



# WELZ MADE TO MEASURE

**NEW SP620**

1.8-525MHz

- ★ Power AVGE/PEP & VSWR
- ★ 3w/20w/200w full scale
- ★ Dual sensors switch selected
- ★ S1 1.8-160MHz
- ★ S2 140-525MHz
- ★ Sens. S1 = 2w
- ★ S2 = 3w
- ★ Accuracy 10%

**£109.95**

12 months parts and labour warranty  
Free 24 hour Securicor delivery until 19th December

Plus free 24 hour Securicor delivery on these models!

**NEW SP825 AUTO RANGING VSWR!**

1.8-1300MHz

- ★ Power AVGE/PEP & VSWR
- ★ 1.8-200MHz/430-450MHz
- ★ 800-930MHz/1240-1300MHz
- ★ Automatic VSWR reading
- ★ Detachable power sensor
- ★ 2w/15w/150w full scale
- ★ Sensivity 2w

**£179.95**

12 months parts and labour warranty  
Free 24 hour securicor delivery until 19th December

**WELZ SP220**

1.8-200MHz

- ★ Power AVGE/PEP & VSWR
- ★ 1.8-200MHz
- ★ SO239
- ★ 2w/20w/200w full scale
- ★ Sensitivity 1 watt
- ★ Accuracy 10%

**£67.95**

12 months parts and labour warranty  
Free 24 hour Securicor delivery until 19th December

**NEW AC200 ALL-BAND ATU 3.5-30MHz**

**£159**

- ★ HF ATU & VSWR/PWR monitor
- ★ Power measurement 20w/200w
- ★ Switchable by pass
- ★ Reduces harmonic radiation
- ★ Size 180/107/244mm
- ★ Matches 15-250 ohms:50 ohms

Available December Free 24 hour Securicor delivery until 19th December

**DIAMOND D130**

"Without doubt the best Discone available today"  
25 1300MHz  
(Tx 50 144.430 1296MHz)

**£75**

Its performance is superb and is really the only antenna to consider for todays wide range scanners. Supplied with approx. 50ft of 50 ohm coax and superbly engineered. This antenna is now being supplied to commercial organisations who know a good product when they see it. Don't deprive your receiver of its full capability. Plug the D130 in and hear the difference!

Free 24 hour delivery until 19th December

**DIAMOND DP-CP5 5 BAND DX ANTENNA 80-40-20-15-10M**

**OTHER DIAMOND ANTENNAS**

Did you know that Diamond make a range of superbly engineered antennas? In case you didn't here's a selection:

★ Max power 200w	CP22	2m collinear 6.5dB base antenna	£49.95
★ Height 15ft	X50	2m/70cm colinear 4.5/7.2dB fibre glass	£59.95
★ Radials approx 6ft	M285	2m 5/8th whip PL 259 hinge-base	£14.25
★ VSWR 1.5:1	M287	2m 7/8th whip PL 259 hinge-base	£25.95
★ Low angle for DX	NR72M	70cm whip 5.5dB	£28.75
★ Wind 85MPH	EL770H	2m/70cm whip	£29.95
	RH2B	2m 1/4 wave whip rubber	£14.95
	RH200B	2m 1/2 wave centre loaded BNC	£33.00
	RH702B	70cm 2 x 5/8th BNC	£28.00
	GLS	Gutter mount and cable	£14.95
	SPM	Magnetic base with cable	£23.95
	TRM	Stainless steel boot mount	£26.95
	EL80	Base loaded 80m whip (Hunky!)	£65.00
	EL40	As above 40m	£57.00

All above carriage free until 19th December!

**£195 FREE SECURICOR**

**LATEST EDITION**

**UK LISTENERS CONFIDENTIAL FREQUENCY LIST**

This publication has now sold well over 2500 copies since it was advertised only a few months ago. Now the recent updated version is selling even better. No self respecting listener should be without a copy. If you enjoy exploring the short wave bands then this publication will add to your enjoyment. It covers the hf spectrum from 2 to 30 MHz and gives details of transmissions outside the amateur bands. Specially designed for the UK and European listener it sets out in a very easy way a comprehensive list of hundreds of interesting transmissions that will keep you occupied, for days on end! Only a fraction of the cost of other similar publications it contains details of Marine, Air, Military, Embassy, Press and News agencies. Many listings have time schedules included together with comprehensive RTTY details. It tells you the frequencies used by civil and military aircraft whilst flying the Atlantic, when and where to pick up the press bulletins, long distance marine traffic, etc., and much more. Send today for your copy of this worthwhile publication.

**£5.95 + 75p P&P**



**WATERS & STANTON**

RETAIL & MAIL ORDER:- 18-20, Main Road, Hockley, Essex SS5 4QS.  
Tel: (0702) 206835, 204965  
RETAIL ONLY:- 12, North Street, Hornchurch, Essex RM11 1QX.  
Tel: (04024) 44765  
Visa and Access by telephone.

# SHORT WAVE MAGAZINE

(GB3SWM)

ISSN: 0037-4261

VOL. 44

DECEMBER, 1986

No. 518

## ADVERTISERS' INDEX

	Page
J. Birkett .....	400
Colomor Electronics Ltd. ....	402
Datong Electronics Ltd. .... <i>inside back cover</i>	
Dewsbury Electronics .....	368
Fantex Radio .....	404
D. P. Hobbs Ltd. ....	402
B. A. Jones .....	402
Kimaski Technology .....	401
KW Ten-Tec Ltd. ....	403
M. H. Electronics .....	404
P. M. Electronic Services .....	401
Quartslab Marketing Ltd. ....	400
F. G. Rylands .....	402
S.E.M. ....	367
Small Advertisements .....	401, 402, 403
South Midlands Communications Ltd.	
<i>inside front cover</i>	
Stephens-James Ltd. .... <i>inside back cover</i>	
S. W. M. Publications. .... <i>back cover</i>	404
Uppington Tele/Radio (Bristol)	
Ltd. ....	403
Reg. Ward & Co., Ltd. ....	403
Geoff Watts .....	400
West London Communications. ...	367
R. Withers Communications Ltd. ...	366
Wood & Douglas .....	400

## CONTENTS

	Page
VHF Bands, <i>by N. A. S. Fitch, G3FPK</i> .....	370
Improving the Heathkit HD-1410 Electronic Keyer, <i>by E. H. Trowell, G2HKU</i> .....	375
G3RJV's Workshop Notebook .....	377
A Feed Point Problem, <i>by A. P. Ashton, G3XAP</i> .....	380
Follow-Up to the G4DCV Multi-Memory Keyer, <i>by Paul Whatton, G4DCV</i> .....	383
The Heathkit HW-9 Kit Transceiver, <i>described by Ian Keyser, G3ROO</i> .....	384
Oblast Corner, <i>by Nigel Cawthorne, G3TXF</i> .....	386
Amateur Radio Computing, <i>by Paul Newman, G4INP</i> .....	388
Communication and DX News, <i>by E. P. Essery, G3KFE</i> .....	390
"Practically Yours", <i>with Glen Ross, G8MWR</i> .....	393
Caution — Watch Your Capacitors! <i>by Martin Thurlow, G1GCT</i> .....	394
Clubs Roundup, <i>by "Club Secretary"</i> .....	396

Editor: PAUL ESSERY, G3KFE/G3SWM

Advertising: Charles Forsyth

Published at 34 High Street, Welwyn, Herts. AL6 9EQ, on the last Friday of the month, dated the month following.  
Telephone: 04-3871 5206 & 5207

Annual Subscription:

Home: £17.40, 12 issues, post free  
Overseas: £17.40 (\$25.00 U.S.), post free surface mail

Editorial Address: Short Wave Magazine,  
34 High Street, Welwyn, Herts. AL6 9EQ, England.

Prices shown in advertising in this issue do not necessarily constitute a contract and may be subject to change.

## AUTHOR'S MSS

Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of A4 sheets. Photographs should be lightly identified in pencil on the back with details on a separate sheet. All drawings and diagrams should also be shown separately, and tables of values prepared in accordance with our normal setting convention — see any issue. Payment is made at a competitive rate for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

© Short Wave Magazine Ltd.

COVER DESIGN:  
Allan & Co. Ltd., Welwyn

E. & O. E. VAT Reg. No. 239 4864 25

365



# R. WITHERS COMMUNICATIONS LTD

Manufacturers, importers and suppliers of world famous communications products

584 HAGLEY ROAD WEST OLDBURY, WARLEY, BIRMINGHAM B68 0BS

021-421 8201/2/3. CELLNET 0860 323056. PRESTEL MBX 214218216 FAX 0215614074

Amateur Radio. Business Radio. Radio Telephones. Sales. Service Accessories and antenna systems.



YAESU



THE TECHNICALLY ORIENTATED  
RADIO COMMUNICATIONS  
SPECIALISTS.

THE MODERN  
CONVENIENT WAY  
TO PURCHASE

Please add £2.50 p&p for accessories, £5 for transceivers,  
Send £1.00 for Raycom catalogue (refundable) or send  
a large S.A.E. for latest used list and information.



★ TOP TWENTY ★

The following RWC Best-Sellers are normally Ex-stock at our Hagley Road Branch, and are offered to privileged customers (subject to status) at these special rates. The RWC Card is available for most adult current bank account and creditcard holders. Your credit limit is 24 times your monthly payment. A 10% deposit is required on initial **Instant Credit** Purchases but existing RWC Creditcard holders need not pay a deposit. Once a RWC Cardholder you will be entitled to access the RWC **CARDHOLDERS SPECIAL BARGAIN LIST**. Please note that all Cash prices are less than current list and in many cases are the lowest prices in the UK.

(Prices correct at time of going to press. E&OE).

**APPLY FOR YOUR CARD NOW. \*\* INSTANT CREDIT UP TO £1000.00  
AVAILABLE TO LICENSED AMATEURS AND ENTHUSIASTS. APR 32.9%**

## YAESU MULTIMODE + HANDHELDS

- 3 YAESU FT290R MULTIMODE
- 9 FT203R + FNB3 2MTR SUPER HANDHELD
- 4 FT209RH + FNB4 2MTR 5 Watts H/H
- 16 ALINCO ALM203E H/H C/W 30W AMP
- 19 FT709R + FNB3 70CMS KEYBOARD H/H

CASH PRICE	P/MONTH
£369.00	£14.00
£255.00	£10.00
£315.00	£12.00
£239.00	£9.00
£319.00	£12.00

## YAESU AND ICOM MOBILES + DUAL BANDERS

- 7 FT2700R 25W 2+70CMS MOBILE
- 13 IC3200E 25W 2+70CMS MOBILE
- 20 IC290D 25W 2MTR MULTIMODE
- 2 NEW IC28E 25W FM MOBILE (RWC mod)
- 12 FT726 ALL MODE MULTI BAND V-UHF
- 17 IC271H 2MTR MULTIMODE 100 WATTS

£399.00	£15.00
£499.00	£20.00
£539.00	£21.00
£349.00	£14.00
£999.00	£42.00
£989.00	£38.00

## YAESU AND ICOM HF MOBILE/FIXED

- 5 IC735 ALL BAND 100W SUPER-RIG
- 6 FT757GX ALL BAND (C/W RWC mod)
- 15 IC745E ALL BAND HF TRANSCEIVER

£925.00	£34.00
£949.00	£33.00
£915.00	£37.00

## RECEIVERS

- 11 FRG8800 ALL MODEL ALL BAND RX
- 1 FRG9600 MK2-RWC SCANNING V-UHF
- 14 ICOM ICR71 ALL MODE HF SUPER RX
- 10 ICOM ICR7000 25-1300MHz SCANNING RX
- 18 BEARCAT NEW 100XL H/HELD SCANNER
- 8 BEARCAT DX1000 SW 10-30MHz ALL MODE

£625.00	£22.00
£499.00	£18.00
£799.00	£30.00
£925.00	£35.00
£219.00	£9.00
£329.00	£13.00

THIS IS JUST A SMALL SELECTION OF THE STOCK WE HAVE AVAILABLE. AT RWC YOU WILL GET THAT BETTER DEAL. WE ALSO HAVE THE BEST UPDATED WEEKLY USED LIST FULL OF BARGAINS ALL OF WHICH CARRY OUR FAMOUS THREE MONTH WARRANTY. **Plus our VERY SPECIAL package Deals!**

Please call us by telephone for a free brochure, Creditcard application leaflet or any other information. You may also order any of the above goods by AMERICAN EXPRESS, VISA, ACCESS, Diners Club on our 24hr answerphone. RWC Ltd are licensed Credit Brokers. Full written details on request.

**OR POP INTO OUR HAGLEY RD. SHOP FOR A NO-OBLIGATION DEMONSTRATION OF ANY OF THE ABOVE PRODUCTS. PLUS THE THOUSANDS OF OTHER LINES IN STOCK... (Junc. 3 M5.)  
DON'T FORGET!!! CHRISTMAS IS JUST AROUND THE CORNER, AND PRICES COULD GO UP AGAIN.**

Tel: 021 421 8201 (24hr answerphone)

Telex: 334303 G TXAGWM



CALL US NOW  
FOR BEST PRICES  
AND SUPER DEALS

**S.E.M. UNIT B, UNION MILLS, ISLE OF MAN**  
**Tel: MAROWN (0624) 851277**



**NEW. S.E.M. QRM ELIMINATOR.** Do you suffer from local QRM. Motors, power lines, TVs, local station? We can stop it, with this entirely new concept, developed by us. Phase out interference using a small pick up aerial. 1.8-30MHz. £85. If you don't believe it's true, try one for 10 days, if it doesn't solve your problem we'll refund, less £5.00 to cover costs.

We have many delighted users now, who can't speak too highly of its performance.

**NEW. S.E.M. TRANZMATCH.** Now has a switch to select DIRECT to aerial, Through ATU, or DUMMY LOAD. The matching unit retains its tremendous versatility. Capable of matching virtually any aerial to 50 ohms, at up to 1kW BALANCED or UNBALANCED. The link coupled output isolates the aerial from the rig, which can cure TVI both ways, and their robust construction is proved by ones in daily use for 15 years. 1.8-30 MHz £110.00, EZITUNE built-in £39.50 (see below), Dummy load built-in £8.90. Ex-stock.

**S.E.M. 2 METRE TRANSMATCH £32.00** Ex-stock.

**NEW S.E.M. DUMMY LOAD.** 100w with Dummy load/Through switch so you can leave it plugged in. £22.00. Ex-stock.

Do you use an aerial matcher? You need our EZITUNE to tune it to your frequency WITHOUT transmitting. Listen to the S9+ noise on your receiver and adjust your aerial tuner for a dip in the noise and you are matched up to 50ohms (1:1 SWR). It protects your radio and stops tuning QRM £45.00 boxed unit or £39.50 for circuit board and fixings to fit in ANY ATU. Ex-stock.

**VERY WIDE BAND PRE-AMPLIFIER**

They cover from 3-40MHz or 20-500MHz with a noise figure of 1.5dB and an unprecedented + 30dB 3rd order 1P at the INPUT. This means that they are quite exceptional in handling very strong signals, very important on wideband pre-amps. Gain is 9dB.

We make each in three types. Straight pre-amp, this has a signal loss if you switch it off, £32.00. One which switches to "straight through" when switched OFF, can be used for transmitting through (100W) if supplied with 12V on receive and 0 on TX, costs £35.00. An R.F. switched unit is £45.00. All Ex-stock.

We are continuing to make our highly acclaimed dedicated 2 Metre pre-amps with adjustable 0-20dB gain and 1dB N.F. Receiver only £21.90. R.F. switched £34.00 and with 240V P.S.U. £39.00. Ex-stock.

**CONVERTER to cover LF, MF, HF, VHF, UHF**

Our new H.F. CONVERTER opens new horizons for receivers, use with the new all mode V.H.F., U.H.F. receivers FRG9600 and ICR7000, extends their coverage down to 100KHz, giving you LF, MF, HF, VHF and UHF. You tune your RX from 100MHz up, e.g. 103.500 is 3.5MHz. It has two aerial sockets, one for H.F. into the converter and one for V/UHF switches straight through into your RX when you switch the converter OFF, i.e. No plugs to change. All this for £45.00. Ex-stock.

**R.F. NOISE BRIDGE.** If you are experimenting with aeriels you need one of these units. Tells you the resonant frequency and impedance of your aeriels and also invaluable for measuring 1/4, 1/2, etc., wavelength of feeders, etc. £45.00. Ex-stock.

**WAVEMETER.** A pretty little absorption wavemeter, to satisfy the licence conditions. 1.5-30MHz with a meter indication. £39.50. Ex-stock.

**IAMBIC KEYS.** We use the world famous CURTIS chip which eliminates the little idiosyncracies common in other keys. Opto-isolators from the chip ensure that R.F. can't get in, a common problem with multi-chip keys. £45.00. An excellent twin paddle key often mistaken for ones costing several times more at £19.50. Ex-stock.

**2 METER LINEAR POWER AMP/PRE-AMP.** People are constantly telling us that comparing different makes our Pre-amp is best. (See Pre-amps for spec.) Three models, Sentinel 35 12x power gain e.g. 3W IN-36W OUT. Ideal for FT290 £85.00, Sentinel 50, 10W IN-50W OUT £95.00. Sentinel 100 10W IN-100W OUT £135.00. All Ex-stock.

**AUDIO MULTIFILTER.** Has fully adjustable BAND PASS, HIGH PASS, LOW PASS and 2 NOTCH filters. From 2.5KHz to 20Hz. Making the most versatile filter available. £69.50. Ex-stock.

**T.V.I.** Our Braid Breaker/High Pass Filter cures T.V.I. by plugging into the TV aerial socket. £7.50. Ex-stock.

**S.E.M. SWITCH.** 3 way ant. switch + 4th position to earth. 1kW. SO239S D.C.-150MHz. £23.00. Ex-stock.

**12 MONTHS COMPLETE GUARANTEE INCLUDING ALL TRANSISTORS.**

Prices include VAT and delivery. C.W.O. or phone your CREDITCARD No. Ring or write for further data. Orders or information requests can be put on our Ansaphone at cheap rate times.

**WEST LONDON COMMUNICATIONS**

**61 FAIRFIELD ROAD, WEST DRAYTON**

**West Drayton 447767 (STD 0895)**

**3 MILES FROM LONDON AIRPORT**

STORNO 800 PMR SETS EX MET POLICE  
 CHOICE OF 20. . . . . £100 EA.  
 DYMAR LYNX  
 CHOICE OF 20. . . . . £20 EA.  
 CB RADIO  
 CHOICE OF 20. . . . . £10-£16 EA.  
 AERIALS FROM. . . . . £2.50 EA.  
 STORNO CAR PHONES 900SA  
 CHOICE OF 20. . . . . £100 EA.  
 PYE MOTORPHONE  
 CHOICE OF 10. . . . . £15 EA.  
 PYE CAMBRIDGES AM/FM  
 CHOICE OF 20. . . . . £3-£5 EA.  
 PYE POCKET PHONES PF2  
 CHOICE OF 100. . . . . £25 EA.  
 PYE WESTMINSTER AM/FM  
 CHOICE OF 25. . . . . £25 EA.

PYE F30 BASE STATION  
 CHOICE OF 5. . . . . £50 EA.  
 PYE CAMBRIDGES HAND HELD  
 CHOICE OF 5. . . . . £10 EA.  
 PYE VANGUARDS  
 CHOICE OF 25. . . . . £3-£5 EA.  
 STORNO 700 EX CAR PHONES  
 CHOICE OF 10. . . . . £20 EA.  
 GEC BASE STATION  
 CHOICE OF 10. . . . . £5-£10 EA.  
 DYMAR BASE STATION  
 CHOICE OF 10. . . . . £5-£20 EA.  
 DYMAR HAND HELD  
 CHOICE OF 10. . . . . £15 EA.  
 STORNO 600 EX CAR PHONES  
 CHOICE OF 20. . . . . £15 EA.  
 STORNO FM LOW BAND SETS  
 CHOICE OF 10. . . . . £25 EA.

Please note it is illegal to operate a transmitter without a licence  
 The following equipment does not meet D.T.I. approval, all sets are sold without crystals and sold as seen and without warranty.

# DEWSBURY ELECTRONICS

## NEW FM BOARD FOR THE TS-930S



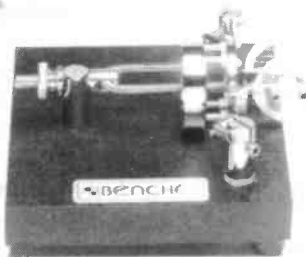
**NOW FROM THE MAKERS OF THE WORLD FAMOUS STAR MASTERKEYERS,  
AN 'FM BOARD' FOR THE TRIO TS-930S**

THIS EASY TO FIT READY BUILT BOARD, ENHANCES ALREADY SUPERB FACILITIES AVAILABLE ON THE TRIO TS-930S. EASILY FITTED TO THE TS-930S, THE FM BOARD IN NO WAY DEGRADES THE PERFORMANCE OF THE TRANSCEIVER, ALL MODES INCLUDING FM ARE READILY AVAILABLE. SUPPLIED AS A READY BUILT UNIT, COMPLETE WITH CONCISE AND EASY TO FOLLOW FITTING INSTRUCTIONS, CAN BE INSTALLED IN LESS THAN 90 MINUTES, OR FOR A MODERATE CHARGE, DEWSBURY ELECTRONICS WILL BE HAPPY TO FIT THE UNIT. COLLECTION AND DELIVERY ARRANGED. FOR FULL DETAILS AND SPECIFICATION, PLEASE SEND S.A.E.



### STAR MASTERKEY CMOS MEMORY KEYS

8 MEMORIES, BEACON MODE, DIRECT & GRID BLOCK KEYING. FULL DETAILS IN PREVIOUS ADS. STILL ONLY  
**£95.00**



### STAR MASTERKEY MKII

DOT - DASH MEMORIES IAMBIC OR SIDE SWIPE, SEMI AUTOMATIC MODE, 12 VOLT OR INTERNAL BATTERY.  
**PRICE £54.70**

FULL RANGE OF BENCHER KEYS

POST, PACKING AND INSURANCE ON EITHER KEYSERS £3.00

FULL RANGE OF TRIO PRODUCTS STOCKED  
We are also stockists of DAIWA—MET ANTENNAS—POCOM—JRC—TAR—TASCO TELEREADERS—  
MICROWAVE MODULES—ICS AMTOR—AEA PRODUCTS—DRAE—B.N.O.S.

**Dewsbury Electronics, 176 Lower High Street, Stourbridge, West Midlands.**

**Telephone: Stourbridge (0384) 390063/371228.**

**Telex: 337675 TELPES G**

Instant finance available subject to status. Written details on request.



FOR THE RADIO AMATEUR AND AMATEUR RADIO



*The Staff of*  
**“Short Wave Magazine”**

*wish all its Readers  
a Merry Christmas  
and a Happy New Year*

**WORLD-WIDE COMMUNICATION**

# VHF BANDS

NORMAN FITCH, G3FPK

**A**FTER the recent exciting events on VHF bands, things have reverted to normal with little to report in the way of super DX worked. The high pressure weather systems have gone and a succession of deep lows sweeping across the North Atlantic has put paid to any chance of a decent tropo. opening.

## Sunspot Cycle 22

Until quite recently, the propagation experts were all forecasting that the bottom of the current sunspot cycle would be in mid-1987. However, it now seems that we "bottomed out" between June and September this year. Currently there are several sunspot groups associated with Cycle 22, and the 2.8 GHz solar flux has increased dramatically. Above 144 MHz, where we are in any particular cycle is not all that important since we can experience excellent periods of tropo., *sporadic E*, *Auroral* and meteor scatter propagation at fairly predictable times. However, now we have the 50 MHz band, this is good news since we may be able to experience VHF ionospheric propagation in the not quite so distant future.

## Award News

Congratulations to John Quarmby, G3XDY, (AM77g) from Rushmere St. Andrew in Suffolk who was elected member number three of the 432 MHz QTH Squares Century Club on October 17. All contacts were on tropo. with 94 on SSB and six on CW. 22 countries were listed from EA in the south to LA/SM in the north, and from EI in the west to SP in the east. John mentions the difficulty getting cards from French stations and suggests UHF types may be less inclined to chase awards perhaps preferring to spend the time building equipment. His present station consists of a *Trio* TS-770E, home-built 3SK97 *Gasfet* masthead pre-amp. and 4CX250B PA, with a *Tonna* 21-ele. *Yagi* at 50ft. The QTH is 140ft. *a.s.l.*

The 144 MHz QTHCC has another new member, Bob Nixon, G1KDF, (YN36j) from Ormskirk in Lancashire whose certificate no. 72 was issued on November 7 for 100 confirmed. All were SSB mode except one, 88 being tropo. 7 *via Ar* and 5 *via Es* propagation. Unfortunately Bob did not send any station and QTH details.

Two readers have been awarded more stickers for their 144 MHz QTHCC certificates. John Hunter, G3IMV, (BKS) who is the holder of certificate no. 3, was issued with no. 375 on Nov. 6 and, while most were from pretty unusual and rare squares, one card was for a 1979 *Es* QSO with I7KBI (IB) and another for a contact with XI square. John has analysed the 395 squares he has worked and found that 300 were worked *via Es*, *Ar* and tropo. modes, the remaining 95 being MS QSOs, ". . . all on a 16-ele. *Yagi*, 4CX250B PA from a mediocre VHF site," to quote him.

Alex Della Casa, I4YNO, (FE25e) was awarded his 200 sticker on Oct. 28 for certificate no. 60, all for 1986 QSOs. 14 were SSB and 11 CW, nine by tropo., three *via Es* and 13 on MS, the latter including G18YDZ (WP) on SSB and GM4YHF/P (ZT) and GM4DHF/P (ZU) on CW. Another choice catch was IT9BLB/IH9 (GW) on July 25, these islands counting as Africa.

On the VHF Century Club scene, not many are issued for 432 MHz but no. 41 was, on Oct. 17 to John Quarmby, G3XDY, who automatically qualified when applying for his QTHCC membership. On 144 MHz, certificate no. 388 has been issued to Dave Kiellor, G0CJL, from Luton, (BFD) on Oct. 28. He started as a very young SWL pre-WW2 listening to his Father's radio. After flirting with CB for some years he took the *R.A.E.* resulting in G6TTZ being issued. He passed the Morse test at the sixth attempt at Broadstairs, after five failures in London. His station is 100% *Yaesu* with the FT-902DM transceiver, FTV-901R transverter and numerous accessories. For 2m. Dave uses a 14-ele. Parabeam from *Jaybeam* at 80ft. *a.g.l.* on a *Strumech* mast. He also operates on the HF bands, 6m. and 70cm. and is a motor engineer having made many "contraptions" for the hobby, such as rotators and indicators.

For details of the VHFCC and QTHCC awards send an *s.a.e.* to the usual address. When sending QSLs for claims, please ensure they are well packed. Recently one envelope from overseas and two from the U.K. had burst open and had been resealed by the *Post Office*. Fortunately in no case did anything appear to have been lost. It is quite likely that in sorting small packages, some are actually thrown several metres into a basket.

## Repeaters

From GB2RS New Bulletin on Nov. 9, a list of new repeaters licensed by the DTI. First, four 1.3 GHz TV ones. GB3GT/Glasgow/RMT2; GB3PV/Cambridge/RMT2; GB3VI/Hastings/RMT1 and GB3CT/Crawley/RMT2. VI uses AM video, the others FM. Next a 1.3 GHz speech relay GB3SE/Stoke-on-Trent/RM3. New UHF repeaters are GB3HL/Hillingdon/RB3; GB3NW/

Hendon/RB5 and GB3LR/Lewes/RB11. The DTI has blessed the re-siting of West Sussex TV relay GB3VR/RMT2 from Worthing to Brighton. This is an FM video "box." Lastly several packet radio repeater sites have been approved; more details later.

## The Satellites

Having reported the writing-off of *Oscar-10* last month it now seems that ". . . the old girl will not lie down," to quote from a late news item dated Oct. 29 from *AMSAT-UK*. The beacons were still transmitting and it may be possible to reset the IHU, after all, to make it commandable as was done on first launch. The Sun angle and illumination are now very favourable so perhaps some form of limited service can be programmed until *Phase 3C* is launched next Spring.

*FO-12* has been working well in Mode JA but the *JARL/JAMSAT* folk were having software problems so had been unable to open the digital, JD, transponder. Arthur Gee, G2UK, *AMSAT-UK* Chairman, relates his experiences using Mode JA in the latest issue of *Oscar News* and concludes, "*FO-12* is not a satellite for the newcomer to satellites to cut his teeth on." The problem is getting satisfactory reception as the space-craft passes over at high elevation.

The Soviet Union has filed with the *International Frequency Registration Board* at the ITU in Geneva details of the transponder frequencies for *RS-9* and *RS-10*, presumably. As well as the familiar 2m/10m. up/down link "A" modes, there are two new modes. "T" is 15m/2m. up/down while "K" is 15/10m. up/down which latter is really outside the scope of VHF Bands. According to an item in *Amateur Satellite Report* No. 135, these satellites will be in lower orbits than the *RS-1* to 8 series, at about 1,000 kms. This means they would be unaffected by *Van Allen* radiation, so could live longer, but their "window" would be only slightly wider than was *Oscar-8*.

On the home front, the *University of Surrey's UoSAT-1*, or *Oscar-9*, celebrated its fifth birthday on Oct. 6 and is now the longest living operational satellite in the amateur service. Far from detecting any significant degradation in performance, the on-board computer software and ground station control facilities have resulted in enhanced performance this past year, to quote from a recent *U-0-9 Bulletin*.

## Contest Notes

The last two legs of the 1.3/2.3 GHz *Cumulatives* are on Dec. 2 and 18 from 2030 to 2300. Thereafter, entries should be sent to the *RSGB VHF Contests Committee* c/o G4JLG at 40 Edge Fold Road, Worsley, Manchester, M28 4QF. On Dec. 7 there is the 144 MHz Fixed and



Affiliated Societies event from 0900 to 1700 in which participants can operate individually or as part of a club team. The details were published in the October *RadCom* and entries go to G3XDY at 12 Chestnut Close, Rushmere St Andrew, Ipswich, IP5 7ED. The last leg of the 432 MHz *Cumulatives* is on Dec. 10, 2030-2300 and entries for these go to G3LCH at 49 Streatbourne Road, London, SW17 8QZ.

