August 2008 £3.50 ISSN 0141-0857

NOW IN ITS 76th YEAR!

Practical WIRELESS

Britain's Best Selling Amateur Radio Magazine

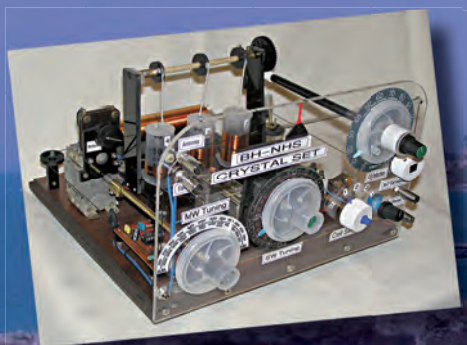
Reviewed

Comet H422

Rotary Dipole

Ideal for operating in a limited space!

The NHS SW/MW Vintage Crystal Set

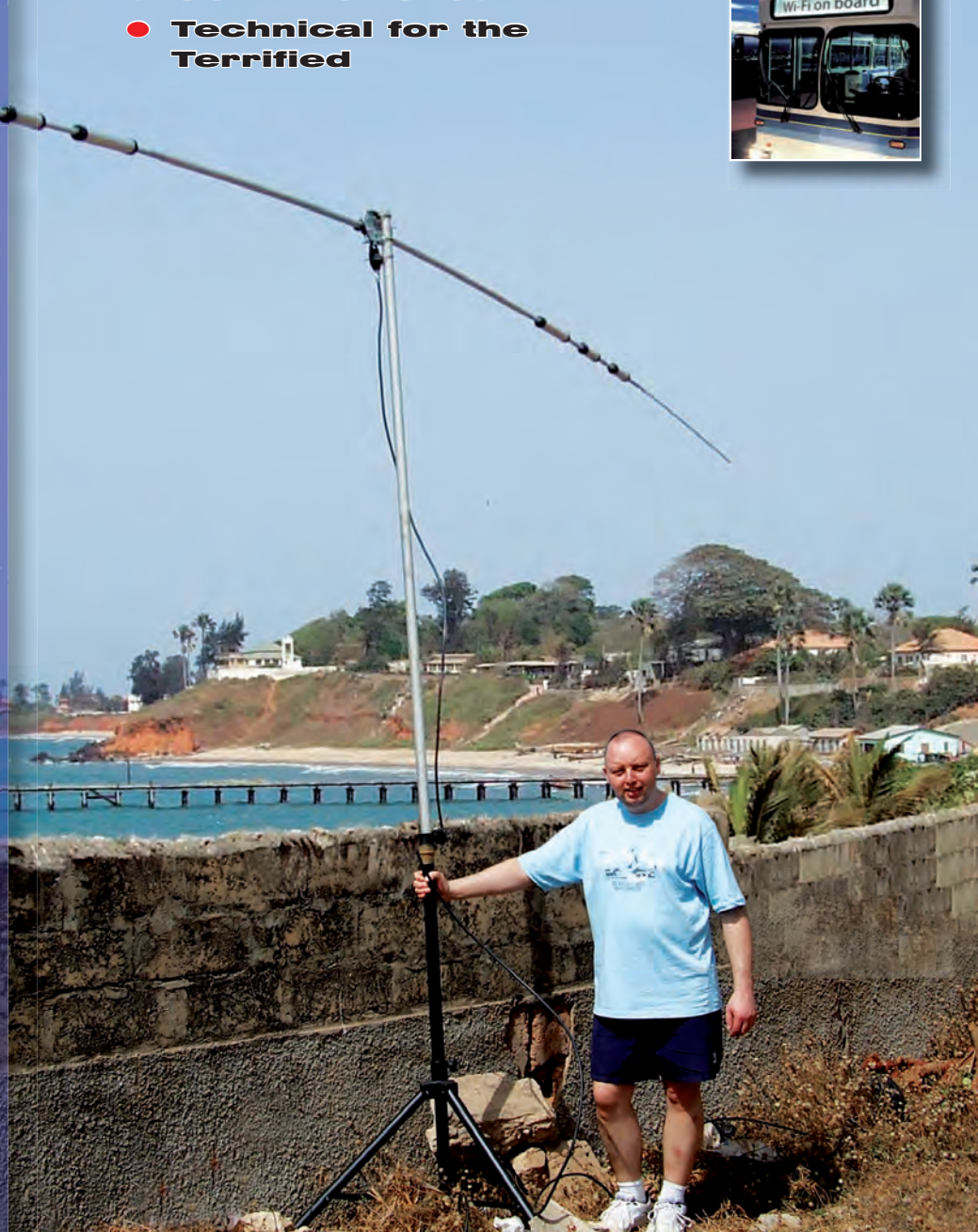


Putting medical odds and ends into vintage radio use!

New Series

Emerging Technology

- Home Brewing Capacitors
- Operating on 28MHz
- G5RV Revisited
- Technical for the Terrified



R 28
08
9 770141 085105
pwp

WATERS & STANTON

SCOTTISH STORE • W&S @ JAYCEE, 20 WOODSIDE WAY, GLENROTHES, FIFE KY7 5DF -CLOSED MONDAYS
• ENQUIRIES: 01592 756952 FAX: 01592 610451 EMAIL: jayceecoms@aol.com OPENING TIMES: Tue-Fri: 9.15am - 5pm Sat: 9am - 4pm

HEAD OFFICE & SOUTHERN STORE • SPA HOUSE, 22 MAIN RD, HOCKLEY, ESSEX, SS5 4QS
• ENQUIRIES: 01702 206835/204965 FAX: 01702 205843 EMAIL: sales@wsplc.com OPENING TIMES: Mon-Sat: 9am - 5.30pm

New Hockley D-Star Repeater GB7SS! Rx 439.8625 Tx 433.2625

HALF PRICE OFFER!

YAESU

FT-2800M

2m 65Watts FM
Mobile Transceiver
List Price: £179.95

W&S £89.95 D

NEW Icom IC-7700 HF Transceiver

• 1.8 - 54MHz up to 200W PEP • SSB CW FM AM

Icom have produced a realistically priced transceiver based on the IC-7800 technology. Dual DSP units form the heart of the design. The rx. front end has a preselector and boasts 40dBm i.p. that equals the IC-7800 at twice" the price! The 7" colour LCD panel is truly amazing in clarity. The spectrum scope allows close signal and band monitoring. Includes built-in PSK31 and RTTY and FREE IC-7000kbd keyboard - no PC needed! Other features: IF notch, professional grade 6m rx, digital voice recorder, dual USB ports, auto atu etc.

Exclusive - get FREE IC-7000kbd with matching lead for instant RTTY/PSK31

In Stock!

£Phone!

Waters & Stanton First with VX-8

YAESU

Waters & Stanton were given a sneak preview of this new radio by Yaesu's top designer Mr Fujiki. We will have the first UK stocks and it should be ***available September.*** This will be the first truly portable APRS radio, and with Blue Tooth, could easily function as a mobile.

YAESU

FT-897D+

The FT-897D+ is exclusive to W&S and comes with dual DC leads making it the ideal base portable radio.

STOCKS LIMITED

*HF + 6m, 2m, 70cm
*CW, SSB, AM, FMN, FMW, PACKET, DIGITAL
*HF/6m 100W, 2m 50W, 70cm 20W

W&S £514 D

Get Ready For D-Star! (first repeater at Herne Bay)

Log on to GB7SS repeater at Hockley

ICOM

IC-E2820

This dual band mobile offers D-Star facillities with digital speech as well as normal FM at 50W

IC-E2820 Mobile FM **£379 C**
IC-E2820 with D-Star **£519 C**

PW customers can claim an extra DC lead when ordering!

IC-E91
Fitted with D-Star
£349.95 C

D-Star Repeater - Low cost subsidised Icom repeater available to clubs when purchasing D-Star Radios from us. Phone for details.

FT-450 NEW

YAESU

160m - 6m 100W
SSB CW AM FM
IF DSP
Voice Memories
23 x 8.4 x 22 cm

Also get voice recorder and announcer!

W&S £529 D

Deal: *Get FREE Extra DC Lead!* Exclusive to PW Readers - Request when ordering

FT-450AT with Built-In ATU **£599 C**

FT-950 NEW

YAESU

100W
160 - 6m

W&S £899 D

DSP filtering, incorporating features such as Variable Bandwidth, IF Shift, and Passband Contour tuning. Digital Noise Reduction and Digital Auto-Notch Filtering. On transmit you get a three-band graphic equaliser and the ability to change the transmit SSB pass-band. There are plenty of other features which you will get from the Internet. What you won't get elsewhere is our offer to PW readers!

Deal: *Get FREE Power-Max-25NF PSU worth £89 when you buy FT-950 from W&S. Offer to PW readers only at time of order.*

These Yaesu offers expire 31/8/08

FT-2000

YAESU

1.8-30MHz +6m 100W

£1695 D

FT-2000D 200W
£2399 D

The FT-2000 series has become the DXpedition favourite. With front end preselector and dynamic range, it handles crowded bands with ease. You can dial in selectivity right down to 25Hz. Transmitted audio quality can be adjusted over an enormous range via the built in DSP. And if you opt for the FT-2000D, it is almost having a 2 el. Yagi for FREE.

PART EXCHANGE? We take in almost any ham gear - even old clunkers!! Give us a call TODAY

FT-857D

YAESU

*Tx: 160-6m(100W), 2m(50W), 70cm(20W)
*USB, LSB, CW, AM, FM (WFM Receive)

W&S £439 D

FT-DX9000D

YAESU

Yaesu's top radio series of transceivers for the ultimate experience!

W&S £7299 D

FT-DX9000Contest £3799 D
FT-DX9000MP £8299 D

FT-817ND

YAESU

*TX: 160-10m, 6m, 2m, 70cm
*USB, LSB, CW, AM, FM, WFM, Digital (AFSK), Packet (1200/9600 FM)

Deal: bhi DSP fitted **£449**

W&S £349 D

TM-V71E NEW

KENWOOD

EchoLink Memories & NODE Terminal
50W on 2m & 70cms!

W&S £269 D

FTM-10R/E NEW

YAESU

Bluetooth

W&S £249 D

New 2m/70cm Mobile with Bluetooth option
*50W 2m 40W 70cms
*Removeable front
*Built-in PTT & Microphone!
*Size: 11 x 3.7 x 17 cm

Deal: FTM-10E with Bluetooth Adaptor (BU-1), Headset (BH-1) & Charger (CAB-1) **Total List Price £382**

Offer Price £279.95 D

IC-7800

ICOM

Icom's greatest HF transceiver ever. Invest in the best! 200W HF Built-in PSU. * *All amateur bands HF + 50MHz 200W SSB, CW, RTTY, PSK31, FM, AM * Output power (continuously adjustable) SSB, CW, RTTY, PSK31, FM 5-200W, AM 5-50W, 137kHz, CW > -20dBm * General coverage Rx: 0.030-60.000MHz * 7in Colour TFT display*

Deal: SP-120 Filter Spkr **FREE**

W&S £6400 D

PAY NOTHING FOR 12 MONTHS

BUY NOW PAY LATER AT BOTH STORES

AVAILABLE ON ALL SALES OVER £200

On most items over £200 in value it is now possible to buy with a finance agreement and pay nothing for 12 months without incurring ANY interest charges. If paid in full within 12 months then a £29 settlement fee is payable. **Typical example** of Buy Now Pay Later: Cash price - £600. Pay no deposit and pay the full amount in 12 months. Pay no interest – just £29 fee. **OR** - 29.8% APR - Then repay £30.85 per month for 36 months. No settlement fee. Total amount due £1110.60. Interest is calculated from date of agreement. All finance is subject to status – written quotation on request.

Carriage Charges: A=£3, B=£4, C=£6.95, D=£10, E=£12

Orderline

01702 206835

Online Catalogue

www.wsplc.com

UK's Lowest Prices

Zero Deposit
Zero Interest

D-Star Dongle NEW

Join the D-Star fun from your laptop PC!

The D-Star Dongle gives you access to D-Star repeaters around the world. It contains the special DVSI AMBE codec chip that allows for encoding and decoding of the audio used with D-Star. Just plug it into your PC port (Windows XP/VISTA or Mac Inte) and transmit and receive. Those without a licence can listen only.

£149.95 C

TS-2000

KENWOOD

*100W All-mode
*160m - 70cms
*Duplex operation
*Satellite ready
*DX cluster QSY

The TS-2000 offers all-band coverage in one very neat & effective high performance system. This is one of the best buys in ham radio. Add our W-25AM 13.8v supply (£89.95) and you are ready to go.

Deal: FREE Extra DC Lead (Quote advert when ordering)

W&S £1295 D

TS-2000X with 23cms **£1599 C**

TS-480SAT 100W HF+6m **£679 D**

IC-756PROIII

ICOM

HF + 6m
100W
All-Mode

W&S £1749 D

IC-756PROIII Special Deal

IC-756 Pro III
+ SM-20 Desk Mic
+ NC-2 Noise cancelling 'phones
+ W-25AM power supply
+ Spare DC lead

Only £1829 D

IC-7000

ICOM

HF/VHF/UHF
All-Mode
Transceiver

W&S £899 D

Deal2: With TFT PAL TV Screen £999
Deal3: With TFT + Power-Mite PSU £1049

IC-7400 OFFER

ICOM

HF - 70cms 100W transceiver plus SP-21 spkr and SM-20 mic **£1169 D**

IC-718 HF 100W transceiver **£439**

IC-706IIGDSP

ICOM

HF/VHF/UHF
100W
Transceiver

Deal: IC-706 + New Power-Mite-NF FREE

W&S £599 D

IC-703DSP

ICOM

10W QRP
HF-6m built-in
Auto ATU + DSP

W&S £449.95 D

Visit our eBay shop for more bargains!

eBay

Go to www.wsplc.com & click on the link to our eBay shop

Exclusive to Waters & Stanton!

Radiomate NEW

For YAESU

Keyboard For FT-817, FT-857 & FT-897

Rig not included!

* *Direct frequency entry*
* *Mode change*
* *Carrier tune mode*
* *VFO A/B*
* *20 Memories*
* *Self-Powered*

£89.95 C

bhi DSP Noise Cancelling

NES10-2 MkII

Speaker and programmable DSP unit. Offers dramatic noise reduction.

£89.95 C

ANEM

"Noise Away" Amplified Noise Elimination Module. Fits in-line between the equipment & speaker.

£112.95 C

NEIM-1031

Noise Eliminating In-Line Module.

£125.95 C

NEDSP-1061-KBD

Noise Eliminating DSP module designed for retro-fit in a number of transceivers,

FT-817, TS-50, IC-706MkIIG, FRG-100, DX-77. WithKeyboard.

£89.95 C

NEDSP-1062-KBD

Noise Eliminating DSP module simply fits into Loudspeaker path, features a small keyboard to control functions.

£94.95 C

Icom VHF/UHF Mobile/Base

IC-E208

Dual Band FM Mobile *144-146MHz, 430-440MHz Tx *55/50W (3 pwr steps each band) *Wideband Rx 118-173, 230-549 & 810-999MHz **£219.95 D**

IC-910H **£1089 D**
2m/70cm 100W Base station all-modes Option for 23cm module (UX-910 £359)

IC-910HX **£1239 D**
As Above but with 23cm Module ready fitted and a big saving as well.

IC-2200H **£179.95 D**
2m 55W FM mobile with rugged construction and with digital option.

IC-2725E **£279.95 D**
2m/70cm radio. Easy to operate and install and a lovely detachable head.

Kenwood VHF/UHF Mobiles/Base

TM-271E

2m FM 60W Mobile Transceiver. MIL-SPEC DTMF Mic. Built-in CTCSS & DCS encoder / decoder.

£149 D

TM-D710E *Low Price* **£399 C**
Dual band APRS 50W FM

Yaesu VHF/UHF Mobiles/Base

FT-7800E

*2m/70cm Dual Band Mobile *High power 50W 2m /40W 70cms *Wide receive inc. civil & military airband *CTCSS & DCS with direct keypad mic. *1000 memories

£169 D

FT-1802E *Low Price!* **£99 D**
*2m FM Mobile transceiver *5,10,25,50W

FT-8800E *Low Price!* **£219 D**
*2m/70cm Dualband FM Mobile transceiver

FT-8900R *Low Price!* **£249 D**
*2m/70cm/6m/10m Quadband FM Mobile

Yaesu ADMS Software

Programming Software For Your Radio

Programme Memories and all your radio's functions from your PC. Includes Windows software and serial lead with adaptor for your Radio.

ADMS-1 F for VX-110/150 / ADMS-1G for VX-7
ADMS-1H for VX-2E / ADMS-1J for FT-60E
ADMS-2H for FT-8900 / ADMS-2I for FT-8800
ADMS-2J for FT-2800 / ADMS-2K for FT-7800
ADMS-3 Programming Kit for VR-500
ALL **£39.95** with FREE PC Radio Data Lead.
ADMS-4A for FT-817 & **ADMS-4B** for FT-857/8 ***BOTH*** **£29.95** both these items require a separate CT-62 lead at **£29.95**

IC-E92 NEW

ICOM

2m/70cm Handheld with Built-in DSTAR

* *144-146MHz / 430-440MHz*
* *FM FMN WFM AM (Rx) DV*
* *5W/2.5W/0.5W/0.1W*
* *1304 memories*
* *100 scan ranges*
* *Rx range 0.495kHz-999.9MHz*
* *CTCSS, DTCS, DTMF*

Includes antenna, and charger.

A fully fledged digital radio using D- Star aswell as traditional dualband.

W&S £Phone C

Icom VHF/UHF Handhelds

IC-E91 D-Star Ready

Latest dual-band handheld transceiver. receiver that covers 0.495 to 999MHz.

£239.95 C

IC-E91 with D-Star **£349.95 C**
IC-V82 7W 2m Digital **£159.95 C**
IC-U82 70cms Digital **£159.95 C**
IC-E90 6m/2m/70cm **£199.95 C**
IC-T3H 2m 5W **£129.95 C**

Kenwood VHF/UHF Handhelds

TH-F7E

* 144-146MHz Tx/Rx: FM
* 430-440MHz Tx/Rx: FM

Up to 6W out with Li-ion battery and **"scanner" style coverage from 100kHz to 1300MHz** including SSB on receive!

£199.95 C

TH-K2E 2m 5W **£135 C**
TH-K2ET 2m 5W FM **£145 C**
TH-K4E 79cm 5W FM **£139 C**

Yaesu VHF/UHF Handhelds

VX-7R (Black)

Limited Special Offer

Totally waterproof, Wide frequency coverage 500kHz-900MHz AM/FM.

£179 C

VX-6E 2m/70cm wide rx 5W **£169 C**
FT-60E 2m/70cm wide rx 5W **£129 C**
VX-120 2m 5W w/8-key pad **£99 C**
VX-170 2m 5W w/16-key pad **£99 C**

Carriage Charges: A=£3, B=£4, C=£6.95, D=£10, E=£12

WATERS & STANTON

General Enquiries
01702 204965

UK's Lowest Prices

Online Catalogue
www.wsplc.com

Feels Just Like Being A Controller!

AirNav® RadarBox™

AirNav Systems
The Most Trusted Name In Flight Tracking

Includes Software, Receiver, Antenna & Leads.

- Watch the Action Live from Home!
- Real-Time Radar Mode-S & ADS-B Decoder
- Zoom Worldwide to Runway Level
- Network your Station with Others
- Self Powered from USB Port. Plug & Play!
- Centre Map on your Home - Direct Reception
- Everything you Need Apart from PC

Unlike it's competitor this is
True "Plug 'n Play"

£399.95 D

Accessories

RADAR-RAMA £49.95 C
External 1090MHz Antenna

RADAR-EXTENDER £79.95 C
1090MHz Gain Antenna

AS-1090 £179.95 C
Pre-Amplifier. Covers 1090MHz

RADAR-CBL-10M £42.95 A
10m ultra low loss cable

RADAR-CBL-15M £49.95 A
15m ultra low loss cable

WATSON

Official Distributer UK's Lowest Prices

Power-Mite-NF

NOISE OFFSET POWER SUPPLY — NEW

22 Amps of continuous power output with variable voltage plus the new Noise Offset Function (NF). This allows you to move any noise spikes out of the ham band with the front panel tuning control.

W&S £59.95 C

Power-Max-45NF POWER SUPPLY — NEW

38 Amp (45A Peak) continuous switch mode PSU with Noise Offset Function (NF). *Output 4-16V DC Variable *Input 100-260V AC *Short Circuit & Over Voltage Protection

W&S £119.95 D

W-3A Output 3A, 13.8V DC, supply 230V AC £22.95 C
W-5A Output 5A, 13.8V DC, supply 230V AC £29.95 C
W-10AM Output 10A, 0-15V DC, supply 230V AC £59.95 D
W-25AM Output 25A, 0-15V DC, Dual meters £89.95 C
W-30AM Output 30A, 0-15V DC, Dual meters £119.95 D
W-25SM Output 22A, 13.8V DC, supply 230V/115V AC £79.95 C

DM-15W 15W DUMMY LOAD

Ideal for testing handhelds and lower powered transceivers. *Range DC-600Mhz *Power 15W (20W CW) *VSWR 1:1:1 *Connector PL-259 *50 Ohms Impedance *Size 34x72mm *Weight 76g

W&S £15.95 A

Power-Max-25-NF

NOISE OFFSET POWER SUPPLY — NEW

This very compact base station supply delivers 22 Amps of continuous power with the new Noise Offset Function (NF) that moves noise out of the band. Includes cigar socket.

W&S £89.95 C

Bargain Price Antennas

Pre-tuned & Weather Sealed Fibre-glass encapsulation

W-30 2m/70cms 3/6dB length 1.15m 150W SO-239 £34.95 C
W-50 2m/70cms 4.5/7.2dB length 1.8m 150W SO-239 £39.95 C
W-300 2m/70cms 6.5/9dB length 3/1m 150W SO-239 £54.95 D
W-2000 6m/2m/70cms 2.15/6.2/8.4dB length 2.5m 150W £59.95 C

Mobile Whips Bargain Prices

Watson mobile antennas are made to a high specification and employ stainless steel whip sections with SO-239 receptors. All models are pre-tuned and will withstand at least 100 Watts RF.

Watson - the name you know!

W-2LE 2m 0dBv length 0.48m £9.95 C
W-285 2m 3.4dBv length 1.33m £12.95 C
W-77LS 2m/70cm 0/2.4dBv length 0.43m £10.95 C
W-770HB 2m/70cm 3/5.5dBv length 1.1m £16.95 C
W-7900 2m/70cm 5/7.5dBv length 1.58m £26.95 C
W-627 6/2/70cm 2/4.5/7.2dBv length 1.6m £27.95 C

Watson Weatherstations

W-8681 Wireless Weather Station — 1000'S SOLD

- LCD Touch Screen
- Atomic Locked Date & Time
- Indoor / Outdoor Temp.
- Wind Speed & Direction
- Rain Gauge
- Indoor / Outdoor Humidity
- Barometer with Trend Data
- Forecaster & Weather Alarm
- USB Connection to PC
- PC Software Control & Data Programme
- Historic Data Storage & Display

W&S £69.95 D

W-8682 Wireless Weather Station — NEW

All you need to obtain a complete weather picture. The W-8682 is very similar to the W-8681 weather station, it offers all the same weather measurements & external sensors for temp, wind & rain. However, it does not feature a touch screen, or USB port for weather data.

W&S £59.95 C

W-8683 Compact Weather Station — BUDGET

- Digital Clock 12 / 24 hours
- Radio controlled time
- Auto daylight saving
- Alarm clock
- In / Out temperature
- In / Out Humidity
- Min / max temp. & humidity
- Barometer 24 hr. history
- Forecaster display
- Perpetual calander
- Remote wireless sensor
- Pressure Alarm

W&S £24.95 C

W-8684 Clock & Temp Display — NEW

- Indoor temperature F°/C°
- Outdoor temperature F°/C°
- Max./Min. temperature memory
- Wireless link to outdoor sensor
- 12 / 24 hour clock
- 3 Channels (with addl. sensors)
- Bright LCD Display
- Display modue 11 x 7.5 cm
- Power 2 x AA & 2 x AAA total (Not inc.)

W&S £9.95 B

W-8685 Bedside Weather Station — NEW

- Indoor temperature F°/C°
- Outdoor temperature F°/C°
- Max./Min. temperature memory
- Wireless link to outdoor sensor
- 12 / 24 hour clock
- Alarm Feature
- Rolling Cable
- Bright LCD Display
- Display modue 60 x 75 mm
- Power 4 x AAA total (Not Inc.)

W&S £7.95 B

Carriage Charges: A=£3, B=£4, C=£6.95, D=£10, E=£12

Practical Wireless August 2008

contents

Volume 84. Number 8. Issue 1216. On sale 10 July 2008

6 Keylines
Rob Mannion G3XFD suggests an on the air day for 70MHz.

7 Readers' Letters
The pages to air your opinions and comments!

10 News
A selections of news and information from the world of Amateur Radio.

17 Emerging Technology
Chris Lorek G4HCL introduces his new bi-monthly column exploring what's new on the technology front.

20 Antenna Workshop
Billy Ward G4NRE takes another look at an old favourite – the G5RV antenna.

26 Technical for the Terrified
Tony Nailer G4CFY aims to dispel the technical myths and mysteries and continues his look at the phase-locked loop synthesiser.

30 Home-Brewing Variable Capacitors
John Morrison G0ICT describes how he builds excellent variable capacitors and insists that you can be successful too!

35 Operating On 10m
In the first of two articles, **Roger Lapthorn G3XBM** looks forward to sunspot cycle 24 and increasing activity on 28MHz.

38 Carrying On The Practical Way
Join the **Rev. George Dobbs G3RJV** as he experiments with with doll's house copper tape 'wiring' to make circuit boards.

42 Club News
A round-up of what's happening on the club scene.

44 What Next?
Colin Redwood G6MXL's column is aimed at the newcomer to the hobby and this month he continues the antenna theme and also looks at antenna efficiency.

48 Antenna Review – The Comet H422
Roger Cooke G3LDI tries out the Comet H422 rotary dipole that's been used on DXpeditions and seems ideal for the smaller garden.

50 The NHS Crystal Set
Victor Brand G3JNB provides a very unusual 'vintage' session as he reports on a unique example of amateur adaptation skills, a crystal set made from disposable operating theatre material!

52 Rally Round–Up
Fancy an Amateur Radio day out? Plan your trip here and support rallies and their organisers!

54 VHF DXer
Join David Butler G4ASR as he reports on the exciting world of Amateur Radio operating above 30MHz.

58 In The Shop
Harry Leeming G3LLL has had many years of experience trouble-shooting on Amateur Radio equipment. This time he looks at v.f.o. stability problems in older equipment.

60 In Vision
Graham Hankins G8EMX turns his camera lens to focus on the Amateur Television scene and looks ahead to the next BATC rally and their new on-line ATV facilities.

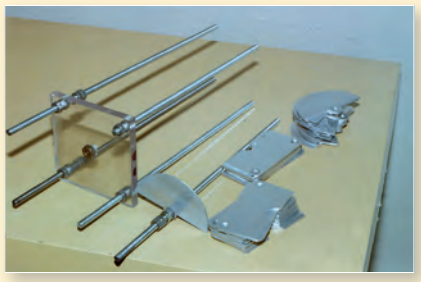
62 HF Highlights
Carl Mason GW0VSW presents readers' reports on their h.f. operations during the last month.

68 Valve & Vintage
Ben Nock G4BXD opens the vintage 'shop' and discusses some interesting new items that have ended up in the Kidderminster Kollection – including the American PRC-74 man-pack.

72 Traders' Tables
74 Classified Adverts
75 Bargain Basement
76 PW Publishing Bookstore
80 Subscriptions

81 Topical Talk
Rob Mannion G3XFD discusses why he thinks some readers were misled by his July *Keylines* and recommends the help of a young assistant for the *PW* QRP Contest day!

Front Cover: Our thanks go to **Mike Devereux G3SED** of Nevada Radio for sourcing the front cover photograph and also, of course, to **Darren Collins G0TSM** for making it possible in the first place because of his DXpedition visit to The Gambia!



30

54

68

Published on the second Thursday of each month by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: 0845 803 1979. Printed in England by Holbrooks Printers Ltd., Portsmouth P03 5HX. Distributed by Seymour, 86 Newman Street, London , W1P 3LD, Tel: 0207-396 8000, Fax: 0207-306 8002, Web: http //www.seymour.co.uk. Sole Agents for Australia and New Zealand - Gordon and Gotch (Asia) Ltd.; South Africa - Central News Agency. Subscriptions INLAND £38, EUROPE £47, REST OF WORLD £57, payable to PRACTICAL WIRELESS, Subscription Department. PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: 0845 803 1979. PRACTICAL WIRELESS is sold subject to the following conditions, namely that it shall not, without written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover, and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever. Practical Wireless is Published monthly for $50 per year by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW, Royal Mail International, c/o Yellowstone International, 87 Burlews Court, Hackensack, NJ 07601. UK Second Class Postage paid at South Hackensack. Send USA address changes to Royal Mail International, c/oYellowstone International, 2375 Pratt Boulevard, Elk Grove Vi lage, IL 60007-5937. The USPS (United States Postal Service) number for Practical Wireless is: 007075.

Rob Mannion's keylines

Rob discusses how the hobby is perceived and has two news items!

Ever since I have composed the *Keylines* editorial, I've been prepared for – and received – some interesting and valuable feedback. However, I've been genuinely surprised at the reaction by several individuals to what I thought were simple and practical commonsense in July's *Keylines* and I'm devoting most of this month's *Topical Talk* to discuss the feedback and ask readers to please join me on page 81.

Wigtownshire Club Visit

On Thursday June 5th I travelled by air from Southampton to Glasgow on my way to visit the **Wigtownshire Amateur Radio Club** in Stranraer, Dumfries & Galloway, south west Scotland. There had been several false starts to this club visit. However, the trip would not have been possible without the help of **Len Paget GM0ONX**, *PW* author and **Radio Society of Great Britain** (RSGB) Deputy Regional Manager for Ayrshire, Dumfries & Galloway.

Len has become my 'regular' volunteer driver on three occasions in the last few years and has used his own holidays to help me out. Thank you Len!

Memories of my time with the **Independent Broadcasting Authority** (IBA) came tumbling out as we drove down the coast to Stranraer. As we drove south, past the Northern Ireland ferry terminal at Cairnryan, I told Len that the last time I had visited the area was during the early 1980s, when the **real** aircraft carrier HMS *Ark Royal* was being broken up. A sad sight as the scrap men demolished her vast bulk. I was also surprised that there was little left of the huge Second World War emergency port that once dominated the area. Times change!

The welcome Len and I received at the Wigtownshire ARC was typical of that in Scotland. Some members had driven over 95km (60 miles) to join us for the evening. My thanks go to **Ellis Gaston GM0HPK** and everyone at the club for an evening and welcome much enjoyed by the *PW* Editor!

Len and I didn't get back to his Kilmarnock home until midnight, after getting the Night Porter to let me in to my hotel! Incidentally, if anyone plans a stay in western coastal Scotland, the **Park Hotel** (right next to Kilmarnock Football ground is a superb place to stay. A modern building it's full of beautiful wood panels and seems more like a cruise ship than a hotel. The breakfasts are legendary and I hope to make a another visit very soon!

Isle Of Bute

On the way to Glasgow Airport for my return trip a remarkable series of coincidences led to Len and I managing an unplanned ferry ride to the Isle of Bute and a trip round the Island! It began at Wemyss Bay station and ferry terminal. A ferry was in, and on the spur of the moment we decided to ride over as foot passengers on the ferry (about 35 minutes) while enjoying some glorious views up and down the Clyde estuary.

On arrival at Rothesay – exactly 40 years since my last visit when I was limited to the town itself – we took another spur of the moment decision and joined the round-the-Island open top bus trip! It's a beautiful Island and Len and I throughly enjoyed the ride, which connected with the return ferry.

It was a great finish to two wonderful days in Scotland. I felt that the trip to Bute was an extra 'thank you' to Len for all his help. And, of course, I'm looking forward to my next visit!

Another On Air Day?

After arriving back from Scotland I had a day to prepare for the *PW* G4HLX 144MHz QRP Contest day on Sunday June 8th. The weather turned out to be glorious and **Freddie** my grandson and I enjoyed it very much – despite the fierce sun that meant Freddie having to wear my large floppy sun hat!

During the day I thought of organising another *PW* 'On the air Day', particularly for 70MHz and on a Saturday. So, how about it readers? Anyone interested in an informal day on Four Metres is asked to contact me so that we can arrange the event. I'm looking forward to hearing from you at the office and working you on 70MHz!

