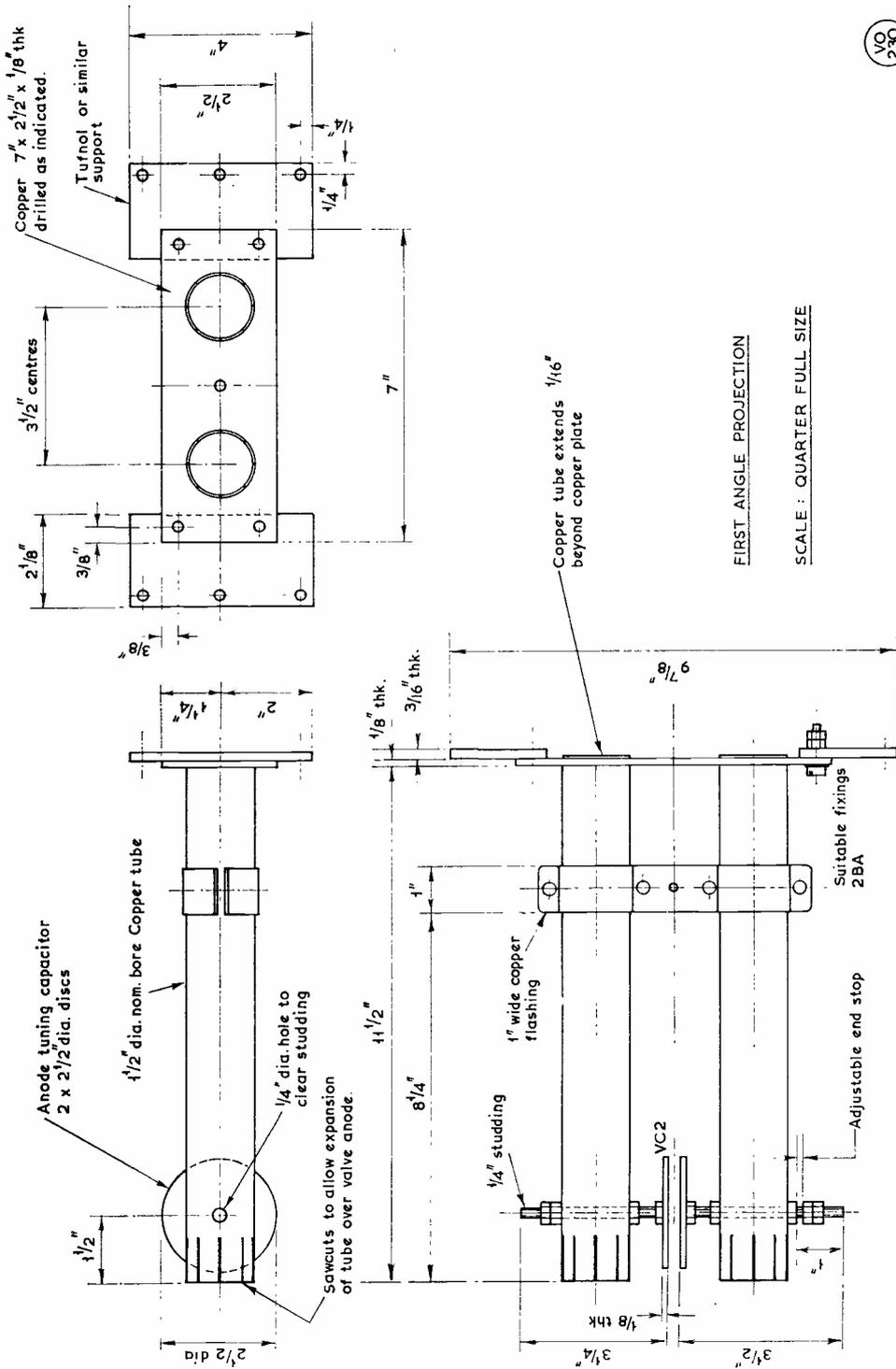


Fig. 5. Anode lines are of copper tube, 1 1/2 in. nominal bore. Tank tuning condenser VC2 made of two 2 1/2 in. diameter copper discs (see drawing Fig. 4). Tufnol strip is used for support pieces. Position of the shorting strap on the lines found by experiment—see text.

Fig. 5. Details of relevant parts of the Linear Amplifier

Fig. 5.

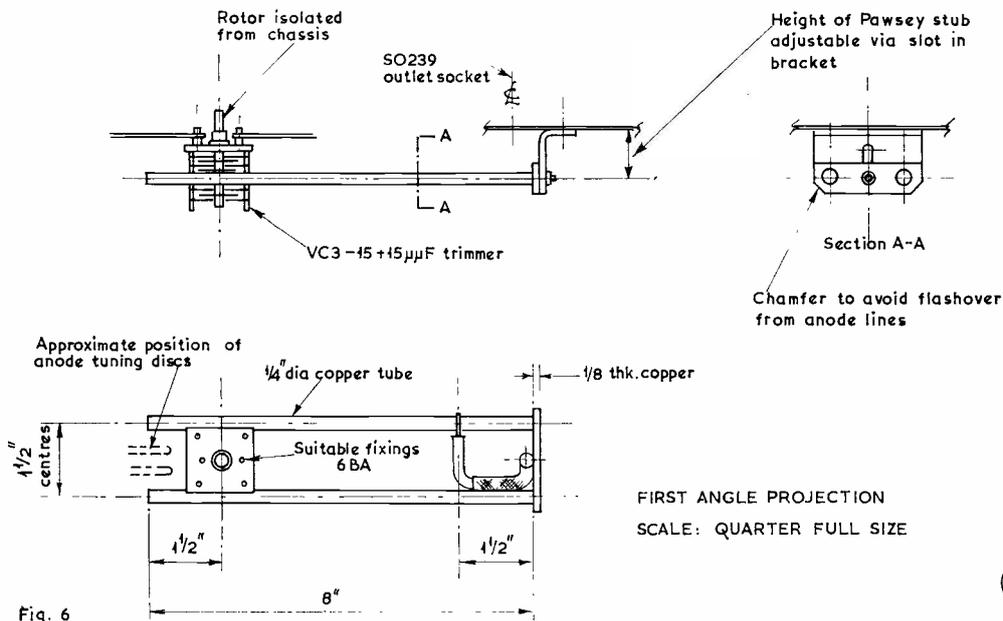


Fig. 6. Showing construction of the Pawsey stub

Fig. 6. In the Pawsey stub for RF power take-off, the position of capacitor VC3 is determined with reference to VC2, Figs. 4, 5. Dimensions shown are for 75-ohm load impedance.

QV2-250F, which are equivalents of the 4CX250B and 4CX250B/M respectively—the suffix “F” indicating a 26.5 volt heater. The 4CX250B/M is a type intended for coaxial cavities but works well in all arrangements, whilst the 4CX250R is a ruggedised version of the 4CX250B. The type numbers 7034 and 7203 are *Eimac* and are the 4X150A and 4CX250B respectively. Another variant is the 4CX350A and 4CX350F, which are the types intended for linear operation only, the suffix “F” being as for the 4CX250F. Other types available in this range include the 4CX300A/8122 but these require different valve holders. There is also available a range of conduction-cooled types and the authors hope to publish a future article on a linear using these.

**Power Supplies**

Fig. 2 on p.288 of the July issue shows a schematic of the station power supplies for the linear. However it is up to the individual as to what form these should take. The main points to follow are:—The blower *must* come on *first*, then the heater and bias supply, with the EHT and screen supplies following in that order. The screen supply should be stabilised and can be fed via a series regulator arrangement of a bank of VR-150/30’s.

During the “receive” period it is imperative that if the EHT is left switched on, the screens should be grounded otherwise the anode currents will rise at an alarming rate. (This is caused by an accumulated charge appearing on the screen by-pass capacitors due to valve secondary emission). Also, in addition a blocking bias should be applied to the control grids during the “receive” periods to cut the valves off effectively and so prevent any hash from valve shot-noise affecting the receiver.

Fusing is of paramount importance, and the present set up at GW3ZTH now includes individual fusing in the screen grids of the 4CX250B’s in addition to those in the PSU.

Anyone attempting this project would be well advised to consult the manufacturers’ data concerning the operation of the valves.

The EHT supply is lethal and one may not get a second chance to make any further mistakes, so absolutely rigid discipline is necessary—remember kilovolts are also “killer-volts”.

Finally the authors wish to thank the following for their assistance and advice: To G3BA, G3DAH, G8AGU, G8ABP, G3UDA, GW3FSP, GW3TMM, GW4BDV and GW8DUP our grateful thanks.

To keep in touch with the world of Amateur Radio, read “Short Wave Magazine” regularly — Independent, Unsubsidised and now in its 31st volume.

\* \* \* **THE MOBILE SCENE** \* \* \*

## NEWS AND PICTURES

With generally good weather, the Rallies held during the mid-month period June-July did well in terms of both attendance and trade support.

For the Elvaston Castle event near Derby, the figures come to about 1,000 cars parked and some 3,000 people estimated to have been present in the course of the day—these are large totals, by any Rally standard. Activities included a display of Police dog-handling and a steam-engine exhibition with working steam models. Put on by the Nunsfield House Community Association Radio Group, of Alvaston, this year they made the catering arrangements themselves—which appears to have worked out well and, even with generous help from the distaff side, must have been a not inconsiderable undertaking! They are already planning for next year's Rally.

\* \* \*

June 17 saw the Amateur Radio Mobile Society's Rally—and we were glad to see A.R.M.S. back again in the Calendar after too-long an absence—at R.A.F. Cosford this time. The event brought in some 2,000 people in about 500 cars, with the focal point a large trade show in a big hangar, and the Aircraft Museum another centre of attraction. Unfortunately, the Top Band station had to cope with a steady and unsurpressible S8 noise-level from an unidentified source, which made it difficult to work 160m. /M's unless they were very strong, and near! However, G3BHT/P on the two-metre SSB channel operated from a remote, QRM-free site with considerable success. On the other hand, the 2m./FM channel attracted few callers. The HF-band SSB station signing G4CES made about 200 contacts.

We are told that a disappointment was the poor attendance of London area mobiles, who had only to come up the M1.

\* \* \*

For the Rally at Upton-on-Severn, Worcs., laid on by the Worcester & District Amateur Radio Club on July 7, they had 550 cars at the ground and some 2,000 people present, in bright and warm Wx. All /M installations were looked over by a panel of judges, their decision being that G8FTC (Sutton Coldfield) showed the best mobile rig. It seems that a disqualifying factor in this adjudication was hand-held microphones, not looked upon with favour, the comment being that too many /M operators still use them. ("Hands on the wheel and eyes on the road" being a very proper rule for safe driving). Once again, an interesting result in the talk-in station scoring: On two metres 51 /M's were worked but on Top Band it was only 17 mobiles in the log—a clear indication of the swing to VHF for mobile operation. (Of course, for long ground-wave ranges and the possibility of real DX, with just as simple and unobtrusive an Ae. installation, ten metres would be even better!—*Editor*).