Many readers have written to give their ideas on the form which the proposed Short Wave Magazine contest might take. What transpires is that your ideas are very varied, ranging from one-off, one band affairs, to multi-band *Cumulatives*. Over the Christmas holiday, your scribe hopes to make some sense of it all.

### San Marino Results

MS addicts will remember the very successful operation from San Marino in July by an international group. I4YNO has sent a resumé of his group's activity from T70A, plus some good colour prints. The station was located in a small outhouse on the roof of the *Hotel Bellavista* approximately 700m. a.s.l. (GD03G/JN63FW).

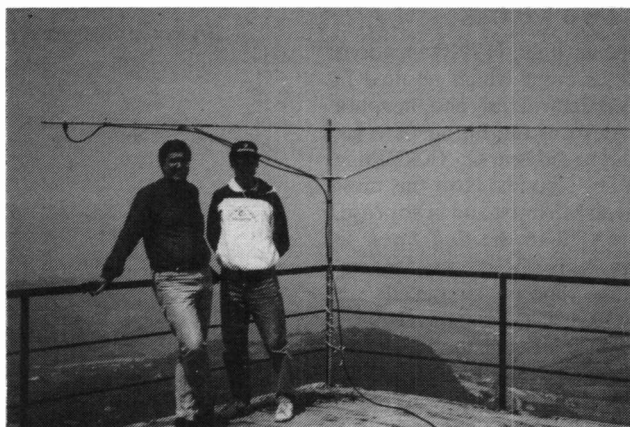
On 2m, they ran two stations, the first comprising a *Yaesu* FT-225RD with *muTek* "front end" and a PA with two 4CX250B valves. The antenna was a 20-ele. long *Yagi*, 8.2m. boomlength, designed by I2ODI. The second consisted of an *Icom* IC-211E with *muTek* board, a single 4CX250B PA and 13-ele. *Tonna Yagi*. 600 QSOs were made including 85 completed on MS and one *E-M-E* one with W5UN. The best tropo. DX were DF7DJ (DL) at 922 kms. and UB5DAA (LI) at 915 kms. On MS, OH5LK (NU) at 2,091 kms. was the best DX and a "first" T7/OH on 2m. The UB5 was another first as was their MS contact with Andy Steven, GM4IPK.

On 70cm. they used an *Icom* IC-402 and 30w PA with a 21-ele. *Tonna Yagi*. 36 QSOs were made, new ones being OK1KKH/P and EA3DUY. They had a 23cm. station using a transverter by OE9PMJ with just 700mw output, the antenna being a *Tonna* 23-ele. *Yagi* and with this they had eight contacts. Best DX on 70cm. and 23cm. were EA3DUY (BB) at 876 kms. and I4EAT/3 (FG) at 281 kms. respectively.

The team comprised I4YNO, DL6LAU, OZ1DOQ, OZ1FDJ and OZ1FTU. QSLs should go via *The Radio Club of San Marino*, P O Box 77, San Marino, I-47031 Rep. of San Marino. Alex I4YNO, wrote that the group would like to extend its thanks to all the hams in the Republic, especially Tony, T77C, who spent a long time with them.

### Nordic VHF Meeting

The Scandinavian VHF meetings are an established part of the European VHF



Tony Ceccoli, T77C, and Bo Hansen, OZ1FDJ, on the roof of the Hotel Bellavista in San Marino. The antenna is the 70cm. *Yagi* used in this summer's DX-pedition to the little republic, 700m. a.s.l. Members of the team were DL6LAU, I4YNO, OZ1DOQ, OZ1FDJ and OZ1FTU. The station T70A made 600 QSOs on 2m. with 85 MS QSOs completed, the best being OH5LK (NU) at 2,091 kms. 36 contacts were made on 70cm. with EA3DUY (BB) best DX at 876 kms.

scene now and the 1987 one will be held in the Aaland Islands, OH0, on June 4 to 6. Thanks to Nick Peckett, G4KUX, for passing along this news and more will be revealed later concerning booking and travel arrangements.

### North Sea DX

From recent QSOs with GM4DMA in Aberdeen on 40m. have come the latest details of Laurence's activity —/A from AS69e. He now runs 130w on 2m. through low loss feeder with about 2.8 dB loss over its long run; i.e. about 67w at the antenna which is a 5-ele. *Yagi* at 64m. over the sea. He has a 1 dB NF masthead preamplifier. and ought to be workable from East Anglia on CW in flattish conditions. Nick also mentioned that GM1AHE/P has been on from AT square but that is a longer haul, still.

### Six Metres

Last month, mention was made of the *RSGB* VHF Committee's proposal that Friday evenings be tried as activity periods between 7pm and midnight. No reader has mentioned participating in these sessions which were due to begin on Oct. 24. It would seem that use of this new band is very low so perhaps with the *Geminids* meteor shower in the offing on Dec. 12/13, some MS activity could be encouraged among those who have not yet tried the mode. By all accounts, it is *much* easier than on 2m. with the devotees achieving very satisfactory results with less than the legal power.

### Four Metres

The CW Ladder was the original idea of Tim Raven, G4AR1, (LEC) and he has sent in his first entry for the 1986 table with 43 stations worked. All his QSOs were on

July 5 or Oct. 26. John Jennings, G4VOZ, (LEC) reports an average month with the following stations worked between Oct. 3 and 25; — G0DQA (KNT) and GB4MTR (HBS) on CW, plus GB2GP in Gilwell Park, the only JOTA station heard on the band on the 18th, operated by G4VTH. On SSB, G4KMG (AVN), G3CJ (GLR), G4CAJ (LEC), G4OXY (AVN) and G4NKO (HWR). New stations were G0DCV and G3LCV both in Derby.

As to the Fixed Contest on Oct. 26, John writes; — "No surprises. Every station heard or worked was totally predictable. Many of the professional contest stations decided that, as they couldn't go mountain climbing, they would not bother". So he was pleased to work G4MGR from the home QTH instead of from a prime —/P site. He raises the point whether it is really in the spirit of this kind of contest for some contestants to arrange callsigns and QTHs "of convenience" in good locations? John mentions that David Butler, G4ASR, who reckoned he was the only 4m. operator in HWR, was surprised to hear two other stations appear and who will be surprised to hear them again until the next fixed event. Perhaps the *RSGB* VHF Contest Committee might consider this "QTH-borrowing" syndrome in fixed contests for surely there is little difference between this practice and going —/P: merely substituting a house and mains electricity for a tent and generator.

G4VOZ is going to have a go at the W.A.B. on 4m. and reports that Jerry Russell, G4SEU, is also thinking about it. John has a mobile capability on CW, SSB and FM so could put on some of the rarer squares. Finally, the GB4MTR operation will be from the QTH of Ian Parker, G4YUZ, (HFD) till Dec. 2 and the last session from the 3rd. through 30th is down to G3RSI (HPH).

## Two Metres

From Modena, Italy, I4YNO mentions the Sept. 20 Es event which resulted in traffic between Central Italy and the south of Sweden. Alex was too far north to get into the act but he did hear G6XKR calling "CQ" for a few seconds. Now this must have been via an MS burst and in any case, there is no '6XKR in the *Call Book* so could it have been one of our readers, G6XKR? Alex reports completed MS QSOs with G0CUZ (YM) and G4XEN (ZM) and from the latter he received a 20s. burst. Reflexions seemed good in October, yet there was little activity with most people apparently waiting for the *Geminids*.

Colin Morris, G0CUZ, (WMD) reports very little activity since the long period of good tropo. conditions went away on Oct. 5. However, if you are a keen MS operator, that does not really matter. He did not find the *Orionids* shower very spectacular but did complete with HG8CE (KG) and SM4HAK (HV), both new squares. He had an interesting sked with MS newcomer EA7TL (XW) which produced a 55s. burst but not much else. That QSO was not completed and it was the only long burst heard in nine hours on Oct. 20/21.

Other CW MS QSOs completed by G0CUZ were YU7PS (KF) on the 28th and on the 26th, YU7EF (KE) at 1,865 kms. using the random CW MS QRG of 144.100 MHz. This contact took 90 mins. and he received bursts from "Pop", who was using 150w to a single *Yagi*, of 4, 17 and 9s. From Oct. 17 to 19, YU7EF and YU7AU were operating two stations simultaneously from LD square using a great variety of calls. Colin took two skeds but neither were completed at 2,000 kms. and he thinks that one hour skeds are insufficient for these long haul QSOs.

Ian Rose, G1PDW, (ESX) has been concentrating on the W. A. B. since the end of the tropo. opening in early October. This activity seems popular when the bands are devoid of interesting DX and it does seem to keep the activity going. His only Annual Table addition is HB9RCJ (DH) on Oct. 6, his 17th country for the year. George Haylock, G2DHV, (LDN) has been operating a special event station GB8AER at the Winter Gardens, Blackpool. The event was the 44th El Alamein Reunion anniversary by the *8th Army Veterans Association*, the 10th such reunion held there. The station was operated on behalf of the *Royal Signals ARS*. George also operated portable with his own call from the North Pier.

Continuing his analysis of squares worked, G3IMV reckons the only British Isles ones currently available and which he needs are UM, UO, VN and VP. He needs OY9JD (WV) and has several times heard East Anglian stations giving him S9-plus reports by marine ducting but with no sign of a signal in Bletchley. John also needs the

QTH LOCATOR SQUARES TABLE				
Station	23cm.	70cm.	2m.	Total
G8TFI	79	141	126	346
G8GXP	13	133	296	442
G3XDY	77	130	177	384
G4FRE	56	124	78	258
G3JXN	77	119	172	368
GJ4ICD	59	117	239	415
G3IMV	—	116	395	511
G3UVR	61	106	213	380
G3PBV	41	106	200	347
G4TIF	—	106	178	284
G3COJ	44	102	175	321
GW4LXO	45	100	240	385
G4NQC	63	99	234	396
G4XEN	—	98	225	323
G6HKM	—	97	152	249
G8HHI	23	96	135	254
G6DER	53	95	164	312
G1LSB	—	92	46	138
G8PNN	53	91	126	270
G4NBS	56	91	81	228
G4RGG	34	90	224	348
GW4TTU	37	87	238	362
G4MIU	23	87	140	250
G1EZJ	32	86	200	318
G8XVJ	—	86	213	299
G6MGL	48	85	135	268
G4NICU	25	82	201	308
G1KDF	20	82	137	239
G6DZH	—	82	136	218
G4JZF/P	—	80	—	80
G4DCV	25	71	248	344
G4FRX	—	66	99	165
G6HKS	—	65	186	251
G6YLO	20	59	67	146
G6YIN	—	58	87	145
G4KUN	—	57	322	379
G4ZTR	35	57	82	174
G0FOT	—	54	47	101
G6JNS	5	53	119	177
G4CQM	—	52	87	139
G6AJE	3	51	90	144
GW8VHI	—	48	101	149
G4NRG	5	47	132	184
G4OAE	—	46	195	241
GW3CBY	18	46	107	171
G4VPM	—	46	117	163
G8MKD	—	45	113	158
G8ZDS	—	41	123	164
G6CSY	16	39	34	89
G3BW	15	38	269	322
G6XVV	7	38	174	219
YO2IS	—	37	341	378
G6XLI	—	36	109	145
G4YCD	—	35	148	183
G4RSN	2	34	92	128
GM8BBDX	13	31	41	85
G1DOX	20	27	49	96
GJ6TMM	—	26	127	153
G4MJC	—	23	165	188
G0FBG/P/A	—	17	54	71
G4ERG	—	16	278	294
G8RWG	—	13	105	118
G1HGD	—	7	38	45
GM6XPI	—	7	38	45
G4DEZ	40	4	246	290
G2DHV	—	3	24	27
G8UDV	—	2	42	44
G3POI	—	—	448	448
G4JE	—	—	338	338
G4DHF	—	—	280	280
9H1CG	—	—	276	276
GM4IPK	—	—	245	245
G3FPK	—	—	219	219
I4YNO	—	—	214	214
G4SEY	—	—	208	208
G6ECM	—	—	200	200
G4MEJ	—	—	198	198
G4IGO	—	—	198	198
G8LFB	—	—	194	194
G0CHE	—	—	181	181
G4YUZ	—	—	168	168
G4XEK	—	—	165	165
G4DOL	—	—	154	154
E15FK	—	—	126	126
G1EGC	—	—	121	121
G0CAS	—	—	115	115
G6XRR	—	—	112	112
G4TGG	—	—	98	98
G8XTJ	—	—	98	98
G1HZO	—	—	82	82
G1DWQ	—	—	72	72
GW6VZW	—	—	63	63
GU4HUY	—	—	54	54
G1PDW	—	—	53	53
G1CRH	—	—	41	41

Starting date January 1, 1975. No satellite or repeater QSOs.  
 \*Band of the month\*, 70cm.

AS and AT stations and mentions GM3ZXH/A (ZV) which is a really long haul.

Pat Billingham, G4AGQ, (SRY) still heads the CW Ladder by a big margin and is the only participant using all four bands. He had a few queries about what to count for different stations. The original idea

was to introduce the table to encourage CW activity so no lengthy list of explicit rules was ever drawn up. Your scribe feels it should be operators rather than call-signs which are counted. *E.g.* If you work Pat at his home, then mobile, then when he operated portable, it should only count as one point. There is an anomaly since he might be worked when operating a club call-sign which it would seem fair to count as a different station. He cites French stations worked with old and new calls and here again they should only be counted once. Lastly he mentioned John Tindle, G3JXN, whose London QTH is in Ealing and who operates from his own alternative QTH in XM square as GW3JXN/A quite often. In this case, especially on the UHF and SHF bands, it would seem mean not to count this as two stations.

G4ARI has been busy computer programming but has found time in between to do some CW operating and so enters this year's ladder with a very respectable 164. More about his programs later. Tim Charles, G4EZA, (ESX) wrote immediately after participating in the CW contest at the very start of November. However, he did not make it clear whether he meant the 24 hours *Marconi* event or the shorter *RSGB* one. Although there was some good ducting to the north at times, generally the conditions were not good. To the east, the band was very flat with only one German in EK worked and no trace of all the QRP PAs and ONs who are usually workable from the east coast.

Bob Ainge, G4XEK, (SFD) is now up to 165 squares worked. At the peak of the "big lift" at the end of September/beginning of October, he worked 26 OKs, four of them in JJ yet none heard from GJ. In the period Sept. 24-30, Bob reports the band open in the direction of 100° plus/minus 10° but not much outside that band. On Oct. 8 he lists HB9JL (DG, HB9DCU/P and HB9BN1 in DH, HB9MY (EH) and F6DDW (DI). John Palfrey, G4XEN, (NHM) offers the following; Oct. 2 OK1ONI/P (JN69) at 0935; 6th HB9CRQ (JN47) and on the 8th, I2FAK (JN45) his first tropo. contact to Italy. On the 14th, he completed an MS sked in 45 mins. with I4YNO starting at 0530 and Reg Woolley, GW8VHI, was in Alex's shack to hear it. Oct. 23 saw a completed sked on MS with I5MZY (JN53). John was on in the CW contest making 75 contacts worth almost 16,000 points and in which FF6KQP/P (IN87JQ) was a new square. On Nov. 4, *Auroral* signals were heard for 20 mins. from 1650. Only weak signals were heard from GI4OPH, GM0ATQ and the Lerwick beacon, GB3LER, but no QSOs made.

John has received his QSL card from CT3DK in Funchal, Madeira and which reveals he was only using a *Yaesu* FT-290R and 10w to a home made 16-ele. *Yagi*. He also mentions that I4BXN, who runs no less than 1-2 kilowatts to eight 20-ele. long

## ANNUAL VHF/UHF TABLE

January to December 1986

*Yagis*, would like to try some tropo. skeds with QRO stations. If there are any readers with sufficient "heavy metal" aloft and with the necessary high power permit, they might like to take up the idea. (N.B. Your scribe calculates that I4BXN should put a readable CW signal into SE England under average conditions by troposcatter provided the station at this end is well sited and using four *Yagis*).

June Charles, G4YIR, (ESX) was away for the first part of October and returned to find conditions flat, hence little to report apart from 12 new CW stations. Colin Ford, G4ZVS, (WMD) lists several OKs worked on CW and which have helped his ladder score along nicely. Oct. 3 OK3KGW/P (JN99BB) at 1,451 kms., then OK1AQF/P and OK1IBL in JO60, the following day bringing OK1EX/P (JO60) at RST589 each way. In the CW contest, Colin's best DX was GM4CAN/P (IO86RW) at 502 kms. in flat conditions.

Ela Martyr, G6HKM, (ESX) writes, "Last month I did not know where to start, so much happened; this month I am wondering whether to start at all". The tower has been down at storm level for days and more time seems to have been spent keeping the antennas pointing into the wind than putting RF into them. She has received an attractive German award for working stations in DOKs, G01, G22, G26 and Z32, called "The WXNN — Nordeifel Award" and the manager is Margret Schreiner, DC5KE, Wildenburger Str. 29, D-5370 Kall-Benenberg, FRG. Cost is DM5 or 10 IRCs which is very expensive.

Welcome now to Irwin Brown, G1IJUS, from Newtownabbey (ATM) whose VHFCC claim is being processed. After many years as a SWL, when he used to contribute to Justin Cooper's column, he took the *R.A.E.* in May, 1984 and got his licence in late August that year. His initial operation was on FM with a *Yaesu* FT-290R which was soon replaced with an FT-221R, the collinear antenna swapped for a 9-ele. *Tonna Yagi* at 35ft. and a *B.N.O.S.* amplifier giving 100w added. The QTH is 200ft. *a.s.l.* Irwin's interests are contest operation and exploring all forms of propagation apart from *E-M-E*. He enters the Squares table with 116 worked of which 76 are confirmed.

### Seventy Centimetres

G0CUZ, in a P.S. to his letter, comments; "Not worth updating my Annual Table scores this month", which adequately sums up the mediocre conditions since the early October tropo. finally fizzled out. Colin's only QSO he reckons worth a mention was with G4KUX (DHM) for an all-time new square and county on the band due to the NE being a 70cm. blind spot from YM40f.

Gerry Schoof, G1SWH, (MCH) is now active on the band using a *Trio* TS-780 and a 19-ele. *Tonna Yagi*. As he has done so

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		23 CENTIMETRES		TOTAL Points
	Counties	Countries	Counties	Countries	Counties	Countries	Counties	Countries	
G1KDF	—	—	94	25	77	16	30	7	249
G4NBS	43	5	72	22	59	21	47	18	239
G1DOX	—	—	83	11	50	8	30	5	187
G6XVV	—	—	83	17	42	7	20	4	173
G4SEU	56	5	62	13	30	4	—	—	170
G6HKM	—	—	74	26	51	17	—	—	168
G4TIF	57	6	50	17	25	12	—	—	167
G0CUZ	—	—	87	30	37	13	—	—	167
G4MUT	35	4	59	16	34	8	14	5	156
G4YCD	—	—	82	23	39	7	—	—	151
G1LSB	—	—	56	12	58	20	—	—	146
G4DEZ	—	—	52	21	7	1	23	13	117
G6AJE	—	—	49	14	39	11	3	1	117
G4HGT	21	2	68	16	6	2	—	—	115
G1SWH	—	—	87	13	11	3	—	—	114
G6MGL	—	—	27	9	32	8	22	8	106
G3FPK	—	—	80	25	—	—	—	—	105
G6ECM	—	—	79	24	—	—	—	—	103
G6OKU	—	—	61	9	25	2	—	—	97
G1EHJ	—	—	49	6	36	4	—	—	95
G4WXX	—	—	79	14	—	—	—	—	93
G4VOZ	44	5	—	—	33	5	—	—	87
GW6VZW	—	—	64	19	—	—	—	—	83
G4AGQ	16	3	40	11	10	2	1	1	82
G8XTJ	—	—	63	16	—	—	—	—	79
G1PDW	—	—	61	17	—	—	—	—	78
G6XRK	—	—	60	15	—	—	—	—	75
G6YIR	—	—	57	17	—	—	—	—	74
G4TGK	—	—	58	16	—	—	—	—	74
G4EZA	—	—	46	13	9	1	—	—	69
G1CRH	—	—	56	12	—	—	—	—	68
G2DHV	8	2	45	6	2	1	—	—	64
GU4HUY	—	—	52	11	—	—	—	—	63
GW4HBK	53	7	—	—	—	—	—	—	60
G8RWG	—	—	45	9	4	1	—	—	59
GM6XPI	—	—	29	12	5	4	—	—	50
G1HGD	—	—	17	4	13	2	—	—	36
G6CSY	—	—	9	4	13	3	—	—	29

Three bands only count for points. Non-scoring figures in italics.

well on 2m. he ought to do so on this band, provided the activity is there. From Oct. 18 he lists G1KDF (LNH), G8XVJ (CHS), G1DOX (CBA), G8HDS (MCH), G1IJEU (ATM), GW4MGR/P (CWD), G8OHM (WMD), GW8TFI/P (GWT), G3GJL (HWR), G4THB/P (DYS) and G8PDP (SRY).

G4EZA has had the use of a borrowed 70cm. Tx in October and with 10w to a 21-ele. *Yagi* via 30 metres of UR-67 feeder, was able to claim additional points for the Annual Table. In spite of the approximately 5 dB. cable loss, Tim's appetite for the band has been whetted.

G4XEN is now up to 98 squares worked and a surprise new one was only realised when a QSL arrived from DF5LQ (JO44) worked in the Feb. 9 *Aurora*. John lists DJ2LF (JN59) on Oct. 4 and later that evening, in the UHF/SHF Region 1 Contest, he reports conditions as superb. He worked OK1s KRY, VUF/P, DIG/P, KRG/P, KHI/P, KVK/P, DJW/P, KIR/P which brought a couple of new squares, JO60 and JN69, but his best DX was OK5UHF (JO80) at 1,213 kms. and another new square.

### The Microwaves

Almost nothing to report this time on the microwave scene except that Bryn

Llewellyn, G4DEZ, (ESX) now has a group of four 55-ele. *Tonna Yagi* on his tower for 23cm. and is now up to 13 countries this year on the band. He has full planning permission for his tower now and no more of this nonsense about licensing it for a year, "... and we will consider renewing it for another year if we don't get any complaints".

### Interference

In the past, G4XEK's severe overhead power line QRM problems have been mentioned in VHF/B. At times, Bob has had to put up with very high level hash due to faulty insulators, etc. He has recently noted S9-plus QRM on 2m. from a signal every 11 kHz throughout the band. This was traced to a house about 500ft. away in which an *Atari* computer was in use, but Bob writes, "... but he is moving soon, however".

Most home video recorders of modern design are wide open to RF from transmitters and one reader with such problems in his own home is G4XEN. John found some interference on his *Sanyo* machine when operating on 2m. which was due to a wideband preamplifier at its front end. He tried a quarter wave stub but that had no effect. A 100% cure was effected by a notch filter and a braid

breaker filter supplied by the *RSGB* and he reckons that other readers might like to learn how effective these were in his case.

Station	ANNUAL CW LADDER				Points
	4m.	2m.	70cm	$\mu$ Wave	
G4AGQ	27	359	13	1	400
G0ABB	—	297	2	—	299
G4YIR	—	287	—	—	287
G4ZVS	—	225	—	—	225
G4SFY	—	221	—	—	221
G4ARI	—	164	43	—	207
G4EIB	—	165	—	—	165
G4OUT	—	158	—	—	158
E15FK	—	116	—	—	116
G4PPV	—	115	—	—	115
G4EZA	—	109	—	—	109
G4XUM	—	105	—	—	105
G4VOZ	58	—	26	—	84
G0DJA	—	78	—	—	78
G4TJE	—	52	—	—	52
GW4HBK	51	—	—	—	51
G0FB	—	—	—	—	—
G/PA	—	38	2	—	40
GU4HUY	—	40	—	—	40
G2DHF	7	30	—	—	37
G0FOT	—	11	1	—	12

No. of different stations worked since Jan. 1.

As observed at G3FPK, in spite of all the assurances from *British Telecom* about its solving the *Ambassador*, and similar, QRM problems, the nuisance from these wretched instruments continues. It is quite obvious that unmodified, defective instruments are still being supplied and installed to customers. Your scribe has had a long correspondence with *BT* concerning problems with *Ambassadors* in the local area, right up to the Chairman, but all to no avail. All that happens is that internally, they shove the matter from one department to another to ensure that nobody actually has to do anything.

The attitude is, "You tell us where the defective instrument is and we will replace it". It is *not* the job of any member of the general public to act as an unpaid interference detector. Some of *BT*'s equipment is behaving as illegal radio transmitters so should be treated the same way as anyone deliberately operating a pirate radio station.

Are other readers still suffering from this telephone QRM? If either you and/or the instrument are well sited, strong interference in the 2m. band can be detected from at least one kilometre distance. In AM mode, the noise is a wide band whining one, accompanied by a hammering sound. On SSB/CW mode, it is a wideband raucous racket with a multitude of carriers. There are usually three or four bands of QRM from each instrument over a band width of about 100 kHz, each band being anything up to 20 kHz wide. If you live very close to an *Ambassador*, you might find the band useless when beaming in its direction.

These unstable transmitters are very

temperature sensitive so will wander about in the course of the day as the temperature in their immediate environment changes. The interference goes when the telephone is being used, which means that if it is in an office, all weekend and in public holidays, it will be happily radiating anything up to 30-40 milliwatts in the 2m. band.

## Digital Matters

No, this is not a new title for the packet radio column since there is nothing to report on that this time apart from acknowledging receipt of a copy of the minutes of the October 23 meeting of the *MAXPAK* group. This is about computer programs of direct use to VHF radio amateurs.

Tim Raven, G4ARI, has been busy with his *Commodore 64* machine for which he has the *1541* disc drive and *MPS803* printer. He has written programs for our CW ladder table and another for HF/VHF contest scoring. The latter produces hard copy *RSGB*-type log sheets, scored and checked and allows full data base manipulation. The VHF program also caters for non-Maidenhead locators and, as well as the required contest data, also analyses the best DX worked, points *per* QSO and a total of the squares worked.

Tim sent a sample of an HF contest log which completely fulfils the *RSGB*'s requirements. He writes:- "If anybody wants a copy I will send them the programs free of charge on receipt of a 40-track, single-sided, single-density 5¼ inch disc and *s.a.e.*". Both programs have full "driving instructions" included in them, with the option to print off.

Your scribe was pondering over the possibility of working GM4DMA/A in AS69e recently and came across the Troposcatter Path Loss article by G3YGF in the August, 1981 *RadCom*. Using a borrowed *ZX-81*, a comprehensive program has been written, in user-friendly style, the object of which is to calculate the path loss for the VHF/UHF/SHF frequency to be used.

Path loss has two basic components, the first being the free space one, the formula for which is in all the text books, the second taking account of the local and distant topography, antenna gain and bandwidth and radio refractive index of the air. Obviously the Rx and Tx data for both stations must be entered. The path loss is broken down into various components so you can see the effect of the site loss, or gain, for example.

The original article illustrated path profile diagrams so for serious microwave use in particular, you will need to know the height of "local" obstructions. As the distance between stations is required, a Maidenhead distance and azimuth locator program is included, including an error checking routine in case you key in something silly.

Of course, the *ZX-81* is very old hat and slow yet extremely versatile nonetheless. After all, its CPU is the same chip as found in many more recent machines. It can only be loaded from a cassette so if any reader would like a copy for free, just send a clean cassette — not one that has been used dozens of times — with sufficient return postage — *to the home QTH*. It takes about 4½ minutes to load and if you state your Maidenhead locator and the height of your antennas in metres above sea level, you can have a bespoke tape. At nearly 10k-bytes long, this program is for the 16K *ZX-81*, of course.

## Tabular Matters

We draw the line under the Annual Tables at the end of December so please make sure you get your last claims in by the all-important deadline in the box, Jan. 7, for publication in the February issue.

About the Squares Table, some entries have remained static for ages and it is usual policy to delete these after a year on the assumption that the participant is no longer interested. If you are still active but have forgotten to update your scores for a long time, please do so. Also would those whose calls appear in the 13cm. All-time Table please send in their latest totals; there must be some additions following the excellent tropo. in Sept./Oct.

## "VHF" Bands deadlines for the next three months:

January issue — December 3rd  
February issue — January 7th  
March issue — February 4th

*please be sure to note these dates*

## Gem of the Month

Overheard on 20m. during an esoteric discussion on conditions; A. "Conditions have changed dramatically. There is a major restructuring taking place on the Sun". B. "Oh, is there? Who's doing that then? Wimpey!"

## Sign Off

Not a very exciting month but maybe we might have a Christmas lift. Hope you all have a very enjoyable Christmas, with some time off to operate on the VHF bands and then write to let us know what you have been up to. As always, all your news, views and claims to:- "VHF Bands", *SHORT WAVE MAGAZINE*, 34 High Street, WELWYN, Herts., AL6 9EQ. 73 de G3FPK.

# Improving the Heathkit HD-1410 Electronic Keyer

E. H. TROWELL, G2HKU

**M**ORE than twenty years ago the Heath Co. of Benton Harbour, Michigan, U.S.A., introduced the Heathkit HD-10 all-transistor electronic keyer which soon established a reputation for good keying and reliability. After being available in this country for some years a smaller self-contained iambic twin paddle unit followed, known as the Model HD-1410.

This keyer has proved to be popular among the CW fraternity and, furthermore, very reliable in operation. It may be operated in either the "iambic" mode by squeezing the twin paddles or as a "normal" keyer by treating the paddles as one unit.

Operated by an external power supply of 10-14.5 volts DC, or by its own built-in AC mains supply, the keyer packs a lot of facilities into its weighted and perforated two-part case with dimensions of 5" wide x 3" high x 7.4" deep. On the front panel, to the left of the twin paddles, is the speed control knob which, when pulled, will lock the keyer in the "ON" position for transmitting tuning or adjustment purposes. The speed control operates from below 10 wpm to above 35 or 60 wpm, the required range being selected during construction by the choice between two resistors. The power "ON" indicator light is above the paddles and to their right is the power switch which, when rotated, increases the volume from the internal sidetone oscillator and speaker. The note from the oscillator may be adjusted internally from 500 Hz to 1000 Hz and a headphone jack which in use silences the speaker, is mounted on the rear panel.