Rob Mannion G3XFD/EI5IW

Practical Wireless

PW Publishing Limited
Arrowsmith Court
Station Approach
BROADSTONE
Dorset BH18 8PW

Directors: Roger Hall & Stephen Hunt

Editor
Rob Mannion G3XFD/EI5IW
rob@pwpublishing.ltd.uk

Technical Editor
NG (Tex) Swann G1TEX/M3NGS
tex@pwpublishing.ltd.uk

Art Editor
Stephen Hunt
steve@pwpublishing.ltd.uk

Advertising Typesetting/Admin
Peter Eldrett
peter@pwpublishing.ltd.uk

Advertisement Sales
Roger Hall G4TNT
roger@pwpublishing.ltd.uk

Finance Manager
Alan Burgess
alan@pwpublishing.ltd.uk

Book Orders
bookstore@pwpublishing.ltd.uk

Tel: 0845 803 1979
Fax: 01202 659950

PW Publishing Website
www.pwpublishing.ltd.uk

Our 0845 numbers are charged at the BT Standard local Rate

Subscription Administration
Webscribe
Practical Wireless Subscriptions
PO Box 464
Berkhamsted
Hertfordshire HP4 2UR, UK
pw@webscribe.co.uk
www.mysubcare.com
☎ 01442 879097
Fax: 01442 872279

Subscriptions
Subscriptions are available at £38 per annum to UK addresses, £47 Europe Airmail and £57 RoW Airmail. See the Subscriptions page for full details.

Components For PW Projects
In general all components used in constructing PW projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article.

Photocopies & Back Issues
We have a selection of back issues, covering the past three years of PW. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. See the Book Store page for details.

Placing An Order
Orders for back numbers, binders and items from our Book Store should be sent to: PW Publishing Ltd., Post Sales Department, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling. Credit card orders (Access, Mastercard, Eurocard, AMEX or Visa) are also welcome by telephone to Broadstone 0845 803 1979. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Broadstone 01202 659950.
The E-mail address is bookstore@pwpublishing.ltd.uk

Technical Help
We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. Any technical queries by E-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by PW, then please write to the Editorial Offices, we will do our best to help and reply by mail.

Practical Wireless

readers' letters

The Star Letter will receive a voucher worth £20 to spend on items from our Book Store or other services offered by *Practical Wireless*.

Part Exchanging Equipment

Dear Rob

After 14 years of being a silent *PW* reader, I finally have to vent some steam! I can remember a time, not so long ago, when an all-band, all-mode, mobile rig was nearer the £800 mark than today's £500. Yes the overall price of new equipment has come down since I was first licensed, however, is it just me, or are we getting a raw deal on equipment when we part-exchange?

For a few months, I have been looking at, nay drooling over, a new rig, well actually, rigs (plural!) You know how it is, you buy a rig, time moves on, and a new piece of electronic wizardry pops onto the scene. That voice in the back of your head pipes up, "oooh shiny", and you've just got to have it!

I recently enquired about part exchanging my aging (but still cherished!) Kenwood TH-G71E handheld for its all-singing-all-dancing younger brother, the TH-F7E. I was hoping to get a fairly good trade in, considering second hand examples pop up from time-to-time well above £100. As I write, there are three advertised in *PW* between £119 and £150. One emporium is still flogging them for £178 brand new. Or so I thought!

After much ringing around and E-mailing, I was offered £70 part exchange! That's £70 if the radio is in good nick, with original charger, battery, manual and box. Bearing in mind, the TH-G71 has been about for a while (I swapped my old TH-79 for the TH-G71 sometime earlier in the decade) I could not tell you where the original manual is, and the box long since went walkies, probably thrown away by my house-proud Mother when I still lived at home – "why do you keep all those empty boxes?" Also being a hand-held, in the time I've had it, it's been subjected to a few accidental drops, but being "Mil-Spec", has survived reasonably well with a few scuffs and scrapes, and, quite expectedly for a rig of its age, but 'looks used'!

Now, I've never been very good at the old mental arithmetic, but, that works out in the region of 85-105% profit each time someone part-exchanges, because I have never seen a second hand TH-G71 advertised for less than £100 at one of the larger emporiums! I don't mind the emporiums making a slight profit, but these kind of figures are, to the Yorkshire part of me, a bit excessive!

Okay, that was a hand-held, what about my dual-band mobile, or my all-band, all-mode, mobile? Both my rigs have also been about for a bit, both rigs have also been replaced by more modern designs. Whilst I haven't been tempted to replace the dual-bander, I have recently been tempted to replace my FT-100 with an FT-857 or FT-897, mainly due to the availability of options in the UK. If anybody knows where I can get a DTMF microphone for either the FT-90, FT-100, or both, at a reasonable price in the UK, let me know – using internet linked repeaters just isn't the same with a DTMF key ring!

I feel put off the idea of 'part-ex', because from previous experience, it looks like I'll only be offered a going rate well below second hand value for the emporiums to make a killing when re-selling it on! I can't really justify the expense of a brand new rig in one hit, and second hand examples are not much cheaper, besides what would I do with two all singing, all dancing mobile rigs – I have a vague idea, but can't justify it – oh to be filthy rich!

That leaves me the option of selling privately, which to my mind is not convenient. Is this why the emporiums can make so much profit? Are we paying for the convenience of 'part-ex' or some hidden overhead (I can't imagine testing a radio before selling it on can be that expensive) or are the emporiums actually making a killing at our expense? I would be interested to know!

To all the team at *PW* – keep up the good work and best wishes.

Tony Corbett G0WFV
Lincoln
Lincolnshire

Editor's comment: *Thanks for your letter Tony! The subject of part-exchanging is a thorny subject as far as I'm concerned and I'm sure if (like me) you've ever part-exchanged a car and felt as though got 'bad deal' (plus the fact that a new vehicle loses up to £3000 in value as it's driven away!) you'll realise that the Amateur Radio market is much fairer than the motor trade! However, to get an idea of what it's like from the other side of the credit card terminal, I've asked Martin Lynch of Martin Lynch & Sons to offer his opinions in the letter that follows.* ***Rob G3XFD.***

Martin Lynch's Point of View

Dear Rob

Thanks for inviting me to comment on the letter regarding part-exchange and trade-ins. Having bought and sold many thousands of pieces of used Amateur Radio gear over the last 30 years I hope you find this useful. Firstly when a dealer prices up your trade-in (or outright buy) there are many parts to the equation that build up our offer.

1: Has the customer owned it from new?
2: What physical condition is it in?
3: Any modifications/repairs made during ownership?
4: Original packing/bill of sale?
5: All accessories complete, i.e. microphone, leads, book, etc.?
6: Is it a trade in or is it an outright buy?

In addition to the above, the dealer will also establish where the item being offered currently stands in the market place. For example, has a new model just appeared? Has there been a large price drop or has an alternative manufacturer produced a model that has suppressed sales of the one being offered? In addition the dealer may already have similar used examples in stock and they are slow to sell.

There are many factors and like most electronics, prices have tumbled considerably in the last 4 years. The FT-857D for example was £900 in 2004, today the same radio is only £449. Ditto FT-817 when first sold at £649 is very expensive to the £349 selling price of today.

Finally, dealers are also obliged to offer their used sales with a proper warranty – again adding to the cost. There other ways of selling, eBay or indeed our dedicated free *LynchLine* are just two examples. However, although you maybe offered less from a dealer – you won't be messed about in dealing with a private individual. Regards.

Martin Lynch
Martin Lynch & Sons Ltd.
Chertsey
Surrey

Echolink Article May 2008

Dear Rob

After I read the article *Internet Linking* by **Jack King G4EMC** on *Echolink* in the May issue of *PW*, I decided to look into it. For several reasons I couldn't see the point of *Echolink*, so I expected that my interest would be short lived – but not as short as it actually was!

The reason for my very quick decision not to have anything to do with *Echolink* is the validation process that your G4EMC glossed over in a single sentence. My problem arises because – for the organisers of *Echolink* to believe that I exist – I must send to them a copy of my Licence Validation document.

Oh very likely! That document is, in effect, a permission for anyone who holds it to use an Amateur Radio transmitter in any CEPT country in the world. Now, while I don't actually think that the organisers would deliberately make my Licence available to everyone, my faith in the security of the Internet is such that I feel quite sure that eventually it will happen to at least one participant, and possibly to thousands.

However, the *Keylines* editorial, and *Topical Talk* in the June *PW*, in my opinion actually provide another valid reason not to participate in the validation process. Copyright in the Licence validation document is held by Ofcom. I know that it is not explicitly stated to be, but it does not have to be explicitly stated. It is their copyright automatically. No one has the right to send any form of their validation document to anyone without express permission from Ofcom to do so. I wonder how many *Echolink* users have broken the law already, even without the *PW* article? Personally, I'm not surprised that the author ommitted the details of the process. Yours faithfully,

Tony Jaques G3PTD
Stretford
Manchester

Using Two Call Letters Only

Dear Rob

I read the letter from **Mike Baker G3TMB** (June *PW* letters) and I must say I totally disagree with him. Having been at the other end of the pile-up more times than I wish. I found the practice of giving only two letters very frustrating as simply giving only two letters slows the pile up down! The reason is, if you're a strong signal then the DX station when they reply to you, they also need to get your full call and confirm it. However, if you had given your full call in the first place there will be no need to do this! I tend to listen into the pile-up and pick out stations giving full calls and ignore the two letter brigade! Keep up the good work at *PW*!

Reg Woolley G8VH (also VP8BPZ, ZD8GW, DA4RG)
Nuneaton
Warwickshire

Trimming Dipoles?

Dear Rob

There have been at least two occasions in recent copies of *PW* where the author has implied the desirability of setting or trimming a dipole to ensure that it's at the resonant frequency for the band to be used. Until about a year ago, I was also of a similar mind and used an antenna tuner to get my dipoles resonant for mid band; trimming them a few millimetres at a time.

Then I read a chapter in **George Brown**'s book *International Antenna Collection – 2*, entitled *Your Tuner Does Tune Your Aerial*, by **Kurt Nostradamus Sterba** (not his real name – obviously!). Interested, I looked up *Another Look at Reflections* by **Walt Maxwell W2DU**, then The ARRL *Antenna Book*, then lots of other items, including papers by **John Fielding ZS5JF** and other sources. I also want to look at the work of the late **L. B. Cebik W4RN**L.

I will never be an expert but feeders and aerials are a fascinating area. I've now stopped trimming my dipoles, as in the light of what I have read, this appears to be a waste of good copper wire. Losses in my coaxial cables feeders look far more important. Provided that I don't have an output stage blowing impedance mismatch onto the transmitter, I'm far more relaxed about a bit of poor s.w.r. between the a.t.u. and the aerial, resulting from a poor feeder to antenna match. Yes, the extra power flowing in the line from the reflected power on top of the transmitter output does increase losses but very little if I'm putting 100W into a good quality coaxial cable. Even less if I'm using ladder line.

If I've interpreted the material that I have read correctly, the importance of matching dipole lengths to frequency is one of the myths of Amateur Radio. If **I am wrong**, I'd like to know from anyone who is both familiar with the above references and knowledgeable on the topic. My regards to everyone on *PW*.

Graham Hart M0EAD (Otley ARS member)
Harden
Bingley
West Yorkshire

A Near Miss In Shetland!

Dear Rob

Many thanks for the most welcome book tokens (June *Star Letter*), although quite unwittingly, I nearly didn't get the chance to use them! In the garden at my home, well above the rooftops, is an inverted 'V' antenna on a crank-up mast. There's also a healthy earth strap bolted to the mast connected to a copper plate buried in the ground. The coaxial cable feeder runs from the top, down through the window to my transceiver in the shack.

At around 6am on June 2nd, the crash of thunder woke me – it was **very loud and very close!** At a guess, the lightning strike was not more than a few hundred yards away. It was obviously a matter of urgency to disconnect the coaxial cable from the transceiver and throw it out of the window where it would be safe. Well! Yes – perhaps! However, what I hadn't reckoned on was the next lightning strike!

The sequence of events went like this – as I started to unscrew the PL259 from the a.t.u., there was an almighty flash, crash and the PL259 plug lit up in my hand. The mast had been hit and there was a lot of arcing around the half unscrewed plug. (No ill-effects thank goodness, not even a tingle!). The mast took the brunt of it, nevertheless, I was too late to disconnect the transceiver but disconnected it anyway, even though it was probably destined for the scrap heap.

When I tried it later, nothing worked – neither did the freezer or cooker. The strike had earthed through the a.t.u. and blown the house ring-main fuse. Once re-set, everything, including the transceiver worked fine – except the computer wireless router which was a write-off. From what I hear, many other routers for miles around and a house also suffered damage.

It was not until much later I thought long and hard about the whole incident. Being so intent on saving the transceiver from storm damage was not the wisest of moves! I failed to see the risk involved. I shudder to think what might have happened had I been five seconds sooner uncoupling the coaxial cable. Two or three more turns of the plug and it would have been out. It would have also disconnected the earth pathway leaving me holding the sticky end of a lightning strike. That's how close it was – just five seconds!

Here was a valuable lesson learned. In future, if lightning is too close for comfort, the transceiver can fend for itself and take it's own chances!

Peter Leybourne MM5PSL
Scatness
Shetland

What a narrow escape Peter – you've had a lesson in safety! However, I think it's also very important for everyone to know that static charges developed on antennas can be very high indeed during 'thundery' weather. You can receive a very severe shock from an unearthed antenna during such conditions – so my advice is to earth the antenna by clipping an earth lead to the antenna first – before disconnection! ***Rob G3XFD****.*

Honest Signal Reporting

Dear Rob

I recently pinned up a copy of the RST signal-reporting code in my shack. Having a copy of the code in front of me, while on the air, has made a huge difference to the way I now report my QSO partner's signals. I now realise that when I used to say "5 and 9", what I really (in all honesty) meant was "4 and 6".

How often can we honestly report a signal as "Perfectly readable" with "Extremely strong signals" when we really mean "Readable with practically no difficulty" with "Good signals"? I sometimes hear stations say "You are 5 and 3, please repeat your callsign several times". How can it be "Perfectly readable" – if you can't even get the callsign first time? Let's put some honesty back into signal reporting- I am quite happy with "4 and 6"; you don't need to flatter me with "5 and 9"!

Best wishes

Jonathan Kempster M5AEO
Limehouse
London E14

Send your letters to:

Rob Mannion
PW Publishing Ltd.,
Arrowsmith Court,
Station Approach,
Broadstone,
Dorset BH18 8PW
E-mail: pwletters@pwpublishing.ltd.uk

Star Letter

True Spirit of Amateur Radio

Dear Rob

I fully agree with what **Pete G4HAK** said in his letter published in the June issue about the 'true spirit of Amateur Radio'. I still think that most of us abide by the rules and it's only a minority who try and spoil it.

In Peter's letter he mentioned the rig given to him by M5STC, and I have a similar story to tell. I'm 13 and pocket money is limited. However, after my uncle got me interested in the hobby, I decided to join the **Leicester Radio Society** (LRS) and I've met some kind and generous people. During my third visit to the club I was handed a Maxon hand-held by **G1GEV**. It may not have been much but considering the only thing I had was a six channel hand-held, this almost tripled my channel coverage.

Now licenced as M3XCJ, I operate regularly on the local repeater. I have also acquired an old Kenwood-Trio TS-520S, a 5A p.s.u. and a massive a.t.u., all donated to me by members of LRS! In fact, the only radio or expensive equipment I've bought is the smallest in the shack – a Yaesu FT-817, thanks to *PW's Bargain Basement*!

As I write this, I'm also look forward to the 144MHz *PW* QRP Contest, and will be encouraging other members of LRS to participate. I believe it's a great way of getting people on air who perhaps don't do so that often. So 73 to all the team at *PW* – what a mag – and anybody else who reads this letter,

Joel Fergusson M3XCJ
Aylestone
Leicester

A great deal of correspondence intended for 'letters' now arrives via E-mail, and although there's no problem in general, many correspondents are forgetting to provide their postal address. I have to remind readers that although we will not publish a full postal address (unless we are asked to do so), we require it if the letter is to be considered. So, please include your full postal address and callsign with your E-Mail. All letters intended for publication must be clearly marked 'For Publication'. **Editor**

news & products

A comprehensive round-up of what's happening in our hobby.

Caldey Island GB2CI Operation

Following a successful reconnaissance visit in March, the **GB2CI Group** will establish a special event station, **GB2CI**, on Caldey, one of the Welsh Islands off the coast of Tenby, Pembrokeshire, IO71PP, from 1800hrs UTC on September 2nd to 1100hrs UTC on September 8th 2008. Operators taking part will be **G1JCC**, **G4LBH**, **G4LOO**, **G4MVU**, **G4UEM**, **G8ATD** and **M0BIK**.

The station will be validated for IOTA (EU-124), WLOTA (L 4056) and WAB SS19. Primarily the event will be a holiday expedition with s.s.b. DX operation on all bands from 1.8 to 144MHz but to encourage local contacts, operation from 0800hrs BST (0700hrs UTC) to 0900hrs BST (0800hrs UTC) and from 1900hrs BST (1800hrs UTC) to 2000hrs BST (1900hrs UTC) will be restricted to 3.5, 7 and 144MHz. Expected operating frequencies will be 3.750MHz, 7.065MHz and 144.310MHz, ±QRM but schedules for 80m and 2m during these times can be arranged

through **Alain Stievenart ON4KST**, at **Ruse Bois Du Prince 61, 5640 Mettet, Belgium**. E-mail **on4kst@skynet.be**

The group will also be taking part in the SSB Field Day and 2m Trophy contests over the weekend of 6th – 7th September using club callsign **GW3SVJ/P**. During the week, some operators may also use their own callsigns (GW????/P) for data mode operation eg PSK31 and SSTV.

Antennas will include a trapped 3-element beam at 12m above ground for 14, 21 and 28MHz, a multi-band trapped vertical and dipoles for 3.5 and 7MHz and an extremely long end fed wire for 1.8MHz. There'll also be a 5-element Yagi antenna for 50MHz at 12m above ground; and a 9-element Yagi for 144MHz, also at 12m above ground. Transmitter power outputs are expected to be 400W on h.f and 200W on 50 and 144MHz.

The Caldey Island Group are proud to announce the sponsorship of QSL cards for this expedition by M**artin Lynch & Sons Ltd** and QSL cards should be sent via the bureau or direct to **A. Barter G8ATD, 63 Ringwood Road, Luton, Bedfordshire LU2 7BG**. QSL cards will be managed on behalf of the group by **Terry Baldwin G4UEM**. Website **http://vhfcomm.co.uk/lvg/caldey-sept-2008.htm**

Newbury & District ARS Rally

Stef Niewiadomski took time off from writing for PW and enjoyed his trip to the long-established Newbury ARS Rally and Car Boot Sale. He wasn't disappointed and many moths were liberated from his open purse! ***Editor.***

Stef writes: I attend maybe three or four radio rallies each year. By far my favourite is the **Newbury and District Amateur Radio Society** (NADARS) event held in the Newbury area every year on Fathers' Day (June 15 this year), which makes the date easy to remember. This rally also happens to be the closest to where I live. A couple of years ago the rally moved to the Newbury Showground from the more 'compact' Cold Ash location, having outgrown the available car parking and selling area. For as long as I can remember the weather on the day of the rally has been good and as the photos show, there was no exception this year.

I can always find a good selection of new and used 'bits', some on tables, some on ground sheets (or just on the grass, a bit on the long side but it was fortunately dry) and some in trailers. I'm actually going through a 'valve' phase at the moment and was pleased to grab a few valve bargains, typically 50p un-boxed and £1 boxed. I liked the box full of 807s for £3 each, although I could have found them cheaper on other stalls. Of course, I could have easily found cast-off finished and not-so finished projects if I fancied salvaging some components or even the chassis itself!

There was lots of professionally-built test equipment and military gear for sale, and as we would expect, traders selling antennas and the paraphernalia to get the antenna into the air and feed with with r.f. One trader was selling a pair of Drake TR-4C transceivers; a 2-B receiver; an MS-4 speaker and MN-4C matching network. It's not often in the UK you see such a collection of Drake gear in one place.

Overall I like the fact that the NADARS rally is still very much an old-style event, with very friendly traders and with not too many craft and computer stalls. See vou there next year!

Stef Niewiadomski

New Home For Oldham Amateur Radio Club

Chris Cunliffe G7OOD, Secretary of the **Oldham Amateur Radio Club** (OARC) writes: "In January's club journal all OARC members were informed about a possible move from our location.

The move will definitely go ahead and it looks more like it will be early in 2009. As soon as this happens I will send everyone the new information about the address. It's only a half mile away from our present site at the Air training Corps headquarters in Oldham. New members are always welcome at Oldham Amateur Radio Club, Royton ATC, Hillside Avenue, Royton, Oldham, Lancashire OL2 6RF.

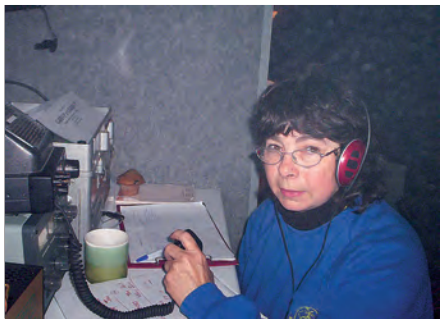
Anyone needing any information about the club and events are invited to contact me directly via **secretaryoarc@btinternet.com** or on (Mobile) **07749 347 142**. I look forward to hearing from you!" **Chris G7OOD**.

Send all your news to:
PW Publishing Ltd.,
Arrowsmith Court,
Station Approach,
Broadstone,
Dorset BH18 8PW
E-mail: newsdesk@pwpublishing.ltd.uk

All Ladies DXpedition To The Falklands

Nicky Marriot M5YLO E-mailed the *PW* Newsdesk with the following appeal for sponsorship for the Falkland Islands DXpedition in January 2009. "This notice is in response to clubs and individuals expressing the wish to give support". Listed are some expenses involved and equipment required:

1: Air Fare (Brize Norton to Falklands and Return) £2060.
2: Travel Insurance (£50 estimated).
3: Accommodation – 14 nights at £35 /Night (meals extra).
4: Band Filters – one per band (Dunestar 300 at £52.95 or Equivalent).
5: QSL card printing.
6: Badges.
7: T–Shirts.
8: Flag (Union Flag or 'Union Jack').
9: An h.f. rig
10: Lap top PC.
11: DX4WIN logging software (use recommended) £45.



If anyone is able and willing to sponsor Nicky in any form (great or small) (sponsors would receive recognition on our WEB Sponsors Page) **http://www.radioclubs.net/aa_vp8yl_/** together with our thanks!

For further details willing sponsors are asked to contact Nicky via **tm@io80vv.freeserve.co.uk** ***or via*** **Tel: (01258) 860741.**

Sheffield Amateur Radio Club Fun Day

Colin G3VCQ contacted the *PW* newsdesk to announce that, "The **Sheffield Amateur Radio Club** (SARC) is hosting Sheffield's first 'Ham Fun Day', on Saturday the July 19th 2008. This event will be held at the Club's QTH at the **Sheffield Transport Club, Greenhill Main Road, Sheffield, South Yorkshire S8 7RH**.

Our new 'Fun Day' will be a relatively small event to start, with only a few major traders such as LAM, in attendance. However, we intend to have a bring and buy stand, and a flea market/car boot sale. There will be fun for all the family at this event throughout the day with various stalls, including bouncy castle, dancing, jazz/brass band, childrens' entertainment and a local 'retro band'. Food and beverage facilities will be available including bar, Prize draw with proceeds to **The Gambian Schools Trust**.

The venue is easy to get to and has ample parking. The doors will open at 11am, the entrance fee will be £1 per person and £2 car parking per car. Disabled parking and access will be available. Talk in will be provided on 145.550/434.550MHz by **G3RCM**".

Interested Traders/Flea Market/Club stall holders should contract **Colin Wilson G3VCQ** on 0114 2745376 or email **hamfunday@sheffield-live.co.uk** before the July 1st. We look forward to meeting you on our Fun Day!

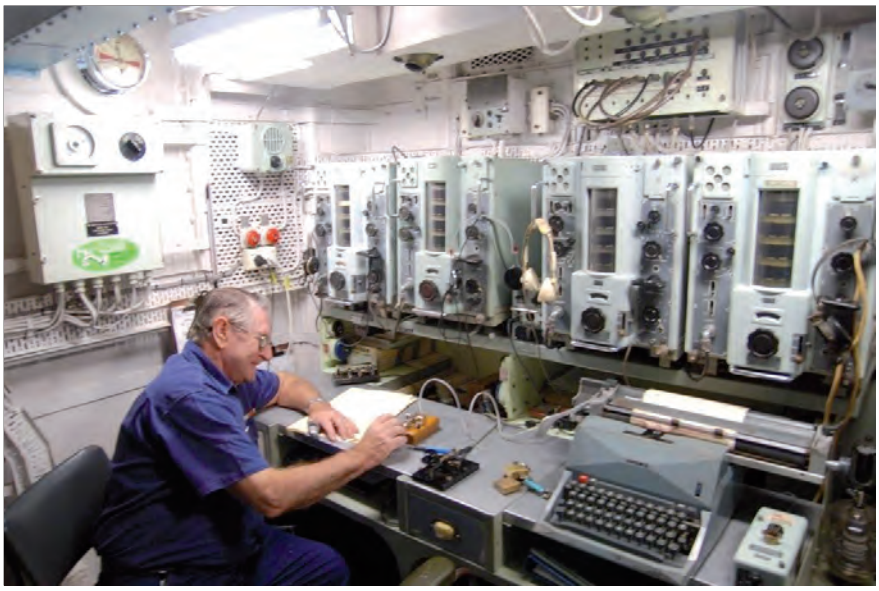
Norfolk Mill On The Air

Over the weekend of the 10th and 11th of May, members of the **Norfolk Amateur Radio Club (NARC)** participated in the Special Event station **GB0WWW** (**Wherrymans Way Windmill**) at Hardley Mill, which was run by **Terry White G0BXL** from the **Harlow and District Amateur Radio Club (HADARC)**, supported by **Alan M0LSX** from the Norfolk Club. The Station was taking part in Mills on the Air weekend and was the only Mill participating from Norfolk. The station was also run as a **Royal Air Force Amateur Radio Society** (RAFARS) station, flying the RAF flag courtesy of RAFARS member **Rex Hunt GOCLR**. Members of Norfolk Amateur Radio Club took part in the event and one, **Nigel Warner M0NWW**, arrived by boat! Rex G0CLR, Stuart G7KBF, David G7URP, Kevin M0UJD, Paul G3VPT, Judi 2E0KNE and Marrianne M3UYY all enjoyed logging stations on 144MHz f.m. and on h.f. Many good contacts were made and 13 other Mills were logged including **Lymm Slitting Mill**, which was used in the manufacture of Nails!

Hardley Drainage Mill sits right on the river Yare, about 13km (8 miles) South East of Norwich, and the Wherrymans Way walk runs between the river and the Mill. This marsh drainage mill was built in 1874. The mill is currently undergoing extensive repair by the Hardley Windmill Trust. Once restored to full working order, the mill will be open for visitors demonstrating how the power of the wind has been historically harnessed to lift huge quantities of water. QRA (Maidenhead) Locator JO 02 SN .

The club weren't operating from inside the Mill this year, as has been the case in previous years because the new Visitors' Centre afforded more space and ease of operating. The weather was fantastic, and that coupled with the wide-open quiet riverside location made it a very relaxing weekend. However, club members said, "It was unnerving – to say the least – to see that the passing boats were higher than us!"

The club reported to the *PW* Newsdesk it was a fantastic weekend, and they've have been asked by the **Friends of Hardley Mill** to come back next year and do it all again! For further information please contact NARC Press Officer **Judi Dale 2E0KNE** via **m3nkw@yahoo.co.uk** Tel. **(01603) 469682**.



A Porter Helps A Murphy!

Dave Porter G4OYX has always made visitors to the former BBC Woofferton short wave transmitters (now owned and operated by **VT Communications**) on the Herefordshire/Shropshire border very welcome. However, after reading the Vintage & Military Amateur Radio Society's *Newsletter* – he ended up helping to get a vintage Murphy transmitter in an Australian museum to work again!

Dave G4OYX writes: It was in September 2007 that I noted in the **Vintage & Military Amateur Radio Society's** Member's *Newsletter*, a request from **Wally Walker G4DIU** on behalf of the **Royal Naval Amateur Radio Society** (RNARS) for some spare parts. These parts were needed for a vintage Murphy 618 transmitter residing in the **Queensland Maritime Museum** in Australia.

Colin Whale VK4CU of the museum (and the RNARS) had been tasked with looking for a keying relay and a 'big boy's resistor'. As regular readers to *PW* know we have 'big boys' resistors' at the VT Communications HF transmitting station in Woofferton, Shropshire and I managed to find a 12kΩ 75W wire-wound of about the right dimensions that was 'going spare'.

The relay required was for a high speed keying circuit and as such had been of specialist manufacture in the UK. It was 24V d.c. operated and sealed in a can. I recognised it as soon as I saw Colin's photo as one we use in main 600kW high tension (h.t.) suppression circuit in the Marconi BD272 250kW h.f. transmitter. Colin was in luck as we have ample spares of this component now– as we have scrapped four of the original six BD272 senders. (Incidentally, 'sender' is the historic term we use for transmitters and the term was used by the BBC from the early days). However, this was not always the case and we didn't always have plenty of spares – until I attended an Amateur Radio rally!

At the **Telford** (Cosford RAF Museum) **Rally** some six years ago I met a man walking round the hangars carrying a green 25 litre capacity bucket, which was crammed full of components. On the top were two of the special relays! I asked him was he selling the stuff or had he just bought it? It was indeed for sale and I offered him £10 for the bucket, he accepted and Woofferton then had two spare relays for six senders! As I'm sure you'll agree this was better than no spares at all and I had the remaining 24.9 litres of components! The relays were a bargain as the last time we managed to (officially) buy them, the relays they were over £100 each!

Back to Australia now! I posted the relay and resistor and soon afterwards received a 'thank you' letter from **Tom Jeffree** the Museum Operations Manager. With my spares they were able to repair the Murphy 618T. As a gesture Tom included four tickets allowing free entry to the museum. But I have to confess – I'm not the world's biggest traveller, and as such not likely to visit 'Oz', so I thought Rob might like them as maybe a competition prize.... over to you Rob! **Dave Porter G4OYX**

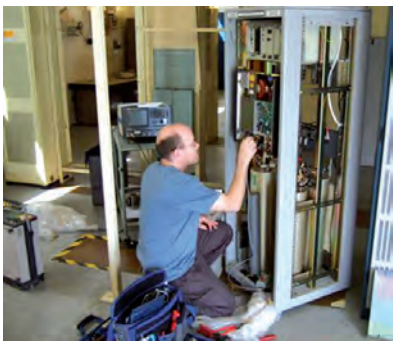
Editor's comment: If any *PW* reader is thinking about a trip to Australia perhaps they would like to contact me so I can pass on the tickets kindly dontated by Dave G4OYX. There's only one stipulation for the gift – I hope you'll accept me as a volunteer to act as your special 'porter' on the trip! **Rob G3XFD**.

New Suffolk 144MHz Repeater GB3EA

The South Anglia Repeater Group have announced that the new **GB3EA** 144MHz repeater has recently gone on the air. The group reports that until the repeater came on the air, there was a coverage hole along the A14 in Suffolk from South of Stowmarket to Newmarket. Plans for the new repeater came about one afternoon over a coffee, where the Group (also responsible for **GB3PO**, **GB3IH** and **GB3EF**) discussed the possibility of a new repeater to cover the gap. Two and a half years later – after a lot of work, 'favours' called in and licenses chased – GB3EA went on air Saturday 26th April at 1530. The first official contact through the repeater was by **Alex M3ZCA,** the son of **Jake G1YFF,** the Project Leader for GB3EA! Initial reports of coverage have been extremely encouraging with good signals reported across East Anglia. Users and listeners can log reports by visiting the group's Web Blog at **http://gb3ea.blogspot.com/**

The GB3EA repeater is located near the village of Wickhambrook between Bury St. Edmunds and Haverhill. The SARG members can be contacted via **g7ciy@raynet-uk.net**

The GB3EA repeater's output is 145.6875MHz. The input is 145.0875MHz and the CTCSS tone is 110.9Hz.



Bishop Auckland ARC Takes To The Rails!

Mike Butler G0NRK contacted the *PW* Newsdesk to get over the 'point' and 'switch' us on 'track' (Groan!!) and, "Just to let you in on the information that the **Bishop Auckland Radio Amateur Club** (BARAC) are to introduce **Railways On The Air** (ROTA) – in the same format as Mills on The Air – during the weekend 27th and 28th September 2008. The reason why we've chosen that date? It was the date of the first timetabled public train journey on the famous Stockton & Darlington Railway!" **Mike G0NRK**

The *PW Newsdesk* team suggests that for further details readers should visit the BARAC club web site at **http://barac.m0php.net** and don't miss their train of activities!

Silent Key

Margaret Snary 2E1AQS/M3AQS

June 18th 1924 – April 4th 2008.

Rob Mannion G3XFD writes: **Robert Snary G4OBE** is one of the most valuable and dedicated Radio Amateurs in the UK. However, as many visitors to the much lamented Picketts Lock Amateur Radio Show will remember – the Snary family came as a 'package deal' with Robert's Mum Margaret 2E1AQS and Dad Frank forming an ever-helpful team. I invited Robert to write a few memories of the charming lady many of us had met.

Robert G4OBE writes: Mum had a number of interests and her father built his own radios (as did my dad's Father) so it's really a 'genetic' hobby! She often used to talk about listening to a 'cat's whisker' crystal set radio with the headphones in a glass basin to allow her mother, father and herself to listen.