## THE RALLY CALENDAR

**July 29:** To be put on by the Wessex Amateur Radio Group at Royal School of Signals, Blandford Camp, Blandford, Dorset, with talk-in on 160/80/4/2 metres. Trade stands and refreshments.—A. G. Emery, G3YWG, 7 Brunel Drive, Preston (3177), Weymouth, Dorset.

**August 5:** RSGB Mobile Rally at Woburn Abbey, near Luton, Beds., as in previous years. Talk-in by GB3RS on 1910 and 3700 kHz, and by G3VHF on

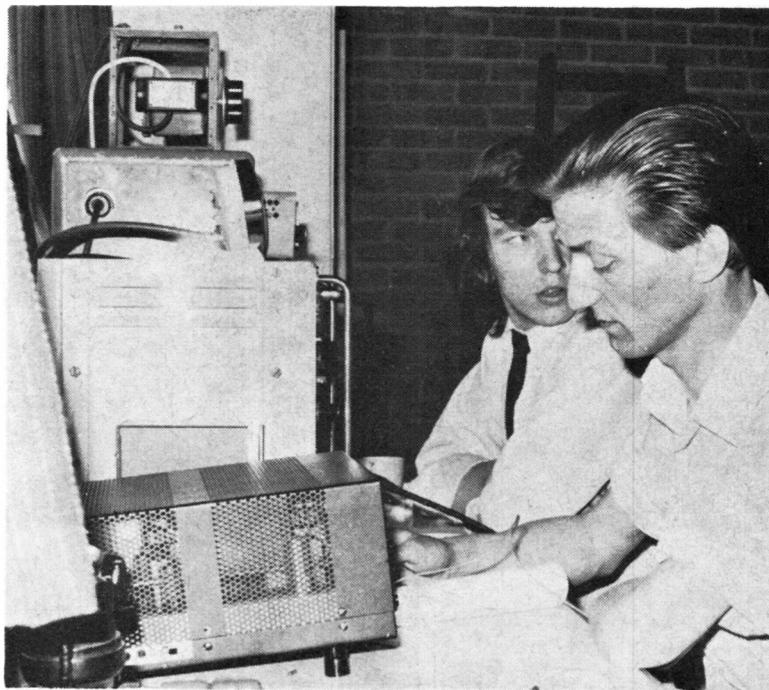


*General view of part of the trade exhibition for the Maidstone Mobile Rally.*

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The 160-metre talk station for the Maidstone Rally was operated by G3ORP (nearest camera) and G3ZSU. They were plagued by a very high noise-level from a nearby static display stand, which hampered them considerably. GB3YSC had a good aerial 160ft. long by 55ft. high above an earth mat and they were getting out well.

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70·26, 144·48 (FM), 145·00 (AM) and 145·41 MHz (SSB). There is a flat-rate charge of 50p for vehicles entering the Park, the bring-and-buy stall will charge 10% commission on sales, and the site is just off the A.50. There will be local sign-posting.—G. P. Shirville, G3VZV, 2 Orchard Close Toddington Dunstable, Beds.

**August 12:** Torbay annual Mobile Rally at Newton Abbot Rugby Club ground, with talk-in on 1867 kHz and two metres, the usual stands, competitions and model aviation.—L. H. Webber, G3GDW, 43 Lime Tree Walk, Newton Abbot, Devon.

**August 12 :** The 1973 Mobile Rally at Derby, organised

by the Derby & District Amateur Radio Society, to be held at the Rykneld School in Bedford Street, as in previous years. Ample accommodation if wet, free entrance and plenty of parking space, many attractions for all comers. Talk-in from 10.0 a.m. by G3ERD/A on 160m., G2DJ 4m. and G8DBY, two metres. Auction sale a speciality! This is a well-established annual event, which regularly attracts a large attendance.—F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby, DE3 7GE.

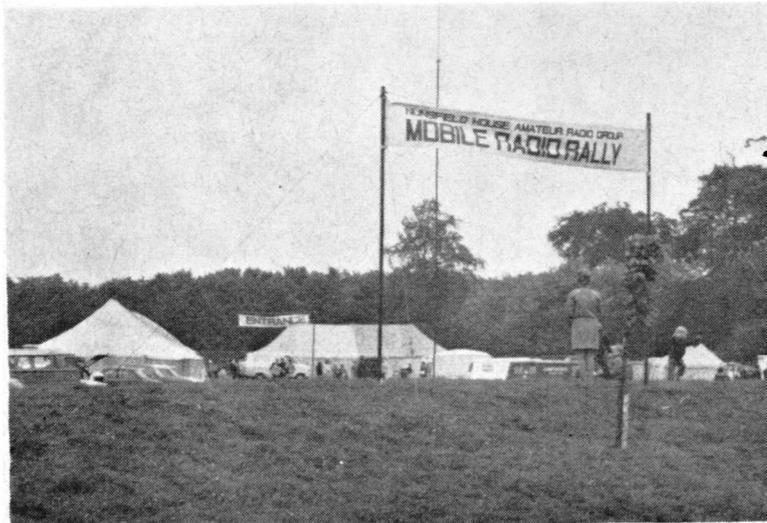
**August 19:** Preston (North Lancs.) Annual Mobile Rally at Kimberley Barracks, Deepdale Road, Preston, Lancs., with free car park, trade stalls,




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View across the car parking on the occasion of the A.R.M.S. Rally at R.A.F. Cosford, attendance being estimated at some 2,000 people in 500 cars.

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Layout at the entrance for the Elvaston Castle Mobile Rally on June 10, organised by the Nunsfield House Group—see report p. 358.

For the Maidstone Rally they had a most impressive Ae. array—having had the use of the field for several years now, the GB3YSC group is slowly converting it into a massive earth mat!



refreshments and a bring-and-buy offering. Talk-in will be given on Top Band and two metres.—Contact man G. W. Earnshaw, G3ZXC, 12 Withy Parade, Fulwood, Preston, Lancs., PR2 4JN.

**August 19:** Bromsgrove & District Amateur Radio Society Rally at the historically interesting Avoncroft Building Museum, off the A.4024, near Bromsgrove, Worcs. Free car parking, large picnic area, light refreshments on site, bring-and-buy sale, talk-in on Top Band and two metres. For details, contact: J. K. Harvey, 22 Elm Grove, Bromsgrove (76941), Worcs., B61 OEM.

**August 26:** Stratford-on-Avon Radio Club Mobile Rally at the Town & Country Festival, National Agricultural Centre, Stoneleigh, Kenilworth, Warwickshire (on the A.444) one of the finest sites in England for an event of this sort, with attractions and activities too numerous to cover in this space. A consortium of Midlands radio amateur societies will organise an exhibition station and SWL display, and there will be a radio trade section, including GB3TCF to work visiting mobiles on Top Band or Two Metres. Information, including pamphlets and

layout map, from: I. A. Cobbold, G3RPJ, 184 Loxley Road, Stratford-on-Avon, Warwickshire.

**September 23:** The annual Harlow & District Amateur Radio Society Rally will take place at Nettleswell School, Harlow, Essex, with ample indoor space available. Routes sign-posted, with talk-in on 2m./80m. There will be trade stands and the usual attractions at this regular event, including a bring-and-buy stall and a junk stand. Correspondence and trade enquiries to: V. Heard, 106 Vicarage Road, Harlow, Essex, CM20 3HQ.

**September 30:** Mobile Rally, opening at 11.0 a.m., at Walton School, Mountsteven Avenue, Walton being about four miles north of Peterborough city centre. Talk-in on Top Band and two metres by G3DQW, callsign of the Peterborough Radio & Electronics Society.—J. Chapman, 10 Bettles Close, Peterborough, Huntingdonshire.

We would be glad to have reports on these events, with photographs, from the organisers responsible. Address to: "Mobile Scene," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

# VHF BANDS

A. H. DORMER—G3DAH

THERE can be little doubt that June offered some of the best propagation conditions on the VHF/UHF bands that we have had for some time. Apart from the aurorae of June 10 and 24, we had extended tropo. available for much of the month, with June 24 as the high spot. On that date, DX was available on two metres from LA through East down to the South at phenomenal strength, and 70 cm. was also yielding superb results to the Continent. Considerable ducting was evident for much of the time. Reports have been so numerous that it is impossible in the space available to quote individual comments. Of particular interest is the fact that some EU operators were able to work through the *Barkway* repeater, not only to contact British stations but also each other! An ON/OZ QSO made thus has been reported. Access to the German repeater network from this country was also possible and around 2000z, when conditions appeared to be at their peak, a call on the input channel would produce replies from more than one repeater, a fact which could be verified as the transmitters dropped out at slightly differing intervals.

A disagreeable feature of this opening was the large number of FM stations trying to get into the act by using excessive deviation—up

to 20 kHz in two cases measured. There seems to be a mistaken and growing belief that to work the DX one has only to step up the deviation. Within certain limits this is true, but the fact appears to be overlooked or, worse still, wantonly disregarded, that this practice is not only anti-social, particularly so as far as proximate band users are concerned, but also that it contravenes the  $\pm 3$  kHz limits agreed at the IARU Region 1 Conference last year. Further, since it is a regrettable fact that the majority of two-metre stations still rely upon slope detection to demodulate FM signals, the result of excessive deviation is to produce a grossly distorted, and therefore less easily read, signal at the far end. The situation is worsened when the offenders forget to turn the deviation back, even to "wide," when the contact has been concluded!

July also started off well with a mini-opening to LA, OZ and F, down as far as Orleans, available on the 3rd of the month.

### Auroral Openings

There were two auroral openings during June, both more evident on 2m. than on 4m., according to reports received. That between about 1800z-1820z on June 10 was a comparatively minor affair and seems to have been most useful

North of the Border. GM3ZVB forced himself away from 2m. to try some 4m. *Ar* work, but could not find a single station to work at the low end of the band although there were several "Tone A" carriers around 70.26 MHz. He reports "... the usual selection of countries on 2m." Sounds all too easy perhaps to we chaps in the South who have to try to divine by the best means we may just when an aurora is going to be productive down our way! GM8FFX also found the effect to be weak.

That on the 24th seems to have been much more lengthy and widespread. For example, GW8FOL in Anglesey heard GW8FMM/P go auroral at 1733z and the last *Ar* signals were being copied at 1827z. The GM's were particularly strong, although copy was difficult. GW8FKB, also in Anglesey, first noticed the effect at 1720z and reports shut-down at 1823z. He worked several GM stations and observes that signals were not very strong with him either and that reception was difficult.

