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No. 5

THE  
**SHORT  
WAVE**  
MAGAZINE

JULY, 1974

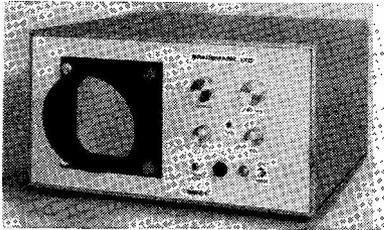
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COMMUNICATION**

**FOR THE RADIO AMATEUR AND AMATEUR RADIO**

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**SSM-I MONITOR**—£143 (includes V.A.T. and U.K. carr.)  
... Why pay double for an imported Monitor?

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- COPIES 850/400/170 HZ SHIFTS
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- F.S. KEYER FOR TX (AND OPTIONAL AFSK)

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

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(Optional plug-in AFSK module, SRD1-AK, £6.43. SRD-1 complete with SRD1-AK, £67.54).

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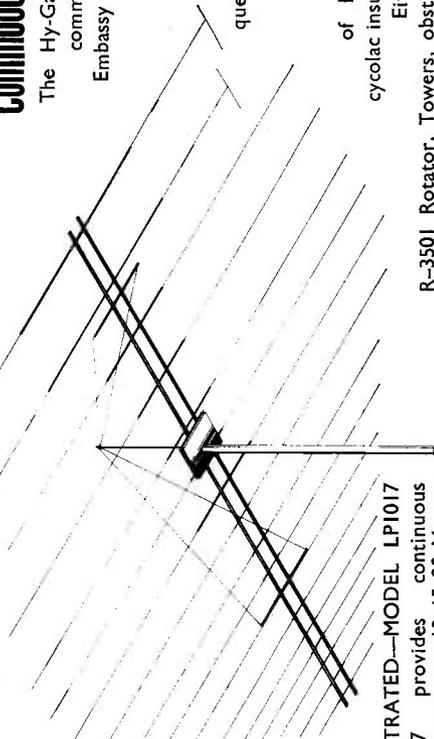
# Professional performance with Hy-gain beam and KW equipment

## Continuous coverage across 10-15-20-40 metres

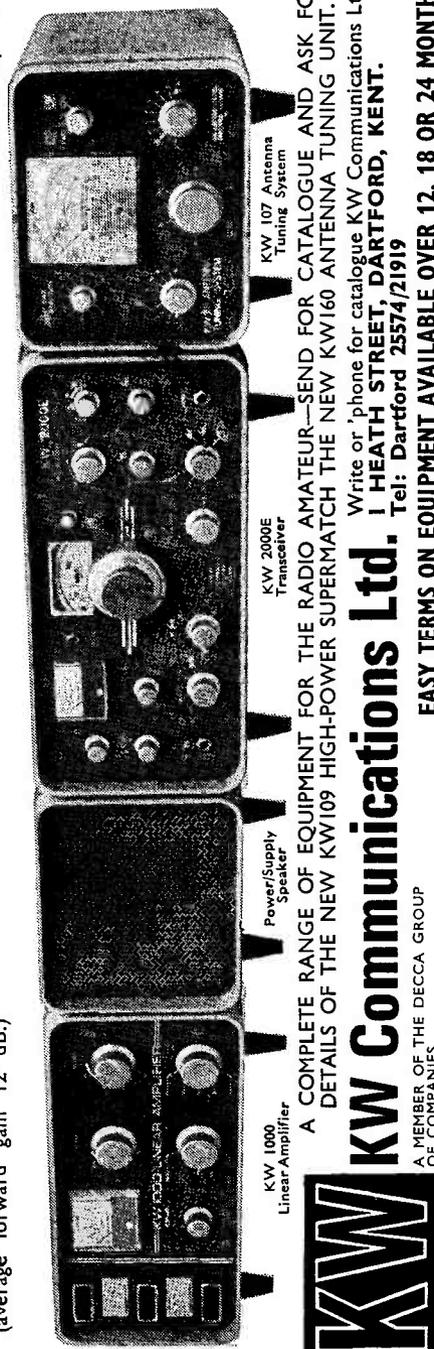
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**KW 2000E Transceiver**  
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**R-3501 Rotator**

A COMPLETE RANGE OF EQUIPMENT FOR THE RADIO AMATEUR—SEND FOR CATALOGUE AND ASK FOR DETAILS OF THE NEW KW109 HIGH-POWER SUPERMATCH THE NEW KW160 ANTENNA TUNING UNIT.

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- ★ FIRST-CLASS DEMONSTRATION FACILITIES
- ★ ON-THE-SPOT CREDIT TRANSACTIONS
- ★ FAIR PART EXCHANGE ALLOWANCES ON ALL COMMERCIAL GEAR

With the Trades Description Act well in mind, we have no hesitation in saying that we have a higher turnover in quality used equipment than any other dealer in the country and our stock often fluctuates between 80 and 100 major pieces. Space does not permit us to detail our full range, but we show below a few examples of equipment which is virtually unobtainable anywhere else in the U.K. If you would like our latest used equipment list, however, please let us have a couple of stamps and we shall be happy to forward this by return post.

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<b>YAESU FR400SDX RECEIVER.</b> In absolutely mint condition	... ..	£160.00
<b>YAESU FT401 TRANSCEIVER.</b> Exactly as the day it was made	... ..	£250.00
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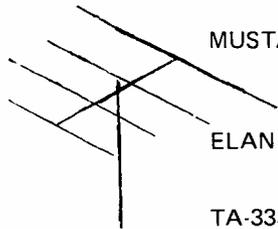
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Dipole (Rotary, Vertical or Horizontal) .. .. .	£ 27
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Triband 3 Element Beam. Fits 1 1/4" mast .. .. .	£39.80

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## R. T. & I. ELECTRONICS LTD.

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**CODAR EQUIPMENT, PR40, £8.90 (30p);** Leaflets on request.

In present conditions we regret that all prices are subject to alteration without notice.

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- ★ We have EASY Parking facilities.
- ★ We welcome your enquiries for specific items which although not advertised, may very well be in stock.

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Prices include VAT and carriage, but are subject to change without notice

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*FP75B ... .. £35.00	*FR101SD ... .. £363.00	*FT220 ... .. £290.00

\* NEW MODELS—come along for a demonstration.

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POSTAGE IS INCLUDED IN THE ABOVE PRICES.

# MICROWAVE MODULES LIMITED

11 CRANMORE AVENUE, CROSBY, LIVERPOOL L23 0QD Tel: 051-928 1610

**IMPROVING THE BEST  
ISN'T EASY . . .**



**. . . BUT WE'VE DONE IT!**

## UPDATED SPECIFICATION

The overwhelming response to the introduction of our 144MHz SSB receive converter has indicated the requirement for a tightly specified converter for use with modern highly accurate 28-30MHz receivers. To this end we have now standardised the design of our 28-30MHz converter using a zener-stabilised 116MHz crystal oscillator, giving a typical read-out error of better than 1kHz. The converter is now available in the two versions, with and without the local oscillator output facility.

**MMCI44/28**

Price **£16.72** inc. VAT

**MMCI44/28 LO** (with 116MHz output)

Price **£17.93** inc. VAT

## SPECIFICATION

Noise figure : 2.8dB max. Gain : 27dB typ.  
Image rejection : 65dB typ.  
Crystal oscillator : 116MHz (zenered)  
Frequency error at 144MHz : 3kHz max.  
Power supply : 35mA at 12 volts.  
116MHz o/p power : 5mW min. (LO o/p version)

## COMPLETE CONVERTER CAPABILITY

We can supply converters in the range 50-1,600MHz.  
Please enquire if you have any specific requirements.

## 144MHz DOUBLE CONVERSION MOSFET CONVERTER

I.F.s available ex-stock : 2-4, 4-6MHz. Price inc. VAT **£16.72**. This unit was developed to meet the heavy demand for a converter suitable for use with receivers having better performance at lower frequencies. It uses two dual-gate mosfet mixers, both fed from the output of a 70 or 71MHz crystal oscillator. Selectivity is obtained at the first IF in the 74MHz range, thereby overcoming the usual problems associated with low-I.F. single conversion converters.

## 144MHz CONVERTER

We have extended our popular range of single conversion converters to include the following I.F.s : 9-11, 12-14, 14-16, 18-20, 24-26, 27.7-29.7, 28-30MHz  
Price **£16.72** inc. VAT

## 70MHz CONVERTER

I.F.s available : 4-4.7, 14-14.7, 18-18.7, 28-28.7MHz.  
Price **£16.72** inc. VAT

## 136MHz SATELLITE BAND CONVERTER

I.F.s available : 28-30MHz and others.  
Price **£16.72** inc. VAT

## 144MHz 5 WATT AM TRANSMITTER

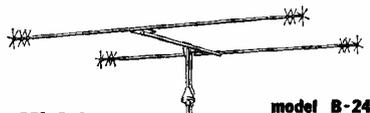
5 watts input, six channel crystal controlled.  
See May SWM advert for full details.  
Price in. VAT **£35.75**

**ALL EQUIPMENT AVAILABLE EX-STOCK — EXPORT ENQUIRIES WELCOME**

# Waters & Stanton Electronics

NO GARDEN IS TOO SMALL!

- \* Element length 11ft.
- \* Turning radius 6ft.
- \* 10-15-20 metres
- \* 1.5 kW rating
- \* No traps to burn out



**Miniature Band, 2 Element BEAM Antenna** model B-24

£35.75 inc. VAT plus £1.50 carr.  
By MINI-PRODUCTS INC. USA

DON'T DELAY SEND S.A.E. FOR DETAILS TODAY

### MFJ SUPER SSB/CW FILTER

We are sole agents for this fabulous little filter that will sharpen up the selectivity of any receiver. It simply plugs into the receiver headphone socket and has three positions of selectivity down to 80Hz with an extremely steep skirt and no ringing. In its widest position it enhances SSB and the way it brings the weakest of signals out of the heavy QRM on 40 metres has to be heard to be believed. The unit employs the latest in circuitry and comes ready for use.

NOW AVAILABLE EX-STOCK  
PRICE : £11.00 plus VAT

There is also an interesting range of audio amplifiers, kits and xtal calibrators in the MFJ range. SAE for full details.  
MFJ 25/50/100 kHz xtal calibrator module, £8.50 + VAT.

### MFJ CW FILTER AND MINI-BEAM STOCKISTS

Amateur Radio Shop, 13 Chapel Hill, Huddersfield.  
Holdings, 39/41 Mincing Lane, Blackburn, Lancs.  
J. & A. Tweedy Ltd., 79 Chatsworth Road, Chesterfield, Derbyshire.  
Amateur Radio Bulk Buying Group, 20 Thornton Crescent, Old Coulsdon, Surrey.

ROTATORS—BRAND NEW CDE AR30, £27.50 ; AR40, £32.50 (p.p. £1).  
COMPACT 80/40 DIPOLE, £9.90. (p.p. 45p).

### SUNDRIES

High Power Wightraps ... .. (p.p. 20p)	£4.29
"Milliwatt" subscription QRP journal ... ..	£1.85
HP2A TVI filters ... ..	£1.43
50 ohms coax ... .. yd.	17p
300 ohm feeder ... .. yd.	8p
Insulators ... .. ea.	10p

G-WHIPS—EX-STOCK.

SOLID STATE AND MICROWAVE MODULES—EX-STOCK.  
SHURE MICS.

DON'T FORGET—

- ★ Barclaycard or Access—simply quote number.
- ★ Full H.P. Facilities—33% deposit.
- ★ All prices include VAT.

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Early Closing—Wednesday.

Tel. Hockley (03704) 6835

# AMATEUR RADIO CHAS. H. YOUNG LTD. G3V FV

170-172 . CORPORATION STREET . BIRMINGHAM B4 6UD

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WE CAN NOW ACCEPT MOST MAKES OF COMMERCIALY MADE COMMUNICATION EQUIPMENT FOR SERVICE

### MICROWAVE MODULES

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70 MHz Converters	28 MHz IF	£16.72
144 MHz	2-4 IF	£16.72
144 MHz	4-6 IF	
144 MHz	28-30 IF	£19.91
432 MHz	28-30 IF	
432 MHz	144-146 IF	£26.40
1296 MHz	28-30 IF	
1296 MHz	144-146 IF	£9.90
144 MHz Pre-Amp (2 outputs)		
432 MHz Varactors Triplers		£19.25
1296 MHz Varactors Triplers		£27.50
144 MHz Transmitter (5 watts)		£35.75

All above post free.

### SOLID STATE MODULES

2M Converter 4-6 or 28-30 MHz (22p)	£15.12
De Luxe 2M Converter, with built-in A.C. p.s.u., 4-6 IF ... (30p)	£21.45
2M to Med. Wave 2 Switched Bands ... (30p)	£20.62
70 CM Converter 144/146 MHz (22p)	£15.12
PA3 Pre-Amp for 2M Equipment (10p)	£5.50
2M Pre-Amp in case ... (22p)	£7.15
Europa 10-2M Transverter with valves (corr. at cost)	£78.09
PCB with Instrs. for G3XGP 2M Converter ... (10p)	75p

### RECEIVERS

TRIO 9R59DS ... .. (Corr. at cost)	£54.45
Eddystone EC10 Mk. II	£108.90
Yaesu FR50B ... ..	£73.70

### TRANSMITTER

KW 204 ... ..	£187.00
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### TRANSCIVERS

TRIO TR2200 Portable 2M	£87.45
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### MICROPHONES

Shure 201 ... .. (30p)	£6.00
Shure 444 ... .. (30p)	£14.40

### ATU

KW EZ Match ... .. (35p)	£22.00
Oskel SWR200 SWR/Power Meter 52/75Ω ... .. (30p)	£21.45

### ACCESSORIES

Tech TE15 ... .. (40p)	£20.95
Eddystone Speaker 935 ... .. (50p)	£12.84
Eddystone LP 3382 Active Aerial 10 kHz-30 MHz ... .. (50p)	£26.67
Parmeko Mains Transformers... (75p)	£3.00
PRI : 115 or 230v.	
SEC : 114v, 10mA	
300-0-300v, 170mA	
63v, 4A C.T.	
5v, 3A	
50v.-140mA. Limited number.	

All prices include VAT

NO C.O.D. PLEASE PRINT YOUR ADDRESS. YOU MAY ORDER GOODS BY PHONE AND PAY BY ACCESS OR BARCLAYCARD. SIMPLY QUOTE YOUR CARD NO. Enquiries S.A.E. please TEL.: 021-236 1635. Prices subject to change without notice.

KW107 ATU/SWR ... .. (40p)	£66.00
KW103 SWR/Power 52 or 75Ω (30p)	£15.40

(Please specify)

### Comprehensive range of multimeters in stock

Bantex Fibre Glass 2M 1/2 wave ... (25p)	£3.14
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J Beam Fibre Glass 2M 1/2 wave ... (75p)	£7.70
J Beam Halo 2M head only ... (25p)	£1.87
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### Full range of J Beam Aerials, Rotators and Accessories.

KW Traps with "AT" ... .. (25p)	£6.60
Low loss coax 75Ω ... yd. (30p)	23p
Low loss coax 52Ω ... yd. (30p)	33p
Hard-drawn 14 SWG Copper Wire 140ft. ... .. (30p)	£3.05
Hard-drawn 14 SWG Copper Wire 70ft. ... .. (30p)	£1.55
Soft stranded PVC covered 7/67 mm. ... .. (30p)	£3.50
3" Ribbed insulators ... .. (6p)	20p
AT Insulator (Centre T) ... .. (6p)	15p
ML1 300 yds. approx. ... .. (25p)	£1.63
ML4 400 lb. ... .. yd. (25p)	4p
KW Ant. Switch IP 3W with SO239 Sfts. ... .. (30p)	£5.50

### COMPREHENSIVE RANGE OF DENCOR S.S. COMPONENTS, FINNIGAN'S PAINTS, EDDYSTONE DIECAST BOXES

● **Midland Agents**  
for EDDYSTONE, J BEAM,  
JOSTY KITS, AMTRON KITS, TRIO





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**YAESU—YOUR ASSURANCE OF QUALITY**  
—introduce

## TWO NEW MODELS!

The superbly engineered FR-101 Receiver



- ★ 23 Bands.
- ★ 160m - 2m.
- ★ Plus general coverage.
- ★ SSB/FM/AM/CW.
- ★ Digital readout option available later.

Full specification available upon receipt of S.A.E. for both models.

FR-101S, £245 + VAT.  
FR-101D, £330 + VAT.

## The FT-220

2m SSB/FM/CW  
TRANSCIVER

£264 (Ex. VAT)



We will be pleased to send you a full specification.

# Electronics (UK) Ltd

## 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 W7CVA 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 6053-T6.  
All our beams come complete with adjustable reactance tuned gamma match network which can handle 4kW plus a CW and SSB.  
Prices include carriage (exclude VAT). 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.

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Model No.							
M340, 3 ele. 40 metre beam, Gain 8.5 dB	...	...	...	...	...	...	£282.00
M240, 2 ele. 40 metre beam, Gain 5.5 dB	...	...	...	...	...	...	£140.00
M720, 3 ele. 20 metre beam, Gain 14 dB	...	...	...	...	...	...	£259.00
M620, 6 ele. 20 metre beam, Gain 13 dB	...	...	...	...	...	...	£199.00
M520, 5 ele. 20 metre beam, Gain 12 dB	...	...	...	...	...	...	£107.00
M320, 3 ele. 20 metre beam, Gain 8.5 dB	...	...	...	...	...	...	£58.00
M715, 7 ele. 15 metre beam, Gain 14 dB	...	...	...	...	...	...	£99.00
M615, 6 ele. 15 metre beam, Gain 11 dB	...	...	...	...	...	...	£83.00
M415, 4 ele. 15 metre beam, Gain 10 dB	...	...	...	...	...	...	£54.00
M810, 8 ele. 10 metre beam, Gain 14.5 dB	...	...	...	...	...	...	£107.00
M510, 5 ele. 10 metre beam, Gain 12 dB	...	...	...	...	...	...	£54.00

### WILSON DUO BAND BEAMS

DB62—6 ELE. 20 and 2 ELE. 40 INTERLACED BEAM. Gain 13 dB-20 5.5 dB-40. Boom length 50 ft.	...	...	...	...	...	...	£325.00
DB52—5 ELE. 20 and 2 ELE. 40 INTERLACED BEAM. Gain 13 dB-20 5.5 dB-40. Boom length 40ft.	...	...	...	...	...	...	£261.00
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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.	...	...	...	...	...	...	£114.00
DB32—3 ELE. 20 and 2 ELE. 15 INTERLACED BEAM. Gain 8.5 dB-20 6 dB-15. Boom length 20ft.	...	...	...	...	...	...	£70.00
DB76—7 ELE. 15 and 6-ELE. 10 INTERLACED BEAM. Gain 14 dB-15 13 dB-10. Boom length 40ft.	...	...	...	...	...	...	£141.00
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DB44—4 ELE. 15 and 3 ELE. 10 INTERLACED BEAM. Gain 10 dB-15 8.5 dB-10. Boom length 20ft.	...	...	...	...	...	...	£321.00
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### BANTEX FIBREGLASS MOBILE ANTENNAS

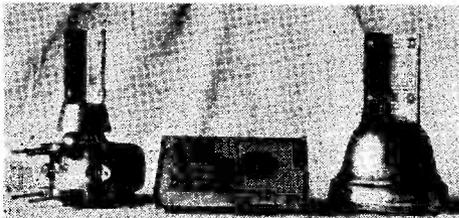
70± 70 MHz, ½ wave	£3.00	BGA, 144 MHz, ½ wave	£6.60
144± 144 MHz, ½ wave	£2.85	B5, 144 MHz, ½ wave	£5.00
Magnetic Mount	£7.50	Note, Deduct 50p from price of aerial if base is not required.	

The NEW SILENT CDE ANTENNA ROTORS are ex-stock.

These supersede the previous "Clunk-click" models.

CDE ROTOR

PRICES:  
AR20, £23 ; AR30, £25 ; AR40, £30 ; TR44, £52.



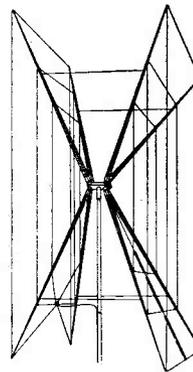
AR30, £25

AR40, £30

NEW MODELS. HAM-2, CD-44. Available shortly.

## Antenna Time

For the most comprehensive service and advice we hope that you will feel free to consult us for advice upon your requirements.



From CANADA

### GEM QUAD

£72.00

for 10, 15 & 20 m.  
+ VAT extra

- ★ Weighs only 21lbs.
- ★ Withstands 100m.p.h. winds.
- ★ Forward gain up to 8 dB.
- ★ Balun included.
- ★ Converts to 3 or 4 element quad.
- ★ Fibreglass tri-dectic spreaders
- ★ Front/back ratio 25 dB.
- ★ Low angle radiation.

### FROM THE U.S.A. HY-GAIN

Hy-gain 18AVT/WB the Great Wide-Band Self-Supporting Vertical for 10-80m. (ex-stock). Take the wide band, omnidirectional performance of Hy-Gains famous 14AVQ/WB add 80 mtrs. plus extra heavy duty construction and you have the new 18AVT/WB \* True ±-wave resonance on all bands \* 52 I/P \* SWR of 2 : 1 or less at band edges \* 1kW (AM) \* Radiation pattern has an outstandingly low angle \* Roof or ground mounting. Prices exc. VAT.

HY-GAIN (Carr. Pd.)	
Hy-Tower, 10-80m. Self supporting tower	£132.00
18V, 10-80m. Vertical self supporting	£15.50
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14AVQ, 10-40m. Vertical self supporting	£29.50
LC-80-Q, Loading coil for AVQ, 80m.	£9.30
18AVT/WB, 10-80m. Vertical self supporting	£42.50
TH6DXX, 10-20m. 6 element beam	£117.00
TH3 Mk. 3, 10-20m. 3 element beam	£90.50
TH3 Jnr. 10-20m. 3 element 600V. beam	£62.00
TH2 Mk. 3, 10-20m. 2 element beam	£62.00
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265, 3 dB Gain 144-174 Stainless steel whip and magnetic mount and 12ft. co-ax	£15.00
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153BA, 15m. 3 element beam	£44.00
103BA, 10m. 3 element beam	£35.00
LA-1, Lightning arrester	£17.50
LA-2, Lightning arrester	£3.00
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I4RMO, Roof mounting kit	£13.00
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## Western Electronics (UK) Ltd

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#### FDK MULTI 2000 TRANSCEIVER

Full coverage 144-146 MHz (148 MHz on receive). Separate I.F. strips for SSB/CW and FM. Antenna impedance 50 ohms. AC or DC operation. R.T. noise blanker. Tone call. 10 watts or 1 watt output. Deviation 3.5 kHz but adjustable up to 15 kHz. Carrier suppression better than 45 dB. Sideband suppression better than 50 dB. Complete with microphone. Digital read-out. PRICE £297.00.

#### IC-210 TRANSCEIVER

FM transceiver. Fully tunable both Tx and Rx. Solid state. AC or DC operation. Automatic repeater operation. 10 watt output. Centre reading discriminator meter. Built-in SWR meter. R.I.T. Complete with microphone. PRICE £286.00.

#### LINER 2 TRANSCEIVER

2 metre SSB transceiver, 144-10-144.34 MHz. Electronically protected, P.A. Switched. Combines the advantage with direct frequency read-out, with the ability to tune between channels with the VXO. In addition the provision of R.I.T. which enables the Rx to be tuned to a kHz or two either side of the Tx frequency. DC operated. PRICE £145.20.

#### MICROWAVE MODULES

2m. AM Transmitter ... .. £35-75  
2m. Converters (state I.F.) ... .. £16-72  
4m. Converters ... .. £16-72  
432 MHz Converters ... .. £19-81  
432 MHz Varactors ... .. £19-25  
1296 MHz Converters ... .. £26-40  
1296 MHz Dual Tripler ... .. £27-50  
144 MHz Dual output Preamp ... .. £9-90

#### SOLID STATE MODULES

2m. Converter ... .. £15-21  
70 Cm. converter ... .. £15-21  
PA3 Dual Mosfet Preamp ... .. £5-50  
2m. FET Pre-amp ... .. £7-50  
Europa SSB Transverters complete with valves ... .. £78-00  
Transverters. Less valves ... .. £64-35

#### J BEAM

2m 5 Element ... .. £5-29  
2m. 8 Element ... .. £6-61  
2m. 10 Element ... .. £12-00  
2m. 14 Element Parabeam ... .. £17-94  
All prices of beams include carriage. Send S.A.E. for full catalogue of rotators, beams, masts, clamps, etc.