Mum was on my first Novice Course and she was very proud of the fact that she passed. One of her prize possessions was the Hands RX1 receiver kit, which she built and often listened to 3.5MHz with – especially when I was operating mobile on my way back from my work at British Telecom events. The other thing that Mum did was build all the projects that appeared in the RSGB's *DIY Radio* – plus others that didn't!

My Mum was also my 'guinea pig' in that she proof-read the instructions and built the projects before they were sent off. Her soldering was exceptional and on-air people were sometimes surprised at exactly what Mum would do, although she did comment that the best way to build was to insert components in order – and it was like following a knitting pattern – I almost wish I could have tried her out on some of the Heathkit units!

As well as encouraging others and publicly being one of the faces of the information stand at Pickett's Lock, she was very much part of the Novice Training establishment, providing tea, coffee, etc., as well as encouraging people – especially on their first contacts.

Mum also enjoyed other aspects of the hobby such as putting on a station on the Sunday on VHF NFD to give away points on 430MHz. Her furthest contact being down to southern France with a 7-element ZL special an 3W s.s.b., from Shoeburyness, when she was lucky with a marine duct.

She was also the first Novice Licence holder to claim a **Solent Fortification Award** and as I type this, I'm looking at the front room wall with her certificates – including WAB awards and in a cabinet, her Crystal Solent award.

Another activity was the Christmas Day net, which she ran from 1992–2006 (2007 was missed as she was in Hospital) and also on at least two occasions she had to take over reading GB2RS news when I suffered a sore throat and lost my voice, people on air did often comment about it being the only time I could supervise her was when she was acting as a second operator! Mum was a member and supporter of the RSGB, WAB, BYLARA and until recently the Southgate Amateur Radio Club.

When the Foundation licence started, she helped by encouraging people on their first contacts and also by invigilating at exams, it was only due to her age and sadly declining health that caused me to have to drop out of running courses. Also in the end Mum's hearing started to fail but she was looking forward to 28MHz opening up to catch up with friends that I'd made while chasing 10-10 awards.

Mum wanted to join the WRNS (Wrens) during the Second World War but due to her work during the war being a 'reserved occupation' (involving Maritime work) she wasn't able to. However, she became a great supporter of the RNLI and as part of her final request (although she enjoyed her gardening) Mum requested that there should be no flowers and she would prefer donations to the RNLI and to date over £600 has been donated in her memory. Locally Mum's call was known as '2E1 a Quiet Signal and prior to the abolition of Morse Testing she took the Morse assessment and also held the call M3AQS, sadly now the calls will be 'Quiet Signals' and my Dad is now trying to survive my cooking! **Robert G4OBE**.

Farnborough Pips Wey Valley For The Hernia Cup!

George Dodd G2DBH, Programme Secretary of the **Wey Valley Amateur Radio Group** wrote to the Editor to share the story of a heavyweight trophy that's cherished by the clubs that win it – although it was found in a roadside ditch!

George G2DBH writes: "Dear Rob, a couple of years ago you came down to see us all in the Wey Valley ARG, Guildford, this despite your very full schedule and two earlier attempts, which had to be aborted due to your temporary ill health. You'll remember we were then a fledgling group of but ten founder members and, as such, we appreciated your visit no end!

It's just splendid to be able to report continued success, with a membership now of 25 and almost sufficiently large to enquire about another visit! The enthusiasm in the club is very catching and we have run some Novice classes and also done well in CW HF NFD, coming first in the single band category stakes. We also acquitted ourselves well in AFS 2008!

Last year we competed for and won the local event known as the **Hernia Cup Quiz** – a competition between local Amateur groups for an unusual piece of heavy metal found in – and rescued from – a ditch, but nevertheless, much cherished locally and we know that you've held it and appreciate its weight!

On May 2nd, we, as holders hosted what turned out to be a very jolly evening, set up to compete for the 2008 cup. Five local clubs joined with WVARG to compete, including **Echelford ARS**, **Farnborough & District ARS** (Hampshire), **Dorking & Distrct ARS**, **Hogs Back ARC** and **Guildford & District RS**. Questions on radio and general matters were put to us by **Adrian Boyd, G4LRP**, the 'neutral' Chairman of the **Horsham ARC**.

We were pipped at the post and Farnborough District ARS had a well deserved win, taking the trophy back to home waters for the year by a heavy-lift truck! Refreshments were served and enjoyed by all. With best 73s from all the crew at the boathouse!" **George G2DBH**
Programme Secretary, Wey Valley ARG
website **http://www.weyvalleyarg.org.uk/index.htm**

From Rob G3XFD: *Well done Farnborough and better luck to everyone else next year! I'm looking forward to my next visit to WVARG George – but perhaps it will be cheaper to come by boat as marine fuel is less expensive!*

MOONRAKER

Manufacturers of radio communication antennas and associated products

HF Verticals

VR3000 3 BAND VERTICAL FREQ: 10-15-20 Mtrs GAIN: 3.5dBi HEIGHT: 3.80m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials) **£99.95**
OPTIONAL 10-15-20mtr radial kit **£39.95**

EVX4000 4 BAND VERTICAL FREQ:10-15-20-40 Mtrs GAIN: 3.5dBi HEIGHT: 6.50m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials) **£119.95**
OPTIONAL 10-15-20mtr radial kit **£39.95**
OPTIONAL 40mtr radial kit **£14.95**

EVX5000 5 BAND VERTICAL FREQ:10-15-20-40-80 Mtrs GAIN: 3.5dBi HEIGHT: 7.30m POWER: 2000 Watts (without radials) POWER: 500 Watts (with optional radials) **£169.95**
OPTIONAL 10-15-20mtr radial kit **£39.95**
OPTIONAL 40mtr radial kit **£14.95**
OPTIONAL 80mtr radial kit **£16.95**

EVX6000 6 BAND VERTICAL FREQ: 10-15-20-30-40-80 Mtrs GAIN: 3.5dBi HEIGHT: 5.00m RADIAL LENGTH: 1.70m(included) POWER: 800 Watts **£299.95**

EVX8000 8 BAND VERTICAL FREQ:10-12-15-17-20-30-40 Mtrs (80m optional) GAIN: 3.5dBi HEIGHT: 4.90m RADIAL LENGTH: 1.80m (included) POWER: 2000 Watts **£319.95**
80 MTR RADIAL KIT FOR ABOVE **£89.00**

(All verticals require grounding if optional radials are not purchased to obtain a good VSWR)

Scanner Discone Antennas

DISCONE ★ Type: Ali ★ Freq: 25-1300Mhz ★ Length: 100cm ★ Socket: PL259 ..... **£29.95**
SUPER DISCONE ★ Type: Ali ★ Freq: 25-2000Mhz ★ Length: 140cm ★ Socket: PL259 ★ Gain:3dB **£39.95**
HF DISCONE ★ Type: Ali ★ Freq: 0.5-2000Mhz ★ Length: 185cm ★ Socket: PL259 ★ Gain: 1.5dB **£49.95**
ROYAL DISCONE 2000 ★ Type: Stainless ★ Freq: RX: 25-2000Mhz Feq: TX 6/2&70cm+ ★ Length: 155cm ★ Socket: N-Type ★ Gain: 4.5dB **£49.95**
ROYAL DOUBLE DISCONE 2000 ★ Type: Stainless ★ Freq RX: 25-2000Mhz Feq: TX 2&70cm ★ Length: 150cm ★ Socket: N-Type ★ Gain: 5.5dB **£59.95**

Scanner Mobile Antennas

G.SCAN II ★ Type: Twin coil ★ Freq: 25-2000MHz ★ Length: 65cm ★ Base: Magnetic/Cable/BNC **£24.95**

SKYSCAN MOBILE ★ Type:Multi whip ★ Freq: 25-2000MHz ★ Length: 65cm ★ Base: Magnetic/Cable/BNC **£19.95**

Scanner Portable/Indoor Antennas

SKYSCAN DESKTOP ★ Type: Discone style ★ Freq: 25-2000Mhz ★ Length: 90cm ★ Cable: 4m with BNC **£49.95**

Tri-SCAN 3 ★ Type: Triple Coil ★ Freq: 25-2000Mhz ★ Length: 90cm ★ Cable: 4m with BNC **£39.95**

Scanner Hand-held Antennas

Going out? Don't miss out! Get a super Gainer! p+p just £2.00
MRW-100 SUPER GAINER ★ Freq: 25-1800MHz ★ Length: 40cm ★ Fittiing: BNC **£19.95**
MRW-210 SUPER GAINER ★ Freq: 25-1800MHz ★ Length: 40cm ★ Fittiing: SMA **£19.95**

Scanner Fibreglass Vertical Antennas

SSS-MK1 Freq: 0-2000Mhz RX ★ Length: 100cm ★ Socket: PL259 ..... **£29.95**
SSS-MK2 Freq: 0-2000Mhz RX ★ Length: 150cm ★ Socket: PL259 ★ Gain:3dB over SSS-1 ..... **£39.95**

Scanner Preamplifier

A great pre-amp at an incredible new low price!
MRP-2000 Mk2 ★ Active wideband pre-amp ★ Freq: 25-2000Mhz ★ Gain: 6-20dB ★ Power: 9-15v (battery not included) ★ Lead: 1m with BNC **£29.95**
M-100 ★ Professional 24-2300MHz pre-amp ★ Freq: Band A:225-1500MHz Band B:108-185MHz Band C: 24-2300MHz ★ Gain: -10 to +22dB ★ Impedance: 50 Ohms **£69.95**

Guy Rope 30 metres

MGR-3 3mm (maximum load 250 kgs) **£6.95**
MGR-4 4mm (maximum load 380 kgs) **£14.95**
MGR-6 6mm (maximum load 620 kgs) **£29.95**

Hand-held VHF/UHF Antennas

Postage on all handies just £2.00
MRW-300 ★ Type: Helical rubber duck ★ Freq TX: 2&70 RX: 25-1800MHz ★ Power: 10w ★ Length: 21cm ★ Connection: SMA **£12.95**
MRW-310 ★ Type: Helical rubber duck ★ Freq TX: 2&70 RX: 25-1800MHz ★ Power: 10w ★ Length: 40cm ★ Connection: BNC Gain: 2.15dBi **£14.95**
MRW-200 ★ Type: Helical rubber duck ★ Freq TX: 2&70 RX: 25-1800MHz ★ Power: 10w ★ Length: 21cm ★ Connection: SMA **£16.95**
MRW-205 ★ Type: Helical rubber duck ★ Freq TX: 2&70 RX: 25-1800MHz ★ Power: 10w ★ Length: 40cm ★ Connection: SMA ★ Gain: 2.15dBi **£19.95**
MRW-222 SUPER ROD ★ Type: Telescopic whip ★ Freq TX: 2&70 RX: 25-1800MHz ★ Power: 20w ★ Length:23-91cm ★ Connection: BNC ★ Gain: 2m 3.0dB 70cm 5.5dB ★ DX Performance **£24.95**

Hand-held HF Antennas

Postage on all handies just £2.00
MRW-HF6 ★ Type: Telescopic Whip ★ Freq: TX: 6m RX: 6-70cm ★ Power:50 Watts ★ Length: 135cm ★ Connection: BNC **£19.95**
MRW-HF10 ★ Type: Telescopic Whip ★ Freq: TX: 10m RX: 10-4m ★ Power: 50 Watts ★ Length: 135cm ★ Connection: BNC **£19.95**
MRW-HF15 ★ Type: Telescopic Whip ★ Freq: TX: 15m RX: 15-6m ★ Power:50 Watts ★ Length: 135cm ★ Connection: BNC **£19.95**
MRW-HF20 ★ Type: Telescopic Whip ★ Freq TX: 20m RX: 20-6m ★ Power: 50w ★ Length: 135cm ★ Connection: BNC **£22.95**
MRW-HF40 ★ Type:Telescopic Whip ★ Freq TX: 40m RX: 40-10m ★ Power: 50w ★ Length: 140cm ★ Connection: BNC **£22.95**
MRW-HF80 ★ Type: Telescopic Whip ★ Freq TX: 20m RX: 80-10m ★ Power: 50w ★ Length: 145cm ★ Connection: BNC **£24.95**

100m Cable Bargains

RG58 Standard 6mm coax cable **£24.95**
RG58M Military spec 6mm coax cable **£39.95**
RGMINI8 Military spec 7mm coax cable **£54.95**
RG213 Military spec 9mm coax cable **£84.95**
WESTFLEX 103 mil spec 9mm coax cable **£129.95**
RH100 Military spec 9mm coax cable **£99.95**
FLEXWEAVE Original antenna wire **£49.95**
PVC FLEXWEAVE Original pvc coated antenna wire **£69.95**
300 Ribbon cable USA imported **£59.95**
450Ω Ribbon cable USA imported **£59.95**

Books

UKSCAN-B The 9th Edition UK Scanning Directory. A must have publication! **£19.50**

LOGBB-B Base log book for licensed amateurs **£4.95**
LOGBM-B Mobile/Portable log book for licensed amateurs **£4.95**

Patch Leads

STANDARD LEADS
1m RG58 PL259 to PL259 lead **£3.95**
10m RG58 PL259 to PL259 lead **£7.95**
30m RG58 PL259 to PL259 lead **£14.95**

MILITARY SPECIFICATION LEADS
1m RG58 Mil spec PL259 to PL259 lead **£4.95**
10m RG58 Mil spec PL259 to PL259 lead **£10.95**
30m RG58 Mil spec PL259 to PL259 lead **£24.95**
1m RG213 Mil spec PL259 to PL259 lead **£4.95**
10m RG213 Mil spec PL259 to PL259 lead **£14.95**
30m RG213 Mil spec PL259 to PL259 lead **£34.95**
1m H100 Mil spec PL259 to PL259 lead **£5.95**
10m H100 Mil spec PL259 to PL259 lead **£19.95**
30m H100 Mil spec PL259 to PL259 lead **£44.95**

(All other leads and lengths available, ie. BNC to N-type, etc. Please phone for details)

ATOM Single Band Mobile Antennas

New low profile, high quality mobiles that really work!
ATOM-6 ★ Freq: 6m ★ Length: 130cm ★ Power: 200W ★ Fitting: 3/8 ..... **£22.95**
ATOM-6S ★ Freq: 6m ★ Length: 130cm ★ Power: 200W ★ Fitting: PL259 ..... **£24.95**
ATOM-10 ★ Freq: 10m ★ Length: 130cm ★ Power: 200W ★ Fitting: 3/8 ..... **£22.95**
ATOM-10S ★ Freq: 10m ★ Length: 130cm ★ Power: 200W ★ Fitting: PL259 ..... **£24.95**
ATOM-15 ★ Freq: 15m ★ Length: 130cm ★ Power: 200W ★ Fitting: 3/8 ..... **£22.95**
ATOM-15S ★ Freq: 15m ★ Length: 130cm ★ Power: 200W ★ Fitting: PL259 ..... **£24.95**
ATOM-20 ★ Freq: 20m ★ Length: 130cm ★ Power: 200W ★ Fitting: 3/8 ..... **£22.95**
ATOM-20S ★ Freq:20m ★ Length:130cm ★ Power: 200W ★ Fitting: PL259 ..... **£24.95**
ATOM-40 ★ Freq: 40m ★ Length:130cm ★ Power:200W ★ Fitting: 3/8 ..... **£24.95**
ATOM-40S ★ Freq: 40m ★ Length: 130cm ★ Power: 200W ★ Fitting: PL259 ..... **£26.95**
ATOM-80 ★ Freq: 80m ★ Length: 130cm ★ Power: 200W ★ Fitting: 3/8 ..... **£27.95**
ATOM-80S ★ Freq: 80m ★ Length: 130cm ★ Power: 200W ★ Fitting: PL259 ..... **£29.95**

ATOM Multiband Mobile Antennas

ATOM-AT4 ★ Freq: 10/6/2/70cm ★ Gain: (2m 1.8dBd) (70cm 3.5dBd) ★ Length: 132cm ★ Power: 200w (2/70cm) 120w (10/6m) ★ Fitting:PL259 ..... New low price **£49.95**
ATOM-AT5 ★ Freq: 40/15/6/2/70cm ★ Gain: (2m 1.5dBd) (70cm 3.5dBd) ★ Length: 129cm ★ Power:200w (2/70cm) 120w (40/6m) ★ Fitting:PL259 ..... New low price **£59.95**
ATOM-AT7 ★ Freq: 40/20/15/10/6/2/70cm (5 bands at once) ★ Gain: (2m 1.8dBd) (70cm 3.5dBd) ★ Length: 200cm ★ Power: 200w (2/70cm) 120w (40/6m) ★ Fitting: PL259 ..... New low price **£69.95**

SPX Multiband Mobile Antennas

All these antennas have a unique flyleaf & socket to make band changing easy! Just plug-n' go!
SPX-100 ★ Portable 9 Band Plug n' Go HF mobile antenna ★ Freq: 6/10/12/15/17/20/30/40/80m ★ Length: 1.65m retractable to 0.5m ★ Power: 50w ★ Fitting: 3/8 or PL259 with adapter included **£44.95**
SPX-200S ★ Mobile 6 band Plug 'n Go HF mobile antenna ★ Freq: 6/10/15/20/40/80 ★ Length: 130cm ★ Power:120w ★ Fitting: PL259 ..... **£49.95**
SPX-300 ★ Mobile 9 band Plug 'n Go HF mobile antenna ★ Freq: 6/10/12/15/17/20/30/40/80m ★ Length: 165cm ★ Power: 200w ★ Fitting: 3/8 Thread **£59.95**
SPX-300S ★ Mobile 9 band Plug 'n Go HF mobile antenna ★ Freq: 6/10/12/15/17/20/30/40/80m ★ Length:165cm ★ Power:200w ★ Fitting: PL259 ..... **£64.95**

Mobile Colinear Antennas

Ever wanted colinear performance from your mobile?
MR3-POWER ROD ★ Freq: 2/70cm ★ Gain: 3.5/6.5dBd ★ Length: 100cm ★ Fitting: PL259 ..... **£29.95**
MR2-POWER ROD ★ Freq: 2/70cm ★ Gain: 2.0/3.5dBd ★ Length: 50cm ★ Fitting: PL259 ..... **£24.95**

CALL MAIL ORDER 01908 281705
Opening times: Mon-Fri 9-6pm sales@moonrakerukltd.com
UNIT 12, CRANFIELD ROAD UNITS, CRANFIELD ROAD WOBURN SANDS, BUCKS MK17 8UR

Feature

Emerging Technology

Memristors · The 'Missing Link'

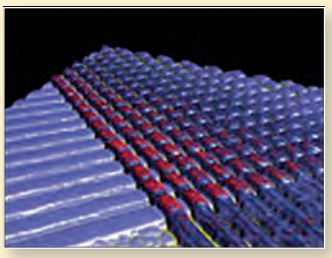
In the radio hobby we know of the three main passive two-terminal electronic components, namely resistors, capacitors and inductors and each has a relationship which tells us how they operate with voltage and current. But there's another – although it's not new as it was originally described back in 1971. However, interest in it has just been revived after an experimental solid-state version was constructed for the first time ever, and described in a published paper on April 30th this year by Hewlett Packard laboratory Scientist **Dr Stan Williams**.

The term 'memristor' is a combination of memory and resistance, describing a passive two-terminal component that has a relationship between the device's resistance and the current that has passed though it over time. As such, it can have a memory as the resistance can be varied with the current applied but it also has a hysteresis, in a similar way to ferrites we know so well. Very early computers used ferrites for memories by talking advantage of the hysteresis effect of these.

Today's memristor is based on thin (5nm) films of titanium dioxide in between electrodes, arranged in a 'cross bar' formation similar to that used by the early computers. Yet this is a much smaller construction and hence allows mass memory storage in a tiny space, as well as being much simpler than metal oxide semiconductor field effect transistors (m.o.s.f.e.t.s) as used in semiconductor memory.

As such, memristors have the possibility to allow nanoscale computer technology, and could even be useful in making artificial neural networks. There's already work underway to develop neural computers, and recently a team simulated half a mouse brain operating at 10% of its normal rate for one second; but that required a supercomputer!

It's been reported that the human brain has around 100 billion neurons and each of these has 10,000 associated synapses. Now essentially a synapse is an electrical connection with a memory, i.e. a memristor. Asked the question as when we could see the advent of neural computers, Dr Stewart says, "I'd be optimistic if I said anything less than 10 years".

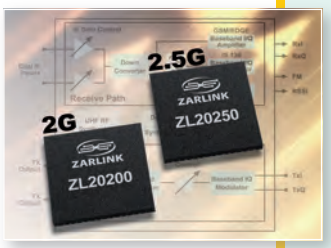


Single Chip Radio Transceivers

In the 'old' days of discrete components for everything, if you opened up a TV you'd see literally thousands of components. This was prior to the advent of integrated circuits (i.c.s), which initially contained several transistors to perform binary logic functions.

Then came analogue i.c.s, for example single-chip voltage regulators such as the well-known 7805 and 7812 types, still used to this very day. Later came more complex analogue i.c.s including audio amplifiers requiring just a few discrete components such as capacitors.

I fondly remember the ZN414 'single chip' receiver i.c., a three-pin device which had the basic semiconductor circuitry comprising 16 transistors within it to form a high gain tuned radio frequency (t.r.f.) receiver for a.m. reception, e.g. on medium wave You just needed to add half a dozen external components, namely two resistors, two capacitors, and an inductor/variable capacitor tuned circuit. With these it would drive an earphone, or by adding a further amplifier such as a 741 op-amp circuit, a small loudspeaker and, of course *PW* produced many projects using the '414 and there was even the simple Top Band Tourer 1.8MHz transmitter-receiver project developed by **Clive Hardy G4SLU** using the chip published in July 1994.



In the early 1990s, one enterprising ›

Commencing a new bi-monthly series, Chris Lorek G4HCL takes a look into his radio crystal ball and gives us an insight into what's happening and what's about to happen in the radio and wireless technology field.

manufacturer set out to make a single chip TV. No one thought it was possible. Then three or four years later they had engineering samples and two years later they went into production and, again two years later, it was reported they had 60% of the market.

For years the firm of NXP Semiconductors (who were formerly a division of Philips Electronics, naturally and quite possibly a more familiar semiconductor manufacturer name for readers) have had an integrated platform solution for mobile phones. Now it wants a single chip mobile phone and what makes that possible is 45nm process technology.

The company modestly says, "We think our engineering talent is so fantastic, both in our company, and in the industry, that with time, with ambition, and with perseverance, it's going to happen," and "In terms of r.f. c.m.o.s. on 45nm, TSMC doesn't make it publicly known but we are number one."

Back down to earth, the company states that they intend to divide the r.f. section of the chip into three sections: a low data rate section for NFC, Bluetooth, Zigbee, Wibree and UWB; a reconfigurable mid-data rate section for cellular; and a re-configurable high data rate section for WiFi, WiMAX and LTE.

But it's not all just cellular and data, as a possible partner on the front end is BitWave of Boston. They already have a prototype 'alpha' stage product using software to control analogue r.f. channels and these are configurable from 700MHz to 4.2GHz for transmissions with bandwidths from 25kHz to 20MHz. The 'beta test' product is due for summer this year, i.e. not far away at all! Overall, it's planned that the 2008, 45nm chip will have 2G, GSM, GPRS, EDGE, 3G, 3.5G, TD-SCDMA, HSDPA, SUPA, LTE, Bluetooth, frequency modulated (f.m.) radio and WiMAX.

Readers might think that a single i.c., fulfilling all the multiple wireless transceiver functions I've mentioned, would suffer from cross-interference, just like an TV or broadcast Band II receiver could suffer breakthrough from an Amateur or CB transmitter by the fact that they're in close proximity to each other. But how about it if these were all on a single i.c., including r.f. front end, intermediate frequency (i.f.), transmitter and so on? Right now, this is solved by physical separation between the various components on different sections of the i.c., in the same way as we try to keep our transmitting antennas well away from other electronic apparatus that could be susceptible to breakthrough.

Ironically, the reported biggest problem at the moment is the co-habitation of Bluetooth and f.m. radio. Nowadays, many people listen to f.m. radio on a shirt-pocket radio is usually through earphones with a wire physically connected to the radio. (That's often a pain in the neck).

Most people don't want trailing wires and would prefer a Bluetooth connection between the headphone, and a small earplug, so that they then dispense with the cable. Of course if you do that then the f.m. radio and Bluetooth transceiver have to operate simultaneously.

There are Bluetooth earphone adapters available (see recent issues of *PW*'s sister magazine *Radio User* for details of using these with handheld and belt-worn scanners) but these are separate plug-in units although the goal is again to combine everything on a single i.c., and apparently it's just around the corner.

So, the days of a wristwatch or top pocket multi-band multi-mode Amateur Radio transceiver with a Bluetooth headset for transmit/receive audio and push-to-talk may well soon be upon us!

In-Clothing Bodyworn VHF Antennas

The University Of Sheffield.

There's research currently underway at Sheffield University that's aiming to come up with antennas for low frequencies (typically centred around 100MHz (e.g. covering the 70 and 144MHz Amateur bands and around 400MHz e.g,. to 70cm, rather than at microwave frequencies) that can be built into people's clothing or even vehicles.

As many of us know, full-sized version of the antennas such as quarter wave whips, or even helical types, can be a bit unwieldy and prone to either breaking or digging into your body or eyes! The research group are hoping to produce antennas measuring between a 50th to a 20th of a wavelength, using 'metamaterials' to produce high impedance surfaces. This allows antennas to be placed very close to them as well as making them compact, the antenna becoming 'platform tolerant'. In other words, they can put an antenna on a human body and shield it, or mount it on the actual body of a vehicle.

The Sheffield team is also looking at shrinking the electronic band gap surfaces, even to the extent where they can effectively be a piece of woven fabric that behaves like metal, together with a patterned metallic surface a millimetre or two above it as the antenna radiator. All this, of course, means that as well as the possibility of incorporating the antenna into clothing, it's also shielded from the human body. When incorporated into the roof of a vehicle it would be a flat plane, rather than a roof mounted vertical whip that could get broken or bent.

The Sheffield group's project leader **Professor Richard Langley** (below), who's the Head of the University's Communications Group says, "The laws of physics tell you the efficiency of how the antenna works is reduced significantly, as is the bandwidth. We're beginning to show that's not the case with this type of approach, that you can actually overcome these physical limits by adopting these techniques. But we still need to make them efficient, otherwise they're useless".

Richard has had many published papers on antennas in the past and I'm sure his team are very capable indeed of achieving their goals. We may soon be seeing T-shirts with built-in antennas!

Wi-Fi On Public Commuter Buses

If you use a laptop computer at home with a broadband Internet connection, you'll most likely be using it with a wireless (Wi-Fi) modem connected to your phone line, enabling you to use your laptop around the house with a high-speed wireless link to your modem.

If you're out and about, then there are a number of subscription services you can use from public locations such as rail and airport travel centres, as well as from an increasing number of food and drink outlets such as coffee houses, junk-food and roadside 'restaurants', hotels, and the like.

Recently, a couple of UK Train Operating Companies (TOCs), have introduced Wi-Fi Internet access for their passengers, either free in First or Premium classes, or as 'pay as you go' in standard class. These benefit from the concentration of typically several hundred potential customers on each localised site, including trains (e.g. 6-12 carriages of 60-80 people each).

However, it's not only business commuters who appreciate Internet service on trains, as more and more people who aren't on business expense accounts are taking advantage of checking E-mails, web surfing, and the like on their daily commute to and from work on the train.

But what about free Wi-Fi on a commuter bus carrying a few dozen people? Well, independent bus operator Trent Barton has equipped a number of its 270 fleet of coaches with a free Wi-Fi service for commuters.

The buses, which are used to ferry commuters from Nottingham to Derby in the English central midlands, have been fitted with a Wi-Fi hub supplied by Moovera Networks to deliver 3.6Mbps connectivity over Vodafone's High Speed Packet Access 3G network. The service, which is free to commuters, piggybacks on an Ethernet in-bus network used to support CCTV, telematics and remote GPS fleet monitoring.

Trent Barton's commercial manager **Mark Greesley** said in a statement: "By putting Wi-Fi hotspots on our vehicles we're offering passengers a way to make the most of the 40-minute journey. The service offers us not only the managed Wi-Fi service but the ability in the future to connect other systems such as ticketing and security over the internet to our operations centre." I'm waiting for the day my local buses will have this, I'm sure it's not too many years away!

Three Dimensional TV?

Those of us of mature years may remember 3D cinema back in the 1950s and onwards, where we wore glasses with red and green lens and gasped as the images looked real! Generally they were science fictions films with monsters and aliens causing havoc left, right, centre and of course coming at us!

Even some theme park cinemas carry on the trend with 3D features and polarised lens glasses. My last trip to Euro Disney with the family gave us all an experience of this!

Current technology from Philips, entitled WOWvx, uses an array of micro-lenses (lenticulars) on a liquid crystal display (l.c.d.) TV panel to send different images to the right and left eye. In fact it transmits no less than nine different images, so that a number of people can easily sit in front of and around the TV and move their heads whilst still getting the 3D experience of the images.

If you're still sceptical, well there are in fact a number of TVs in UK, European and US stores that already have 3D capability! The design labs at Samsung, Texas Instruments and Mitsubishi have all been working together to include 3D-ready functions in their products – not just this year – but back in 2007.

The big difference is that the new sets don't need viewers to wear 3D glasses. The system gives a full 50-60Hz image to each eye (i.e. at total 100-120Hz total system rate), unlike normal systems which use 25-30Hz images with interleaved lines. The contrast ratio, which is given the term 'extinction ratio' in the 3D TV field, between the left and right eye is very high as the image can switch completely between the two in a few microseconds, preventing any crosstalk.

So, next time you're looking for a high-definition TV, maybe you should ask the dealer whether it's not just Freeview, HDMI and Blu-Ray compatible – but also whether it'll support 3D. Finally, As Radio Amateurs and experimenters have always traditionally been at the forefront of technology, maybe Amateur TV on 23cm will be the first to actually transmit 3D TV!

See you soon as I explore the future on behalf of *PW* readers. Chris G4HCL.

Bill Ward's antenna workshop

The G5RV Revisited

Billy Ward G4NRE was asked about the G5RV by an M3, and to help, looked again at this popular antenna.

The G5RV – a favourite for generations of Amateurs!

Recently I had an M3 Amateur ask me to explain more about the G5RV antenna after he'd come across the antenna design in *PW*. The antenna, as many of us know, was designed by the late **Louis Varney G5RV** and it's been popular for many years.

There's much confusion regarding the 'classic' version of the G5RV antenna, using twin and open wire feeder. Referring to this version of the G5RV as a 'Classic' example is very misleading as the twin feeder – in this application – is not a feed line. Instead it's a matching stub as shown in **Fig 1**.

Thinking about it – I could fill *PW* with the technical descriptions of the workings of the G5RV, just what the twin feeder is used for and how it works on each band! Despite this I see no reason to 'go there' as long as it's clearly understood and that some radiation from the twin feeder occurs because it's part of the antenna and not the feeder line.

With coaxial cable a number of interference problems arise due to the radiation from the coaxial cable itself. And, as it's an unbalanced feeder line, it also picks up electrical noise. However, the pick-up might be small and the good points are that the cable is easy to route down metal poles.

To get it down into the shack you just stick a plug on each end and 'away you go' – attach the SO259 socket on the antenna tuning unit (a.t.u.). It's as simple as connecting up the electric kettle!

Loss & Radiation

Unfortunately, the G5RV antenna is not that easy to tune over a wide frequency range without loss and radiation from the coaxial cable itself. For example the RG8 (a popular size of coaxial cable) cable has an attenuation of 0.8dB per 30m (approx.100ft) at 14MHz and 1.2dB per 30m at 29MHz. This is clearly a very satisfactory cable for high frequency (h.f.) work but, being a 10mm (0.4inch) diameter cable, it's somewhat bulky to hang in free space from the average Radio Amateur's wire antenna. Instead, for the wire antenna we might choose a lighter 5mm (0.2inch) diameter cable, such as the RG-58 variation.

Let's now suppose we are aiming to feed an h.f. dipole antenna set at a height of half a wavelength above the ground for the band to be used. The radiation resistance at this height could be assumed to be 73Ω and a 75Ω 5mm cable, such as RG59, could be used to match the antenna through a 1:1 balun transformer at the antenna centre. Referring again to the RG59, which has an attenuation of 1.5dB per 30m at 14MHz and 2dB per 30m at 28MHz. Let's now look at the open wire feeder.

Open Wire Feeder

Open wire line is perfectly balanced, the fields around the two conductors are equal and opposite and hence radiation from the line is essentially cancelled. However, as the wires are a finite distance apart, there must be a small difference.

Instead of using RG8, we could use 450Ω open wire line via a 4:1 impedance ratio balun transformer. This feeder is quite light and flexible and hangs very well from a wire antenna and its attenuation for an s.w..r. of 1:1 is around 0.08dB/30m at 14MHz and 0.17dB/30m at 28MHz.

So, with the figures I've mentioned, it should become clear that, for an s.w.r. of 3:1, the attenuation of the open wire line is still only a fraction of a dB/30m at both frequencies. Obviously, it's far more efficient than the RG59 coaxial cable.