G3NHE (Sheffield) was first alerted to the possibility of *Ar* activity by the cry of "Aurora" which went up on the 2m. SSB channel at around 1740z, causing the calm and peaceful local nattering which was going on to degenerate into a mad scramble to get the beams

### OSCAR VI — Prediction Data

Orbit	Date	Time	Position	Direction	
3664	Aug. 4	0730	35°E	N/S	
3665		0925	06°E		
3666		1120	22°W		
3670	Aug. 11	1835	19°E	S/N	
3671		2030	10°W		
3672		2225	39°W		
3752		0809	25°E		N/S
3753		1004	04°W		
3754	1159	32°W			
3757	Aug. 18	1720	37°E	S/N	
3758		1915	09°E		
3759		2110	20°W		
3839		0654	44°E		N/S
3840	0849	15°E			
3841	1044	13°W			
3842	Aug. 25	1239	42°W	SN/	
3845		1800	28°E		
3846		1955	01°W		
3847		2150	30°W		
3927		0733	34°E		N/S
3928		0928	05°E		
3929		1123	23°W		
3933	Aug. 25	1839	18°E	S/N	
3934		2034	11°W		
3935		2229	40°W		

Times shown are for crossings at 52°N on Saturdays. Orbits beyond 45°E or W are not included. To calculate later orbits, deduct 5-15 minutes and add 1.29°E each 25 orbits. Time in GMT. E/W positions in degrees relative to Greenwich 0°.

## THREE BAND ANNUAL VHF TABLE

January to December, 1973

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	
G3NHE	26	5	67	12	26	7	143
G3ZMD	36	5	57	7	24	4	133
G4BEL	23	2	60	11	30	6	132
GD2HDZ	25	3	71	9	18	4	130
G3OHH	49	6	42	6	8	2	113
G3FIJ	31	3	42	8	17	5	106
G8FUI	—	—	73	10	17	2	102
G2AXI	39	4	43	7	6	1	100
G3DAH	32	3	41	8	11	2	97
G4BMM	16	2	50	9	15	4	96
G4ASR	28	2	57	7	—	—	94
G8EOP	—	—	50	8	27	2	87
GW8FOL	—	—	75	10	—	—	85
GW8FKB	—	—	75	10	—	—	85
G8GNE	—	—	55	9	14	3	81
G8BXX	—	—	50	8	16	1	75
GW3ZTH	—	—	64	10	—	—	74
G8ECK	—	—	60	13	—	—	73
G3XDY	—	—	62	10	—	—	72
G8DNK	—	—	59	10	—	—	69
G3BW	—	—	57	9	—	—	66
G8FQE	—	—	54	11	—	—	65
G8FMK	—	—	38	2	23	1	64
GM3ZVB	8	1	45	8	—	—	62
G8CKZ	—	—	47	9	—	—	56
GW8DUP	—	—	46	9	—	—	55
G3SMU	18	3	10	2	16	3	52
G8CKY	—	—	42	9	—	—	51
G4BKG	—	—	40	7	—	—	47
G8FWB	—	—	42	4	—	—	46
GM3ZVL	—	—	34	7	4	1	46
G4AEQ	—	—	25	2	13	3	43
G8CBU	—	—	32	3	6	1	42
G8BKR	—	—	31	3	6	2	42
G4AJE	—	—	32	6	2	1	41
G8DGR	—	—	32	2	6	1	41
GW8EHK	—	—	33	8	—	—	41
G8DOT	—	—	27	8	—	—	35
G8GPR	—	—	30	4	—	—	34
G18EWM	—	—	26	5	—	—	31
G8GNC	—	—	28	2	—	—	30
G8COG	—	—	23	3	—	—	26
G8EMS	—	—	20	2	2	1	25
G8GBV	—	—	16	3	5	1	25
G4BOW	—	—	23	2	—	—	25
G8GJB	—	—	21	3	—	—	24
G4AEZ	—	—	22	1	—	—	23
G8ECU	—	—	19	2	—	—	21
G3EKP	8	3	4	2	2	2	21
G3WHK	—	—	17	3	—	—	20
G8FUL	—	—	18	2	—	—	20
GW8CMA	—	—	14	3	—	—	17
G3CBY	—	—	11	5	—	—	16
G8GXE	—	—	15	1	—	—	16
GW8CGH	—	—	12	2	—	—	14

The Table shows claims to date from January 1, 1973 and runs through to December 31, 1973. Your claims should be sent to: "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ each month.

round to the North and QSY to the CW end of the band. No CW to be heard and a check on the beacons revealed everything to be normal at T9. Back up to the SSB channel where the first signal heard was that from GM8AOB/P who was fully auroral! ESP on someone's part?

Finally, a comment from GD2HDZ on the subject of auroral openings generally. He wonders why people bother to work, *via* aurora, stations which could be worked by normal propagation at any time, and this seems to be a reasonable point of view. It is still fun, though, to work a chap five miles away using the curtain if there are no UQ2's available! (The "local" path could be about 4,000 miles!)

## From GM

The Scottish VHF Convention has now been finalised. The event takes place at Edinburgh University (Pollack Halls of Residence) on Saturday, September 22. Speakers are GM8FFX, who will be relating some of his portable experiences and offering advice to intending expeditionaries; GM8BJF, expounding on the use of IC's in VHF environments; and G3FZL, who will be covering current topics of VHF/UHF interest. The Convention will be followed by a dinner in Hall, and as a self-catering service operates there the cost is likely to be considerably less than it would be in an hotel. Visitors are encouraged to bring along items of home built equipment for the exhibition, and if mobile may get guidance from GM3HAM/A on 2m. Further details from Vic Stewart, GM3OWU, *QTHR*.

GM4FH, now operating in Edinburgh on 2m., was once (in 1939) G4FH but, according to our man in the field, is completely civilised after 20 years residence in that City. His job as Senior Physiology lecturer at the University involves him in electronics of a rather specialised nature, but report has it that he is finding his first experience of Amateur Radio activity on 2m. both relaxing and interesting.

A tip from GM3BQA for "Liner-2" users: A great improvement in speech quality results from the use of the Pye "Cambridge" type of mike rather than the one supplied.

Anthony Mills, G8GOO, of 46 Marlborough Road, Shipley, Yorkshire, is 18 years old and started on two metres just a year ago. He has a T.W. "Two'er" (one of the best such rigs ever offered to the amateur) running 5w. with a halo on the roof, and a Heathkit HW-30. The CR-100 is from his SWL days, with which he has a converter. He remarks "It is hard to believe that so much pleasure can be gained from such a modest set-up".



The Aberdeen Can DX Club using their call GM4CAN were active during the weekend June 23/24 from a site near Dundee in Angus and were in great demand. Operators on this occasion were GM4AFF, GM4AXE and GM8FTJ. They plan more outings during the summer months.

#### Annual VHF Tables

Claims for the Annual Tables have fairly leapt up this month with the leaders already showing totals well above the leading scores at this time last year. The good weather, which has encouraged much /P operation, and the better conditions in June were responsible for this as examination of the claims in detail shows. Many claimants have expressed their appreciation of the efforts of GM8AGU and GM3JFG during their recent foray into remoter Scotland which provided either new counties for many or at least gave them the county for the first time this year.

The number of claims also shows a gratifying increase from 43 at this time last year to 56 at the time of going to press. Although there is nothing in the rules to stop you sending in your first claim as late as December, it is a bit disconcerting for others to find, at the last moment, that they are several places further down the list than they had expected with no chance of concentrating on a particular band, on which they may be short of contacts, in an effort to pull the lead back. It would be

appreciated, if only from that point of view if, when you decide to participate, you could get the claim in as soon as possible to make a start in the Table.

One query which has cropped up this month is whether claims for contacts with /MM stations are acceptable. The answer must be that they are not—there is enough trouble with territorial water definitions in another field as it is!

Our thanks for your response to the appeal that claims should show not only increases over the total for the previous month, but also the new total. This helps a lot in the double-checking process.

Finally, all claims *should* be sent direct to Buckingham, but there are occasions, when time is running short after a contest or a major opening, when they are arriving direct at the G3DAH QTH. Under such circumstances, or others which appear to warrant a departure from normal practice, please note that your scribe has changed QTH and that his present address is: 43, Mickleburgh Avenue, Herne Bay, Kent, CT6 6HA. But the general rule remains that all VHF correspondence should be routed through the Buckingham address. There are important admin. reasons for this.

#### Expeditions

Final details of the Blackwood Club trip to GW are now to hand. Callsign is GW6GW and counties to be visited are as follows: August

4/5, Carmarthen; 5/6, Pembroke; 6/7, Cardigan; 7/8, Radnor; 8/9, Montgomery; 9/10, Merioneth; 10/11, Denbigh. Operating times are 0630z-0730z and evenings daily during the week and from 0630z to as late as the activity justifies at the weekend. Frequencies: CW, 144-140 MHz; FM, 144-480 MHz; AM, 144-380 MHz and SSB, 145-410 MHz. *Modus operandi* is to check their own frequency before tuning the Zones, but they will be able to operate cross-mode, so call them to suit the conditions. All QSL cards via GW4BUE, 87 Thornbury Park, Rogerstone, Newport, Mon.

The March & District Radio Amateur Society are mounting an expedition to Huntingdonshire over August 18/19 to coincide with the low-power 2m. and SSB Open contests. Callsign is G3PMH/P and operating times and frequencies as follows: *Saturday 18*, 1700z-2100z, 145.2 MHz AM, 145.41 MHz SSB\*, 433.0 MHz AM+; 2100z onwards, 433.0 MHz AM. (\*145.41 MHz—first 15 minutes of each hour; +433.0 MHz—by arrangement on 144 MHz.) *Sunday 19*, 0800z—1600z, 145.41 MHz SSB.

Skeds for 70 cm. may be made via G4BEL (ex-G8BBB), QTHR.

The Aberdeen VHF Sideband Group will be returning to the Isle of Man between August 13 and 20th. They will have 400 watts of SSB on 2m., 100 watts of FM on 70 cm. and, hopefully, SSB on 432 MHz also. Callsigns will be GD8FFX for the SSB contest on August 19

and the Club call, GD4BRN, for the rest of the trip.

### Oscar VI

A letter from Larry Kayser, VE3QB, raises some interesting points. First, let it be said that he is the control station for most of North America and as such he spends much time monitoring passes over Europe and the West Coast of Canada and the U.S. As control, the station runs 24 hours a day with window times on 9 and 10 orbits daily. Programming is by computer which selects the appropriate antenna, instructs the command generator and operates the high power Tx to the tune of some 10,000 commands during a 24-hour period. Reliability in the command window is about 85%—this figure taking account of the on-board problems and the fact that Larry has to compete with other, high level signals. The control range is about 2,600 miles, so if you plot that out from Ottawa you can get some idea of the size of the control area. A comment which it behoves us all to heed, is that many EU (and that includes the U.K.) stations are still running excessive power and are frequently heard calling "CQ" but are obviously not getting their own signals back since, although they are being called on channel by W's, they do not reply.

Oscar now operates *officially* on Thursdays, Saturdays and Mondays and under these conditions the battery performance has stabilised reasonably well, although the high on-board temperature is still causing some difficulties. It is very important that no attempt be made to work the satellite during official "Off" periods. If it is heard transmitting it is likely that the various control stations are running checks or that essential telemetry is being recorded. Now that the 70 cm. beacon is no longer available it is vital that the 29 MHz beacon channel be kept clear. This cannot be achieved if operators persist in using the satellite at other than "On" times.