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FT101B Transceiver ... .. £363-00  
FT401 Transceiver ... .. £341-00  
FT200 Transceiver ... .. £236-50  
FT75 Transceiver ... .. £150-00  
FR400SDX Receiver ... .. £231-00  
FL400 Transmitter ... .. £212-30  
FL2100 Linear ... .. £214-00  
FR50B Receiver ... .. £71-50  
YC355D Frequency Counter ... .. £139-70  
SP400 Loudspeaker ... .. £14-30

#### KW ELECTRONICS

KW2000E Transceiver ... .. £302-00  
KW202 Receiver ... .. £176-00  
KW204 Transmitter ... .. £187-00  
KW1000 Linear Amplifier ... .. £165-00  
KW107 Antenna Matching Unit ... .. £66-00  
KW108 Monitorscope ... .. £77-00  
KW E-Z Match ... .. £22-00  
KW 160m. Tuning Unit ... .. £17-60  
KW Balun ... .. £2-75  
KW 3 way Antenna switch ... .. £5-50

KW103 SWR/Power Meter ... .. £15-40  
KW109 Antenna Tuning Unit ... .. £82-50  
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12AVQ 1-15-20m. Vertical ... .. £22-00  
14AVT/WB 10 to 40m. Vertical ... .. £32-45  
18AVT/WB 10 to 80m. Vertical ... .. £46-75  
TH4DX Tribander Beam ... .. £134-00  
TH3MK3 Tribander Beam ... .. £99-00  
TH3JNR Tribander Beam ... .. £68-00  
LC80Q Loading Coil ... .. £10-23  
BN86 Balun ... .. £10-45

#### SPACEMARK

S.S.T.V. Monitor ... .. £143-00

#### EDDYSTONE

EB37 Receiver ... .. £88-00  
EC10MK2 Receiver ... .. £101-90  
LP3382 Active Aerial ... ..

#### COPAL CLOCKS

Model 227 24 hour alarm ... .. £8-00  
Model 228 24 hour alarm ... .. £10-00  
Model 601 day/date 24 hour ... .. £12-50  
Model 601 day/date Teak ... .. £14-00

#### G-WHIP MOBILE ANTENNA RANGE

Tribander Helical 10-15-20m. ... .. £13-53  
40m., 80m. and 160m. coils, each ... .. £4-51  
Telescopic whip for coils ... .. £1-21  
Basemounts ... .. £1-81  
Multimobile 10-15-20m. ... .. £15-73  
40m., 80m. and 160m. coils ... .. £4-51  
Telescopic whip for coils ... .. £1-21  
Flexiwhip 10m. basic with basemount ... .. £10-45  
Coils for 15m., 20m., 40m., 80m., 160m. each ... .. £4-67  
Send S.A.E. for literature on this range.

#### MICROPHONES

Yaesu 844 Desk Microphone ... .. £16-22  
Yaesu 846 Hand Microphone ... .. £6-32  
Shure 201 Hand Microphone ... .. £6-00  
Shure 444 Desk Microphone ... .. £15-00  
Shure 444 Desk Microphone ... .. £16-00  
Electro-Voice 619 Desk Microphone ... .. £28-50  
Electro-Voice Desk Microphone ... .. £14-41  
Electro-Voice 715 Hand Microphone ... .. £7-50  
**BARLOW WADLEY**  
XCR-30 Mk. 2 Solid State Receiver ... .. £110-00  
TR801 FM Tuner ... .. £17-25

#### ACCESSORIES

Single Meter SWR Bridge ... .. £6-60  
Twin Meter SWR Bridge ... .. £11-00  
Diamond SR435 VHF/UHF SWR Bridge ... .. £18-70  
Omega Noise Bridge TE701 ... .. £14-85  
Omega Noise Bridge TE702 ... .. £21-45  
B & W 5-way Antenna Switch ... .. £9-00  
MF100 Audi Generator ... .. £22-00  
3" Ceramic Insulators ... .. 20p  
2½" Ribbed Plastic Insulators ... .. 10p  
Egg Insulators ... .. 6p  
PL259 Plugs ... .. 40p  
SO250 Sockets ... .. 40p  
Cable Reducers ... .. 14p  
Line Connectors ... .. 80p  
B/Lee aluminium co-ax plugs ... .. 10p  
300 ohm twin feeder ... .. yd. 7p  
75 ohm twin feeder ... .. yd. 7p  
UR43 50 ohm Co-Axial cable ... .. yd. 16p  
UR67 50 ohm Co-Axial cable ... .. yd. 40p  
UR203 75 ohm low loss Co-Axial cable ... .. yd. 14p  
Morse Practice Oscillators ... .. £2-75  
QSL Card Holders. Holds 120 cards ... .. 40p  
Tech 15 Grid Dip Meters ... .. £20-00  
Multimeters from ... .. £5-00 to £30-00

#### R.S.G.B. PUBLICATIONS

Examination Manual ... .. 90p  
Radio Communication Handbook ... .. £4-13  
R.S.G.B. Standard Log Book ... .. 63p  
R.S.G.B. De Luxe Log Book ... .. £1-30  
Book prices include postage.

#### AMTRON

Send S.A.E. for latest catalogue and price list on these exciting kits.

#### TUNERS

138 to 170 MHz Tuner ... .. £16-30  
144-146 MHz Tuner ... .. £15-84  
Both Tuners battery operated. I.F. 1.5 MHz.  
144 MHz 200 mWatt FM Transmitter ... .. £19-86

#### SECONDHAND EQUIPMENT

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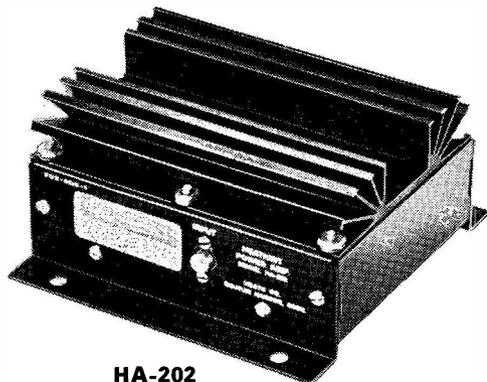
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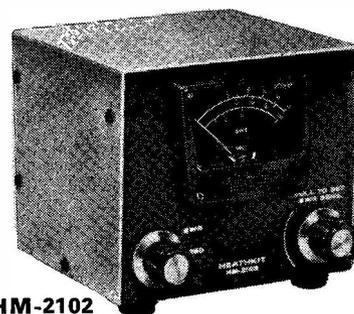
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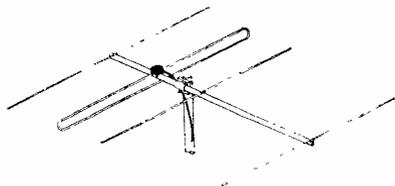
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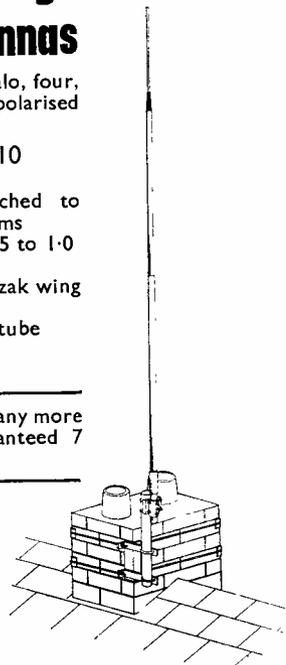
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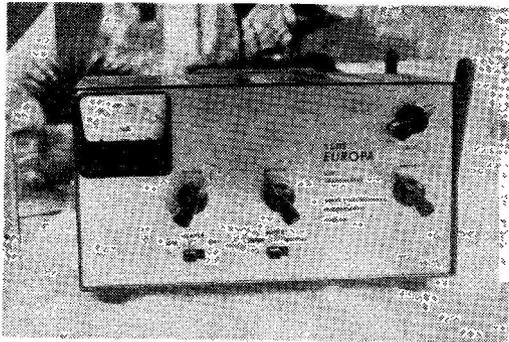
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(GB3SWM)

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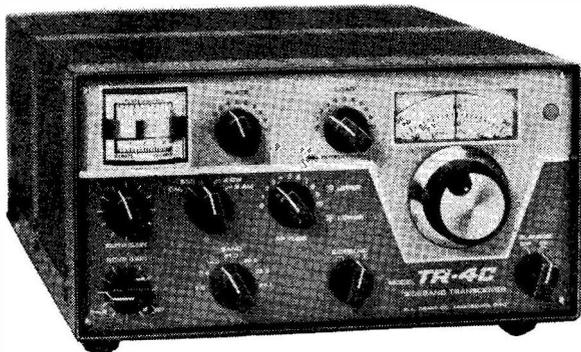
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# The SHORT-WAVE Magazine

## EDITORIAL

### POSSIBLE DELAY

Just as this issue was going to press, another dispute had developed in the printing industry. As it was likely to affect the machining and binding of many periodicals, the possibility is that your copy will not have reached you by the due date. *Please* don't blame us—as always, we had cleared this issue with the printers on time.

### R.A.E. COURSES

With the August-September issues, we shall be starting our usual listing of centres, up-and-down the country, at which courses of instruction are offered for the Radio Amateurs' Examination (Subject No. 765 in the City & Guilds of London Institute syllabus). Those responsible for the conduct or arrangement of courses should let us have the relevant information as soon as possible to ensure appearance in the lists.

### AMATEUR LICENCE FIGURES

The latest Ministry return puts the total of amateur licences in issue in the U.K. at 19,565 of which 4,575 are in the Class-B category. Mobiles, Class A-B together, total 4,444 and there are also 264 current A/TV permits. A most surprising figure is the total of 28,752 licences for radio model control—these are cheap, on-demand and for a five-year term.

### OLD TIMERS' ASSOCIATION DINNER

This took place on May 17, with 71 members and guests present, under the presidency of Kenneth Alford, G2DX. Membership of RAOTA is open to those who have held a U.K. full transmitting licence for 25 years at the time of application. The hon. secretary is Miss May Gadsden, 79 New River Crescent, London, N13 5RQ.

It is perhaps of some slight historical interest to add that the RAOTA was initiated, as the British Old Timers'

Club, by Austin Forsyth, G6FO, in 1948, with the late Howard Thomas, G6QB, as hon. secretary. The first dinner-meeting was held on May 20, 1949, at the Horse Shoe Hotel, London, there being 78 members present. Chairman on that occasion was the late Gerald Marcuse, G2NM, and the event was reported, with pictures, in the June 1949 issue of *SHORT WAVE MAGAZINE*. Thus, the RAOTA itself achieved 25 years' existence at the recent dinner.

### THEFT—MEAN AND DANGEROUS

The R.N.L.I. lifeboat station at Borth, near Aberystwyth, was broken into recently and the boat's radio equipment stolen. It consisted of a "Westminster" F.15FM, No. 7603, set up for frequencies in the range 156.0-156.7 MHz; a portable transceiver, Derritron "Seafone," Type 625 No. 044, for spot frequencies in the same range; and an Elnic battery charger. If you should encounter any of this equipment, please let your local Police know immediately.

### YOU CAN HELP US

If when sending in an entry (new call sign or change of address) for the "New QTH" page, you state clearly whether or not you are a direct subscriber—this can save having to check on the subscriber card index, involving hours of office time. Similarly, when renewing a subscription, make it clear that it is a renewal and, if possible give the expiry month.

Existing direct subscribers can also be of considerable assistance if they send in their latest wrapper (in which the *Magazine* is received) when querying our subscription department, stating also whether they are in the first or second class post category.

Without such basic information as readers themselves can give us when writing in, much unnecessary office work-time is generated.

Austin Forsyth  
G6FO

# COMMUNICATION and DX NEWS

*E. P. Essery, G3KFE*

AS this comes to be written, Murphy's Law has just operated again; it is just after closing-time for NFD, and close of play at the local ground for one-day county cricket—the only county stuff this season—and, at this precise moment, the thunder and the lightning (and the static), and the rain, have cleared up for effectively the first time for three days. Dear old Murphy—he can *always* be relied upon!

And, since we are talking about static crashes, let us make our start at Top Band.

## 160 Metres

Although much of the local activity has moved from this area, with consequent reduction in the GDX working, there is still much happening in terms of real, inter-continental, DX.

W1BB starts the ball rolling with his Top Band Bulletin. Conditions, he reckons have been, by and large, a wee bit down as compared with the previous season, which is *not* to say that the DX isn't there—it most certainly is. A new country to appear on the band was 4S7GV, worked by PY1RO in April, and our own old friend G3AAQ seems to have nipped over to the States to collect his W1BB QSL personally.

We understand that further operations on Top Band by 4X4NJ are to be announced. A new district to appear on the other side of the pond is VO2AB/VX2AB, there till 1976. G3YUV is known to work some DX over the pond, but it seems he has a "Fred Phoney" attachment, who worked W5KL and VE7UZ; luckily these two chaps were alert and realised what was happening. A snippet of interest is that it is understood that, at least in U.S.A., recommendations have been made that Loran-A, because of its inherent inaccuracy, should be phased out in favour of the Loran-C and other nav-aids, Loran-A to close by 1980, with W's then to have full band privileges once again. Loran-A is, of course, the rattlebox on 1850 kHz—the East Coast one, and 1950

kHz the European chain. It would seem that if this comes off, the top end of the band may well become fit for human occupancy once again.

G4CTR (Poole) makes an initial report on his doings. He started with a homebrew AM rig at ten watts, and an R.107 receiver; his best DX with that was to work GM3VLB up in Aberdeenshire—not a bad haul at all for an AM rig. However, on May 4, an FT-101 was obtained, which has been used on Top Band and Eighty with a 132ft. end-fed to work all round the U.K., while on Twenty there have been forays after the DX, of which more anon.

From G2HKU (Sheppey) comes on of the longest letters for many moons; Ted kept up his usual activity, and worked SSB to DL8PC, OH1JG and PAOPN, while CW accounted for GM3FXM, GM3PFQ, GM3PIP, GW3YTL and OL8CCP.

## Eighty

What *can* one say about this band? The mind, frankly, boggles. Perhaps that is the reason for the dearth of reports, either on CW contacts or Sideband DX.

G2NJ (Peterborough) worked G15DX while the GI was running a 19 Set from a twelve-volt battery in otherwise blackout conditions. Nick also mentions G3CEL as doing good work on the QRP side, with 1.8 watts, a contact on 3575 kHz which has in the end to QSY because of QRM from a couple of G Phone stations.

Still on the QRP tack, G2HKU is still on his lantern battery rig, at one watt; he worked CW to DJ2FR, DJ0FF, DK9KC, DL8KO, GI2DZG, HA5KKN, ON4QO, ON4TA, and PA0PBL.

Having got the 100 countries up on the bands 7-28 MHz, GW4BLE (Newport, Gwent) has now set off in earnest after his 100 on Eighty; to that end the 18-AVT/WB has been taken down and replaced by an inverted-Vee with the apex at fifty feet, which has brought the European stuff up considerably

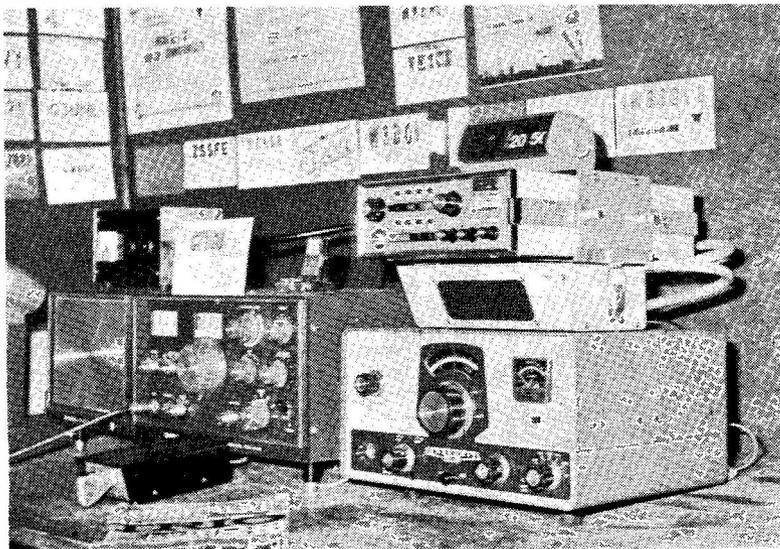
in strength and still seems to be acceptable at DX. So far reports have been exchanged with KP4AN, CP1EU, FP8DH, PY2FUS, PY5CAW, VE1's, W's and VP8NP (who by the bye is *ex-G3ZKH*).

## DX Points

G3YRR (Grimsby) notices the number of DX operators who fail to QSL even though IRC's are sent; Charles has several of his better DX contacts unconfirmed, among them Korea and the Solomon Is. The latest was an HZ who gave a German station as his QSL manager, and of course the card came back marked "Not Known." Charles, like so many more of us, finds it hard to understand the motives of these characters.

W4WFL/1 continues to keep us in the picture. This month he sent over a news release from the Northern Californian DX Foundation, regarding the Kingman Reef expedition, which should, if all goes well, be all but over by the time this comes to be read. However, it is of interest that, as part of the expedition, they were to run a propagation experiment using a Heath HW-7 QRP rig. The operator was first of all to announce the start of the test on full power SSB; then to key the HW-7 into a vertical aerial and ask for listeners to note the signal level, a letter or letters keyed *slowly* to give positive identification. Then, with the signal attenuated, and the test repeated, using a different code letter and again the listener asked to note the strength of the signal. The order of attenuation will be changed in each of the series of tests, making the level the vital thing to note. If you copied the signal but only partly due to QRM, QRN, or whatever, report it anyway, making the nature of the problem known. Tapes of the reception would be of interest, but every report *must* bear the date and time (GMT) of the reception. A special QSL card will be sent to all listeners who send in reports to W6WX, Box 717, Oakland, Cal

J. Outen, G3VGU, runs this station at 31 Carlton Road, Grays, Essex. He has a Trio TS-510 into a TA-32Jr. for the HF bands, with 20m. CW the favourite mode. Slow-scan TV is also an interest, using Robot equipment, and he sent us some good pictures to prove it.



fornia 94604, U.S.A. The tests, hopefully, were to be repeated on all the bands of operation, and even if you heard the announcement but not the test signal, that report would be of help. This is no tinpot experiment, as the name of Prof. O. G. Villard, W6QYT, as the scientific adviser to the Foundation makes very clear. It is understood the Kingman expedition will also collect coral and marine-life specimens for the Radiation Lab. at University of California.

On a different front, a nice collection of DX QSL cards landed on the mat with some other mail one day; they were 8P6DR, ZF1WL, VP2AGA and G3RWL—all the same chap, Richard Limebear, who your conductor recalls some years ago as an SWL member of the Southgate Club, back around 1957.

G3DCS (Ipswich) has been off the air on account of his latest toy, a Digital 200S rig, with 11 valves and fifty odd transistors, not to mention 30 IC's. This beauty was almost new but has a drifty VFO. After weeks of experimentation—painting the screening-boxes matt black to improve cooling, and trying temperature - coefficient compensation, the cause turned out to be nothing more complex than the tuning slug in the VFO coil—when this was changed to a VHF (purple colour-coded) slug-type the drift disappeared and went the opposite

way, so more weeks were spent gradually removing all the mods until the original circuit was regained, when the VFO was near-perfect! Murphy's Law again; but a useful point to recall by those who use ferrite slugs in VFO coils. Another fault was a noise blanker that didn't, until it was discovered that although the circuit was correct, the noise blanker operation was critically dependent on antenna tuning!

G3WW (Wimblington) raises a point that has always interested your scribe when he says that to prepare for reception of SS/TV, one should tune the SSB voice signal for best fidelity—why do most, if not all, SSB operators tune SSB voice signals to an unnaturally high pitched sound from the speaker when operating?

ARRL Bulletin 482 announces that after May 31, 1974, QSO's with Tibet will count as China, and contacts with Zanzibar, as Tanzania. Whatever one thinks of the political implications there can be no doubt that this change at least reflects the practicalities of the situation.

A new block allocation of calls granted by the ITU people gives C4A-C4Z to the Republic of Cyprus.

#### Forty Metres

A dearth of reports on this band—we had thought people were beginning to give it the attention it deserved in the DX context; the

DX is almost always there if one is prepared to scratch for it a bit.

G2HKU raised UJ8JJJ on SSB, and on the key made his mark with K4TQ and UJ8AE.

G3ORP (Maidstone) reports in again, this time using a 137ft. Zepp aerial on all bands; the device enabled him to get in touch with W2FST/2 and W2JDC, and in both cases to get a considerably better report in than he felt able to give.

Some time since we heard from G3MZE (Stevenage), who is another of the QRP brigade, using around three watts to an indoor aerial, and finding a lot of fun in trying to devise the best skywire possible under these conditions. One odd one on Forty was to raise an LX on three watts after years of missing them with forty watts!

However, at this point it would probably be no bad idea to give an indication of the stuff that *can* be worked on the band, with the relevant times, which might stir up some interest among the many who regard Forty either as a place to avoid or at best a dump for inter-G ragchews. On CW: CR7JO, at 2125; FG7AN, 2345; HC1CW, 0045; HI8RFM, 0100; HKØBKX, 0015; HP1AC, 0158; OX3CT, 0203; PJ2VD, 2353; TI2LA, 0028; TR8PB, 2302; UH8DU, 2245; UJ8AE, 0010; VP2KF, 2210; VS5MC, 2221; ZD7PS, 2346; ZP5AL, 0515;

6Y5MD, 0125 and 9Y4TR, 2248. On SSB there was also quite a bit about, such as C31LC, 1118; CN8BB, 0703; HP3FA, 0111; TI2AJF, 0559; UJ8JJJ, 2344; UK2FAA, 2331; ZP5AR, 0004; 9G1DY, 2228; A4XFE, 1912; CR5AJ, 0035 and PZ1AP, 2327—to name but a few known to have been collected into various logs.

GW4BLE worked Forty over for a while before he took the vertical down, with reports exchanged on SSB with HC2TV, HK6BRK, XE1CCW, 3D6AJ, PZ1AK, VK2WC, PQ7ITU, PS0ITU, WIRED, W2GO and K2LWR.

### Twenty

Since May 4, G4CTR has been giving his new FT-101 a bit of exercise; on Twenty there is a dipole available as well as the long-wire, and so far (the end of May) PY8JO, PY1BSC, WA1BCY, UA6HCB, UK5UAN, UA1PS (Franz Josef Land), UK2GW, WB2EJZ, W1SOZ, K2RAP, W9RYK, 9H1BG, K8BND, W4RYS, W4YIJ, K8DKG, G3ZKX/4X and CF3AS have been worked, plus a near-miss with W7JLY, despite the valiant efforts of K8DKG to get them together. Regarding the CF3AS, there are about six of them about, and a certificate can be obtained for working three of them and sending a log copy to Certificates Committee, P.O. Box 756, Brantford, Ontario. Apparently it is all to do with a commemoration of Alexander Graham Bell.

G3UZ (Goring) has his usual little gripe about QRM and the consequent gotaways, but he still did pretty well with his CW, as witness ZP3CA, EL0W, CR7IZ, VK2VA, VK2EO, VK3XB, VK3SE, VX1AW, CN8CC, JA8PMF, JA8TW, ZS4KC, HC1XG, OX3MP, PY1DB, PY1BDU, PY1BMB, PY1DJY, PY4ALC, PY5CMS, PY6HA, PY7APS, VE6KY, EA6AU, SJ9WL, EP2EA, 4Q2OM, YV1AD, UL7LAV, UI8MV, UI8IR, UM8MAQ, UI8IF, UH8HC, UI8ACE, 3A0AA, UA0ACJ, UA0YAE, UK0AAA, UA9CM, UA9AS, UA9LBB, UA9XS, UA9GDW, UA9FBA, and several "ITU" stations, like KD1ITU, KS2ITU, KX3ITU, KB3ITU, KE4ITU, KR4ITU, and the grand-daddy of 'em all in 4U1ITU.

## Reporting the HF Bands

G3YRR took the point about the verb to gongoozle last time, and decided to do a bit of gongoozling on his own account, reckoning to see a panorama starting with VK's and ZL's, progressing through W's to PY and LU *via* all sorts of exotic DX. However, in the event, his gongoozle saw a lot of lumps of dead band, three VE8's, a couple of LU's, CR5, CR6 and CR7 and some run-of-the mill stuff, not to mention a lunatic pile-up on a ZD7 from which Charles abstained before losing his dignity.

Nice to hear again from G3DCS (Ipswich) who as mentioned elsewhere has Had Problems. However, between times, to keep his keying hand in, tried his arts on VP9GO, FP8AA and a shoal of W's, with success.

G3WW (Wimblington) continues with his slow-scan activity, on Twenty and Eighty in particular, and is at the moment trying /M slow-scan. Incidentally, the FT-101 has a special anti-shock mount for it in the Saab 99, securing the rig to the vertical metal portion of the back seat—that is, in what in a normal car would be the boot. Since the rear seats fold down, estate wagon-wise, to give a large luggage space, the result when this is done is that the FT-101 pops up in an operating position, and can be hidden away at a moment's notice should the need arise. As Richard says, he is not the only SS/TV mobile; there are some in the States, such as W9WED, but the latter has to wait until he gets to home or office to play over the tape and see what appears on it, while G3WW aims to have the whole dabooosh operational in the car.

Only the HF bands were worked, says G4CXM (Paignton), and he goes on to comment on the remarkable amount of true short-skip about of late, which enable him to peg quite a few near-EU stations, and have a three-way including himself, Yorkshire and Jersey.

Twenty CW accounted for PY5CMS, VE7BZC, VK2EO, ZS6KT, IS0FPH, UM8FI; SSB held its own in the log with OX3ZI, JA3GZN, FL8BH, UL7JAM, VE8BA, HV3SJ, OJ0MA, KH6IAG, ZS6DN, ZD7SS, ZD8KO, VK6KK, 8R1J, 6W8ITU, CN8CC and ZP5AY.

Band conditions have been very much in-and-out, says G2BJY (Walsall), who reckons to operate between, say, 0530 and 0830z, and never after 2030. His CW made contact with A4XFD, GW3ZME on Long Mountain, Powys (a Club expedition, this one) KB3ITU, KR4ITU, KL7GKZ, UA9ABU, UA9CDF, UA9XAT, UK9XAN, UD6DFK, UH8BO, UH8BX, U18IR, UL7PA, VK7CH, WA7NHQ, lots of the commoner UA9 *oblasts*, also W1, W4, W6 and W9. During the same period, there accumulated a list of heard-but-not-worked stuff, as FO8EG, HP1AH, JA's, KH6DV, K7ACB, KL7HSV, UA0SAU, UM8FI, VE6CCU (who was S8 while working a local at 8 w.p.m.), VE7HN, ZL4AC, 6W8FU and 3B8DO. We know the feeling!