Differential Field

In practice, when balanced line feeders are used a differential field is created, which might be detectable close to the line. If the feeder runs, or is installed close to (let's say) a microphone lead within the radio shack, the differential field might be sufficient to cause radio frequency (r.f.) feedback, perhaps even more so than coaxial cable with its confined field. One way to reduce the differential field is to twist or 'barrel roll' the cable so that over a distance the differential effect is cancelled.

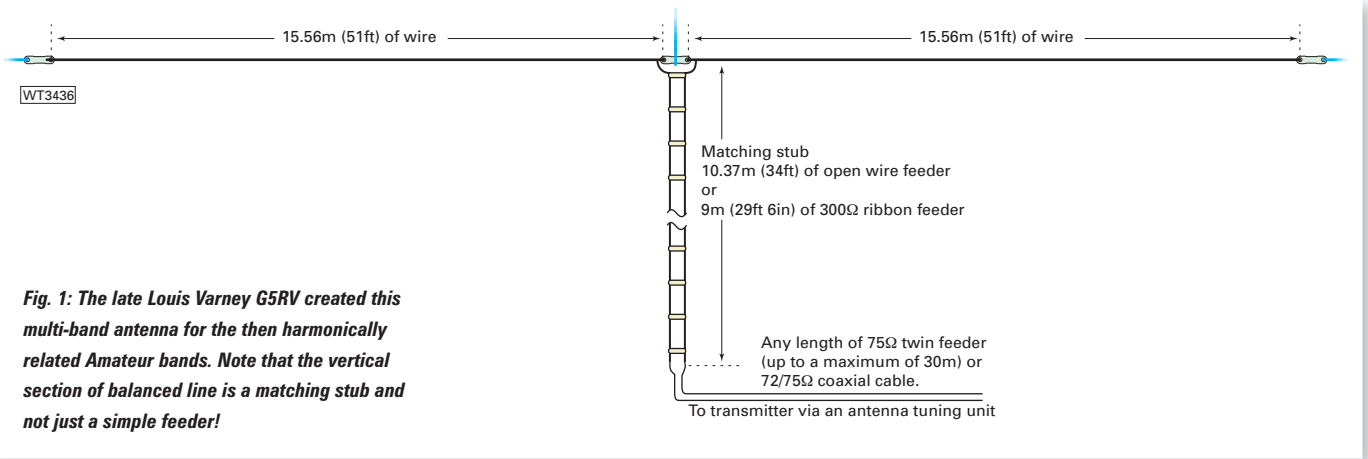


Fig. 1: The late Louis Varney G5RV created this multi-band antenna for the then harmonically related Amateur bands. Note that the vertical section of balanced line is a matching stub and not just a simple feeder!

Bill Ward G4NRE
PW Publishing Ltd.,
Arrowsmith Court,
Station Approach,
Broadstone,
Dorset BH18 8PW
E-mail: antennas@pwpublishing.ltd.uk

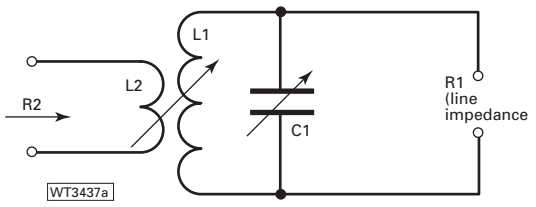


Fig. 2a: This circuit is used when the shack end of the feeder appears as a high impedance.

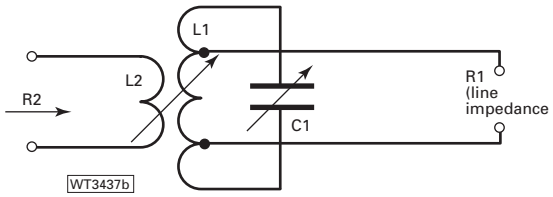


Fig. 2b: This circuit is for use when the shack end of the feeder appears as a lower impedance. The tapping points should be symmetrical from the outer point of the coil.

Incidentally, so little noise can be heard from the feed line that it's not unusual for the noise level to drop from a S8 to S4 when coaxial feed line is replaced with open wire.

Unbalanced Tuner & Balun

On paper, an unbalanced tuner, feeding a balun, connected to a ladder-line fed antenna should work well. However, in practice it doesn't work well and the reason for this lies in the balun!

As a rule of thumb, a balun should have about four times as many reactive ohms impedance as the resistive value of the load. This means that for use with a 600Ω balanced load, the balun should have a secondary winding reactance of about 2400Ω. For 3.5MHz (80m) operation, this works out to be more than 100μH of balun inductance! To create this much inductance on an appropriate m.f./h.f.-rated [μ=40] ferrite core, an impracticably large number of turns of wire would be required.

The use of a balun, in a high-impedance circuit, inevitably creates two, very sticky problems! More turns means more ampere-turns of magnetic flux in the balun's core, and high magnetic flux densities can cause the ferrite-core to saturate. This distorts the r.f. waveform and creates harmonics. These harmonics extend well into the ultra high frequency (u.h.f.) TV band. The remaining problem with using many turns of wire is that in doing so increases the winding-capacitance of the balun!

The high capacitance of the winding creates unwanted reactance and/or balun imbalance. This is especially true with the commonly used 4-to-1 bifilliar-wound balun, which does not have an evenly distributed winding capacitance like the trifilliar-wound balun. When enough turns are placed on the 4-to-1, bifilliar balun for satisfactory 3.5MHz operation, the inherent capacitive imbalance in the balun causes a progressively greater imbalance in the output voltage of the balun as the operating frequency increases.

This imbalance within the balun causes a differential r.f. current to flow through the ground wire on the tuner. Actually, I think that the term '4-to-1 balun' is misleading. They are much better suited for broadband, unbalanced-to-unbalanced 4-to-1 transformer service such as would be needed in the input circuit for a grid-driven Class-AB1 amplifier, whose grid terminating resistance was 200Ω.

There's also a problem with the substantial current flowing in the ground wire on any tuner. This is because **all conductors**, no matter how wide, have inductive reactance and the r.f. current that flows through the ground wire or strap can develop a large r.f. voltage on the tuner-end of the ground wire.

With 1000W on 21, 24 or 28MHz, the r.f. voltage on the "matches everything" tuner chassis can light a neon lamp brilliantly. It can also produce sparks with a graphite pencil and burn fingers!

The 1-to-1 trifilliar-wound balun solves the capacitive imbalance problem of the 4 to 1 balun. Unfortunately, it does not solve the problem of high capacitance in the windings themselves. And, more importantly, it does not solve the problem of core saturation due to the high magnetic flux-density created by the large number of turns required for any high-impedance balun.The bottom-line is: I think that high-impedance baluns are a very likely source of **grief** no matter how carefully they are engineered and constructed!

Easily Avoided!

Fortunately, all of the problems I've highlighted are easily avoided! The solution is simple – don't put the balun in the highest impedance part of the circuit. Instead, put the balun in the lowest impedance part of the circuit and build a balanced L-network tuner for the balanced output of the low-impedance balun.

So, (you may ask me) why have we been putting the balun in the wrong part of the circuit for these many years? A good question – but I'm not sure of the answer!

In most cases, the lowest-impedance part of the circuit is the 50Ω coaxial cable input to the a.t.u. and building a 'no grief' 1.8MHz to 30MHz 50Ω balun is easy!

No costly ferrite-cores are needed, just a short length of plasic pipe of 76mm to 127mm (3 to 5 inch), about 7.6m (25ft) of 50Ω coaxial cable plus some nylon cable ties. Solid dielectric coaxial cable is best for this application because foam dielectric has a tendency to allow a change in the conductor-to-conductor spacing over a period of time if it's bent into a tight circle. (This can eventually result in voltage breakdown of the internal insulation).

The required length of the plastic pipe depends on the diameter and length of the coax used and the diameter of the pipe. For RG-213/U coaxial cable, about 310mm (1ft approx.) of 127mm (5inch) size pipe is needed for a 1.8 to 30MHz balun. For 3.5 to 30MHz coverage, about 5.5 to 6m (18 to 20ft) of coaxial cable is needed. This length of coaxial cable is also adequate for most applications on 1.8MHz.

The number of turns is not critical because the inductance depends more on the length of the wire (the coaxial cable) than on the number of

turns, which will vary depending on the diameter of the plastic pipe that is used. The coaxial cable is then close-wound as a single layer on the plastic pipe.

The first and last turns of the coaxial cable are secured to the plastic pipe with nylon cable ties passed through small holes drilled in the plastic pipe. The coil winding **must not be** placed against a conductor. The name of this simple but effective device is a choke-balun.

Some people build choke-baluns without a plastic coil-form, by scramble winding the coaxial cable into a coil and taping it together. However, the problem with scramble winding is that the first and last turns of the cable may touch each other. This creates two complications – the distributed capacitance of the balun is increased and the vinyl jacket of the cable is subjected to a high r.f. voltage. The single-layer winding on the plastic coil form construction method solves these problems since it divides the r.f. voltage and capacitance evenly across each turn of the balun.

A more compact (less ugly) 1-to-1 impedance ratio, 50Ω trifilliar wound (with wire) ferrite core balun could also be used but there would be some trade-offs. Ferrite cores aren't cheap! Additionally, the air core of the coaxial cable balun can't saturate like the ferrite-core and – unlike ferrite core wire wound baluns – single-layer wound coaxial cable baluns never (almost!) have an insulation breakdown problem.

Note: A trifilliar wound balun doesn't like to work into anything but a perfectly balanced load. With an imperfectly balanced load, the coaxial cable-balun won't, as does the trifiliar balun, generate a differential third r.f. current on the outside of the coaxial cable that brings the r.f. to the input of the tuner.

The choke-balun isn't fussy! It will work as well into a less-than-perfectly-balanced load as it will into a perfectly balanced load and do so without the possibility of creating a differential r.f. current on the station ground and frying the operator's fingers!

I suggest that the by far the best way to correct the impedance to 50Ω to suite a transmitter is to use a balanced a.t.u. (or as it should be called, an 'impedance matcher'). See **Fig. 2** for two versions of the simple balanced tuner for open wire feeder. All that has to be done is put as large a dipole as possible and then can feed it with 300/450Ω twin feeder and take care how it's terminated at the transmitting end.

Best Choice?

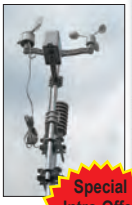
Whilst heavy duty coaxial cable seems the best choice of r.f. transmission line to run up a solid metal structure, such as a steel tower, I think that open wire line is often a better choice for wire antennas, particularly those functioning in multi-band operation. Because of its low transmission loss, the open wire line can be efficiently used on the high frequency bands with a high standing wave ratio or in a fully tuned mode. ●

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 5.00pm

ML&S martin lynch & sons
Suppliers of Communications Equipment

Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS
Tel: 0845 2300 599 (Local Call Number) Tel: 01932 567 333 (Direct Dial Number)
Web: www.hamradio.co.uk E-mail: sales@hamradio.co.uk

MODEL WX-2008MkII Weather Station



Latest version of this exciting touch-screen radio connected (no wires!) advanced weather station.
Everything you need is included in the box even high quality Ultra-Alkaline batteries. A short support mast and clamps are supplied to attach the assembled sensors to. There is a generous amount of cable to interconnect the sensors to each other, but as it is W RELESS, you do not need any cable back to the LCD control console that you use indoors. You can mount the sensors up to 50m away from the LCD panel and not a cable in sight!

Special Intro Offer ONLY £79.95

RRP: £99.95

Another great feature is the large, touch controlled extra bright illuminated LCD panel. Being wireless means that you can take the panel anywhere around your house, garden or shed and be able to see all the weather parameters on a screen that is not tethered by cable. Locating your sensors is easy too as it is not governed by where the wiring should go. If you want to move them, you do not have to worry about re-wiring, IT'S W RELESS!

Included in the package:
- Complete set of Batteries
- 23 x 14.5 x 3.5cm LCD touch screen extra-bright illuminated and monitor
- Wind speed sensor
- Wind direction sensor
- Rain gauge
- Outside temperature / humidity sensor with transmit module
- Cable harness to connect sensors to transmitter
- Mounting arms for sensors and hardware
- Short stub mounting mast
- USB cable
- Latest CD with PC software and operating manual

Hustler Antennas

Full range of Hustler Mobile & Base HF antennas available from stock

Full range of Hustler accessories in stock

See web for full listing

Base Station Range, free standing, max 7.3m tall, 1kW
4-BTV 40/20/15/10m..... **£149.95**
5-BTV 80/40/20/15/10m..... **£219.95**
6-BTV 80/40/30/20/15/10m **£219.95**
17-BTV-S 17m add on for 5-BTV or 6-BTV.... **£49.95**

Mobile Range, 200W or 1kW, both stocked.
RM10 to RM-80 10M to 80m single-band whips,
£19.95 to **£31.95**

Kinetic SBS-1 MkII Real-time Virtual Radar

ML&S: £379.95

Aircraft enthusiasts worldwide are now able to directly monitor the skies in an unprecedented fashion. Additionally, the SBS-1 provides small and medium sized airfields with many of the safety and operational bene its previously only available to large international airports - at a fraction of current radar costs. Coupled with a Mode-S/ADS-B transponder the SBS-1 becomes an invaluable tool in light training operations.

Shipping £10.00 (UK mainland)

- NEW Ethernet option available**
- Connects to laptop/desktop PC via USB
- Track Mode-S/ADS-B equipped aircraft in real time*
- An invaluable tool for aircraft enthusiasts
- Enhances operational efficiency at airfields
- Easy to install, portable and lightweight
- Real-Time aircraft position and identity data
- Powerful SBS-1 Basestation software included
- Package includes all necessary components to connect to your Windows XP / Vista PC

* UK airspace from March 2005 and for all categories of flights in all other airspace from March 2008.
** SBS-1/EM Ethernet module. Self it option: £79.75.

Begali Morse Keys

Begali

For the entire range and choice of bases and contacts see our website.

The finest range of keys available today.

Sculpture. The definitive CW operators dream key. Iambic with Carbon Fibre & Stainless Steel. Available from stock. **£349.95**


Begali Sculpture

Simplex. Excellent value available with Palladium or Gold Contacts. **From £109.99**


Begali Simplex

Simplex Mono. As above but single lever. **From £125.99**

Magnetic Classic. As the name implies, employing magnets for the return rather than springs. **From £169.99**


Begali Signature

Signature. Beautiful design. Uses precision bearings, magnetic system & two sets of paddles. **From £234.99**

Camel Back. Original design dates back 150 Years. Mounted on cast iron base. Superb. **£114.95**


Begali Camel Back

Kent Morse Keys

The best British range of keys money can buy!

The Kent twin paddle Morse key
Designed and precision engineered to the highest standards. The key is machined from solid brass having a solid steel base with non slip feet for stability. Precision and individual adjustment on each of the two contacts and springs. **Price: £84.95**

Kent Single Paddle Key
Designed to allow each individual operator total flexibility in setting adjustment. Precision made contact screws with instrument knurled heads and locking nuts to allow for precise and positive gap setting. **Price: £72.85**

Kent KT-1 Professional
High rigidity and stability, smooth, reliable, trouble-free operation under the most arduous conditions. The professional KT1 is the ideal choice for training, commercial and military use. **Price: £79.90**

New Product!

COOLTALK "Technology to talk about"
VOICEBOX

ML&S: ONLY £38.95

Cool-Talk Voice Box

This lightweight device sits around the back of your neck and picks up virtually NOISE FREE speech from the mobile operator. Supplied with Earpiece, PTT and ready wired lead for Yaesu FT-8900, FT-8800, FT-7800, FT-1802 etc. Also available for: Icom, Kenwood & Yaesu Handies!

NEW! Flex SDR-5000

FlexRadio Systems introduces the FLEX-5000 family of ultra high performance Software Defined Radio (HPSDR) transceivers. The FLEX-5000 family builds on the very popular FlexRadio SDR-1000, and now integrates all I/Q data and hardware control over a single FireWire® (IEEE-1394) connection to a user provided computer. Sound cards and multiple cables are no longer necessary. Convenience and ease of setup are built right in!

Available usually from stock: £1895 Internal ATU: add £229

WonderWand

New! WonderWand Combo
A one-stop solution to your portable antenna requirements. The new WW Combo is a single unit housing the famous WonderWand and TCP Tuneable Counterpoise. Full operation 7MHz-440MHz, max 40PEP. **In stock now! £159.95**

New! WonderWand WonderPole
As featured in CQ magazine n Japan! Yet another new antenna system from WonderWand products. 20-10M Portable dipole for any rig with an SO-239 Socket. 40 Watts PEP. **Only £129.95**

The original and best selling **WonderWand 40m-6m** portable antenna for all rigs. Ideal for IC-703, FT-817, FT-897 etc. Superbly made and excellent value for money. **Only £89.95**

WonderWand TCP
A tuneable counterpoise ideally suited to the WonderWand for increased performance. **Only £59.95**

5 STAR **British Products**

Mini VNA PC Controlled Antenna Analyser

The mRS miniVNA is a compact 100kHz to 180MHz antenna analyser interface that is operated via a PC powered by a single USB connection. You can see at a glance where the antenna is resonant, what the SWR and the return loss is. The best (minimal) SWR frequency is automatically found and displayed. An optional internal RS232 connection is also available. **MLS: £229.95**

MFJ Innovative Ham Radio Accessories at LOW Prices

MFJ-949 £119.95
MFJ-971 £79.95
MFJ-902 £69.95
MFJ-16010 £49.95

Don't forget ML&S stock one of the largest displays of MFJ in the country!

MFJ-949E 300 Watt Antenna Tuner
If you want a good reliable All-in-One ATU this is the one for you. Worldwide reputation for being able to match just about anything. **£119.95**

MFJ-993B
This very popular Autotuner from MFJ lets you tune any antenna automatically balanced or unbalanced - ultra fast. It's a comprehensive automatic antenna tuning center complete with SWR/Watt-meter, antenna switch for two antennas and 4:1 current balun for balanced lines. What will it tune? Just about anything! End feds, open wire feeders, beams, dipoles, G5RV's you name it. **Only £189.95**

MFJ-974HB 160 Thru 6 Meters Balanced Line Antenna Tuner.
The MFJ-974HB is a fully balanced true balanced line antenna tuner. It gives you superb current balance throughout its very wide matching and frequency range. **£159.95**

MFJ-971
Portable ATU, 1.8-30 MHz 200W cross needle SWR/PWR. An ideal QRP ATU. Easy to use and very compact. QRP Portable ATU **Only £79.95**

MFJ-834 RF Current Meter 160-10M 3 Amps. **Only £59.95**

MFJ-16010 Mini Random Wire 100W ATU. Just plug your HF transceiver on one end, throw out some wire out of the window and tune. Nice and compact (only 2 x 3 x 2 inches) **Only £44.95**

MFJ-259B/L
Range: 1.8-170MHz. HF frequency coverage. Keeps your antennas in check. Complete pictures of your antenna's performance. You can read antenna SWR and Complex Impedance 1.8 to 170MHz. **£199.95**

Open six days a week. Mon - Fri: 9.30am - 5.30pm Sat: 9.00am - 5.00pm

ML&S martin lynch & sons
Suppliers of Communications Equipment

Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS
Tel: 0845 2300 599 (Local Call Number)
Tel: 01932 567 333 (Direct Dial Number)
Web: www.hamradio.co.uk E-mail: sales@hamradio.co.uk

YAESU

Yaesu FT-2000 HF Base Transceiver

ML&S: £CALL!

The FT-2000 & FT-2000D (200W version) are available from ML&S. No cuddly toys that you don't really need, just excellent customer service and a fair deal.

Available from stock and on permanent demo in our showroom

- The Yaesu FT-2000 was the best selling HF Base Transceiver in 2007.
- The Yaesu FT-2000 was the ONLY radio used on the 3B7C St Brandon Island during 2007.
- There were NO FAILURES during 18 days of continuous 24 hour operation during 3B7C.
- ML&S sold more FT-2000's than any other dealer in the UK.
- ML&S always has the FT-2000 on permanent demo with large stocks of the 100 & 200 versions.
- Peter Hart said: "SON OF FT-1000MP, aimed at the serious DX and contest operator".

FT-2000 Accessories

DMU-2000 Data Management Unit. £699.95
- Spectrum Scope with Limited Bandwidth Sweep feature
- Audio Scope/Oscilloscope Display Page
- Swept-Frequency SWR Page
- Memory Channel List
- World Clock withGreyLine Page
- Rotator Control Page
- Log Book Feature

SP-2000 External Speaker with 2 inputs & filters. **£139.95**
MD-200A8X Desktop Deluxe Microphone, sounds amazing with the FT-2000! **£189.95**
MD-100A8X Desktop Microphone **£116.95**
CW Filters for Sub-Receiver
YF-122C (500Hz) CW Filter **£94.95**
YF-122CN (300Hz) CWN Filter **£109.95**
FH-2 Remote Control Keypad **£33.95**
RF External Tune Kits
3 versions available.160m Band Kit "A". 80/40 Band Kit "B". 30/20m Band Kit "C" ..... **NOW IN STOCK £359.95**

The Ultimate Accessory!

Quadra System 1kW HF Linear Amplifier, PSU & Auto ATU
Always available from stock ..... **£Call**

Yaesu FT-950 HF Base Transceiver

ML&S: £889.95

FT-950. Yaesu's "Midship Radio"
Many of you grabbed the new Yaesu FT-950 HF & 6M from us at the end of last November. Once again Yaesu identified a position in the market and hit it spot on. When Peter Hart said it was "An eye catching radio with some very nice features" and "it represents extremely good value" he wasn't kidding. If you don't need dual receive or internal PSU like its Dad, (the FT-2000) then check out the FT-950.

The FT-950 available NOW from ML&S at only £889.95
Price Match! or £100 deposit and 36 x £28.68

Yaesu FT-450 HF Base Transceiver

ML&S: £599.00 With ATU

ML&S: £529.00 Without ATU

The Yaesu FT-450 is a major new HF & 6m transceiver offering full a 400MHz IF DSP design at a very low price. Available with or without internal ATU, this new rig offers serious performance for those who are not bothered about the upper V/U bands.

Yaesu FT-897D

High Power version of the FT-897. Use as a transportable, (200W) or as a base/mobile (100W)
Call for stock availability and special "Bundle" offers

Yaesu FT-857D

The Ultimate HF Mobile Installation!
Plus ATAS-120D 40m-70cm Auto Antenna
Bundle Price Only £CALL
(Rig only: £CALL)

Yaesu FT-817ND

The worlds only all-band portable transceiver. Only £349.95
Why not add a CSC-83 Carry Case for only £19.95?

Bundle 1
FT-817ND 'Vanilla' - Basic FT-817 ..... £349.95

Bundle 2
FT-817ND + YF-122C 500Hz CW Filter £429.95

Bundle 3
FT-817ND + YF-122S COLLINS SSB Filter £449.95

All ML&S FT-817ND's include; 2 Years Warranty, Metal Hydride batteries, charger, mic, etc.

More Yaesu at ML&S!

Yaesu FT-7800E. NOW ONLY £169.95
Bar make the tea it'll give you 2m/70cm @50W/40W. ML&S

Yaesu FTM-10R. ML&S £239
A small compact dual band 2m/70cm transceiver with high power output of 50W on 2m and 40W on 70cm, (adjustable power levels of 50/40W, 20/20W, 5/5W). Receive range from 0.5–1 8MHz, 76–108MHz, 137–222MHz and 300–999MHz.

Yaesu FTdx9000D. ML&S £7299
200 Watts or 400 Watts, TFT Screen or not. You choose. Call for more info or see www.FTdx9000 com 'D' spec now shipping.

Quadra VL-1000. ML&S CALL
The easiest way to get 1kW output from any Yaesu HF Transceiver. Plug in 240V, attach rig & antenna and you have a fully automated amplifier with auto tuner.

Yaesu FT-8800. ML&S £219.95
Similar to the FT-7800 but can receive on 2 & 70 simultaneously.

Yaesu FT-8900. ML&S £249.95
High-power FM on 10m, 6m, 2m & 70cm. When your local repeater is busy, slip onto 10m & work DX! **NEW Yaesu**

FT-1802E. ML&S £99.95
2m FM Mobile. 5-50W out. Very similar to the FT-2800.

NEW Yaesu VX-3E. ML&S £119.95
Micro Handie 2/70 with scanner. Complete with Li-ion battery, charger & antenna.

Yaesu FT-60. ML&S £129.95
Latest twin band handie complete and ready to go.

Yaesu VX-6R. ML&S £189.95
Yet another 2/70 handie from Yaesu.

Yaesu VX-7R. ML&S £CALL
The UKs best selling Triple Band Handie.

Apply now for your very own ML&S Store Card

Conditions Apply

The new LynchLine is open for business

The web's best place for private buyers and sellers of radio gear – and it's totally FREE!
Click on: www.LynchLine.co.uk

KENWOOD

Kenwood TM-V71E v.h.f/u.h.f. Mobile Transceiver

ML&S: £269.95

- High r.f. power output (50W)
- Dual receive on same band
- Green and amber colour display
- Invertible and detachable front panel
- Programmable memory
- Multiple scan
- Built-in CTCSS/DCS
- Wide Band Reception : 118-524MHz & 800-1300MHz (excluding cellular blocked frequencies)

Kenwood TM-D710E APRS & TNC Loaded mobile

ML&S: £398.00

- Built-in TNC & APRS® Ready
- Switchable Backlight LCD & Multifunction Key Display
- High RF Power Output
- Dual Receive on Same Band
- 1,000 Memory Channels
- Multiple Scan & Visual Scan
- Built-in CTCSS/DCS
- EchoLink® Memory
- EchoLink® NODE TERMINAL Operation

Kenwood TS-2000E

Flagship Base Transceiver

Just superb on all bands 160m-70cm with optional 23cm (X-Version) RRP: £1699 **ML&S: £1299**

Kenwood TS-2000X

As above but with 23cm fitted. ..... **RRP: £1999**

TS-2000E Bundles

Bundle 1 TS-2000E Supplied with hand Mic, DC Lead **£1299**
Bundle 2 As above with MyDEL MP-250A PSU **£1379**
Bundle 3 As above with MC-60A Desk Mic **£1499**

The TS-2000X (itted with 10W 23cm module) version of any of the above is available for as additional £400.

Kenwood TH-F7E 2/70 Handie With Gen Cov RX.

The only dual-bander with proper SSB receive capability!
RRP: £289.95 ML&S LOW PRICE: £199.95

Kenwood TS-480SAT

This best selling Kenwood H F. Can be used mobile or base. Includes ATU. **ML&S: £699.95**

Kenwood TS-480HX

As TS-480SAT but 200 Watts, no ATU.
ML&S: £799.95

Perseus VLF-LF-HF Receiver

RRP: £649.95

PERSEUS is a VLF-LF-HF receiver based on a outstanding direct sampling digital architecture.

Unlike lower class direct sampling receivers, the PERSEUS RF analog front-end has been carefully designed for the most demanding users. PERSEUS can be operated also in a wide band mode as a 10KHz - 40MHz spectrum analyzer with more than 100dB dynamic range in a 10KHz resolution bandwidth. PERSEUS is a Software Defined Radio and relies on PC software applications to carry out the demodulation process.

New Product!

ML&S are Sole Distributors for Perseus in the UK and Ireland

Callsign Database CD 2008

Latest release from PW Publishing – a comprehensive and totally up-to-date listing of licensed Radio Amateurs and Clubs throughout the UK.

This fantastic value disc also includes the very first 5 issues of Practical Wireless in PDF format and other useful options.
Price: £3.98

Take Away Now and Pay NOTHING for Six Months!

Having many years of experience offering specific finance packages for our customers, we can now offer various options on payment. We have added "Take-Away Now & Pay Later" to all our products over £199. It works like this: 0% APR An example of our Take-Away Now: Discounted price of £300. Pay no interest provided you pay by the date the amount is due, in full. If you do not settle the original amount differed within the six month period* you will then pay £13.54 for 36 months at an APR of 29.8% TAP £487.44. Please note that interest is calculated from the date of the original agreement. 29.8% APR. * For six months deferred a £30 set up fee is required for all confirmed applications, payable in advance. E&OE

Nifty Equipment Manuals and Quick Reference Cards

For Yaesu, Icom, Kenwood, Elecraft & Ten-Tec radios. See Web for details.

see www.hamradio.co.uk for more details on all of these items ... and much, much more! ML&S are approved stockists for the following: Alpha Delta, AOR, Begali, bhi

Martin Lynch & Sons Annual Summer Party 2008

at the McMichael Rally & Boot sale

Sunday 13th. July 2008 @ 9:30 am
Holme Park Farm Lane
(for GPS users) SU 753 747
Sonning Lane (B4446),
Sonning on Thames, Reading. RG4 6ST
Just off the A4 East of Reading, Berkshire.

See you at the Major Thames Valley Radio Event!

ICOM

The New Icom IC-7700

HF/6m All Mode Base Transceiver

RRP: £4499.95

The wait is over! This fantastic new HF & 6M base station has finally arrived and is available from stock and on demo in our Chertsey showroom.

Same size as Icom's flagship IC-7800, the IC-7700 has 200 Watts output on HF & Six, Two independent DSP units (same as 7800) a +40dBm* 3rd order intercept point and ultra wide dynamic range, again like its big brother.

Icom IC-E2820

Dual Band Mobile

GB7ML D-Star repeater now active

Rig Only ML&S: £379.95

Buy the new IC-E2820 with UT-123 for only £519! Rig Only £379.95

PC Controlled Receivers from ICOM

All Windows XP Controlled via USB with four models to choose from:

D-Star Capable

Bonito

IC-PCR1500 10kHz-3300MHz All Mode.....**£359.95**
IC-R1500 As above but with remote head.....**£419.95**
IC-PCR2500 Twin Receiver version of PCR-1500.....**£474.95**
IC-R2500 As above but with remote head.....**£529.95**

See web for full details, PDF's etc.

Icom IC-7000

If you want a small IC-756Pro111 in your shack (or car) then the IC-7000 comes very close. Superb display & HF-70cm operation.

ML&S: CALL

Icom IC-706MkIIG Mobile / Base

HF+6M+2M + 70cms Mobile/Base.
ML&S: CALL

Icom IC-7400

Fantastic HF+6M+2M 100W All Mode Base Transceiver.
SALE: ONLY £979.95
SPECIAL PACKAGE DEAL AVAILABLE - PLEASE CALL!
SM-20 Desk Mic, SP-21 Speaker, MP-250A

Icom IC-756Pro mkII

Buy now, pay later!

Package deal
IC-756ProIII
SM20 Microphone
SP-23 New Base Speaker with filters
RRP: £2768 ML&S: £1969

Rig Only: £1749

Icom IC-7800mkII

RRP: £6400 Call for ML&S package deal

ALWAYS IN STOCK

Defer payment for 6 months - Interest FREE!*
The Icom Flagship **Base Transceiver** just keeps getting better & better. Now fitted with 3 Roofing Filters for even more receiver performance.
On permanent display next to the FTdx9000.

Icom IC-910X

The best 2/70 & 23cm dedicated all mode base. 23cm included.

RRP: £1675 ML&S: £1239
Basic Version (without 23cm) also available: £1089

Icom IC-E92ED

Latest waterproof VHF/UHF dual band with D-STAR Operation included!

The IC-92ED has waterproof protection and is equivalent to IPX7 (1m depth of underwater for 30 minutes). The aluminium die cast chassis and gasket-sealed housing provide performance you can count on in harsh outdoor environments; when hiking, mountain biking, touring and for alpine activities. **ML&S: £CALL**

Icom IC-E90 Triple Band Handie

Multi-band handheld transceiver
ML&S: £199.95
Or available with 4m and extra antenna for Only £239 95

Icom IC-703

IDEAL FOR M3 USERS
10W Portable/Base HF Transceiver with built-in ATU.
RRP: £703 ML&S: £CALL

Icom IC-718 HF Transceiver

Basic ready to go 100W HF Transceiver supplied with Microphone & DC Lead. **ML&S: £439.95**

Icom IC-E208

2/70 mobile 50/55W Transceiver with host of additional features. Remote head leads included.
RRP: £365 ML&S: £219

MyDEL CG-3000

With 200W and 200 memory channels.
Tunable frequency: 1.8 - 30 Mhz with long wire antenna from 8 meters
Input impendence: 50 ohms
Input power: 10 - 200W PEP
SWR: <2:1
Power supply voltage: 12V +/- 10%
Current consumption: <0.8A
Auto tuning time: Approx. 2 seconds (first time tuning)
Less than 1 second (return to memory frequency)
Memory channels: 200
Weight: 1.8 KG
Size: 310 x 240 x 72mm (L - W - H)

CG-3000 shown with optional remote switch.

NEW! Remote control for the CG-3000. £29.95

ML&S Only £229.95

As reviewed by Steve White in Radcom
"A real bargain when compared to its obvious USA competitor" "Well built & performs impressively"
Steve White, Radcom November.