GW3FSP is still going great guns *via* Oscar and has been chasing 8P6DR (Barbados)—so far without success, although G6CJ worked the Barbadian on June 9. On June 23, Dewi had a visit from W4FJ whom he has worked several times and who is over here on a short visit to

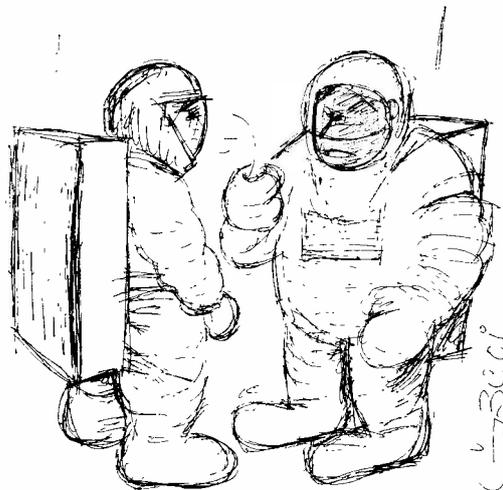
observe *Oscar VI* operations. From him came the information that some 1,100 different stations in 59 countries have been logged through Oscar to date. AMSAT still require as many reports of contacts as they can get, and ask that users send them a list, in alphabetical order, of all QSL's received to assist the computer analysis which they are undertaking. He also gave some information on AMSAT *Oscar B*, which will become *Oscar VII* after successful launch. The frequencies to be used in this case are still under discussion, but it seems certain that there will be three translators. The UHF/VHF channel is likely to be 432-125 MHz to 432-175 MHz for the up-link and 145-925 MHz to 145-975 MHz for the down link with inverted sidebands. Of the other two, one will probably operate on the same frequencies as *Oscar VI* and the other should run high power with the up-link on 145-9 MHz to 146-0 MHz and the down-link on 29-4 MHz to 29-5 MHz. *Oscar VII* has a predicted life of three years.

### Contests

The VHF/UHF Contest over the weekend of July 7/8 provided opportunity for good DX contacts on all bands. Several correspondents comment on the high noise-level on 4m. throughout the event and

although this made phone contacts a bit tricky at times, the CW operators experienced little difficulty. There appeared to be more SSB on this band than has been recorded during earlier contests. 2m. was open to the Continent for part of the time, DC6BB/P and ON5EW/A on SSB being particularly strong signals in the early hours of Sunday. PA0 and F were also fairly readily available on both SSB and AM/FM. GM was readable in the South in the early part of Sunday afternoon, but signals were weak and subject to heavy QSB. GM4BJD/P and GM3YOR/P both lifted to 5 & 5 at times. CW activity did not seem as high as warranted by the propagation conditions, but the SSB channel around 145-41 MHz was densely populated for most of the time, with stations spread out  $\pm 50$  kHz from the calling channel—and pretty ropery some of them were! There was also quite a bit of AM/FM on this channel.

Among the Welsh portables, outstanding signals came from GW3WAS/P and GW8COP, both in Denbigh, and from GW3ORL/P in Brecon. 70 cm. did not appear to carry the DX traffic which conditions could support—a little surprising in view of the multiplier for that band. One can only suppose that operators preferred to make a multiplicity of



“ . . . Say, Houston, where did you tell us to plug in this Earth lead . . . ”

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Watch that deviation! G8FFV, of the U.K. FM Group (Southern) measuring that factor during a Transceiver Alignment session recently. In the course of a three-hour meeting, some 13 FM mobiles were checked for Tx power, frequency calibration, VSWR, Rx sensitivity and deviation. More than 20 members were present to watch the proceedings at Chineham House, Popley, Basingstoke, where they meet on the first Wednesday each month, FM talk-in being provided on 144.48 MHz.

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short-haul contacts on 2m. while the going was good.

It is difficult to make an assessment of the scores for all the usual reasons plus the fact that many stations, who presumably were not submitting an entry for the contest, were using the same numbering sequence irrespective of the band they were on, while others had obviously used separate sequences as required by the contest rules.

We reported on the 70 MHz Open of June 9/10 last time, but a few more snippets have come to hand. GM3WOJ/P in Peebles (and what a good signal he was) ran an FT-560 into a transverter with a '6-40A PA and a 4-ele. beam at 20ft. QTH was 2,900ft. a.s.l. which helped a bit! EI2VFZ/P was operated by G3WOS of Rugby. Some scores noted were: GW3MHW with 103; GW4ABR/P, 98 at 1351z; and G3VER/P with 99 at 1525. The final score at GW3MHW was 822 points, which might well bring him to the leading position—portables and all! He was working from Cardiganshire and finds this a

much better site than the previous 1,200ft. a.s.l. cottage in Montgomery.

**Forthcoming Events:** The 5th RTTY contest organised by the B.A.R.T.G. is slated for Saturday, September 8 at 1700z—2300z and Sunday, 16th, 0600z—1200z. Bands are 144 MHz and 432 MHz, and logs should be sent to G3IIR, *QTHR*, by October 19. Further details from Ted Double, G8CDW, *QTHR*. (By the way, the speeds quoted when reporting the Mid-Severn Valley RTTY contest last month should have been 45 and 50 bauds).

Other dates to note are August 5 for the RSGB Region 1 contest; August 12 for the 70 MHz fixed and portable; August 18 for the 144 MHz QRP (input power not to exceed one watt DC); August 19 for the 2m. SSB Open and the weekend of September 1/2 for VHF/NFD and the concurrent IARU event.

#### News Items

**Four Metres:** G3NHE (Sheffield) is now fully operational on the band and, as the Annual Tables indicate,

has not been wasting his time, with GM, GD and EI safely under his belt. G3VPS, operating as GW3VPS/P, was in Merioneth, Hereford and Glamorgan between June 17/19. He worked about 30 stations each night on either phone or CW. G3VPK will be /P in Co. Antrim for the 4m. contest on August 18. G3ZMD (Luton) now runs 12 watts AM/CW to a QQVO4-7 and 4-ele. beam at 22ft. He was one of the many who raised GW3MHW/A in Cardigan, firing over the 2,500ft. mountains, and also made it with G3JYP on CW while half of Southern England was calling him! Both contacts on July 1st.

**Two Metres:** HB9HB was heard on several occasions during June. He was 5 & 9 in Sheffield (G3NHE) on the 11th and 5 & 2 with G3PFR (Norley, Cheshire), on the same day, but no workable HB9 were heard. In the South, the beacon was audible for days on end. G3ZMD (Luton) made it with GD8DMA (Douglas) on June 29 under fair conditions. He also worked, at

5 & 8, GC2FZC, that good old regular from Guernsey, the following morning and GW3VZV/P in Montgomerly on both 2m. and 70cm. Nice going!

G8FWB in Winchester now has SSB with 100 watts p.e.p. to a QQVO6-40A and a 6/6 beam. G3XDY (Cleethorpes) worked 45 PA0, 25 DL and several F's and ON's during the opening on June 24 and notes that the ducting was very selective, since the PA0 stations could be heard working SM and LA which were inaudible with him. He did raise OZ6KV and found that the signal strength was much weaker with him than it was further South and further inland. He comments on the strength of some of the low-power EU stations and quotes as example PA0LAK who was S9 with him using only 100 milliwatts!

G8BKR reports an increase in 2m. activity (notably on 144.35 MHz) from Wales, and instances GW3LXI, GW8BXQ, GW3RPR and GW3KGD — all from Pembrokeshire, a good one for the county chasers! GW8EHK (Port Talbot) hopes to be up with a 4CX260B shortly.

GW8FKB in Anglesey is another good signal over much of the country. He made it with GC2FZC on June 21 and was much helped in his county score for the Annual Tables when he contacted the GM8AGU/P expedition in most counties they visited. A very nice haul! Also in Anglesey is GW8FOL who had an interesting 4-way, 4-country QSO with ON5TA, G8FUI and EI5BH on June 29. He, also, is grateful to GM8AGU/P for giving him many new counties this month.

Other good DX available from the West, now that he has cleared his antenna troubles, is provided by EI9Q in Co. Waterford, who has been knocking off the G and GW stations at a rate of knots with his 250-watt p.e.p. set-up. He runs a Swan 350 prime mover, an

FR-DX500 Rx and a 6/6 at 55ft. He is usually to be heard during the early evenings of Monday, Tuesday and Wednesday, with occasional weekend appearances.

G3BHW (Margate, Kent) found conditions most unusual during June with good propagation in diametrically opposed directions. For example, after working GW8FKB in Anglesey on June 11 he was called by a DL, both contacts at good signal strength. An unusual encounter on June 22 was that with GW8AYW/P, who was walking with a chum down the side of a mountain in Denbighshire at the time bearing a "Liner-2" and a 4-ele beam. One doesn't get many pedestrian mobile contacts! The same evening produced a QSO with GW8FQF in Abergele who is 30ft. below sea level!

G4ASR (North Weald, Essex) is still running his lunchtime skeds with G3CSP in Sheffield and G8GPR somewhere in Lancs. and they haven't missed yet! One recalls some of the notable skeds over the same sort of distances in the early days of 2m. when gear was much less sophisticated than now-a-days. G6FO ran one with PE1PL at 0900z daily which went on for years. G5YV, G5QA, G3BLP and G8VZ also ran 100+ mile skeds with 100% success. The G8VZ (Princes Risborough, Bucks.)/G3JWQ (Ripley, Derbys.) sked, nightly for years over the 95-mile path, was completed irrespective of conditions. A really good, long-haul one was that between G2JF (Ashford, Kent) and a DL near Frankfurt, which was made every single day for one year as part of a propagation analysis. One doesn't seem to hear so much of this type of activity these days.

GD2HDZ comes up with a couple of items of general interest. There are at least seven stations QRV on 2m. from the Island now and one or two more likely to come up shortly; that should ease the QSL situation for him! And it should be noted that

from July 5, the Isle of Man takes over its own postal service, so that from that date U.K. stamps will *not* be usable there, and s.a.e.'s should not be sent, although IRC's are still OK.

70cm: The 2m. lift on June 24 also brought some nice DX on this band. G3NHE (Sheffield) made it with PA0, DC, ON and OZ to add to his success in working GD2HDZ earlier in the month. He mentions also the interesting cross-band contacts made by GM8AGU/P during his Scottish trip. Although unable to transmit on 432 MHz, Paul took signals from many stations while in various counties, and this may have convinced him that it would be worth while to take 70 cm. gear with him on his next trip—a conviction which will gladden the hearts and race the pulses of many!

23 cm.: John Tye, G4BYV of Dereham, Norfolk has been at it again. Over June 23/24 he worked G8CKV in Peterborough at 5 & 9, G4ALN/P in Rutland at 5 & 9, on this band as well as on 2m. and 70 cm., and G8ARM (London) and G8BAV (Derby.) at 5 & 8 and 5 & 9 respectively. Later he found PA0HVA at 5 & 9. On July 3 the 23 cm. band was again open for DX and he got S3-4 from ON4HN when the latter had not even got his dish plugged in! *Phew!*

If you haven't yet had a go at this band, but would like to make a start, *Microwave Modules* have just brought out a new 23 cm. converter to go with their varactor tripler gear. This uses a pair of hot carrier diodes in the front end with a hybrid ring mixer—noise figure approx. 8dB and price around £24 + VAT. Sounds good.