Above and to the right of this headphone jack are three phono sockets marked RCVR AUDIO, KEYSER OUTPUT and EXT KEY respectively. To their right is the external 12v DC power socket and to its right the mains input fitting. If a cable is connected between the RCVR AUDIO socket and the headphone socket on the receiver, the audio from the receiver will be heard from either the keyer speaker or the headphones together with the sidetone monitor note. Heathkit claim the KEYSER OUTPUT position will key most-transmitters using solid-state keying circuits in addition to those using valves with grid-block or cathode keying (note the phrase "most transmitters"). The EXT KEY socket enables a "straight" key to be used in addition to, or

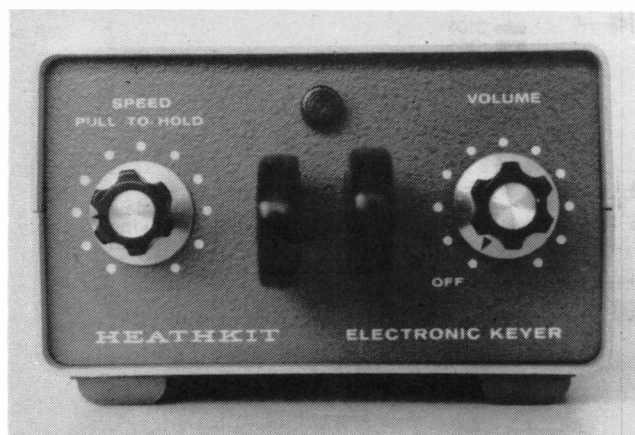


Rear view of the modified keyer showing the additional phono socket at upper left.

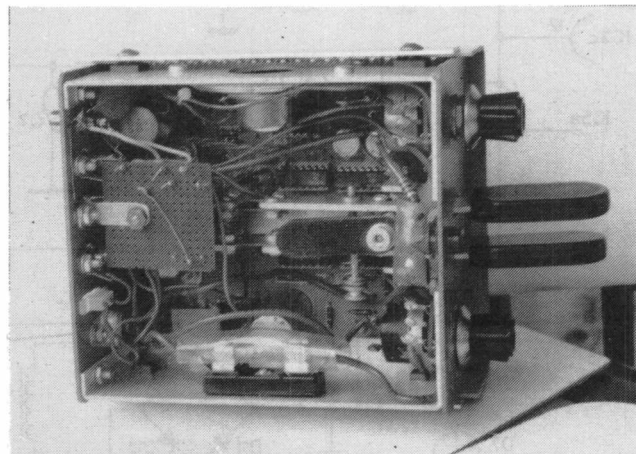
in place of, the electronic keyer, the sidetone facility remaining operative.

With this keyer, some operators have experienced difficulty in keying transmitters using solid-state keying circuits that require the keying line to be brought within a few tenths of a volt to ground. This is where the phrase "most transmitters" in the preceding paragraph becomes reality. However the modification to be described will overcome this problem and while retaining all original transistor keying functions offers an additional alternative relay keying system.

The heart of the additional keying system is a dry reed relay, the type specified being used by the writer in this and other similar projects over the years with excellent results. The relay is a magnetically operated type, capable of high operating speed

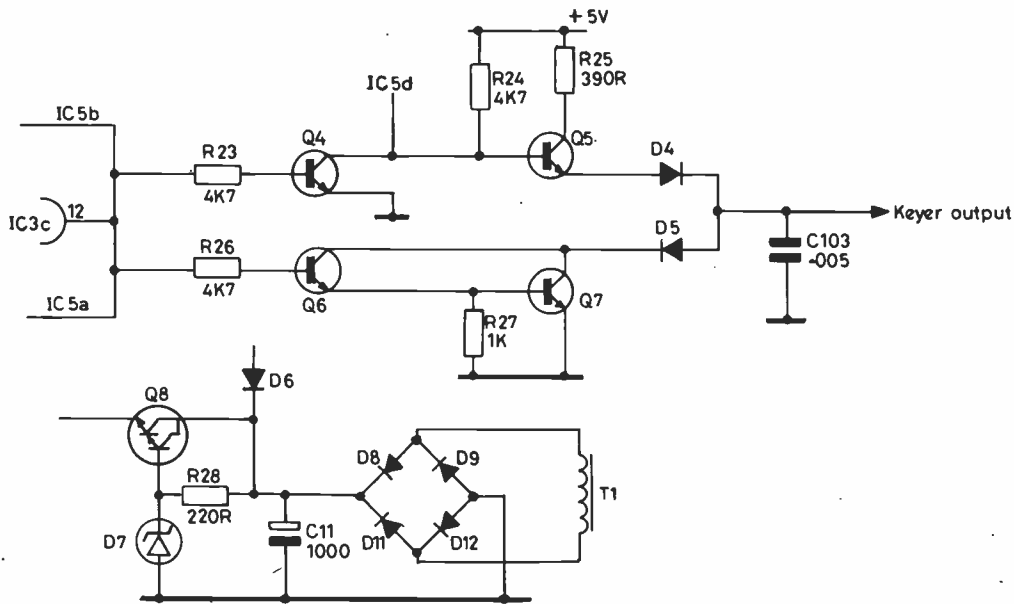


The Heathkit HD-1410 Electronic Keyer.



Internal view showing the new board mounted in the middle of the rear panel.





E 824

Fig. 1 PART OF THE ORIGINAL HD1410 KEYER CIRCUIT

(nominally 1-2ms). Precious metal contacts produce low bounce and contact resistance, in effect negligible for this purpose. The reed is capable of switching a load of up to 15 watts and is housed within its own printed circuit mounting reed operating coil which has connecting and mounting pins also acceptable to Type 3 *Veroboard*.

Using a piece of *Veroboard* as specified, mount the complete relay on the board, first bending the reed wires to pass through the

board, as it is difficult to mount the reed after the coil is fitted. The BC107 (or BC108) N-P-N type transistor mounts directly through the *Veroboard* and the simple board wiring and layout is shown in the photograph. The mounting bracket should be made as shown in Fig. 3 and bolted to the *Veroboard* prior to the final installation.

Referring now to the keyer main printed circuit board and the Heathkit lettering on this board, on some boards there may be a hole at the junction of pin 12 of IC3c and R23 (4700 ohms). If not, drill a 1/16" hole through the board from the print side. Pass an insulated piece of stranded wire through the hole from the component side and, after cleaning the area around the hole, solder this wire to the board. Make this lead long enough to reach the 4.7K resistor on the new *Veroboard* when in position.

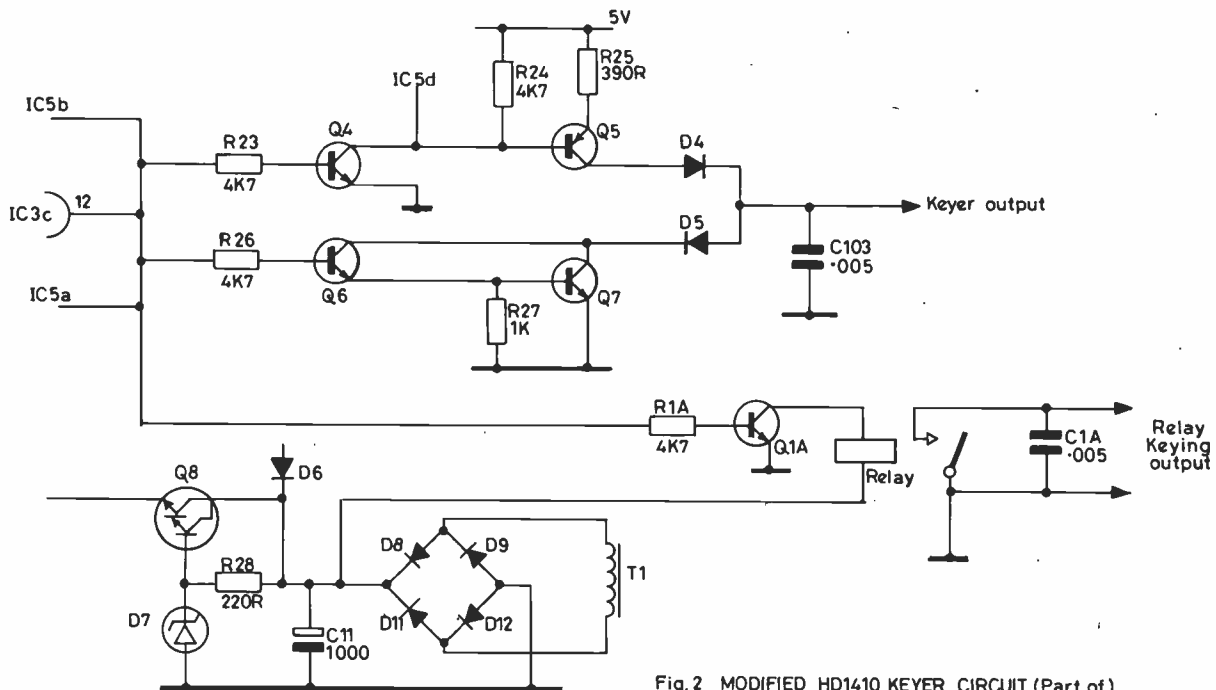
Drill another 1/16" hole through the main keyer board (again from the print side) at the junction of C11 (1000µF) and R28 (220

**Table of Values**

Fig. 2

- R1A = 4700R
- C1A = 0.005µF
- Q1A = BC107 or BC108
- Reed relay = RS Components Type 6 RSR A (stock no. 338-147)
- Reed coil = RS Components Type 3 (stock no. 349-844)

Also: Type 3 *Veroboard*, phono socket (single hole fixing).



E 825

Fig. 2 MODIFIED HD1410 KEYER CIRCUIT (Part of).

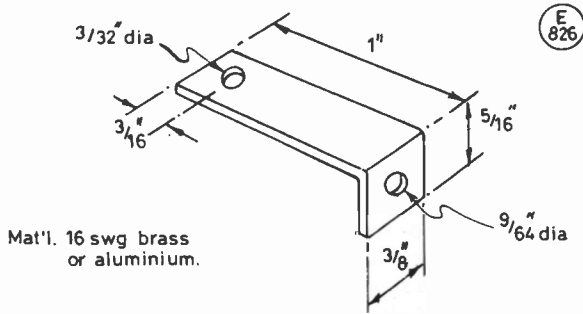
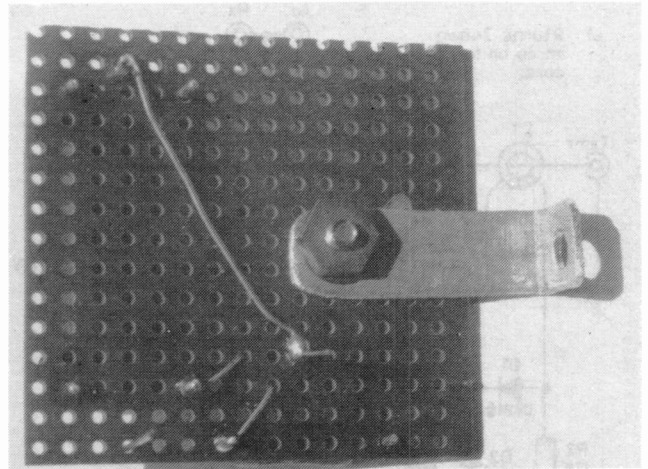
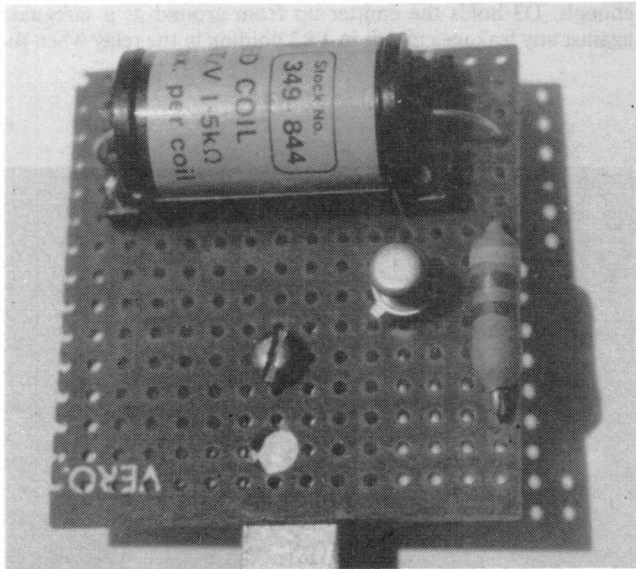


Fig.3 HD1410 KEYER RELAY MOUNTING BRACKET



The wiring and mounting bracket of the new board.



Component layout on the new board.

ohms). Solder another similar lead from this point to reach the relay coil on the new board.

A single nut fixing type of phono socket was used for the relay output as this type requires less room than the twin bolt mounting variety and will just fit nicely on the rear panel. It should be positioned 9/16" from, and in line with, the phono socket marked RCVR AUDIO. This will allow sufficient clearance for the securing nut to be tightened and the 0.005µF by-pass capacitor to be mounted directly on the socket.

After connecting the two leads from the main board and installing the two from the reed relay to the new output socket, the completed new board should be attached to its mounting bracket with a 6 BA nut and bolt. The bracket is attached to the top securing screw of the existing socket marked KEYER OUTPUT, being careful to ensure that the socket is not short circuited by the bracket.

The modified keyer has been in use for over a year using various makes of equipment with excellent results, no problems being encountered at any speed and all existing facilities being retained.

G3RJV's  
WORKSHOP NOTEBOOK

AN RF CHANGE-OVER SYSTEM

THE Bard of Wisconsin, W9SCH, once suggested a good motto for QRP operation might be:

*"How far the little rig throws its signal . . .  
So shines a good deed in a naughty world"*

Certainly in recent years there have been enough buildable little transmitter circuits for any radio amateur to shine a good deed in a naughty world. One of the ways I enjoy doing amateur radio is to use a simple transmitter board alongside a decent receiver and see what I can work on a band. I have usually advised this approach for those who want their first taste of homebuilt amateur radio.

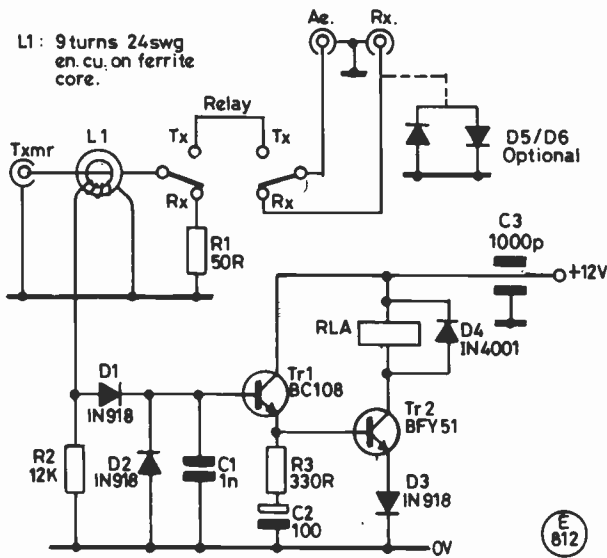


Fig. 1 RF CHANGE-OVER

which appears across the resistor R2. Diodes D1 and D2 detect the signal which is decoupled by C1. The resultant small DC signal operates the DC switching circuit formed by TR1 and TR2. This energises the relay, changing over the switching arrangement. The output from the transmitter is now connected to the antenna; the receiver is disconnected.

It would be inconvenient if the circuit followed the action of a keyed transmitter; the relay would chatter in and out with the keying. The relay driver transistor is therefore "slugged" by R3 and C2 so that when the key is up and no signal appears at TR1, TR2 holds on for a short time. The amount of time that the relay holds in is controlled by the values of R3 and C2. The values given in the circuit are about right for holding the relay on during normal keying speeds. The relay will not fall out during words and groups but a pause will return the circuit to the receive position.

What about all those diodes? Don't worry, they are cheap enough. D3 holds the emitter up from ground as a safeguard against any leakage current in TR2 holding in the relay when the

In recent times I have used my Drake 2B receiver, a magnificent machine of the 1960's, with such transmitters. Usually each transmitter has had a simple transmit/receive change-over arrangement to switch between the transmitter output and the receiver input. It occurred to me that life would be easier if I used a common change-over arrangement for all the transmitters, housed in the receiver.

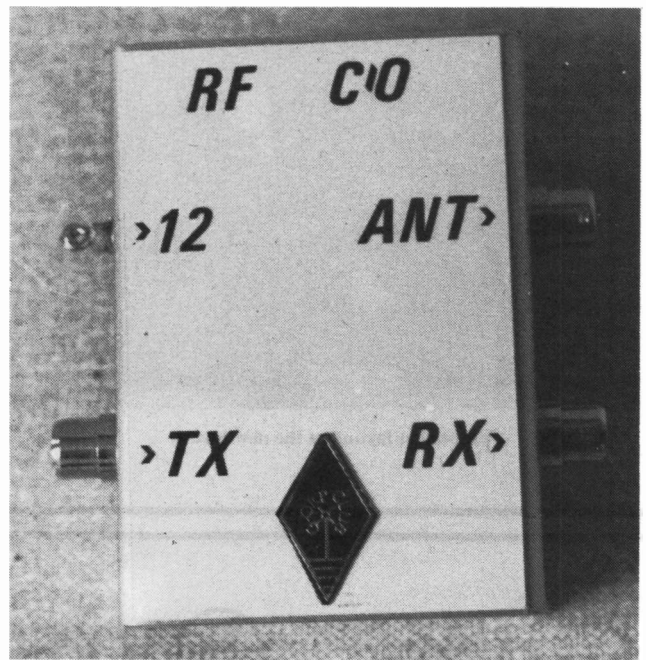
The ideal system would be an RF powered change-over built into the receiver so that any transmitter could be used by simply connecting its output to the receiver. The action can be actuated by the RF output of the transmitter: key the transmitter and automatically the antenna is switched from the receiver to the transmitter output. Such a system ought to be physically small and capable of responding to a typical QRP transmitter producing in the order of 500mW to around 10W of RF power.

RF change-over systems are common circuits, many being used in the change-over of external PA's for low power VHF transceivers. After looking through a selection of available circuits and rejecting many as too complex, I evolved the circuit shown in Fig. 1.

**The Circuit**

The circuit has three signal terminations for ANTENNA, RECEIVER and TRANSMITTER which are interconnected via the contacts of a two-pole changeover relay. Fig. 1 shows the switching set in the receive state, the basic operational position when the unit in housed in the receiver. In this state the receiver functions normally with the antenna connected to the receiver input.

When a connected transmitter is keyed, the signal feeds to a 50Ω load, R1, the wire bearing the signal passing through a ferrite toroid. This toroid has a small winding to pick up a sample of RF



An external view of the RF changeover.

transistor is switched off. D4 acts as a spike suppressor when the field in the relay coil collapses. D5 and D6 are optional protection diodes for the receiver input. A couple of small signal diodes wired back-to-back ensure that large signals cannot enter the receiver input. This is a sensible precaution, especially for solid-state receivers, although good old valve receivers should have no trouble.

The basic circuit does not contain any form of muting circuit for the receiver. Being a simple man I am happy just to turn down the audio gain and monitor the transmitted signal with the receiver. It would be a simple matter to use a relay with extra switch contacts and include some form of muting for the receiver. Some receivers do have circuit options for providing muting and the switching would have to be arranged to suit. The easiest method would be to arrange an extra set of switch contacts to take the receiver input socket to ground on transmit. This may still provide a residue of carrier pickup on the leads to and from the switch points which may be enough to comfortably monitor the signal.

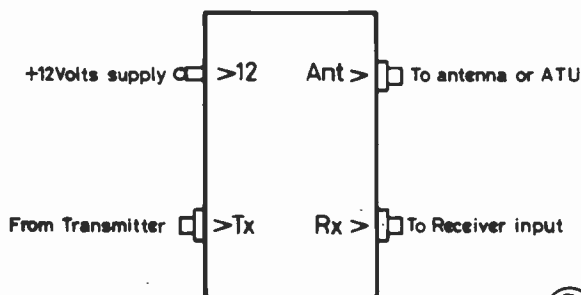
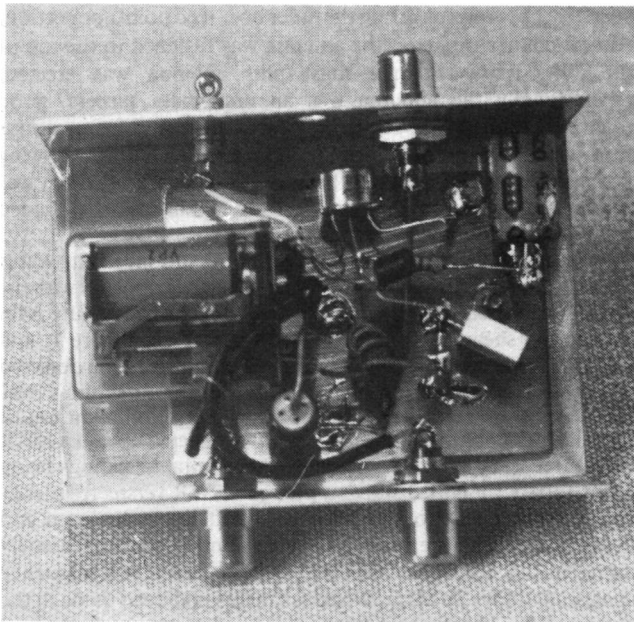


Fig. 2 RF Change-over connections



Inside the RF changeover.

The pickup coil L1 is wound on a ferrite toroid. I happened to use a surplus toroid of unknown type and origin which had an outer diameter of about half an inch. For those who have to buy a toroid, the FT37-43 should be suitable. I found that nine turns of wire provided enough pickup to actuate the circuit from RF power levels as low as 100mW. The circuit was still happy at 10 watts: the most RF I can generate in my shack. The individual constructor will have to experiment with the number of turns for L1 to suit the toroid in use. The wire (unscreened) from the transmitter socket to the relay switch passes through the centre of the toroid. This circuit is only advised for use with lower powered transmitters.

### Construction

The whole circuit was built into a small aluminium case measuring 2" x 3" x 1" and sold as *Minffordd Engineering* Aluminium Box Type A6. The method of construction used is the one the Americans call "Ugly Construction". A piece of blank printed circuit board is bolted, copper side up, inside the lid of the box. The components which connect to ground, i.e. R1, R12, D2, C1, C2 and D3 have one side soldered directly to the copper surface of the board. These components are mounted vertically to provide fixing points for the other components. The layout spacing depends upon the physical sizes of the components.

R3 should be capable of handling the power of the transmitters expected to be used with the circuit, for at least a short time. I used a 3 watt resistor which did not 'cook' at momentary exposure to 10 watts. Naturally, R1 can be made up with combinations of lower wattage resistors to give the desired value. The supply is brought into the box via a 1,000pF feedthrough capacitor.

The whole circuit is built into what is really the lid of the box. The three sockets and the 12 volt input point are mounted on the sides of this lid as shown in Fig. 2. I have phono sockets for all my shack terminations so these were used in this project. Those who use larger sockets may have to resort to a larger box.

The relay in the prototype was yet another surplus item. I know nothing about it except that it was sold as a 12 volt, 2-pole changeover relay. These are common items but if a surplus relay is used, do check that it will easily pull in with 12 volts across the coil, a lot of surplus relays are designed for 24 volt operation. The leads from the receiver and antenna sockets to the switch contacts are thin screened leads. Miniature coaxial cable is ideal, although for

short runs like these, cheap microphone screened lead will serve the purpose.

### Using the Unit

Although I designed it to go inside the receiver, it ended up mounted on the back of the Drake 2B. In a solid-state receiver, 12 volts could be taken from the receiver, or the power could be derived from the transmitter board. The RECEIVE socket is permanently connected to the receiver input and the antenna is fed to the receiver via the ANTENNA socket on the change-over box.

The net result is that the receiver is now available for use with a transmitter at any time. The output from the transmitter is connected up to the TRANSMITTER socket and the set up is ready to go.

It's a useful little box, this one. After I built and tried it out I wondered why I had never made it up before. It proved to be the idle experimenters dream . . . just knock up a little transmitter board, hook it into the receiver, and off you go!

### COMPONENTS SOURCES

FT37-43 cores are available from *TMP Electronics*, Unit 27, Pinfold Lane, Buckley, Clwyd, tel: (0244) 549563; or from *Cirkitt Holdings*.

Aluminium Box Type A6 is available from: *Minffordd Engineering*, Sun Street, Ffestiniog, Gwynedd. Tel: (076-676) 2572.

## MORE ON "CHEAP POWER"

Following the item in this series in *Short Wave Magazine* for April 1986 on using the inexpensive Power Supply available from *J. Birkett* of Lincoln, I received a letter from Richard Newton, G0EWH.

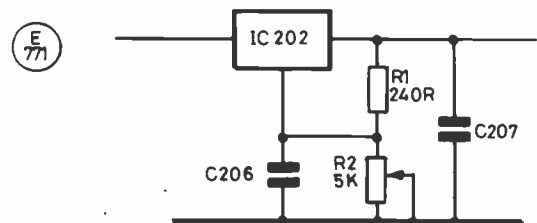


Fig. 1

Richard points out, quite rightly, that the 5K potentiometer added to the original circuit of the power supply does not give a fully linear control of voltage output. There is little change at the low end and a considerable swing at the top end of its travel.

This can be corrected by adopting the circuit changes shown in Fig. 1; R1 and R2 are repositioned as shown. The complete modification is to proceed as follows:

R201 is replaced by a link, R202 is set fully anticlockwise to give its maximum value of 220R between the output and adjust pins of IC202. R203 is replaced by the 5K linear pot wired as a variable resistor.

Richard's modifications gives him a fairly linear scale from 1.5—20 volts.

Thanks Richard!

# A Feed Point Problem

*a mystery unravelled*

A. P. ASHTON, G3XAP

OVER the 15 or so years since obtaining his amateur radio licence, the author has constructed a variety of different vertical antennas and has obtained very good results from them. One point that has been noted is that the feed impedance is always around the value that is expected and, subsequently, resonating and feeding these antennas has never been a problem.

However, more than one amateur has reported problems with the feeding of vertical antennas and the author was at a loss to explain why. For example, one G3 station constructed a five-eighth wave vertical for 14 MHz, resonated with a base loading coil, and was unable to get a feeder VSWR of below 2.5:1 in spite of trying various coils of differing diameter, former material, wire gauge, etc. Improvements to the ground system also failed to resolve the problem and in the end the amateur concerned bypassed the problem by erecting a loop antenna and discarding the vertical. It had always been a disappointment to me that in spite of having inspected the antenna, I could put forward no suggestions regarding the cause of the problem — in short I considered that the antenna should have worked; in fact it didn't!

Recently I encountered exactly the same problem myself and, not to be beaten a second time, investigated the situation and eventually found the cause and, hence, the cure. Similar anomalies have occurred regarding the feeding of Yagi antennas, and the purpose of this present article is to explain the problem in detail in the hope that other constructors can avoid similar problems.

## The Problem

With the availability of easily converted CB transceivers at very low cost, activity on 29 MHz FM has increased at quite a pace and the author joined the ranks of "29 FM-ers" using a mobile set up with a mag-mount antenna. Although many contacts were made with this station, the author spends little time in his car and decided that more enjoyment of the mode would be obtained by setting up a base station. Some form of vertical antenna appeared to be mandatory since most local activity is by means of the ground wave which is, as we know, vertically polarised.

After some deliberation it was decided to build a five-eighth wave and that it should be mounted on top of an existing 30ft. mast. The design depicted in Figure 1 was devised and such an antenna duly constructed. It was initially mounted on a 4ft. length of aluminium tubing sunk about 2ft. into the ground, with the four radials laid out along the ground. This gave easy access to the feedpoint to enable adjustment of the loading coil and also to enable test equipment to be used at the feed point rather than at the end of a longish length of coaxial cable. The wire from the coaxial socket on the tuner box was tapped up the coil until a position was reached that resonated the system at 29.6 MHz — this being established by means of a noise bridge. After soldering the wire to the tap point, an SWR bridge was installed at the feed point and the VSWR checked across the whole 400 kHz that the transceiver covered. The maximum indicated VSWR was well below 1.2:1, endorsing the author's view that such antennas are easily tuned and display a feed impedance which is a good match to 50-ohm feeder!

After fully waterproofing the tuner box, feed point connection, coaxial connectors, etc., the antenna was fastened to the top of the 30ft. mast and the mast plus antenna was erected. Operationally the antenna was an immediate success, good reports were received both from local stations and from various Europeans during a period of Sporadic E propagation. Allowing for feeder losses, it is unlikely that more than 3 watts of energy was actually reaching the antenna, and the actual results obtained were somewhat above expectations.

After about 2 weeks of very enjoyable operation, strong winds passed through Suffolk and the antenna parted company with the mast! Subsequent examination showed that the heavy duty ABS tubing had sheared at the point marked "X" in Figure 1, and modification was obviously necessary. The construction depicted in Figure 2 was thus devised, the necessary modifications duly made and the strengthened antenna was repositioned on top of the 30ft. mast. The rig was immediately connected up and a check on the feeder VSWR was made — the resultant readings being quite horrific! Figure 3 shows a plot of VSWR versus frequency over the range 28.0 to 29.7 MHz (the readings at the lower end being made using the main station rig) and it was immediately apparent that the device appeared to be resonant at a frequency somewhat above 30 MHz. No adjustments had been made to the antenna's length, its resonating coil, its radials or its feeder and the immediate inference was that a connection somewhere had either broken or gone "high resistance". The antenna was again lowered and given a very thorough examination but no parts of the device were in any way defective.

The next stage was to reposition the antenna on the short mast so that measurements could be made, the first of which was to determine the resonant frequency. The result was somewhere above 31 MHz but accurate assessment was not possible as the receivers used in conjunction with the noise bridge did not cover such a high frequency.