MyDEL CG-5000

At last! 600W PEP High Speed Remote Tuner from MyDEL
Specifications:
Tuneable frequency:
1.8 - 30Mhz with long wire antenna from 8 meters
Input impendence: 45-55 ohms
Input power: 10 - 600W PEP
SWR: <2:1
Power supply voltage: DC 13.8V
Current consumption: <1.5A
Memory channels: 800

Auto tuning time: 0.5-6 seconds (first time tuning), less than 0.2 second (return to memory frequency)
Weight: 1.8 KG. Size: 365mm x 240mm x 75mm (L - W - H)

ML&S Only £439.95

MyDEL Power Supplies

The neatest smartest looking desk top power supplies that money can buy. Ideal for powering any main rig or accessory requiring 13.8 Volts at up to 60 Amps.

2 Year Warranty!

MyDEL MP-250A. Only £89.99
25 Amps maximum, 22Amps constant, ideal for most modern HF Transceivers

MyDEL MP-8230. £69.95
The latest version of our popular MP-4128. 13.8V DC, 25Amps, rear posts for neat installation of cables & Cigar outlet.

MyDEL MP-925. £99.95
Linear 25-30A 13.8VDC PSU, using a large transformer, twin meters to monitor Volts & Amps. Been on the market for over 20 years in various different brand names and model numbers.

MyDEL MP-9600. £179.94
The UK's best selling 60 AMP switch mode PSU. Massive rear facing binding posts with additional low current front facing sockets. Digital Volts & Amps reading in big clear numbers. Housed in a strong metal case, huge near-silent speed sensitive fan to enable cooling. Over Volts protected. Minimal RF & fan noise generation.

MyDEL MP-6A. £29.95
Another model to the MyDEL PSU range, 13.8V DC, 6 Amps with front facing binding posts. Ideal for FT-817, handies etc.

LDG Tuners & Accessories

NEW! AT-1000Pro

Building on the success of the AT-1000, LDG Electronics has refined and expanded its flagship 1KW tuner. Continuous coverage 1.8 to 54 MHz, Power rating HF (1.8 to 30 MHz), 1000 Watts Single Side Band 750 Watts CW, 500 Watts Digital (RTTY, Packet, etc.) 6 meters: 250 Watts (any mode) Capacitor / Inductor fine tune controls. Tuning time: 0 2 recall, 10 seconds average, 30 seconds max. Antenna impedance: 6 to 1000 Ohms (approximately 10:1 SWR, 3:1 on 6M) **Intro price £399.95**

LDG AT-7000 Specifically designed for the IC-7000! The AT-7000 is the ideal tuner for your shiny new IC-7000. First, it matches up to 10:1 SWR (3:1 on 6 meters), so just about anything you can feed with coax is good to go. And, it has 2,000 (not a typo; that's 2,000!) memories.£139.94

LDG Z-100 100W Auto ATU 160M-6M.....Only £119.95

LDG AT-100Pro & AT-200Pro 100W or 200W Auto Tuner,160M-6M with 2 Antenna outputs. **AT-100Pro** £169.95 **AT-200Pro** £179.95

AT-897 Bolt-on Alternative Auto Tuner for the FT-897.Wider tuning range and cheaper too!.....Only £179.95

LDG Z-11Pro Portable compact & tunes 100mW to 125W.....£139.95

LDG RBA-1:1 & RBA 4:1 Probably the best 1:1 & 4:1 baluns out there.....£29.95 each

LDG TW-1 & TW-2 Talking Wattmeters! TW-1 HF 0-2kW TW-2 6/2/70 250W.....£109.95 each

LDG DTS-4+4R & DTS-6+6R Remote Antenna Switchers. 1.5kW 1-54MHz. Either 4 or 6 way,.....£89.90 & £119.90

FT Meter - External meter Add-on analogue meter for the FT-857 and FT-897. Just plug & go! Enables you to read signal strength. Discriminator, power output, s.w.r., ALC etc.....£39.95

Palstar - Full range now in stock

Palstar AT-Auto Automatic 1500 Watt ATU.....£899.95
Palstar AT-1KP 1200W Antenna Tuner.....£329.95
Palstar AT-1500DT 1500W Differential Antenna Tuner.....£339.95
Palstar AT-2K 2000W Antenna Tuner.....£389.95
Palstar AT-4K (2.5kW) & **AT-5K** (3.5kW) Antenna Tuners
AT-4K.....£649.95 **AT-5K**.....£849.95
Palstar BT-1500A Balanced Antenna Tuner.....£449.95
Palstar ZM-30 Antenna Analyser.....£289.95
Palstar Power/SWR Meters
PM-2000A....£139.95 **PM-2000AM**....£139.95 **PM-5K Digital**....£299.95
Palstar Dummy Loads
DL-1500 (1.5KW)....£69.95 **DL-2K** (2kW)....£139.95 **DL-5K** (5kW)....£279.95
Palstar R30CC Receiver
Palstar R30CC, fitted Collins filters for SSB & AM.....£499.95
R30 Matching Accessories:
Palstar MW550P Active preselector & ATU for AM & 160M reception£199.95
Palstar SP30 Matching Desk Speaker.....£49.95
Palstar AA30 New Low Noise Active Antenna 300kHz-30MHz.....£79.95

For the full range of Palstar products see: www.HamRadio.co.uk

Ltd., CG, Comet, Diamond, Hustler, Icom, Kenwood, Kinetic, LDG, MFJ, Optibeam, Palstar, Super Antenna, Sommerkamp, Watson, Wonder Wand, Yaesu, and many more!

Tony Nailer's

technical for the terrified

This month Tony G4CFY continues his detailed look at the phase locked loop synthesiser.

Editorial comment: In recent months the 28MHz (10m) band has shown really good signs of its 're-awakening' for DX. My own recent enjoyment – and successful QSOs all over Europe – with QRP on 'Ten' led to discussions with Tony G4CFY on how we could prepare the ground for some projects for 28MHz using various techniques. As usual G4CFY has 'come up trumps' and this article will form the first in a series. They will be aimed at helping readers to build or adapt rigs to provide their own dedicated equipment for the band that can provide some truly exciting DX opportunities as well as useful local QSOs 'across town'. I hope readers enjoy the articles in *Technical for the Terrified* (*T4T*) and *Doing it By Design* (*DiBD*) as much as Tony and I have discussing and planning them! **Rob G3XFD**.

It seems that one of my most avid readers is **Rob Mannion G3XFD**, the Editor of *PW*. He found the previous article in this series, in June *PW Technical for the Terrified* (T4T), most instructive and suggested I gave the subject further treatment as he feels that the techniques used in phased locked loop techniques have often been neglected previously in *PW*.

In the June article I gave three reasons for using a phase locked loop (p.l.l.) synthesiser as: **1:** To control a high frequency (h.f.), or very high frequency (v.h.f.) oscillator, to the same stability as that of a low frequency one. **2:** To arrange for an h.f or v.h.f. oscillator to be tuned in distinct frequency steps. **3:** And, to allow an h.f. or v.h.f. oscillator to employ frequency modulation (f.m.). In the June article I also gave due consideration to the first reason, by examining the use of a p.l.l. in an off-air frequency standard. In this article I will consider the use of digital synthesisers in CB radios, which justifies the second and third reasons.

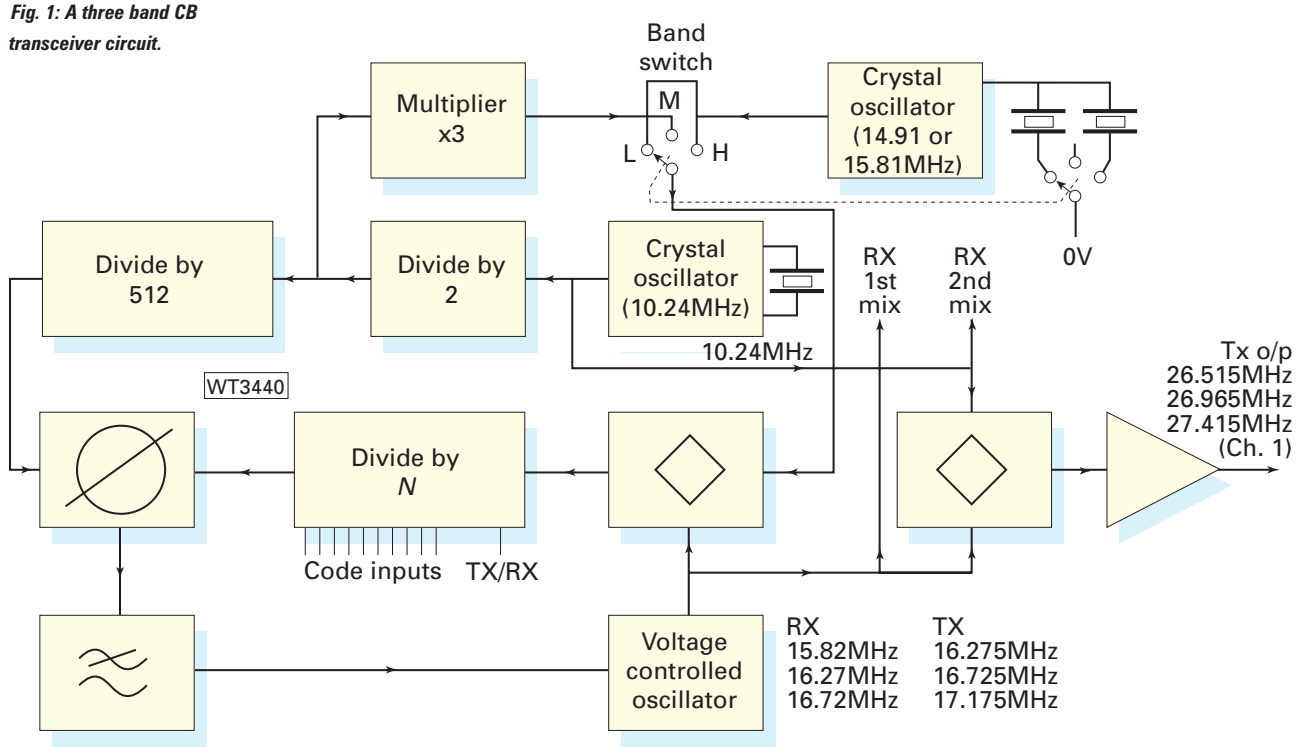
First Generation PLL CB

The synthesiser i.c. used in the early Citizen Band (CB) radio rigs was the PLL02A. This worked with a 10.24MHz crystal, and a divider chain of 1024, to produce a 10kHz reference frequency at the phase detector, which fixed the steps to 10kHz.

The voltage controlled oscillator (v.c.o.) ran 10.695MHz higher than the signal frequency, and was mixed with a 10.695MHz oscillator to produce the transmit frequency. Another oscillator running at 11.8066MHz was tripled and mixed with the v.c.o. to produce a difference signal between 2.5 and 3MHz to the main divider of the PLL02A.

The 10.24MHz reference oscillator was also used to inject into the second mixer to convert from 10.695MHz to 455kHz. These rigs were really quite complex and also suffered badly from receive overload. They are probably extinct so I'll not consider them further!

Fig. 1: A three band CB transceiver circuit.



Contacting G4CFY & *PW*

If you wish to correspond regarding this article or previous ones subscribe to the list **pw-g4cfy-on@pwpublishing.ltd.uk** by sending a blank E-mail with the word subscribe in the subject box. When you receive confirmation from the server you can send an E-mail to **pw-g4cfy@pwpublishing.ltd.uk** and your comments will be answered by the *PW* team or myself.

Tony Nailer
PW Publishing Ltd.,
Arrowsmith Court,
Station Approach,
Broadstone,
Dorset BH18 8PW
E-mail: tony@pwpublishing.ltd.uk

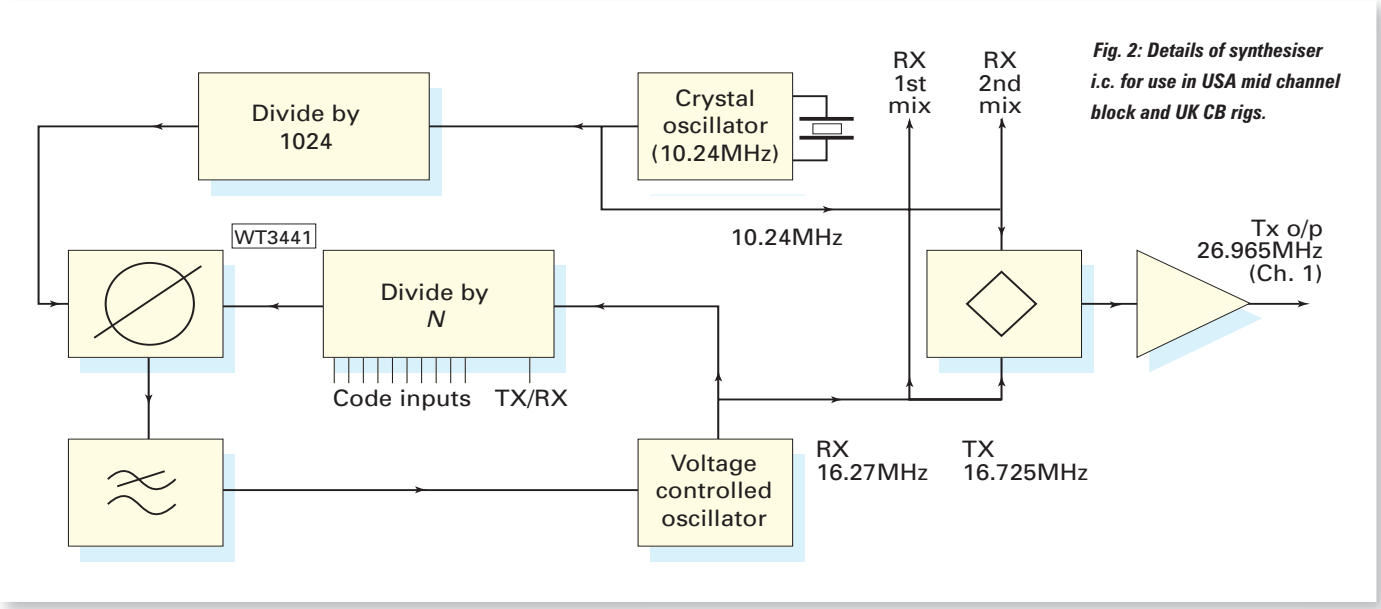


Fig. 2: Details of synthesiser i.c. for use in USA mid channel block and UK CB rigs.

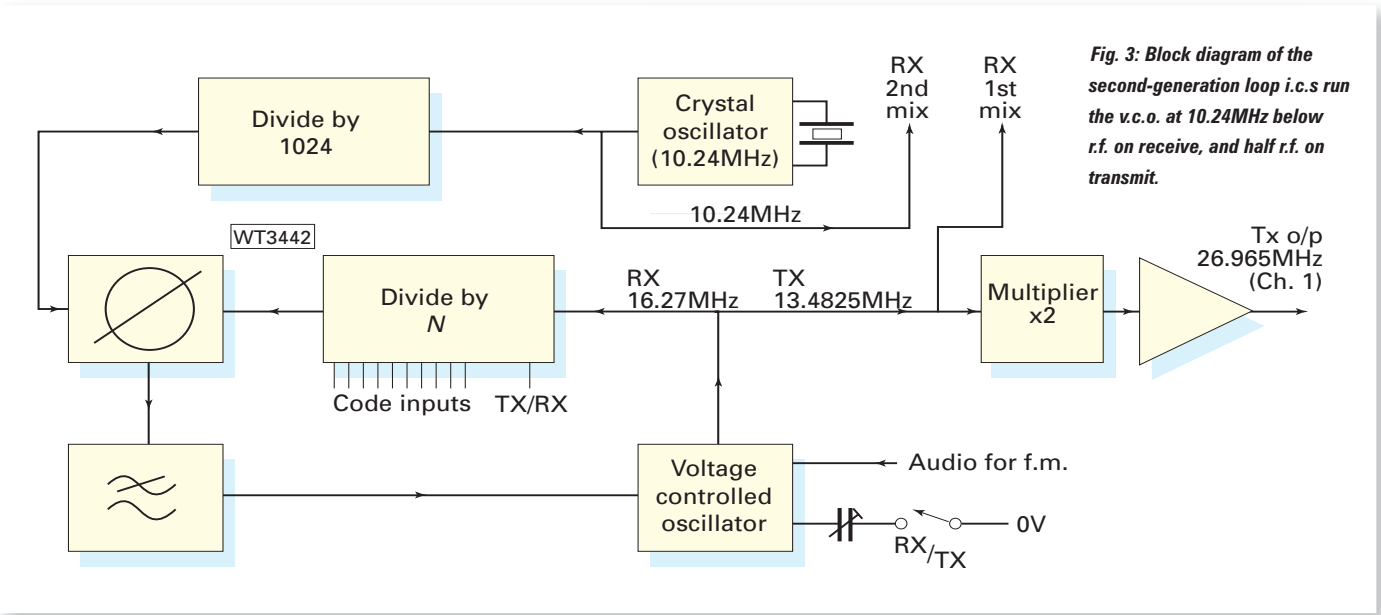


Fig. 3: Block diagram of the second-generation loop i.c.s run the v.c.o. at 10.24MHz below r.f. on receive, and half r.f. on transmit.

Second Generation PLL CB

As soon as CB radio equipment had achieved viable quantities, the integrated circuit (i.c.) manufacturers in the Far East produced synthesiser i.c.s to be used with binary coded decimal switches and with a set of 40 read-only-memory (ROM) encoded channels for receive and another set for transmit. A very popular i.c. of this type was the LC7120.

The drive to do this was to simplify the frequency synthesis by doing away with the 11.8066MHz and 10.695MHz oscillators used in the 1st generation rigs.

The CB rigs now used a v.c.o. running at 10.695MHz below the r.f. frequency on receive, and 10.24MHz below the r.f. on transmit. That's 16.27MHz on channel 1 receive and 16.725Mhz on channel 1 transmit.

On transmit the 10.24MHz reference crystal was mixed with the v.c.o. to give the r.f. output frequency. The v.c.o. swing was made wide enough to cope with the range between channel 1 receive and channel 40 transmit.

The N-divider only had a limited divide ratio, which required a low frequency to be derived from the v.c.o. However, applying real ingenuity, the i.c. designer made the reference divider in two parts, the first part being divide-by-two, and the second divide by 512.

The output from the divide-by-two stage was then tripled to 15.36MHz and mixed with the v.c.o. to give

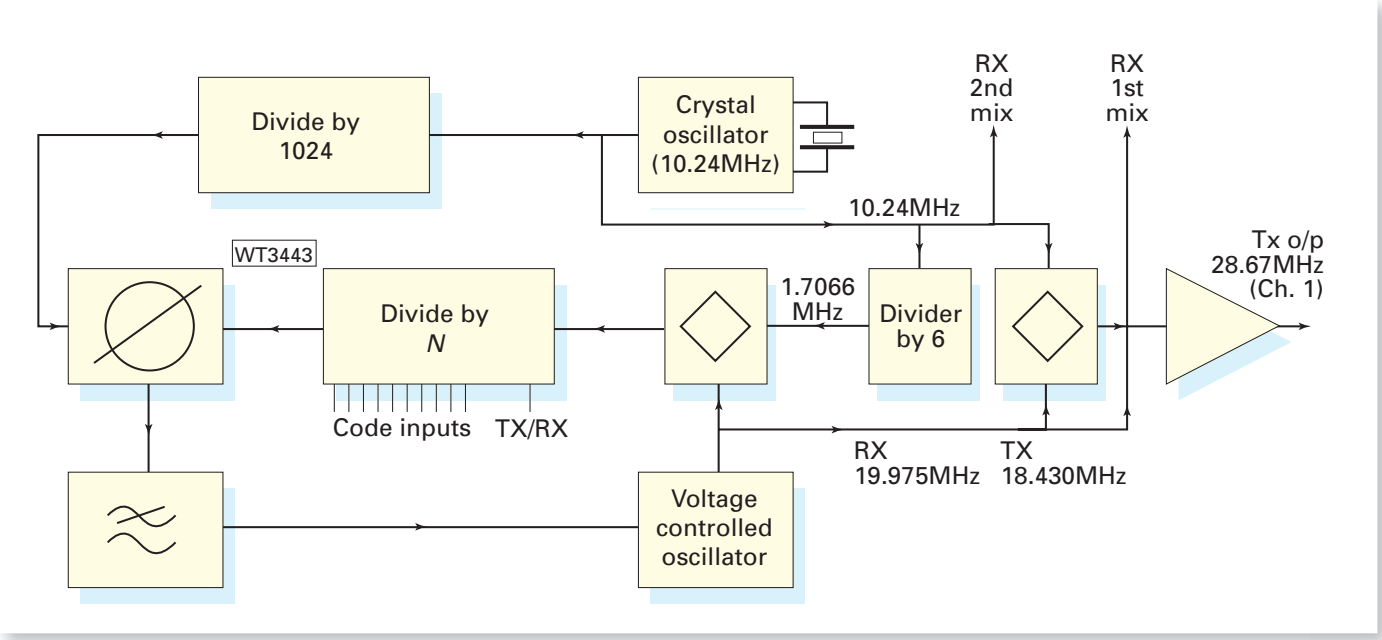


Fig. 4: Tuning the v.c.o. up to 28MHz means the difference signal is then where it was previously and the p.l.l. continues as before. Its range is now 18.275-18.415MHz on receive and 18.73-18.87MHz on transmit.

910kHz on receive and 1.365MHz on transmit on channel 1.

Three band CB rigs had a crystal board, which substituted 14.91MHz for Low band, and 15.81MHz for the High band, in place of the 15.36MHz. The circuit is shown in **Fig. 1**.

A further range of i.c.s were developed for single band use and which had a greatly expanded N-divider and an input frequency range up to 20MHz to be directly fed by the v.c.o. This did away with the need to mix the v.c.o. down to the p.l.l. input. Synthesiser i.c.s using this principle are the TC9106 and LC7130, and LC7131 for the USA mid channel block, and TC9119 for the UK CB band. (See **Fig. 2**).

Half Transmit Variant

Another variant of the second-generation loop i.c.s is to run the v.c.o. at 10.24MHz below r.f. on receive, and half r.f. on transmit. The block diagram of this is shown in **Fig. 3**. This means that on channel 1, the v.c.o. is on 16.27MHz on receive, and 13.4825MHz on transmit. To achieve this, a capacitor is switched across the v.c.o. coil during transmit, to reduce its frequency to the correct lock range.

The advantage of the approach I've described was the avoidance of spurious products. On transmit the output of the frequency multiplier would be 13.4825, 26.965, 40.4475MHz. It was clearly easy to filter out the wanted signal and i.c.s of this type were TC9109 and LC7132 for the USA CB channel frequencies and LC7137 for the UK CB band.

Conversion To FM

In order to convert an a.m. rig to f.m. on receive only requires an f.m. detector i.c. to be added at the end of the 455kHz i.f. pathway. Output from this detector is switched with the output of the a.m. detector to pass to the volume control.

On transmit it's necessary to amplify the audio from the microphone sufficient to clip it, then filter it. This then passes either directly to the existing varicap diode in the v.c.o., or better still to a separate varicap specifically added for the modulation.

Note: It's important though that the loop time constants are sufficiently fast to compensate for drift of the v.c.o., but sufficiently slow that they cannot respond quick enough to damp the f.m.

Third Generation CB PLLs

All the previous synthesiser i.c.s I've mentioned had been used in conjunction with triple gang channel switch assemblies. One wafer for the p.l.l., one for the tens digit and one for the units digit of the display.

The latest generation i.c.s now provide ROM coded output for the units and tens l.e.d. and l.c.d. displays, so only a single wafer channel switch is required. These i.c.s now have about 100 surface-mounting legs 0.5mm wide, with 0.5mm gaps. No attempt has been made by me to convert these to any other frequency and they also virtually impossible to repair!

Ten Metre AM CBs

The second-generation USA a.m. CB rigs using the LC7120 i.c. can be simply converted to 28MHz by using a single crystal of 17.055MHz, in place of the 15.36MHz.

After conversion, channel 30 equals 29.00, 31 equals 29.01, 32 equals 29.02MHz, etc. Channels 26 to 40 will give straight steps from 28.96 to 29.10MHz. Most rigs of this type have no problem retuning transmit, receive, and v.c.o. stages to work on 10 metres.

Rigs using the LC7130 and LC7131 are a bit more difficult. The 10.24MHz reference crystal can be divided by six, to give 1.7066MHz. This then is mixed with the v.c.o. and the difference signal fed to the loop i.c. By tuning the v.c.o. up to 28MHz the difference signal is then where it was previously and the p.l.l. continues as before. Its range is now 18.275-18.415MHz on receive and 18.73-18.87MHz on transmit. (See **Fig. 4**).

In this case channel 29, which was 27.295MHz, becomes 29.0016MHz. Now by slightly offsetting the 10.24MHz reference crystal, by about 600Hz, the transmit frequency can be accurately set. On receive the 600Hz

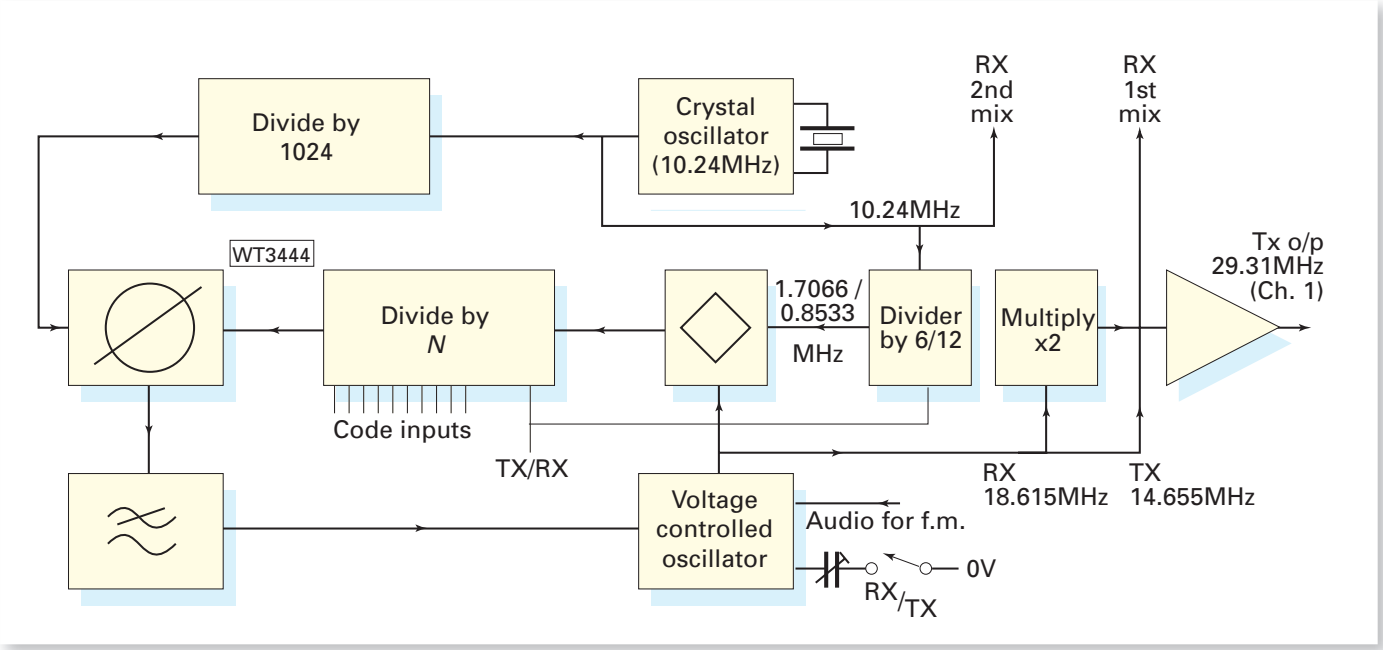


Fig. 5: On transmit it is necessary to add half as much again to the half frequency v.c.o. This is achived by a further division of the reference frequency, which provides 0.8533kHz. The v.c.o. then runs 18.615-19.005MHz on receive, and 14.655-14.85MHz on transmit.

error in the second conversion from 10.695 to 455KHz will not cause a problem. The 10 metre tuning range from channel 26 to 40 becomes 28.970 to 29.110MHz.

Converting UK81 CBs

The first generation of UK legal CBs transceivers were single band f.m. units in the range 27.60125 to 27.99125MHz. However, I can't understand why there was an odd 1.25kHz, but at least all the channels were in straight 10kHz steps, without any gaps.

The most popular synthesiser i.c. was the LC7137, which ran the v.c.o. at 10.695MHz below r.f. on receive and half r.f. on transmit. Using the same method as before, by dividing the reference frequency by 6 to give 1.7066MHz, and then adding this to the channel 1 frequency gives 29.30785. Removing some of the loading capacitance from the reference crystal allows the frequency to be 29.310MHz.

On transmit we have to add half as much to the half frequency v.c.o. This is done by doing a further division of the reference frequency, to give 0.8533kHz. The v.c.o. then runs 18.615-19.005MHz on receive, and 14.655-14.85MHz on transmit. (See **Fig. 5**).

Some UK f.m. rigs will not have the v.c.o. adjustment range to work at the higher frequency. Fortunately, most v.c.o. coils contain a small capacitor located in the base and this can be removed.

The coil has to be removed from the board and the capacitor broken up using a small tipped screwdriver, or a scriber. The coil is then returned to the board and the v.c.o. retuned until the control voltage does not hit zero or maximum over the range channel 1 on transmit, and channel 40 on receive. Any UK rig using the TC9119 synthesiser i.c., which runs with the v.c.o. at 10.695MHz below r.f. on receive, and 10.24MHz below r.f. on transmit, can be converted by adding 1.7066 to the v.c.o. both on transmit and receive.

General Guidelines

Now for some general guidelines! Conversions of CBs to 28MHz shouldn't be attempted unless a minimum of test equipment is available. For example, a high impedance voltmeter should be available. The ideal type is an f.e.t. input moving coil type, second best is a moving coil instrument of 50,000Ω per volt. (Worst case, try using a digital voltmeter!).

A frequency counter is essential to check the v.c.o. range prior to conversion. This is done by removing the capacitor linking the v.c.o. to the p.l.l., which then causes the loop to be unlocked. The next job is to tune the core of the v.c.o. coil until the required frequency is achieved. If it won't 'stretch' far enough in frequency then capacitance has to be removed from the circuit.

Having done the job for receive it has to be repeated to see if the correct transmit v.c.o. frequency can be achieved. If a USA a.m rig is being converted, it all has to be done within the available v.c.o. control voltage range.

In UK f.m. rigs with the v.c.o. running on half r.f. frequency on transmit, there's a capacitor or a trimcap, which is switched across the v.c.o. coil during transmit. Note: It's advisable to adjust this to achieve the desired transmit frequency on channel 1. Then, once a conversion board has been fitted, the rig will most likely lock straight away. To complete the rig's alignment requires a dummy load, power meter, a watt-meter and also a signal generator.

For those with sufficient test equipment, the CB to 28MHz conversion board SC29, which has been available from **Spectrum Communications** since the early 1980s, will do the required division and mixing to convert rigs using the i.c.s mentioned in this article. It's available with fitting instructions for the majority of rigs for the modest cost of £23.

As Rob G3XFD mentioned in his Editorial comment at the head of this article, I'll be discussing and presenting more projects and designs for 28MHz in both T4T and DiBD. Cheerio for now! ●

Feature

Home-Brewing Variable Capacitors

Editorial note: During our correspondence and telephone conversations before we decided to publish his article, John G0ICT asked – to encourage readers to try building the capacitors themselves – that the fact that he had to retire due to Parkinson's Disease should be mentioned within the article. Obviously, because of his fight against such a debilitating and crippling condition, I just had to agree! Congratulations John – my colleague **Tex Swann G1TEX** and I are most impressed with your skills. Have a go yourself readers! **Rob G3XFD**.

I had got my Class B Licence and was enjoying being on v.h.f. using a battered old Icom IC–201 but my thoughts were always on high frequency (h.f.) operating. At the time I could not afford an h.f. transceiver but I knew that, when I could, I would need an h.f. antenna tuning unit (a.t.u.). I decided that I would use my spare time productively and find the parts to make one!

Fortunately, I came by a roller coaster at a **Dover Radio Club** junk sale and then came upon a useful looking design by **Mike Grierson G3TSO** in an old copy of the RSGB's *Radio Communications* journal. The hunt was then on for suitable variable capacitors but I could not find any that I could afford! So we should all know the answer to that dilemma – make them yourself!