#### Deadline

Deadline for the next issue is August 10. The address for news, views, claims and comment is: "VHF Bands", SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

Cheers for now and 73 de G3DAH.

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*"Short Wave Magazine" covers the whole field of Amateur Radio and should be obtainable to order through any newsagent.*

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# 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 will be 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.

- G2ZA**, L. Davis, 48 Steepdene, Parkstone, Poole, Dorset. (*re-issue.*)
- G3GMC**, R. H. McVey, 4 Hawthorn Gardens, Worle, Weston-super-Mare, Somerset. (*Tel. Weston-super Mare 21271.*)
- GM4BDJ**, R. B. McCartney, Kelowna, 6 George Street, Peebles, EH45 8DL.
- G4BRV**, T. Kelty, 38 Colclough Road, Meir Stoke-on-Trent Staffs., ST3 6DL.
- G4BVS**, S. K. Overend (*ex-G8GHY*), Monticello, 22 Highland Road, Amersham, Bucks. (*Tel. Amersham 3176.*)
- G4BWZ**, R. Harris, 16 Shortwood View, Kingswood, Bristol.
- G4BXF**, B. Lambert, 58 Broadmead Road, Woodford Green, Essex. (*Tel. 01-504 6157.*)
- G4BYG**, V. Lindgren, 14 Rosedale Grove, Spring Bank West, Hull, Yorkshire, HU5 5BT. (*Tel. 0481-53005.*)
- G4BZB**, D. A. Parsons, 27 St. Ledger's Way, Hunston, Chichester, Sussex.
- G4CBS**, N. A. Swain, Hill Cottage, Camerton, Bath, Somerset, BA3 1PS.
- G4CCB**, A. W. Brown (*ex-G8DWK*), 22 Poplar Street, New Ollerton, Newark, Notts., NG22 9PY.
- G4CDS**, W. J. Highgate, 421 Portway, Shirehampton, Bristol, BS11 9UQ.
- G4CDU**, N. R. Huntley (*ex-G8GPV*) 212 St. Stephens Road, Saltash, Cornwall, PL12 4NL. (*Tel. Saltash 2066.*)
- G4CDW**, G. A. Trickey, 53 Holly-guest Road, Hanham, Bristol, BS15 3RN. (*Tel. Bristol 671409.*)
- G4CEY**, J. E. Ball (*ex-G8GNG*), 8 Buntings Lane, Warmington, Peterborough, PE8 6TT.
- GM4CFM**, L. G. Bell, 114 Glenurquhart Road, Inverness, IV3 5PB.
- G4CFZ**, M. Stevens, 72 Firgrove Road, Freemantle, Southampton, Hants, SO1 3EP. (*Tel. Southampton 771856.*)
- G4CGE**, W. A. Dore, 14 Poppy Road, Princes Risborough, Aylesbury, Bucks, HP17 9DB. (*Tel. Princes Risborough 5537.*)
- G4CGL**, J. H. Miller, 88 Mattox Road, Wednesfield, Wolverhampton, Staffs.
- G4CGS**, D. Sugden (*ex-G8BHL*, *VS9MT*, *ZCADS*), 11 Uplands Avenue, Clayton Heights, Queensbury, Bradford, Yorkshire, BD13 1EN. (*Tel. Queensbury 881605.*)
- G4CGT**, N. Jenkin, 125 Lambeth Street, Blackburn, Lancs., BB1 1SG.
- GW6TM**, Hq. Stn. Conway Valley Amateur Radio Club, The Quarries, Llandulas, Nr. Abergale, Denbighshire.
- G15BBR**, R. F. Glavice, 98 Irish Green Street, Limavady, Co. Derry.
- G8GEA**, K. T. Warriner, 69 Crofton Road, Orpington, Kent, BR6 8HK. (*Tel. Orpington 31156.*)
- G8GZT**, R. C. Jones, Weald House, Seale Hill, Reigate, Surrey, RH2 8HZ.
- G8HBX**, M. J. Tout, 18 Kirby Road, Corsham, Wilts, SN13 9DS.
- G8HFZ**, S. J. George, 100 Middlepark Road, Russells Hall Estate, Dudley, Worcs., DY1 2LJ. (*Tel. Dudley 57395.*)
- G8HGI**, M. Warriner, 69 Crofton Road, Orpington, Kent, BR6 8HK. (*Tel. Orpington 31156.*)
- G8HIB**, G. Strangward, Wilton House, Wilton Terrace, Hornsea, Yorkshire.
- GM8HKR**, R. G. Card, 4 Hill Street, Tillicoultry, Clackmananshire, FK13 6HP.
- G8HLG**, I. B. Gane, 27 Highclere Drive, Longdean Park, Hemel Hempstead, Herts, HP3 8BY.
- G8HLJ**, E. J. Edwards, 85 Gaypine Close, Ford Estate, Bidston, Birkenhead, Cheshire, L43 7TX.
- G8HMF**, D. P. Jones, 275 Griffiths Drive, Ashmore Park Estate, Wednesfield, Wolverhampton, Staffs., WV11 2JT.
- CHANGE OF ADDRESS**
- G3BRL**, R. Caws, Jasmine House, Bellington, Chesham, Bucks., HP5 2XW.
- G3DQT**, J. Ayres, 16 The Ridings, Surbiton, Surrey, KT5 8HQ. (*Tel. 01-399 3421.*)
- G3FMN**, T. W. W. Dearlove, 42 The Street, Crowmarsh Gifford, Wallingford, Berks. (*Tel. Crowmarsh 4501.*)
- G3JRS**, J. R. Simpson, Kegworth Road, Kingston-upon-Soar, Notts. (*Tel. Kegworth 2042.*)
- G3OHB**, Cornish Radio Amateur Club, c/o J. Farrar, Elm Cottage, 2 Marsh Lane, Hayle, Cornwall, TR27 4PS.
- G3OHJ**, E. W. Ashley, 33 Hazel Rise, Hornchurch, Essex, RM11 2AR.
- G3SAA**, J. N. Helsby, 47 Canterbury Road, Newton Hall, Durham.
- G3TSO**, M. J. Grierson, 34 The Ridings, Kingston St. Michael, Chippenham, Wilts. (*Tel. Kingston Langley 393.*)
- G3UCQ**, J. Farrar, Elm Cottage, 2 Marsh Lane, Hayle, Cornwall, TR27 4PS.
- G3VNJ**, C. H. Fowler, 19 Hartland Road, Worksop, Notts., S80 1XL.
- G3WTD**, J. R. Davis (*ex-GM3WTD*), 20 Swallow Lane, Aston, Sheffield, S.31. (*Tel. Sheffield 873239.*)
- G3XVP**, P. V. Pimblott, 52 Park Edge Close, Wetherby Road, Leeds, 8, Yorkshire.
- G3ZUK**, R. G. Whitehead (*ex-5X5NA*), Church End, Weston Colville, Cambs. (*Tel. 0223 829524.*)
- G8AAU**, C. G. Partridge, 2 York Crescent, Babbacombe, Torquay, Devon, TQ1 3SH.
- G8EBP**, R. A. Royall, The Rectory, 63 Coborn Road, Mile End, London, E3 2DB. (*Tel. 01-980 2074.*)
- G8EQT**, A. D. Parker, 32 Pond Croft, Hatfield, Herts., AL10 ORX.
- G8GHZ**, S. J. Purser, 2 Dobson Close, Great Houghton, Northampton. (*Tel. Northampton 61794.*)
- GM8GIQ**, C. Wearing, 12 Holms Crescent, Bargarran, Erskine, Renfrewshire.

# THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for September issue: August 10)

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

PERHAPS this is as good a time as any to make some points to those who either read or report to this piece. In the first place our file on Clubs, with the names and addresses of their hon. secretaries, contains data on about four times as many Clubs as are mentioned in any month; this is due to irregular reporting on the part of Clubs concerned.

Thus, when we get an enquiry—which we quite often do—from a reader asking whether there is a Club of any sort within his range, we can usually give him one, and often several, groups to try, with an address for a first contact.

However, more readers join their local Club as a result of reading about it, and its "vital statistics," in this piece; therefore, to help themselves, Club correspondents are asked to try always to bear in mind the following points which the reader needs to know in order to decide to attend a meeting. First, the dates and the venue; secondly, what is happening on those dates or, if not, the fact that *something* will be laid on for his interest, or if the meeting will just be an informal ragchew; thirdly, the name and address of the secretary, with his telephone number, both exchange name *and* STD code where applicable.

The current Secretary of any Club has his name and address in our file, with his phone number.

However, we *cannot* accept letters giving several month's details *in lieu* of separate letters each month—for one thing, the risk of error at this end is too great and for another it must be realised that if this writer did not "ditch" his regular Club mail at intervals, his shack would be so full of paper as to make it impossible to get himself on the air.

## The Reports

This month, as a change we are taking the reports as they fall, rather than by Regions.

To start the ball rolling we have to go to **Plymouth**, whose secretary has more news to offer than we can make space for. For example, they have revived their news letter; there are several VHF Projects under way; the Club recently ran a coachload to the Longleat Rally; the most important information, that the group meet on the first and third Tuesdays, at Virginia House, Bretonside, Plymouth.

For **Stoke-on-Trent** G8CRS says it is hard for him to advise details of the programme—it depends on whose arm he can twist at the last moment! To judge by some of the items noted in the recent past, he is quite an adept at finding victims: try him out by visiting the lads one Thursday evening at 2A Racecourse Road, Stoke-on-Trent, where the club has its Hq.

The usual date for **Sutton and Cheam** is the third Tuesday, but we notice in the newsletter that the August date is yet to be finalised, although we can say it will be at the group Hq. at "The Harrow," in Cheam. This being the case, the hon. secretary will, we are sure, not mind at all if you contact him first.

We seem to be in the doghouse with G3NLY of **Lichfield**, who sees no relationship between what he sent in and what appeared in the June issue. A pity, that the only error we could find was that the change in the hon. secretary's QTH had not been picked up. However, for August 6, G3NAS is down to talk about a Linear Amplifier for 144 MHz; but nothing is shown for August 21. Both dates will be taken at the Club Hq., the Swan Hotel, Bird Street, in Lichfield.

The **Hereford** Newsletter which is to hand does not go quite far enough with its forward programme for our purposes; however it does make it clear that something happens on the first and third Fridays in the month, invariably at their venue in the Civil Defence headquarters, Gaol Street, Hereford.

August 18 at Emmanuel Church Hall, Barry Road, London S.E.22, will see the **Crystal Palace** chaps listening to a combined effort by G3FZL and G3OOU, who will talk about "Components and Materials, Inductors, Microstrip, Variable capacitors," and such. Quite a spread for one session, but these two know their stuff.