It was obvious that the antenna required more loading in order to bring its resonant frequency back down to the required figure, and this was achieved by altering the tapping point on the loading coil — resonance again being established by use of the noise bridge. However, the feed impedance (also measured with the noise bridge) was noted to be around 90 ohms and this figure was

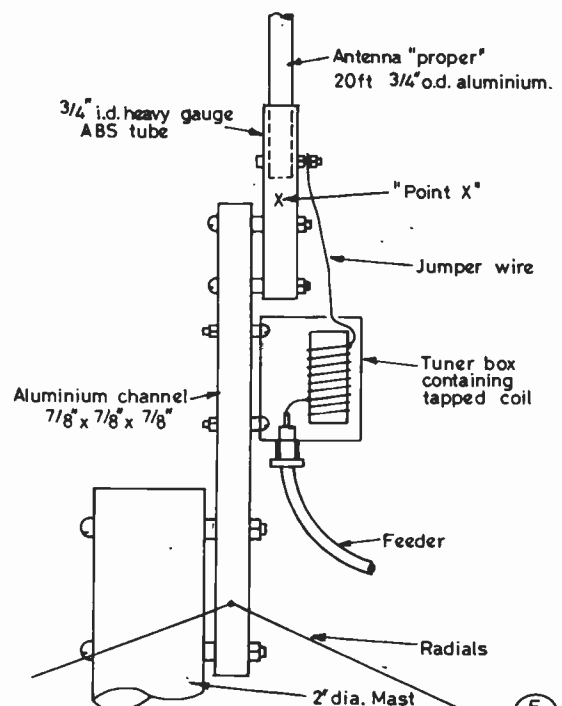


Fig.1 THE ORIGINAL ANTENNA



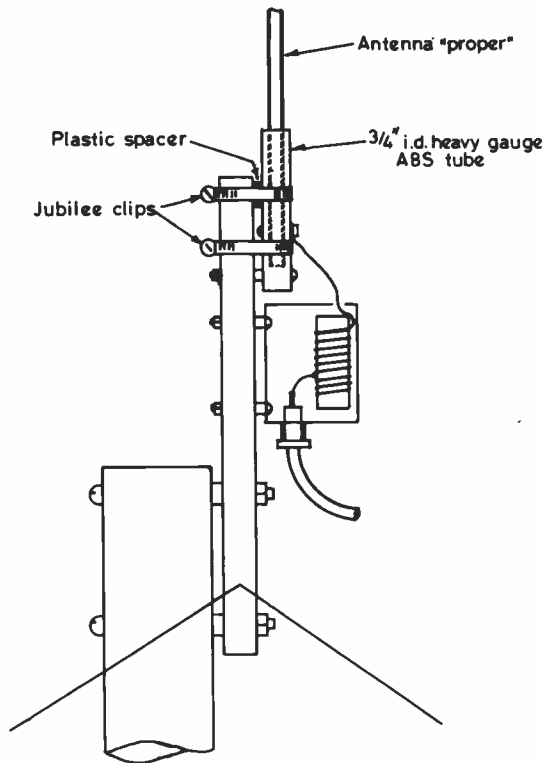


Fig. 2 THE MODIFIED ANTENNA

E 819

confirmed by measuring the VSWR — a result of around 2:1 being obtained. It was now apparent that for some reason the modified construction method had not only moved the resonant frequency by over 1 MHz but had also doubled the feed impedance!

It would have been possible at this point to have constructed an “L” network in order to transform the feed impedance down to 50 ohms, but the author was more interested in finding out what had caused the change than in operating on 29 MHz FM! By investigating the exact nature of the phenomenon two things could be achieved — firstly, re-occurrence of the problem with other antennas could be avoided and, secondly, the author would learn a little more about the subject of antenna feeding. It was also very clear at this stage that problems reported by other amateurs were of a very similar nature to the present problem (e.g. the example given above) and possibly occurred for the same reason.

### The Investigation

A significant point to note is that the antenna as first constructed displayed the feed impedance expected of it, whilst the second did not, so the first step was to rebuild the device exactly as per Figure 1 — weak point and all! Having done this and also

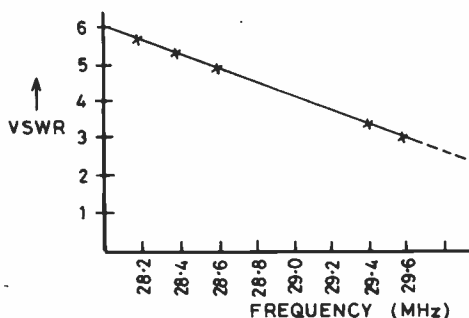


Fig. 3 VSWR v Freq. on the modified antenna

E 819

moved the coil tap point back to its original position, resonance was measured at 29.60 MHz, the feed impedance was around 55 ohms and the feeder VSWR (according to a resistance bridge at the feed point) was approximately 1.2:1 — i.e. almost identical to the original results. It was apparent, then, that the changes in electrical properties of the antenna were caused by the change in construction method used.

After a period of studying the two designs it was noted that the biggest single difference between them was the large degree of overlap between the modified antenna and its supporting structure, the latter being to all intents and purposes at earth potential. It was possible that this area of the device was acting as a capacitor, the antenna forming one “plate”, the mast the other plate, and the heavy duty ABS tubing the dielectric. Figure 4 shows in schematic form the original antenna and the modified design — assuming the capacitance to be present. Assuming the dielectric constant of ABS to be around 3.5 it should be possible, I decided, to calculate the effective capacitance and to introduce, with a discrete component, the same value of capacitance into the original design. By so doing, the original antenna should be detuned to the same extent as the modified antenna.

However . . . consider Figure 5 which shows an ‘end on’ view of such a capacitor and it soon becomes apparent that, as it is difficult to determine the effective areas of the plates and their mean distance apart, plus the fact that the dielectric is part ABS and part air, such a calculation is far from simple! After some rapid revision of the long-forgotten mysteries of integral calculus, a result of 12pF was eventually obtained. (It would have been far simpler to measure the capacitance, of course, but this easy option did not occur to me until the mathematical exercise was complete!) Subsequent measurement gave a value of 16pF which was sufficiently close to the calculated value (with all its inbuilt assumptions) to convince old G3XAP that all those long hours

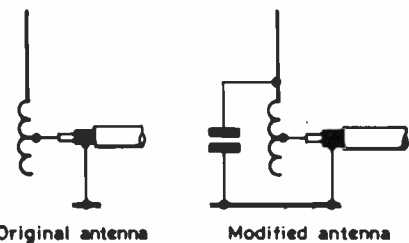


Fig. 4 Electrical representation of the two antennae

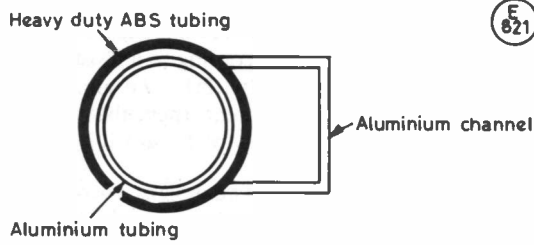
E 820

spent in the study of mathematics many years ago were perhaps not wasted after all:

A 15pF ceramic capacitor was connected between the top of the loading coil and earth with the antenna as rebuilt to the design of Figure 1 and the electrical properties of the antenna determined. A graph of VSWR versus frequency gave results practically identical to those depicted in Figure 3, whilst moving the coil tap position to that used with the antenna in Figure 2 produced a resonant frequency of 29.5 MHz, and indicated VSWR (at resonance) of 1.9:1 and a feed impedance of 88 ohms. The results were so close to those obtained with the modified antenna that the author believes that the cause of the problem had indeed been verified.

### The Cure

The solution to the problem was obviously to redesign the antenna mounting components in order to either avoid any overlap between the lower section of the antenna and any part of its supporting structure which is at earth potential or if overlap must occur, to space the antenna and its support sufficiently far apart that the capacitance between them is negligible. In fact the latter option was decided on and the latest version of the antenna



E 821

Fig. 5 End-on view of the 'capacitor' formed by overlapping the antenna with its supporting structure.

is seen in Figure 6(a). It will be noted that the actual antenna tubing is mounted on its supporting structure by means of two blocks of ABS, these blocks being drilled and tapped as shown in Figure 6(b). The new antenna has been in use for some time and has survived several periods of strong winds and hence appears to be mechanically superior to the original design.

Tuning the final version was very straightforward and the coil tap position for resonance on 29.60 MHz was found to be practically identical to that used with the original. The feed impedance was measured at 55 ohms and VSWR measurement (at the feed point) gave the results seen in Figure 7, from which it will be noted that the device is very broadbanded — the VSWR being below 2:1 from 29.7 MHz down to below 28 MHz.

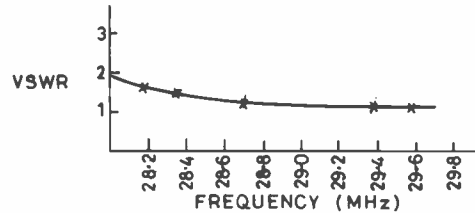
**Results**

The antenna has proven to be very potent with ground wave contacts in excess of 25 miles (with 4 watts of FM) being easily obtained. Many Europeans have been worked with this same power input and reports of 5-9 are common, with few stations failing to reply to a call. On adding a 'retuned' CB linear to boost the power output to 45 watts, a PY station gave G3XAP a 5-6/7 report during a brief lift, tending to confirm the efficiency of the antenna. With 150 watts DC input, the main station rig has been

used with the antenna to work many South American stations on CW which shows the broadband characteristics of the device — no ATU being used at this lower frequency. This, remember, is on 28 MHz at a sunspot minimum!

**Conclusion**

This exercise has shown that the close proximity of the high current portion of an antenna to a structure at earth potential can have the effect of shunting the antenna to earth with a capacitance of significant value. Not only is the antenna detuned by this



E 823

Fig. 7 VSWR v FREQUENCY ON THE FINAL ANTENNA

practice, but the feed impedance at resonance is also affected to a very large degree. It would appear that antenna constructors must be aware of the possible consequences of introducing such capacitance into their designs and ensure that suitable mounting methods are used. Although the example quoted was for an end fed antenna, the same problem could occur with the driven element of a Yagi antenna and go unnoticed if the feed impedance is adjusted to 50 ohms with a Gamma match. With such a system, a 1:1 VSWR might well be achieved, but the presence of several pF of capacitance between the feedpoint and ground is unlikely to permit the antenna's efficiency to be optimised.

It is hoped that the detailed discussion of this particular problem will help other amateurs to avoid this possible pitfall.

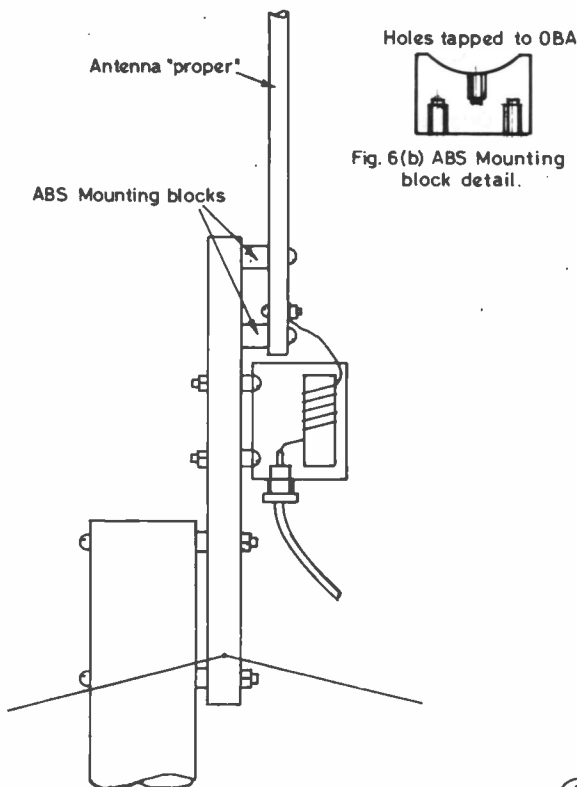


Fig. 6(b) ABS Mounting block detail.

Fig. 6(a) FINAL ANTENNA ASSEMBLY

E 822



"No, no! Not 'affirmative', say 'I will'. . . ."

# Follow-Up to the G4DCV Multi-Memory Keyer

PAUL WHATTON, G4DCV

**T**HE author's memory keyer (*S.W.M.*, September and October, 1986) has proved very popular. Now that a large number are in use the following modifications have come to light. The author would like particularly to thank G3WOS, G4MVR and G4WFR for their helpful feedback.

### Keyer Board.

1. An additional pull-down resistor should be connected between the junction of D1, D2, D3, IC4d to 0V: R6 (Figure 1) value 100K.
2. An additional resistor should be connected between pins 2 and 4 on IC8, (Figure 1, Sept. *S.W.M.*): R7 (Figure 2) value 220K.
3. Increase the value of R2 and R3 (Figure 1, Sept. *S.W.M.*) from 10K to 100K.

### Memory Board.

1. An additional pull-down resistor should be connected from the junction of D14, D15 and IC8a to 0V: R29 (Figure 3) value 100K.
2. An additional diode, D20, Should be connected from the reset line to 0V. This can be done at the reset-button. (Figure 3).
3. The keyer produces clean CW at up to 1000 LPM (letters/minute). Altering the value of C3 (Sept. 1986, Figure 2) from 0.01 $\mu$ F to 0.0047 $\mu$ F allows higher speeds to be used. With this modification the author's units produce very clean CW at a maximum speed of 1600 LPM. Also, R28 = 10K.

Printed circuit boards supplied by the author from the article have an amended layout in order to incorporate the above

E 814

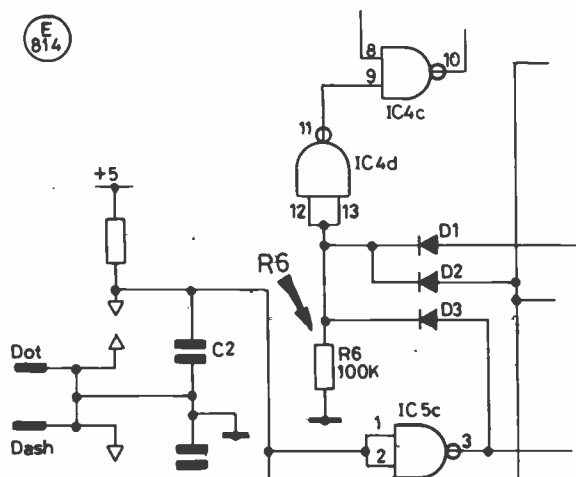


Fig.1 Part of Fig.1 Sept '86 SWM p.264

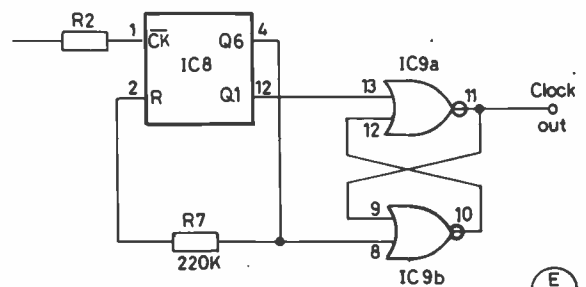


Fig.2 Part of Fig.1 Sept 86 SWM p.264

E 815

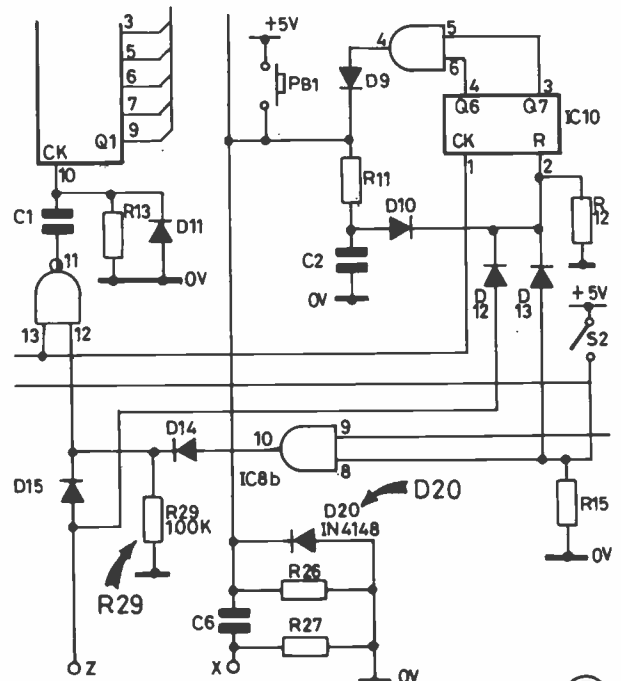


Fig.3 Part of Fig.2 Sept. '86 SWM p.265

E 816

changes. Constructors wishing to make their own boards can obtain a copy of the artwork and layout free of charge from the author. A full kit including the PCBs and all board-mounted components (optional EPROM not included) is also available for £29.50 plus 50p post/packing. A large *s.a.e.* is appreciated with all enquiries and requests for artwork. Please note the author is *not* QTHR, his address is: P. E. Whatton, G4DCV, 36 Jubilee Road, Littlebourne, Canterbury, Kent CT3 1TP.

# The Heathkit HW-9 Kit Transceiver

described by IAN KEYSER, G3ROO

**T**HIS transceiver was kindly loaned to me by Eddy, GODVS, to whom I am very grateful. He had purchased the kit to get on the HF bands after obtaining his "A" licence and felt that this was a fairly cheap way to do so.

The kit comes in a very sturdy box with a mass of data enabling even the extremely inexperienced constructor to build the equipment with great ease; the only requirement being the ability to read and use a soldering iron, and the latter can be learned very quickly by practising on an old printed circuit board.

## The Design

The set covers 250 kHz of each band using broadband circuits; it covers the "old" bands 80, 40, 20, 15, and 10 metres and an accessory option enables the "new" bands of 30, 17 and 12 to be covered. Solid-state switching allows full break-in operation with fully variable output level. IRT and audio filtering assists ease of operation and a front panel meter allows signal strength to be displayed on receive and relative transmitter output on transmit.

The set is constructed on two printed circuit boards, the first being the Crystal Mixer VFO PCB which houses the VFO, crystal oscillators and mixer, as well as the transmit carrier oscillator which doubles as the receiver BFO.

The second PCB contains the receiver proper which is a single-conversion superhet with a diode ring mixer. The IF is on 8.83 MHz, and as a small 4-pole SSB bandwidth filter is used the selectivity is not all it could be. To help overcome this an audio filter can be selected from the front panel which greatly improves the set. The use of a crystal filter also enables 'single signal' reception, the lack of which I find very disconcerting in direct-conversion receivers.

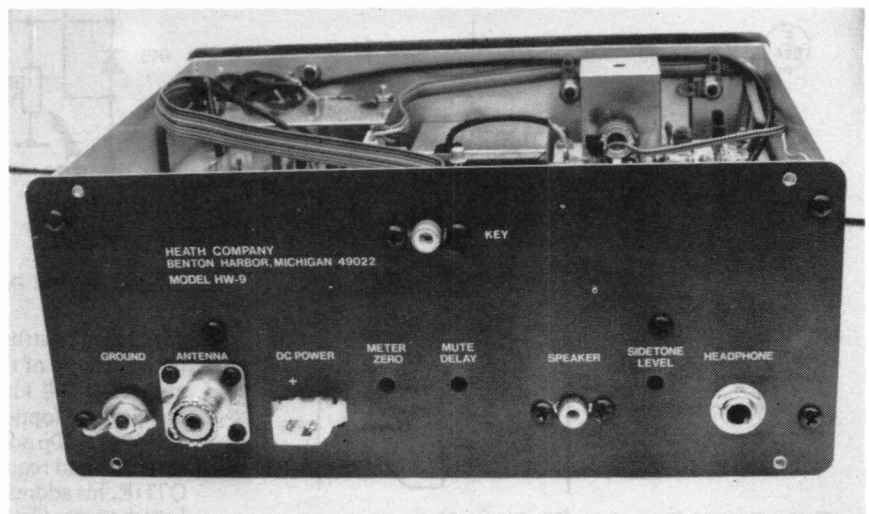
The transmitter circuit utilises the receiver mixer to mix the transmitter carrier oscillator with the crystal mixer VFO signal. Bandpass tuned circuits are used to select the required in-band signal. This is amplified in a three-stage wideband amplifier to a level sufficient to drive two MRF237 transistors to an excess of 5 watts output. Low pass filtering on the output of the transmitter reduces the harmonic output to an acceptable level and these filters are also used on the receiver input.

Muting of the receiver on key down is very smooth and the receiver comes back to life with minimum click. Sidetone is generated by an operational amplifier and is fed to the audio output stage. It has an adjustable level control accessible through the backdrop to enable the operator to adjust the level to suit.



The Heathkit HW-9 Transceiver.

Rear view of the HW-9.



---

Bottom view of the HW-9 showing the receive PCB.

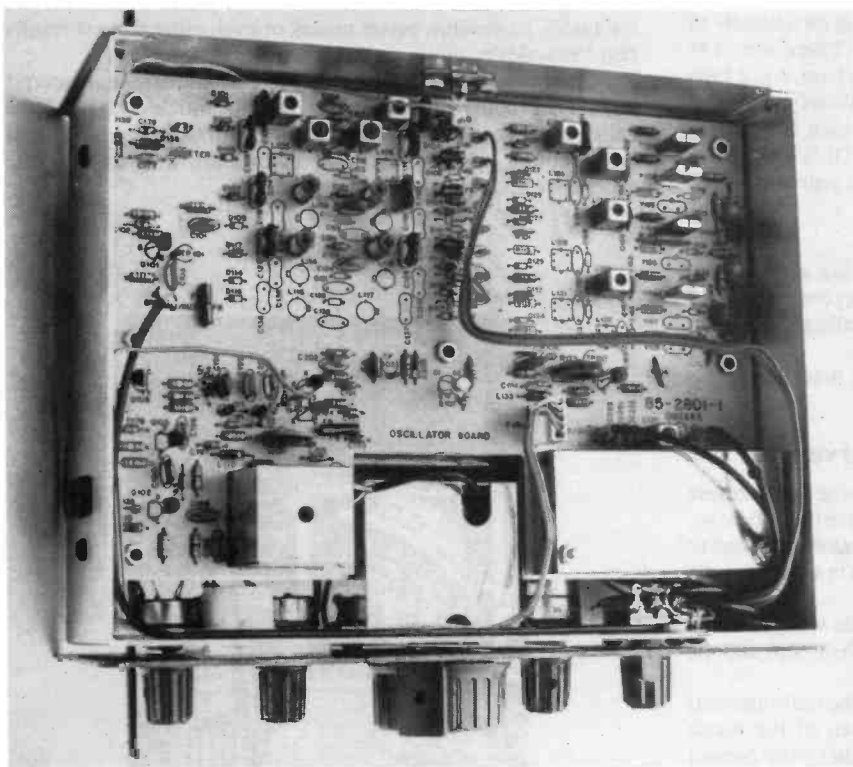
---




---

Top view of the HW-9 showing the crystal mixer PCB.

---



### Conclusion

In use the set was very "user-friendly" and in a few minutes I felt at home with it. Half an hour's operating on 20 metres produced contacts in U.S.A. and Europe, the receiver handling the strong signals well. No cross-modulation was noted at any time even using the station 3-element beam on a southerly heading.

The cost at £199.95 including VAT for the basic transceiver at first seems high, but when the component value and the quality of

the instructions are taken into account it turns out to be far more acceptable. The options pack costs £29.95 and makes the set into a very versatile piece of equipment. Another advantage is its light weight: all construction is aluminium, a feature that is important if the unit is to be carried in a suitcase.

Apart from a slight drift and the lack of dial lights (something that would make it so much better looking) I have little criticism, in fact I would say that I was impressed!

The Heathkit HW-9 is obtainable from *Maplin Electronic Supplies Ltd.*, P.O. Box 3, Rayleigh, Essex SS6 8LR.





# OBLAST CORNER



NIGEL CAWTHORNE, G3TXF

## Contest Reports

**T**HIS year's CQ Worldwide SSB Contest (October 25-26) coincided with some excellent HF conditions. Good openings were reported on all HF bands with plenty of Asiatic USSR signals.

SWL Philip Davies reports that JA stations were coming in faster than he could log them on 15m. Philip was disappointed at not hearing any Asiatic USSR stations on 15m. but he heard 47 oblasts throughout the contest with six new ones for 1986.

Several readers reported the special contest call UP9A (Obl 038). Franz Josef Land stations UV100 and RZ10WA were both active during CQ WW. DXNS reported in mid-October that it was not then long before UV100 was due to go QRT from FJL; he has been very active from this Soviet Arctic outpost. FJL is a separate DXCC country but does not have an oblast number.

## QSL Turn-Around

Tom, K1KI, has done some interesting analysis on a bundle of QSLs received from the bureau in September. There were 131 QSLs from the USSR. The most recent card was from April 1986 and the oldest from July 1979. The statistical half-way point was August 84. It therefore took just over two years for 50% of the USSR cards to arrive. By comparison JA's and DL's took about six months and the rest of the world just under a year and a half.

## Yuri Gagarin

Dex, W4KM, reports in USSR *Tidbits* receiving a letter from Boris, UW3AX, stating that none of the Russian cosmonauts so far had, or has, an individual radio amateur callsign, although some of them have operated from club stations.

This would appear to put an end to rumours that the world's first spaceman Yuri Gagarin was an amateur!

## "Radio" — Readership Survey

*Radio*, the monthly Russian electronics magazine which covers amateur radio, claims a circulation of 1.2 million in the July issue. The figure is given in a preamble to a questionnaire addressed to all *Radio* readers asking them about their interest in amateur radio and their views on the magazine.

In the same July issue there are several articles which contain strong criticism of the state of amateur radio in the USSR and the need for improvement.

The first is a leader article entitled "Speed up the radio amateur movement" written by Yuri Zubarev, chairman of the Radio Sport Federation of the USSR. Zubarev says that "the present state of the amateur radio movement (in the USSR) cannot be considered satisfactory". He starts by questioning the reliability of statistics on amateur radio in the USSR. Apparently the DOSAAF Central Committee, which organises amateur radio in the USSR, had given a figure of in excess of half a million radio sportsmen for 1982, whereas the comparable figure for January 1986 was 338,000. Amateur radio is not on the decline in the USSR, it is just the statistics which are "questionable" according to Zubarev.

The figures given for "radiosportsmen" presumably includes all those taking part in the different forms of "radio-sport" in the USSR: e.g. fox-hunters (radio DF-ers), high-speed telegraphers, SWLs, shortwavers (HF operators) and ultrashortwavers

(V/UHF operators). Figures of 106,000 and 48,000 are given elsewhere in the same article for "speed radiotelegraphy" and "fox hunting" respectively. This would leave a 'balance' of 184,000 for HF and VHF operators and SWLs.

The article notes that in 1981 a goal was set of having one club station for each 20 or 25 general education schools, technical schools and teachers colleges. "Almost five years have passed, but even today we are very far from fulfilling this goal. For example, in the Armenian SSR (Ob1 004) there is only one club station for all the educational establishments".

The RSF's head added that in Moscow where there are 1,200 schools there are today only 10 school club stations installed.

Marginal contest operating habits also get a mention in the RSF article. "The number of high scores achieved in competitions by fraudulent means has increased extraordinarily in radiosport". "Excessive power, additions to reports (logs), dummy team-members, have become everyday occurrences in some places". The article urges the RSF and the Central Radio Club (CRC) of the USSR to develop better means of evaluating contest results that "practically eliminate the possibility of fraud".

Echoing the problem of getting young people to take an interest in amateur radio found the world over, the article adds that "the amateur community and radiosport enthusiasts simply must infect young people with their enthusiasm and transfer the experience and knowledge to them".



The key to identifying the oblast for RT4UN is the 'T' before the number and the 'U' after. The 'T-U' combination is Kiev city oblast 186. RT0U and RT7U are two special calls from the same oblast.

## Rural Radio

In an article entitled "Who needs enthusiasm?" in the same July issue, the problems of developing amateur radio in rural areas of the USSR are aired. A letter from UA3OI, organiser of club station UZ3NWD (UA3N Ob1 132 is one of the rarer UA3 oblasts) complained that the local DOSAAF committee "had lost interest in radiomen". UA3OI had been trying to organise a club station in the school where he works as a physics and maths teacher.

The same article also refers to another letter from a Siberian village where a school club had been organised. Although 28 children turned-up for Morse classes at the beginning, the main problems started when they tried to get equipment and licences for the club station.

The writer, who was also a teacher at the school, said he had "been battling with the Krasnoyarsk Radio Club for over one and a half years". Documents for both club and individual calls have been submitted three times, but no results. The frustrated UA0 radio club organiser concludes that the people at the Krasnoyarsk radio club must be "deaf-mutes"! So after all these delays the numbers in the Morse classes have dwindled to only four. The writer adds that whereas in the large towns finding space for a radio-club is a problem, in the rural areas there is no problem with accommodation but that "the basic problem is indifference" on the part of some organisations.

## USSR Equipment Review

An article by UA3AVG called "Progress at a snail's pace" bemoans the quality of much of the commercially produced amateur radio equipment in the USSR. Several USSR amateur radio products are mentioned including the UM-200 power amplifier made in Kiev, the "Youth" 160m. transceiver and the "Volna" transceiver.

The writer challenges an assertion made by its designers at a conference in Kiev that the "Volna" transceiver produced in the USSR "is one of the latest designs and meets the highest world requirements". The designers of the "Volna" had said that the parameters were comparable with those of the TS-120 or TS-130. The writer comments "maybe so, but the TS-120 and TS-130 were on the world market for short period at the end of the '70s, whereas the Kiev Experimental Factory doesn't plan to make a first run of the "Volna" before next year.

"What kind of world level product is it" continues the disgruntled UA3AVG, "when the dynamic range is a little over 70dB, whereas in transceivers mass-produced abroad this basic parameter is around 80 to 90dB?"

On the subject of receiver dynamic range performance, UA3AVG notes that RA3AO (ex-UA3AAO) has "broken through the 100dB barrier".

Continuing his castigation of nationally produced equipment, UA3AVG quotes Mr Gorbachev telling factory workers that "many negative features in industry come from a tendency to make small improvements in what already exists rather than creating fundamentally new things that are the best in the world". UA3AVG then adds that the Kharkov Construction Technological Bureau who are responsible for some of the amateur product designs in the USSR, "run into bumps even on a level, well-trodden path".

UA3AVG quotes the example of where the state designers were asked to manufacture VHF equipment based on an original design by UA3FL. The UA3FL equipment had been successfully built by hundreds of individual amateurs. However UA3AVG reports that the state constructors ended up producing a product inferior to the original model because they had used ordinary circuit boards rather than the more advanced techniques originally used by UA3FL. The dissatisfaction with the production model is made worse because, apparently, this is the only commercially produced VHF amateur product in the USSR.