Now G2HKU, who used both CW and SSB, as usual. On CW, there was a contact with VA4RRC, while SSB came up with G3BID /M/HB0, OJ0MA, W6DMJ, W6FXZ, VA4FG, VK6MK and 9H1DP.

Although he mentions the odd contact on 14 MHz, most of G3ORP's time was spent on 21 MHz. However, Twenty yielded SSB with VK5QG, VS9MB and ZL4BX. Peter reckons to use "SSB on the easy bands, CW on the sticky ones!"

G3MZE has an indoor bent dipole and his HW-7—not, one would have thought, a very promising combination—but it worked UF6FK, 9H1DP and, a couple of hours later, K1SWG and WA3SZV within minutes of each other, solid contacts when both the W's were saying conditions on the band were

poor. Perhaps there would be more fun in Amateur Radio if all licencees, world-wide, were restricted to five watts CW or a maximum of 50 watts p.e.p., figures which if applied would put CW and SSB on level pegging—theoretically, anyway.

A couple of days during the month saw GW4BLE take refuge on Twenty from his fans on the other bands; and in so doing he signalled to HR6SWA (Swan Is.), CE2NM, TI2MEF, FY7AQ, numerous Americans and a collection of the W special-prefix and "ITU" stations.

### The 21 MHz Band

Some people swear by it, others swear at it; it all depends on your point of view. For many people this band is the world's worst when it comes to TVI, in Channel 1 TV areas. Your scribe has to admit it was a tough nut to crack, but the one local TV still using Ch. 1 was tamed by using two ferrite-ring braid-breakers and two high-pass filters in the TV aerial lead-in. This, with an original signal from the TV aerial so weak that it is on the edge of breaking line sync., allows the KW-2000B to be used to a 14-AVQ aerial, through a low-pass filter and a quarter-wave stub, and over-driven at that, without a ripple of response on the TV set. It has to be admitted, though, that it hasn't much to spare, as the addition of the linear (grounded-grid) upsets the apple-cart still, as too much second-harmonic energy is put up the spout

for the low-pass filter to cope with alone; so a second low-pass filter is on the stocks. The annoying part about it is that G3KFE owns another low-pass filter, a surplus Admiralty type, which he lent to someone and can't for the life of him recall who! Perhaps this note may resurrect it.

However, back to our muttuns. G3DCS's CW tangled with KO2ITU, KX3ITU and various more mundane W's.

G2HKU was a bit surprised to find 21 MHz "giving" at 1.0 a.m. in the morning, but masked his incredulity and made CW contacts with KD1ITU, KX3ITU, KH6EEO, VE2WA, VE3BZH and WAØSYV. The last-mentioned contact lasted for over 30 minutes quite solidly, and ended with R5 signals; checking over the band when the QSO finished, and there wasn't another signal to be heard. Interesting little bit of propagation oddity, that.

Another indoor-dipole merchant is G4CXM, who has one on 21 MHz. With it, SSB contacts were made to JA's, all over the USSR, and Europe, including GC3JGS, GM3CFS, GI4BXB/M, 7P8AZ, 5U7AZ, 5U7BB, ZD8KO, KV4AD, HV3SJ, OJØMA and A51PN. That GC, incidentally was definitely a skip signal, as GC cannot be heard on ground-wave from Paignton.

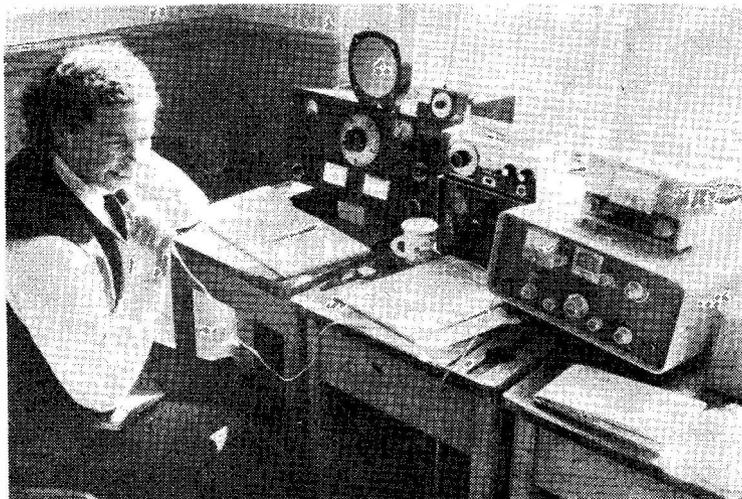
Fifteen for G3ORP was quite an interesting exercise; SSB all, to CE3YY, SVØWKK, LU9DM, LU6EM, ZP5AY, WB80FE, VO1EV, W4PRN, WA8COB,

SV1CB and LU1NH, mostly raised during evening TV viewing hours. Peter, on the TVI question—you may remember that some time ago he had real problems, which provoked your conductor into print on the subject in this piece—finds he now has no TV's with aerials troubling him, as a new 40 kW UHF TV station has set up shop about three miles away and he couldn't compete with *that* even with a snap-recovery diode in the aerial! Otherwise there is one stereo record-player, and one Redifusion piped TV, when 14 MHz SSB is used; but the parties concerned are being very helpful and the problem should cause little real difficulty.

The last three to make the 100 countries up on 21 MHz were duly knocked off by GW4BLE, in the shape of SV, 3A2 and 3D6. However, Stephen reckons that the bare 100 is hardly enough when one has sights set on 5BDXCC, as it is a certainty that someone will fail to come across with the QSL card; this being so, thoughts are being turned to a monobander for Fifteen to help in wiping up a few more countries.

After a pretty sordid month, G3YRR reports in a last-moment second letter, conditions changed abruptly, and 21 MHz started to play. CX6AM was worked, with VP8KF in the shack, just leaving to return to G3VPW. Also in the net were 5T5DY, LU3DJJ, PY1DBU, PY2HT and CR6EQ, not to mention

The Top Band talk-in station for the White Rose Rally signed G4CPD/A and was operated by YL/G4CUY.



at various times an assortment of W's, W6, W7, VE8 and VE7.

### Ten Metres

All the fun of the fair, and twice as much uncertainty. There is always the possibility of a VHF-style opening on Ten, as much after dark as in daylight; occasionally, in daylight hours, a full-blown ionospheric opening may occur, usually North-South in direction, but occasionally East-West. However, it is your scribe's firm opinion that many of these are effectively lost by lack of the odd CQ call than ever are missed by the VHF fraternity on Two for the same reason. Even if we transferred some of the local nets to Ten instead of Top Band or Two, we should have a greater chance—recall the Stevenage local net being called by a W one evening?

G4CXM found CX8DM, VP8HZ, OJØMA, HV3SJ, IT4FGM, PY1NBA, UP2AS and DM2DUK.

For G3ORP Ten was mildly rewarding, in that, in the early evening/late afternoon period, he had the odd listen and made it on SSB with OK3HM, PY1ZAE and LU2DNC.

Around the middle of the month seems to have been the best time for Ten, with Europeans at S9 plus, and the odd bit of DX from the South thrown in for good measure, says GW4BLE. Out of the Europeans a new country for the band was notched up in LX1RF in Luxembourg.

### Look Forward

We have already mentioned the Kingman Reef affair which will likely be over by the time this reaches you. On the subject of other expeditions to Kingman, there are conflicting stories; one usually reliable source says the other groups who were planning Kingman have dropped out to leave the field to the Northern Californian DX Foundation trip already mentioned. Another, equally reliable, suggests possible activity there in July and again in September. Personally, your conductor rather favours the theory that says "wait and see" because he finds it a bit difficult to credit some of the information being fed to him.

Mount Athos operation is hinted at around the end of the month and

the early part of July, by OH2BH, but there have already been some hang-ups, causing the dates to slide out, so if he doesn't pop up dead on time, stick around—OH2BH usually contrives to serve up the promised fare somehow.

Late-June, early July is pointed out as being the likely time for some activity from Desroches by the VQ9 lads. No more details available at the time of writing, unfortunately.

Looking a bit further on and into August, the Nauru expedition signing C21DX, activated by JA1OCA plans to operate from late August and into September; there will be two stations with linears, beams and dipoles, covering all bands 160 to 10. Anyone wishing to fix up any special skeds can write to Isao Nume, JA1OCA, Central P.O. Box 1409, Toyko, Japan. Last year this group made 2000 contacts on six bands and this year they are aiming to do better!

The Agalega situation is clarifying; Jacky will, it is now understood, be there for another year, and VQ9R has sent him a new relay to replace the one he popped, plus a TA-33Jr. beam, which should help things along a bit.

On a more negative note, the last

station in 9U5-land was 9U5CR, who has now returned home. One wonders when we will see any more activity from Burundi.

Activity from BV2A has to date been CW only, on a frequency of 14025 kHz. It is understood the authorities in Taiwan have now issued a permit for SSB operation at the 100 watt p.e.p. level on a frequency of 14218 kHz; activity may well have commenced by the time you get round to reading this. QSL's will be handled by INDXA.

There seem to have been some 9Q5 stations about over the past few weeks. As will be recalled, the 9Q5's were all closed down some long time back, so clearly these new calls are, strictly speaking, "Fred Phoneys"; however, they seem to be in no fear of action by the authorities there, and indeed indicate that the licence situation may be rectified within weeks. One hopes so, indeed.

### QRT

That seems to wrap up the DX and communications news for another month. Next time we will be back for a deadline of July 9, addressed as ever to "CDXN," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18-1RQ. 73 *es GL*.



The late Norman Turner, G4NT, High Wycombe, Bucks., who died recently, aged 63, after having been confined to a wheel-chair for several years. He was principal of Ernest Turner Electrical Instruments, Ltd., and the active and popular president of the Chiltern Radio Society.

For the Northern Mobile Rally at Keighley, Yorkshire, the reception point was manned by members of the Otley Radio Society. This was again a very successful Rally event.



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

NOTES AND PICTURES

WITH some more Rally dates to be listed, we can also add that number of U.K. mobiles licensed is 4444, as at the latest Ministry count. Of these 3164 are A-licences and the remainder Class-B (VHF), showing an increase of 56 mobiles, in both categories, in the month.

Though in this list we have eight Rallies taking place on four Sundays, the geographical separation is such that there should be no serious clash as regards attendance.

Note that the Peterborough Rally has now been changed to September 29, not as given on p.192 of the June issue.

RALLY CALENDAR

- July 7: West of England Mobile Rally at Longleat, the stately home of the Marquis of Bath, near Warminster, Wilts., as in previous years. Apart from the menagerie, it is a magnificent place to see.—Details from Brian Croker, G3ULJ, *QTHR*.
- July 14: Anglian Mobile Rally at Stanway School, Winstree Road, Colchester, with talk-in on two metres, trade stands, bring-and-buy stall, and general entertainments.—Information from: J. L. Spurgeon, G8GIC, *QTHR*.
- July 14: Annual Rally event organised by the South Shields & District Amateur Radio Club, at Redwell School, Prince Edward Road, South Shields, on the A.1300, with talk-in on 1980 kHz by G3DDI/A and 145.8 MHz by G8BQF/A. Trade stands, prize draw and competitions, light refreshments available on site. This is the longest-established Rally in the North-East, and the contact-man is still Derek Forster, G3KZZ, *QTHR*.
- July 21: Southdown Society Mobile meeting at the Polegate (Sussex) Steam Engine Rally, signing GB2SS on the HF bands and with VHF talk-in by GB3SS.—Details: B. Houghton, G4BCO, *QTHR*.
- July 21: Cornish Radio Amateur Club Rally at Cornwall Technical College, Pool, nr. Redruth, on the A.30. Usual Rally arrangements, with refreshments available and talk-in on Top Band and two metres.—M. C. Locke, G3NKE, *QTHR*.
- August 11: Claimed to be the "No. 1 amateur rally event," the 17th in the long series of Derby Rallies will, as usual, be at Rykneld Schools, Bedford Street, just off the Derby outer ring road. Open at noon, with free admission and ample parking, there will be numerous trade stands (no further trade space now available, and waiting list for possible cancellations), static displays, a brass band contest, tombola and the famous monster sale, with something for everyone. Refreshments on site and talk-in on 160m. (G3ERD) and two metres (G2DJ/A)—T. Darn, G3FGY, *QTHR*. (Tel.: Ripley 2972).

August 11: Torbay Amateur Radio Society annual Mobile Rally at Newton Abbot Rugby Club ground, with talk-in by G3NJA/A on 1862 kHz and G8IUI on 145.0 MHz. There will be displays by Army Signals, also trade stands, refreshments and bar from noon.—Details from L. H. Webber, G3GDW, *QTHR*.

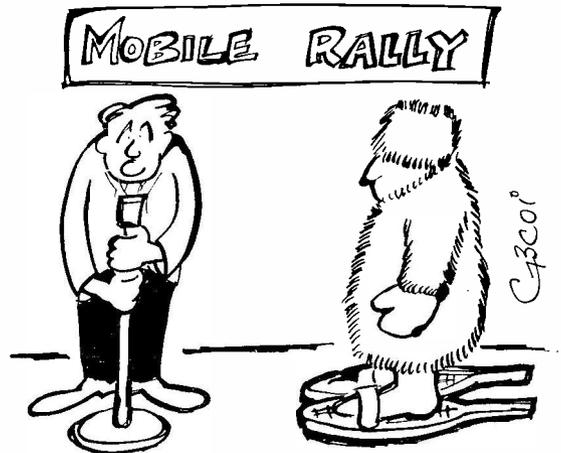
August 18: Preston Amateur Radio Society Mobile Rally at Deepdale County School, St. Stephen's Road, Preston, 11.0 a.m. till 5.0 p.m., with talk-in on 2/160m. Trade stands, bring-and-buy stall, and refreshments.—G. W. Earnshaw, G3ZXC, *QTHR*.

August 18: Bromsgrove Mobile Picnic, Avoncroft Museum, Bromsgrove—J. Dufrane, 44 Hazelton Road, Bromsgrove, Worcs.

September 22: Harlow & District Amateur Radio Society annual Rally at Harlow.—Information from B. G. Capper, G4DBC, 36 Woodhill, Harlow (0279-38453), Essex. (Details later).

September 29: Peterborough Mobile Rally, as last year. (Details later).

(over)

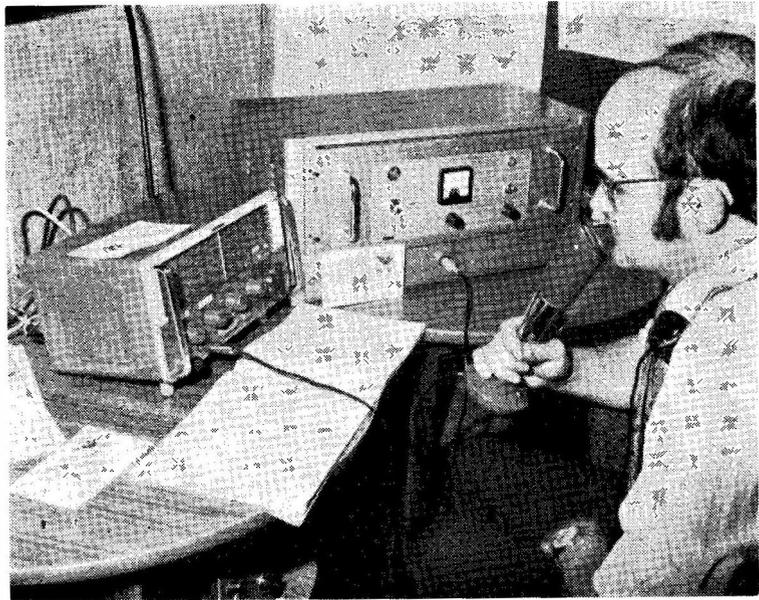


"... Now we come to the prize for the visitor having travelled the greatest distance ..."

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One of the talk-in stations for the Northern Mobile Rally—this being on two metres and operated by G8AWN/A.

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*Crowd view during the raffle draw at the Northern Mobile Rally.*

## REJUVENATING THE AR88 RECEIVER

### SOME WORTH-WHILE MEASURES

J. R. G. BEAVON, Ph.D., A.R.I.C. (G3PPR)

*Probably one of the most popular and successful of "surplus" receivers, the AR88 and its variations is an American design and was manufactured by the Radio Corporation of America. Large numbers were supplied to the U.K. for ground-station operation under the war-time Lend-Lease agreements—which, while it dates the design, does not in any way diminish its merits as a receiver. Oddly enough, very few AR88's appeared as surplus in the States as they were mainly sold off in this country after the War. Even today, a really good AR88D, "with manual and in original packing," is worth around £60. On the other hand, there must be 100's of AR88's still in use which could well do with the treatment suggested in this article.—*  
 Editor.

THE very popular AR88 receiver, manufactured by R.C.A., is now growing old, and many of those around must be in none-too-good a condition. The writer's, after 8 years' storage, had grown mildew on the wiring and the rubber insulation on the block paper capacitors was powdery and disintegrating. It was decided to rebuild the set, for despite its disadvantages of great weight and size, it is still a very good receiver, and a few pounds spent on new components will transform an indifferent receiver into a startlingly good one. It did in this case, anyway!

But the work needs courage! You can't change your mind halfway through; it'll take three weeks or so of fairly intensive effort after which you'll not want to see the inside of an AR88 again. No actual modifications to the receiver were attempted at this stage, so this article simply gives a few tips on rebuilding the Rx as-is. The AR88 manual is helpful, but is not absolutely necessary.

**(A) Initial Preparation:** Get the Rx free of all external leads, remove the valves and the covers to the RF unit and the tuning gang, and take off the knobs with the Allen key which you should find inside the set. Undo the jack socket, remove the S-meter leads (if fitted) and then detach the front panel. A box spanner or a socket set is useful for this. Remove the dials, noting which way round they go and which one is in front, and the flywheel and flywheel mounting bracket.

The RF unit should now be taken out. Cut all the wires to it, and undo the three screws on the underside at the front and the eight around the sides on the top. The unit will now lift out from underneath, and can be set aside until needed.

**(B) Power Wiring:** Slit all the cable lacing and remove it; cut also all leads to the resistor board located on the chassis drop near the AF output transformer, and remove both it and the 3 x 0.25  $\mu$ F capacitor mounted close by.

Replace the power wiring systematically on the "old wire out, new wire in" basis, running all leads in the same positions as the original. The temptation to shorten or simplify is best resisted; one must presume that R.C.A. knew what they were doing! Also put in new heater wiring throughout the AF and IF stages, and renew the leads to the jack socket, the speaker output terminals, and the relay terminals. The writer discarded the leads to the "diversity" terminals, and didn't bother to rewire the voltage selector, though that was pure laziness! The connections to the octal socket on the rear chassis drop were scrapped, too (are you going to use an AR88 as a /P receiver?), and this can now be used to feed power to an amateur-band converter—there is plenty of power available for this, or for a preselector.

The Rx should now have new wiring on T1, 12, X11, X13, X14, L49 and L50 (reading the manual nomenclature). One or two "old" wires, which feed HT into the rest of the set, will be left intruding into this fresh new territory. Don't leave any of these dangling without a note of where they should go; you'll have forgotten next time, and if you haven't a manual, trouble lurks.

**(C) IF strip:** The writer worked backwards from the 1st AF stage, X10, replacing all components and wiring on the same basis as the power supply. The resistor board was replaced by a printed-circuit board since the original was extremely decrepit; the board and its connections are shown in Fig. 1. The components were mounted on the copper side of the board, rather than through the board, as is usual. The 5-watt resistors should be mounted well away from the board and from any other wiring, since they can get rather warm.

As rewiring progresses, the block paper decoupling capacitors should be removed and discarded; the new components can be mounted near to the pins they decouple, and polystyrene capacitors were adopted because

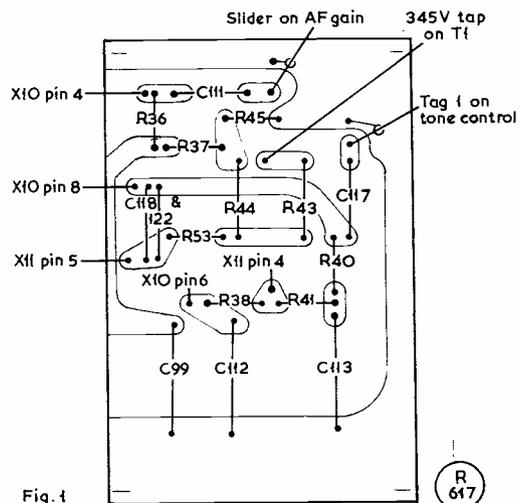


Fig. 1

Fig. 1. Printed-circuit board to replace resistor board

they are small. There shouldn't be any problems here; accessibility is good and wiring is straightforward. Again, replacement leads should be in the same positions as the originals. The screened leads to the variable potentiometers must be replaced with similar wiring and when refitting these it is useful to leave the original pots. *in situ* almost till the last minute to ensure that you get the connections the right way round. If you have a manual, beware of R.C.A.'s curious nomenclature! For example, 10K resistors, are labelled "10M" in the circuit. Megohm resistors are labelled "xMEG." All variable potentiometers were replaced by moulded-track types, since some of them carry DC and are more resistant to noise development under these conditions. The NL and AFG pots, are 66K in the original; these were replaced with 100K in the rebuild. Be very careful when unsoldering connections to the IF transformers that the lugs don't just break off, and *don't* get them sizzling hot. It was found useful to clean off the filthy ceramic valveholders with a wad of cotton wool dipped in meths. and held in a pair of forceps.

At this stage, all of the wiring on the main chassis should be new; you'll be surprised at the apparently wide-open spaces there are, chiefly because of the elimination of those huge decoupling capacitors.

**(D) RF Stages:** The nasty bit! Undo the 22 (!) nuts and the 12 screws holding the baseplates in position. Undo the eight nuts which hold the sides on to the RF amplifier screens, and remove the sides. Disconnect the wavechange switch, and extract the 12 screws which hold three sides of the oscillator box in position and remove this.

The coil in front of the oscillator socket (X3) has to be taken out (L52). Make a note of the connections to this coil, unsolder it and remove it. Replace all the components on X3, and be very careful *not* to touch the ceramic pillar-type trimmers with the iron; the metal is lead alloy, and if they get hot they'll disappear, fast! In many cases the mica capacitors are non-standard values, and have to be made up from standard values in parallel; these are given in the Table. Wire the heater of X3 to that of X4 (pins 7), and bring a 10 cm. lead from X3 pin 7 out of the RF unit. Also bring a 15 cm. lead from pin 4 of X3 the same way, so that they will go through the small hole near the bottom front of the oscillator screen. Replace L52 and rewire. There seemed no point in replacing the bulk of the wiring to the wavechange switch itself but where sleeving was decomposing it was renewed.

To get at the other half of X4, note the connections to and then remove L25/26 and C60. Wire the heater of X2 to that of X1, and bring this out *via* a 20 cm. wire, to pass through the semi-circular hole in the rear part of the RF unit side. (When rewiring X4, mind the plastic former of L29 with the iron). When renewing R10, bring a 20 cm. wire out through the side from the point where R10 is soldered to the wavechange switch. Bring a 20 cm. wire from pin 3 of X4 out between the oscillator and RF sections screens.

When X2 and X4 are done, replace and rewire the coil and capacitor. To deal with X1, L15/16 is removed. Other components around the wavechange switch are replaced as you go. When the wiring is all complete, check for loose bits of solder, etc., and then re-assemble

## Table of Values

For Diagrams Fig. 1 and Fig. 2

C1, C11,	C95,
C33, C47,	C102 = 0.1 $\mu$ F paper or poly
C51, C52,	
C54, C63,	C99,
C83,	C112,
C117 = 4700pF poly	C113 = 0.25 $\mu$ F paper or mixed
C4, C5,	C105 = 560 pF mica
C14, C34,	C123 = 10pF, mica
C57 = 220pF, mica	R1, R6,
C7 = 18pF, mica	R19, R49 = 33,000 ohms
C8 = 33pF, mica	R2, R33,
C9, C10 = 25pF, mica	R36, R47 = 2.2 megohms
C12 = 56pF, mica	R3, R10,
C13, C26,	R12, R16,
C29, C42,	R22, R26,
C65, C67,	R31, R34 = 1,000 ohms
C69 = 82pF, mica	R4 = 56,000 ohms
C15, C21 = 15pF (10+5), mica	R5, R37 = 1 megohm
C17 = 525pF (500+25), mica	R7, R17 = 10 ohms
C18 = 13pF (10+3.3),	R8, R18 = 5,600 ohms
C20 = 1550pF (1500+50), mica	R9, R14,
C119,	R41 = 100,000 ohms
C23, C28 = 3000pF (2700+300), mica	R11 = 10,000 ohms
C24,	R13 = 560 ohms
C111,	R20, R39 = 100 ohms
C116 = 2700pF mica	R23, R27,
C30 = 3900pF (3600+300), mica	R50, R57,
C31 = 75pF, mica	R58 = 560,000 ohms
C36, C58 = 180pF, mica	R25 = 180 ohms
C44, C46 = 91pF (10+82), mica	R30 = 2,700 ohms
C48,	R32 = 390 ohms
C109,	R35 = 680,000 ohms
C110,	R38 = 1.5 megohms
C103,	R40 = 270,000 ohms
C106,	R42 = 390,000 ohms
C107 = 0.05 $\mu$ F paper or poly.	R43 = 100 ohms, 5 watts
C53 = 6.8pF (3.3+3.3), mica	R44 = 150 ohms, 5 watts
C75, C76,	R45 = 15 ohms
C93 = 0.01 $\mu$ F paper or poly	R53 = 330,000 ohms
C61,	R54 = 2,700 ohms
C120 = 15pF (10+5), mica	R55 = 6,800 ohms
C71, C79,	R56 = 5 ohms 5 watts
C84, C92,	R46, R48 = 100k log, moulded track. (RF gain and NL)
	R51 = 2 megohm log, moulded track (AF gain)
	R52 = 1 megohm log, moulded track (tone)

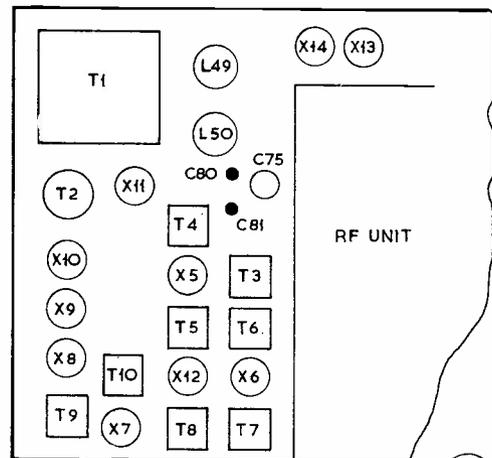


Fig. 3

Fig. 3. Receiver viewed from underneath

**Alignment**

Alignment data for the AR88D. For Band 1, use a dummy aerial of 200 pF; for the other bands, one of 200 ohms. Adjust the coils or capacitors for maximum output across the speaker voice coil with RF and AF gain set at maximum, NL/AVC at position 4 (AVC), and the selectivity switch at posn. 2.