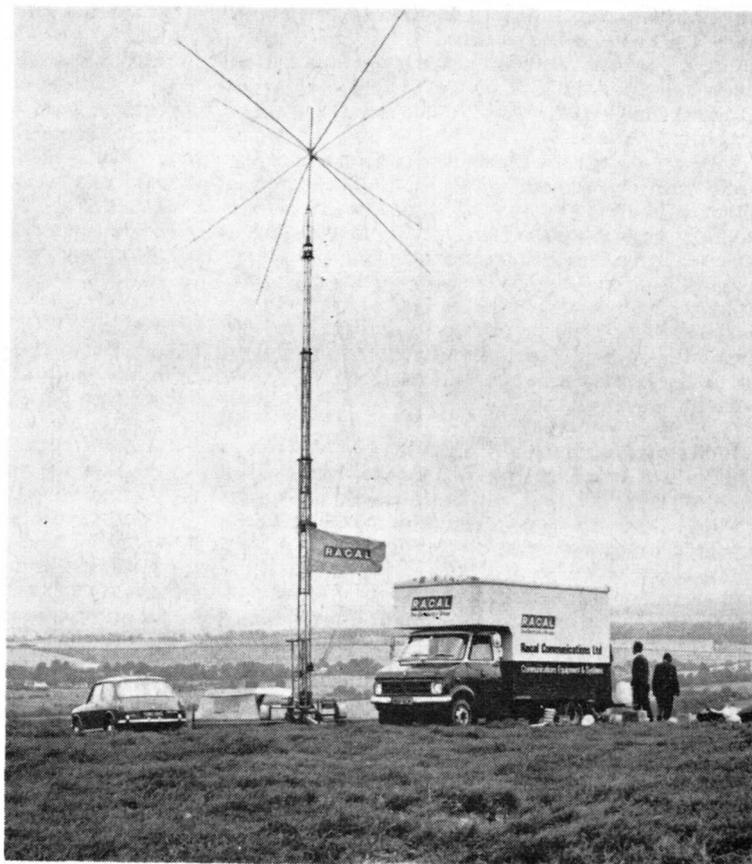
All members of **Surrey** are to please take note—the meeting on August 21 will be at a new venue, the "Ship," 47 High Street, Croydon, thanks to G3KER. The speaker will be G2YL, once again giving a "travelogue" of her most recent trip, and illustrating it with slides.

At **Coventry** the form of things is a session every Friday evening at Baden-Powell House in St. Nicholas' Street, Radford Road. August 10 and 24 are "Nights on the Air" with the Club rig; August 31 is, not surprisingly, given over to preparation for VHF/NFD. That leaves August 3, for which a visit to Coventry Police Hq. is proposed, and August 17, on which even-

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The Racal Amateur Radio Group set up for NFD on Ham Hill, Hungerford—the name of the QTH alone was worth another S-point in the report from many Stateside operators! The Racal pantechnicon provided a very effective mobile kitchen. We are assured that, contrary to certain opinions, said vehicle was not (repeat not) packed with kilowatt Tx gear!

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ing they have organised a Quiz, based on the "University Challenge" model.

Normal meetings of the **Mid Sussex** crowd are suspended in August, as the Hq. is closed; however, the usual routine is to foregather at members' homes during this period, and so we have to direct you to the hon. secretary—see Panel p.370—for the latest information.

Anyone who has an interest in RTTY should make a point of becoming a member of **B.A.R.T.G.** The *Newsletter* alone is, without anything else, worth the membership sub., with its articles and advertisements all aimed at the specialised interests of the members.

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Another change of venue comes up for mention now, coupled also with a change of date: **Maidenhead** are changing to the British Red Cross Hall, The Crescent, Maidenhead, on the first Thursday and the third Tuesday in each month. This gives August 2, when G3UKS will be talking about Aerial Design, and August 21, when the lecturer will reinforce his words by means of films and tapes. His subject will be "Interference Suppression for /M working" and he is F. Shirville, of Bosch Limited.

The lads at **Nottingham**, as do so many others, like to relax a bit in August, with a less-formal-than-usual

formula for meetings. Thus August 2, 9, and 16 are all Activity Nights with the Club rigs, August 23 is a Forum, and August 31 is set apart for a talk about the VHF/NFD arrangements. Sherwood Community Centre, Mansfield Road, is the venue.

Every Thursday the Yeovil chaps make tracks for the Club Hq. at 31 The Park, Yeovil. However, if you want to know what goes on, you can either drop a line to G3NOF, as Panel, or just drop in to the meeting, when you will be made welcome.

**Brighton Technical College** write to point out that they are closed for the summer vacation. However, all is not lost! On August 12 and September 9, they will be having a Picnic Party, at a site about 200 yards North of the cross-roads Dyke Road and King George VI Avenue. In addition, on certain Mondays, some of the group can be found from about 8.30 onwards at the "County Oak," Hollingsbury. Listen on 1970 or 1920 kHz on Sunday mornings for the full details, or contact the hon. secretary at the address in the Panel, p.370.

Not much notice for the **South Birmingham** session—it's on August 1! No more details are to hand, saving that it is, as always, at Hampstead House, Fairfax Road, West Heath.

What a long time it is since last we heard from **WAMRAC** and their large group of Methodist Church members. G3NGF, the Secretary, is not saying outright

what has happened, but he is continuing to run the group—see Panel for his address.

**Acton, Brentford and Chiswick** will get together on August 21, when G3CCD will be at Chiswick Trades and Social Club, 66 High Road, Chiswick, talking about his visit to France as FØUT.

**Sully** are on the search for new members from the Cardiff area, says secretary GW4AMV. The reason is that most of the members who started as SWL's are now fully licensed transmitters, thanks to the mutual help given in the Club. They seem to find lots of interesting things to do on their weekly Tuesday-evening sessions. A pity we have no details of the Hq. address; but no doubt GW4AMV will be pleased to pass this vital bit of information over if you were to either write him or ring, at the address shown in the Panel, below.

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Wolverton Youth Club is where the **North Buckinghamshire** lads have their place. As this comes out a group will be in GD-land, and so the session on August 13 will be divided between a discussion on Phase-Lock-loop Techniques and a *post-mortem* on the Isle of Man shindig already mentioned.

A very important subject comes up for discussion at

the **Wirral** session on August 15, namely "Safety in the Shack," with G8ALA rubbing home the various points. Before this, on August 1, there is a Fox Hunt. Hq. for this Club is at present the Community Centre, Carr Bridge Road, Woodchurch, the entrance being the large doors on the left of the building.

**Hull** next. They advise us on their programme by a copy of a poster which they seem to have had printed in quantity, so that it can be displayed, complete with the current month's programme, in various places to catch the eyes of prospective members—not to mention being sent each month to us. From it, we note 592 Hessle Road, as the Hq., every Friday evening from 1945 clock. August 3 is for G3PQY, to talk about receiver alignment, while on 10th, G8EAH will be discussing those useful accessories which add so much to the shack. August 17 is set apart for a talk on VHF/NFD operating techniques, the various points being rammed home by G3WWD. A D/F Night follows on August 24, and then there is, on the 31st, the preparation work for VHF/NFD.

**Cornish** meet on August 2, at the SWEB Clubroom, Pool, Camborne, for a Natter Session, plus a talk by G3VWK and G3NKE on "A Station Inspection." Doubtless there will be some who will go away from this one a bit chastened to realise how many of the tricks are

#### Names and Addresses of Club Secretaries reporting in this issue :

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, London, W3-8LB.  
 BISHOPS STORTFORD: E. P. Essery, G3KFE, 17 Ascot Close, Parsonage Lane, Bishops Stortford (S2501), CM23-5BP.  
 BRIGHTON (Technical College): R. J. Henley, G2CMH, 35 Wilmington Way, Brighton, BN1-8JH.  
 BRISTOL (Shirehampton): R. E. Fineman, G4BOL, 5 Hillside Close, Frampton Cotterell, Bristol. (*Winterbourne 774300.*)  
 B.A.T.G.: G. P. Shirville, G3VZV, 2 Bradford Way, Taddington (2470), Dunstable, Beds.  
 BROMSGROVE: T. Harper, 60 Wildmoor Lane, Catshill, Bromsgrove, Worcs.  
 CHELTENHAM (Group): S. E. Janes, G2FWA, Hillside, Bushcomb Lane, Woodmancote, Bishops Cleeve, Cheltenham, Glos.  
 CHILTERN: F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks. (*Penn 4240.*)  
 CORNISH: H. Webster, G3XTF, Crandale, Gillyfields, Redruth (6903), Cornwall.  
 COVENTRY: G. A. Whenham, G3TFA, Lavernock, 33 Chapel Street, Bishops Itchington, Warwickshire.  
 CRAY VALLEY: P. Vella, G3WVP, 78 Hurst Road, Sidcup.  
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, SE23-3BN. (*01-699 6940.*)  
 DUNSTABLE DOWNS: C. G. Powell, G8BPK, 1 Wenwell Close, Buckland Wharf, Aston Clinton, Aylesbury (630600).  
 ECHELFORD: V. W. Higgs, G3VWJ, 205 Commercial Road, Staines (57021), Middlesex, TW18-2QT.  
 FARNBOROUGH: A. M. Streeton, G8FWE, 10 Sinhurst Road, Camberley (228877), Surrey, GU15-3AW.  
 GLENROTHES: A. B. Givens, GM3YOR, 41 Veronica Crescent, Kirkcaldy, Fife, KY1 2LH.  
 HARROGATE & KNARESBOROUGH: R. Troughton, G4AZJ, 2 King James Road, Knareborough (3494), HG5-8EB.  
 HEREFORD: S. Jesson, 181 Kings Acre Road, Hereford (3237).  
 HULL: F. Moss, G8GDD, 334 Ings Road, Hull, HU8-ONA.  
 ILFRACOMBE: D. Raby, G3IDR, Ilfracombe School, Worth Road, Ilfracombe, North Devon. (*027-16 3427.*)  
 KINGSTON: R. S. Babbs, G3GVU, 28 Grove Lane, Kingston-upon-Thames. (*01-546 2801.*)  
 LICHFIELD: R. Smethers, G3NLY, 46 Church Road, Burntwood, Walsall, Staffs., WS7-9EA.  
 LINCOLN: F. Day, G4BXL, 5 St. Marks Avenue, Cherry Willingham, Lincoln (51058), LN3-4LX.  
 MAIDENHEAD: A. K. Chennells, 10 Lower Cippenham Lane, Slough (20417), SL1-5DF, Bucks.  
 MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Birmingham, B32-2AN. (*021-422 9787.*)