OBLASTS 'WORKED' TABLE

Station	1986 (max 184)	All- Time (max 184)
G4AYO	164	174
G4OII	154	164
G3TXF	149	172
G4WSX	142	152
G4ZFE	138	143
G0BZV	135	135
G4PWA	131	175
GW4BK G	121	152
G4UNH	120	144
G3PMR	120	127
G3YRW	106	135
G4OBK	96	152
G4DJX	87	115
G4ZZG	76	84
G M0CBX	71	80
G4T WX	65	120
G4XR V	60	60
G4XT M	51	93
G4LZZ	45	88
G4VFG	44	77
G3URA	42	91
G4YIR	18	43
VK5BS	—	73

OBLASTS 'HEARD' TABLE


Station	1986 (max 184)	All- Time (max 184)
Brad BRS-1066	158	176
Frank BRS-88557	151	174
Eddie 9H1-15357	130	149
Tony BRS-87156	120	135
SWL Philip Davies	115	126
Norman BRS-28198	105	116
Ken BRS-88465	77	77
SWL Ray Williams	73	105
Maurice BRS-32601	67	148
SWL Angela Sitton	63	63
SWL Mrs G. Cooke	60	112
Graeme BRS-44984	48	105
Luciano G1VDW	47	88
SWL Neil Melville	—	158

Table 1. Send your entries for the '1986 in-year' and 'All-time' tables to reach G3TXF by January 3rd (absolute deadline!) for the February issue. The 'All-time' table is based on current oblasts only (max 184).

## Standards for the '90s

The article says that amateur radio equipment produced by the Soviet industrial branch does not use "yesterday's technology but rather the technology of the day-before-yesterday". UA3AVG also criticises the draft specification standards against which future products are designed and manufactured: "At present the real selectivity of amateur receivers is evaluated not only by the third order intermodulation distortion but also by fifth order distortion, by dynamic range and by in-band and cross-modulation. There is nothing in the draft specification standard about these. And if the draft is approved, then in the '90s we won't see modern transceivers at club stations. However the designers and manufacturers, citing the design specification standard (to which they have worked), will live in peace!"

Zone I6 Reg. 133

Tks  
fer QSO 

UA4HLD   
UA4HLE   
UA4HNP

To radio GJΦAAA via G3TXF QTH: TOGLIATTI  
CPM ur QSO.

DATE	GMT	BAND	RS7	MODE	RX	TX	ANT
24 11 85	04.22	3.5	599	cw		zww	Δ

CQ WW DX CONTEST  
PSE/TKS QSL via P.O.Box88 Moscow USSR. op. Volany

Multi-call QSLs are not uncommon in the USSR. Shown here is a QSL for three different individual calls in oblast 133 (UA4H).

### Contester UZ4FWO

In the same issue of *Radio* there is a description of the massive antenna farm at UZ4FWO, the club station of the clock factory in Penze (Obl 148). UZ4FWO is the first Soviet station to have a 5-element beam for 40m. and a 3-element beam for 80m. For the HF bands they have 6 and 3-element arrays for 20m, 10 and 8-element arrays for 15m. and 12 and 8-element arrays for 10m.

### Mailbag

SWL Eddie, 9HI-15357, from Malta reports receiving his Victory 40 award at long last. SWL Philip Davis has received a QSL from UB5NGA (Obl 57) for his last Ukraine oblast. Incidentally the Ukraine accounts for 27 oblasts including the two city oblasts UT-J 187 (Sevastopol) and UT-U 186 (Kiev). A very active special-call station from the latter oblast is RT0U. There is

also RT7U from the same oblast (QSL via UT4UW).

Paul G4PWA recently logged two rare oblasts UZ9OWB/UD (UD-K 003) and UW6AR/UF (UF-O 015), but is still waiting for QSLs from oblasts 174 (UB4UWN/UA8T) and 176 (UL7YAT). Paul has received SWL cards for these QSOs but still no cards from the stations themselves!

Richard, G4ZFE, who uses a vertical at ground-level agrees with Paul, G4PWA's, comments that it is easier to find many of the USSR oblasts on CW than on SSB. Richard also reports working the RA6AR/UF DX-pedition to UF-O 015.

Rupert, G4XRV, who uses 10W of CW and a 20m. dipole, reports that most of his new ones are from UB, but that he is still waiting to catch his first UD, UG, UH, UJ and UM.

Alan, G3PMR, reports the appearance of USSR stations for the first time on 10MHz. They gained access to the band on October 1st.

Mike, G4AYO, worked UL7DAZ and UL7DD both from all-time needed oblast 29.

From down-under Barry, VK5BS, queries UH8BO. This is one of the older two-letter calls and although from his callsign he appears to be in oblast 180 (UH-B), in fact he is in the new UH-A oblast 191; his oblast would have been 180 prior to the creation of 191 in 1984. Barry also queries UK3B. This one is likely to be 170, as a special call from the Moscow City oblast (UA3A).

Brad, BRS 1066's, confirmed oblast total is now up to 90. DXNS notes that there are only two permanent stations in oblast 106: UA0HAA and UZ0HWA.

### Table Entries

Send entries for the "All Time" and the final entries for the "1986 In-Year" oblast heard/worked tables to reach G3TXF at "Holt Cottage", Kingston Hill, Kingston-upon-Thames, Surrey KT2 7JH, by *January 3rd (absolute latest!)* to appear in the February issue.

Many thanks to Tom KIKI (USSR *Tidbits*), IARU/ARRL, Dex W4KM (for the lengthy *Radio* extracts) and RSGB/*DX News Sheets* for items extracted. Good hunting for those final few for the 1986 table!

## Amateur Radio Computing

*a bi-monthly feature for all those with a radio station and a computer*

PAUL NEWMAN, G4INP

THE use of computer-controlled terminal-units having a certain amount of their own intelligence is growing with the interest in both AMTOR and Packet Radio. Most terminal node controllers now require a computer capable of driving them with the RS232 system so on this occasion we shall open with a few comments on this aspect of computer-radio work.

This brings me to a letter received from B. Collins of London who took me to task for my earlier remarks in this area concerning

the use of machine-code for control purposes with the Spectrum. He maintains that I should not commend machine-code because of its complexity.

Whilst I understand, and sympathise with, Mr. Collins' objections to machine-code, my advocacy of machine-code was based on simple experience. Sinclair BASIC was just *too slow* and it has a fundamental problem concerned with "break" when RS232 operations are in progress.

There seems to be no way that a practical keyboard handler/input routine for an RS232 device (it doesn't matter what) could ever be written in either BASIC, BETABASIC or any other high-level language which might be run in the Spectrum. There's no escaping the fact that a micro's "native tongue" is faster than any higher-level language.

In the months between my first writings on this, and now, I have put a considerable amount of work into programming a simple control routine to drive the ICS AMT-2 intelligent terminal unit (RTTY/CW/ASCII/AMTOR) with Interface-One on the Spectrum. The results are very encouraging especially since I've used the occasion to brush up my ZOO machine code.

The routine overcomes most of the problems concerning Interface 1's RS232 by using a modified system resident in RAM rather than ROM. "Break" is disabled in RS232 input/output and the Spectrum is given the full set of ASCII "control" (ctrl) and "escape" (esc) codes necessary for proper control of any RS232-driven unit. Thus, all the correct controlling sequences

may be sent by the Spectrum — which is not possible from BASIC.

I have no doubts that this system would be equally applicable to other RS232-driven units and (with suitable address changes) to other RS232 interfaces. I will be pleased to provide any advice on this provided return postage is enclosed.

I hope that a fuller version of this system incorporating a memory facility will be published either *via* these pages or through the SARUG newsletter. This will depend on its complexity and ease of presentation.

A QL SuperBasic RS232 terminal program was published in SARUG newsletter number 24 (3) and should prove useful with any RS232-driven device like a TNC or ITU. It proved quite satisfactory with the AMT-2 unit.

A number of readers have expressed interest in receiving SSTV in a similar manner to the GIFTU RTTY and CW programs. I'm pleased to say that the progress report from John, GIFTU, is good and that a program to receive SSTV is well on its way. I look forward to reviewing this system and publishing my findings in due course.

Justin Branch has carried out a most interesting review exercise on three or four of the "direct ear socket" RTTY/CW programs currently available for the Spectrum. All his results have been collated into a highly readable set of review notes which will be of most interest to potential SWL users of these programs. All the results are available from Justin directly (1). I confess I found a few surprises in his results although I have absolutely no doubt of them given the obvious detail with which they were obtained.

A number of correspondents recently have drawn attention to their success in receiving various TOR transmissions using the RX4 "multimode" Spectrum program. I understand that several marine frequencies have been monitored which contain some interesting reading! A number of SARUG members have reported success here too.

If you are a QL user you will probably be fairly fed-up by now with the enormous amount of time it takes to load SuperBasic programs. Typically, QL SATS takes 2 minutes 20 seconds. Thanks to a very clever piece of software, under the title of "SNAPSHOT", I am now able to load any piece of QL software in about 20 seconds!!

SNAPSHOT by Breakthrough Software (2) uses a program which saves the whole of QL memory in very short order indeed. Using the simple instructions almost any program, including machine-code, can be saved as a fast-loading snapshot. I found it most useful especially for my radio programs like WOTSON and SATS.

The successful launch of JAS-1 satellite brings me to the latest satellite program offering from GM4IHJ. JSAT-1 is a full prediction suite for JAS-1 and includes a data-dump table for users of the Packet system. As usual, JSAT-1 for the Spectrum is available through SARUG and details are available from me. (3)

Numerous satellite watchers have asked about Spectrum-based predictor programs for NOAAs and METEOSAT. METEOSAT is geostationary so the correct program for this is GEOSAT — all it requires is the correct constant. NOAA on the other hand does not have a predictor of its own although one is soon constructed using program PROP9 (OSCAR-9 program).

A listing which converts PROP9 to NOAA prediction for NOAAs 6 and 9 (others added very easily if you want) is available for an additional 50 pence when ordered with PROP9. Present users of this program may just send 50 pence and an s.a.e. for the listing. It's very simple and takes about 15 minutes to enter and construct the new predictor. Full details of these and other satellite software as reference 3. (The QL SATS program, also from GM4IHJ, already has facilities for predicting both JAS-1 and the NOAA's.)

This brings me neatly to the subject of receiving NOAA pictures with the Spectrum. Judging by the quality of the picture-dumps which reached me recently, a practical system is perfectly possible given that a purpose-built receiver is necessary (15 kHz deviation!).

If you are interested in such a system please write to me and I will coordinate with the intending supplier (enclose s.a.e.). Please state carefully if you would require a purpose-built receiver as well as a ready-built interface. A built interface is likely to cost around £27.00 including the program with the receiver extra.

It would be fair to point out that you will require a good quality dot-matrix printer and that modified amateur receiving equipment is *not* suited to receiving the NOAA APL transmissions. Recognising these two provisos is essential to obtaining a viable Spectrum-based system in my view.

The eventual availability of such a system will be solely governed by the demand. If you want it — say so!

During the course of running the Sinclair Amateur Radio User Group I have amassed a large number of newsletter back-issues which I am hesitant to throw out. If anyone is interested in receiving some back-issues these can be obtained as per reference 3. Prices depend upon the issue, since it must reflect the cost of either the photostat or the printed copy. The newsletters represent a useful source of programs, ideas and references as well as reviews.

There was a 'nil' response to my plea in my last article for further information concerning radio programs for the "minority" computers still in use. It seems worthwhile mentioning here that GM4ANB has compiled a list of radio software through his column in *RadCom* and whilst I have yet to see a copy of it, I am told that despite a disappointing response it may hold some useful material. I believe a copy can still be had — see ref. 4.

A sample of the "COMLINK" ZX81 RS232 and ASCII interface has just reached me from the U.S.A. where it is opening up great possibilities for ZX81/TS1000 users in the use of Packet Radio and intelligent terminal units. It gives the ZX81 RS232 capabilities together with a full ASCII character set (without which no RS232-controlled unit can be made to function correctly). "COMLINK" will function perfectly well in a U.S.A. TS1000 (2K RAM) although 16K of RAM will allow full use of the memories which are programmed from Basic. Although not tested yet I am sure that "COMLINK" will allow the ZX81 to be used with other RS232-driven devices.

Unlike many interfaces "COMLINK" is quite cheap and is becoming very popular since it opens up exciting uses with the ZX81 very inexpensively. I hope to publish a full review in the February issue of *S.W.M.* So blow the dust off that old ZX81 — there may be life left in it yet!

It's interesting to note here that our American friends take their ZX81's (or TS1000's) much more seriously than we do. There are still thousands of them in use as Packet controllers, repeater controllers and many similar uses. It's always seemed a pity to me that we don't take this machine more seriously. Perhaps the "COMLINK" might spur some of us to using it again.

News of a "computerist and amateur radio" magazine reached me the other day. It's called *CTM* and claims to be the "number one source" of Packet Radio information. I am trying to get a sample copy but if anyone can't wait they can be contacted as ref. 5.

Do write in if you have any comments or contributions to G4INP, care of *S.W.M.* address.

---

#### References:

1. Justin Branch, 111 Yelland Road, Barnstaple EX31 3EE. Enclose s.a.e. for details on how to obtain review information.
2. Breakthrough Software, 17 Shaftesbury Way, Royston, Herts. SG8 9DE. "SNAPSHOT" is £7.50 incl.
3. Paul Newman, G4INP, 3 Red House Lane, Leiston, Suffolk IP16 4JZ; an s.a.e. is essential in all instances if you want a reply.
4. John Morris, GM4ANB, 6a Morlich Grove, Dalgety Bay, near Dunfermline, Fife KY11 5UX; enclose large s.a.e.
5. *CTM* Circulation Manager, 1704 Sam Drive, Birmingham, AL 35235, U.S.A.

# COMMUNICATION and DX NEWS

*E. P. Essery, G3KFE*

THE most interesting event of the month was undoubtedly the Big Contest; while many of the non-contest fraternity will have been cursing it to high heaven, many more will have noted that yet again, the fact of a big contest being on caused a remarkable improvement in 'conditions'. On the other hand, it is also the case that during the month conditions have perked up quite a bit with reports of such things as short-path VKs, contacts to W4 and so forth on 28 MHz.

We hear of another sunspot at high latitudes. . . and a recent RSGB News Bulletin went so far as to say words to the effect that "all the signs point to the possibility that we have passed solar minimum, although it will be another month before we can be sure". Flux units up in the 90's and the geomagnetic 'A' index lower than it has been since late 1983 meant that the bands have been humming with interest. So — let's look around the bands.

## Ten Metres

G3NOF (Yeovil) noted openings to Europe and the Middle East in the earlier part of the period and then, and in particular during the contest weekend, noted the short-path openings to the Antipodes and Indonesia, not to mention openings to Florida and Africa. Don logged SSB contacts with CN8ES, FR4DN, J49A, JY7Z, OD5RF, P36P, TZ2XN, UA4HAC, UG7GWB, VK6HD, VQ9GB, W4LZZ, W4ZR, YC1EHR, YC0SY, ZS3HL, ZS6AMB, ZS6BRZ, and 4Z1A.

GM4WJA (Elgin) was chuffed enough with his collection to write in a first letter — thanks, John — to tell about the band as seen from N.E. Scotland. The rig is an Icom 745 into a three-element monoband Yagi, and all contacts on SSB. October 11 saw a contact with FH5AD at 0915, and on 13th RA9XBM plus SM, OH, UA1 and LA, as a result of a bit of Sporadic-E and an Aurora event at once; beam heading north-east. Teatime on 14th yielded TZ6FK, and the evening of 21st I, EA, and G. Then came the contest, and between noon and 1400z three EA8s, I, EA2, N4ESV, HC5EA, and VO1MP were worked. Next day, UL7ACI, HZ1HZ, TA2BK, J49A, UB4MZU, ZS6P, UA6ADC, EA3, ZS6BRZ, EA6VQ, 7Q7LW, YU, HA, IT, RB5, DJ, 9H1MRL, UB3, EA8VV, and HB0AON. October 27 found things humming between 0930-1700z, to UZ6, RA6, RA3, UA6, UB5, 4X6DK, UW6, I, CU2BR,

N4HSK, WB3FGU, G, CX8CF, G, WP4EAU, AA4CM, VP8FIR (and what a pile-up!), ZP5CVI, CU2AX, LUIFOW, and G stations, the latter by backscatter. The morning of 28th offered ZS6OQ, J28DN, F, Z21GU, and a couple of EA8s; 29th for two hours either side of noon with UA6BPM, RA6ALD, 9H3BG, F, SV1 (times three), OZ, 9H1DU, ZS6NK, DLs and F. October 30 saw another ZS among the Europeans: and in addition to all that little lot the month saw gotaways like VK6, VK4, VU2, 4S7, 4X, YI, 9K, and 5N.

G4HZW (Knutsford) runs a TS-820 to a two-element Quad; his collection included 3B8DB, 4U1ITU, 4X6DK, 4Z41A, CE3HFI, DL, EA, EA8, HB9, HB0, OD5RF, P36P, UB4, UA6, UL7ACI, RL8PYL, RW9WA, TAIKA/2, TA2BK, T77C, VK6HD, VU2CVP, W1-2-3-4-5-8, YC1EHR, YE0X, YB0ELM, YU, Y2, Z23JO, ZS6BRZ, and gotaways included VOICE (who was 59+20), VE1BNN, and VP8FIR. In a postscript, Tony notes that VK6HD held up at RS55 for over 90 minutes at a time.

Our other practitioner of 28 MHz is G4ZZG (Warrington); Charles has 26 watts p.e.p. output on SSB or ten watts of CW to phased verticals. Nothing much appeared on the first nine days, but then on 9th a couple of EU beacons were heard and EA2ANS worked on SSB. On 13th a SSB contact with local G4XOL was followed by hearing the ZS6PW beacon, and then Z21ANB calling CQ AF and drawing a blank. On 14th EA7, IK2 were heard but wouldn't answer and no beacons were audible. European beacons were heard on 16th, 18th, 19th, 20th, 21st, and the ZS beacon on 22nd along, again, with Z21ANB calling CQ AF to no effect. CQ WW SSB Contest weekend and 26th at 1130 was livened by VK5WO on SSB and working Europe but Charles's QRP wouldn't quite do the trick; never mind, because on 27th PT9EF fell to the ten watts of CW. The ZS beacon was audible again on 28th and for the rest of the month beacons were noted. However, G4ZZG has been, well, 'narked' by the low power of his TS-120V, and is now building a linear, which will have up to four 807s. In fact, Charles is a bit doubtful about four of them on 28 MHz, but we would think he would get away with it if he tolerates a lower input level on this band; and with 807s still only a couple of pounds apiece, the pocket will be relatively unharmed! Our only comment would be to be sure to sink the valveholders under the chassis so that the lower part of the electrode

structure is level with the chassis; this plus screens around the upper part of the valve should be enough to stop the parasitic oscillation problem with 807s.

As for your scribe, there was a gale of wind on the Friday night of the contest weekend; the nearest neighbour had assembled his new garden shed the previous weekend and then gone off on holiday. Saturday morning, and the wind had opened the shed door, got inside and lifted the roof, which then removed some of the more fundamental parts of my radiating system before landing and doing a severe mischief to my rose-bed! So — Saturday was turned into an involuntary make-and-mend.

## Fifteen

The theme could almost be 'anything you can do I can do better' when compared alongside Ten. G3NOF found the mornings frequently adorned by long-path openings to VK and ZL around 0800, plus short path openings to VK, ZL, JA, YC and S.E. Asia. West Indies appeared from 1200, and N. Americans up to 1700. Some Africans were to be heard in the afternoons, but little was heard from

### "CDXN" deadlines for the next three months:

January issue — December 3rd  
February issue — January 7th  
March issue — February 4th

*please be sure to note these dates*

South America. SSB contacts were made with DF6FBL/VP9, CE4FXV, CE6EZ, HL9CW, HS0A, J37AE, J37AH, JA6YAI, K3ZUF/VP2M, K7RI, KE5CV, KP4BZ, N3JT/HK0, N4SF/VP9, N5AU, N5RZ, NF7T/5, NR5M, NZ5C, P36P, PJ2FR, PJ1B, TG9NX, TI1C, VE4UM, VK2EBX, VK4NDV, VK8NHM, VP2EC, VP2MU, VP2MW, VP2V/KQ2M, VU2Z, W8KKF/C6A, W3MA/VP9, WP4G, WP4U, YB3CN, YC1EHR, YC3HCM, YC0EHA, YC0HML, YC0TNX, YC0WR, ZP5JCY, ZS1JD, ZS3BI, ZS3PQ, ZS6AWX, ZS6AUQ, 8P6OV and 8R1X.

As I said last time out, the question of aerials for this band has been taxing the writer's mind, and I have in fact had some improvised aerials up aloft; however the swing-about conditions have not been



On the roof of the South London Science Centre, John Osborne, G3HMO (left), and his helpers installing a TVRO system to be used as a modern language teaching resource. The equipment was supplied by G4BSU (North East Satellite Systems). G3HMO is warden of the Centre, and the dish in the background is a home-brew for Meteosat.

photo: Tony Langham



conductive to what one hopes would be 'sensible' evaluations of results. Nonetheless some few inter-continental contacts have been made.

G3BDQ (Hastings) had a little play on 21 MHz in the contest, and his half-hour on 21 MHz produced such as W0s, ZSs, YBs and other quite DX'y countries.

### Top Band

G3BDQ (Hastings) notes that the nasty thing on 1831 has now subsided back into normality, only to be replaced by the QRO AMTOR signal on 1833 kHz which sports some nasty clicks for some 3 kHz above its centre frequency. On the all-important aerial side of things, John has added *another* 100 square feet of earth mat, and he believes that this won't have reduced his signal strength any! To prove the point a play on this band during the CQ WW contest on SSB, using only 'civilised' hours, yielded EA9UE, LA7Q (first LA to be allowed use of the band), HB0AON, HB0/HB9BHA, UG6GAW, J48CS, N2AA, VE1ZZ, VE8DX (worked at 2020), many ordinary EUs, and P36P for Cyprus and a new country.

Next we come to G2HKU (Sheppey) who has some hard words to say about the cheek of the Post Office in telling the world 90% of their mail reaches destination on time. Reverting to radio, SSB on Top Band found OK1DXS, N2AA, LX1GQ, VE3WQ, and 14JMY, while the preferred CW mode made it to UF6VBC, HG6N, LX9BV, OZ1W, OK1DRO, LA2UA, SP9DH, I5NPH, UB4MPC, UA3DCZ, VE1ZZ, OK1OND, PA3DJL/LX (a YL), PA3CQU/LX, and G0/N4TO.

For the writer, it really began to seem progress was being made towards a viable antenna system for the band. . . until the

above-ground portion was removed by a flying garden-shed. It is interesting to speculate on the strength of that wind — after the wire broke, the two ends both ended up going through a fence and even then were flailing about enough to tie themselves in knots.

### Eighty

The band where many a Sunday-morning net comes to grief! Also, the band where, over the contest weekend, there were a few stray voices calling CQ Contest at noon; and of course the odd sensible signal here and there.

G2HKU used his CW to work VE3BCH and W3OV.

On the other hand SSB was used for the band by G3BDQ, who found VK2AVA, VP2VA, ZL4AP, ZL4BO, and JF11ST/SU1 for an unusual one; John was pleased to find himself getting reports comparable with other G stations on the band, which at least shows the aerial was working okay.

G3ZPF (Kingswinford) seems to have left a gate open somewhere, and so when he wrote was incubating a hefty cold; so much so that he can't even work up any great enthusiasm over the arrival of his 5BDXCC plaque. Horror of horrors, G3ZPF has actually been heard *entering a contest* — the three-hour straight key event organised by the DLs. However, it sounds as though David made heavy weather of it, and he doesn't intend to do it again. Otherwise a CW contact with K8MP at least proved the system still worked.

### Forty

The practitioners on this band conspire to keep their doings under wraps, but anyone with a decent pair of ears and an aerial can find for themselves that DX is being quietly amassed by a few stalwarts.

G3ZPF says he has made a pair of 7 MHz traps to the design in the January 1986 *RadCom*, and they seem to be working out well; CW contacts made with HK0BKX, YV1AD, K4YF, and TV6PAP on the two mornings David sampled the band.

### Points from the Post

WIWY's bit first. Frank always sends us his 'Contest Calendar' galleys, and first the series of six contests being run by *73 Magazine* and designated World SSB Championship. Dates first: for 28 MHz, January 3-4, 0000z-2400z (48 hours); for 21 MHz, the 24 hours of January 10, while 14 MHz is down for the 24 hours of January 11; Top Band has the 48 hours of January 17-18, and 7 MHz the 24 hours of January 24, leaving January 25 for 3.5 MHz. W/VE give RS plus state or province, while we give them RS plus and country. DX Windows are designated at: 7.08-7.09. 3.790-3.805, 1.825-1.830. 1.850-1.855, 1.907-1.913 kHz. W/VE not permitted to transmit within the windows, DX may do so but must listen outside. One wonders whether *73 Magazine* will in fact make the Window concept stick, or whether it will go by default. Logs to be mailed by February 18 to the following addresses: Top Band — KE7C, 2665 North Busby Road, Oak Harbor, WA 98277; Eighty — Ron Johnson KC7PA, 68 South 300 West, Brigham City, UT 84302; Forty — NE6I, 43261 6th Street East, Lancaster CA 93535. Twenty or Ten, logs go to Chuck and Linda Ingram, 44720 N. 11th Street East, Lancaster CA 93535; and for Fifteen, Gary Vest NW5E, Star Route, Box 34 Holliday, TX 76366, U.S.A. The scoring is the usual states and DXCC countries effort, and the taking credit for more than 3% duplicate contacts rates a hefty 100 QSO points for each one over the

top. Rules and log sheets from KE7C at the given address.

More interesting perhaps is the Results list of the 1986 CQ WW Top Band affair. It shows Top Single-Op CT3BZ operated by OH2BH, with G3SZA second, while in the multi-op section GW3YDX was World Top Scorer followed home by GM31GW at fifth; all these were on CW. On the Phone side we find no G single-op in the Top Ten, but GW3YDX was third in the multi-op list.

The 1987 version of the same contest (CQ WW Top Band) is down for January 23-25 (CW) and February 20-22 (Phone). Rules are the same as last year but the multiplier paragraph has been clarified. We quote:

"Multiplier. Each U.S. State, Canadian area (13), and DX Country. Canadian areas: VO1, VO2, VE1, NB, VE1N.S., VE1 P.E.I., VE2, VE3, VE4, VE5, VE6, VE7, VE8 N.W.T., VE8 Yukon. KH6 and KL7 are considered countries and the U.S. and Canada are not counted as a multiplier. A Maritime Mobile counts as a multiplier in each world Region. ARRL DXCC and the WAE country lists and the WAC boundaries are the standards". Note also the penalty for duplicate, false or unverifiable contacts: three additional removed from the log with their points, and multiplier credit too where it applies. Mailing deadline for CW February 28, for SSB March 31. Send them to CQWW 160 Contest Director, Donald MacLennan, N4IN, 3075 Florida Avenue, Melbourne, FL 32904, U.S.A., or to CQ's office at 76 North Broadway, Hicksville, NY 11801, U.S.A. marked CQ 160 Contest CW or SSB as applicable.

Now we must mention the TOPS Activity Contest on Eighty; 1800-1800z December 6-7 on Eighty. Use 3.500-3.585, but the bottom 12 kHz is reserved for intercontinental QSOs. Exchange RST plus serial number and if TOPS member give your membership number. Call CQ TAC and claim QSO points as follows: own country one, own continent two points, and other continents six points. Multiplier is the number of prefixes worked, like the CQWW WPX contest. Call areas in W, VE, VK, PY, U, and JA count as countries for scoring. Logs to be received by January 31 at: Bertil Arting, SM3VE, Bergesvegen 26, S-823 00, Kilafors, Sweden.

From WIWY we turn to *DX News Sheet*. Several people have mentioned working A6XB of late; everything marries up *except* that this operator became a Silent Key some while back! Whoever that pirate is he rates 'worm' classification.

Although Jim Smith couldn't get on the trip to Heard, he indicates there is an amateur in the party on Nella Dan, and that the group will be on Heard between November 4 and around January 21. If you already have Heard confirmed, don't work them but let The Deserving get a look

in — it seems the VI0CC expedition never sent out any cards, and the number of expeditions to Heard will be restricted.

If you worked YI4BRD then you almost certainly hooked a clandestine activity of the Kurdistan Independence movement. We don't think he would rate as okay for DXCC.

If you haven't worked Franz Josef yet, make haste, we hear the UV100 station there is going QRT pretty soon.

That JX1AC, and indeed JX5AG are both Slims; the only good active one is JX8KY.

Those still wanting a Minami Torishima card can take heart from the fact that 7J1ACH will be active until June 1987, and has already made some 11000 QSOs.

XF4, we hear, is the target for a major operation slated for March 1987; and Kermadec has ZL8HF operational for about a year. However the latter will be slow on the QSL cards, as there are major problems; incoming mail by courtesy of R.N.Z.A.F., and outgoing by way of passing ships!

7Q7LW, we understand, will be leaving Malawi for good on May 11 1987, and we also hear he will be in England between mid-December and mid-January. His operating times are defined by his generator power and are 0200-0600, 10-1200, and 1500-2200z.

As regards China, there are plenty of BYs about these days, and we hear that Tom, VE7BC, who did so much to cause this to occur, has now been issued with his own call, BX1BC.

The business of a Spratly Is. expedition has cropped up again. We understand there is a DU expedition being set up, which will include K6EDV; and in a recent issue of *TDXB* we noticed a picture of a licence granted to VP2ML. We only hope this one does not result in loss of life by violence.

And, of course, as always, the ZA situation. The rumours of an operation to Albania turned out, yet again, to be something of a busted flush — and, frankly we doubt if we shall see a legal operation from there in the foreseeable future, and also if there has ever been one!

Turning now to *TDXB*, we see that the CEs are to mount an expedition to Antarctica, signing 3G9SBY from about when you see this until the end of December.

That tedious Mount Athos business: the latest rumour is that the monk who has been travelling to classes for a licence failed to show up for the examination! And the DXCC desk is still waiting for more documentation before ruling on the DL7FT/SV/A activity.

Finally, in this section, that TV6PAP was a 'special' for the Papal visit to France.