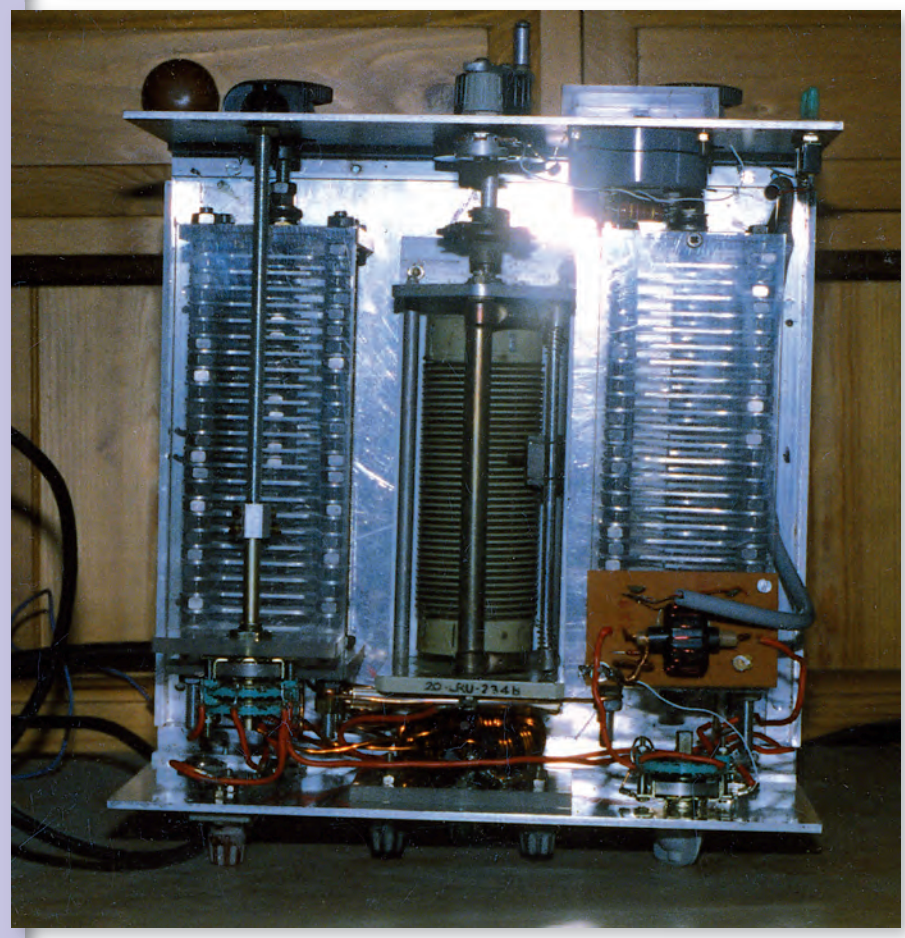


Fig. 1: An example of John G0ICT's home-brewed variable capacitors.

Sean EI7CV's Article

I then found an article in *PW* for August 1989 by **Sean Linehan EI7CV**, giving all the information on how to calculate the values. Then a speech bubble – comic style – seemed to appear above my head with the words, "Why not try and make them"?

At that time I was working as a Pattern Maker and my workshop was next to the Tool Room so I asked the manager if I could have some scrap aluminium off-cuts. His answer was yes – providing I did it in my own time.

For the next two weeks I spent my time like the girl in the 'Exorcist' with my head swivelling round searching for bits and pieces that would be useful! Eventually, whenever I entered the tool shop mutters went round, 'What's he up to now!?'

In no time at all I had all the bits I needed, 6mm studding, nuts, bolts, 6mm washers with outside diameter of 12mm, three 1/8 inch radiator air vents and flat rubber tap washers. It was time for my dream to become a reality.

Having calculated the dimensions necessary, I set to and built my variable capacitors. They have now been in use in my a.t.u. for over ten

John Morrison G0ICT describes how he builds excellent variable capacitors and insists that you can be successful too!

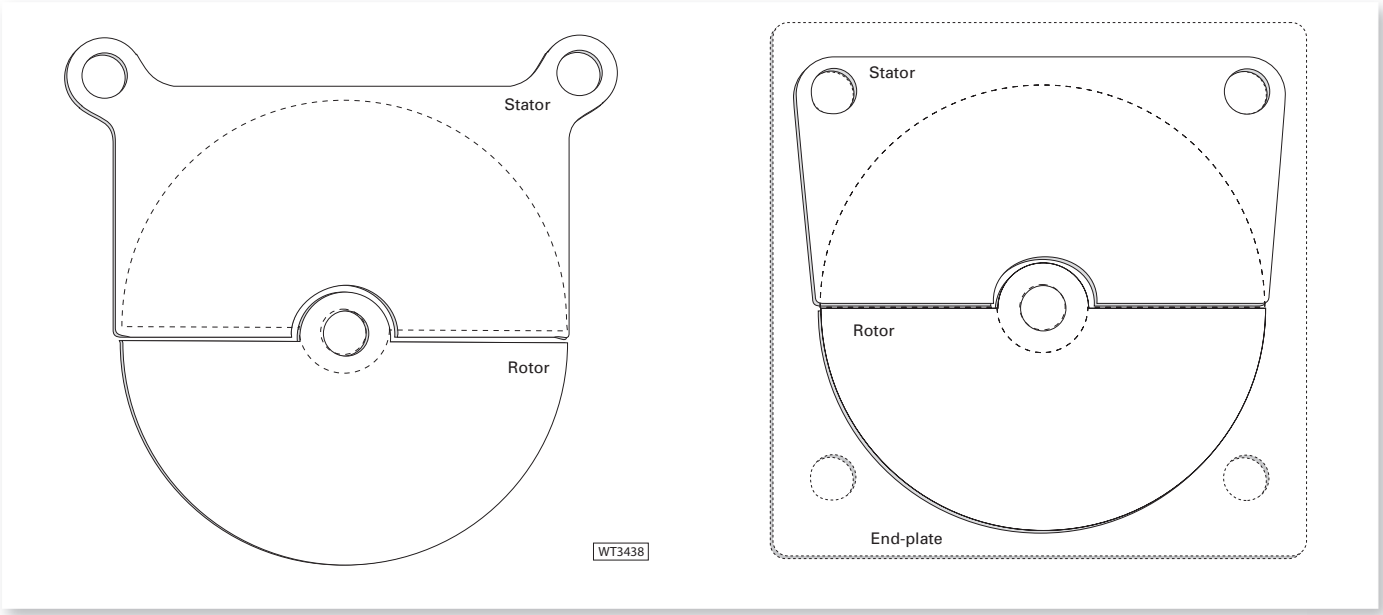


Fig. 2: The capacitor plates can be made from aluminium or copper clad p.c.b. material.

years proving that they have been a great success, as can be seen in **Fig. 1**.

Making The Capacitors

I've now made several of the home-brewed capacitors over the years and (as I stressed to **Rob G3XFD** and **Tex G1TEX**) if I can do it, **anyone can!** Only few basic hand tools are all that are required and I'll go through the process stage-by-stage

Firstly, having decided on the physical size of the capacitor, we must make patterns of the fixed and rotor plates. These can be done in either aluminium or in printed circuit board (p.c.b.) material, as in **Fig. 2**.

Next comes the most tedious – but not unpleasant job – task of making the fixed and rotor plates. The fixed plates are relatively easy to make, rectangles of the correct size and a filed out recess to take the rotor shaft.

I prefer to use 1mm thick aluminium for the plates as it's not easily bent out of shape when drilling and filing. However, it's possible to use thinner if the constructor wishes to do so.

Having made your own choice it will be time to mark out the two centres for the mounting holes in the stator plate. **Warning:** Don't cut the aluminium into plate size pieces yet.

Next, draw along the material and carefully mark the centres along this line leaving enough room between one plate and the adjacent plate. This is so that you can cut them out when you need to.

Make sure that you use a centre punch on all the centres – as this will greatly help when you drill the holes. When all the centres are punched you can cut

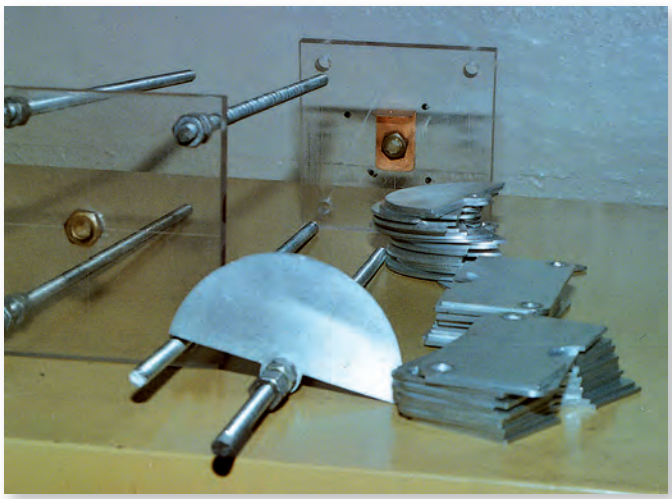


Fig. 3: The completed plates can be file-finished either individually or together.

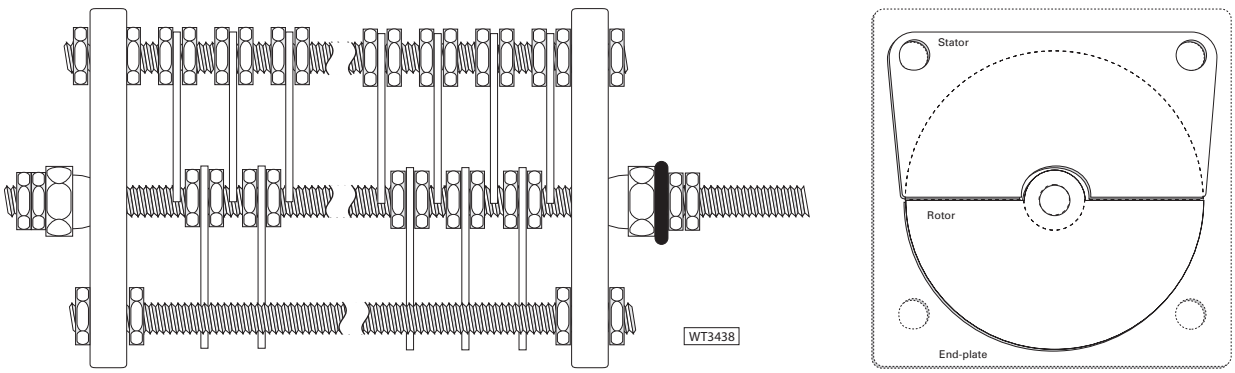


Fig. 4: It is very important that the plates don't touch anywhere as they mesh and unmesh.

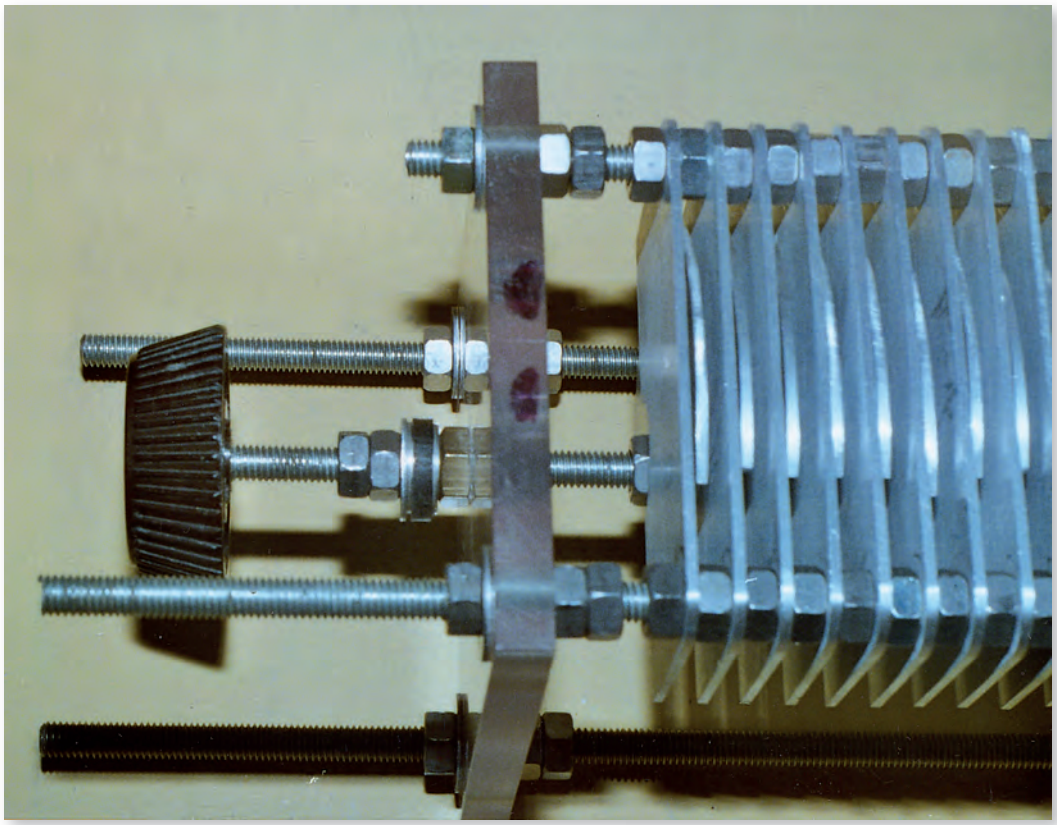


Fig. 5: Rapid-setting (Cyanoacrylate) glue is used between two washers.

the aluminium into handy lengths of 450mm (18in). Then support the job on a piece of scrap plywood and – using a slow drill speed and some oil for lubrication – carefully drill out the 6mm mounting holes making sure that the drill is upright.

The next stage is to cut two 25mm lengths of studding and push them through the holes in the template. Next, thread the studding through the first set of holes in the aluminium and use a nut each side to hold it in place. Then mark the aluminium around the template using a sharp scriber,if a scriber isn't available, use a cheap ballpoint pen having cleaned any oil off the aluminium surface. Repeat this until you have all your plates marked out.

Marked Out

At this stage, constructors should now have some lengths of aluminium with the mounting holes drilled out and plate sizes marked out. The plates can be sawn out using a hacksaw for the straight edges and a coping saw for the curved sections – cut as close to the line as possible as this will mean less filing to finish them off.

The pile of plates can now be individually filed to the finish lines. Although they can be one at a time or – two or three bolted together can be successfully prepared (I do one at a time). Having finished them and having a very satisfying pile of plates you can do the same thing for the rotor plates as in **Fig. 3**.

Next job is to make up the end cheeks. To make these cut two pieces of 6 or 8mm Perspex allowing 12mm over-size all around, file or use a small plane to make one of the edges straight and square. Then mark horizontal and vertical centre lines working from the straight edge if one is available, if not a carpenter's marking gauge or an adjustable square can be used.

Then, using dividers or a compass – and working from the centre point where the studding for the rotor will go in the completed capacitor – mark out and centre punch the centres for the stator mounting holes. Do the same for the bottom studding holes.

Note: It's important to make sure that when the plates are fully unmeshed the gap between the bottom and top plates is not less than the spacing between the plates, as in **Fig. 4**.

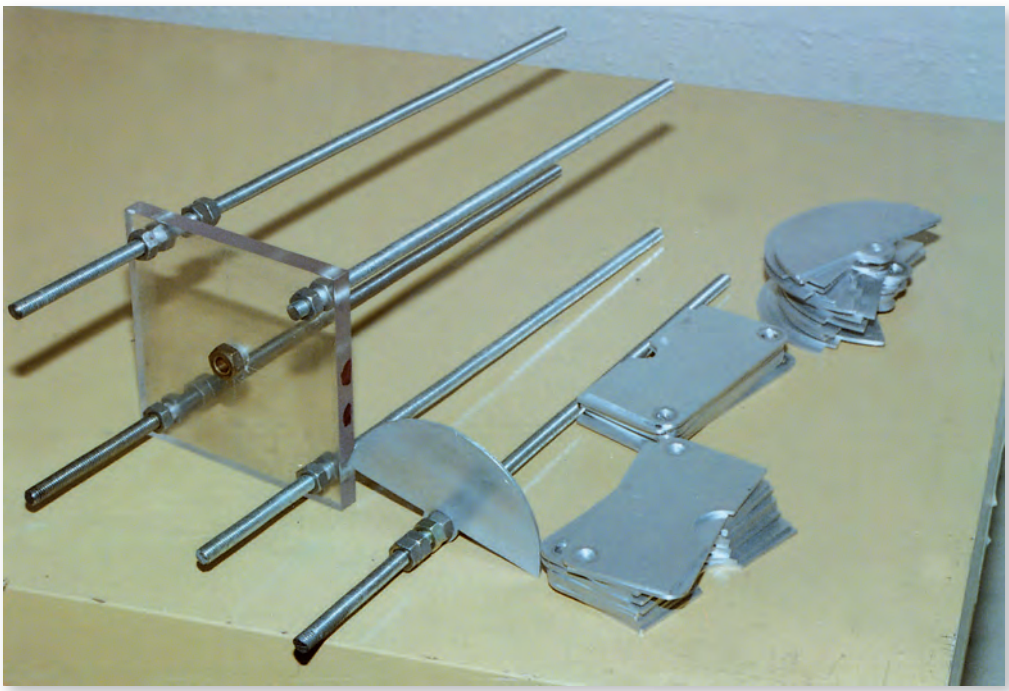


Fig. 6: It is necessary to allow 40mm from the end of the stator plates for fitting the cheeks, fixing nuts, and washers.

Having finished the marking out, the finished piece of Perspex can be fixed over the second piece of Perspex. I find it's better to do this with a couple of self-tapping screws as they are less likely to get in the way when you are working. The next job is to carefully drill the four 6mm holes for the 6mm studding.

End Bushes

Next, it's necessary to work on the end bushes using spare the radiator air valve. It's necessary to 'tap' (form a thread) the end cheeks to accept the bushes. Of course, it's possible to buy a suitable tap, but the Perspex is quite soft so the spare third valve may be used as a tap. To do this it's necessary to make a cross saw-cut across the end of the threads and down as far as the hexagonal end and this will provide a nice cutting edge for the Perspex.

Then, take a piece of scrap plywood and drill two holes of 11/32 ins, (or 8.5mm) and screw in the two remaining air valves squarely – using plenty of oil as a lubricant. Drill the vent hole out to 6mm using a slow drill speed.

Remove the drilled out bearings and before they're screwed into the two end cheeks the connecting tag or tags (if you want to put one in each end) must be fixed on using the bushes to hold them in place. (These can be cut from copper sheet or use a good quality crimp connecter). It's best to crimp and solder a length of lead to this before you fix it behind the bearing thus using it to hold the connecter in place and make a good connection.

Then carefully drill out the holes in the centre of the cheeks using an 8.5mm drill. Cut off the excess Perspex and finish the cheeks to size. Next, mark the top of the Perspex with a felt pen to use as a register (this will help to keep them aligned when they are separated). Then remove the self-tapping screws and separate the cheeks.

When this is completed – making sure that it's square to the hole – run (thread it into the hole) the home made tap into the centre hole, remove and repeat for the second cheek. Then put the connecter over the end of your drilled out bush and – using a spanner – wind them into the centre holes. The next job is to take the tap washer and use rapid-setting (Cyanoacrylate) glue between two washers, as in **Fig. 5**.

The studding can now be cut to length, as in **Fig. 6**, allowing 40mm from the end of the stator plates for fitting the cheeks, fixing nuts, and washers. The centre studding has the 40mm extra at the rear. The front needs to be longer to allow for the knob. **Note:** I like to leave 100mm or so and run the shaft through an over-sized hole in the front panel, which is then hidden behind an insulated knob.

The plates can then be threaded onto the studding along with the nuts, one nut between each plate. **Tip:** I found it often helped to keep the rotor plates in line if they were supported on two strips of wood to keep the centre boss away from the bench top.

Shopping List

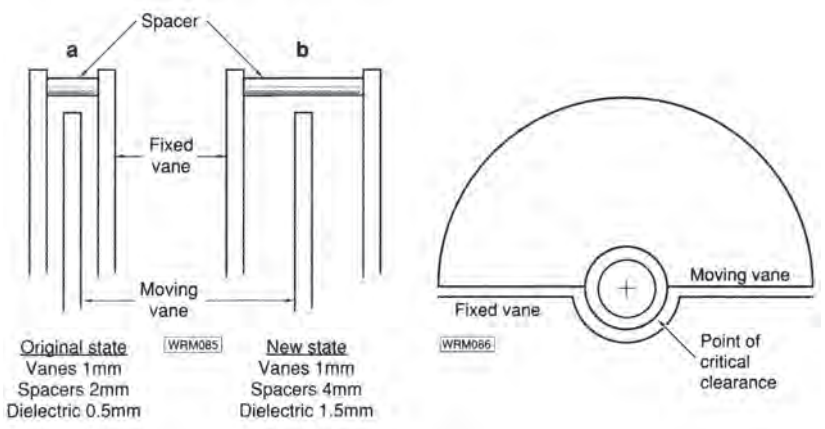
1/8in radiator valves – from B&Q
Aluminium sheet /angle /corner – from Home-Base
6mm studding – from Home-Base
6mm nuts /washers – from Screwfix
Perspex scrap from local sign writers/DIY shop
Cost: Around £24 or less for one 500pF variable capacitor.
If readers need any further help , please E-mail me at **johnmorrisonsnr@aol.com**
Cost around £24 or less for a 500pF variable capacitor.

Plates Into Position

Having fixed the plates into position on their studding the stator and lower studding needs a nut and washer threaded on to take the inside of the cheeks. The cheeks can then be fitted to both ends. **Notes:** Don't forget to put the rotor studding through the centre bushes.

The four outside nuts, washers and a connecter for the stator can then be fitted to each end. At the rear a washer and a nut – plus a second locking nut are threaded onto the rotor stud. At the front the tap washer – which was glued between two washers earlier – is slipped onto the centre stud and rests against the hex end of the bearing, nut and locking nut are threaded on.

All that will remain to be done is to tension and centre-up the plates using the nuts at each end of the rotor stud. And last – but certainly not least – my thanks go to *PW* author **Ian Keyser G3ROO**, without whose generous help and encouragement this article would never have been written. Thanks for your generous and helpful support Ian! ●



Further Reading

More details on the simplified maths of capacitor calculations is to be found in the one-page article by Sean Lineham E17CV that appeared in the August 1989 issue of PW.

LAM COMMUNICATIONS

Specialist Dealers in New and Used Equipment Located within 1/2 mile of junction 36, M1 Motorway

The North's Leading Radio Emporium

52 Sheffield Road, Hoyland Common, Barnsley, S74 0DQ, South Yorkshire

www.lamcommunications.net

sales@lamcommunications.net

Tel: 01226 361700

NOW OPEN

Superb Air Conditioned Premises
Rigs from ICOM, KENWOOD & Yaesu always on demo & in Stock.
Only 1/2 Mile from Junction 36 off the M1 motorway. Car Parking opposite the shop

GO DIGITAL

Future proof your next 2 & 70 radio purchase with ICOM

IC-2820 XB D-Star Complete
This model has cross band Repeater enabled for analogue use. D-Star and GPS compatible, inc UT-123 digital board and GPS antenna @ **£519.99**

IC-2820 50W VHF-UHF, D-Star complete @ **£499.99**

IC-E91 'Going Digital' @ **£239.99**
+ the UT 121 digital unit, 'Special Offer' price @ **£319.99**

IC-E92D waterproof dual band VHF-UHF handheld @ **£299.99**
shown here with the optional HK-175GPS speaker-mic @ **£179.99**

ICOM Authorised Dealer

IC-756 PRO 3 @ **£1749.00**

IC-7400 @ **£1199.00**
with the SM 20 desk mic and SP 21 speaker @ **£1295.00**

IC-718 HF160-10M @ **£439.99**

IC-208 145/430 + Wide RX @ **£219.00**

IC-E90 includes 6/4/2/70 @ **£239.99**

IC-910H 2m/70cm Base @ **£1089.99**

IC-910HX 2m/70cm Base +23cm module @ **£1239.99**

IC-7000 click on-line for 'Special Offers' on this rig @ **£CALL**

IC-706 MKIIG HF160-6M+145/430Mhz, @ **£599.95**

IC-703 HF160-6MQRP+ATU @ **£449.00**

We carry a large selection of Icom accessories.

www.junksale.co.uk
-Buy-Sell-Exchange-Wanted-
The Premier Radio Website for UK & Europe

AVAILABLE NOW
ICOM 7700

HF/50Mhz base transceiver. 200 watts output power & performance @ **£3995.00 rrp**

YAESU
Choice of the World's top DX'ers

FT-2000 HF/50Mhz @ **£1695.00**
FT-2000D 200 W version of above @ **£CALL**

FT-950 HF 160-10 + 6M All modes, 100 Watts, DSP @ **£CALL**

FT-450AT HF 160-10 + 6M All modes, 100 Watts, DSP including internal ATU @ **£599.00**

FT-897 D HF 160-10 + 6M All modes, 100 Watts @ **£CALL**
Battery deal 2x FNB 78 batteries, 1 x PA 26 adaptor, 1 x CD 24rapid charger @ **£799.99**

Power supply deal 1 x FP 30 PSU, 1 x FC 30 ATU @ **£799.99**

FT-857D HF/50/145/430Mhz @ **£495.95**

FT-817ND the ultimate portable rig HF/50 145/430MHZ all mode QRP @ **£349.99**

FT-8900 10/6/2/70 dual receive + DTMF 50watts @ **£249.99**

FT-8800 145/430 dual receive + DTMF 50watts @ **£219.99**

FT-7800 145/430Mhz + DTMF 50watts @ **£169.99**

VX-6 submersible 5watts 145/430Mhz handheld @ **£169.99**

VX-7 submersible 5watts 50/145/430Mhz handheld @ **£209.99**

FT-60 5watts 145/430 Mhz handheld @ **£129.99**

VX-170 5watts 144/145Mhz handheld @ **£99.99**

SPEAKERS

bhi NES 10-2 MKII
Noise eliminating speaker @ **£89.99**

ANTENNA TUNERS

MyDEL CG3000 ATU @ **£229.99**

- Tunable frequency: 1.8 - 30 Mhz minimum wire length 8 meters
- Input impendence: 50Ω
- Input power: 10 - 200W PEP
- SWR: <2:1 • PSU: 12V +/- 10%
- Auto tuning time: Approx. 2 sec (1st tune).>1 sec to memory
- 200 Memorys • Weight: 1.8 KG, Size: 310 x 240 x 72mm(LWH)
- Remote switch optional **£29.99**

CG-3000 shown with optional remote switch.

CG5000 500W version of above @ **£439.99**

LDG

Z100 100W auto ATU 160-6m @ **£119.99**
AT100PRO 100 watts 160-6m @ **£169.99**
AT200PRO 200 watts 160-6m @ **£179.99**
Z-11PRO portable QRP to 100 watts ATU @ **£139.99**
AT7000 for the Icom IC7000 rig @ **£139.99**
AT897 100 watts 160-6m @ **£179.99**

MFJ also in Stock

A LAMCO FIRST

The Ultimate in RF Cables imitations need not apply

TIMES MICROWAVE SYSTEMS

LMR400 Extra low loss coax@ **£2.60 /m**
LMR300 Extra low loss coax @ **£2.20 /m**
For more info visit www.timesmicrowave.com

POWER SUPPLIES

MyDEL power supplies carry a 2 year warranty

MP-925
25 amp transformer PSU @ **£99.99** Best selling ever!

MP-8230 23 amp switchmode PSU @ **£69.99**
MP-250, MP-9600 also available

MLS martin lynch & sons
Suppliers of Communications Equipment

VISA MasterCard Switch Maestro

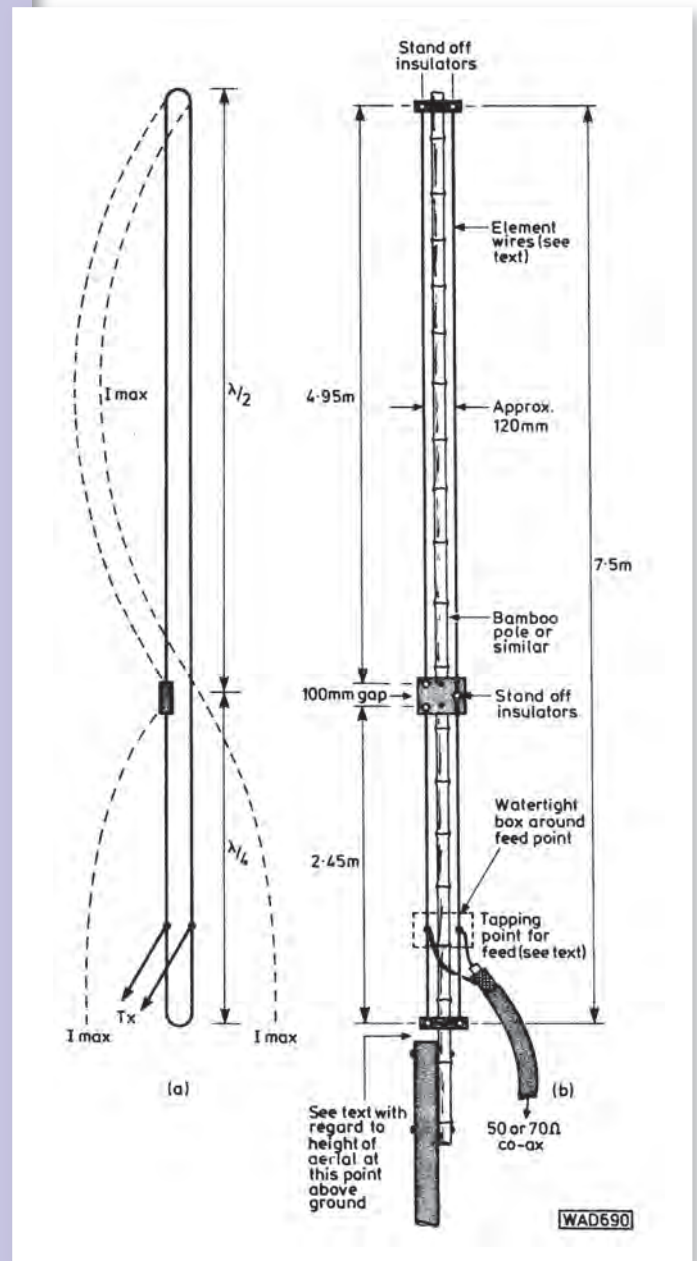
skype us at lamcomms

E&OE

Feature

Operating on 10m

Editorial introduction: Roger G3XBM's Part 1 article has been waiting for publication until 28MHz started to show real signs of life! Roger launches *PW*'s series of articles and projects aimed at helping more readers get on to the band – and in Part 2 he'll will describe the design of a very effective dedicated 28MHz antenna. **Rob G3XFD**.



For what appears like forever we have been experiencing pretty lousy conditions on the 28MHz (10m) band. In reality, these poorer conditions have only been around for a few years since sunspot cycle 23 took a nosedive and the level of solar activity and amateur activity on the band has been low.

Actually, 28MHz is one of the most rewarding bands we have access to and we have **plenty** to look forward to again in the next few years. So, join me as I do my best to encourage readers to get ready to join in the fun on 10m.

At Its Best

Many newcomers to Amateur Radio will have not experienced the 28MHz band when it's at its best. They'll only know it as a band appearing to be devoid of activity for most of the year and most of the time a casual tune around will probably reveal nothing but noise and some man-made interference from local switch mode power supplies.

In the summer months, Sporadic-E (Sp-E) conditions buck things up a bit and there are usually European stations from some part of the continent workable between the months of May and August. If you strike lucky, you may find some sporadic-E openings at other times, but the peak in the northern hemisphere is early to mid-summer with a much smaller peak around December and January.

Beyond Europe?

What about DX beyond Europe? Well, even in the depths of the sunspot cycle 28MHz is capable of supporting far more F2 layer long distance DX that many Amateurs realise, especially on north-south paths across the equator into Africa and South America.

During the CQWW DX contest in October 2007, the sunspot count was hovering around zero, yet the increased activity that always occurs in a big contest gave rise to two pages of 28MHz s.s.b. QSOs being entered into the G3XBM logbook and spanning four continents. This was despite running only 5-10W to a small end-fed antenna strung down the garden.

The main issue is actually Radio Amateurs **thinking** the band is dead and not calling "CQ" at times outside of

Fig. 1: A 'Slim Jim' style antenna for 28MHz, designed by the late Fred Judd G2BCX. Nowadays, a fibreglass fishing rod could be used rather than a long bamboo cane (Reprinted from PW November 1980).

In the first of two articles, Roger Lapthorn G3XBM is looking forward to sunspot cycle 24 and increasing activity on 28MHz.

contests. It is always worth checking the band and **putting out a CQ call**. Many people watch the DX clusters for signs of an opening but if we all do this then no-one will ever know the band is open and no-one will work anyone!

The more vigilant 28MHz DXers with larger antennas and reasonable powers are able to work DX in more marginal conditions. Even places like VK (Australia) have been worked in the poorer years.

Sporadic-E conditions are usually thought of as being limited to about 1200 – 2400km (800-1500 miles) i.e. Europe only workable from G stations. However, in recent years people have woken up to the fact that multi-hop sporadic-E openings are not that uncommon in the summer months. This allows paths as far as the Middle East, the Caribbean, northern South America and the USA to be workable using this mode. **Note:** These paths have also been worked on 50MHz (6m) every summer now for many years.

Both HF & VHF

Interestingly, 28MHz is a band that behaves both as a high frequency (h.f.) band when conditions are good and as a very high frequency(v.h.f.) band when they're not. So, not surprisingly, other modes occur from time to time which allow DX to be worked.

Aurora, which people associate with 50 and 144MHz operation is often very good on 28MHz, with much less 'smearing' of signals that render s.s.b. signals unreadable on bands like 144MHz (2m). On 28MHz, auroral openings allow European DX to be worked on c.w. and s.s.b., often allowing contacts with countries that otherwise would be quite hard to work because the skip distance means that signals 'hopping over' them.