MID-SUSSEX: E. J. Letts, G3RXJ, 87 Meadow Lane, Burgess Hill (3552), Sussex.  
 NORTH BUCKS: R. J. Pye, G8AAT, 7 Meadow View, Potterspury, Towcester, NN12-7PH, Northants. (*Yardley Gobion 542440.*)  
 NORTH DEVON: H. G. Hughes, G4CG, Crinnis, High Wall, Sticklepath, Barnstaple, Devon.  
 NOTTINGHAM: S. F. Claringburn, 49 Fernleigh Avenue, Westdale Lane, Nottingham, NG3-6FN.  
 PLYMOUTH: C. Mitchell, G3UVS, Kechil Rumah, Green Lane, Yelverton, South Devon, PL20-6BW.  
 SLADE: J. E. Drakeley, G8GRC, 186 Conway Road, Chelmsley Wood, Birmingham 37.  
 SOUTH BIRMINGHAM: R. J. Thompson, G8GDZ, 23 Fox Hill, Selly Oak, Birmingham 29. (*021-472 0553.*)  
 SOUTHGATE: J. Batchelor, G3XMY, 22 Faversham Avenue, Bush Hill Park, Enfield, Middlesex. (*01-360 6537.*)  
 SOUTH MANCHESTER: D. Holland, G3WFT, 7 Alcester Road, Sale, Cheshire, M33-3GW.  
 SPALDING: R. Harrison, G3VPR, 38 Park Avenue, Spalding, Lincs., PE11-1QX.  
 STEVENAGE: C. Barber, G4BGP, 473 Canterbury Way, Stevenage, SG1-4EQ, Herts.  
 STOKE-ON-TRENT: R. G. Procter, G8CRS, 8 Birch Road, Bignall End, Stoke-on-Trent, ST7-8LB, Staffs.  
 STOWMARKET: A. P. Ashton, G3XAP, 30 Fordview Road, Stowmarket, Suffolk.  
 SULLY: S. K. Lamprey, GW4AMV, 11 Broadacres, Leckwith, Cardiff (387076), Glam.  
 SURREY: S. A. Morley, G3FWR, 22 Old Farleigh Road, South Croydon, CR2-8PB. (*01-657 3258.*)  
 SUTTON & CHEAM: A. Keech, G4BOX, 26 St. Albans Road, Cheam, Sutton, Surrey.  
 THAMES VALLEY: C. B. Seaman, G3ATF, 40 Park Road, Ashford (56030), Middx.  
 TORBAY: M. Yates, G3UIQ, Top Flat, Waverley Road, Newton Abbot, Devon.  
 VERULAM: H. Young, G3YHY, 93 Leaford Crescent, Watford, WD2-5JQ, Herts.  
 W.A.M.R.A.C.: Rev. A. W. Shepherd, G3NGF, Lawn House, West Felton, Oswestry, Salop. (*Queens Head 366.*)  
 WIRRAL: A. Fisher, G3WSD, 34 Glenmore Road, Oxtou, Birkenhead.  
 YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset.  
 YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

known to those wily old station inspection wallahs!

There is no let-up in the pressure of activity for the **South Manchester** lads during August, between their Monday evenings at the Club shack, Greeba, Shady Lane, Manchester 23 for the VHF-minded, and the Friday full meetings at Sale Moor Community Centre, Norris Road, Sale, for which the programme is something like this: August 3, a discussion on Aerials; August 10, P. Stewart talking about the History of Radio up to the year 1922; August 17, the secretary, G3WFT discusses his transistor Top-Band Transceiver; August 24 is a good old rag-chew session; and to round off the month, August 31 is a Radio Clinic—Fault Diagnosis.

\* \* \*

**Stowmarket** send a special (for the local Carnival) edition of their well-produced *QUA*, from which we get it that there are meetings on August 6 (Rx Alignment and Constructional Project); August 20, mid-monthly get-together; and September 3 (BC Listening, and again the Constructional Project). Place is the Adult Centre, Onehouse Road, evenings at 7.30 p.m.

**Cheltenham** Group report that their meeting on August 2 will deal with hash suppression in mobile working, at the Royal Crescent Hotel, Clarence Street, 7.30 for 8.0 p.m.

Up in Scotland (we do not hear often enough from Clubs in those parts) **Glenrothes** will be in the Library, Old Nursery Lane, Douglas, on August 5 to arm themselves in preparation for VHF/NFD. On September 9 they have their AGM, while on the 11th they will be visiting the IBA's Blockhouse Hill Transmitting Station, in Lanarkshire—which should be interesting if they are allowed to see inside those equipment cabinets.

From **Ilfracombe**, North Devon, we have news of a new Club in process of formation—at Ilfracombe School, Worth Road, where they already have their own call-sign G4CHU, with G3IDR in charge. From a site 350ft. a.s.l. they will have a good take-off all round. Study for



“ . . . I name him D-delta, A-alpha, V-victor, I-india, D-delta . . . ”

SHORT CLUB NOTICES

CLUB NAME	HEADQUARTERS LOCATION	MEETING MONTHLY
Bromsgrove	“Royal Oak,” Barley Mow Lane, Catshill, Bromsgrove	August 10
Chiltern	Ernest Turner, Canteen, Totteridge Avenue, High Wycombe	August 14, 29
Cray Valley	United Reformed Church Hall, Court Road, Eltham, S.E.9.	August 2, 16
Dunstable Downs	77 High Street South, Dunstable, Beds.	August 3, 10, 17, 24, 31
Harrogate	Womens' Institute, Park Road, Scriven.	August 13, 20
Midland	Midland Institute, Margaret Street, Birmingham	August 18
Southgate	Southgate Swimming Baths, Winchmore Hill Road, London, N.21	August 9
Stevenage	Hawker Siddeley Dynamics, Ltd., Gunnels Wood Road, Stevenage.	August 2, 16
Thames Valley	King Georges Hall (Small Hall), via Council Car Park	August 1
Torbay	Bath Lane, rear 94 Belgrave Road, Torquay.	August 25
York	British Legion Club, 61 Micklegate, York	August 2, 9, 16, 23, 30

N.B.—In each case, the Secretary's name and address appear in the Panel, opposite.

the R.A.E. is being arranged at Barnstaple Technical College—and they have the G.P.O. coast station Ilfracombe Radio, GIL, in the neighbourhood.

One of the go-ahead clubs is **Slade**, based on Church House, High Street, Erdington, Birmingham, in the Committee Room. Like many other clubs, Slade reckon August to be a slack month, and so they have, at the time of writing, nothing firm planned for August 10. However, August 24 is somewhat different, insofar as this is the session when the VHF/NFD briefing takes place. One notes that they have obtained permission to erect aerials for VHF and maybe other bands; and that they have a strong D/F interest, demonstrated by the fact that they are organising the D/F Qualifying Event on August 5.

**Echelford Newsletter** states that they get together on the second Monday and the last Thursday of each month, the meeting-place being St. Martins Court, Kingston Crescent, Ashford, Middlesex. However, as the *Newsletter* has much to be passed on to the members, mention of the detailed goings-on for these evenings is omitted—but we know from our own experience that something will be fixed up for the faithful.

August 8, at The Scout Hq., Stirling Walk, Raeburn Avenue, Surbiton, Surrey is booked into the diaries of all the **Kingston** gang. The reason is that the lecture will be by G4CDY of Mullard talking about RF Power Transistors—visitors are welcome.

One would imagine **Spalding** as a small group in a large catchment area—nothing like it, they have no

less than 81 members so *something* must be happening to attract these numbers and hold them. For August 17, they are getting the SWL's to bring up their problems, and the more experienced types will do their best to assist. Venue is the Ship Albion, Albion Street, Spalding.

Visiting is always encouraged by the members at **Lincoln**—they like to see new faces at the Lecture Room, Lincoln Astronomical Society, Westcliffe Street, off Burton Road. However, it should be noted that the Club will be closed on August 1 and 8. August 15 re-opens with an Open Night; August 22 is a Treasure Hunt; and August 29 is set aside for VHF/NFD preparations and discussion.

If you want to know about the **Farnborough Club**, write or ring G8FWE *see* Panel. However, we can tell you that the lads get together twice each month.

The main pre-occupation at **Shirehampton** is surely the exhibition station GB2BEX they are running as part of the Bristol 600 Charter Celebrations—it has to be manned from 10 a.m. till 9 p.m. daily right through to August 12. The regular weekly Friday evening sessions

will be held as usual, at Twyford House, High Street, Shirehampton, Bristol.

**Bishops Stortford** have nothing fixed for August, although the Hq. at the British Legion Club, Windhill, Bishops Stortford, will be opened as usual on August 20.

The fortnightly routine of the **North Devon Club** gets a bit of a setback in August, as there is no meeting on August 22. However, the talk on August 8 is on, as usual at Crinnis, High Wall, Sticklepath, Barnstaple.

The Market Hall, St Albans is the home for **Verulam**. Here, on August 15, they have a talk on the uses of *Veroboard* in the construction of Amateur Radio equipment—start as usual 7.30 for 8 p.m.

#### Conclusion

That's about it for another month. The deadline is **August 10**, with letters carrying information to cover *September* goings-on. Meantime, for the majority who are on holiday, have a good time, and take care. 73. The address for reports is, as usual, "Club Secretary," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

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**SEPTEMBER Issue: Due out August 31.** Single-copy orders 30p, post free, to reach us by Wednesday, August 29, for posting on August 30.—Circulation Dept., Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

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## READERS

**FOR SALE:** Trio 9R-59DS Rx, £35; Heathkit GC-1U Mohican Rx, £20. Both little used.—Bennett, 13 Dickinson Road, Formby, Liverpool, L37 4BX.

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**QUICK SALE: Heathkit equipment: SB-610E** monitor 'scope, £38; IT-12 signal tracer, £10; RF-1U signal generator, £15. All in absolutely mint condition and practically unused. Will consider all reasonable offers.—Barkham, 63 Stanley Road, Broadstairs, Kent.

**SELLING:** Telequipment D.43 oscilloscope, fitted "A" amplifiers, with handbook and leads, very good condition, £65 or near offer; Farnell L.30 power supply, offers?—Ring Ritchie, Yardley Gobion 542278, evenings. (Northants).

**OFFERING:** Thousands of Japanese electronic components (about 30,000 parts), will Exchange for all-mode IC TCVR/TV.—Hertz, 20 Corporation Road, Chelmsford, Essex.

**SALE:** FT-DX401 SSB transceiver, 5 months old, mint, £200; new Shure 202 microphone free to purchaser. Going home-built CW.—Stone, G3JFC, 26 Crayford Way, Crayford (22489), Dartford, Kent, DA1 4LQ.

**SALE: FR-DX500 Rx, coverage 160-2m., FB receiver,** £100; Codar A.T. 5 with AC/PSU, £17.50; Avo Minor, in case, £4.50.—Derrick, G3LVX, 37 Gregory Avenue, Bolton, Lancs.

**FOR SALE:** Heathkit DX-40 with VF-1U VFO, one xtal, handbooks, mic. and key, in good condition, £18. Prefer buyer collects.—Walters, 61 Sussex Gardens, Chessington, Surrey. (Tel: 01-397 6924).

**WANTED:** B.40 or similar receiver in working or repairable condition. Details and price, please.—Smith, 64 Pashive Road, Goole, Yorkshire.

**SELLING:** CR-100/B.28 in working order, with instruction manual, £15. Offers? (Lincs.).—Box No. 5157, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

**SALE:** Trio 9R-59DS receiver with SP-5D speaker and headphones, £30.—Rayment, Smithend, Barley, Nr. Royston, Herts.

**SELLING:** Trio 510 transceiver with PSU, £140; Lafayette HA-350, £55; DX-100U Tx with SSB adaptor, £50; Heathkit RA-1 Rx with xtal calibrator, £28. All in mint condition and with manuals.—Highgate, G4CDS, 421 Portway, Shirehampton, Bristol, BS11 9UQ.