Dial Position, kHz	General Frequency, kHz	Antenna trimmer	Adjust
<b>Band 1</b>			
1 Extreme low end	535	—	L51
2 Extreme high end	1600	—	C16
3 Repeat 1 and 2 until extreme end frequencies are as shown			
4 1500	1500	Max. output	C37, C59
5 600	600	Untouched	L2, L14, L24
6 Repeat 4 and 5 until circuits remain in alignment over band			
<b>Band 2</b>			
7 Extreme low end	1570	—	L52
8 Extreme high end	4550	—	C19
9 Repeat 7 and 8			
10 4300	4300	Max. output	C38, C60
11 1700	1700	Untouched	L4, L16, L26
12 Repeat 10 and 11 as above			
<b>Band 3</b>			
13 Extreme low end	4450	—	L53
14 Extreme high end	12150	—	C22
151 Repeat 13 and 14 as above			
16 11500	11500	Max. output	C39, C62
17 4600	4600	Untouched	L6, L18, L28
18 Repeat 16 and 17 as before			
<b>Band 4</b>			
19 Extreme low end	11900	—	L54
20 Extreme high end	16600	—	C25
21 Repeat 19 and 20 as above			
22 16400	16400	Max. output	C41, C64
23 12100	12100	Untouched	L8, L19, L29
24 Repeat 22 and 23 as above			
<b>Band 5</b>			
25 Extreme low end	16100	—	L55
26 Extreme high end	22700	—	C27
27 Repeat 25 and 26 as above			
28 22500	22500	Max. output	C43, C66
29 16400	16400	Untouched	L10, L20, L30
30 Repeat 28 and 29 as above			
<b>Band 6</b>			
31 Extreme low end	22000	—	L56
32 Extreme high end	32000	—	C32
33 Repeat 31 and 32 as above			
34 31500	31500	Max. output	C45, C68
35 22500	22500	Untouched	L12, L21, L31
36 Repeat 34 and 35 as above			

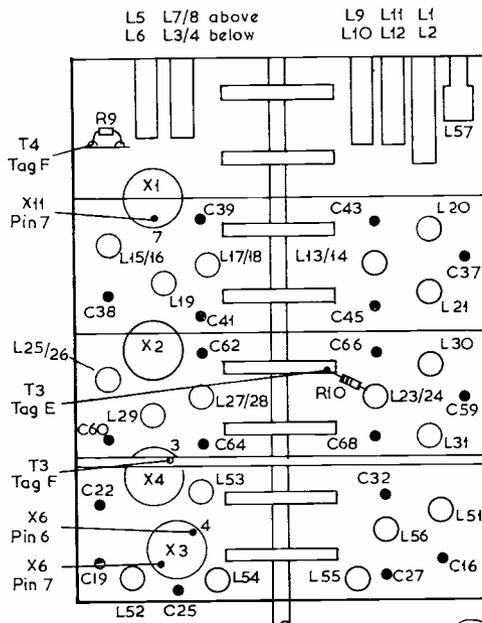


Fig. 2

**Fig. 2. RF unit, AR88, seen from underside**

the screens. Before replacing the RF unit in the main chassis, lace up all the wires running between the RF unit and the chassis drop; then replace the unit, reversing the steps used to get it out. Wire up the heater, HT and IF output wires (Fig. 2), and connect the aerial input leads (or replace input tagstrip with a coax socket). Replace the dial lamps and their leads, reassemble the dials and the front panel, and lace up the wires wherever possible. Check once again for loose bits of wire, etc., and on switching on you should find that noises come from the speaker.

For lacing-up leads, it is convenient to use thin waxed cord, or heavy nylon fishing line, to get a strong and tidy finish

**(F) Alignment:** The RF unit was aligned as given in Table 2, using an output meter across the voice coil of the speaker. The IF strip was left as-was and so this may not be "on the nose," but no wobulator was available.

So there it is; if the realignment is done carefully, you should now have a receiver which is virtually as good as new. That at G3PPR certainly performs like it has never done before—now to start on the Tx!

To keep in touch with the world of Amateur Radio, read "Short Wave Magazine" regularly —

Independent, Unsubsidised and now in its 32nd volume.

## CUBICAL QUAD FOR TWO METRES

### FIVE-ELEMENT DESIGN— HIGH GAIN— DETAILS AND MEASUREMENTS

#### A. LEAVER (G8HGR)

FOR some time various types of aerial had been thought about for use on the two-metre amateur band. The choice is very wide, but the final objective was to put up an aerial with as many points in its favour as possible. Among these was ease of construction.

As far as could be seen the only VHF aerials that could be purchased were Yagi's or Omni's, but as the intention was to construct an aerial it appeared that the Quad did merit consideration, as being easier to build than a Yagi of equal gain. As the effective gain at VHF is an important consideration and from theoretical calculation it is easily shown that a five-element Quad has more gain than a five-over-five Yagi, this was in its favour.

As gain is important, then equally so the angle of radiated power relative to ground must be as important. For if a high angle of radiation results then the gain achieved will be wasted. Also is the consideration that if skip occurs then why not retain power by using a low angle of radiation by keeping low—simple mathematics will show that the main lobe power of the aerial will strike the troposphere at a much greater distance and at higher e.r.p., hence fewer reflections at low angle radiation put many more at high angles, plus a loss of effective power. Yagi's by very careful design and long boom-lengths can be made low angle, but even if perfect it will not match a Cubical Quad—which by virtue of design is a low-angle aerial.

When SWR is considered on a VHF aerial it should remain within reasonable limits over the entire two-metre

band. With Yagi aerials this is difficult, as it means very careful design or slightly decreasing performance in order to obtain a flat response. On the other hand, omnidirectional aerials are quite good but lack gain.

The Quad however is a low-Q aerial and so the SWR will not go worse than 1.5 : 1 or so at band edge. This is very useful, as many stations now use a VFO and do not wish to lose reasonable matching due to standing waves on the feeder.

Most transmitters work at their best with a 75-ohm load. A Quad is a natural choice because this is its input impedance without using baluns. VHF aerial considerations differ on one point in particular, that is the beam width. Many operators say it is not important as a narrow beam-width can lose contacts, while others say a narrow beam-width is an advantage. Operators who do not require a narrow beam-width are those who live in areas of very low VHF activity. On the other hand, if you are in an area of even moderate activity then a narrow beam-width is of importance if the virtue of a good aerial is not to be made useless by heavy QRM from nearby stations. Also, to achieve high gain in the main lobe the beam width has to be reasonably narrow. Yagi aerials of very long boom lengths are less than 20° between half-power points. The Quad is less than this and when sidelobes are considered the Quad need have only two minor side lobes while giving a front-to-back ratio of 25 dB. This is important as a narrow beam-width is useless if the aerial will accept signals from the back.

#### Polarisation

One of the outstanding features of the Quad on VHF compared with a Yagi is the acceptance of various angles of polarisation. It has often upset many a /M that his new, neat vertical aerial that looks so well on his car gets very bad reports from fixed stations using horizontally-polarised Yagi's. This is simply because the Yagi will badly degrade any signal out of its own plane of polarisation, and the better the Yagi the worse it goes.

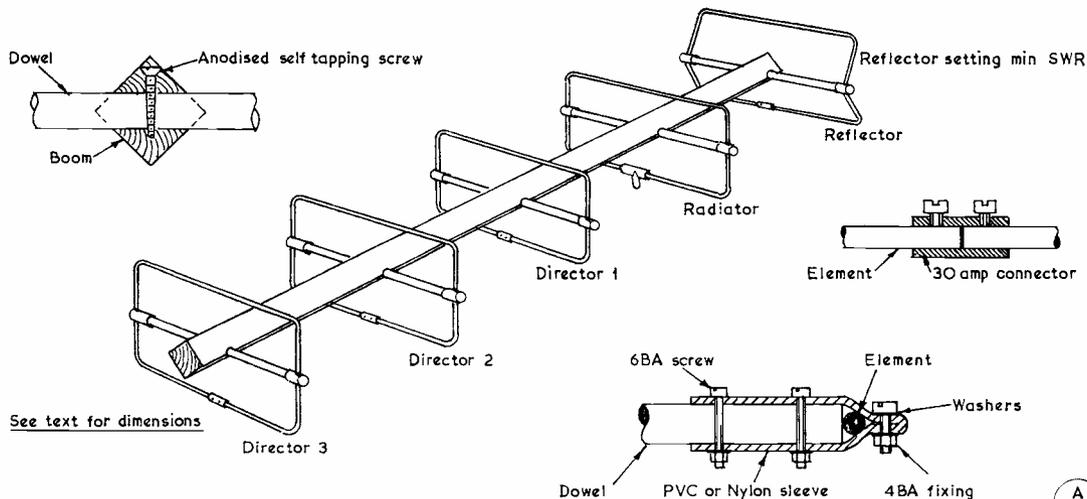
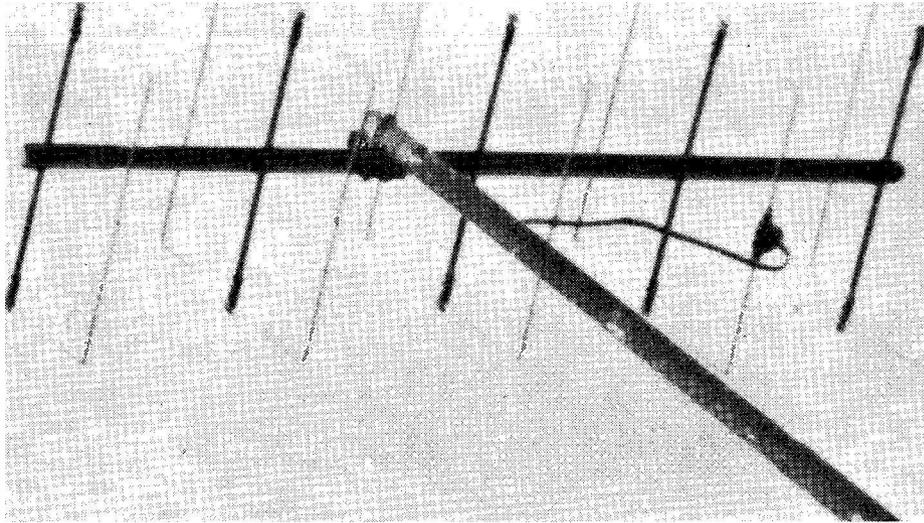


Fig. 1



*General view of the five-element Cubical Quad  
for Two Metres*

You may now be saying to yourself, well, I don't operate mobile or vertically polarised stations—maybe not, but you may in a sense, without being aware of it forget, as many VHF operators do, that over long signal paths, reflected paths and skip paths, the angle of the transmitted plane of polarisation relative to the horizon may change considerably from horizontal to vertical, slant and even circular. This is when the QSB really starts, when the signal is continuously changing polarisation plane. If the aerial will not accept any polarisation other than its normal, then it is time for a rethink on VHF aerials. (QSB can be caused by other factors as well as polarisation changes, *e.g.*, Doppler shift path changes, etc., but as these are complex and would take a separate article to evaluate, the point remains that a major cause of QSB is polarisation change). The Yagi, as previously mentioned, will not accept signals off its normal plane, but if the Yagi is stacked as a diversity aerial, *e.g.*, one vertical, one horizontal, then it will accept either polarization plane.

#### Practice

Some work has been carried out commercially based on the foregoing considerations and excellent results have been obtained. This does merit much further investigation, as tests show greatly improved signals over long paths.

Another aerial that is foremost in this field is the

helix. The helix will accept vertical, slant, horizontal and circular polarization. The disadvantages are that in the case of circular polarization the helix has to be in the same polarization plane as the signal being received, *e.g.* if the Tx is left-hand plane the Rx has to be left-hand, or the signal is badly degraded. Also, as many VHF operators use Yagi aerials, transmitting circular would be useless; the Yagi won't accept this without loss, but as it is circular the loss would not be as great as vertical signals, though at least 3 dB. The main disadvantage is that the helix is a difficult aerial to construct for VHF.

This leaves the Cubical Quad. As already said, this aerial will accept all forms of polarization (though with some loss if not horizontal) but nowhere near as high as the Yagi. This has been very noticeable on long-distance contacts using the five-element Quad, as a considerable reduction of QSB when the station at the other end reports heavy QSB using, of course, a Yagi. Also, mobiles are far easier copy at much further distances. This is irrespective of the form of polarization on the mobile.

The only point that remains within the scope of this article is the size and if it is affected by nearby objects. Taking size first, as far as size-for-gain goes the Quad is the smallest aerial known. Finally, the presence of nearby objects do not appear to affect the SWR of the Quad. It is the ideal VHF aerial to try as a loft-space beam.

(over)

The Cubical Quad holds great possibilities on VHF, yet it is rarely used, mainly because it cannot be purchased (as far as known), also because of lack of knowledge or poor designs—but it is an aerial that is regarded as one of the finest aerials on the HF bands. On Two, a 5-ele. Quad will out-perform a five-over-five Yagi.

At first, a four-element Cubical Quad was tried. This did very well, so an eight-element array was tried. This did exceptionally well, but due to high winds and poor construction the weather made short work of it. In the end, a five-element design was decided upon—it will stand high winds or bad weather and gives a very good performance on two metres. Many stations worked have shown great interest in the construction of the 5-ele. Quad described here.

### Construction

With reference to Fig. 1 all the elements are  $\frac{1}{4}$  inch dia. aluminium solid bar. The reflector is of 84.2 inch, the radiator 81 inches and the three directors each 76.8 inches. The respective bars are then formed into squares, for 21.05-inch reflector, 20.25-inch radiator and 19.2-inch for the three directors. The ends of the reflector and the directors are fastened together using a 30 amp. electrical type sleeve connector, which has a  $\frac{1}{4}$ -inch clearance hole, or by flattening the ends of the bar and drilling for a screw. (The first method is preferable as it is more secure in wind). The radiator element ends are trimmed as to leave a  $\frac{3}{8}$ -inch gap, and the ends of the bar flattened and drilled for fixing. A standard dipole connector is then fitted and it will be found that the radiator bar ends fit exactly to the screw holes in the connector. (It may be found that the only connector available is the dipole type with entries for  $\frac{1}{2}$ -inch bar, but by using a fibre-glass filler, or *Araldite*, these can be filled in). The dipole connector must be of the outdoor enclosed type, e.g., as stripped off an old TV aerial.

The boom is made of 1.25 square cedar wood 68-inch long. The reason for a wood boom is that it is in no way effects the aerial. If a metal boom were to be used it would form a parasitic element and become an effective part of the aerial, so affecting the gain and the polar diagram.

The boom is drilled  $1\frac{1}{2}$  in. from one end with an  $\frac{1}{2}$ -inch drill (see Fig. 1B) and at 16.2-inch centres for all elements. Next, cut five half-inch dia. *Tufnol* or wood dowel at 21.05 ins., 20.25 ins. and three at 19.2 inches. These dowels are then pushed through the respective half inch holes in the boom. Just before they are central a spot of *Araldite* is smeared on and the dowel centralised. A  $\frac{1}{8}$ -inch hole is drilled through the boom and the dowel, and an anodised self-tapping screw is put through both. At this point the boom and spreaders should be given several coats of a waterproofing paint.

It was found that mounting the elements straight on the dowel after the paint was dry was not advisable as a too-rigid fixing caused the elements to vibrate at high wind speeds—so ten 2-in. nylon tubes were slotted to make a push fit and sealed with *Araldite*, making sure the slot is in the same plane as the elements. The dowel is then drilled using the holes already made in the tube as a template and 6 BA brass screws, washers and nuts fitted and tightened.

When all tubes are fitted, the respective elements are then put into the slots, ensuring that they are central, and secured with 4 BA brass screws. This was found to be the best form of fixing the elements and has proved to be very secure.

### Matching

Many mistakes have been made by forgetting that if the Quad is fed direct with coaxial cable, then you are presenting an unbalanced feeder into an highly balanced load. This would be disaster. Not only would the outer braid of the coax carry high levels of RF due to "overspill" of the VHF wave, but the polar diagram would look similar to a spider, and the front-to-back ratio would be very poor, if it happened at all.

The Quad is a 75-ohm impedance load to the Tx and it must be fed either with 75-ohm balanced feeder or with coaxial cable and a one-to-one balun. The Quad described here is fed with 75-ohm coax and the balun used is a coaxial sleeve, or "bazooka." This is easily constructed (see Fig. 2). The feeder coax is made off as normal, and from the end of the outer braid measure 20.25 inches back along the coax, cut away a further  $\frac{1}{4}$ -in. of the outer insulation, taking care not to damage the outer braid. A piece of outer braid about 25 ins. long is stripped off an old piece of coax (preferably larger) and this is pushed over the feeder and soldered to the outer braid of the coax at the point bared off. The other end of the sleeve braid nearest the aerial is trimmed off so as not to connect to the feeder outer braid. The whole balun is then insulated with p.v.c. tape. If preferred, a sleeve can be made using aluminium foil, but it cannot be easily soldered—however, wrapping this round tightly with thin wire to the feeder braid will do, with a slight smear of grease on the connection to prevent oxidation. This is then taped up with p.v.c. strip, again ensuring that the foil does not touch the outer braid of the coax near the aerial.

### Setting Up

Now all that is needed is to set the input impedance to match the Tx at 75 ohms. With an SWR bridge as near the aerial as possible (as measuring the transmission line is not required) the reflector only is adjusted by bending it away from the radiator until no better SWR can be achieved. Easier still is to use a VHF impedance bridge and set the reflector so that the input is 75 ohms—and that's it. If, however, you do not possess either set the reflector to approximately 3-inch out of centre away from the radiator and it should not be far off 75 ohm (see Fig. 1 and picture).

### Performance

Measurement of the performance of the five-element Quad was taken with the aid of G4ACB. A linear field strength meter, SWR bridge, VHF impedance bridge, and a mosfet converter, IF 4-6 MHz into a GEC BRT-400K Rx were the tools. The results were: The gain of the five-element Quad is 12.5 dB relative to a dipole. A front-to-back ratio of 25 dB, SWR of 1.15 : 1 mid-band; high end 1.52 : 1, low end 1.52 : 1; a beam width of 18.5° between half-power points, two very minor side

lobes (one each side) and a very low angle of radiation—so low, in fact, that with the aerial mounted at 35 feet off the ground it was necessary to stand on 6ft. steps at 125 yards away to measure the main lobe power.

**Conclusion**

From the foregoing it can reasonably be claimed that the quarter-wave five-element Cubical Quad is a very efficient aerial on two metres and holds even greater possibilities if it could be stacked two or four bay. The addition of extra elements is feasible and as mentioned earlier an eight-element array has been tried—however, it was found that after the fifth element the others have some effect on the input impedance, though this can be overcome by progressively bending the sixth, seventh and eighth elements away from the radiator, similar to the reflector. This has been tried and does work. The gain will go as high as 16 to 18 dB but stacking is probably the better choice.

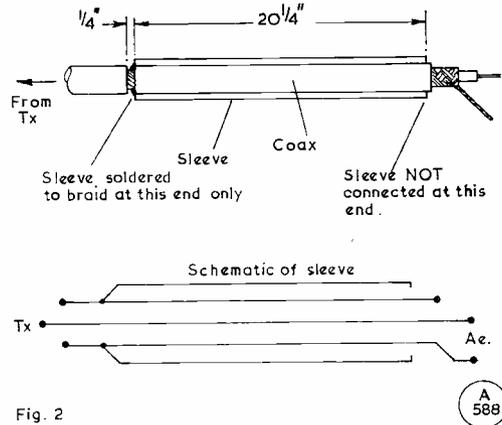


Fig. 2

A 588

**LOW-VOLTAGE PSU**

**FOR TRANSISTOR APPLICATIONS**

J. S. CUSHING (G3KHC)

At the present time when solid-state devices are coming more and more into use, some form of low voltage power supply becomes a necessity in any amateur workshop.

The power supply described here is mains-powered and is a very simple type, offering the prospect of quick and easy construction. Standard components are used so no problems need arise shopping round for specialised bits and pieces, in fact a well filled junk-box might supply all necessary items.

Although this PSU is of a simple nature it will be found adequate for many applications. Output voltage can be set anywhere between 0.5 and 15 volts, the output may be shorted with impunity, and regulation is good enough for circuits likely to be powered from this unit. One possible drawback is that no more than about 100 mA may be drawn, but circuitry taking greater current tends to require higher voltage so the drawback is more apparent than real.

Two basic types of regulator circuit are used in power supplies of the type under consideration, and some general information about each type may be helpful. One is the shunt regulator, the other the series regulator. Basic circuitry for the series regulator is given in Fig. 1 where it will at once be noted current taken by the load must pass through the transistor (Tr.). This means an overload or short places Tr at risk so series regulators are commonly provided with moderately complex protective circuits. The only other practical point needing mention is that the voltage applied to the transistor base is approximately the same as the output voltage.

In Fig. 2 basic circuitry for the shunt regulator is shown. Here it will be seen current taken by the load has to pass through resistor  $R_s$  and under short-circuit

conditions  $R_s$  becomes rather warm, at the same time voltage across the output falls to a low value so the transistor runs no risk. Under normal operating conditions power is dissipated partly in  $R_s$  and partly in the load with Tr handling very little power.

As with the series regulator, voltage applied to the transistor base in the shunt regulator approximates to the output voltage.

Full circuitry of the supply is given in Fig. 3 and does not seem to warrant any detailed analysis.

A transformer (T1), bridge rectifier (D1-to-D4), and capacitor (C1) provide DC, the remainder of the circuit being the regulator. From C1 current passes to the output via R2 (corresponding to  $R_s$  of Fig. 2) and current also passes through R1, RV1. The base of the shunt transistor (Tr1) is joined to VR1 slider, hence RV1 determines the output voltage.

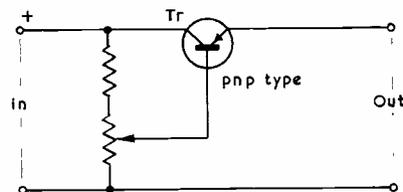


Fig. 1

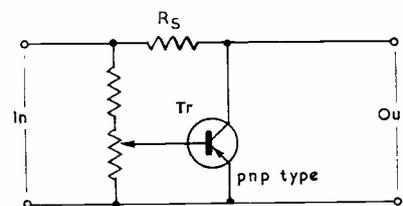


Fig. 2

X 367

Fig. 1, Fig. 2. Series and shunt fed regulator circuits— see text.

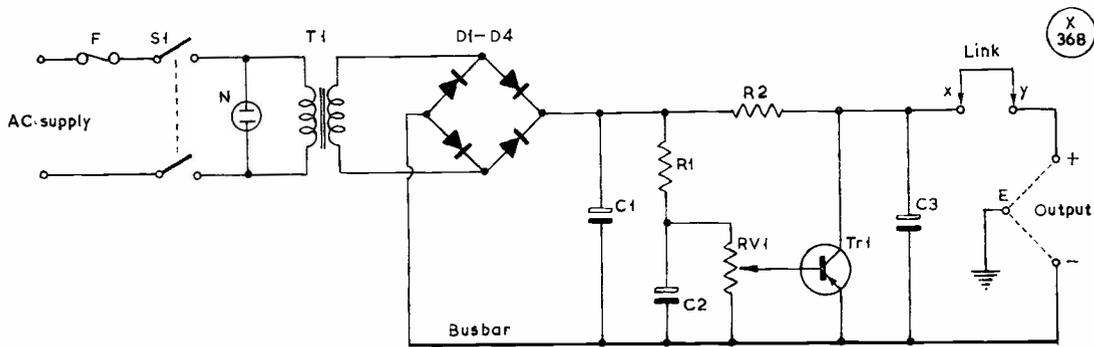


Fig. 3. Circuit of the PSU, in which the negative line goes to a bus-bar, not case or chassis. E goes to chassis. X-Y are connections for current meter, if used (see text). Values can be: C1, 5000 mF, 50v. wkng.; C2, C3, 500 mF, 25v.; R1, 650 ohms, 2w.; R2, 300 ohms, 5-10w.; RV1, 500 ohms, 2-3w.; D1-D4, four 2 amp. 100 p.i.v. rectifiers; Tr1, OC26 or similar; T1, mains xformer with 24-25v. secondary, rated 1/2-amp.; N, panel type neon, with resistor; S1, DPST mains toggle.