Countries and areas including Scotland (GM), Wales (GW), The Netherlands (PA) and Belgium (ON) have been worked from the G3XBM shack using c.w. on 10m with low power. Monitoring of 28MHz European beacons will also confirm that meteor scatter also works on the 10m band.

Inter-G working

The 28MHz band is also surprisingly good for inter-G working. Even a very basic 10m narrow band frequency modulated (n.b.f.m.) station working up around 29.6MHz will be able to work up to 48km (30 miles) or so with a few watts and a CB type half wave vertical antenna.

By swapping over to s.s.b. or c.w., the range will extend quite a bit further. Up the power and stations a few hundred of kilometres away will be within range. In fact I well remember some RSGB evening 10m activity contests many years ago in an earlier sunspot minimum.

Despite only having a maximum of 10W c.w. or s.s.b. available to me – together with a CB half wave or a sloping dipole – I never failed to work stations over 160km (100 miles) away from the south coast up to Yorkshire from my Cambridgeshire location. Again, a lack of activity is the main reason people don't try to work these sorts of paths more often.

Like the v.h.f. and u.h.f. bands, 28MHz is also affected by tropo (Tropospheric) lifts. Many old-time CBers will tell you that getting on the band just after sunrise will allow improved inter-G ranges to be worked in much the same way as seasoned 144MHz contesters will recall on a misty dawn on a hilltop! Then, factor in weak signal modes – like PSK31 and c.w. – and the ranges possible in 'flat band' conditions across the country can well be imagined.

What To Expect?

Enough about what may be worked at the moment, what about the next few years? What can we expect to work? To start answering the question, most experts now agree that the sunspot cycle has – at last – reached its minimum and it seems a long time since the last peak!

The good news is that predictions for the next cycle are good with some operators even predicting quite a high peak in 2010-2012. The 'climb out' of the minimum is more rapid than the slide towards it, so conditions will rapidly start to improve as the months progress.

Within 12 months the 28MHz band will be returning to its real form with **easily workable** DX even for modestly equipped QRP stations. When the band is at its best 10m DXCC is certainly workable with 5W c.w. or s.s.b. and a simple (non-beam) antenna.

Usually, h.f. conditions tend to be best with lowest signal absorption when operating just below the maximum usable frequency (MUF). Unlike professional short wave users. Radio Amateurs are quite prepared to work 'on the edge' and so are likely to catch openings on marginal bands – just as the MUF reaches the band or just before they fade out. These are the very best times for modestly equipped stations to snag some choice DX!

In the better years, F2 layer conditions will be good until well after dusk, but it is during daylight hours when the band is normally at its best. **Note:** Always remember that h.f. conditions can vary on an almost daily basis – especially on the higher bands – and that the sunspot count and solar flux levels can reach quite high levels periodically even quite early in the new cycle. At such times, and with settled geomagnetic conditions, some choice DX can be worked.

Beacons & CB

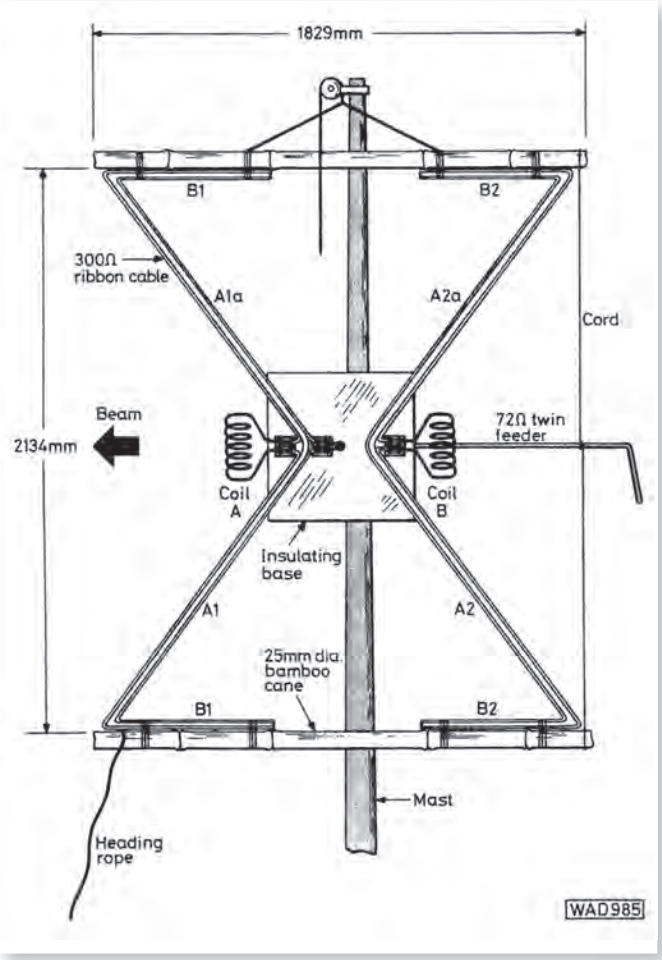
We're fortunate in that the 28MHz band has a large collection of propagation beacons – with the International Beacon Project (IBP) transmitters on 28.200MHz – and it's well worth monitoring these and European beacons to check conditions. Even when there's nobody on the band the beacons allow DX paths to be monitored. Many of the beacons are running modest powers to small antennas, so if they're audible the chances are the path is workable!

Another useful check on conditions is the 27MHz CB band. Certainly in earlier cycles when CB activity was very high worldwide it was always worth checking activity levels just below 28MHz. In the UK and Europe the level of CB activity has dropped but I think checking for DX CB signals will still be worth it.

Equipment For 28MHz?

To get the best from the band in the current part of the cycle there's no doubt that a reasonable power and a decent antenna will certainly help. A 100W 'black box' rig and a small beam will certainly allow you to work DX that a QRP station couldn't, especially in very marginal conditions.

However, as I mentioned earlier, having a much more



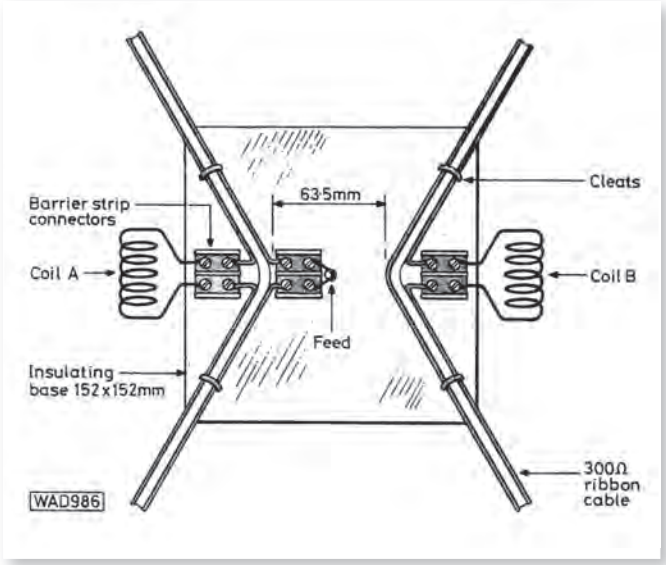


Fig. 2:* The Mini-X beam, *designed by F. C. Smith GW2DDX. this beam antenna can be used either vertically (as shown) or horizontally. (Reprinted from* PW *March 1982).

modest station does not stop you still having plenty of fun. In fact, this summer (2008) I've worked many stations in Europe with just 50mW (Yes – 50 milliwatts!) of c.w, to a wire halo (details coming in Part 2).

I've worked most continents, at close to sunspot minimum time, with just 5 to 10W and similar small antennas – it's just a bit harder when you don't have the power and large antennas but the feeling of achievement is wonderful! When conditions really pick up we can forget about the high power and big antennas as a modest QRP rig like the FT-817 and a small antenna will allow inter-continental DX to be worked on almost all modes.

Working Ten AM

When the band returns to its good shape – don't forget to take a listen just above 29MHz where activity using amplitude modulation (a.m.) is centred, especially from the USA where there are enthusiasts using restored rigs from the golden ages of the 1950s and 60s. Indeed, listening between 29-29.2MHz when the band is open to the States is like going back through a time warp, with 'warmly' modulated a.m. rigs with nice strong carriers (and heterodynes!) to be heard. It always reminds me of my first days in the hobby when most people were using a.m. rigs and s.s.b. was relatively rare.

Another bonus on 10m is the small size of antennas. A wire dipole or vertical half-wave antenna is only just over 4.9m (16ft) long. A wire halo antenna can be just a few feet square, almost omni-directional in its radiation pattern and very effective.

Even a 28MHz beam antenna is relatively small when compared with a 14MHz equivalent. 'Ten' also makes an excellent band when mobile using CB whips and for portable operation antennas – such as base loaded whips – can be very effective when used on rigs like the FT-817 as long as a small counterpoise wire is used. Indeed, I've worked stations as far away as the USA, Argentina, Brazil and Venezuela on 28MHz s.s.b. with a hand-held rig and without much difficulty during good conditions.

Bandwidth available

The other thing to remember about 10m is the space available as it's 1.7MHz wide. This allows plenty of space for all modes to spread out across the band.

Even at the peak of the sunspot cycle you should be able to find places to operate without interference.

Simple QRP Rigs

The 28MHz band is an excellent band on which to build and fire up a simple homebrew QRP transmitter. Indeed my very first experience of the band was with a small, crystal controlled, 1W c.w. rig.

With just a wire dipole in the loft, I worked plenty of DX and often with 599 reports! On 10m don't expect to struggle too hard to work stations using QRP when the band is open!

So, why not build a simple 10m transmitter or transceiver and get ready for the exciting times just ahead? A rig like **George Burt GM3OXX**'s famous variable crystal oscillator (VXO) controlled, c.w. mode, 'OXO' rig using just a couple of transistors will give around 500mW output. Connect this to a wire dipole or halo antenna and working the world will be your prize.

The 28MHz band is about to spring into life and **now** is the time to get ready to enjoy working the DX. Go on – give it a go and you'll not regret it! In part 2 I'll be introducing my own antenna for 28MHz – the Homebase 10. In the meantime there are a couple of *PW* 'classics' to encourage you to get on the air. ●

The Rev. George Dobb's

carrying on the practical way

Rev. George Dobbs G3RJV describes an interesting little project – 'The Doll's House Transmitter', after the appropriate quote!

"Improvising is wonderful. But, the thing is that you cannot improvise unless you know exactly what you're doing." **Christopher Walken** (American Actor)

In the 1990s we used to run an annual craft fair in our Church hall. Craft makers and traders would pay to rent a stall and set out their wares for would-be buyers. The event always attracted an interesting collection crafts.

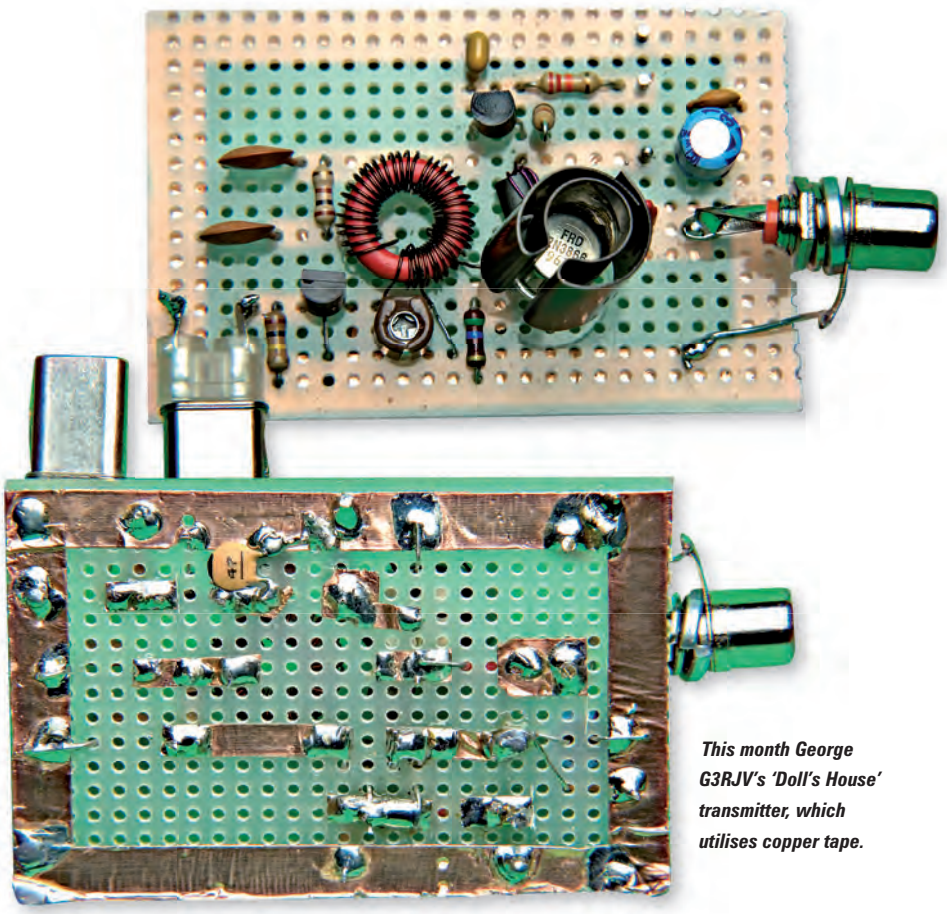
One of my favourite stalls was run by a man selling his hand-made furniture and fittings for dolls' houses. However, I don't mean dolls' houses for children but the really 'serious' dolls' houses built and fitted by adults with everything made to scale.

We were amazed by his craftsmanship; miniature replicas of all manner of household effects. His prices could not possibly reflect the amount of time he must have spent on making the items for sale. It appeared to me that he simply enjoyed making the things, talking about them to other people and selling a few to recover his costs.

The man's approach reminded me of a quotation from *Shop Class as Soulcraft* by Matthew B. Crawford. (The New Atlantis, Number 13, Summer 2006). *"The satisfactions of manifesting oneself concretely in the world through manual competence have been known to make a man quiet and easy. They seem to relieve him of the felt need to offer chattering interpretations of himself to vindicate his worth. He can simply point: the building stands, the car now runs, the lights are on."*

Could there be something of the Amateur Radio constructor in that quotation? In society where very few people make anything and few jobs exist where people can fabricate an object from raw materials to completion, our hobby allows us to take a collection of parts and construct something that is functional and interesting, if not beautiful.

We engage in a therapeutic pursuit.



This month George G3RJV's 'Doll's House' transmitter, which utilises copper tape.

Not only can we go to bed saying, "I made something today", but many Amateur Radio constructors use creative improvisation in building their equipment. All of this leads me to suggesting yet another practical method of construction and one that has links with dolls' houses!

Copper Wiring Tape

Some time ago a member of the G QRP Club internet mailing list suggested that doll's house copper wiring tape is a useful item in the armoury of the radio constructor. I was intrigued! Investigation showed me that a common method of providing lighting in a doll's house is to use a thin copper foil tape. This is stuck to the walls of the house to carry the 12V supply for the miniature lamps.

The tape lies flat against the walls and can be covered with paint or wallpaper allowing 'invisible' distribution of power around the diminutive building. The material is described as "self adhesive copper foil tape with a solvent based acrylic adhesive that sticks aggressively and will solder."

Usually the tape is 6mm wide and is sold in reels three or four metres in length. Although it is available from model shops, I bought a 3m reel for £1.65 on eBay. My reel showed promise; the peel-off backing revealing the adhesive which actually did stick very well to the surfaces I tried and it took solder with great ease.

There are several ways of using the copper foil for radio construction. Obviously, it will form tracks for the interconnection of components in much the same way as a conventional etched printed circuit board (p.c.b.). One simple way to do this is to use 'island construction'.

Rev. George Dobbs G3RJV
PW Publishing Ltd.,
Arrowsmith Court,
Station Approach,
Broadstone,
Dorset BH18 8PW
E-mail: pracway@pwpublishing.ltd.uk

Island construction is a surface mounting technique where the tracks are stuck onto a suitable surface, which then becomes the top of the board and the components are soldered directly to the copper tracks. The end of each component lead can be bent to form a small 'L' which lies flat on the copper surface to accept the solder.

The Island technique is a version of what American constructors call 'Manhattan construction'. In fact **Jim Kortge K8IQY**, runs a website called 'Manhattan Madness' in which he describes the building of quite complex projects using this technique. Jim uses copper pads made of p.c.b.material, which he glues to a ground-plane of the same material.

The doll's house foil will have to be stuck to an insulated material but it will form islands of copper material for the component interconnections. One advantage of such a technique is that it doesn't require the drilling of holes to accept the components. The components are simply soldered directly to the copper surface and using the self-adhesive copper foil, copper pads can be added easily as the construction proceeds.

Cardboard Circuits

Another possible technique is to use cardboard circuit boards. This may sound suspect but viable circuit boards are possible with thick card. My wife keeps card for her craft work, so I borrowed some samples ….. I think I had her permission!

Paper or cardboard thickness is usually specified by its weight per square metre rather than its dimensional thickness. Most copier paper is 80g/m^2 (grams per square metre – sometimes designated as gsm) and postcards are often 160 g/m^2.

Looking at the card samples, it seemed to me that the ideal thickness is probably in the order of 200 g/m^2 or perhaps a little thicker. Most craft shops sell a good range of card but, in the true spirit of Amateur Radio, I suggest that *COTPW* readers look around to see what can be found as scrap cardboard at home!

The card needs to be thick enough to bear the weight of the components without undue bending – although most components are quite light. An alternative is to use several smaller boards to build a project rather than using one large board.

With the carboard method, the copper foil tape forms tracks under the board, in the conventional p.c.b. manner, and the component leads are pushed through holes from the top of the board.

However, what about all those little holes? The answer is it's simple – using stiff card makes the task very easy. I found that a mapping pin, rather like a beefy drawing pin with a sharp point and cylindrical plastic top, pushed easily through the card and the copper foil.

The pin is best pushed through the board from the copper side to give a clean hole. My mapping pin provided a hole of roughly the right size for most component leads.

The copper foil is 6mm wide, which is perhaps too wide for the average circuit board track but 3mm works well. Fortunately, it's possible to cut pieces of the copper tape to half width with a small pair of sharp scissors and still be able to peel-off backing with relative ease.

Short Track?

Sometimes, very short lengths of track may be required and handling short pieces of 3mm foil really does require some dexterity. A simple solution I've

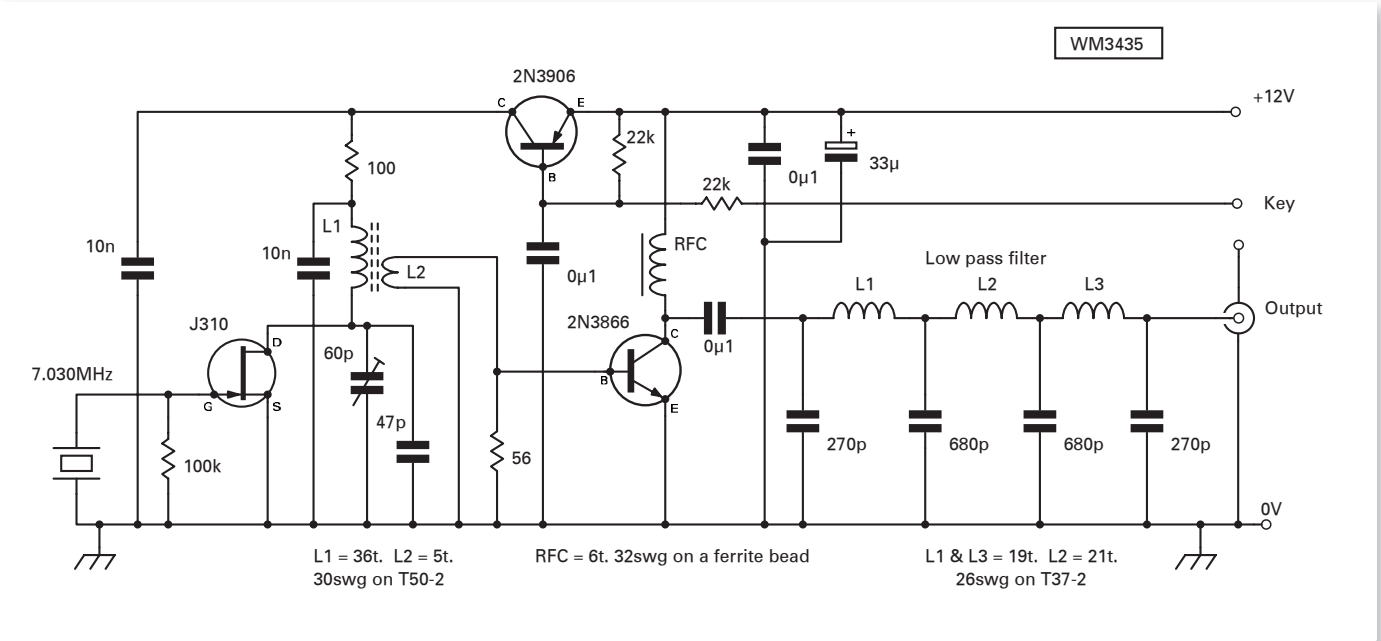


Fig. 1: The 7MHz QRP transmitter circuit used by G3RJV to evaluate the 'Doll's House wiring' copper tape.

found is to cut the track longer than needed. Apply one end of the track to the board, press as much to the board as is required and cut off the excess with a sharp modelling knife.

The inexpensive Stanley disposable modelling knives, which are sold in packs of three, are ideal for cutting the foil. If the foil has been stuck on too far, or even in the wrong place, careful use of the modelling knife will cut the track and it can also be prised off the card. In this way a bit of stiff card, a reel of copper foil, a mapping pin and a few simple tools can produce quite an acceptable circuit board at very low cost.

Using Perf Board

But I decided to try the copper tape on behalf of *COTPW* readers, using yet another technique. I've often described the use of 'perf board' in electronic construction. This is an insulated material with a matrix of holes spaced 0.1 inches apart. It's like Veroboard without the copper strips on the underside.

In use the component leads are pushed through the appropriate holes and usually connected on the underside with wire. It occurred to me that the copper tape would make easy to apply tracks for the component connections. The result would like very much like a conventional etched p.c.b. – but with a lot of extra holes. I happened to have some perf board made from translucent material. (This is ideal for a demonstration board because the tracks can be seen from the top of the board).

Test Transmitter For 7MHz

The test project I built using this technique is the 7MHz band (40 metre band) QRP transmitter shown in **Fig. 1**. Naturally, I called it the 'Doll's House Transmitter'!

There's nothing novel about the circuit. It came from my circuit notebook where I record circuit ideas and I suspect it originated from **George Burt GM3OXX**.

The transmitter's oscillator is a crystal controlled field effect transistor (f.e.t.). I used a J310 f.e.t. but most other N-channel f.e.t.s would probably do the job.

The crystal is a 7.030MHz fundamental crystal for the QRP calling frequency on that band. The inductor, L1, with a 60pF trimmer tunes the output at the oscillator frequency. Since L1 has an inductance of about 6.35uH, about 80pF will tune the desired frequency. I didn't have a suitable trimmer, so I used a 5mm Murata trimmer of 60pF (coded brown) with 47pf in parallel.

The inductor, L2, is made up with five turns wound over the 36 turns of L1 on a T50-2 core. This link winding feeds the signal to a 2N3866 power amplifier transistor. **Note:** Please don't omit the 56Ω resistor in the base of the 2N3866.

The collector load of the power amplifier is a small r.f. choke made by winding six turns of 32s.w.g. wire through a small ferrite bead. The FX-1112 type is suitable although my ferrite bead came out of the junk box! Choose a bead with a fairly large hole to accept the turns of wire.

When winding the choke, avoid scraping any of the enamel coating from the wire. The output from the amplifier goes to a seven-element low-pass filter to reduce harmonic radiation.

Keyed Oscillator

Usually in little QRP transmitters, I key the power amplifier – but in this case the amplifier remains on all the time and I key the oscillator. The keying is done via a d.c. switching transistor; a 2N3906 *pnp* device. This enables one side of the key to be connected to ground.

Take care with the connections of the 2N3906 as the emitter goes to the positive 12V supply. Note that the decoupling capacitors (100nF and 33μF) on the 12V supply are essential.

On the air I found that my prototype transmitter gave about 2W of r.f. output. This is a viable signal for contacts on the 7MHz band, although it does mean that the 2N3866 amplifier does require a clip-on heat-sink to dissipate excess heat.

Making the transmitter using the copper foil tape on the perf board proved to be very easy. The foil stuck easily to the board and the mapping pin was used to puncture the foil in the appropriate holes on the board.

I found it was possible to connect two strips of the board by dragging solder with the soldering iron tip across the edges where they join. I made a ground connection around the four edges of the board using this method.

It's also possible to rework the board. I tried to remove and then return the 2N3906 transistor and a couple of other parts. After de-soldering and pulling out the leads, application of de-soldering braid and a hot iron tip should clear the holes of solder.

Ideally I should have worked out the component layout in advance but in my usual fashion, I laid it out as I built it. In practice this worked well and I was able to build and test the oscillator before I built the amplifier and then added the d.c. switching transistor.

So the method is ideal for modifying circuits on the hoof! And I will certainly try it again. *"Improvising is wonderful".*

Please note that my prototype shown in the photograph doesn't include the necessary low pass filter. This is because I have a series of these ready-built to plug into any little transmitter I make. The 47pf capacitor in parallel with the trimmer is mounted under the board. I just forgot to leave space for it! ●

Choose Your Favourite *COTPW*!

Rob Mannion G3XFD writes: As announced in the July issue of *PW*, the Rev. George Dobbs G3RJV is moving home in July 2008 after retiring and for a number of months he won't be able to produce new projects for his regular column. However, to ensure G3RJV's loyal readers won't miss out altogether, George and the *PW* Editorial team have decided to re-publish some of the 'classics' produce during this long established series.

To help G3RJV and the Editorial team prepare the most suitable articles we would like to hear from readers just what topics they'd like to see again. In some cases the re-publication of the article will give G3RJV the opportunity to suggest modifications and updates to help projects to be built again, or in the case of new readers, for the first time. Each re-published article will have a new introduction and further guidance written by G3RJV

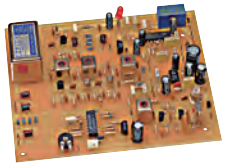
The feedback from readers will also help us to evaluate what articles from the *COTPW* series we can use in the long-awaited re-print collection, to be published in the same format as we have used for our antenna special booklets, such as *Antennas To Go*. Tex Swan G1TEX and I look forward to hearing from readers so that we can pass on all the information on to George. **Rob G3XFD**.

AMATEUR & CB RADIO KITS & MODULES

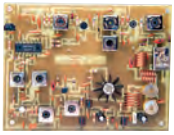
TRANSVERTERS for 2 or 4 or 6 metres from a 10 metre rig, or 4 or 6 metre from a 2 metre rig. Includes new overtone local oscillator, and integral interface unit. 20dB receive gain, 25W transmit power. Low level drive dual IF versions **TRC2-10dL, TRC4-10dL & TRC6-10dL**, high level drive single IF versions **TRC2-10sL**, **TRC4-10sL**, **TRC6-10sL, TRC4-2sL, TRC6-2sL**, Complete kit **£163.00**. **Built £244.00**

TRANSMIT AMPLIFIERS, for 2 or 4 or 6metres, single stage switched class AB linear. Diecast box with SO239 connectors. 1W to 5W drive, 8W to 30W output, Types **TA2SA, TA4SA, TA6SA**. **Complete kit £59.00, Ready Built £82.00**. 5W to 20W drive, 22W to 60W output, Types **TA2SB, TA4SB, TA6SB**, **Complete kit £65.00, Ready built £88.00.**

TRANSMIT AMPLIFIER & RECEIVE PREAMP, for 2 or 4 or 6metres. Receive gain adjustable 0-26dB gain. Switching for either part or straight through. RF & DC switched on transmit. Diecast box with SO239 connectors. 1W to 5W drive, 8W to 30W output, Types **TARP2SA, TARP4SA, TARP6SA**. **Complete kit £72.00, Ready Built £109.00**. 5W to 20W drive, 22W to 60W output, Types **TARP2SB, TARP4SB, TARP6SB**, **Complete kit £75.00, Ready built £112.00**.



POUNDBURY SSB IF UNIT
9 or 10.7MHz SSB generator & receive IF unit. Incorporates a speech processor, double balanced mixer and crystal filter. Crystal carrier Oscillator. Receive IF amplifier, balanced demodulator and AGC generator, and S meter circuitry. Also a 1W audio amp. Supplied with a 9MHz 6 pole crystal filter and matching carrier crystal for USB generation. **PCB and component kit £80.00 including P&P**. Optional extras mic gain pot, volume control pot, £1.75 each, signal meter £9.00, 8ohm loudspeaker £2.00, P&P £1.50.



POUNDBURY 70MHz FRONT END as featured in this issue. Receive preamp and mixer, transmit mixer and three stage amplifier. Sensitivity 100nV on receive, output 250mW minimum on transmit. Works in conjunction with the POUNDBURY 9MHz SSB IF UNIT the PORTLAND VFO, and the MIXER-VFO board to create a tuneable 70MHz SSB transceiver. Also available is a 250mW to 25W two stage amplifier type TA4S3 to complete the project.
PCB and parts kit with potentiometers £44.00

CB to 10FM CONVERSION, suitable for CB's with LC7136/7 or TC9119P PLL IC's. Puts the rig on 29.31 - 29.70MHz. Each board is aligned prior to despatch. Data available for a variety of chassis types. Please state rig type when ordering. **SC29 Built & aligned £23.00**.

STATION PREAMPS for 2 or 4 or 6metres. RF & DC switched. Adjustable 0-26dB gain. 100W power handling. **RP2S, RP4S, RP6S, PCB & Hardware kit £29, Ready Built £47**.

MASTHEAD PREAMPS, for 2 or 4 or 6meters. 20dB gain 1dB NF. 100W through handling. RF switched & DC fed via the coax. Heavy duty waterproof masthead box, and a DC to RF station box with SO239 connectors. **RP2SM, RP4SM, RP6SM, PCB & hardware kit £38.00, Ready Built £57.00**.

MASTHEAD PREAMPS 400W rated, for 2 or 4 or 6metres. RF switched. DC fed via a separate wire. 20dB gain 1dB NF. Heavy duty waterproof masthead box with SO239 connector. **RP2SH, RP4SH, RP6SH. PCB & hardware kit £45.00, Ready Built £78.00**.

TWO TONE OSCILLATOR as featured in *PW* March 2005. A vital piece of test equipment used together with an oscilloscope for setting up AM, DSB, & SSB transmitters. **PCB & bits £10.00. PCB assembled £20. PCB & hardware kit £25. Ready Built £52.50**.

SPEECH PROCESSOR increases the average sideband power of SSB transmitters without driving the PA into clipping. Includes filtering to enhance the higher voice tones to increase intelligibility, and it sounds nice too. Panel control for clip and output level. Supplied with plugs & sockets to suit most popular rigs. Type **SP1000, PCB & Hardware kit £29.00, Ready built £63.50**.

PORTLAND VFO as featured in March 2006 PW. 7-7.2MHz as local oscillator for a 40m direct conversion receiver or transceiver. Otherwise as 7.9-8.4MHz to use in conjunction with a mixer-vfo system as local oscillator for a 4 metre receiver/transmitter with a 9MHz or 10.7MHz IF. Available with Buffer 2 for high drive output or with Buffer 1 suitable for the Poundbury project transceiver. **VFO PCB with Buffer 1 or Buffer 2 PCB and parts kit with potentiometer £14.50. PCB and parts kit with drilled box £23.50**.

MIXER-VFO for 4metres as described in DiBD PW May 2006. A crystal oscillator and mixer and amplifier producing 61-61.5MHz or 59.3-59.8MHz local oscillator signal when used in conjunction with the Portland VFO. **PCB & parts kit £23.30.**
Ready built and tested £34.00.

SPECTRUM COMMUNICATIONS

12 WEATHERBURY WAY, DORCHESTER, DORSET, DT1 2EF. Tel & Fax 01305 262250.

Mail order only. Prices include postage. Cheques payable to A.J. & J.R. Nailer.
Also by Paypal plus 3.6% commission, send e-mail for invoice

e-mail tony@spectrumcomms.co.uk **Web site www.spectrumcomms.co.uk**

Amateur and CB kits and modules and G4CFY/G2DYM aerials.

club news

Please remember to include full details of your club, E-mail and telephone contact details and the postcode of your meeting venue - it helps potential visitors to find you!

Send all your club info to

PW Publishing Ltd.,
Arrowsmith Court,
Station Approach,
Broadstone,
Dorset BH18 8PW
E-mail: newsdesk@pwpublishing.ltd.uk

BEDFORDSHIRE

Shefford &DARS
David Lloyd. Tel: (01234) 742757
www.sadars.org.uk
The Shefford and District Amateur Radio Society meets every Thursday at the Community Hall, Ampthill Road, Shefford, SG17 5BD (next to the Chip shop). On September 25th, they will be holding their 60th anniversary celebrations and would like to hear from any past members of the club (see web site for full programme).