## New Bands

Those interested in these bands will be pleased to know that the Russian stations now have 10 MHz.

Our only report this time is of G2HKU's activity; Ted worked N3EZK, RT5UO, UB5ES, OZ1W, UC2AG, and UR2FU on 10 MHz, and then went to 18 MHz where he managed EL0BY/MM off California and bound for Hawaii, CT4AH, and IT9QDS, plus gotaways VK, YV5 and FM5. On a different tack Ted notes that he heard DL2GG/YV5 on 18 MHz saying he had 2 kW into a beam on Europe. We hope he and others will realise the need to listen carefully for the QRP Europeans, and not just to work the high-power merchants.

## Twenty

This is where it all happens not just the main DX traffic, but lots of the liddery — if only we had some sort of RF shot-gun to down some of the 'policemen' list-takers, gurglers-into-mikes, QSY'ers-with-the-power-on, over-excitabile operators, and practitioners of the long CQ call with call-sign once caper. Wouldn't it be *super!*

G2HKU likes his bit of CW, and used this method to work TA2V and G3FXB/W1. The QSL address for TA2V, by the way, is PO Box 14, Emek, Ankara.

G3NOF says he noted similar changes on this band to Ten, over the couple of weeks prior to his writing. It seems to have been mainly short-path to the VK and ZL gang in the mornings, and around 1100 it has opened to Asia generally. North Americans have been on from 1100 until the close around 2100, with the West Coast coming up around 1600-1700z, but the afternoon Asians haven't been heard. Don made SSB QSOs with BY9GA, C6ANX, DU9RG, FY5YE, G3MHV/W6, G4DUW/DU1, I3BQC/IL3, JA1RZN, JA2IIN, JA2THS, JA2YKA, JA3YBF, JA3YKC, JA4QZA, JA6ABG, JA9YBA, JH1EBO, JK1MAZ, JN1KEJ, JT1BG, JY7Z, KL7TC, N4SF/VP9, NY6M/KH2, RF0FWW, TI2D, UA0QA (Zone 19), UV100, UZ0FWM (Zone 19), V31CV, VE4QZ, VE5RU, VE6AKY, VE7ALC, VE7EIKJ, VK2AGA, VK2ANO, VK2BZA, VK2UT, VK7BC, VP2EC, VP2MU, VP2MW, W3MA/VP9, W5VWK, ZL3FO, ZL4BC, and ZL4OP.

The writer realises and accepts that the big contests are the good times to fish for new ones; however this month my only spare time was during the contest weekend and I don't like contesting at that level.

## Concluded

That's it for another month; we hope we shall hear from you for next time, and the deadline for arrival is given in the 'box', addressed as always to your scribe, "CXDN", Short Wave Magazine, 34 High Street, WELWYN, Herts. AL6 9EQ. And let's hope we have indeed seen the bottom of the sunspot cycle through!

# “Practically Yours”

with GLEN ROSS, G8MWR

ONE of the most confusing areas for the novice constructor to get involved in is that of the colour coding of the various components that he will need to use to complete his project. In the old days life was simple because if a resistor had a value of 50000 ohms then that was printed somewhere on the component. We are now starting to get back to that idea but with a considerable amount of shorthand involved simply because of the minute size of the modern components.

## Colours

During the period since the end of the war practically all component values were indicated by a colour coding system which use a selection of dots or colour bands to indicate the value of everything from resistors to fuses and even dial light ratings. To make matters even worse there always seemed to be at least three conflicting systems in use at any one time! Fortunately the one thing that has not changed are the colours that are used to indicate the values and these are shown in Table 1.

Table 1.

Black	= 0	Brown	= 2
Red	= 3	Orange	= 4
Yellow	= 4	Green	= 5
Blue	= 6	Violet	= 7
Grey	= 8	White	= 9

## Memory

The eagle-eyed amongst you may have spotted that the series from two to seven follows the same sequence as the colours of the rainbow which makes memorising them fairly easy. If you then remember that the lower figures are represented by darker colours, brown and black, and that the higher end by even lighter colours, grey and white, the whole thing starts to make sense.

## Decoding

Having now got at least most of the basic colour code organised (there is more) we can start to put it to use. In the case of resistors the colours are used to indicate the actual value by the use of coloured bands as shown in Fig. 1.

The left hand band is used to read “tens” the second one indicates “units” and the third one shows how many zeros should be added to get the final result. Let us take as an example a resistor which has three bands, one each of brown, red and orange. You will notice that these bands are offset to one end of the component and that the value is always read with the component held so that these colours are to the left hand end of the body as shown in Fig. 1. From our code we get the tens as being (brown equals) one and the units as (red equals) two. The number of noughts is (orange equals) three and so the final result is 12000 ohms.

## Tolerances

Many resistors will have only three bands and if this is so it indicates a standard unit with a tolerance of plus or minus 20% of

the indicated value. You may also notice on the body an extra band and this is used to give the tolerance of the component using the values shown in Table 2.

Table 2.

Black	= 20%	Brown	= 1%
Red	= 2%	Orange	= 3%
Yellow	= *	Green	= 5%
Blue	= 6%	White	= 10%
Gold	= 5%	Silver	= 10%

Yellow is the odd man out and is used only with capacitors to show plus 100% to minus 0%. In other words the component cannot be less than the value marked although it could be considerably higher in value than the marking would indicate.

## Capacitors

The coding dots or bands for these are based on the same system as that used for resistors and the actual markings for the various types are shown in Fig. 2. The units used are picofarads for polyester and ceramic capacitors and microfarads for the tantalum types.

If we use the polyester diagram as an example we see that there are in fact five bands, the first four are read in exactly the same way as the resistor was and the extra band indicates the voltage rating of the component using the values shown in Table 3.

Table 3.

Black	= 10v	Brown	= 100v
Red	= 250v	Yellow	= *
Green	= 16v	Blue	= 20v
Grey	= 25v	White	= 3v
Pink	= 35v		

As in the case of tolerance, yellow is the exception as it can indicate two values depending on the type of capacitor. If it is a tantalum then the voltage is 6.3 but on a polyester type it indicates 400 volts.

## Mystery Band

Sometimes an extra band will be found and this indicates the temperature coefficient of the component expressed as parts per million per degree Centigrade using the values shown in Table 4.

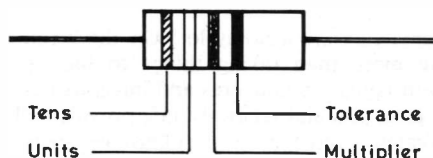
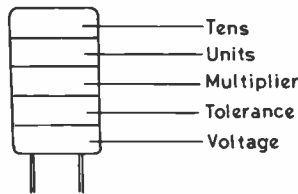


Fig.1 RESISTOR COLOUR CODING



POLYESTER

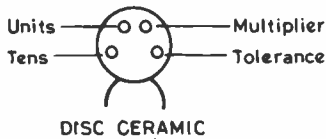
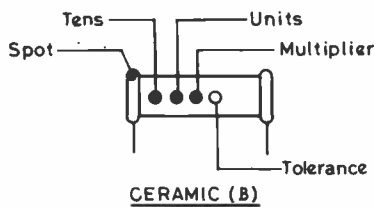
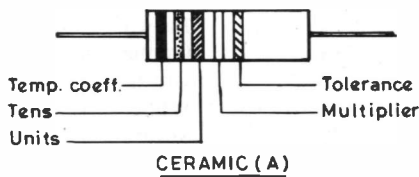
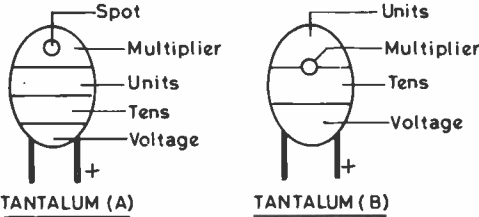


Figure 2

E  
832

Table 4.

Black	=	0	Brown	=	- 30
Red	=	- 80	Orange	=	- 150
Yellow	=	- 220	Green	=	- 330
Blue	=	- 470	Violet	=	- 750
Grey	=	+ 30	White	=	*

In this case it is white that is the odd man out and indicates a tolerance of plus 100 to minus 750.

Fuses

This is another component which is frequently colour coded rather than being stamped on an end cap with the carrying capacity, and the various codings are shown in Table 5.

Table 5.

Green and Yellow	=	10mA
Red and Turquoise	=	15mA
Eau de Nil	=	25mA
Salmon pink	=	50mA
Black	=	60mA
Grey	=	100mA
Red	=	150mA
Brown	=	250mA
Yellow	=	500mA
Green	=	750mA
Blue	=	1 amp.
Light blue	=	1.5A
Purple	=	2A
Yellow and purple	=	2.5A
White	=	3A
Black and white	=	5A
Orange	=	10A

Next month we will take a look at the letter and figure codes that are also used to indicate the values of common components and also at the letter codes which are used to specify the generic types of semiconductor devices.

# Caution — Watch Your Capacitors!

MARTIN THURLOW, G1GCT

**R**ADIO amateurs are a nosy lot! On the whole they love nothing more than taking things to bits — not easy nowadays with layflat components and integrated circuits. But nevertheless great fun and relatively safe provided all forms of power are isolated or removed. Some I know get great pleasure in taking somebody else's old junk (or pride and joy!) and make it do something "it didn't ought ter".

But QRX. You could find something more than a satisfied curiosity. Some of the older oil-filled components (pre-1980 for example) can be positively dangerous. Capacitors in particular. The danger lies with a family of chemicals collectively known as poly-chlorinated-biphenyls — PCBs for short (not to be confused with printed circuit boards).

These were used in the manufacture of various components for

television sets, air conditioners, fluorescent light fittings etc. and rank equally hazardous with other toxic contaminants such as asbestos, lead, DDT, paraquat and dioxin. Dioxin, incidentally, is an especially malevolent substance that can kill, and it is found in PCDD\* and TCDD\* both of which may be formed when PCBs are exposed to fire.

Just to give the danger some perspective, an estimated 350,000,000 capacitors containing PCBs were in use throughout the United States during 1984. There is no reason to doubt that a proportionate number would not apply to the United Kingdom.

The biological damage caused by PCBs is not yet entirely understood. Some experts say that, by themselves, they are not killers and that fairly large quantities are necessary to disable. However, the majority believe that they bring about any number of disorders and there is mounting evidence that they are carcinogenic.

An incident in Yusho, Japan, in 1968 emphasises the danger. A quantity of PCBs leaked into rice oil which was subsequently — and quite inadvertently — used for cooking by some 15,000 people. Nearly 7% reported *major* symptoms that included liver and nervous-system disorders, abnormality in the reproductive organs, chronic bronchitis, impairment of the immune system (similar to AIDS symptoms), bone disease and chloracne. A retardation in the growth of children was also identified. And because PCBs collect in fatty tissues — the liver for example — they found their way into the milk of breast-feeding mothers and subsequently got passed on to their children. One thousand of Yusho's inhabitants were monitored and, during a period of five years, 22 of them had died — 9 of them from cancer.

If PCBs are exposed to fire or subjected to electrolysis, hydrogen-chloride (HCl) is formed. When mixed with water, hydrogen-chloride will form hydrochloric acid which will then attack the welds and seals of components thus releasing PCBs. In fire this could lead to the formation of any number of unsafe

chemicals such as PCDF\*, PCDD\*, TCDF\*, TCDD\*, CDF\*, CDD\*.

The risks should now be obvious. Any brown, gungy substance shown to be around a capacitor should be treated with considerable respect and caution. If heat should be applied (from a soldering iron, for instance) there is every chance that a chemical transformation will begin to take place. Almost for certain, the PCBs will vaporise and can get into the system either through the lungs or through the skin, even if unbroken. If at this stage it is decided to get rid of the capacitor by throwing it on to a bonfire, hydrogen-chloride will form and so too will phosgene — a very nasty poison gas once used in warfare. Phosgene has a TLV (threshold limit value) of only one part per million and it is obviously very, very dangerous.

So take heed. Another widow holding a silent key sale is one too many . . . and this assumes she was not standing by the bonfire with her beloved and ever-so-careless husband!

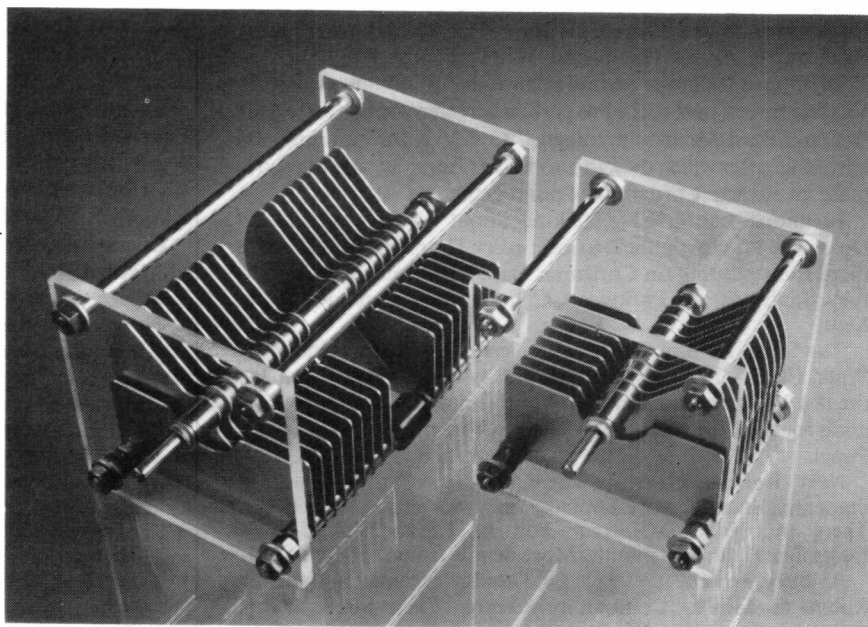
Remember: there is *danger* in some used components. Be extra-careful of old equipment. If you want to know more you can contact me QTHR (1985 *Callbook*, not 1986) or at work on Watford (0923) 27445. *73 and safe building!*

#### Abbreviations

PCB	=	Polychlorinated Biphenyl
PCDF	=	Polychlorinated dibenzofuran
PCDD	=	Polychlorinated dibenzo-p-dioxin
TCDF	=	2, 3, 7, 8 — tetrachlorodibenzofuran
TCDD	=	2, 3, 7, 8 — tetrachlorodibenzo-p-dioxin
CDF	=	Chlorodibenzofuran
CDD	=	Chlorodibenzo-p-dioxin

*Some names to look out for include:* Arochlor, Kanechlor, Askarel, Pyrochlor.

**Telecomms** announce the release of two new high-power variable capacitors made by their manufacturing division, *Nevada Communications*. The Nevada TC-250 is a 13-250pF variable capacitor priced at £15.61 plus VAT, and the Nevada TC-500 is a twin 13-250pF variable capacitor (500pF max.) which costs £19.50 plus VAT. Both models are British made and are available ready-built or at a lower price in kit form to suit radio amateurs building ATUs, etc. For full specifications contact *Telecomms*, 189 London Road, Portsmouth, Hants. PO2 9AE (tel: 0705-698113, telex: 869107 Telcom G).



# CLUBS ROUNDUP

By "Club Secretary"

## The Mail

**A**BERGAVENNY & Nevill Hall advise us that for all the programme details you should contact the Hon. Sec. at the address in the panel.

The Acton, Brentford & Chiswick group has its Hq. at Chiswick Town Hall, which is in Chiswick High Road, London; on December 16 they have a discussion on electrical safety starting at 7.30 p.m.

**AMRAC** is the name of a group based at Bishops Waltham, Hants., which is interested in the application of computers to amateur radio. Find them in "The Crown" pub on December 5 and January 7; or get details from the Hon. Sec. — see Panel.

It's a long time since we last heard from **Ariel** radio group; this club caters for all amateurs, SWLs or radio constructors within the BBC staff, present or retired. They have stations operational at BBC centres, a newsletter, and various other activities. Details from the Hon. Sec. — see Panel.

**BARTG** caters for all those who have an interest in the various forms of data communications within amateur radio as well as its original, more limited brief for those who use RTTY, Details from the Hon. Sec. — see Panel.

Next we head for **Basingstoke** where a new Hon. Sec. writes in with his name and address; we suggest you contact him for details of the activities going on in his area — see Panel.

Now we turn to **BATC** which is the one for all enthusiasts for amateur TV transmission, whether slow or fast scan. We have advance notice of the next BATC Rally, which is down for May 3, at the Post House, Rugby, just off Junction 18 of the M1, to which entrance is free. More details from the Hon. Sec.

It looks like the third Tuesday of each month for **Biggin Hill**, at Downe Village Hall, next door to the "George and Dragon", in High Street, Downe, Kent. We understand there is a Christmas Dinner on December 16 so you had better check with the Hon. Sec. at the address in the Panel.

The second Monday of each month is given as the date for **Borehamwood and Elstree**, at Organ Hall Community Centre, Birstowe Close, Borehamwood, Herts.

Turning to **Braintree** we find them at the Community Centre in Victoria Street, next to the bus park, where they are booked on the first and third Monday evenings; 7 to 7.30 is for nattering and bartering, after which they go into session formally, and they have quite an attractive programme put together.

**Bredhurst** has G3ZHZ talking about an HF vertical on December 11; the routine is to meet every Thursday, but of course there is no meeting on Christmas Day. The venue is, although they don't say so, Parkwood Community Centre, Rainham, Kent.

The Small Lecture Theatre, University of Bristol, University Walk, Clifton, is home to the **Bristol City RSGB** group; normally the last Monday of the month, but this time December 14 is set aside for the Christmas Party. Details from the Hon. Sec. — see Panel.

Next **Burton-on-Trent**, where they have their place at Stapenhill Institute, the booking being for every Wednesday. There are regular D/F events both on 1.8 and 144 MHz — December 17 for this month. More details from the Hon. Sec.

At **Bury** we find the locals on Tuesday evenings in the Club Room at Mosses Community Centre, Cecil Street, Bury. December 9 is shown for the AGM.

**Central Lancs** has a place at Priory Club, Broadfield Drive, Leyland; December 1 is a junk sale and final planning night for the

144 MHz AFS, and on December 12 they have a Christmas Social; no meeting on December 15.

The **Chelmsford** crowd is based on Marconi College, Arbour Lane, Chelmsford. December 2 is entitled 'From RDF to Radar' and January 6 is a film and video show.

December 5 is the AGM at **Cheltenham** and is at Stanton Room Charlton Kings Library, Cheltenham; December 12 is a Christmas Party at "The Hobnails" and on 19th they have a natter night.

The weekly Wednesday evening meetings at **Cheshunt** are as usual at the Church Room Church Lane, Wormley, but we don't have programme details for December. Contact the Hon. Sec. for them.

Tuesdays are the days for **Chester** at the Chester Rugby Union club, Hare Lane, Vicars Cross, Chester. December 9 is an evening of 'your questions answered' and on 16th there is the construction contest. December 23 is a special Christmas meeting — details from G6IFA — and on 30th they have a drink and waffle evening. January 6 is the AGM.

Home for the **Chichester** gang is the North Lodge Bar, County Hall, Chichester, on first and third Tuesdays. The December 16 session is a Christmas Social Evening and presentation of the Marcuse Trophy.

December 10's Christmas Party for **Chiltern** is at Orchard End Country Club, although the normal Hq. is the Science Block, Sir William Ramsey School, Hazelmere, High Wycombe, on second and fourth Wednesdays.

December 11 for **Colchester** is a film and video Evening in the Lecture Theatre, Colchester Institute, Sheepen Road. Normally, though, they use the Staff Common Room, so look for them there on January 8 or 22.

The **Cornish** venue these days is the Church Hall, Treleigh, on the old Redruth by-pass, on the first Thursday each month; December 4 is a Christmas Party.

---

### Deadlines for "Clubs" for the next three months—

January issue — November 27th

February issue — December 29th

March issue — January 29th

April issue — February 26th

*Please be sure to note these dates!*

---

Baden-Powell House, 121 St. Nicholas Street, Radford, is the **Coventry** Hq. and they foregather there on Fridays. December 5 is down for a talk on Raynet, and on 12th they have a night-on-the-air. December 19 is down for a social at the "Bull and Butcher". Nothing is shown for December 26 or January 2.

**Crawley** newsletter indicates they have a fish and chip supper on December 10, details of which you will have to get from the Hon. Sec. — see Panel. Hq. is the Leisure Centre.

The **Crystal Palace** meeting on December 20 is at All Saints Parish Rooms, Beulah Hill, London SE19, starting at 8 p.m., and is to be a social evening plus a video from the RSGB library.

The pre-hunt meeting of the **Dartford Heath D/F** group is to be at the "Horse and Groom" pub, Leyton Cross, on December 9, and on 14th there will be the dual-band-hunt of which details are to be announced at the pub meeting — which, by the way, begins as late as 9.30 p.m.

Looking now at the **Derby** dates we see December 3 is a junk sale, and on 10th they have a visit by **Birkett** of Lincoln. December 17 is a Christmas Party in the club room on the top floor at 119 Green Lane, Derby. Note that there are no meetings on December 24 or 31.

The group serving the Dover area is called **SE Kent YMCA** which gives a clue to the Hq. address: Dover YMCA,



Godwynehurst, Leyburne Road. December 3 and January 7 are natter evenings, and December 10 is G3EMU's talk on weather satellites. December 17 is a Christmas Social.

The letter from **Dunfermline** simply indicates a change of Hon. Sec. to that given in the Secretaries Panel: thus it is to the Hon. Sec. that we refer you to for details of the club's activities.

Meetings of the **Edgware** gang are on the second and fourth Thursday each month at 8 p.m. For December, though, they have a Grand Junk Sale on December 11, but the other meeting would have fallen on Christmas Day and so is cancelled. The place to go is Watling Community Centre, 145 Orange Hill Road, Burnt Oak.

On the second Monday of each month you can find the **Exeter** club members at the Community Centre, St. David's Hill, says the club PRO; however he doesn't mention the programme details for which you will have to either attend a meeting or contact the Hon. Sec. — see Panel.

Up north now to **Falkirk**, and this means the first and third Wednesdays of every month at Grange Centre; Brightons, near Falkirk. Further details from the Hon. Sec. — see Panel.

**Fareham** now, and this means Portchester Community Centre, in Westlands Grove. December 3 is a talk by G6TJT on decoding Morse with a micro while December 10 is a natter night. December 17 is down for a talk on VSWR facts and fallacies, while the meetings due for December 23 and 31 are cancelled, leaving January 7 for a natter night.

For the **Felixstowe** details we see they are at "The Feathers" pub in Walton High Street; December 1 is a computer evening, and on December 15 there is a Family Social. December 29 is also a social meeting.

The **Fylde** solution to the Hq. problem is to meet at the Kite Club, Blackpool Airport, where members have a dual subscription so that they can go and watch the aircraft any time, and have a good club Hq. as well. December 2 is the home-brew equipment contest and on December 16 there is a hot pot supper. January 6 is the Annual General Meeting.

The members of the **G-QRP Club** are interested in low-power operating and home-construction. Details from the Hon. Sec. — see Panel for G3RJV's details.

**Grafton** report they are picking up again after the fall-off in membership arising from the change of Hq. to *T. S. Wizard* in White Hart Lane, Haringey, London. December 12 is a Christmas party and constructors' Contest rolled into one. December 26 meeting is cancelled.

The Hon. Sec. of the **Grimsby** club doesn't give the club Hq. address so we must refer you to him — see Panel — for this rather important information. December 4 is a talk about a terminal unit by G8RIW, and 11th is the Christmas slide show and photo competition, leaving December 18 for a talk on 'How to Fix It'.

Harrow Arts Centre is the home base of the **Harrow** group; this is in High Road, Harrow Weald; find them there on Fridays. The club newsletter has been giving a potted history of the club in recent issues and it is interesting to observe how, after many changes of home, they have now come safely into 'harbour' — they have been at the Arts Centre now for eight years.

Member of the **Hastings** club are to be found on the third Wednesday of each month at West Hill Community Centre for the formal meeting, but they also have informal club nights every Friday at Ashdown Farm Community Centre in Downey Close.

**Ipswich** has Hq. at the "Rose and Crown" pub in Norwich Road, Ipswich, on the second and last Wednesdays, and there is often Morse tuition on the other Wednesdays unless they clash with another event. The room is detached from the bars so juniors are welcome.

Over the water now, and **IRTS**, which is Eire's equivalent to RSGB. This is the place to direct any enquiries you may have about amateur radio activity in Eire, whether national or local.

### Change of Venue

We have a letter from the Hon. Sec. of the **Lagan Valley** group in GI-land. They now have Hq. at the Harmony Hill Art Centre,



The Mayor and MP for Yeovil both joined in the recent celebrations to mark the 40th anniversary of Yeovil Amateur Radio Club. Left to right, G4JGH (hidden), G3MYM, G3NOF, G3GC (secretary), G3OMH, Mrs. Joy Stanton (Mrs. Joy Stanton (mayor), Paddy Ashdown MP, G3BEC (president) and BRS10663.

photo: G4PDG

Harmony Hill, Lisburn, Co. Antrim. The routine is to meet on the second Monday in each month excepting July and August.

The meetings of the **Lincoln** short wave club are held at the City Engineers' Club, Waterside South, Lincoln on Wednesdays. December 24 and 31, though, are noted as 'to be arranged' and for that reason we refer you to the Hon. Sec. and the address shown in the Panel.

At **Loughton** the meeting on December 5 is an informal; the venue is Loughton Hall, Rectory Lane, Loughton, Essex.

For **Maidstone YMCA** the meeting on December 5 is a natter night plus RAE; December 12 is a constructional contest, December 19 a social, and there is no meeting on 26th. The club Hq. is at the 'Y' Sportcentre, Melrose Close, Maidstone, Kent.

Up in **Maltby** they have a place at the Community Centre, Clifford Road, Hellaby, just off the M18 junction 1, between Rotherham and Maltby. December 5 is an activity night, and on 12th they will look into a 'Direct-Conversion Receiver for Eighty'. December 19 is the Annual Christmas Junk Sale and Buffet, and on December 26 they have no meeting.

December 9 at Henstead House is Christmas party time for the members of **Midland**; the Hq. in Henstead Street, Birmingham, is up several stairs, so be warned!

The **Nene Valley** crowd is still, so far as we know, based on the "Prince of Wales" pub, Well Street, Finedon, every Wednesday, but we don't have the December details for which we must refer you to the Hon. Sec. at the address in the panel.

The **Plymouth Polytechnic** group writes to advise us of the name and address of the Hon. Sec. for this session; he is the chap to write to if you want to make contacts with them.

**Pontefract** has a place nowadays on the ground floor of Carleton Community Centre, where on December 11 they have a video 'Visit to China'; on 15th it is party night, and December 18 is an informal.

To find the **Powys** crowd on a Thursday evening you need to start in the centre of Montgomery, and take the Chirbury road out of town; just before you reach the de-restriction sign, turn right along a private road, and travel slowly along it for about a mile when you should see Lymore Park Cricket Club Pavilion on your left, with a light outside. You've arrived! They start quite early, around 7.30, and usually knock off around 10 p.m.

We come next to **RAIBC** which is of course the club for the invalid and blind radio amateur or SWL. Details of the various types of membership from the Hon. Sec. — see Panel.

The **RAOTA** crowd are all possessed of twenty five years or more in amateur radio or SWL. Details from the Hon. Sec. — see Panel.