Resistors R1 and RV1, incidentally, form a bleed circuit and discharge all capacitors fairly quickly at switch-off.

Capacitors C2, C3 provide additional smoothing. C2 is placed across VR1 so very little ripple is present in the voltage applied to Tr1 base, while C3 provides smoothing at the output. The points marked X, Y indicate where to connect a built-in current meter (if one is fitted); this is covered later.

As a rule power supplies are not critical as to layout so the constructor may use any convenient method, but as mains voltages are involved a metal case is recommended.

**Points to Watch**

The main points to keep in mind are as follows: Resistor R2 can become warm, or even hot, so should be mounted clear of other components, while RV1 which runs slightly warm will in the long run be more reliable if a good quality component of two watts rating is used. Transistor Tr1 becomes only just warm to the finger tip so a heat sink is not needed.

One final point about construction is to note that a bus-bar is used as a negative line, allowing both output terminals to be isolated from the case.

In the case of a simple circuit there is obviously scope for minor variations, but those without some experience are advised to experiment with care. Amongst small changes which may be tried are reduction of the value

of capacitors (not the voltage) and diodes of higher ratings could be used.

Alternatives to the OC26 transistor are almost any other "power" transistor, not forgetting an OC26 is a p-n-p type.

Testing the finished job is simple enough. A multimeter set to a range greater than 15 volts f.s.d. is connected to the output and RV1 rotated. Readings from about 0.5 to 15 volts should be seen on the meter. The multimeter is next set to a DC current range greater than 100 mA. When the supply is switched on a current of about 100 mA will be indicated. A multimeter set to DC current has little resistance so the reading shown is the current which flows under short circuit conditions, and as resistor R2 is then dissipating about 3 watts it quickly becomes warm, or hot, to the finger tip! If a second meter is to hand the output voltage will be found to be about 0.25 or 0.5.

Enough current is available to run a broadcast transistor receiver. If this is done and modulation hum occurs, it can be largely eliminated by connecting a capacitor across primary or secondary of T1. Values between 0.01 and 0.001  $\mu$ F may be tried, some experiment probably being needed.

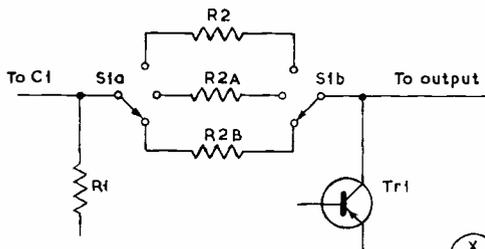


Fig. 4

Fig. 4. R1 is R1 of Fig. 3 and Tr1 as transistor Fig. 3. S1A, S1B, double-pole three-way; R2 is R2 of Fig. 3; R2A, 600 ohms, 5w.; R2B, 1200 ohms, 5w. See text for notes reference S1, R2A and R2B.

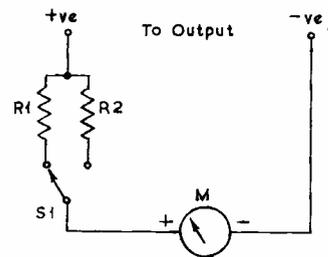


Fig. 5

Fig. 5. R1, 10,000 ohms; R2, 20,000 ohms; S1, SPDT; M, 0-1 mA meter. See text for notes reference R1, R2, which should be rated 1/2-watt 2% tolerance.

### Other Points

Two refinements are worth considering. Resistor R2 in Fig. 3 limits short circuit or overload current to about 100 mA, but if this resistor is made greater in value current will be limited at a lower figure. Fig. 4 shows an easy way of doing this by using a 2-pole 3-way switch. The switch can select one of three resistors, R2, R2A or R2B and current will limit at about 100, 50 or 25 mA respectively. Obviously more resistors could be used if S1 has more positions. The limiting current for other values of resistor is easily measured by connecting a milliammeter across the output. For S1 a good quality wave-change switch will do, but the habit should be cultivated of altering S1 when power is off; this type of switch is not intended to switch more than a few milliamps.

Metering is worth installing as an aid to convenient use. Figs. 5 and 6 show a voltmeter and a current meter. Use of two meters need not be too costly for only moderate accuracy is needed, small inexpensive imported meters being suggested. The voltmeter circuit of Fig. 5 uses a 0.1 mA meter with S1 bringing R1 or R2 into use. With R1 in circuit f.s.d. is 10 volts which fits a standard meter scale well, but R2 is available and reads to 20 volts.

Precision resistors are hardly necessary. A couple of resistors of correct value may well be to hand; if they have been lying about for some time they will have aged, tending to be more stable. Otherwise 2% or perhaps 5% tolerance resistors should be satisfactory.

Circuitry for a current meter with two ranges, 10 or 100 mA f.s.d. can be seen in Fig. 6. Switch S1 brings either of two shunt resistors into circuit across a 0.1 mA meter. These shunt resistors have a value calculated

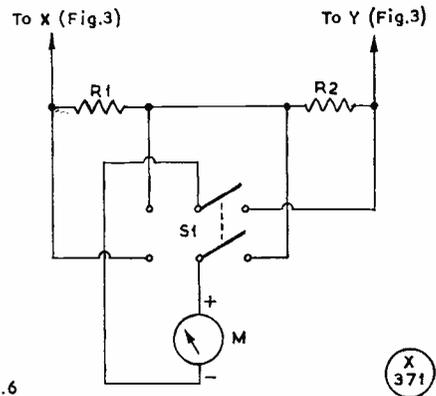


Fig. 6

Fig. 6. R1 is 100 mA shunt, about 1.01 ohms; R2, 10 mA shunt, 11.1 ohms (and see text); S1, DPDT; M, 0.1 mA meter.

on the assumption the meter has an internal resistance of 100 ohms, this being a representative value.

In practice the precise value of a shunt resistor is of little importance, for the shunts will probably have to be home-made, the value being found by trial and error.

Shunts are conveniently made from ordinary enamelled copper wire, 38 or 40g. being suitable for the 10 mA shunt and 30g. for the 100 mA one.

The prototype PSU has been in fairly regular use now for some two years, with no trouble developing during this time, so it would seem to be reliable as well as very useful.

### SPECIALLY ON THE AIR

THE Home Office Broadcasting Dept., Waterloo Bridge House, Waterloo Road, London, S.E.1 will always issue "for duration only" licences under the GB-prefix for stations to be "Specially on The Air" for this-or-that event locally—such as exhibitions, gala occasions, anniversary celebrations and the like, where an amateur-band station is to be put on and the public will be present.

Such a permit is issued in the name of a licensed AT-station operator, to be responsible for its conduct, log-keeping, etc.

So far as we are concerned, for a notice in this space we need date, callign to be used, the occasion for it, the band/modes to be worked and the address for the QSL procedure. You would hardly believe it, but for this month we have had requests for publicity where (a) The date of operation has not been given, (b) There is no indication as to how the QSL'ing is to be dealt with, and (c) No clue as to why the station should be listed under this heading, anyway.

We do *not* give publicity (in this space) to individuals who are simply going out for the day and want to attract a bit of attention to themselves!

Attention should also be drawn to the note on p.201 of the June issue as regards the GB-station QSL procedure. This is very important for all interested in GB-activity cards.

**GB2DHC, July 6:** Run by the Torbay Amateur Radio Society at Buckfastleigh for the Devonport Home for Children Fête.—L. H. Webber, G3GDW, *QTHR*.

**GB3ZTS, July 6:** Operating for Worthing High School 50th anniversary, SSB on all bands and run by Old Boys. Special QSL card.—P. Chegwin, 10 Ashurst Drive, Worthing, Sussex.

**GB2BA, till July 7:** British Airways Amateur Radio Society, to celebrate merger, station located West London, working 20m./80m. SSB, with special QSL's to confirm.—D. A. Evans, G3OUF, *QTHR*.

**GB3SFG, July 11-13:** Operated by the Southgate Radio Club for the Finchley Carnival at Victoria Park, N.3, running 2m./4m./160m. and 10-80m.—A. E. Edwards, G3MBL, *QTHR*.

**GB2DTS, July 13-14:** For the Dagenham Town Show, put on by the Barking Radio & Electronics Society, on the HF and VHF air, Saturday 2.0-10 p.m., Sunday 2.30-8.0 p.m. All contacts will be QSL'd.—J. Wiles, Westbury Recreation Centre, Ripple Road, Barking, Essex.

**GB3LRC, till July 14:** For the Lowestoft & District Amateur Radio Club, on the occasion of its 25th anniversary, running all bands 2-160m., AM/CW/SSB, with a special commemorative QSL card.—K. Dawson, G3XSK, *QTHR*.

**GB3OCS, July 20:** At the Ounsdale School Fête, Wolverhampton, operating two-metre AM and SSB on 80m., with a distinctive QSL.—D. Taylor, G3ZYT, *QTHR*.

**GB3LSR, July 20-21:** In conjunction with the Lytchett Steam Rally, at Lytchett Matravers, near Wimborne Dorset, with SSB on 10-80m., four metres (70-26 MHz) and two metres (144.48 MHz FM). Talk-in on these frequencies for /M's in the area.—P. R. Ciotti, G3XBZ, *QTHR*.

**G3CTR, July 21:** At the Cheshire Home, Le Court, Basingstoke Annual Fête, running 3770 kHz SSB and 144 MHz FM, with DX working on 14/21 MHz bands.—P. Sterry, G3CBU, Ashley, Orchard Road, Basingstoke, Hants.

**GB3NBS, July 26-28:** For the Northampton Borough Show, Abington Park, working 10-160m. SSB and two-metre AM/FM/SSB.—S. J. Purser, G8GHZ, *QTHR*.

**GB3PK, July 27-August 3:** For the Scout/Guide Camp at Chatsworth Park, Derbyshire, operating on 10-80m. This is expected to be a big Scout occasion, with many overseas visitors. Very special card for all contacts.—D. F. Reynolds, G4BPW, *QTHR*.

**GB2BRC, August 3:** For the Bromsgrove Gala Day, on 80m. and the HF bands.—J. Dufranc, G3VGG, *QTHR*.

## DX-Peditions

THE Southend Group are organising an expedition to GM for June 30-July 13. They plan one morning and one evening session in a different county daily. Details as follows: On 2m.: 144-20 MHz, SSB 0700-0830 BST and 1900-2330 BST with FM 2100-2130 BST. On 70 cm.: 432-22 MHz, SSB 0730-0800 and 2000-2100 BST with an FM session 2130-2200 BST. They will have 300 watts of SSB and 100 watts of FM on 2m. and 10 watts SSB and FM on 70 cm. Antennae—14-ele. on 2m. and 46-ele. on 432 MHz. Callsigns—GM8FUF/P and GM8GSX/P, and skeds can be arranged, if there is time, by s.a.e. to G8FUF or G8GSX, QTHR. Location for the following day will be announced during the evening session.

The Lichfield A.R.S. also are mounting an expedition to GM. Dates are August 24-31 and counties visited will be in Mid and Northern Scotland. They will run high power SSB only on 144-17 MHz and will be on each evening from 2000z onwards. Callsigns are GM8FQE/P and GM3NAS/P. Wonder if anyone can talk them into CW also? Organiser is Roger Smethers, G3NLY, QTHR.

Before it disappears from the claims Tables at the end of this year, the March & District A.R.S. will activate Huntingdon on August 17-18. They will have SSB on 144-20 MHz (hope they will QSY from the calling channel for long contacts) during 1700-2200z on the Saturday and they will be on during the QRP contest hours on the Sunday. Callsign is G3PMH/P and skeds can be arranged via G8BFX, QTHR. They will QSY to 70 cm. on request.

Members of the University College of North Wales A.R.S. (GW3UCB as if you didn't know) are also planning to visit Scotland in late September and they will have 10 kW e.r.p. on 70 cm. (four, 46-ele. Multibeams) and a mast head pre-amplifier with a noise temperature of better than 200°K. Wow! More details later.

If last year's pattern is anything to go by, these expeditions represent just a few of the many which will be going to GM during the summer months, and it might not be out of place here to remind organisers that they should not fail to contact the locals in the early planning stages. First, it is only good manners to do so, and secondly, they can help a great deal with choice sites and the availability thereof. This done, you can be sure of a warm welcome. GM6X1, QTHR, has offered to co-ordinate matters in the South, and will put you in touch with the appropriate chap in the North. One last point: Welcome though two metre expeditions to remote counties are, can we not have a few more using the other VHF/UHF bands? G3VPS has demonstrated quite recently (in GD) how popular and successful a four-metre trip with comparatively simple gear can be, and the GM8AGU/GM3JFG Scottish venture was much sought after on 70 cm., a further indication of the growing interest in that band. And what about 23 cm? VHF/NFD can produce quite a crop of signals from portable sites, so how about giving it a try at other times? We shall always be pleased to give advance publicity to properly organised efforts of this nature.

\* \* \* \*

It was with pleasure that a report was received from Peter Lennard, on 4 metres as GD3VPS/P, May 13-16. He had a total

# VHF BANDS

A. H. DORMER—G3DAH

of 40 QSO's during the two hours of operating time each evening, 13 different counties were worked and all except 12 of his contacts were with stations South of the Midlands, with the best DX as G3DAH—27 different stations were worked and all but ten of the contacts were on CW. These results were achieved without prior publicity, and would undoubtedly have been bettered had there been time for advanced warning of the trip. The site, north of Castletown, was at 950ft. a.s.l. and the equipment was his standard '640A Tx and 4-ele. Yagi. Conditions, he says, were nothing special, but he noted a considerable amount of EU broadcast QRM which was strong enough to disrupt contacts at times. (See last month's "VHF Bands" for details of his trip to Cumbria, Angus, Kincardine and Aberdeen, July 6-17). Nice going, Peter!

GM8AGU and GM3JFG enjoyed a considerable success during their recent portable expedition to Scotland. On very few evenings were they inaudible on the South Coast on 2m., and their 70 cm. contacts with, for example, G3JVL in Hayling Island, were outstanding. It was unfortunate that they had to cut the trip a bit short due to the fuel shortage up there and Wx conditions, but even so, judging from the claims that are coming in for the Annual Tables, they seem to have given vast numbers of operators their first contacts with GM.

## Four Metres

Recent criticism (not in this piece!) of four-metre operators for "apathy, outmoded technical equipment and operational procedures" have provoked some lively reactions on the band. Listening to comments and reading through the published, and a certain amount of unpublished, correspondence it seems that too much emphasis is being placed on Group activity and too little on the individual. If, as has been suggested, Groups use four metres on VHF/NFD merely to boost their score, knowing that they cannot hope to come in the first twenty without it, all well and good. But NFD comes, like Christmas, just once a year and to judge activity levels, expertise and interest by this criterion alone would seem fallacious. Individual activity, both within and outside contests, would seem a more reliable measure. Groups do take part in contests other than NFD, but they are in a minority. Single operator activity, hampered though it be by the menace of TVI in many areas, and perhaps frustrated by the lack of EU/DX, is far from moribund and the increasing number of SSB stations to be heard on the band an indication that, technically,

users are keeping up to date.

The situation could be improved by the introduction of activity periods as on the other VHF bands (and the best time for these is undoubtedly Sunday mornings) more 4m. expeditions by individuals or Groups, the timing of contests to avoid, as far as possible, operation during TV hours and, finally, more technical, constructional articles.

## Twenty-Three

Four more entries for the 23 cm. All Time Table this month, and promises of more to come. Just to recap, as the title states, claims are for all-time contacts by direct routes, i.e., excluding EME, M/S and satellites, and it would be appreciated if your first claim could list the countries and counties worked and give details of the equipment in use so that highlights may be picked out for special mention. As with the Three-Band Annual VHF Tables, claims should be based on the old county organisation for England and Wales until the end of this year, when we shall bring the new names and boundaries into force. The situation regarding the new scheme for Scotland is still under discussion and we shall discuss this aspect in due course.

G3COJ (High Wycombe, Bucks.) is having beam problems at the present time and as a temporary expedient mounts and de-mounts eight half-waves in phase, with a plane reflector, each time he comes on the band. The Tx runs a TD1-100A (2C39) as a doubler from 648 MHz and produces about 8 watts of RF. The Rx is a modified "K6AXN" with a BFR90/91 in the front end. Counties worked are G and F.

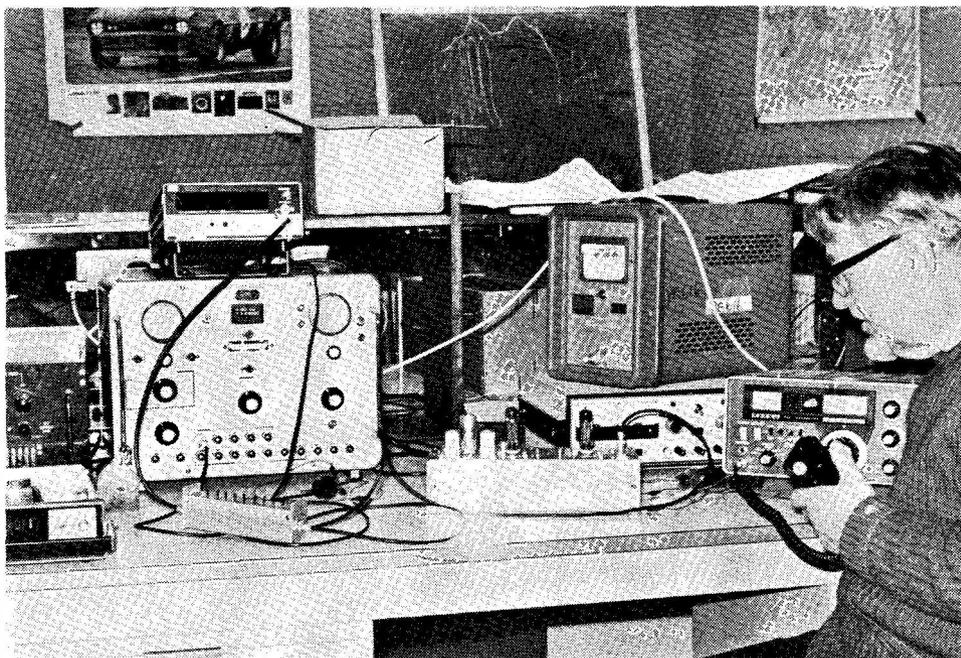
A bit isolated up in Dewsbury, G8EOP runs a 2C39A tripler at 30 watts DC input to a corner reflector at 30ft. The Rx is the Microwave Modules converter to an 888A or FT-200. Skeds welcomed, QTHR.

G3JVL (Hayling Island) turns in a respectable 14 + 2 claim (G + F). He runs 40 watts output from a 8533 (2C39) into four, 27-ele. Yagis to his own design (drop him a line if you want him to make one up for you) and the converter has an NEC-25C987 in the front end with the very respectable noise figure of 4 dB. As a check on band conditions, it may be helpful to note that he has the following skeds: With G3OBD on 1296-18 MHz daily at 2230 BST followed by G3DAH at 2245, same QRG; with G6XM at 2200 clock on 1296-4 MHz; and with G3KAC at 2000 BST via QSY from 432.

## TWENTY-THREE CENTIMETRES

### ALL-TIME TABLE

Station	Counties	Countries	Total
G8ARM	20	2	22
G3JVL	14	2	16
G3EHM	14	2	16
G3COJ	14	2	16
G4ALN	10	3	13
G8AOD	11	1	12
G5DF	8	1	9
G8FMK	7	1	8
G3DAH	4	1	5
G8EOP	1	1	2



In the April issue of "Short Wave Magazine" G3DAH described the construction of a Sideband Transceiver for Four Metres. This was extensively checked and tested before the article was published. Here, he is verifying the stability of the driver stage, using a frequency standard and counter.

26 MHz to 1296.8 MHz. On Monday evenings at 2030 he and G4BEL give it a whirl on 432.15/1296.45 MHz, and on an *ad hoc* basis, he and G3BNL contact on 432.3 MHz and QSY to 23 cm. when conditions look promising. Mike had 14 QSO's during the recent contest to net 1270 points! Best DX was with G4BEL at 183 km.

In Herne Bay, Kent, G3DAH runs 10 watts RF output to a 34-ele. Yagi (to the G8AZM design) at 50ft. and uses the *Microwave Modules* tripler and converter. His only claim to fame is that you won't get a contact on 23 cm. any further to the South-East of the country. Want a sked?

The Southampton Group claim to be the first to run 23 cm. SSB portable equipment from 12 volts. Any contenders?

#### VHFCC Awards

We are pleased to congratulate G4AGE, Ray Evans of Bolsover, Derbyshire, on his achievement in successfully claiming awards for both 2m. and 70 cm. simultaneously. Certificates Nos. 220 and 17 respectively have been despatched. He uses simple gear, 5 watts of SSB into an 18-ele. *Parabeam* on 70 cm. and 25 watts of SSB into a 10-ele. beam on 2m. The main Rx is an FT-101 with BRT-400 stand-by. One must conclude that the 550ft. a.s.l. site has helped a bit! Ray now has SSB on 4m. also (G3DAH design less the '640A PA) and the signal from Derbyshire, a rare county on 70 MHz in view of the local TV frequency and TVI problems, will be welcomed by many.

G4AEZ (Enfield, Middlesex) gains Award No. 221 for two metres. Early contacts were made with a modified Pye "Cambridge," home-built converter and the *Trio JR-500SE*

with a halo antenna, but this set-up has been superseded by a transverter with a QQV06-40A PA, a reconstructed converter and the Yaesu FT-101B. Add to this an 11-ele. Yagi on a *Strumech* tower and a very satisfactory medium power station must result.

#### Oscar VI and VII

Latest information is that the launch date for the *Oscar VII* satellite has been put back to October due to problems encountered with the *ITOS* launch vehicle.

An amusing, if that is the right word, piece of bureaucracy has come to light in connection with an application by AMSAT for permission to carry a 2304 MHz beacon aboard *Oscar VII*. The FCC have given authority for the beacon to be carried provided that provision is made to ensure that it is never switched on. Ah, well!

*Oscar VI* continues to function, exceeding its planned life by some 50%, but a further reduction in operating schedules has had to be made. Only ascending orbits may be used for traffic and this means that, in this country, we can only use late afternoon and evening passes on Monday, Thursday and Saturday, yielding less than one hour operating time per week.

We should like to draw attention again to the excellent service offered by G3WPO and G3IOR in their publication *Oscar News*. This news sheet is crammed with information on current and future *Oscar* problems, and includes useful hints on transmission and reception, equipment and procedures. Initially a privately-financed venture, the time has come when mounting costs make it necessary to make a small charge for the purchase of paper, stencils, etc., although

their time is still given for free. A charge of £1 per annum has been suggested and this would bring you the news sheet plus (if have lodged s.a.e. with G3WPO) immediate information on any modification to the *Oscar* programmes. It seems well worth while. Drop a line to Tony Bailey, G3WPO, *QTHR*, if you are interested.

#### Beacons

The Dunstable Downs Radio Club is to be congratulated on the effort and expertise put in to establishing a 23 cm. beacon on a site up on the Downs, QRA ZL08e. This installation was the culmination of nine months' intensive effort on the part of members of the Club, notably, G4CPE, G3ZFP, G8ADC, G3NUE and SWL Bates. The radiated frequency is nominally 1296.05 MHz, although measurements at the G3DAH QTH show it to be fractionally below this. The keying cycle consists of a long dash and the callsign GB3DD repeated at 13-second intervals, the frequency shift being 800 Hz. The antenna, a scaled down version of the "HB9CV" 2-element Yagi, enclosed in a fibre glass sphere, is mounted at 130ft. above ground on a site 675ft. a.s.l., and radiates 18 watts of RF on a Northerly heading. The site is somewhat screened to the Southwest. The beacon transmitter is solid-state throughout, the final amplifier being a special development model of the RCA TA8695, which is followed by a filter to reduce harmonic and other unwanted outputs by 45 dB or so. Reception reports would be welcomed by the beacon keeper (G3ZFP, *QTHR*). As a guide, the signal averages RST 539x over a 120 kms path between Luton and Herne Bay. A fine

effort, chaps.

GB3SX is radiating a potent signal on 70-685 MHz, some 14 kHz below the published frequency. Keying cycle is of one-minute duration and consists of a long dash followed by the callsign in A1. There is a bit of a chirp on the keying. GB3SU continues to function on 70-695 MHz from the temporary site in Sheffield, although one gets the impression that the signal strength is a bit low.

An amusing letter signed "One of the many Cornish Piskey's" contradicts the official statement that GB3CTC is off the air, and says that it is still paralysing the local front-ends on 144-127 MHz. Good news, but what have "The Little People" done with the other 3 kHz, since the published frequency is 144-130 MHz? GB3VHF is still off the air, reportedly awaiting a xtal for 144-15 MHz. After all this time it would be nice to have it back on 144.5 MHz, at least *pro tem*. Still no sign of GB3DM on 70 cm., although the two-metre beacon continues to function.