**FOR SALE:** Heathkit HR-10B amateur bands receiver, with speaker and manual, little used, £28; Fantavox HE-50 4-band communication receiver, with built-in speaker, £10.—Constable, 23 Horne Close, Hillmorton, Rugby (75926), Warks.

**WANTED: Three-band beam, state model and year.**  
**EXCHANGE:** 12-AVQ with cash adjustment.—Forbes, 40 Hempshaw Avenue, Woodmansterne, Banstead, Surrey. (Tel: 073-73 51799).

**SALE:** 15-ft. whip aerial, tapered copper tube, in sections, with base insulator and wooden tripod, £4.—Leighton, Tangley Cottage, Wonersh, Guildford.

**SELL OR EXCHANGE:** Macgregor Digimac 1-plus-1 proportional radio control transmitter, with receiver, battery box, two servo's (used only once), and two model boats: Sell or part-exchange for communications Rx (solid-state preferred but any considered) or 2m. gear.—Sayers, 140 Wolverley Court, Telford, Salop.

**SALE:** The equipment of the late G3FMB/G8CNQ is offered for sale on Saturday, August 18, from 10 a.m. until 8 p.m. Much useful gear at very low prices for callers only.—Harrington, G3VQM, QTHR (Rochester, Kent).

**SELLING:** Sommerkamp FR-100B, £50; FL-200B, £50; CN-2 2m. convertor, £15; SWR meter, £8.—Ring Brownhills 3651 or Tamworth 3988 after 6.30 p.m.

**SALE:** FT-101, with fan and speaker, 3 months old, going VHF, £270. (Derbys).—Box No. 5158, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

**FOR SALE:** Sommerkamp FT-100, coverage 160-10m., PSU AC/12v. DC, £80; Hy-Gain 18-AVT, hardly used, £20; J-Beam 2m. 8-over-8, £4; Tavasu mobile whip, all coils, £10. Prefer buyers collect.—Tibbert, 11 Darwin Road, Mickleover, Derby (511434), Derbys.

**MANUALS:** B.40, CR-150, CD-1016, 13A, £1.75; TT40A, J4, SP-600, £2; CV89, BC-640, T.1509, £4.—Brooks, 5 Farrant House, Winstanley Road, London, SW11.

**SELLING:** Sommerkamp FR-DX500, very good condition, £110; Trio 9R-59DE, good condition, £30; Heathkit 10-12U 'scope, £20.—Ring Berg, 01-863 1638.

**FOR SALE:** Versatower P.60, galvanised, auto-braked winches and coax stand-off brackets, works reconditioned (present list price £214), £150. Delivered UK mainland. Prop pitch motor, fitted to this head unit, £10.—Tel: Brownhills 3651, or Tamworth 3988 after 6.30 p.m.

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**WANTED:** Eddystone 680X or 730/4 receiver in good working condition. Buyer will collect reasonable distance. Details and price please. (London).—Box No. 5159, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

**EXCHANGE OR SELL:** Trio JR-599, £140 or exchange. **WANTED:** SSB transceiver, portable or mains/battery, with Top Band, or What-Have-You?—Jackson, G3HQJ, 243 Rawlinson Street, Barrow-in-Furness (22303), Lancs.

**SALE:** Tiger 200HF Tx, 150 watts AM/CW, £30; HQ-170A triple conversion amateur band Rx, £75.—Hooper, G3SCW, QTHR.

**OFFERING:** Drake R.4B with 160m. crystal (purchased new 1973); Heath SB-101; SB-600 with AC/PSU; 30-ft. alloy self-supporting tower. Offers invited.—Bray, G3RWQ, 54 Grange Avenue, Worcester.

**SHACK CLEARANCE:** Heathkit SB-101, with CW filter, incorporating a few sensible modifications, with power supply and speaker. Heathkit SB-300 Rx, with 3 filters and speaker. Valves: New PL172's, 4-400A's, new; 4X250's, 4-125's, etc. Offers invited.—Pilkinton, The Quarries, Quarry Drive, Aughton, Ormskirk, Lancs. (Tel: Aughton Green 422203).

**OFFERING:** Linear amplifier, 500 watts, used most successfully with Viceroy. Best offer secures. Buyer collects. Now gone transceiver.—Templer, G3RDX, Parsonage House, Woodbury, Exeter.

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**SALE:** Pye U.450L 70cm. Tx/Rx, FM, excellent condition, £30.—Raven, Wedgwood, Green Lane, Rackheath, Norwich NOR 02Z.

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**SALE:** Eddystone EC-10, £28; R.1475 Rx and new PSU, £15; Micro Modules 2m. converter, IF 4-6 MHz, unused, £10.—Stampton, 88 Wilberforce Way, Gravesend (G3284), Kent.

**OFFERING:** Heathkit GR-54 SWL receiver. Offers —Box No. 5160, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

**SELLING:** Holdings JR-310 Super de Luxe receiver, fitted mechanical filter, mint, 3 months old, (cost over £100), £85 including delivery. Gone transceiver.—Bell, GM4CFM, 114 Glenurquhart Road, Inverness IV3 5BP, Scotland.

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**SALE:** Hy-Gain TH-3M111 beam, zinc sprayed, £45; Polyquad cast aluminium spiders and boom mount, with manual, £5; Sentinel converter, IF 28-30 MHz, £13.—Wynes, G3TLV, 20 Cross Lane, Middlewich, Cheshire.

**FOR SALE:** Trio 9R-59DS with calibrator and handbook, plus other information, as new, £35. Buyer collects.—Plant, 13 Highfield, Elton, Chester, Cheshire. (Tel: 024-463 433).

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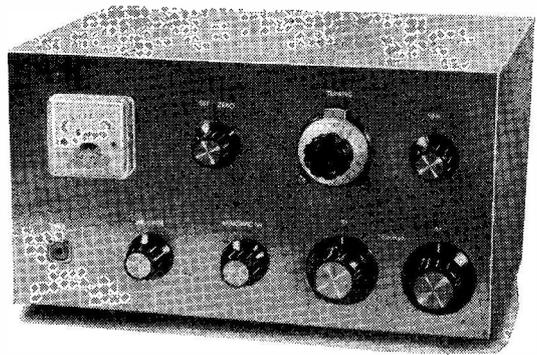
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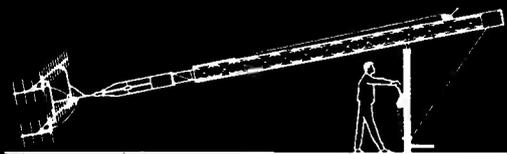
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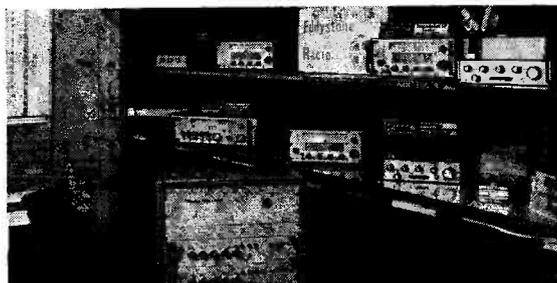


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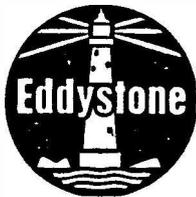
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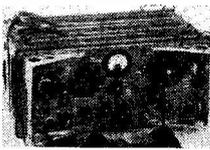
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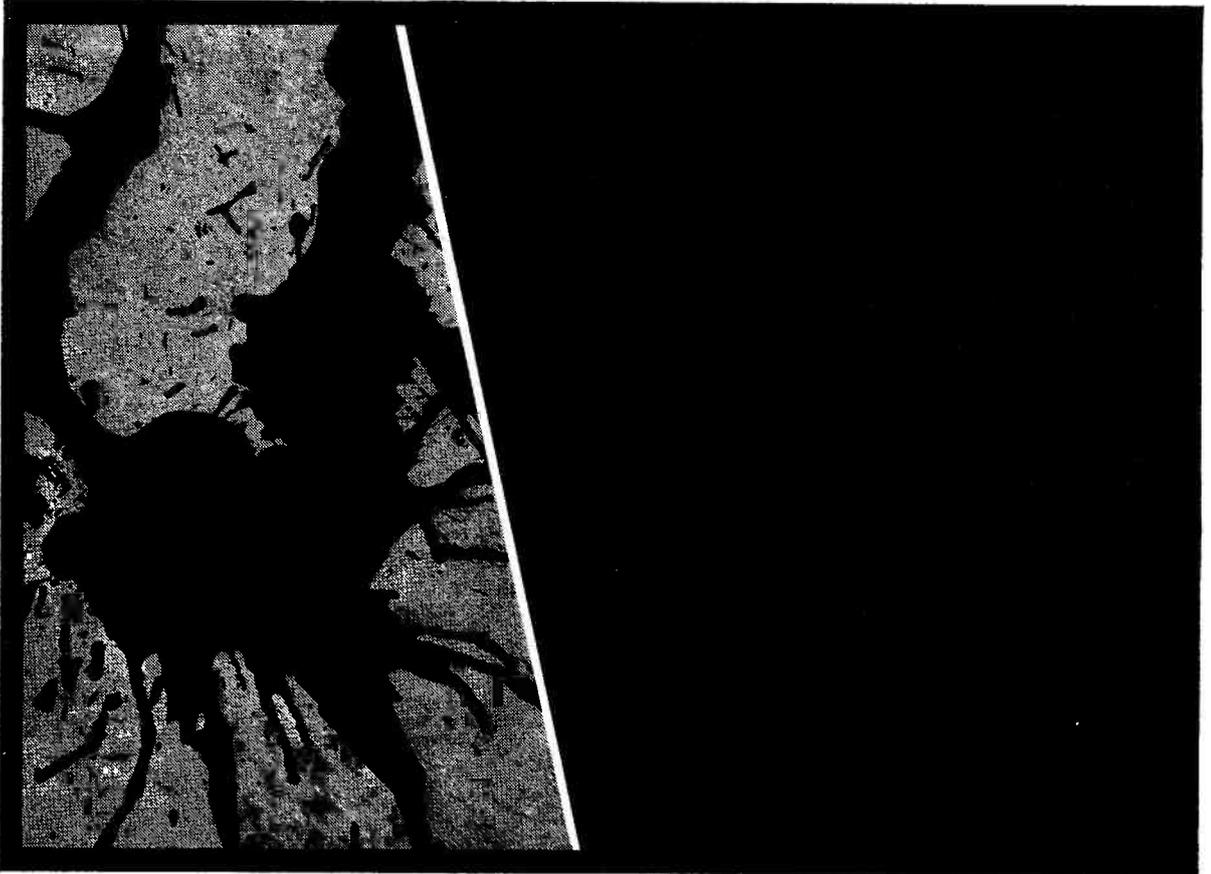
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