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

- ABERGAVENNY & NEVILL HALL: J. B. Davies, GW4XQH, 109 Croesonen Parc, Abergavenny, Gwent NP7 6PF. (0873) 4655
- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W3 8LB. (01-992 3778)
- AMRAC: P. Bridges, G6DLJ, 9 Hollydene Villas, Southampton Road, Hythe, Hants. SO4 5HU. (0703) 847754
- ARIEL: T. Butler, 333A Bush House, London.
- B.A.R.T.G.: P. & J. Beedie, GW6MOJ/GW6MOK, Ffynnonlas, Salem, Llandeilo, Wales SA19 7NP. (0558) 822286
- BASINGSTOKE: A. Windsor, G1OQU, 28 Mendip Close, Bucksin 2, Basingstoke, Hants. RG22 5BP.
- B.A.T.C.: T. Brown, G8CJS, 25 Gainsborough Drive, Adel, Leeds LS16 7PF.
- BIGGIN HILL: R. Senft, G0AMP, Mill Hay, Standard Road, Downe, Kent BR6 7HL. (0689) 57848
- BOREHAMWOOD: Ivor Rosenberg, 11 Parkside Drive, Edgware, Middx. BRAINTREE: D. Brades, 3 Coldnailhurst Avenue, Braintree, CM7 7SL.
- BREDHURST: K. Fay, G0AMZ, 37 Sandringham Road, Rainham, Kent ME8 8RP. (0634) 376991
- BRISTOL CITY RSGB: C. R. Hollister, G4SQQ, 34 Battersby Way, Henbury, Bristol BS10 7SU. (0272) 508451
- BURTON-ON-TRENT: M. Cotton, G4HBY, Burton-on-Trent. (Burton-on-Trent 33958)
- BURY: M. Sivieri, G4ZTB, 47 Ramsay, Bacup, Lancs.
- CENTRAL LANCs: D. W. Fowler, G4YWG, 22 Larchwood Crescent, Leyland, PR5 1RJ. (0772) 432275
- CHELMSFORD: A. C. Mead, G4KQE, 9 Abraham Drive, Silver End, Witham, Braintree, Essex CM8 3SP.
- CHELtenham: T. Kirby, G4VXE, 29 Tivoli Road, Cheltenham, Glos. GL50 2TD. (0242) 36723
- CHESHUNT: J. & T. A. Watkins, G4VMR/G4VSL, 'One Ash', Frogs Hall Lane, Haultwick, Herts. SG11 1JH. (Dane End 250)
- CHESTER: D. Hewitt, 31 Broadmead, Vicars Cross, Chester.
- CHICHESTER: C. Bryan, G4EHG, Marmanet, Salthill Road, Fishbourne, Chichester, Sussex PO19 3PZ. (Chichester 789587)
- CHILTERN: C. Dunn, G4KVI, 24 Mynchen Road, Beaconsfield, Bucks.
- COLCHESTER: F. R. Howe, G3FII, 29 Kingswood Road, Colchester. (0206) 851189
- CORNISH: N. Pascoe, G4USB, Bosuathick Farm, Constantine, Falmouth, Cornwall. (Falmouth 40367)
- COVENTRY: W. Hahn, G3UOL, 91 The Chesils, Coventry, CV5 9NA. (Coventry 0203) 414684
- CRAWLEY: D. L. Hill, G4IQM, 14 The Garrones, Worth, Crawley, W. Sussex RH10 4YT. (Crawley 882641)
- CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London SE23 3BN. (01-699 6940)
- DARTFORD HEATH D/F: A. R. Burchmore, G4BWV, 49 School Lane, Horton Kirby, Dartford, Kent DA4 9DQ.
- DERBY: J. Anthony, G3KQF, 77 Brayfield Road, Littleover, Derby DE3 6GT. (0332) 772361
- DOVER (SE KENT YMCA): J. Saueressig, G0ADK, 8 The Ridgway, River, Dover. (Dover 823226)
- DUNFERMLINE: D. Young, GM0DYD, 4 Primrose Avenue, Rosyth, Fife KY11 2SS. (0383) 413440
- EDGWARE: J. Cobby, G4RMD, 4 Briars Close, Hatfield, Herts. (Hatfield 64342)
- EXETER: R. Donno, G3YBK, 8 Mincinglake Road, Exeter EX4 7EA. (0392) 78710
- FALKIRK: G. L. Leishman, GM4MCB, Woodside, Redding, Falkirk, Stirlingshire FK2 9UQ. (0324) 715624
- FAREHAM: A. S. Chester, G3CCB, 'Deva Wood', 44 The Ridgeway, Down End, Fareham, Hants. (0329) 288139
- FELIXTOWE: P. J. Whiting, G3YQC, 77 Melford Way, Felixtowe, IP11 8UH.
- FYLDE: H. Fenton, G8GG, 5 Cromer Road, St. Anne's, Lytham St. Anne's, Lancs. FY8 3HD. (Lytham St. Annes 725717)
- G-QRP: Rev. G. C. Dobbs, G3RJV, St. Aidans Vicarage, 498 Manchester Road, Rochdale, Lancs. OL11 3HE. (Rochdale 0706) 31812
- GRAFTON: J. Kaine, G4RPK, 74 Camden Mews, London NW1 9BX. (01-267 1000)
- GRIMSBY: T. Matthews, G3RGC, 38 Foxhill, Wybers Wood, Grimsby, South Humberside DN37 9QL.
- HARROW: D. Atkins, G8XBZ, 25 Maxwell Close, Rickmansworth, Herts. (0923) 779942
- HASTINGS: D. Shirley, G4NVQ, 93 Alfred Road, Hastings, Sussex. (Hastings 420608)
- IPSWICH: J. Tootill, G4IFF, 76 Fircroft Road, Ipswich, Suffolk IP1 6PX. (0473) 44047
- I.R.T.S.: G. Gervin, E18CC, 185 Elton Court, Leixlip, Co. Kildare, Eire.
- LAGAN VALLEY: W. J. Jackson, G14TCS, 21 Carnreagh, Hillsborough, Co. Down BT26 0LJ.
- LINCOLN: Mrs. P. Rose, G4STO, Pinchbeck Farmhouse, Mill Lane, Sturton-by-Stow, Lincoln LN1 2AS. (Gainsborough 788356)
- LOUGHTON: D. Thorpe, G4FKI, 44 Townfield Road, Flitwick, Beds. MK45 1JF.
- MAIDSTONE YMCA: P. Martin, G0BUW, address wanted. Tel: (0622) 30544
- MALTBY: K. Johnson, GIPQW, 20 Rolling Dales Close, Maltby, Rotherham, Yorks. S66 8EJ. (0709) 814135
- MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 1LB. (021-422 9787)
- NENE VALLEY: M. R. Byles, G6UWS, 108 Kingsway, Wellingborough, Northants. (Wellingborough 71189)
- PLYMOUTH POLY: K. Taylor, G4ZTZ, Amateur Radio Society, Students Union, Plymouth Polytechnic, Drake's Circus, Plymouth PL4 8AA.
- PONTEFRAC: C. Mills, G0AAO, 27 Pendennis Avenue, South Elmsall, Nr. Pontefract, W. Yorks. (0977) 43101
- POWYS: M. Smith, GW4DWX, Tonn Marr, Welshpool, Powys. (Welshpool 2068)
- R.A.I.B.C.: Mrs. C. Clark, G1GQJ, 9 Conigre, Chinnor, Oxon OX9 4JY.
- R.A.O.T.A.: Sylvia Havard, G4USN, 'Altonwood', 1 Merricks Lane, Bewdley, Worcs. DY12 2PA. (0299-403163)
- READING: S. J. Wilson, 6 Pendennis Road, Freshbrook, Swindon, Wilts. SN5 8QD.
- ROYAL NAVY: M. Puttick, G3LIK, 21 Sandyfield Crescent, Cowplain, Portsmouth, Hants. PO8 8SQ. (Waterlooville 55880)
- SARUG: P. Newman, G4INP, 3 Red House Lane, Leiston, Suffolk IP16 4JZ.
- SOLIHULL: P. T. Gaskin, G8AAY, 58 Elmcroft Road, South Yardley, Birmingham B26 1PL. (021-783 2996)
- SOUTH BRISTOL: L. Baker, G4RZY, 62 Court Farm Road, Whitchurch, Bristol, Avon. BS14 0EG.
- SOUTHDOWN: R. Evans, G4VOS, Oakside Waldron, Heathfield, Sussex. (Heathfield 3168)
- SOUTH ESSEX: A. Smith, G4FMK, 8 The Parkway, Canvey Island, Essex SS8 0AA. (0268) 683805
- SOUTHGATE: D. C. Elson, G4YLL, 200 Churchgate Road, Cheshunt, Herts. EN8 9EL.
- SOUTH LAKE: R. Pearce, 72 Queen Street, Dalton-in-Furness, Cumbria LA15 8EH.
- SPEN VALLEY: I. F. Jones, G4MLW, 54 Milton Road, Liversedge, Heckmondwike, W. Yorks. (Heckmondwike 409739)
- STEVENAGE: F. Wilson, G4ISO, 15 Byrd Walk, Baldock, Herts. SG7 6LN. (Baldock 892765)
- STOURBRIDGE: C. S. Williamson, G1IEB, 7 Hanbury Hill, Stourbridge, DY8 1BE.
- SURREY: J. Simkins, G81YS, 18 Riding Hill, Sanderstead, Croydon CR2 9LN. (01-657 0454)
- SUTTON & CHEAM: G. Plucknett, G4FKA, 32 West Road, Malden Rushett, Chessington.
- TIVERTON: A. Smith, G1OYO, Box 3, Tiverton, Devon EX16 6RS.
- TODMORDEN: Mrs. V. Mitchell, G1GZB, Parrock Farm, Shore Green, Todmorden W. Yorks. OL14 8SF. (Todmorden 7572)
- TORBAY: B. Wall, G1EUA, 48 Pennyacre Road, Teignmouth, TQ14 8LB. (Teignmouth 78554)
- VERULAM: G. Wimpenny, G4OBH, 30 Faircross Way, St. Albans. (St. Albans 52003)
- WAKEFIELD: W. Parkin, G8PBE, 14 Cleveland Grove, Lupset Park, Wakefield WF2 8LD. (Wakefield 378727)
- WARRINGTON: P. Forster, G0CBN, 6 Birchdale Road, Paddington, Warrington, Cheshire WA1 3ER. (0925) 814005
- WELWYN-HATFIELD: D. Fairbank, G0AII, 2 Sandpit Road, Welwyn Garden City, Herts. AL7 3TN. (Welwyn Garden City 326138)
- WIGAN: J. E. Cooke, G6TYB, 106 Wirral Drive, Winstanley, Wigan WN3 6LD. (Wigan 214969)
- WIMBLEDON: G. E. Cripps, G3DWW, 115 Bushey Road, Raynes Park, London SW20 0JN. (01-540 2180)
- WIRRAL: R. Bridson, G3VEB, 17 Zigzag Road, Wallasey, Wirral.
- WORTHING: R. Jones, G4SWH, P.O. Box 599, Worthing, W. Sussex BN14 7TT. (Worthing 208752)
- YEOVIL: E. H. Godfrey, G3GC, Dorset Reach, 60 Chilton Grove, Yeovil, Somerset BA21 4AW. (0935) 75533
- YORK: K. R. Cass, G3WVO, 4 Henworth Village, York.

Now Reading who write to say they are still at the "White Horse" in Emmer Green near Reading, where they meet on alternate Tuesdays; the first one in the New Year being January 6.

The members of RNARS are all either current or past members of the Royal or Merchant Navy, or associate members who are from foreign navies. Details of membership from the Hon. Sec. — see Panel.

Now we come to SARUG; this group caters for all those interested in using a Sinclair computer of any model in their amateur radio set-up. Details from the Hon. Sec. — see Panel.

December 18 is the Christmas social meeting for the lads at

Solihull. The venue, and indeed the club Hq. is at Shirley Centre, Stratford Road, Shirley.

Every Wednesday the South Bristol crowd head for the Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol. December 3 is G5KT's talk about amateur radio in the 1930s, and on 10th they have a video retrospect of 1986. December 17 is Christmas Families' Evening, and December 24 and 31 see the club station operational.

Southdown members have their main meeting on the first Monday of every month at Chaseley Home for Disabled Ex-Servicemen, Southcliff, Eastbourne. In addition there are

informal meetings on Tuesdays and Fridays at Wealden District Council Offices, Vicarge Field, Hailsham.

The **South Essex** catchment area is around Canvey Island, and the club meets at the Paddocks, Canvey Island, every Wednesday. Chat Night is December 3, and on 10th there is the Christmas social; December 17 is a junk sale, and the meeting which would have been on Christmas Eve is scrubbed.

If you live in the **Southgate** area, the club Hq. is at Trinity Church Hall (upper), Green Lanes, Winchmore Hill, London N21. December 11 is the club's AGM.

### New One

This one is **South Lakeland** and they get together on the first and third Thursday each month at the Norweb Sports and Social Club room at the rear of the Ormsgill Hotel, Barrow-in-Furness, where new members and visitors are always welcome. December 4 is a film show, and on 18th they have a 'night out'; details from the Hon. Sec. — see Panel.

Over to **Spenn Valley** now. Seek them in Old Bank Working Men's Club, Mirfield, on any Thursday. December 4 is a talk on the breathalyser by G1DWA, and on 18th they have the anti-Christmas anti-Social.

A surplus sale is down for December 2 at **Stevenage** and on 16th they have a natter night. There is a Christmas Dinner planned for sometime during the month too. Club meetings are in Electronics Room No. 1, Sitec Ltd, Ridgmond Park, Stevenage.

Turning to **Stourbridge** we find them at the Robin Woods Centre, School Street, off Enville Street, Stourbridge. December 1 is informal, and on 15th G3ZOM talks about QRP kits. Thus, we see the routine is first and third Monday of each month.

**Surrey** has its place at *TS Terra Nova*, 34 The Waldrons, South Croydon, on the first and third Monday in the first floor mess deck. No details of programme to hand, but we hear that they had five prospects to choose from!

**Sutton & Cheam** seems to have settled in Downs Lawn Tennis Club, Holland Avenue, Cheam. December 1 is a natter night, and on 19th there is the Christmas get-together, both at Downs — the informals are, we understand taken, in the bar.

At **Thames Valley** the club has a base at Thames Ditton Library, Watts Road, Thames Ditton. Meetings are on the first Tuesday of each month.

For details of the **Tiverton** activities we have to advise you to write to the Hon. Sec. — see Panel for his address.

The Queen Hotel in Todmorden is the Hq. of the **Todmorden** club; December 1 is a Christmas social and talk by George Dobbs, and on 15th they have a chat night.

On to **Torbay** now, and they have alternate Fridays and Thursdays plus the monthly business meeting on the last Saturday of each month. The venue is the EEC Social Club, Ringslade Road, Highweek, Newton Abbot.

### Change!

So as to miss the Christmas rush, the **Verulam** types are changing for this month only to the *third* Tuesday in December, at the R.A.F. Association Hq., New Kent Road, St. Albans, for their main meeting. The informal will be on the normal date of December 9, and on 16th there is the AGM.

The **Wakefield** club newsletter to hand is very difficult to read, thanks to a bad Xerox copy, but we think the Hq. address is the Community Centre, Prospect Road, Ossett. December 2 and 30 are 'on the air' nights, while December 9 is a 'mastermind quiz' and December 23 a social.

Grappenhall Community Centre, Bellhouse Lane, Grappenhall, Warrington, is the home base for the **Warrington** group. December 2 is a guest appearance by CPO McDonald of *HMS Inskip*, talking about the 'Chirpsounder' and frequency measurement. December 9 is G3NFB on computer security, and on 16th an open forum. December 23 is a social evening with Big Eats, and December 30 is open.

It is the AGM on December 1 for **Welwyn-Hatfield** at 9th



TV weatherman Jim Bacon, G3YLA, visited Chesham & D.A.R.S. recently and unravelled some of the mysteries of lift conditions and weather forecasting for the members of the club. During the evening Jim also officially opened the club's new extension to its premises.

photo: G4UXA

Welwyn Scouts Hq., Knightsfield, Welwyn Garden City, and then on December 15 they have the Christmas social evening.

The recently-formed club at **Wigan** is meeting at St. Jude's club every Wednesday evening and they would welcome visitors. Details from the Hon. Sec. — see Panel.

For the **Wimbledon** details you had better check with the Hon. Sec; we think the meeting is on December 14 at St. Andrews Church Hall, Herbert Road, Wimbledon, but the bit of paper says November 14!

Now we come to the **Wirral**; this is the group based on Ivy Farm, Arrowe Park, on the first and third Wednesday of each month. December 3 is a talk on 'RTTY and Other Things' by G3VQT and G8WQB, while December 17 is the Christmas meeting for which details were being finalised.

The Oddfellows Hall, New Street, is the home of the **Worcester** club; December 1 is a talk on Raynet, and on December 15 they have an informal club night.

At **Worthing** one can find the local chaps every Wednesday evening at Lancing Parish Hall. December 3 is G8FXB's Russian visit, and December 10 a possible antenna talk; then on 17th it's party night! December 24 and 31, no meetings.

### Forty Years On

**Yeovil** club was formed in 1946 and to celebrate they have put out a very fine brochure; from it we notice that G3NOF was Hon. Sec. for a total of thirty-three years in one stint which is pretty good going! Now they are settled in their present Hq. and running a strong weekly programme. December 11 is G3MYM's talk on 'Preparing for Cycle 22', and on 18th G3GC is to talk about oscilloscopes. No meeting on Christmas day, and they resume on January 1 with a natter night.

In among the regular Friday night activities at **York** we notice they have a Christmas party at the clubroom on December 19. The Hq. is at the United Services Club, 61 Micklegate, York, where they say visitors are welcome — and this is one club where we know they mean it.

### Finale

This is the last chance we shall have to wish you all a Very Happy Christmas and a Successful and Prosperous New Year. The deadline dates are in the 'box' in the body of the piece, and are dates for arrival of your letters, addressed to your "Club Secretary", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ.

# IF YOU BUY

A KIT OR MODULE FROM US THE CHANCES ARE IT WILL BE FROM THE TOP BEST SELLERS LISTED BELOW. WE ARE PLEASED TO SAY THAT THEY JUST SELL AND SELL AND SELL . . . . . SHOULDN'T YOU HAVE AT LEAST ONE IN YOUR SHACK?

70CMS Modules		Assembled	Kit	24cms Modules		Assembled	Kit
70FM05T4	500mW N8FM Transmitter	63.40	39.85	1250DC50	TV Down Converter	79.95	—
70FM05R5	N8FM Receiver	79.40	59.95	1250PA2	TV Pre-Amplifier	49.95	—
70FM10	10W Power Amplifier	56.45	45.50	1240TVT	Frequency Locked Transmitter	145.00	—
70LIN3/LT	500mW Linear Amplifier	39.90	30.55	UFM01	420 MHz FMTV Exciter	41.25	28.25
70PA2/S	RF Switched Pre-Amplifier	30.56	19.10	VID1F	IF Processor/Demodulator	63.75	47.60
70PA5	GaAs FET Pre-Amplifier	23.60	14.75	SCT - 2	Transmit Sound Modulator	16.50	—
TVUP2	70cms TV Converter	38.40	28.75	SCR - 2	Receive Sound De-Modulator	24.95	—
TVM1	70cms TV Modulator	11.60	7.25	VD/P1	Pre-Emp/De-Emp Module	10.50	—
<b>2M Modules</b>				<b>General Accessories</b>			
144PA4	2M MOSFET Pre-Amplifier	17.20	10.75	T82	Toneburst	7.50	4.70
144PA4/S	RF Switch Pre-Amplifier	31.20	19.50	PT3	Piptone	8.45	5.10
144LIN25B	RF Switch 25W Linear	49.20	35.75	MPA2	Microphone Pre-Amplifier	6.25	4.60

All prices include VAT but please add £1.00 for postage and handling.

Delivery is usually from stock or within 28 days.

A copy of our full list of modules and kits for practicing amateurs is available for the cost of an A4 size SAE.



**WOOD & DOUGLAS**

VHF/UHF COMMUNICATIONS PRODUCTS



Unit 12-13  
 Youngs Industrial Estate  
 Aldermaston, Reading  
 Berkshire RG7 4PQ  
 Telephone: (07356) 71444 Telex: 846630

## QUARTZ CRYSTALS

STOCK CRYSTALS		FUNDAMENTALS		MADE TO ORDER CRYSTALS			
<b>CRYSTALS FOR 2 METRES</b> HC25 £2.15 FOR ONE CRYSTAL HC6 £2.15 FOR ONE CRYSTAL TX CRYSTALS RX CRYSTALS HC6/U 4 & 8 MHz 30PF 44 MHz SERIES RES HC25/U 12 MHz 30 & 40PF 44 MHz SERIES RES HC25/U 18 MHz 25 & 20PF 14/15 MHz 20 & 30 PF HC25 SCANNER XTALS (NOT SR9) Full list available on request; please send SAE.		<b>WHEN 2 OR MORE PURCHASED</b> £1.95 <b>WHEN 2 OR MORE PURCHASED</b> £2.05 CHANNELS IN STOCK ROTO R7, S11, S20 TO S23 ROTO R7, S8 TO S23 & S32 ROTO R7, S8 TO S23 & S32 ROTO R7, S8 TO S23 & S32		<b>PRICE</b> 5 TO 50kHz £21.00 50 TO 150kHz £11.00 150 TO 500kHz £7.80 180 TO 999kHz £11.90 1 TO 1.5MHz £10.75 1.5 TO 2.0MHz £5.10 2.0 TO 6.0MHz £4.75 6 TO 21MHz £4.55 21 TO 25MHz £6.50		<b>OVERTONES</b> FREQUENCY RANGE 21.00 TO 65.00MHz 60.00 TO 110.00MHz 110.00 TO 125.00MHz 125.00 TO 175.00MHz DELIVERY 2.0 TO 175.00MHz 2 TO 3 weeks 5.0 TO 999.9kHz 6 TO 8 weeks 1.0 TO 1.499MHz 3 TO 4 weeks	
<b>4 METRE CRYSTALS FOR 70.25 IN HC6/U AT £2.40 each</b> TX 8.78250 RX 29.78000 70CM CRYSTALS £6.00/pr or £2.50 each For Five PF1 PF2 & PF70 series. Wood & Douglas and FDK Multi U/I SL8 (433.2) SU20 RB2 RB4 RB5 RB6 RB10 RB11 RB13 RB14 RB15. ALSO FOR MULTI U11 ONLY SU16 SU18 CONVERTER CRYSTALS IN HC18/U AT £2.95 each 22.000 35.698 70.000 96.000 105.695 101.000 101.500 116.000 <b>FREQUENCY STANDARDS</b> £2.75 each HC6/U 1000kHz 3.50MHz 5.00MHz 10.00MHz 10.700MHz HC18/U 1000kHz 7.00MHz 10.700MHz 48.00MHz 100.00MHz <b>TONEBURST, I.F. &amp; MPU CRYSTALS IN HC18 £2.25 EACH</b> 7.188 MHz (for 1750 Hz Tone), 10.245 MHz (for 10.71 F.I.) 3.2768 5.06888 14.3190 16.00000 YAESU CRYSTALS for FT101's FT901 and etc. £4.00 each		DISCOUNTS: Price on application for 10+ units to same frequency/spec. or bulk purchases of mixed frequencies. We supply FREE xtals for use in U.K. repeaters. COMMERCIAL CRYSTALS: Available on fast delivery and at competitive prices. Please send for list starting interests. EMERGENCY SERVICE: for XTALS 1 to 125MHz. Add the surcharge for each XTAL. Days refer to working days. 4 days + £12 6 days + £7, 8 days + £5, 13 days + £3. CRYSTAL SOCKETS HC25 £0.20 ea. HC6 £0.25 ea. <b>MINIMUM ORDER CHARGE £1.50 unless ordered with crystals.</b> TERMS: Cash with order post inc. to U.K. & Ireland. Cheques & P.O.'s to GSL LTD.		HOLDERS: PLEASE SPECIFY WHEN ORDERING — also HC25/U supplied for XTALS above 3MHz HC13/U & 200kHz HC6/U & HC33/U 170kHz HC 18/U & HC25/U 2.175MHz. P.O. Box 19 Erith Kent DA8 1LH Telephone: 01-318 4419 24Hz Anafone; Dartford (0322) 330830 Telex: 8813271 GECOMS - G (Attention QUARTSLAB)			

USL QuartzSlab MARKETING LTD ALL PRICES ARE EX. VAT. PLEASE ADD 15% P.P. 60p UNDER £5, OVER FREE.

## RADIO AMATEUR PREFIX-COUNTY-ZONE LIST

published by GEOFF WATTS  
 Editor of "DX News-Sheet" 1962-82

The list you have always needed, the list that gives you everything, and all on one line! For each country:-

- a. its DXCC "status"
- b. the normal prefix
- c. the special prefixes
- d. the ITU callsign block allocation
- e. the continent
- f. the "CW" Zone No.
- g. the ITU Zone No.

Full information on Antarctic stations, USSR Klub-stations, obsolete prefixes used during the past 10 years, and much more.

The list is completely up-to-date, and includes all the latest information.

Everything arranged alphabetically and numerically in order of prefix. Ideal for Contest operators and SWL's.

Tell your Club-members about it. Order an extra copy for that overseas friend. 15 pages. Price £1.00 (UK), overseas (air mail) \$2.00 or 6RCs.

**GEOFF WATTS**

62 BELMORE ROAD, NORWICH NR7 0PU, ENGLAND

## J. BIRKETT 25 THE STRAIT, LINCOLN, LN2 1JF. Phone: 20787

BFW16A LOW POWER R.F. TRANSISTORS @ 75p each.  
 75 + 75p AIR SPACED VARIABLE with ball bearings, silver plated @ £2.30.  
 14 PIN OIL OP-AMPS, 710, 741, 747, all 20p each, TTL SN 7400 @ 6 for 50p, 7475 @ 12p.  
 CRYSTALS wire ended 100kHz @ £1, B7G 100 kHz @ £1.50, 10KAJ 600 kHz @ 60p, 1 MHz @ £1.50, W/E 5 MHz @ £1.50, 10MHz @ £1.50.  
 AVX MULTILAYER AXIAL CAPACITORS 1000pf 100 v.w., @ 25p doz.  
 POWER MOS FETS VN10KM @ 50p, WM 211 @ 40p, VN 10LM @ 40p, VN 90AA @ 60p.  
 BRIDGES 100 PIV 20 Amp @ £1.20, 100 PIV 10 Amp @ 65p.  
 MOTOROLA PLASTIC BC 108C (C9123) @ 6 for 50p.  
 ITT CRYSTAL FILTERS Type 014DG, 10.7 MHz B.W., .3.5 MHz @ £3.95.  
 TRANSMIT-RECEIVE PIN DIODES VHF @ 5 for 60p, UHF @ 5 for 75p.  
 10 WATT 70 MHz TRANSISTORS NPN 2SC1056, 2SC1226, PNP 2SA699, all 45p each.  
 TRANSFORMERS 240 VAC input, output 24 volt tapped at 14 volt, 1 amp, @ £1.50 (p & p 75p).  
 CRYSTALS 10KAJ 1 MHz @ £1.50, 800 kHz @ 60p, 7 MHz @ 60p, 8 MHz @ 60p, W/E glass 100 kHz @ £1, B7G 100 kHz @ £1.50.  
 DUAL GATE MOS FETS like 40673 @ 80p each.  
 FETS J304 @ 6 for £1, J230 @ 5 for 60p, BF 256 @ 20p, 2N 3819 @ 20p.  
 AIR SPACED VARIABLE CAPACITORS 10pf @ £1.50, 10 + 10 + 20pf @ £1.30, medium size 450pf @ £2.30, 200 + 300pf @ £1.95, 200 + 176pf @ £1.50, 500 + 180pf @ £1.50, 310 + 310 + 310pf @ £1.95, 100 + 200pf @ £1.60.  
 VARIABLE POWER SUPPLY KIT 6 to 22 volt consisting of transformers, LM317, 10,000uf P.C. board, 5k pot. with instructions £4.95 (p & p £1.50).  
 WOOD AND DOUGLAS KITS AVAILABLE BY POST AND FOR CALLERS.  
 ACCESS AND BARCLAY CARDS ACCEPTED. P.P. 60p UNDER £5, OVER FREE.

### ("SITUATIONS" AND "TRADE")

30p per word, minimum charge £3.60. No series discount. All charges payable with order. Insertions of radio interest only accepted. Add 50 per cent for Bold Face (Heavy Type). No responsibility accepted for transcription errors. Box Numbers £1.50 extra. Send copy, with remittance, to the Classified Dept., Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ. Prices include VAT

### TRADE

**Amidon toroidal cores**, ferrite rings and beads. Send *s.a.e.* for data and prices. Business hours: 10-5 p.m. Tues., Wed., Fri.; 10-4 p.m. Sat. — **SMC (TMP Electronics)**, Unit 27, Pinfold Workshops, Pinfold Lane, Buckley, Clwyd CH7 3PL.

**Wanted: EE8** American field telephones, any condition, any quantity. — Ring 01-743 0899, 9-5 p.m. Monday-Friday.

**Service Manuals:** most makes, models, amateur, test, televisions, vintage etc., *s.a.e.* with enquiries please;—**Mauritron (SWL)**, 8 Cherrytree Road, Chinnor, Oxon. OX9 4QY.

**Pye Tx/Rx's**, large stock, send *s.a.e.* for details. — **Cityline Communications Group**, Elystan House, Elystan Place, London SW3 3LA. (Tel: 01-597 9770).

### FREE READERS' ADS

*see Information Panel on page 404*

**For Sale:** Ham International Jumbo Multimode, 240v., ideal for 10m., boxed, very good condition, £110 inc. p/p. Or *exchange* for as new Sigma IV with cash adjustment. — Hawkins, 4 Albert Road, Cinderford, Glos. GL14 2HS.

**Wanted:** W.W.II radio/radar equipment by private collector: receivers CR-100, BC-348, HRO Senior, Collins 75A-4, APR-4; radio equipment TR-1082/1083, TR-9H, T.1154; radar transmitters TR-3151, TR-3191, T-3065; receivers R-1355, R3515; modulators 64, 158; indicator units 6, 48A, 96, 182A; Magnetrons CV38, CV64; Klystrons CV67, GL446, GL464; scanners, and any other units British, American and German. — Bristow, 6 Finmere, North Lake, Bracknell, Berks. RG12 4WF.

**For Sale:** Trio 7930 5/25-watt FM transceiver, as new and boxed (bought May '86), £250. — Derrick, GM30M, QTHR. (Tel: 0324-558457 after 7 p.m.)

**Wanted** by enthusiast: Marconi Type R.1155 receiver. Details and price please. — Stubbings, 12 Otter Avenue, Saxilby, Lincoln LN1 2HU. (Tel: 0522-702601 after 6 p.m.)

**Wanted:** Codar PR-30 or PR-40 preselector needed quickly, cash waiting. — Ring Ian, 0224-636828 after 5.30 p.m.

**Selling:** Complete HF station comprising Trio TS-130V CW/SSB digital transceiver, fitted narrow CW filter, 10 watts output, £375; remote '120 VFO, £30; DFC-30 digital frequency controller, £40; unused mobile mount, £15; Kenwood PS-20 PSU, £50. Also Yaesu FL-110 solid-state linear amp., 10W input, 100W output, 80-10m. All manuals including workshop manuals, all items mint condition and prices 'or near offer'; price reduction for complete station. — Clarke G0AYZ, QTHR. (Tel: 0705-589560)

**Sale:** Datong AD270 indoor active antenna, complete, £25. — Blanchard, 1 Kent Gardens, Hetton-le-Hole, Tyne & Wear DH5 9LA.

## ATTENTION

### ALL ICOM IC 2, 02 and 04 OWNERS.

Now available for the above ICOM hand portable transceivers is the Kimaski Audio Booster (KAB 1). The KAB 1 is designed to increase the audio output from your handheld by a substantial amount. The improved audio level will drive the internal or an external speaker to full volume and it will even help you pull in those stations with low deviation.

The KAB 1 is a solid state hybrid amplifier which fits neatly inside the rig, it is fully sealed with only four connections needed to be made. Full details are given for installing the unit and installation should take no more than 10 minutes.

The standby current is typically 4mA and should not affect the useful battery life by more than 10%.

The KAB 1 is manufactured by

**Kimaski**  
TECHNOLOGY

The KAB 1 costs £12.95 inc. VAT + £1.25 P&P  
and is available from  
Scarab Systems, 39 Stafford Street, Gillingham,  
Kent ME7 5EN  
(Tel: 0634 570441).

Dealer enquiries welcome.

## P.M. ELECTRONIC SERVICES

2 ALEXANDER DRIVE, HESWALL, WIRRAL, MERSEYSIDE, L61 6XT  
Telephone: 051 342 4443 Telex: 627371

### THE QUARTZ CRYSTAL SPECIALIST

#### AMATEUR RADIO CRYSTALS FROM STOCK

4m, 2m, 7cm and transverter/converter

<b>MICROPROCESSOR</b>	<i>from</i>	<b>MARKER</b>
<b>CRYSTALS</b>	<i>stock</i>	<b>CRYSTALS</b>

DOUBLE BALANCED MIXERS M8 and M18  
PIN compatible with MD108 and SBL1  
but with superior spec available from stock.