#### Contests

Results: The 432 MHz Open contest in March was won by G4BEL with a comfortable points lead over G3JQA/P. As stated in the April issue of SHORT WAVE MAGAZINE, conditions were generally poor for the 70 cm. Cumulative contests, and this was borne out by the small number of entries for the event and the comparatively short-haul "Best DX" contacts. However, G3NHE added to his laurels by scoring 285 points from 71 QSO's to take the leading place, and was followed by G8CXH with 211 points from 39 contacts.

Reports: Activity for the 23 cm. Open on May 25, followed by the 432 MHz Open on May 26, was low. This could well be due to the unwillingness of operators to go through all the nausea of traipsing off to some elevated site with a load of equipment for what, due an error in the Rules (nothing to do with us!) turned out to be a three-hour contest on 70 cm. Conditions were tolerable without being outstanding.

Propagation was a little above average for the 4m. event on June 2, as witness the 460 km. contact between G3XUS/P near Brighton and G3VVP (Kendal, Westmorland). GD2HDZ put in a welcome appearance on SSB as did G3JYP/P in Co. Durham. There appeared to be only two Welsh portables available. GW4ABR/P at Hay-on-Wye and GW3WRA/P near Brecon, the latter being a particularly strong signal in the South East for much of the time. A couple of good scores heard near the end were those of G3XUS/P with 075 and G3JYP/P with 052. Activity was lower than might have been expected due to the last-minute change of date which caught many people napping.

Microwave Contest, June 15-16: The high pressure system moving slowly across the British Isles brought good propagation conditions for this event. Seventycems, on which most contacts for other bands were arranged, was producing excellent DX from PA, ON, DL and several EU contacts were made on 23 cm.

On this band ON5FF (running a kW), PA0SSB and PA0VV were particularly strong signals. Although conditions held up for the Sunday, there were very few signals on the UHF/SHF bands and the whole event seemed largely to have disintegrated by mid-day. As an example of activity, G3DAH

### THREE BAND ANNUAL VHF TABLES January to December, 1974

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	
G3NHE	34	5	59	16	43	11	168
G3DAH	32	5	54	15	26	7	144
G5DF	31	3	51	13	30	5	133
G4AGE	8	1	47	9	35	8	108
GD2HDZ	15	4	50	11	20	6	106
G3OHH	32	5	27	6	11	2	83
G3ZDY	—	—	60	11	6	5	82
G8EOP	—	—	41	7	25	8	81
G3FIJ	24	3	26	10	12	3	78
G8GNE	—	—	40	10	23	3	76
G2AXI	21	3	32	8	9	1	74
G8GHZ	—	—	53	10	7	1	71
GW8FOL	—	—	55	12	—	—	67
G4AEZ	2	1	43	8	11	2	67
G3SHY	3	1	26	5	22	5	62
G8ECO	—	—	42	7	10	2	61
G4CZP	—	—	53	8	—	—	61
GW8VXQ	—	—	47	11	1	1	60
G3AHB	—	—	41	8	7	1	57
G8FWB	—	—	48	7	—	—	55
GW8FKB	—	—	44	7	1	1	53
GW3KGD	—	—	41	12	—	—	53
G8FUI	—	—	35	8	5	2	50
G8DGR	—	—	41	6	2	1	50
G8CBU	—	—	42	5	—	—	47
G8HAE	—	—	37	9	—	—	46
GM3ZBE	1	1	26	5	4	6	43
G8BBP	—	—	37	5	—	—	42
G8HHI	—	—	36	5	—	—	41
G8HQA	—	—	33	4	—	—	37
G8GXE	—	—	29	5	1	1	36
GM4CXP	—	—	30	6	—	—	36
G8HQQ	—	—	27	3	5	1	36
G8FMK	—	—	—	—	31	3	34
G3FPK	—	—	29	2	—	—	31
G8HYH	—	—	27	4	—	—	31
G8BPJ	—	—	23	2	1	2	28
G3XSK	—	—	21	6	—	—	27
GW4BXE	—	—	17	10	—	—	27
G8GGP	—	—	20	5	—	—	25
GW3XJQ	—	—	16	7	—	—	23
GI8EWM	—	—	15	8	—	—	23

Notes: 1. Claims should be on the basis of the *old* county boundaries until January 1, 1975.  
2. The Table shows claims to date from January 1, 1974 and will close on December 31, 1974.

Two-metre station G3UDN, of the mid-Warwickshire Club group, with G8HRH operating and the QSL manager doing the logging. On the wall will be noted some interesting items of early amateur equipment—yes, years ago we did use valves about the size and shape of Rugby footballs!



worked eight counties and three countries on 23 centimetres.

**Forthcoming Events:** July 21, 432 MHz Open. July 28, 70 MHz Open. The 6th BARTG (RTTY) contest has been arranged for Sunday, September 22. Bands are 144 MHz and 432 MHz and logs should go to G3IIR, QTHR. Further information, rules, etc. from G8CDW, QTHR.

#### News Items

##### Four Metres

GD2HDZ is now up on 4m. SSB from Laxey, I.o.M. G3XCS (Saltash) and G3IUD on the Lizard were both QRV on SSB during the June contest.

GM3ZBE (Inverurie, Aberdeen) has just worked GM4AOR in Midlothian for his second contact on 4m. in two years, the first being with GM3AUG in Ellon. How's that for perseverance? It's rough going in them thar hills! Alex now has a 3-cle. at 30ft. on this band, fixed at present on GB3SU, which he hears regularly at strengths varying between S1 and S4. He is engaged at the moment in getting his lattice tower up to 60ft., and this should improve matters a bit in his search for G stations.

##### Two Metres

GW8EHR has developed a new omnidirectional antenna for mobile work. He calls it a Quadra-Horizontal-Cycloidal Radiator, which is a bit of a mouthful, but it has a very symmetrical radiation pattern, and a bit more gain than a pair of crossed dipoles. He has worked into EI with it and got an S8 report. He promises more details later.

Portable operation from Cardigan is taking place every Monday-Thursday evening under the call GW8BXQ/P. The site is 1,000ft. a.s.l. and SSB is available around the calling channel. GW4AKO now has 2m. SSB from a "Liner 2" located at Pembroke Dock. This once rare county is now very well represented on 2m. How about some 4m. activity?

Writing from Shrewsbury, G8HQ observes that there is very little activity on AM and FM in the Midlands these days, and with all the "Liner 2" gear around this is hardly surprising. It is also noticed that activity around 145.41 MHz seems very low. As is to be expected, most of it has moved to 144.2 MHz and thereabouts, but many operators have cottoned on to the fact that the Continental stations are congregating round 144.35 MHz to avoid interference with the input channels of repeaters which have not yet been moved to their new frequency allocations, and are putting in some rewarding hours on that frequency. Incidentally, have you noticed how often EU operators will go to CW on the sideband channels if conditions are difficult? This is quite an acceptable practice although AM/FM mixed with SSB is not!

G8DGR in Newbury, Berks, has been working round the compass quite well with simple equipment having raised Lancs., Shropshire, Devon, Montgomery, Durham,

Eire and the GM8AGU/GM3JFG expedition towards the end of May. He is convinced, as is your scribe, that the early mornings produce some of the best propagation conditions on this band. On the subject of working DX, and it was particularly noticeable that with the GM8AGU contacts, calling exactly on channel with a pile of other chaps doing the same thing is not productive of the best results. If you have ever been on the receiving end of a pile-up, you will know that selecting a call from the QRM is not the easiest of matters, whereas a transmission just off the channel will often get the contact.

G8HAE (Grimsby) has a moan about the difficulty of working DX from the East Coast. He claims that on several occasions recently stations inland and to the North have been heard working Continentals which are quite inaudible to him. This seems strange, since from Herne Bay the temperature inversion along the coast line has produced, on many occasions, better signals from North of the Border than are reports from more elevated sites inland at comparable range. Even without this effect, he should be better placed than many of us when the OZ/SM path is open. There is a private net in the Grimsby/Hull area these days with some 20 operators using SSB and plenty more on AM/FM.

GM4CXP is trying to stimulate early morning activity from Roxburghshire. He is on during 0715-0745 BST most mornings and beaming South on 144.215 MHz, with SSB. What with the Cheviots to the South and the Lammermuirs to the North, and some fairly rough country to the West, it is quite a challenge to work him.

G3OUF, Amersham, is trying out a new antenna system. He has crossed 10-ele. beams with separate feeds brought into the shack and suitable phasing arrangements give him horizontal or vertical and RH or LH polarisation.

##### Seventy Cm.

Quite a surprise to hear from GC2FZC (Guernsey) that he is having trouble making

70 cm. contacts, even during contests. He was active for the whole of the recent 432 MHz event and only heard two stations and made nary a single QSO. Now, Walter is an old hand at the game, and you can reckon that his gear is up to scratch and that he knows what he is doing from the operating angle, so how about having a gander in that direction during the next 70 cm. event and helping him to keep Guernsey on the VHF/UHF map—and get yourself a goodly number of points into the bargain? He copies GB3SC regularly at up to RST599 at times.

An interesting comment from GC8AAZ in Jersey during a recent QSO. He has now observed auroral effects on 70 cm. on no fewer than four occasions to date. Doubly surprising in view of the latitude of the Channel Islands and the frequency involved.

G5DF (Reading) reckons the GM8AGU/P trip to be the best ever. He worked them in five counties on 70 cm. G3SHY is QRV on 70 cm. from Notts if you are looking for that county.

##### General

G8CVD of Nuneaton is now G4BBS. He must be one of the very few who have had listener reports from CT1 and C31. G8DOT is now G4DEZ. G8IHI was licensed almost to the day 25 years after his illustrious father G3FDW. He is plugging away at the CW and hoping for the G4FDW callsign! Two successive QSO's produced an odd coincidence the other day: The first was with G3NRT (ex-G8AKH) followed by his father-in-law, GW4DCA (ex-GW8CTP).

Operating from GD recently, GM3OXX set up three new records on 3 cm.—G/GD, GW/GD and GM/GD. He would like publicly to thank the GD boys for their help and hospitality.

##### Deadline

Deadline for the next issue is July 5. Please send your news, views, comments and claims to: "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. Cheers for now and *vy 73 de G3DAH.*



## SHORT WAVE LISTENER FEATURE

By Justin Cooper

### GETTING GOING — BUILDING IT YOURSELF — IMAGE INTERFERENCE — THOSE "ITU" CALLSIGNS — LATEST LADDER POSITIONS

DESPITE the widespread use of SSB telephony on the bands, there are still many SWL's who "find" Amateur Radio through listening on the bands. *J. Hesman (Birmingham)* came to it when TV was not on due to the power problems at the turn of the year. His transistor Rx had the usual BC bands, but also a short-wave band, and this was explored to relieve boredom; Top Band and Eighty were stumbled on, AM only, but soon the knack was picked up of using another transistor radio as a front-end BFO to obtain SSB reception—and the bug had bitten! Now there is a JR-500 in the shack, and prefixes are being actively collected, with thoughts being turned to R.A.E.

The point John brings out so clearly is that, while it is nice to have shiny equipment, it is possible to collect one's prefixes with nothing more than a brace of transistor portables, or a one-valve (or transistor or FET) receiver of home brew, and to get a lot of fun out of it. Indeed it is still on the cards to build up a station to *work* DX for under a tanner if one goes about it with care—and that amount covers receiver, transmitter, aerial, and frequency-measurement device! Of course this implies the need for home-construction to some degree, enough courage to use a soldering-iron, and a junk-box, for which some buying at Club junk-sales and some swapping among members of the Club will produce most of the bits. This in turn presupposes membership of a Club, even if one does not attend every meeting. And, good people, isn't this just what Amateur Radio is about, in addition to just working the stuff? This writer would rather be QRT than miss his Club meeting, and as for the station, he designs and constructs all the items he can't for any reason buy.

#### The New Ones

There are quite a few this time, apart from John Hesman already mentioned. *M. Peir (Liverpool)* is 13 years old and has a UEF-204 transistor portable as his receiver, it being tacked to fifty feet of wire as an aerial. Malcolm says he envies all these chaps with their AR88D's and whatever! True—but the skill obtained in winking the DX out with, relatively speaking, basic equipment, will stand him in good stead when the advance is made to more sophisticated gear.

*A. Buckman* hails from *Jamaica, New York*, and has been a reader for three years. Al uses a Drake R4C with an American B. & W. "Vacationer" aerial mounted on the window-frame, with which his first list totals 510 prefixes—no mean total for a starter!

*D. Yeoman (Peterborough)* wrote originally to

G3KFE, who passed it on as being more appropriate to this piece. Dave mentions that the Peterborough Club has a SWL contest in the form of countries-heard in the current year, a ladder being published in their Newsletter each quarter. For himself, Dave's score is 177 countries this year from a half-size "5RV" aerial and a Trio JR-310.

From *Luton, S. H. Bandy* sends in a list of 208 prefixes heard. He has an end-fed wire of 130 feet and a loft loop for Twenty, both fed into the receiver by way of an ATU and RF attenuator. He says his interest was sparked off by G8CBU, G3YUI and G3WXS at last year's Jamboree-on-the-Air event, and already their influence has been such that there are hopes of R.A.E., either in the winter or next May, depending on progress.

It had to happen sometime—an entry for HPX read-out from a computer! *Bob Swan (London, SE19)* has clearly got his computer tamed, as it reads out all the essential details for each entry. Rig is an R.107, fed from a Codar preselector, and 132 feet of wire wrapped round a frame indoors. Bob wants to know how to count the /MM lads who quote the Region in which they are located. Answer is just disregard the Region, and log him, for HPX purposes, as so-and-so/MM.

*Miss P. Goddard (Cranleigh)* has an FR-50B receiver running from the old 405-line TV aerial, and listens mainly on Twenty and Eighty, although a recent excursion on 21 MHz resulted in a VQ9 right out of the blue.

Some of these Liverpool types are very keen—*P. Rooney (Liverpool L4-7TE)* reckons to spend 30 to 40 hours weekly at the receiver! Wish J. C. has that sort of time for the bands! Philip tripped over all the odd prefixes that were out and about during the *CQ WW* Contest, plus CF2UN. This last is mentioned by many people, most of whom have queried it. He is quite OK, QSL via VE2UN, and was some sort of "special-activity" affair.

Not really a new chum is *A. Roberts (Kidderminster)* as he used to make an entry years ago; but since learning the code Tony has found a renewed interest and so his list goes to swell the band of CW-Only entries in HPX.

\* \* \*

Commercial stations in the amateur bands annoy *S. McHugh (Pontefract)* particularly during the afternoon on Twenty. Not knowing the IF's involved it is not possible to be sure whether these are in fact in the band, or are spurious responses of some sort, such as images, which appear in the band whenever they are strong enough to overcome the level of image-rejection inherent in the receiver. A quick way to tell with a "single-signal" receiver is to switch in the BFO and tune the band, say, from LF to HF—all signals having carriers in the band will change pitch as you go through them,

low to high, but an image will appear to be changing pitch in the opposite direction, in this case, high to low. The method can only be used with a receiver having such selectivity that the beat note from a carrier on the unwanted sideband is so low as to be all but inaudible—a condition satisfied in most SSB receivers and others having a crystal filter.

The list from *A. C. Gullis (Ogbourne St. George)* raised quite an interesting phenomenon this time, as *A. C. G.* starts his entry at the bottom of the 1974 Table while his brother sits right at the top of the 1974 listings! One suspects this will cause some amusement in the *Gullis menage!*

Being a member of the Torbay Club has obviously been of help to *K. Salter (Newton Abbot)*, as his R.1155 runs off a home-brew PSU in which the guiding hand of G3LHJ is clearly visible, both in the bits and the wiring. Kevin's method of lightning protection is *very* simple—just open the shack window and the aerial flies out!

### More From Letters

First, the chaps with technical queries of one sort or another. *B. Russell (Runcorn)* has a 5RV-type aerial, and wonders whether, since the ends are sloped down from the feedpoint at 45° to enable the complete aerial to be got into a shorter garden than the one hundred-plus feed of garden otherwise required, the aerial should still be called a "5RV," or renamed as a Vee-beam. The quick answer is that no shape of 5RV-type aerial could ever be a Vee-beam, as this latter comprises two *horizontal* legs of wire several wavelengths long, connected through open-wire feeders at the corner of the Vee, and having the angle between the legs so chosen that radiation is reinforced in the direction of the "arrowhead" and the reverse way, to the relative exclusion of radiation at right-angles to the arrowhead. From this aerial is derived the rhombic. No, R.R.'s device should if anything be described as an inverted-Vee form, 5RV-style aerial, and the sloping legs of the aerial are probably not having a significant effect much above 21 and 28 MHz, certainly not on Eighty or Forty.

His absence is explained by *B. Cushing (Hove)* in the simple terms that his receiver worked much better when he rectified a bad aerial connection to the AR88, thus renewing his interest! Yes, it is surprising how often a bout of "bad conditions" is due to not much more than a bad connection somewhere, or the receiver going out of alignment gradually with increasing age. This is often not realised, which tends to increase the feeling that the trouble must be conditions! There is no cure saving regular preventive maintenance.

### Prefix Points

Almost everyone has a few "ITU" stations in their loggings this time. It was all done to coincide with ITU Week, and there were all but 100 stations signing in this manner, mainly W's, but some South Americans; and 4U6ITU was presumably 4U1ITU from Geneva in disguise.

Then of course there were the odd prefixes which surfaced, as usual in the *CQ WW WPX* contest, mainly South American stations, signing things like PS for PY, YY for Yv stations, and so on. Perhaps the most



SWL G. Law, 80 Knowle Road, Mirfield, Yorkshire, has been at it for nearly ten years and now has an Eddystone EA-12, with a choice of antennae, including a full-size "G5RV." For two metres, he has JXK converter into EC-10 to a pair of stacked halo's. At the age of 67, he finds Amateur Radio a most satisfying relaxation.

interesting series of odd callsigns of late have been the Russian ones coming up with a "30" in the middle of the call. This one commemorates the thirtieth anniversary of the day they finally hoofed Hitler out of their country, in 1944. The exercise was called Pobieda-30. The Central Radio Club station U3ØA started the ball rolling, with U3ØR next from Tyumen, the geographical centre of the U.S.S.R., where they were 200 km distant from the nearest town of any size. May 9 saw the opening-up of UB3ØSE from Sevastopol, followed in turn by various stations with a suffix to denote the city from which they operated, each one starting on the date the city in question was liberated. Thus the exercise will be going on well into July, each town-station being on for 24 hours only to give them some rarity value and keep the thing in proportion. No doubt about it that since *CQ Magazine* first thought up the idea of working prefixes and our own SWL's started to listen for them, the world has taken to the game with a vengeance!

### Rest of The Mail

It becomes evident, even this early in compiling the piece, that space is running out; so in this section we will not mention those who have simply sent in a Ladder entry.

*J. H. Sparkes (Trowbridge)* remarks on the number of "specials" of one sort and another in his log of callsigns, which have bumped up his totals quite remarkably.

*B. F. Hughes (Worcester)*, and one or two others also, have raised a point by offering entries for the 1974 table as well as their normal All-Time Post-War entries. This has caused us to think about the whole question again. The ruling we have come up with is that, as was originally intended, at 500-up you are transferred to the All-Time regardless, and you are no longer eligible to have a score in the 1974 table. The reasoning is that the Annual listing was originally invented for the benefit of the newcomers who are competing amongst themselves and gaining experience; once they have 500 prefixes "under their belt" it is felt that they can then compete on

equal terms in the All-Time. This being so, we have only taken into account the "senior" list for all those folk who have entered two—and hope this will be regarded as reasonable!

*D. Sharred (Birmingham)* also questioned the matter of the Table. He has a problem with /AM stations. WA5PGV/AM sounds fair enough, but the chap signing "5Y7ADA/AM" was for certain operating, one would think, in a quite unauthorised manner, with the aircraft number as his call sign!

All the bits have been collected for a Digital Frequency Meter, remarks *G. George (Woodmancote)* so no doubt construction will begin ere long. There is also a VHF aerial and rotatable mast project on the go to keep Gareth out of mischief.

As usual, there is much of interest in the letter from *H. M. Graham (Harefield)*. Maurice adds to our knowledge of the "ITU" stations already mentioned. It seems the basis was to take an initial letter K, any second letter, the W call area number as appropriate, and the suffix ITU to complete the callsign. Of course, this is pretty well within the normal rules—after all is said and done, there are almost as many stations having K as W in the prefix operating from the States, as a look through the *Call Book* will confirm—W1AAA could well be in the same street as K1AAA, and of the same licence class. Maurice heard several openings on Ten, mainly North-South of course, and found items of interest on Ten, Fifteen and Twenty to add to his loggings.

The trees of *Harefield* which support the aerials of *M. Cornwall* have been getting a bit of a pasting, he having hung up with their help dipoles for the HF bands, to add to his LF aerials, and another one for Two, with Seventycems projected, and four metres covered by means of TV set modified chassis which works quite well.

*A. E. Glass (Plymouth)* is at the top of the CW table in HPX, and is the first CW entrant to get over the 1000 mark since J.C. took on this feature. Bert mentions May 7 as being a superb opening on Ten with VK, South Americans and Europe all audible together.

Roars of approval from the shack of *N. Askew (Coventry)* indicates to the neighbours that after five weeks away from the receiver he had switched on and was gathering in a goodly crop of assorted "ITU" and South American contest prefixes—how does his wife explain these noises to the neighbours, one wonders?

Nice question of propriety is raised by *R. C. Woolley (Ashbourne)* when he enquires whether GB2RS is an acceptable amateur prefix to add to his total in the absence of any other GB2 stations. Why not, indeed? It would seem to your conductor that GB2RS is a perfectly normal callsign but with extended privileges, unlike, say, the beacons or repeater stations, or the U.S. MARS stations, which last are quite definitely *not* amateur stations although manned by amateurs. The beacon and repeater stations are a separate case which need thinking about.

*A. W. McNeill (Newbury)* has an R.1082 receiver, a TRF device, as back-up to his R.1155 when the latter is being modified or worked on. This old wartime receiver is a fine demonstration of how good a TRF with plug-in coils can be in skilled hands—this receiver must be regarded as "vintage" now. Incidentally SWL McNeill's

list is all CW.

Two letters came in from *M. Peters (Newbury)*, the first one having missed the 'bus last time out. He has an AR77E receiver, and for aerials there are thirty feet of wire up in the loft, with or without 23ft. out of the shack window and down the garden, and an indoor two-metre beam for 144 MHz worked into a valved converter tuning 19.5-21.5 MHz on the AR77E. Morse is up to "twelves" already, and at the time of writing R.A.E. was being worked for seriously.

Two letters also came from *M. Quintin (Wotton-under-Edge)*, he having been a little quick off the mark first time—all the odd prefixes noted this time came in handy as they took Mike over the magic 1000 prefixes score; oddly enough, the thousandth prefix logged was in fact a G4 operating mobile less than four miles away! That's often how it is!

*R. Carter (Blackburn)* was saddened to hear of the death of his, and our, old friend, Rev. A. W. Shepherd, G3NGF of WAMRAC fame, at the age of 59. He was a sincere and devoted man. It is believed G3VAP will be taking over the WAMRAC reins although we have no firm news to date. Ben goes up to 1129 in the lists this time.

For *M. Cuckoo (Herne Bay)* the activity was almost all in contests, accounting for four new zones, nine new countries and forty-six new prefixes, to bring the total almost to 800.

Having said what he would do about Amateur Radio when he retired, *L. A. S. Poole (Winchmore Hill)* is in process of eating his words, and through no fault of his own, it is clear. However, all the snags having been coped with, even if R.A.E. was not taken this time, and by the time this comes to be read, he should be safely holed up in St. Ives, Hunts. On a different tack, comes the question of continuance on the Table or starting again. There is no hard-and-fast rule on this one at the moment, though your conductor is rather of the opinion that there *should* be one; let us say, from now on, that a move of more than 100 miles entails starting again.

*K. A. Whiteley (Castleford)* listened through the

## ANNUAL HPX LADDER

(Starting date January 1, 1974)

SWL	PREFIXES	SWL	PREFIXES
G. F. Gullis (Ogbourne St. George)	491	J. Hesman (Birmingham, B42-2AR)	268
P. Rooney (Liverpool, L4-7TE)	454	G. George (Woodmancote)	258
M. Eccles (Lancaster)	426	W. McFaul (Londonderry)	247
J. Bell (Hampstead)	392	K. Salter (Newton Abbot)	243
M. F. Parry (Shrewsbury)	391	S. McHugh (Pontefract)	232
M. Rodgers (Harwood)	353	M. Peir (Liverpool, L18-6HX)	232
R. Swan (London, S.E.19)	338	S. Sharred (Birmingham)	231
M. L. Peters (Newbury)	305	B. Russell (Runcorn)	210
S. Lawrence (Market Harborough)	300	S. H. Bandy (Luton)	208
B. F. Hughes (Worcester)	291	A. J. Gullis (Ogbourne St. George)	202
R. C. Woolley (Ashbourne)	289		

Starting score 200, in accordance with HPX Rules. All Prefixes on this list to be heard in 1974. When a score of 500 is reached, transfer to the All-Time table will follow.

period 1963-1967 and then gave it all up until the beginning of 1974. He now runs a Yaesu FR-50B, a Hamgear Preselector, and a Joystick in the corner of the room.

*M. F. Parry (Shrewsbury)* claims 391 prefixes but has omitted to send in any list with his claim, for checking purposes. Of his queries, all are OK. CF3 we have dealt with elsewhere, 9F3 is another variant for Ethiopia, and the rest are contest prefixes with the exception of "LO8" which, with regret, we have to regard as either an outright phoney or a misreading. For the moment, we have put SWL Parry's claim in the Table, but we must see the list for next time.

*M. Eccles* hails from *Lancaster*, and enters a tally of 426 prefixes; he says he has in fact got enough to go straight on to the All-Time Post-War Table, but as yet time has prevented him adding the extra list. His query on 6F8J is easily answered—this one was XEIJ operating in a contest.

In answer to *P. Baker (Pontypool, Mon.)* A7XA is indeed in Qatar, and the QSL's go to DJ9ZB. P.B. has been an SWL since 1966, and in that time has got through about thirty log-books, of which the last fifteen have been all DX! He started with a Lafayette HE-30, which gave up the ghost a couple of years ago and was replaced by a KW-202, coupled through an ATU to 85 feet of wire. His location sounds to be a good one, 1200 feet above sea level with a clear take-off in all directions.

*E. Parker (Hove)* found time to book in the odd one or two prefixes; he has doubts about "PIIROS," but this could likely be OK, as some Dutch stations with connections with the Services are given calls in the PI series.

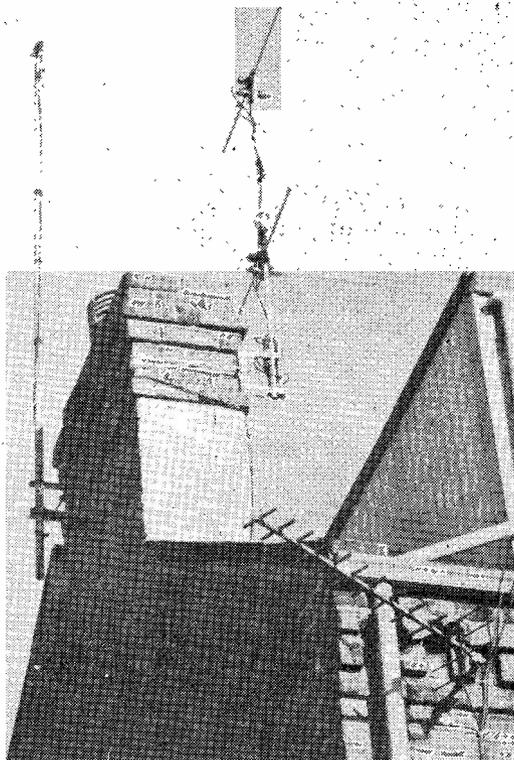
A little problem arises in dealing with the list from *Mrs. J. B. Jane (Looe)* in that her last entry claimed 604—at least, that's what our card-index says—but her total this time gives the previous score as 574. So—we're blown if we know to which starting number we have to add Mrs. Jane's current claim of 69 more prefixes.

However, OM *P. C. Jane (E. Looe)* continues to forge ahead with 89 new ones to add to his collection, from which claim we have to dock one for a definitely odd "VLINP."

*H. A. Londesborough (Swanland, Yorks.)* has been turning up new prefixes on Two, using as collector an old 405-line TV aerial. Results were so promising that a four-element Quad for the band is now being put together, but SWL Londesborough bewails the lack of CW on Two; a complaint with which we cannot but agree. On a different line of thought, he wonders about VEØNEA, which he knows to be on H.M.C.S. *Yukon*, but which does not sign /MM. A look at the *Call Book* suggests that most of the VEØ stations are on ships, and possibly the VEØ callsign absolves them from the need to sign /MM.

On to *J. Bell (Hampstead)* who notes how, after listening for years for a particular country, hearing it is immediately followed by hearing lots more of the same—sort of "breaking the barrier" effect which many of us have noticed and which is yet another manifestation of Murphy's Law. However, John seems to have slipped up with one of his loggings—his "UA5" must be a misreading for "UK5" which prefix covers the Klub stations in UB5-land.

*R. Shilvock* has now moved from Lye to *Kingswin-*



Aerial system at the SWL station of Chris Cooper, 11 Cyprus Terrace, Garforth, Leeds, the mast supporting a trapped inverted-Vee, the crossed dipoles (J-Beam "Turnstile") being for two metres. Chris is a professional photographer and you see many of his pictures in "Short Wave Magazine."

ford where he has a 66-foot dipole, an FR-DX500 receiver and a KW E-Zee match between them, with an eight-element Yagi at thirty feet for 144 MHz reception.

\* \* \*

Next we come to the Old Maestro himself—*S. Foster (Lincoln)* who finds that gardening and such-like chores inescapable from married life have rather reduced his listening time—nonetheless, Stew bumped up his score from 1345 to 1377. He has an 18AVQ aerial now, cut for 3.8 MHz which is certainly helping along with the Eighty-metre DX.

Another 1000-plus correspondent is *J. Fitzgerald (Gt. Missenden)* who also found a sizeable number of the odd prefixes to be garnered; John's Morse classes have had to be abandoned, so more time is being spent in compensation at the CW ends of the bands. However, John reckons that the price of building or buying a rig is the great deterrent to regular CW operating, which sounds a bit odd to your old conductor—J. C. would reckon that, using the existing receiver as a basis for the station, it should be possible to fix up about 25 watts of DX-worthy CW on one band to choice

for almost pence, given a bit of scrounging around for a reasonable power transformer and choke. An 807 will do for the PA, and maybe an EF91 for the VFO; some bits of *Tufnol* for the coil formers, and a handful of resistors and capacitors, and there you are! Such a rig at the CW end of, say, Forty, with a Q-Multiplier added to the 9R-59 receiver, will give something very much like the good DX station rig of a few years ago, still capable of satisfying DX results today.

One who took the R.A.E. in May was *S. Eldridge (Crawley)*, who had company in the shape of 11 others from the local area. He feels tolerably happy about Part II of the paper but less so about Part 1, particularly Question 2, on the subject of low-pass filters and things. However, as he says, even if he "comes unstuck" he will have learned a mighty lot about radio in the process.

*R. H. McVey (Weston-super-Mare)* has been using time otherwise wasted when the bands are not producing anything of interest by writing out QSL cards; this so far resulted in 25 countries confirmed and four continents.

Once again our reporter from New Zealand, *M. Smith (Matamata)* comes into the picture, this time with some enlightening comparisons with the price of gear in U.K. and New Zealand—for instance, a Trio 9R59DS, at about £54 in Britain, costs the equivalent of £150 sterling over there. On the question of prefixes, FY7AM is in French Guiana, while A4XFF is in the Sultanate of Oman.

At this time of year the letter from *N. Henbrey (Northiam)* is usually pretty brief. However, this time he relates how he had the misfortune to find himself, and his car, in a ditch in a country lane. While Norman and the garage types were struggling to get the car back on the road again, a passer-by in another car stopped, helped with the task, and enquired whether Norman had used /M gear to call for help! It turned out that the rescuer came from Eastbourne, and was a candidate for the recent R.A.E. Whoever he was, he was a good example of what we used to know as the Spirit of Amateur Radio—a spirit sadly lacking in contemporary life generally. Norman, and your scribe, will burn some joss-sticks for his R.A.E. success.

Earlier in this piece we mentioned *A. Gullis*; now we come to brother *G. F. Gullis (Ogbourne St. George)*. They share a PCR-3, mainly used by *A. Gullis*, and an FR-50B; their 150-foot aerial recently fell down, so they tried the novel solution of chopping it into two seventy-footers and using one each! In addition there is a Quad for 21 MHz, at a height of twenty feet—as *G. F. G.* says, it would be nice to have it a bit higher, but it's not all that elegant an object for the neighbours to look at!

*R. A. Smye (Shrewsbury School)* writes to offer a *nil* report and to explain his long absence by saying that everything has simply gone by the board in favour of R.A.E. study—he reckons the May paper wasn't as bad as it looked at a first sighting!

In reply to *W. McFaul (Londonderry)* A6XG is in the United Arab Emirates, as shown in the latest edition of our *Prefix List*. Reader McFaul was misled by the fact that his prefix list was of an earlier issue, before the callsign allocation batches began to take on this weird form—no wonder he thought maybe he had snagged a

## HPX LADDER

(All-Time Post War)

SWL	PREFIXES	SWL	PREFIXES
PHONE ONLY		PHONE ONLY	
W. Bingham		H. Londesborough	
(Carrickfergus)	1521	(Swanland)	709
R. Shilvoek (Kingswinford)	1432	C. K. Verstage	
T. Rootsey (Ilford)	1405	(Old Basing)	709
S. Foster (Lincoln)	1377	S. Eldridge (Crawley)	694
K. Kyezor (Perivale)	1268	L. Thomas (Castleford)	674
J. Fitzgerald		K. A. Whiteley (Castleford)	671
(Gt. Missenden)	1194	F. Barker (Sunderland)	650
A. W. Nielson (Glasgow)	1139	Mrs. J. B. Jane (East Looe)	643
R. Carter (Blackburn)	1129	B. Cushing (Hove)	632
L. A. S. Poole		L. Craven (Alvechurch)	621
(London N.21)	1090	C. L. Lee (Ilford)	610
H. Alford		J. R. Cowan (Rochford)	591
(Burnham-on-Sea)	1049	G. Lucas (Kennoway)	585
M. J. Quinton		M. Kitchener (Hitchin)	533
(Wotton-under-Edge)	1035	D. Sharred (Birmingham)	530
B. Hughes (Worcester)	1003	R. Smye (Shrewsbury)	526
J. H. Sparkes (Trowbridge)	948	M. Smith (Matamata)	512
G. W. Raven		A. Buckman	
(London, S.E.13)	921	(Jamaica, N.Y., U.S.A.)	510
P. C. Jane (E. Looe)	895	CW ONLY	
C. Henderson (Beckenham)	873	A. Glass (Plymouth)	1019
A. West (Herne Hill)	870	T. Rootsey (Ilford)	723
N. Henbrey (Northiam)	857	G. Proud (Letterston)	693
N. Askew (Coventry)	855	W. B. Taunton (Meopham)	656
R. H. McVey		C. Henderson (Beckenham)	617
(Weston-super-Mare)	838	H. A. Londesborough	
A. R. Holland (Malvern)	818	(Swanland)	553
H. M. Graham (Harefield)	808	G. Richards (Aberdeen)	319
M. Cuckoo (Herne Bay)	798	A. F. Roberts	
W. B. Taunton (Meopham)	796	(Kidderminster)	301
E. W. Robinson		A. W. McNeill (Newbury)	299
(Bury St. Edmunds)	784	W. Hutchinson	
J. Gravell (Burry Port)	775	(Hornchurch)	276
E. Parker (Hove)	771	S. Sharred (Birmingham)	263
B. Thomas (Pontefract)	758	S. J. Proud (Letterston)	201

Starting score, 500 for Phone, 200 for CW. Listings include only recent claims. Rules for HPX—see p.43, March issue.

pirate.

For a seasoned old campaigner like *H. Alford (Burnham-on-Sea)* to find nothing much of interest does indeed show how flat, relative to the conditions of some years ago, things have become. And the ears haven't "gone off" either, as two of the four prefixes claimed this time were ZL and VK *mobiles*, both heard on Twenty on the morning of May 14.

*C. L. Lee (Ilford)* continues on his merry way with his Drake receiver, and seems to have looked at all the bands from 160 to Ten, with very different degrees of success—14 and 3.5 MHz were best and the others more or less nowhere, in terms of useful prefixes to add to the score, although not lacking in interest, of course.

### Conclusion

Which brings us to the deadline for this feature next time out: July 26 it is, to arrive by first post, addressed, as ever, to "SWL," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. Till then good hunting.

Publications for the SWL, obtainable from us, are: *Sun, Earth and Radio* (92p); the *DX Zone Map*, with the complete *Prefix List* (£1.20); and *Guide to Amateur Radio* (90p). Prices quoted are post free, obtainable from stock, of our Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H 0HF.

## THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for August issue: July 4)

ONE often wonders whether the difference between the Club of large membership and the small group in a similar-sized town is not mainly a matter of local publicity. Some groups confine their publicity to writing to this piece, others don't even do that; others again take part in local events such as carnivals, Town Shows, and so on. To get a mention in the local paper is a good thing, provided you make sure the edited version makes sense; and a picture to go with the paragraph is even better. Then there is the notice board at the local public library entrance. Perhaps, too, the local electronics-trade shops would be prepared to carry a publicity poster in their windows—every little extra helps. And of course, having got your potential member to make the effort and attend, you must be sure to welcome him; get his name, let the chairman formally welcome him, and make him stand up a moment so everyone can associate a name and a face. Then make sure he is spoken to by various people for the next couple of times he attends, until it seems fairly sure he has made a niche—that way you won't lose your hard-won new man after the first visit!

### Southerly Parts

U.K. FM Group are at the top of this clip; we have their Hq. as being the Scout Hall, Southall, Middx., but understand an announcement is due regarding a change of venue. This being the case it is strongly suggested you get in touch with G4AOG (as Panel) if you intend paying a visit. As for the date, it will be July 9, details to be arranged, and July 28 for a Treasure Hunt and outdoor social meet.

At Bishops Stortford they are ever ready for punishment; on July 15, at the British Legion club, Windhill they have to listen to colleague G3KFE talking about Modern Receiving Techniques. As for August 19, at the same venue, it is to be, as tradition dictates, the annual natter session.

South of the Thames now, to Sutton and Cheam where they have their Hq. at the Library, Cheam. Here they can be found on July 16, listening to G3LCH discussing the process of "Getting Going on Four" with particular reference to his own activities.

Surrey send in their *Newsletter*, from which we gather the Hq. to be at the Ship Inn, High Street, Croydon. However, we do not have a date for the July meeting, or any indication of the subject, at this moment, so we suggest a call to the Secretary—see Panel—should you propose attending this group.

July 11 is the date for the North Kent crowd, to hear Mr. White of Greenwich Cable Vision, giving a talk on this interesting project, illustrated with slides. Meeting dates each month are the second and fourth Thursdays, at the United Reformed Churches Hall, Bexleyheath Clock Tower.

A familiar signature reappears after a long break at the foot of the Maidenhead letter; G3FVC is back in the Secretarial post. Nowadays they get together at the Red Cross Hall, The Crescent, Maidenhead, on the first Thursday and the third Tuesday in each month; this gives July 6, for a talk on the Working and Technical Development of the Independent Broadcasting Authority, and on the 14th there is the Club Picnic. Two evenings later, on July 16, there is a Junk Sale.

For Cray Valley, it seems from the *Newsletter* that the date to be reserved is the first Thursday in each month, at the United Reformed Church Hall, 1 Court Road, London S.E.9. However, we do not at the moment have any news as to what entertainment is laid on.

Now to Acton Brentford & Chiswick where this group have their place at the Chiswick Trades and Social Club, 66 High Road, Chiswick, the date being July 16, when they will have a debate on the "Current Changes in the Amateur Radio World."

Although the Crystal Palace newsletter says that July 20 is to be an informal evening, it is also indicated that something may yet be fixed up; this one is at Emmanuel Church Hall, Barry Road, London, S.E.22, the kick-off being at 8.0 p.m.

For Stevenage, "home" is the canteen of Hawker Siddeley Dynamics, Gunnels Wood Road, Stevenage, where they have two Thursday evening dates each month—details can be obtained from G4BGP—see Panel overleaf.

At Barking July will be specially busy, as they have the special-activity station GB2DTS running at Dagenham Town Show over the weekend July 13-14 at Central Park, Dagenham. This is in addition to their normal goings-on at Westbury Recreation Centre, Westbury School, Ripple Road.

Basingstoke write in to report their continued activity, with Club projects of one sort and another. They also will be operating /P in connection with the Cheshire Home, Le Court, near Liss, on July 21, when they hope to work other Cheshire Homes stations. Then looking further ahead, we see that in September they hope to have a station on the air at the Basingstoke Show. All the details from the hon. Secretary, as Panel.

Special activities also appear on the Southgate calendar for July, including SSB Field Day and the Finchley Carnival on the following Thursday and Friday. However, in all the excitement over these, the *Newsletter* compiler has completely forgotten to give the dates and venue for the normal monthly get-together—so, once again—see Panel.

A change of home for the Bedford crowd. After some years at the Dolphin in Broadway, they are now moving two doors away to the Units Services Club, where they will be assembling every Thursday evening. July 4 sees them in the new shack with G3WTP; on the

The Wakefield Radio Society, formed about 11 years ago, meets at the Youth Centre, Ings Road. Members' interests cover a wide range, from LF/HF to the VHF bands. The Club owns an FT-200, with a long-wire aerial, and also a Pye Ranger for two metres, with different types of antennae. All but two of the members in this group hold call-signs.



11th, there will be a talk about an el-bug, and the rest of the time will be occupied with SSB Field Day plans. July 18 is a shack night with a difference in the visit of the RSGB Regional Representative. On Sunday, July 21 there is an outing to the Science Museum and GB2SM, while on the 25th the subject will be Microwaves. Quite an interesting programme.

The *Chiltern Newsletter* carries an obituary notice for Ernest Turner, G4NT, their president, who died recently after a long illness which had confined him to a wheelchair for the last five years. From where we sit, the regular meetings would seem to be on the second Tuesday and the fourth Wednesday in every month, at the canteen of the Ernest Turner works, High Wycombe.

The Wolverton Youth club is home for the Milton Keynes lads, who will be gathered there on July 8, with minds all ready to boggle at the topic—"Interstellar Communication." Then there is the Club DX-pedition, to Northumberland, July 20-27, when they will be behind the call G4AFN/P.

On Friday evenings the local amateurs and SWL's in the Harrow area head for Harrow Sea Scouts Hq., Woodlands Road. July 5 is down for Morse Practice and a Trouble-shooters Corner; July 12 has David Pedley on Microwave Equipment; the 19th sees Morse Practice again and operating the Club station; and July 26 is for a talk, which has yet to be finalised.

There seems to have been an AGM at West Kent as we are advised of a new secretary and that the details of the programme are in the process of being sorted out. This being the case, we have to advise you to get in touch with G4CCQ (as Panel) for all the details.

The Grafton term finished officially at the end of June, and they are now in recess until the beginning of the Autumn term on September 27; however, it is possible that the group may have Fridays after the official close of term, this having been the custom in the past. This being so the Constructors' Contest will be held on July 5.

It's quite a while since last we heard from the Southampton group; however, they now tell us they have a station planned for the Southampton Show, July 12-13-14, on Southampton Common, with talk-in on Four and Two for an event which is promised to be of interest to the whole family.

Reigate despite their name of "Amateur Transmitting Society" assure us they welcome new members whether licensed or SWL; try July 2 at the Marquis of Granby, Hooley Lane, Redhill, for the informal, or July 16 at St. Mark's Church Hall, Alma Road, Reigate, on which evening Burns Electronics will take the stand.

On to Mid-Sussex who meet at Marle Place Further Education Centre, Leylands Road, Burgess Hill, for their normal indoor activities. July 4 is "to be arranged" and July 18 is an informal when the members will turn the Club beam in the direction of Portugal and try to work their president, G5RV. It should be noted that in August, Marle Place is closed and so the meetings will be formal at members' homes.

The second Monday and the last Thursday each month are held sacred to Club meetings by the folk who are members of Echelford. On these evenings they all head for St. Martins Court, Kingston Crescent, Ashford. Owing to a lack, momentarily, of a social secretary, we cannot tell you what is programmed for either of the July dates.

An interesting evening is in prospect for Verulam on July 17; they are entertaining Mr. Dickson of the Ordnance Survey, who will tell them all about the workings of that organisation. The Market Hall, as usual, 7.30 for 8.00. In addition, the lads have informal sessions still at Salisbury Hall, London Colney, one of which crops up on the first Wednesday in the month.

That energetic and enterprising Dunstable Downs Club—now running a 23-cm. beacon signing GB3DD from a good site up on the Downs, which they built and installed on their own initiative—note a change of secretary and a weekly programme for July (on the 5th, 12th, 19th and 26th) meeting at Chews House, 77 High Street South, Dunstable, on these Fridays at 8.0 p.m. G8BPK gives up the secretarial chore after a long period of successful service.

The Havering & District Amateur Radio Club report on their successful foray into Rutland, March 30-31, to mark the demise of that ancient little county under the Govt. reorganisation scheme. Signing GB2RUT, some 370 stations in 40 counties were worked on the HF bands, with G3TPI, G3WRO and G4CAF as regular operators. They also had GB3RUT going on the VHF bands, again with excellent results, much appreciated by many operators given their first, last and only possible contact with Rutland.

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

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London, W3-8LB.  
 A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2, 1EZ.  
 BARKING: R. E. Clark, G8BXC, 62 Waltham Road, Woodford Bridge, Woodford Green, Essex, IG8-8DN.  
 BASINGSTOKE: P. J. Sterry, G3CBU, Ashley, Orchard Road, Basingstoke, Hants.  
 B.A.T.C.: J. J. Rose, G6STO/T, Pinchbeck Farmhouse, Mill Lane, Sturton-by-Stow, Lincs. (Stow 356).  
 BEDFORD: G. E. Parker, 12 Dawlish Drive, Bedford, MK40-3BB.  
 BISHOPS STORTFORD: C. Harlow, G8BTK, Thorn Cottage, Old Mead Lane, Henham, Elsenham, Bishops Stortford.  
 BURY & ROSSENDALE: C. Kirby, G8HQW, 2 St. Peters Place, Haslingden, Rossendale (4915), Lancs.  
 CHELTENHAM (Group): G. D. Lively, G3KIL, 131 Mandaring Way, Wymans Brook, Cheltenham (34785), Glos.  
 CHILTERN: F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks. (Penn 4240).  
 CORNISH: H. Webster, G3XTF, Crandale, Gillyfields, Redruth (6905), Cornwall.  
 CRAY VALLEY: P. F. Vella, G3WVP, 78 Hurst Road, Sidcup, Kent.  
 CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, SE23-3BN. (01-699 6940.)  
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 HAVERING: M. E. Oliver, G8ISH, 159 Clockhouse Lane, Romford (44515), Essex.  
 HEREFORD: S. Jesson, G4CNY, 181 Kings Acre Road, Hereford (3237).  
 MAIDENHEAD: E. C. Palmer, G3FVC, 37 Headington Road, Maidenhead (20107), Berks., SL6-5LA.

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 SOUTHAMPTON: A. Partner, G3HKT, Tekhi, Hound Road, Netley Abbey, Southampton.  
 SOUTH BIRMINGHAM: R. J. Thompson, G8GDZ, 23 Fox Hill, Selly Oak, Birmingham 29. (021-472 0533).  
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 WIRRAL: F. Smith, G3YGL, 72 Church Road, Bebington.  
 WOLVERHAMPTON: J. P. H. Burden, G3UBX, 28 Coalway Road, Wolverhampton, WV3-7LX.  
 YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

### Specials

Grouped under this head are the clubs whose objectives make them cover the whole country, or even more.

**B.A.T.C.** is that for the amateur television addicts, whether quick or slow-scan variety. They have various useful supplies for the amateur TV station, and their *CQ-TV Magazine* is firm proof that constructional work in the amateur field is far from dead.

The latest issue of *Mobile News*, the A.R.M.S. journal, is full of interest for the /M fraternity, as regards both news-items and technicalities. The Society has been kept going now for 15 years and a great deal of work is put into it by Norman Fitch, G3FPK, the hon. secretary, and other honorary helpers.

### Midlands

Straight away we find ourselves with a problem, as the hon. secretary at Derby says that city is in the Midlands and not to be confused with the "black-pudden' wallahs" of the North! If this be accepted the Midlands clip becomes proportionately fatter. The only way out is for more Northerners to report in! Wednesdays are their evenings, at 119 Green Lane, Derby. A Surplus Sale takes up July 3, and on July 10, G2CVV will answer your licensing queries. On 17th there is a D/F Practice Night, starting from outside the clubroom at 19.30 sharp; July 24 sees them back inside for a Film Show, while on July 31 they have an intriguing Surprise Night.

Mid-Warwickshire recently ran a successful Open Evening to which the public were invited, at their Hq. at 28 Hamilton Place, Leamington Spa. There they have meetings every Monday evening, the facilities available including the lecture room, library, workshop and radio shack.

At South Birmingham a Film Show is organised for July 3, at Hampstead House, Fairfax Road, West Heath.

Still around Birmingham we have Solihull, on July 16, at the Manor House, High Street, for G3YZW to give a talk on Colour Television.

Tuesdays it is for Bury and Rossendale, at Mosses Community Centre, Cecil Street, Bury, the second one in each month being set aside for a formal session with speaker; however, we can't tell you what happens in July, as the publicity chap wrote a two-page letter and only posted one—the half which discussed past doings.

Wirral look forward to July 3 and July 17, at the Sports Centre, Grange Road West, Birkenhead. The first date should be of much interest as it is a discussion, led by G2AMV, on "Operating." A subject indeed where opinions can vary enormously, depending on the individual operator's scene within Amateur Radio.

For South Manchester we always have a lot to cram into one paragraph. Fridays are at Sale Moor Community Centre, and Mondays at the Club shack where the VHF types foregather, at Greeba, Shady Lane, Manchester 23. On the Friday evenings we see the following items: July 5, a talk by G3MBQ on RAEN; on July 12 a Night on the air; July 19 a talk on DC-to-AC inverters for domestic use; and on July 26 the gang will meet at the special-event station they are running at the Manchester Show, Platt Fields.

The Royal Crescent, Clarence Street is the imposing name of the Cheltenham Hq. They will be there on July 4 to listen to a talk by Dick Sutton on Colour TV servicing.