WE CAN SUPPLY CRYSTALS TO MOST  
COMMERCIAL AND PROFESSIONAL  
SPECIFICATION INCLUDING COLD  
WELD SPECS.

CRYSTAL SOCKETS for HC6/u, HC13/u  
and HC25/u

### MADE TO ORDER SERVICE

OVER FREQUENCY RANGE 6KHz to 250MHz with  
express service if required

For full details of the above services,  
please send *s.a.e.*

# Make Morse Manageable

- Letters    ● Numbers
- Mixed     ● Practice Oscillator
- Variable Speed     ● Volume Control
- Earphone Socket

Learn morse  
the easy  
way.

An electronic  
tutor for  
only

**£29.95**

**NO STAMP NEEDED**

**B. A. JONES**

**FREEPOST**

**(GR 1863)**

**CHELTENHAM**

**GLOS**

**GL50 3BR**

**GZVF** inventor and proprietor of Patent for **VARIABLE HIGH FREQUENCY FRAME ANTENNA** offers circuit and full assembly details for the modest sum of £5. A Do-It-Yourself project. Components required to be found in most Hamshacks. Most expensive components, two variable tuning capacitors. Antenna twenty-one inches square, mounts on top of control box, fully rotatable from operating position, tunable all the way 80 to 10 metres there being only one inductance. SWR One to One 40, 15 and 10 and One Point Five to One 80 and 20. S9 on CW from JA, W areas 0 to 9, VE 1 to 6 and all Europe. Ninety awards obtained with frame. Maximum power 100 watts. **NEW EFFICIENT L.W. AND M. WAVE FRAME ANTENNA.** 21 inches square. D.I.Y. project. Circuit, parts list, assembly data £3. Ideal Caravan and flat dwellers. **DIY SWL ATU 80 to 10 for LONG WIRE or LOOP ANTENNA.** Parts List Assembly data £4.  
F. G. Rylands, 39 Parkside Avenue, Millbrook, Southampton SO19AF. Tel. (0703) 775064

## D. P. HOBBS NORWICH LTD. G3HEO

Amateur Radio and Electronic Component Specialists.

Full range of "Velleman" kits now available.

Large S.A.E. (18p) for current catalogue.

13 ST. BENEDICT'S ST., NORWICH. Tel. 615786

## ALL VALVES & TRANSISTORS

Call or phone for a  
most courteous quotation  
**01-749 3934**

We are one of the largest  
stockists of valves etc. in the U.K.

**COLOMOR ELECTRONICS LTD.** 170 GOLDHAWK ROAD  
LONDON W12

**Selling:** 144 MHz antennas:  $\frac{7}{8}$ -wave with wing/roof mount, £15;  $\frac{1}{4}$ -wave magmount, £5; Tonna 9-ele. crossed Yagi, £20. BC-221 wavemeter with PSU, £20. — Ring Colchester (0206) 395720.

**For Sale:** SR-9 2m. receiver, £30. Aiwa AR-158 6-band Rx, £5. **Wanted:** Trio or Kenwood R-2000 receiver, about £360. Also mint ATU. — Ring Wood, Clochan (05427) 378.

**Wanted:** To buy, or borrow and copy, circuit diagram and/or manual for U.S. Navy LM-14 (serial no. 5127) frequency meter. — Duncan, G4IZM, QTHR. (Tel: Rugby 811295 evenings).

**For Sale:** Eddystone Model 1830/1 HF/MF professional marine reserve communications receiver (also to civil aviation ref: 10D/CA 10696), little used and in perfect working order, 120kHz to 31 MHz, 9 bands, crystal-control from 1.5 to 31 MHz, switched crystal controlled spot frequency facilities available, with internal speaker and plinth speaker, and maker's handbook. LAR Omni-Match SWL ATU, Joymatch ATU, Joystick, extensive library of RSGB/ARRL technical books. The lot £600 cash, buyer collects. — Ring Langport (0458) 250235, Somerset.

**Selling:** Vintage U.S. Army Signal Corps BC-221-AH frequency meter in mint condition, complete with canvas field hoods, calibration charts and phones, £50. Signal Corps EE-65-B telephone test set, looks new, £40. — Ring Bookham 52569 evenings.

**Wanted:** FP-707 power supply for FT-707 transceiver. Buyer will arrange collection. — Mosley, Apt. 24 Bellavista, Loma de los Riscos 53, Torremolinos, Malaga, Spain. (Tel. from U.K.: 01034 52 380878).

**Selling:** 14 Type FT243 crystals between 7005 and 7040 kHz, £25. HC33/U crystal, 1911.46 kHz, £2. **Wanted:** AC/PSU for Marconi Mercury 1017 Rx; Codar Type 250/S AC/PSU's; Codar preselector. — Marris, 35 Kingswood House, Farnham Road, Slough, Berks. SL2 1DA.

**Exchange:** Blaupunkt 'New York' car radio cassette player with amp., graphic equaliser and 6 speakers, superb quality unit (cost over £900) for HF linear, dual-mode mobile or handhelds; or W-H-Y? — Ring McCallum, G4VNG, 0733-231639.

**For Sale:** Trio TS-430S transceiver with general coverage Rx built-in, fitted YK88SN SSB filter and FM board, service manual, good condition, £620 or near offer. FT-480R 2-metre multimode transceiver, good condition, £280 or near offer. — Ring Terry, G4OXD, Hitchin (0462) 35248 after 6 p.m.

**Sale:** Trio TS-830S transceiver (originally purchased from Lowe's), used only as a receiver, selling to finance purchase of weather FAX equipment, £640. — Ring Haslam, High Wycombe (0494) 715467.

**For Sale:** Yaesu FT-101E with G3LLL FM module and spare valves, £350 or near offer. Yaesu FT-290R, with Microwave Modules 30-watt linear, mobile mounting bracket and two sets of nicads, £250 or near offer. Jaybeam 6-ele. 144 MHz quad, £15. — Johnson, 61 Moss Lane, Alderney Edge, Cheshire SK9 7HP.

**Selling:** Racal RA-117E short wave receiver, with ATU, pan adaptor, LF unit, and two sideband units, all 19" rack mounting, with books and cables, £475 or near offer. — Ring Eric, G1ANO, 09141-69207.

**Sale:** Icom IC-290D 2m. 25-watt multimode mobile, excellent condition, £295. AOR-2001 scanner, very good condition, £195. Yaesu FT-404R 6-channel UHF handheld, new, with new battery and speaker/mic., carrying case, mobile PSU, and Puma 15-watt PA, £145. — Ring Chris, G6IHN, Ironbridge 2711.



**For Sale:** Grundig 'Yacht Boy' 700 International Rx, 150 kHz to 30 MHz, 88-108 MHz FM, USB/LSB/AM/FM/CW, digital and analog readout, coarse and fine tuning IF bandwidth filter, 5 kHz AM filter, digital clock, S-meter, battery/mains (cost £120), now £85. — Ring Terry, 0462-35248.

**For Sale:** WPO DSB-2 transceiver, digital display, 160m. DSB/CW, £100. Westminster: W.15FM, 70.26 MHz, 10-channel, dash mount, £60; W.15AM, 70.26 MHz, 3-channel, boot mount, £40; modified W.15AM, 6 channels on 145 MHz FM (Rx/Tx), £60. All with accessories and handbooks. WPO VHF Minisynth, all crystals, built and tested, £45. Unmodified Pye HB-1FM Bantam, 156 MHz, with handbook, case and mic., £25. All 'or near offer'. — Ring G3VKM, 050277-622 (Norfolk).

**Selling:** Multimode-2 transceiver, 26.9-28.3 MHz coverage (great unit for 10m. conversion), only additions are 'A' channels otherwise untouched, a little scratched though, £120 or near offer. Harrier CBX CB, rather "used", needs attention, £20 or near offer. — Ring Mike, 04023-45969 evenings.

**Sale:** Eddystone 770/U Rx, 150-500 MHz, in newish condition, £50. — Stansfield, 125 Park Road, Elland, West Yorks. HX5 9HZ. (Tel: 0422-76062).

**Sell or Exchange:** KW-204 Tx and KW-201 Rx, with manuals, good condition, £170 or near offer. Blazestone 2m. FM, very good condition, £100 or near offer. Or exchange for 2m. multimode. — Ring Ron, G6XCO, Stanley (0207) 235930.

**For Sale:** TS-520, superb condition, with CW filter, DC unit and Shure mic., £285. — Ring G4OER, Dunstable 608152.

**Wanted:** Yaesu FP-707 power supply, must be in good condition and working. — Ring Boston, 01-359 2276 after 6 p.m.

**Wanted:** AC/PSU for Marconi 2207C Atalanta Rx. Also KW-2000, working or non-working. — Frost, G0DCR, 36 York Gardens, Braintree, Essex CM7 6NF (Tel: 0376-40317).

**For Sale:** FT-690 with Spectrum 25-watt PA and B.N.O.S. low-pass filter, £180. FT-290 with nicads and charger, £190. Both rigs boxed and 10 months old. — Ring Dave, G4VPV, Byfleet 44706 most afternoons and evenings.

**Sell or Exchange:** Kenwood/Trio TS-530SP transceiver, current model, as new, £595. National HRO-M, 9 coils, power pack, rack mount, very clean, £75. Hallicrafters S.72 general coverage Rx, 8 valves, mains/battery, £50. Echophone Commercial general coverage Rx, £45. 1934 McMichael 135, mains, £35. 1934 Ferranti Una 3-valve battery set, original carton, £25. **Wanted:** early crystal sets, wireless sets, also TS-930. — Taylor, G4ERU, 5 Luther Road, Winton, Bournemouth. (Tel: 0202-510400).

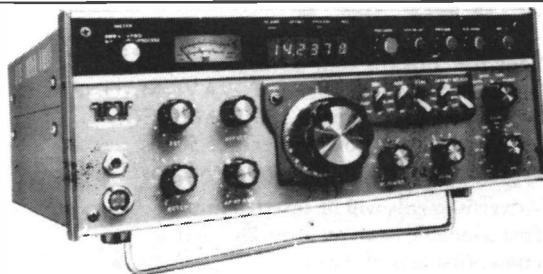
**Wanted:** Circuit diagram/handbook for repair of KW-2000 (photostats are fine), all costs plus reasonable fee paid. — Ring Allan, 0248-600114.

**For Sale:** TS-520SE transceiver in very fine condition, £375. — Ring Jack, Cheltenham (0242) 528431.

**Wanted:** Sony CRF-220 Rx, onward turret tuner model, must have BFO built-in and two-speaker system, fair price paid for example in good condition. — Amoroso, 60 Highfield Road, Salford, Lancs. (Tel: 061-743 1570).

# KW TEN - TEC CORSAIR II

NO FRILLS, "GIMMICKS", OR UNUSED FACILITIES—FOR THE SERIOUS PHONE/CW OPERATOR WHO WANTS THE LOWEST NOISE, CLEANEST AND MOST SELECTIVE AMATEUR hf TRANSCEIVER ON THE WORLD MARKET.



**Other KW-TEN TEC winners**  
The ARGOSY II phone/cw transceiver. The CENTURY 22 cw only transceiver. The original KW TRAP DIPOLE and TRAPS, 8 ATU's, KW BALUN, and ANTENNAS  
**WRITE OR PHONE FOR DETAILS**

## KW TEN - TEC LIMITED

Vanguard Works, Jenkins Dale, Chatham, Kent, ME4 5RT  
Telephone. 0634 - 815173.

## REG WARD & CO LTD

The Southwest's largest Amateur Radio Dealer

1 Western Parade,  
Axminster, Devon EX13 5NY



- appointed agent for
- ★ Yaesu, Trio, Icom, FDK ★
- ★ Complete range stocked ★
- ★ Full demonstration facilities ★
- ★ Mail/Phone orders on all items ★
- ★ Barclaycard, VISA, Credit Access ★

Ancillary equipment by Aerial, AKD, AOR, Bencher, BNOS, Cap. Co, Datong, Dawa, Drae, Hansen, Himound, JIL, Kenpro, Micanave Modules, Mutek, SEM, Shure, Tokyo Power, Tono, Toyo, Welz, Wood & Douglas

Aerials by: G. Whip, Hygain, Jaybeam, Mini Products, MET, Revco, Tonna

full range of Wood & Douglas kits: Tel. Axminster (0297) 34918  
Opening hours: Tues-Sat 9.00-5.30 (lunch 1-2) Closed Mondays

# UPPINGTON

COMMUNICATION ELECTRONICS  
G2BAR BERT RS85565 PAUL G1DFK PETER  
G2BAR HAM BAND AERIALS

Gamma Matched Yagi Arrays		Plus carriage		THE G5RV	
	2EI		3EI	MULTIBAND DIPOLE	
6M	£18.50		£ 22.00		
10M	£56.00		£ 66.70		
15M	£68.00		£ 80.50	FULL SIZE	½ SIZE
20M	£88.00		£103.50		
<b>ZL SPECIAL TYPE ANTENNAS</b>	12ELE £25.00 P&P £3.50	7ELE £14.25 P&P £3.00	80-10 MTRS	40-10 MTRS	
	5ELE £10.50 P&P £2.50	+ £1.80 P&P			

AMATEUR ELECTRONICS UK  
12/14 PENNYWELL ROAD, BRISTOL BS5 0TJ  
Telephone: Bristol (0272) 557732/558578

# FREE READERS' SMALL ADS.

Send the copy for your advertisement to the Classified Dept., SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. (If you require a Box No. send £1.50 to cover postage costs). Please write clearly!

Advertisements will be inserted in the first available issue on a strictly 'first come, first served' basis

*We reserve the right to alter, shorten or refuse at our absolute discretion any advertisement as we may deem appropriate. We can accept no responsibility whatsoever for any losses or claims of any kind which may arise out of any advertisement; nor for any transcription, setting or proof-reading errors, although every possible care is taken to ensure such errors do not occur.*

## MORSE CODE PREPARATION

Cassette A: 1-12 wpm for amateur.  
Cassette B: 12-25 wpm for professional examination preparation.  
Each cassette is type C90.  
Price of each cassette (including booklets) £3.95.  
Morse key with separate battery (PP3) — driven solid-state oscillator and sound transducer produces clear tone for sending practice. Price of key with electronic unit £9.95.

Price includes postage, etc. Europe only.

**MH ELECTRONICS (Dept. SW)**

12 Longshore Way, Milton, Portsmouth PO4 8LS.

## FANTEX RADIO

Introducing our new range of 2 metre aerials

5 Element beam..... 19.75      8 Element beam..... 27.75

### 6 & 4 METRE EQUIPMENT

3 Element beam..... 23.50      3 Element beam 4 metres..... 19.99

2 Element beam..... 19.95      2 Element beam 4 metres..... 16.90

Single dipole..... 9.90      Single dipole..... 7.95

MOSFET converter 50 (any IF)..... 28.80      MOSFET converter 70MHz (any IF)..... 29.95

Prices include postage and packing — Please send for further details

33 Alexandra Street, Carrington, Nottingham NG5 1AY Tel: 0602 625099

## "S.W.M." DX ZONE MAP

Latest 10th Edition!

Great Circle Projection on durable, quality, paper for wall mounting, 33% in. wide by 24½ in. deep. Giving essential DX information — bearing and distance of all parts of the world relative to the U.K., the Zone areas into which the world is divided for Amateur Radio purposes, with major prefixes listed separately. Distance scale in miles and kilometres. Time scale in GMT. Marking of Lat./Long. close enough for accurate plotting. Hundreds of place names, mainly the unusual ones, and most of the rare islands.

Price £4.35 inc. p/p

Publications Dept.

**Short Wave Magazine Ltd.,**

34 High Street, Welwyn, Herts. AL6 9EQ.

## CALL BOOKS

### RADIO AMATEUR CALL BOOKS (1986)

International Listings..... £17.20  
North American Listings..... O/S  
U.K. Callbook, 1986 Edn. (RSGB)..... £5.65

## MAPS

### "SHORT WAVE MAGAZINE" DX ZONE MAP

(GREAT CIRCLE) in colour. Latest 10th edition..... £4.35

### AMATEUR RADIO MAP OF WORLD Mercator Projection —

Much DX Information—in colour. Latest 15th edition..... £1.85

### RADIO AMATEUR MAP OF THE U.S.A. AND NORTH

AMERICA State Boundaries and Prefixes, size 24" x 30", paper. Latest 7th edition..... £1.20

### RADIO AMATEUR'S WORLD ATLAS In booklet form,

Mercator projection, for desk use. Gives Zones and Prefixes. Latest 12th edition..... £2.75

## LOG BOOKS

Amateur Radio Logbook..... £2.70

Receiving Station Log..... £2.75

Mobile Logbook..... £1.20

(The above prices include postage and packing)

Available from:

Publications Dept.

**Short Wave Magazine**

34 High Street, Welwyn, Herts. AL6 9EQ

Tel: Welwyn (043871) 5206/7

(Counter Service, 9.30-5.00 Mon. to Fri.)

(Giro A/c No. 547 6151)

# THE ARRL ANTENNA COMPENDIUM

## Volume 1

Recently published by the ARRL, this book makes fascinating reading of hitherto unpublished material, and will appeal to every antenna experimenter. Among topics discussed are Quads and Loops, Log Periodic Arrays, Beam and Multi-band Antennas, Verticals and Reduced Size Antennas. There is a section on Antenna Construction and Installation, as well as a chapter giving General Antenna and Transmission Line Information.

175 pages

£8.95 inc. p/p

Order from:

Publications Dept.

**SHORT WAVE MAGAZINE LTD.**

34 HIGH STREET, WELWYN,

HERTS. AL6 9EQ

# Morse Tutor

Learning morse with D70 is fast and painless. And you can "do it anywhere" because D70 is built to travel and the battery lasts for months. Field proven by thousands of users.

**Price: £56.35** Inc. VAT

To order simply dial  
**0532 744822**  
 or write with cheque or postal order to



**Dept SW Datong Electronics Ltd., Clayton Wood Close, West Park, Leeds LS16 6QE**



Access/Barclaycard welcome – Fast delivery service

Catalogue and data sheets on any product available free on request. Dial 0532 744822 (2 lines)

## STEPHENS-JAMES LTD.

47 WARRINGTON ROAD, LEIGH, LANCS. WN7 3EA  
 Telephone (0942) 676790  
 Turn at the Greyhound Motel on the A580 (East Lancs. Road).

LANCASHIRE & THE NORTH WEST'S LEADING RETAILER IN AMATEUR RADIO. 20 YEARS SERVING THE AMATEUR'S BY AMATEURS SPECIALISING ONLY IN AMATEUR RADIO EQUIPMENT.  
 24 HOUR MAIL ORDER SERVICE

### TRIO RANGE (Sole authorised TRIO dealer in N. West)

TS940S HF Transceiver.....	£1895.00
TS930S HF Transceiver.....	£1566.00
TS440S HF Transceiver.....	£998.00
TS430S HF Transceiver.....	£867.00
TS830S HF Transceiver.....	£981.00
TS530SP HF Transceiver.....	£849.00
AT230 Antenna tuning unit.....	£185.98
AT940 Auto Antenna tuning unit.....	£229.08
AT930 Auto Antenna tuning unit.....	£192.75
TL922 HF Linear Amplifier.....	£1360.00
TH21E 2m Hand held FM.....	£199.00
TS780 2m/70cm All mode Transcvr.....	£998.00
TR751E 2m Multimode.....	£590.78
TR2500 2m FM Portable.....	£321.00
TR2600E 2m FM Portable.....	£328.00
TM201A Mobile 2m Transceiver.....	£322.68
TS711 2m All mode base station.....	£839.96

Full range of accessories available.

Full size G5RV antenna.....	£16.85
Half size G5RV antenna.....	£14.25
80-10 Dipole Kit.....	£24.95
Pair 7-1 MHz Traps.....	£9.75
HS50B 1-1 balun.....	£24.21
Large dipole centre piece.....	£3.50
High Power 7 MHz Traps.....	£15.75
Welz D130 Discone Antenna.....	£79.35
Revcone-Discone Antenna.....	£31.50
GPV52M Co-Linear.....	£54.92
RS37 Hand Held Airband Receiver.....	£69.50

We are also stockists for: G-Whips – Welz – Kenpro – Diawa Rotators and SWR meters, power supplies. Microwave Modules, Global, Tonna antennas, ARRL and RSGB Publications. Pocom Auto RTTY readers.

Full range of clamps, aluminium tubes, vertical antennas, dipoles.

Send large SAE for full details. Our secondhand equipment is one of the largest in the country, send S.A.E. for our up dated list.

Quotations for HP on request.

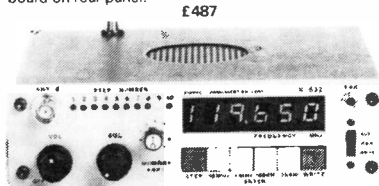
Shop hours 9.30 till 5.15 Mon – Friday, 4 pm Sat.

### TRIO TS940S TRANSCEIVER

Top of the range for all serious DX and competition users. Designed for SSB-CW-AM-FM and FSK operation. All Amateur bands from 160 to 10 metres. The Transceiver also incorporates a 150KHz to 30MHz general coverage receiver having an excellent dynamic range. 40 memory channels. The latest feature is a green back-lit matrix LCD which shows graphical VBT and OF slope tuning positions, can also be used to review the frequencies stored in the memory and the other VFO. Variable power output control. Break in keying on CW. Split frequency working.

### NEW MODEL

AOR2002 Scanning receiver. Replacing the AR2001 receiver which has proved to be the best scanning receiver available. Now with frequency coverage 25 to 550MHz plus 800 to 1300MHz. Improved keyboard. Front panel knob for frequency stepping in addition to the up/down buttons. Front panel LED strip "S" meter. Front panel headphone jack. Socket for RS232C interface board on rear panel.



THE R532 AIRCRAFT BAND RECEIVER £224

**Specification.** Frequency range: 110 to 136MHz, i.e. all NAV/COM channels. Number of channels: 1040 (25KHz steps). Sensitivity: Better than 0.75 microvolts 10dB/SN. Memory channels: 100 (10 banks of 10) Memories can be scanned automatically or selected manually. Power required: 12V dc negative earth 300 mA typical. (Display can be switched off to reduce consumption when operating portable). Size: 160 x 45 x 130mm. Weight: approx. 1Kg. (including memory backup batteries).

### STATION ACCESSORIES

DL600 600 watt Dummy Load.....	£62.47
DL60 60Watt Dummy Load.....	10.96
LF30A Low Pass Filter.....	£30.18
SWR50 SWR/Power Meter.....	£24.61

### WELZ SWR/POWER METERS

SP122 1.8-60MHz.....	£85.00
SP220 1.8-200MHz.....	£59.00
SP420 144-525MHz.....	£71.00

### TONNA

17 Element 2m Yagi.....	£37.66
19 Element 432MHz Yagi.....	£20.70
21 Element 432MHz Yagi.....	£29.67

### G-Whip New all band Base Station Antenna

G-Whip New Single Band HF Mobile Antennas  
 Welz Diamond DCP5 10-80 trapped vertical with radial kit..... £149.00

### JAYBEAM

LW5 5EI 2m Yagi.....	£16.68
LW8 8EI 2m Yagi.....	£21.06
LW10 10EI 2m Yagi.....	£27.20
PBM 10 10EI Parabeam.....	£65.49
C5/2m 2m Co-Linear.....	£86.25
D5/2m Double 5 Element Slot Yagi.....	£29.67
Q4/2m 4 Element 2m Quad.....	£33.98
Q6/2m 6 Element 2m Quad.....	£44.51
Q8/2m 8 Element 2m Quad.....	£55.60
D8/70cm Double 8 Slot Yagi.....	£28.18
PBM 18/70cm 18EI Parabeam.....	£37.08
MBM28 28EI multibeam.....	£24.72
MBM48 48EI multibeam.....	£40.82
MBM88 88EI multibeam.....	£56.77
8XY/70 Crossed 8 Yagi.....	£48.24
12XY/70 12EI Crossed Yagi.....	£59.28
5XY/2m Crossed 8EI Yagi.....	£32.14
8XY/2m Crossed 8EI Yagi.....	£41.40
10XY/2m Crossed 10EI Yagi.....	£51.92
TB1 Rotary Dipole.....	£83.37
TB2 2 Element Tribander.....	£155.25
TB3 3 Element Tribander.....	£287.50
VR3 10-15-20m Vertical.....	£67.70

# Technical Books and Manuals

(ENGLISH AND AMERICAN)

## AERIAL INFORMATION

Antenna Handbook (Orr and Cowan) .....	£7.75
Beam Antenna Handbook .....	£6.50
Cubical Quad Antennae, 3rd Edition .....	£6.90
Simple Low Cost Wire Antennas, by Orr .....	£6.20
Aerial Projects (Penfold) .....	£2.30
Antenna Book (ARRL) <i>latest 14th Edition</i> .....	£8.00
The (ARRL) Antenna Anthology .....	£4.50
Two-metre Antenna Handbook, F. C. Judd G2BCX .....	£6.35
HF Antennas for All Locations (RSGB) .....	£6.65
25 Simple Shortwave Broadcast Band Aerials (E. M. Noll) .....	£2.25
25 Simple Amateur Band Aerials (E. M. Noll) .....	£2.25
25 Simple Indoor and Window Aerials .....	£2.05
25 Simple Tropical and MW Band Aerials .....	£2.05
The ARRL Antenna Compendium, Vol. 1 ( <i>new title</i> ) .....	£8.95

## BOOKS FOR THE BEGINNER

Amateur Radio ( <i>Lutterworth Press</i> ) .....	£9.60
Solid State Short Wave Receivers for Beginners (R. A. Penfold) .....	£2.25
Beginners Guide to Radio (9th Edition) .....	£5.45
Beginners Guide to Electronics, 4th Edition .....	£5.45
Beginners Guide to Amateur Radio (Newnes) .....	£5.45
Beginners Guide to Integrated Circuits, 2nd edn. ....	£5.00
Guide to Amateur Radio, 19th Edition (RSGB) .....	£3.40
Morse Code for the Radio Amateur (RSGB) .....	£1.70
Understanding Amateur Radio (ARRL) .....	£5.45
Radio Amateur's Examination Manual, <i>latest 11th edition</i> (RSGB) .....	£3.90
How to Pass the Radio Amateurs' Examination (RSGB) .....	£3.30

## GENERAL

The Complete DX'er, by W9KNI .....	£8.25
Weekend Projects for the Radio Amateur (ARRL) ..	£3.05
Projects in Amateur Radio and Short Wave Listening ( <i>Newnes</i> ) .....	£4.20
How to Build your own Solid State Oscilloscope (Rayer) .....	£2.25
How to Design and Make Your Own PCB's .....	£2.25
Better Short Wave Reception, ( <i>5th Ed.</i> ) .....	£6.20
FM & Repeaters for the Radio Amateur (ARRL) ..	£4.35
Easibinder (to hold 12 copies of "Short Wave Magazine" together) .....	O/S
World Radio & TV Handbook 1986 Edition .....	O/S
The World's Radio Broadcasting Stations and European FM/TV (Newnes) .....	£8.10
Guide to Broadcasting Stations (18th Edition) .....	£5.50
International Radio Stations Guide ( <i>new ed.</i> ) .....	£3.25

Long Distance Television Reception (TV-DX) for the Enthusiast ( <i>revised edition</i> ) .....	O/S
An Introduction to Radio DXing .....	£2.30
Radio Amateurs DX Guide (14th Edition) .....	£2.45
Power Supply Projects (Penfold) .....	£2.80

## HANDBOOKS AND MANUALS

Radio Communication Handbook, <i>5th ed.</i> , Vols. 1 and 2 combined (paperback), RSGB .....	£14.00
Teleprinter Handbook, New 2nd Ed. (RSGB) .....	£12.70
TVI Manual ( <i>2nd Edn.</i> ) (RSGB) .....	£2.20
The ARRL 1986 Handbook for the Radio Amateur, <i>soft cover</i> .....	O/S
The ARRL 1986 Handbook for the Radio Amateur, <i>hard cover</i> .....	O/S
The Satellite Experimenter's Handbook (ARRL) ..	£9.70
Test Equipment for the Radio Amateur (RSGB) ..	£5.75
Amateur Radio Operating Manual (RSGB) <i>3rd Ed.</i> ..	£6.10
Oscilloscopes — How to Use Them, How They Work (Newnes) .....	£5.90
Practical Handbook of Valve Radio Repair (Newnes) .....	£17.15

## USEFUL REFERENCE BOOKS

Foundations of Wireless and Electronics, 10th Edition (Scroggie) .....	£10.05
Amateur Radio Techniques, 7th Edn. (RSGB) .....	O/P
U.K. Call Book 1986 (RSGB) .....	£5.65
Hints and Kinks (ARRL) .....	£4.30
Radio Frequency Interference (ARRL) .....	£2.40
Electronics Pocket Book, 4th Edition (Newnes) ...	£6.20
Radio Data Reference Book, <i>new 5th edition</i> (RSGB) .....	£8.90
Amateur Radio Software (RSGB) .....	£8.60
The Radio and Electronic Engineer's Pocket Book (Newnes) <i>new title</i> .....	£5.90

## VALVE AND TRANSISTOR MANUALS

Towers' International Transistor Selector, latest 1985 Edition (Up-Date No. 3) .....	£14.50
Semiconductor Data Book, 11th Edition (Newnes)	£8.50
International Transistor Equivalents Guide .....	£3.40
International Diode Equivalents Guide .....	£2.60

## VHF PUBLICATIONS

VHF Handbook, Wm. I. Orr W6SAI <i>latest 3rd</i> Edition .....	£9.75
VHF/UHF Manual (RSGB) 4th edition .....	£11.20

orders despatched by return of post

O/P (Out of print)

THE ABOVE PRICES INCLUDE POSTAGE AND PACKING

O/S (Out of stock)

Many of these titles are American in origin

(Terms C.W.O.)

Prices are subject to alteration without notice.

Available from

SHORT WAVE MAGAZINE

Publications Dept.

34 High Street, Welwyn, Herts. AL6 9EQ — Welwyn (043871) 5206/7

(Counter Service: 9.30 — 5.00 Mon. to Fri.)

(GIRO A/C No. 5476151)