*Wolverhampton Newsletter* is unmistakable, with its distinctive front cover. On the back of this we note July 1, down for a visit to Sutton Coldfield TV station; July 8, a visit to Wolverhampton's Hq. by members of the Sutton Coldfield group; July 15 a "VHF Converter Evening" at which you can bring your pet device and have its performance evaluated, provided it uses Belling-Lee coaxial connectors for the RF in and out; July 22 is the committee meeting; while July 29 is a Natter Night. All of these are at Headquarters, Neachells Cottage, Stockwell End, Wolverhampton WV9-9PH.

### Further North

July 5, at the Teachers Centre, Knight Street, will be the place to look for Spalding members—hopefully, all 138 of them. The lecture will be by G3YFS, on Direction-Finding.

East Lancs. seemed to be a borderline case between Midlands and North, so it ended up in the present list on the toss of a coin. They are to be found at the YMCA, Shearbank Road, Blackburn, on July 4, for a talk on the conversion of Pye gear to the amateur bands.

No doubt, though, about Harrogate and Knaresborough who have recently, as a result of the change of local authority from West Riding to North Yorkshire, found it necessary to move their Hq. from Knaresborough to Christchurch Further Education Centre, Murch Square, in Harrogate, where they now get together every Monday except Bank Holidays. For all the details on the activities, contact G8HDR—see Panel.

Star is the name of the group who meet at the New Inn Hotel,

Bramley Town Street, Bramley, Leeds 13, every Wednesday evening. On July 10, they have an exhibition of home-built gear, which we understand will be judged; on other evenings they have a station going on HF and VHF, Morse tuition, and an SWL set-up.

They certainly get their visitors from faraway places at York—some time ago there was a UA type, and now they report a visit from W6 at one of their regular Thursday-evening sessions at the British Legion, 61 Micklegate. One of their recent meetings was addressed by G3XFM on Model Engineering—a subject not so far removed from Amateur Radio as one would think, especially in the upper UHF and microwave regions.

Like many others, Nottingham run no formalised activity during August, owing to the number of folk away on holidays; however for July the picture is different. July 4 sees another of their "Forum" sessions, and on July 11 G3XPM/W1 will be giving a talk on Amateur Radio in U.S.A. July 18 is an Activities Night, and the 25th a Multiple Activities session. As always the Hq. is in Sherwood Community Association, Woodthorpe House, Mansfield Road, Nottingham.

### West Country

A thin clip this month, for some reason—perhaps they are all relaxing on their beaches!

Torbay give no programme details. being content to mention that six members tried the R.A.E. this time, that another member has been granted a G8 call, and that, after years of service, G3LHJ has stepped down from the chair to become vice-chairman for a spell, being succeeded by G3VTQ. Their club Hq. is in Bath Lane, 94 Belgrave Road, Torquay.

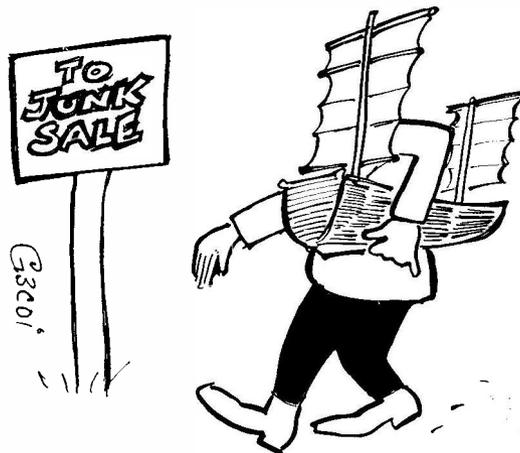
Cornish main meetings are at the SWEB Clubroom, Pool, Camborne, on the first Thursday in the month; they usually have two talks arranged. In addition there are the West Cornwall Group, based on the Guildhall, Penzance, and a VHF group. Details on all these various goings-on can be obtained by getting in touch with G3XTF—see Panel.

Over at Hereford, they look forward to having the exclusive use of their Club-room once more—at present it serves also as the traffic wardens' office! Having been beaten in an away skittles match with the Worcester Club, they propose that the next challenge should be darts. Of a membership of 50, average attendance at meetings is but fifteen (perhaps because of the aforementioned traffic warden occupancy?). The "forthcoming events" panel in the current *Newsletter* does not list the July activities—so ask the hon. secretary, G4CNY, about what is going on.

### Sign-Off

That completes the clip for this month. For next month send in your *August* programme details, to arrive by first post July 4, addressed as always to "Club Secretary," *SHORT WAVE MAGAZINE*, BUCKINGHAM, MK18-1RQ.

The reason for the new setting style you see here is simple enough—it is to save space without impairing readability. This will enable us to get more in under the "Clubs" heading and also make room for more illustration for this feature than previously we could use.—EDITOR.



# NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. callsigns, as issued or changes of address of transmitters already licensed. All addresses published here 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.

**GW3KLU**, E. Eaton, Newstead, Northop Road, Flint (2601), Clwyd, CH6 5QC. (*Re-issue*).

**G4CEZ**, W. Kitchen, 12 Clonard Way, Pinner, Middlesex, HA5 4BU.

**G4CVE**, J. T. Halford (*ex-G8HSA*), 1 Little Lane, Great Houghton, Northampton. (0604 61887.)

**G4CYN**, R. S. Bell, Gosmere Cottage, Selling, Faversham, Kent, ME13 9QW.

**G4CZE**, A. Mercer, 42 Malvern Crescent, Spring View, Nr. Wigan, Lancs., WN3 4QA.

**G4CZN**, G. H. Tomkins (*ex-G8CZN*), 4 Fortune Green, Alington, Norwich, Norfolk, NOR 40W.

**G14DAH**, G. Heaney, 49 Greystown Avenue, Belfast (615199), BT9 6UG.

**G14DAV**, D. A. Hart, Brookholme, 85 Station Road, Green Island, Carrickfergus, Co. Antrim, BT38 8UP.

**G4DAW**, P. A. Gibson-Daw (*ex-G8GSZ*), Parkside, 479 Wellingborough Road, Northampton, NN3 3HN.

**G4DBD**, A. M. Borland, 69 Packenham Road, Basingstoke (3446), Hants., RG21 1YB.

**G4DBK**, H. Shaw (*ex-G8BZF*), 80 Whitefield Road, Penwortham, Preston, Lancs., PR1 0QQ.

**G4DBS**, B. K. Middleton (*ex-G8CRI*), 11 Chiltern Road, Brant Road, Lincoln, LN5 8SB.

**G4DCB**, P. Mortimer, 13A Elder Avenue, Wickford, Essex.

**G4DCF**, N. W. Booth (*ex-G8HRX*), 7 Hall Royd Walk, Silkstone Common, Nr. Barnsley, Yorkshire, S75 4QA.

**G4DCK**, M. R. Holliday, 16 Styleman Way, Snettisham, Kings Lynn, Norfolk, PE31 7NT.

**G4DCX**, E. F. Trickey, 53 Hollyguest Road, Hanham, Bristol (671409), BS15 3RN.

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**GW8HVP**, T. J. S. Hugill, Rathmore, 8 Castle View, Haverford-

west (0437-2728), Pembs., West Wales, SA61 2JA.

**G8IBD**, D. W. Luing, 8 Gosden Hill Road, Burpham, Guildford, Surrey, GU4 7JE.

**G8ILS**, A. C. Lock, 70 Vicars Hill Gardens, Worsley, Lancs. (061-790 5427.)

**GM8INY**, R. M. Grant, 31 Stormont Park, Scone (52477), Perth, PH2 6SD.

**G8IPG**, A. Shaw, 46 Orion Crescent, Leeds (708951), LS10 3JQ.

**G8ISF**, K. H. Wright, 6 Limerick Road, Chaddesden, Derby, DE2 6TP.

**G8ISI**, F. V. Breame, Ellacombe, 68 Church Road, Bramshott, Liphook (0428-723168), Hants., GU30 7SH.

**G8ITK**, C. Boulter, 20 Red Lion Street, Chesham (3296), Bucks., HP5 1EZ.

**G8ITT**, J. R. Courtney, Wilton, Grove Road, Beacon Hill, Hindhead, Surrey.

## CHANGE OF ADDRESS

**G2CVY**, W. H. J. Yeo, Ebberley House, Newport, Barnstaple (3355), Devon, EX32 9BW.

**G3ASC**, E. D. Power, Turnberry, 6 Llanforda Rise, Oswestry (2500), Salop, SY11 1SY.

**GM3CFS**, J. M. Robson, Freswick Cottage, Dunbeath, Caithness, Scotland.

**G3FGD**, W. J. Mordue (*VK6JM*), British Embassy, Tokyo, c/o Foreign & Commonwealth Office, London, S.W.1.

**G3FXB**, A. J. Slater, Wychwood, Park Lane, Maplehurst, Nr. Horsham, Sussex. (*Lower Beeding* 342.)

**G13HNM**, C. E. Davies, 11 Society Street, Coleraine, Co. Derry, Northern Ireland.

**G3IVF**, H. E. Smith, Greenacres, Kirk Langley, Derby, DE6 4NN.

**G3LDU**, R. Ballantyne (*ex-GM3LDU*), 29 Westbourne Court, Orsett Terrace, London, W.2.

**G3MHV**, T. G. Langdon (*G3MHV/W6*), 129 South Swall Drive, Beverly Hills, California 90211.

**G3OLB**, T. Boucher, Tamarisk, Forest Road, Whitehill, Nr. Bordon, Hants.

**G3OOZ**, C. F. Simpson, 18 Miskbourne Avenue, Hicks Farm, High Wycombe, Bucks.

**G3SAH**, R. J. Matthews, C.Eng., 354 Birchfield Road, Redditch (69250), Worcs., B97 4NQ.

**G3TKO**, E. E. Snow, 118 The Ridgeway, Harrow, Middlesex, HA2 7QB.

**G3UAO**, A. L. Gilham (*ex-ZC4UA/VS9UA*), 11 Kingfisher Close, Birchwood, Lincoln, LN6 0JW.

**G3UNL**, R. H. Lawrence, St. Michaels, 17 Hazel Close, Chandlersford, Eastleigh, Hants., SO5 1RF.

**G3WFO**, G. W. Stacey, 5 Oak Road, Wath-Upon-Dearne, Nr. Rotherham, Yorkshire, S63 7AR.

**G3XED**, C. Masters, 79 Kings Head Lane, Bishopsworth, Nr. Bristol, BS13 7DB.

**G3ZIV**, K. J. Nolan, West End Cottage, Woodhall, South Duffield, Selby, Yorkshire, YO8 7JG.

**G4ADF**, P. D. Harrison, 1 Cherry Tree Walk, Petworth, Sussex.

**G4APF**, M. Richards, 82 Oldtown Street, Dawlish, Devon, EX7 9AT.

**G4BCP**, L. Graves (*ex-VP8KO*), 106 Weardale Avenue, Forest Hall, Newcastle-upon-Tyne (0632-667569), Northumberland.

**G4BFV**, D. A. Sinclair, Hawthorn Den, Wendover Road, Weston Turville, Aylesbury, Bucks.

**G4CME**, M. A. Deacon, 313 Forest Road, Loughborough, Leics.

**G5BDE**, G. A. Cottrell, Kingsholme, 74 Church Lane, Gorleston-on-Sea, Great Yarmouth, Norfolk.

**G5DS**, J. L. Danks, 57 Queens Drive, Surbiton (390-1566), Surrey.

**G8CKY**, M. W. Cartwright, Sea Cue, 8 Adelaide Avenue, West Bromwich, Staffs., B70 0SL.

## AMENDMENT

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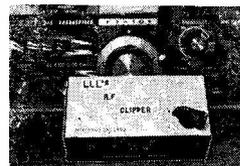
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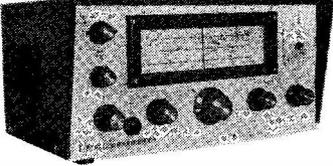
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**WANTED:** Manual, circuit diagram and information for Mullard E.805 oscilloscope and Avo valve tester (two-unit type). (Devon).—Box No. 5228, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

**TRANSCEIVER WANTED:** Heathkit HW-101, HW-100, HW-12A, Yaesu FT-101, Trio TS-515, or similar. Must be in mint condition and with power supply.—Beekar, G3WY, 5 Sandown Road, Evesham (45497), Worcs.

**FOR SALE:** Swan 270B transceiver, 300 watts SSB, coverage 10-80m., £150. Heath Pawnee 2m. transceiver, with VFO Tx and Rx, £50. Heath Two'er two-metre transceiver, £12; phone patch. £3; inverter, 12v. DC to 115v. AC, £15. Turner 33D mic., £15; Transformers, 1000-watt, 220v. AC to 110v. AC. Miscellaneous parts, speakers, RG.58U wire, TVI filters and xtals.—Kolstad, G5BFT. (Tel: High Wycombe 22571).

**WANTED:** HRO tuning dial and gearbox. Details and price please.—Corder, 88 Angel Street, Hadleigh, Ipswich IP7 5EY.

**OFFERING:** Drake C-Line R-4C and TX-4C, fitted noise blanker, with 160m. xtals, AC power supply and speaker and manuals, delivery-test use only, genuine reason for sale. Offers? Katsumi MC-701 speech compressor, £10. Hamgear PM-11BX preselector, £8. Asahi AS-104W 10-metre beam, new and boxed, £25. Available soon: BXI 50-ft. tilt-over tower with ground post. Offers? (Worcs.)—Box No. 5331, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

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**WANTED:** Drake TC-2 and SC-2 transverter combination. Details and price please.—Baker, G8FYI, 65 Crompton Street, Chelmsford, Essex.

**SELLING:** Lafayette KT-320 Rx, coverage 550 kHz-30 MHz, ideal for SWL. £20 or near offer.—Ring Lee Iver (Bucks.) 1194, after 6 pm.

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**SELLING:** Heathkit HW-12A with microphone and HP-13B mobile power pack, £75 the lot.—Hathaway, G3JHI, Officers Mess, High Wycombe, Bucks. (Tel: High Wycombe 2600, extn. 2565, daytime).

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**SALE: Murphy 821 Hi-Band transmitter/receiver, complete with circuit diagram, mains and 12v. power supplies, all in good condition, £20.—Warren, 43 Rodney Court, Anson Drive, Sholing, Southampton, Hants.**

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**SELLING: JR-310 with Top Band, filter and calibrator, mint, £65. Sony TR-8460, aircraft band, mint, £25.—Ring Butler, Leatherhead 73906, evenings.**

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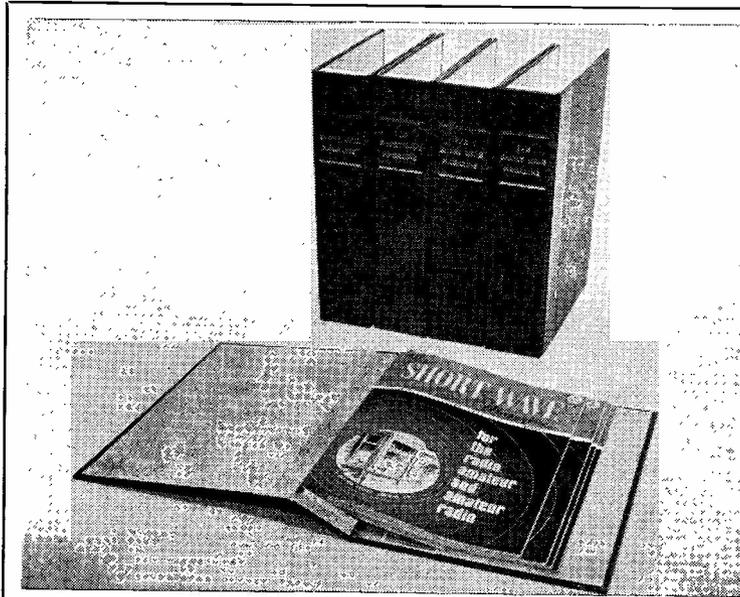
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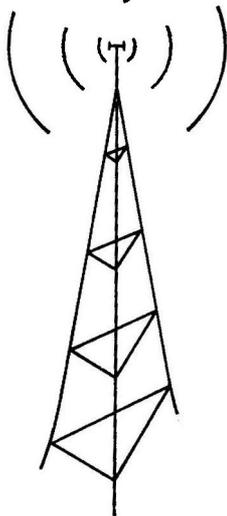
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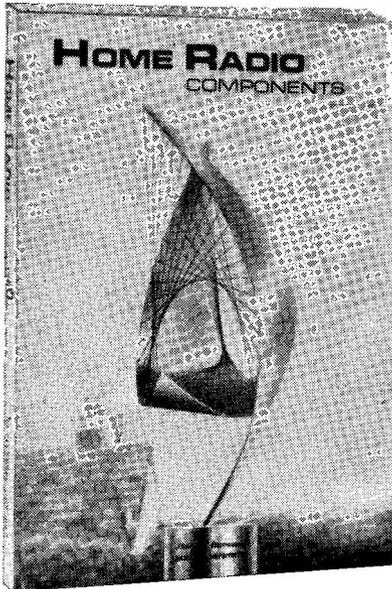
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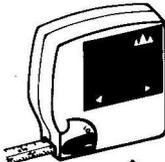
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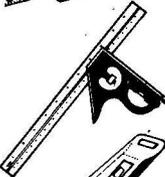
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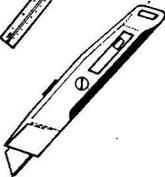
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 5 Pin Din Plugs, 270 deg., 5 for 50p.  
 Reed Relays, 12v. 400 ohm, 2 pole make, 2 for 50p.  
 Min. Switches 4 pole 2 way, rotary spindle dia. 4mm, 2 for 50p.  
 Relays, 12v. 4 pole c/o, 3a contacts, 2 for 50p.  
 Bulbs, 6-3v. 3A, capless, 20 for 50p.  
 Capacitor Clips, mixed sizes, 10 for 50p.  
 Fuses, 1 1/2in. and 20mm, mixed bag of 25 for 50p.  
 Xtal Plates, containing 2 HC6U sockets and one 1-10pf trimmer (no coils), 3 for 50p.  
 Min. 4 core Screened Cable, 10m for 50p.  
 Chrome Equip. Handles, new 2 1/2in. centres, 2 pairs for 50p.  
 Valves, min. CV types, 20 for 50p.  
 Bandpass Filters, 25-32.5 MHz RT type, 50p.  
 Pots, 10 assorted values, 50p.  
 Miniature slider switches, 2 pole, 2 way, 5 for 50p.  
 Stereo Jack Sockets, 2 for 50p.  
 Self-adhesive foam pads, 30mm x 20mm x 3mm thick, large roll, 50p.

## SPECIAL £1 PACKS

2N3055 Power transistors, new, unmarked, 5 for £1.  
 Capacitors, mostly elect., asstd., large bag, £1.  
 BY185 Rect. Sticks, 35kV at 2.5mA, ideal for scopes or SSTV monitor, £1.

## TRANSISTORS (NEW)

2N3819, 25p; AFZ11, 50p; AFZ12, 50p; OC200, 20p; BD121, 50p; AC128, 10p; NKT0032, 25p.

LEDEX SWITCH Min. 6 way with 4 wafers, 24v. coil. Brand new, 88p each.

Modern Telephones, with dial, fawn and grey, £3-00; carriage 50p.

## VALVES

QAVO3 20A (ex equipment), £2-20.

DET22 (ex equipment), £1-00.

2C39A (ex equipment), £1-10.

4CX250B (ex equipment), £2-20.

6BH6 (ex equipment), 2 for 50p.

EZ81. New, 25p.

EF80. New, 25p.

E88CC (ex equipment), 25p.

E88C (EC88 new), 2 for 50p.

Large Stocks of Valves available.

Many hard to get items.

HEAT SINKS containing 2 x 4025I and 1 x 40318. Brand new, £1-65.

Circuits of Pye Vanguard AM25B, showing TX, RX, Inverter, etc., 65p, post paid.

Circuits of Pye Cambridge AM10D, showing TX, RX, inverter, etc., 55p, post paid.

BYX25/600 STUD RECTIFIERS, 20A at 600V, on curved heatsink, 20p each or 3 for 50p. (Ideal for Linear.)

AR88D RECEIVER, 540 kHz to 32 MHz, reasonable condition, working, £35. Buyer collects.

SELF-TAP SCREW PACK, mixed sizes, 30p.

4BA HANK BUSH PACK (ideal for making aluminium cases, just drill 1/4in. hole, push in, and hammer over reverse side), 30p.

## MINIATURE UNISELECTOR BASES

(42 pin), 40p each.

REELS OF 16 STRAND COPPER WIRE, Pink PVC covered, 0.5mm, ideal for long wire antennae, 100 metres, £1-10 per reel.

TWIN HEAVY DUTY CABLE, PVC covered, 50/0-25mm, ideal for mobile LT supply leads, 15p per metre or £11 per 100 metre reel (carriage £1).

PYE CAMBRIDGE AM10D, dash mount, low-band only, medium cond., complete but untested, with circuits, £26-50, carriage 50p.

PYE CAMBRIDGE FM10D, dash mount, low-band only, medium cond., complete but untested, with circuits, £26-50, carriage 50p.

20.25 kHz XTALS, glass B7G, for 405-line SPG, new, £2-20 each.

1in. VIDEO TAPE SPOOLS, empty, 9in. dia., 80p each.

STAINLESS STEEL CASES, 7in. x 4 1/2in. x 1 1/2in., open end 4 1/2in. x 1 1/2in., ideal for portable or screening box, 55p each.

WESTMINSTER CONVERTERS (W24), 24V-DC in, 12V-DC out, for VV15, etc., £5-50 each.

HT SMOOTHING CHOKES, 4H, 0.24A-DC, brand new, 75p each.

MAINS TRANSFORMERS, 240V in, 28V at 4A + 125V at 0.5A out, ex new equip., £3-50 each.

PSU, 19in. rack mount, 190-280V preset, at 500mA stabilised, plus 6.3V at 5A twice, mains input, £5, carriage £1-50.

MAINS ISOLATING TRANSFORMER, 375VA, tapped primary, 240V output, new, £5-50, carriage 50p.

MAINS ISOLATING TRANSFORMER (ex equip.), in metal cases, totally enclosed, tapped mains input, 110-240V etc., output 240V at 3A + 12V at 0.5A, £11, carriage £1.

AS ABOVE, output 240V at 12A + 12V at 3A + 22V at 2.5A, £27-50, carriage £2.

RADIO SPARES 500 - WATT AUTO TRANSFORMER, 100/110/150/200/220/240/250V tapped input and output, step up or step down facility, ex new equip., £5-50, carriage 50p.

SILICON RECT. BLOCKS, bridge type, 50V at 6A, £1 each, 100V at 10A, £1-50 each.

## MAINS TRANSFORMERS

Ex PYE F27 Base Station Tx., 500v. at 350mA, 6-3v. at 8A, £5-50. 40v. at 2A, 80p each.

18v. at 8A, £4 each, carriage 50p.

16v. at 6A, £3-50, carriage 50p.

20-0-20v. at 1.5A, 60p each, 2 for £1.

13-0-13v. at 100mA, 40p each, 3 for £1.

Mike inserts, Pye type 4103F, new, 50p each.

Hash filter, (for use in mobile supply leads), 20p each.

Vidicon scan and focus coil assemblies, new, boxed, modern type, no details, £6 each.

## HIGH QUALITY SPEAKERS

6in. x 4in. elliptical, 2in. deep, 4 ohm, 90p each, 2 for £1-70.

8 1/2in. x 6in. elliptical, 2in. deep, 4 ohm, recess magnet, rated up to 10W, £1-50 each, 2 for £2-75.

DIN Speaker sockets, 2 pin (flat and round), 4 for 30p.

Xtal Ovens, 80 deg. or 10 deg., 40p each. Bases, HC6U or 2XHC25U, 10p.

Ferrite Rods, 5 1/2in. by 1/2in. dia. with Med. and Long wave coils, 15p each.

FM STEREO TUNER PC BOARDS by well-known British manuf. includes I.C. decoder, 100mV output, supplied with tuning scale and circuits (runs from 30V + psu, not supplied) £2-50 ea.

MARCONI DEVIATION METER, Type TF791D, 4-1024 MHz, good cond., £150, carriage £1.

MARCONI AUDIO POWER METER, Type TF340, £15, carriage 75p.

SHEPHERD CASTORS, trolley fitting, 4in. wheel, Rubber tyred. Brand new, £2-75 per set of 4.

MOD. TRANSFORMERS (ex equipment) with data, P.P. EL84/6V6 to QQVO3-20A, £1-50 each.

CRYSTALS type B7G glass 54 kHz, 55p.

CRYSTALS type HC6U in kHz, £2 each.

9003	9006	9015	9018	9021	9025	9028	9031	9037	9040
9043	9050	9053	9056	9059	9060	9065	9075	9227	9255
9261	9276	9284	9287	9294	9341	9344	9402	9412	9431
9433	9438	9451	9465	9477	9479	9480	9481	9484	9486
9487	9493	9494	9497	9505	9526	9527	9543	9551	9552
9559	9563	9566	9569	9572	9573	9575	9581	9590	9591
9594	9600	9602	9604	9605	9608	9611	9612	9631	9634
9653	9718	9723	9728						

## DIECAST BOXES (New ITT)

3 1/2 x 4 1/2 x 1 1/2, 65p;

3 1/2 x 4 1/2 x 3 1/2, £1-10;

10 1/2 x 6 1/2 x 2 1/2, £1-85;

3 1/2 x 4 1/2 x 2 1/2, 80p;

6 1/2 x 4 1/2 x 2 1/2, £1-20;

8 1/2 x 5 1/2 x 4 1/2, £2-25.

# B. BAMBER ELECTRONICS

20 WELLINGTON STREET, LITTLEPORT, CAMBS.

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