BERKSHIRE

Reading & DARC
Pete Milton. Tel: (01189) 695697
www.radarc.org
The Reading & District Amateur Radio Club meets on the second and fourth Thursday of the month at Woodley Pavilion, Woodford Park, Haddon Drive, Woodley, Berkshire RG5 4LY. Only one meeting this month, on Thursday 14th August "On the Air Evening" with your host Tom G0VQR.

CHESHIRE

Chester & DRS
Graham. Tel: (07930) 655 121
E-mail: info@chesterdars.org.uk
www.chesterdars.org.uk
The Chester & District Radio Society meets on Tuesday evenings at the Burley Memorial Hall, Common Lane, Waverton, Chester CH3 7QT.

Halton RC
Sam. Tel: (01928) 714231
http://g7wfs.sytes.net/hrc/index.htm
The Halton Radio Club meets in The Play Centre, Norton Hill, Windmill Hill, Runcorne WA7 6LJ every Thursday from 7.30 to 9.30pm. There's plenty of parking and full disabled access.

Macclesfield & DRS
Ray King. Tel: (01260) 278431
www.gx4mws.com
The Macclesfield & District Radio Society meets every Monday at the Pack Horse Bowling Club, Westminster Road, Macclesfield SK10 3AT at 8pm.

Stockport RS
David Simcock. Tel: 0161 456 7832
www.stockportradiosociety.co.uk
The Stockport Radio Society meets on the first and third Tuesdays at the Bramhall Air Scouts HQ, Leewood Hall, Benja Fold off Ack Lane East, Bramhall, Stockport SK7 2BX.

Warrington Amateur Radio Club
Paul Carter. E-mail: g7odj@warc.org.uk
www.warc.org.uk
The Warrington Amateur Radio Club meets every Tuesday at 8pm at the Grappenhall Youth and Community Centre, Bellhouse Lane, Grappenhall, Warrington WA4 2SG.

CORNWALL

Cornish RAC
Ian Williams. Tel: (01872) 561058
E-mail: ianporsche964@aol.com
www.cornishradioamateurclub.org.uk
The Cornish Radio Amateur Club meets at the Church Hall, Church Road, Perranarworthal, Truro TR3 7QE on the first Wednesday of every month at 7.30pm. There is also a Computer Section that meets at the same venue and time on the second Monday of every month, except December.

Poldhu ARC
Keith Matthew. Tel: (01326) 574441
E-mail: g0wys@yahoo.co.uk
www.gb2gm.org
The Poldhu Amateur Radio Club meets at The Marconi Centre, Poldhu Cove, Nr Mullion, Cornwall TR12 7JB. Tel: 01326 241656.

COUNTY DOWN

Bangor and District ARS
Mike. Tel: 028 4277 2383
http://www.bdars.com
The Bangor and District Amateur Radio Society meets on the first Thursday of every month in 'The Boathouse', Harbour Car Park, Groomsport BT19 6JP at 8pm. Visitors and new members are most welcome.

COUNTY DURHAM

Bishop Auckland RAC
Mark Hill. Tel: (01388) 745353
http://barac.m0php.net/
The Bishop Auckland Radio Amateur Club meets every Thursday at 8pm in the Village Community Centre, Stanley Crook, Co. Durham DL15 9SN. Tuition for Foundation, Intermediate and Advanced licences is available. The club is registered as an RSGB exam centre.

Great Lumley AR&ES
David Barclay. Tel: 0191 3888113
E-mail: m0bpm@btinternet.com
The Great Lumley Amateur Radio & Electronics Society meets in the Community Centre, Front Street, Great Lumley, Chester-le-Street, Co. Durham DH3 4JD on Wednesday nights from 7 to 9pm.

DERBYSHIRE

South Normanton Alfreton and District ARC
A J Higton. Tel: (01773) 783658
E-mail: snadarc@linuxmail.org
www.snadarc.me.uk/
The South Normanton Alfreton and District Amateur Radio Club meets in the Village Hall, Community Centre, Market Street, South Normanton, Derbyshire DE55 2EJ.

DEVON

Exeter ARS
Paul Cheshire. Tel: 01392 660246
E-mail: pchesh-29@hotmail.co.uk
The Exeter Amateur Radio Society meets on the 2nd and the 4th Monday at 7.30pm in the Moose Centre, Spinning Path Lane, Blackboy Road, Exeter EX2 5RP. Tuition for Foundation, Intermediate and Advanced licence is available. The club is registered as an RSGB examination centre.

Torbay ARS
Dave Helliwell. E-mail: g6fsp@tars.org.uk
www.tars.org.uk
The Torbay Amateur Radio Society meets Fridays at 7.30pm in the Teignbridge District Scout Headquarters, Wolborough Street, Newton Abbot, Devon TQ12 1JR. July 11th - Natter Night, July 18th - Operating Night, July 25th - Talk by Tony Swale about Bletchley Park and the code breakers, August 1st - Natter Night, August 8th - Operating Night, August 15th - Natter Night, August 22nd - Operating Night, August 29th - A Talk by Derrick G3LHJ about DXpeditions

DORSET

Bournemouth RS
John. Tel: 07719 700 771
www.brswebsite.org.uk
The Bournemouth Radio Society meets on the first and third Friday of each month at the Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth BH10 7LH. Meetings take place in Room 5 at 8pm and members assemble in the bar from 7.30pm. Visitors are always welcome.

Poole Radio Society G4PRS
Tex Tel: 07966 460 552
www.g4prs.org.uk
Meetings are every Friday at 19:30 for 20:00 at the The Old Chapel Hall, Cabot Lane, Creekmoor, Poole BH17 7BX, the second friday meeting of each month is the formal evening, all others are basically shack and Natter nights. Training for the Foundation and intermediate licences will start again soon.

EAST SUSSEX

Brighton RC
Reg Moores. Tel: (01273) 503869
The Brighton Radio Club meets on the second and fourth Tuesdays of each month at the Vallance Community Centre, Conway Court, Sackville Road, Hove BN2 3WR at 7.30pm. Anyone wishing to know more are welcome to come along to a meeting, entrance is free.

Hastings E&RC
Gordon Sweet. Tel: (01424) 431909
E-mail: gordon@gsweet.fsnet.co.uk
www.herc.uk.net or http://g4cus.mysite.wanadoo-members.co.uk/
The Hastings Electronics & Radio Club meets on the third Wednesday at the Taplin Centre, Upper Maze Hill, St Leonards on Sea TN38 0LQ at 7pm.

ESSEX

Braintree & DARC
Keith. Tel: (01376) 329279
www.badars.org.uk
The Braintree & District Amateur Radio Society meets on the first and third Monday of the month in The Clubhouse, Braintree Hockey Club, Church Street, Bocking CM7 5LJ.

Colchester RA
David Chambers. Tel: 07766 543784
www.g3co.ccom.co.uk
The Colchester Radio Amateurs meets at 7.30pm on alternate Thursdays at St Helena School and The Colchester Institute, Sheepen Road, Colchester, Essex CO3 3LE. Members and non-members welcome.

Chelmsford ARS
Martyn Medcalf. Tel: (01245) 469008
E-mail: info2007@g0mwt.org.uk
www.g0mwt.org.uk
The Chelmsford Amateur Radio Society meets on the first Tuesday of each month in the Marconi Sports & Social Centre, Beehive Lane, Great Baddow, Chelmsford CM2 9RX at 7.30pm.

Loughton & Epping Forest ARS
Marc Litchman. Tel: 020 8502 1645
E-mail: info@lefars.org.uk
www.lefars.org.uk
The Loughton & Epping Forest ARS meet Friday fortnightly at All Saints House, Romford Road, Chigwell Row, Essex IG7 4QD between 7.45 and 10pm. All visitors will be made most welcome.

HAMPSHIRE

Fareham & District ARC
Ken Sapsed. Tel: 023 9279 7240
E-mail: secretary@fareham-darc.co.uk
www.fareham-darc.co.uk/
The Fareham & District Amateur Radio Club meets on Wednesdays evenings from 7.30pm in the Portchester Community Centre, Westlands Grove, Portchester, Fareham PO16 9AD.

Horndean & District ARC
Stuart Swain. Tel: (02392) 472846
E-mail: g0fyx@msn.com
www.hdarc.co.uk
The Horndean & District Amateur Radio Club meets on the first and fourth Tuesdays each month in the Lovedean Village Hall, 160 Lovedean Lane, Lovedean, Hants PO8 9SF at 7.30pm. Visitors are always very welcome. On the weekending July 12th/13th the club will be operating a special event radio station from the Queen Elizabeth Country Park Show, near Petersfield. On Tuesday July 22nd visit by Rob Mannion, Editor of *Practical Wireless* magazine, August 5th Natter night/ social evening. And on August 26th there's a talk on 'Amateur Satellites' by Quintin Gee M1ENU

Isle Of Wight Radio Society
Tony Pegg Tel: 01983 868 978
e-mail tony.pegg1@btinternet.com
www.g3sky
The IWRS meets every Friday evening 7.00pm-10.pm at Haylands Farm,Salters Rd. Ryde PO33 3HU.
Visitors very welcome.The club runs courses for Foundation,Intermediate and advanced licenses. The club is registered as an RSGB exam centre

HERTFORSHIRE

Verulam Amateur Radio Club (St Albans)
Norman. Tel: 07773 628912
E-mail: g1bsz@aol.com (sec)
www.radioclubs.net/verulam
The club normally meets every 3rd Tuesday of the month 800pm at Aboyne Lodge School, Etna Road, St Albans AL3 5NL. New members and visitors are always very welcome. Regular talks, events, Foundation, Intermediate courses exams are held. Club nets also take place every Sunday 12.00noon 40m (7.150MHz), then 14.00pm 2m (145.375) and on Tuesday 19.45pm 160m (1.975) then 20.00pm 2m (145.375). For further information about the club and events please see the website.

HUMBERSIDE

Hull & District ARS
Raymond Penny. Tel: (01482) 504618
E-mail: sirraymond@sirraymond.karoo.co.uk
The Hull & District Amateur Radio Society meets every Friday at the Walton Leisure Centre, Walton Street, off Anlaby Road, Hull HU3 6JB.

KENT

Bredhurst RATS
www.the-brats.co.uk
The Bredhurst Radio Amateur & Transmitting Society meets on Thursdays at the Parkwood Community Centre, Rainham, Gillingham, Kent ME8 9PN at 8.30pm. If you are interested in joining the club, write to: Membership, The BRATS c/o The Club Room, The Parkwood Community Centre, Long Catlis Road, Rainham, Gillingham, Kent, ME8 9PN.

Bromley & DARS
Graham
E-mail: bdars@grahamc.net
www.bdars.org
The Bromley & District Amateur Radio Society meets in The Victory Social Club, Kechill Gardens, Hayes, Kent BR2 7NH (off B265, Hayes Lane, Bromley) on the third Tuesday of the month at 7.30pm.

LANCASHIRE

Oldham RC
Christopher Cunliffe. Tel: 07749347142
E-mail: secretaryoarc@btinternet.com
www.oarc.org.uk
The Oldham Radio Club meets on Thursdays at Royton Air Training Corps, Hillside Avenue, Royton, Oldham OL2 6RF at 7:30pm. July 10th committee meeting 8pm. On July 20th, we're holding our fourth 144MHz Backpackers' day (from Moss Moor). August 28th is our AGM Meeting 8pm start, On September 4th there will be the start of our next foundation course.

Ellenroad RC
David. Tel: (01706) 358650
E-mail: info@ellenroadradioclub.org.uk
http://www.ellenroadradioclub.org.uk/info.htm
The Ellenroad Radio Club (ERC) meets every Monday evening from 7 to 9pm at the Ellenroad Steam Museum, Elizabethan Way, Newhey, Rochdale OL16 4LG. The museum houses the UK's only fully-working cotton mill engine, complete with its original steam raising plant and 220ft high chimney. Newcomers are always welcome and made to feel at home.

LINCOLNSHIRE

Eagle RG
Eddie Lingard. Tel: 01507 472695
E-mail: e.f.lingard@btinternet.com
www.eagleradiogroup.com
The Eagle Radio Group meets at The Eagle Hotel, Victoria Road, Mablethorpe LN12 2AJ on the second Tuesday of each month, meetings start at 8pm. The group operates an open policy so, if you are in the area, pop in.

Spalding & DARS
Graham Boor. Tel: 07947764481

E-mail: secretary@sdars.org.uk
www.sdars.org.uk
The Spalding & District Amateur Radio Society meets at the Castle Sports Swimming Complex, Spalding PE11 1QF on Fridays at 7.30pm. June 1st is the Spalding Rally.

LONDON

Cray Valley Radio Society
Bob Treacher. Tel: 020 8265 7735
www.cvrs.org
The Cray Valley Radio Society meets on the first and third Thursdays of the month at the Progress Hall, Admiral Seymour Road, Eltham, London SE9 1SL at 7.30pm for 8pm.

Southgate ARC
Donald F Berry. Tel: 020 8360 3614, E-mail: dfberry@eggconnect.net
www.southgatearc.org
The Southgate Amateur Radio Club meets on the second Thursday of the month at Winchmore Hill Cricket Club, The Paulin Ground, Firs Lane, Winchmore Hill, London N21 3ER at 7.30pm.

Wimbledon and District ARS
Jim Bell. Tel: 020 8874 7456
E-Mail: james@jbell5.wanadoo.co.uk
www.gx3wim.org.uk
The Wimbledon & District Amateur Radio Society welcomes new comers to our meetings whether they are licensed or not. We hold our meetings at 8pm the second and last Friday of each month at Martin Way, Methodist Church, Buckleigh Avenue, Merton Park, London SW19 9JZ. The church is on the corner of Martin Way and Buckleigh Avenue. July 11th Metal bashing; Painting & finishing ; CRO use. Bob G3OOU, July 25th Commence Summer Camp, August 1st Barbecue at Summer Camp, August 3rd Dismantle Summer Camp, August 8th No Meeting, August 29th Summer Camp debrief Eric G0KRT.

THE LOTHIANS

Cockenzie & Port Seton ARC
Bob Glasgow. Tel: (01875) 811723
E-mail: gm4uyz@cpsarc.com
www.cpsarc.com/news.php
The Cockenzie & Port Seton Amateur Radio Club meets in the Thorntree Inn (Lounge Bar), High Street, Cockenzie, East Lothian EH32 0HP from 7pm till late. Organised talks are held in the Port Seton Community Centre, South Seton Park, Port Seton, East Lothian EH32 0EE. July 26th/27th RSGB IOTA Contest from the Island of Tiree, August 1st it's a Normal Club Night, on August 8th we hold our '15th ANNUAL JUNK NIGHT' Community Centre, Main Hall, Port Seton. Bring along your own 'junk' and sell it yourself. Tables on First Come First Served basis. Entrance fee £1 for everyone. Money Raised will be donated to BRITISH HEART FOUNDATION. Timings 18:30 to 21:30hrs.

Lothians Radio Society
Tony Sigouin. Tel: 07739742367
E-mail: enquiries@lothiansradioscoiety.com
www.lothiansradiosociety.com
The Lothians Radio Society meets on the second and fourth Mondays of the month in the Royal Ettrick Hotel, 13 Ettrick Road, Edinburgh EH10 5BJ from 7pm. Membership costs £12 per year and includes a free BBQ every June!

MERSEYSIDE

Wirral & District ARC
Tom. Tel: 07050 291850
E-mail: secretary@wadrac.com
www.wadarc.com
The Wirral & District Amateur Radio Club meets at the Irby Cricket Club, Mill Lane, Irby CH61 4XQ on the second and fourth Wednesdays of each month. Other Wednesdays are informal (D&W) meetings at a local hostelry.

NORFOLK

King's Lynn ARC
Ray Dowsett, MBE. Tel: (01553) 671307
E-mail: ray-g3rsv@supanet.com
http://www.klarc.org.uk
King's Lynn Amateur Radio Club meets every Thursday at the Scout HQ, Chequers Lane, West Winch, King's Lynn, PE33 0NY off the A10 at West Winch at 7.30pm.

Norfolk ARC
Mark Taylor. Tel: (01362) 691099
E-mail: narc@g0lgj.co.uk
www.norfolkamateurradio.org
The Norfolk Amateur Radio Club meets every Wednesday at the *Happy Landings, Norwich Aviation Centre, Norwich Airport NR6 6JA a 7.30pm.* July 16th Informal, July 20th Radio by The Seaside Low Power FD, July 23rd Bluetooth / Wifi David G7URP & Mark G0LGJ and July 30th Bright Sparks/Informal

North Norfolk ARG
Tony Smith. Tel: (01263) 821936.
E-mail: g4fai@btinternet.com
www.radioclubs.net/nnarg/
The North Norfolk Amateur Radio Group meets in the Radio Hut at the Muckleburgh Collection Military Museum, Weybourne, North Norfolk NR25 7EG on Wednesdays and Thursdays from 10am to 4pm and some Sundays from 1 to 4pm. New members always welcome.

NORTHAMPTONSHIRE

Kettering & District Radio Society
Lorna Froggatt. Tel: 0153 676 2523
E-mail: LornaSteveLorna@aol.com
The Kettering & District Radio Society meets each Tuesday from 7 to 9pm in the winter at The Lilacs Pub, Church Street, Isham, Northants NN14 1HD and in the summer at the Carpetbagger Aviation Museum, Sunnyvale Farm Nursery, Harrington NN6 9PF. Foundation, Intermediate and Advanced courses are held regularly.

SHROPSHIRE

Salop ARS
Richard Golding. Tel : 01743 356195
The Salop Amateur Radio Society meets in The Telepost Club, Railway Lane, Abbey Foregate, Shrewsbury SY26BT on Thursday between 8 and 10.30pm.

Telford & District ARS
Mike Street. Tel: (01952) 299677
E-mail: mjstreetg3jkx@blueyonder.co.uk
www.tdars.org
The Telford & District Amateur Radio Society meets on Wednesdays at the Little Wenlock Village Hall, Malthouse Bank, Little Wenlock. Telford TF6 5BG at 8pm.

SOMERSET

North Bristol ARC
Dick Elford Tel:(01454) 218362
E-mail: g0xay@aol.com
www.nbarc.org.uk
North Bristol ARC meet Fridays at 7.30pm at SHE7, Braemar Crescent, Northville, Filton Bristol BS7 0TD. We are having a field meeting on 18th July to try out portable gear and HF operating on 25thJuly. Our next training course will be for Intermediate exams.

South Bristol ARC
Len Baker. Tel: (01275) 834282
E-mail: g4rzy@msn.com
www.sbarc.co.uk
The South Bristol Amateur Radio Club meets at the Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Road, Whitchurch, Bristol BS14 0LN.

Yeovil ARC
Gary.
E-mail: g.swain@tesco.net
www.yeovil-arc.com/
The Yeovil Amateur Radio Club meets at the Red Cross Centre, Grove Avenue, Yeovil BA20 2BE (on the corner where Grove Avenue meets Preston Road).

SOUTH GLOUCESTERSHIRE

Thornbury and South Gloucestershire ARC
Tony. Tel: (01454) 417048
E-mail: tonytsgarc@beeb.net
http://jma-databases.co.uk/tsgarc/index.php/Thornbury_%26_South_Gloucestershire_Amateur_Radio_Club
The Thornbury and South Gloucestershire Amateur Radio Club meets in the United Reformed Church Hall, on the corner of Chapel Street and Rock Street, Thornbury BS35 2BA at 7.30 - 9.30pm.

SOUTH WALES

Barry ARS
Glyn Jones. Tel: (01446) 774522
E-mail: glyndxis@talktalk.net
www.bars.btik.com
The Barry Amateur Radio Society meets on Tuesdays from 7.30 to 10.30pm in the Sully Sports & Social Club, South Road, Sully CF64 9TG. July 8th Talk by Ivor MW3UNM on C.A.V.R.A. Cardiff & Vale Rescue Association. Over the period July 24th to 29th we're holding the BARS expedition to Flatholm Island EU124, on August 12th it's our 'Table Top' Junk Sale in club house all welcome, September 9th we have a talk called 'Starting in Microwaves' by Keith Winnard GW3TKH.

SOUTH YORKSHIRE

Axholme Radio Club
John Fennell. Tel: (01427) 872522
E-mail: g4hoy@tiscali.co.uk
The Axholme Radio Club meets at Hollytree Farm, Westend Road, Sandtoft, Epworth DN9 1LB on Wednesdays at 10amm to 4pm, Thursdays at 7 - 9pm and Saturdays from 10am - 4pm (other times by arrangement).

Sheffield ARC
Trevor Wood. Tel: 0114 2216947
E-mail: trevorwood6@yahoo.co.uk
www.sheffieldarc.org.uk
The Sheffield Amateur Radio Club meets at the SYPTE Social Club, Greenhill Main Road, Sheffield S8 7RH every Monday at 7.15pm. Thy hold all three types of classes for the Foundation, Intermediate and Advance levels of licensing. The Sheffield Amateur Radio Club is hosting Sheffield's first Ham fun day, on Saturday the July 19th to be held at the Sheffield Transport Club Greenhill Main Road, Sheffield S8 7RH. Talk in on 145.550/434.550MHz, G3RCM.

STAFFORDSHIRE

Tamworth Amateur Radio Society
Colin Marks. Tel: (01827) 700893
E-mail: colin.marks2@ntlworld.com
The Tamworth Amateur Radio Society meets every Thursday at 7.30pm at St Francis Church, Masefield Road, Leyfields, Tamworth B77 8JB. July 3rd Natter night, 10th constuction/ fault finding, 17th G8TRS on air. And on July 24th it's a talk (tbc).

SURREY

Sutton & Cheam RS
John Puttock. Tel: 020 8644 9945
E-mail: info@scrs.org.uk
www.scrs.org.uk
The Sutton & Cheam Radio Society meets on the third Thursday of the month at 7.30pm in Sutton United Football Club, The Borough Sports Ground, Gander Green Lane, Sutton, Surrey SM1 2EY. In addition to monthly meetings, licence training courses are held at regular intervals in Banstead Surrey.

TYNE & WEAR

Angel of the North RARC
Nancy Bone. Tel: 0191 477 0036
E-mail: nancybe2001@yahoo.co.uk
www.anarc.net
The Angel of the North Radio Amateur Radio Club meets every Monday 7 to 9pm at Whitehall Road Methodist Church Hall at the corner of Whitehall Road and Coatsworth Road, Bensham, Gateshead NE8 4LH. The entrance to radio club room is through door at the side of building next to the car park. The car park entrance is on Whitehall Road. Monday 7th July 2008 from 7-00 p.m. to 9-00 p.m.'talk and take to the air'. July 14th 2008 at 7-30 pm there will be a talk (as yet undecided), July 21st from 7-00 p.m. to 9-00 p.m. 'talk and take to the air'. On Monday July 28th it's also a 'talk and take to the air' evening.

Tynemouth ARC
Tony Regnart. Tel: 0191 280 1981
E-mail: tony.regnart@gmail.com
www.gx0nwm.co.uk
The Tynemouth Amateur Radio Club meets each Friday from 7 to 9pm at St. Hilda's Church, Stanton Rd, North Shields, Tyne & Wear NE29 9QB. It's known locally as 'the church near the fire station'. July 11th - Operating Night and Morse. July 18th Building Blocks Capacitors - Ian 2E0IGB/G0EDK.

WEST MIDLANDS

Aldridge & Barr Beacon ARC
Roy Horton. Tel: (01922) 691646
E-mail: leslie137@btinternet.com
www.g0neq.co.uk
The Aldridge & Barr Beacon Amateur Radio Club is a daytime club and meets at the Aldridge Community Centre, Middlemore Lane, Aldridge, Walsall WS9 8AN on the first and third Monday of every month at 2pm to 4pm. They have a long wire and a 2 metre antenna for radio operation using the club callsign G0NEQ.

Midland AX25 Packet Radio Users Group
Miles. Tel: 01384 254199
www.maxpak.org.uk
The Midland AX25 Packet Radio Users Group, MaxPak, meets on the first Monday of the month at The Sir Robert Peel, 104 Bell Lane, Bloxwich, Walsall WS3 2JS.

Stourbridge and District ARS
John. Tel: (01562 700513)
www.g6oi.org.uk
The Stourbridge and District Amateur Radio Society meets on Monday evenings, except for Bank Holidays at The Radio Shack, Old Swinford Hospital School, Heath Lane, Stourbridge, West Midlands DY8 1QX at 8pm. Tuesday 15th Malcolm G8JTL - Test equipment Overview/Practical hands on. Tuesday 22nd Open Shack Night, 29th Open Shack Night - Tea/Coffee Available along with an opportunity to get on the air or just a natter with whoever attends

Sutton Coldfield RS
Andy Sherman. Tel: (01827) 875155
E-mail: peugeotnut@hotmai.com
www.hamradio.piczo.com
The Sutton Coldfield Radio Society Meets on the second and fourth Monday of the month at 7.30pm (no meeting on bank holiday Mondays) in the Sutton Coldfield Rugby Club, 160 Walmley Road, Sutton Coldfield, West Midlands B762QA.

Wythall Radio Club
Chris Pettitt. Tel: (07710) 412 819
E-mail: g0eyo@wythallradioclub.co.uk
www.wythallradioclub.co.uk
The Wythall Radio Club is based at Wythall House, Silver Street, Wythall, near Birmingham B47 6LZ. They meet every Tuesday at 8pm and meetings are informal and friendly.

WEST SUSSEX

Horsham ARC
Andrew Vine. Tel: (01483) 272456
http://www.harc.org.uk/
The Horsham Amateur Radio Club meets on the first Thursday of the month at The Guide Hall, Denne Road, Horsham, West Sussex.

Worthing & DARC
Roy or Joyce. Tel: (01903) 753893
www.wadarc.org.uk
The Worthing & District Amateur Radio Club meets every Wednesday at 8pm in the Lancing Parish Hall, South Street, Lancing, BN15 8AJ. There's a free car park at the rear and full disabled access. Visitors are always welcome.

WEST YORKSHIRE

Pontefract & District Radio Club
Colin. Tel: (01977) 677006
E-mail: info@pontefractradioclub.org
www.pdars.com
The Pontefract & District Radio Club meets every Tuesday from 7pm and Thursday from 8pm at the Carleton Centre, Carleton Grange, Carleton Road, Pontefract, West Yorkshire WF8 3RJ.

WILTSHIRE

Trowbridge & District ARC
Ian Carter. Tel: (01225) 864698
E-mail: ian.l.carter@btinternet.com
http://uk.geocities.com/tdarc@btinternet.com
The Trowbridge & District Amateur Radio Club meets at Southwick Village Hall, Southwick (nearest postcode is BA14 9QN). On July 16th there's a Natter night (alternative DF night if the weather is bad on 4th). On August 6th its' Radio Codes &Standards (TBC) with Peter Chadwick G3RZP, On August 20th it's a Natter night

WORCESTERSHIRE

Worcester RAA
Martin Carter. Tel: 07976 917987
E-mail: secretary@m0zoo.co.uk
www.wraa.co.uk
The Worcester Radio Amateurs Association meets on the second and fourth Tuesday at the Hallow Scout HQ, off Main Road, Hallow, Worcester WR2 6PP. Visitors, as always, will find a warm welcome at the new clubhouse, as will potential new members.

Club Secretaries

Please remember to include full details of your club, E-mail and telephone contact details and the postcode of your meeting venue - it helps potential visitors to find you!

Colin Redwood's

what next?

Colin Redwood G6MXL chats about antennas and looks at a few more of the factors needed for efficient operation.

Last month, I looked at one of the most important aspects of an effective antenna system, namely resonance. This month I'm going to look at a few more factors that contribute to an effective antenna system. These are the height above the ground, feeder loss, polarisation and orientation.

First, let's look at height above ground and from a safety point of view, antennas should be mounted at least above head height. It's considered generally unsafe from both a physical and electrical point of view for someone to be able to walk into and touch an antenna. In addition, height is an important consideration for high frequency (h.f.) and very high frequency (v.h.f.), ultra high frequency (u.h.f.) operations, but for slightly different reasons.

At h.f. the height above the ground will affect the angle of radiation, which in turn will affect how far we can work. In practice, h.f. antennas that are mounted low to the ground (well below a quarter wavelength above the ground) will send most of their signals almost vertically up into the ionosphere, from where it will be refracted back down to earth almost vertically. This is fine for making contacts with stations within a few hundred kilometres see **Fig. 1**.

To make contacts with stations further afield, the height of the antenna needs to be increased so that more of the signal leaves almost horizontally, so that it will be refracted by the ionosphere many more hundreds of kilometres further from our stations. Getting the antenna mounted at least a quarter wavelength above the ground will give some useful amounts of low angle radiation.

At 14MHz (the 20m band) low angle radiation means getting the antenna 5m (about 16 feet) or higher above the ground, which is quite feasible for most Amateurs. On the lower frequency bands such as 3.5MHz (80m), getting an antenna a quarter wave up at 20m (66 feet) is not feasible for most Amateurs, who consequently have to settle for working stations on 3.5MHz much closer to home than on 14MHz.

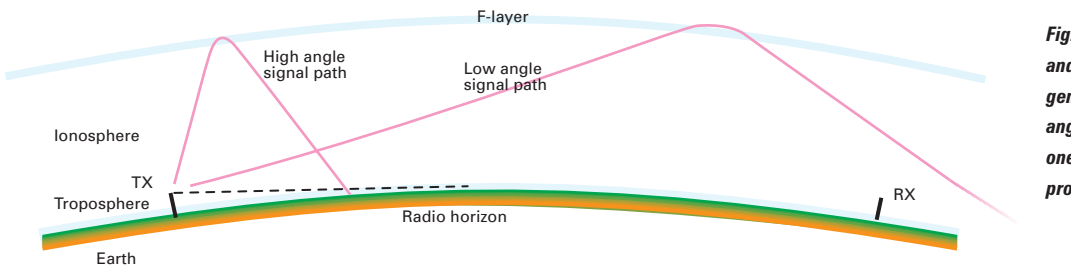


Fig. 1: Diagram showing high and low angles of radiation. In general, low antennas give high angle radiation, high-mounted ones give a lower angle of propagation.

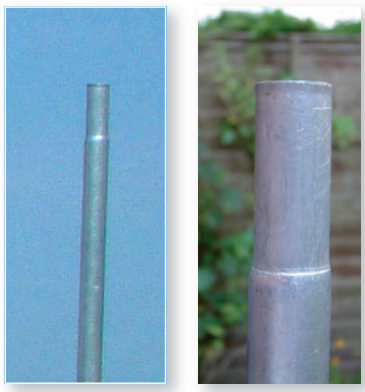


Fig. 2: The swaged type of aluminium pole used by G6MXL. Colin advises that buyers checks the diameter of poles on sale to ensure available clamps will fit them.

Different Heights

Readers who built the 14MHz dipole from last month's *What Next?*, might like to experiment with the antenna mounted at different heights. Try the dipole at – let's say – 1m above the ground and see what stations you can work and then try it at a height of 5m or higher above the ground and see if you can work more distant stations.

Be careful when operating the antenna at low heights that nobody trips over the antenna or touches it. (It's easily done!).

At v.h.f. and u.h.f. the height is also important, but for somewhat different reasons to h.f. Local obstructions like the neighbour's shed, houses and local vegetation will all attenuate signals at v.h.f.

Raising the height of the antenna will start to clear these local obstructions. The higher the antenna, the more obstructions are cleared and hence the transmitted signal locally is stronger.

The small back garden of my QTH is barely 10m x 10m, and a tower would totally dominate it, and the neighbours' properties. However, I was determined to get on the air as best I could.

At a local rally, I purchased a set of 4 x 1.5m (5ft) aluminium swaged poles which slot into each other, **Fig. 2**. These I hoped would support either the middle or the end of an h.f. dipole for 14MHz (20m). I also bought the smallest triple-band vertical I could find covering 50MHz (6m), 145MHz (2m) and 433MHz (70cm) bands to go on top.

If *WN?* readers are thinking of doing the same, I suggest that before they buy the aluminium swaged poles, they check the minimum and maximum diameter pole that the antenna clamps will fit. Most antenna clamps require a minimum pole size of about 32mm (1.25 inches).

Colin Redwood G6MXL
PW Publishing Ltd.,
Arrowsmith Court,
Station Approach,
Broadstone,
Dorset BH18 8PW
E-mail: what.next@pwpublishing.ltd.uk

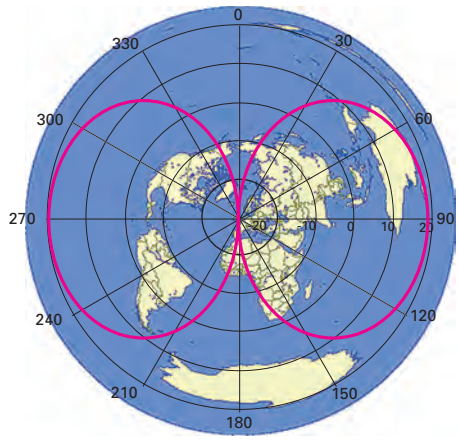


Fig. 3: With the antenna running North-South, it's usable over most of populated world, but is poor on Antarctica and New Zealand

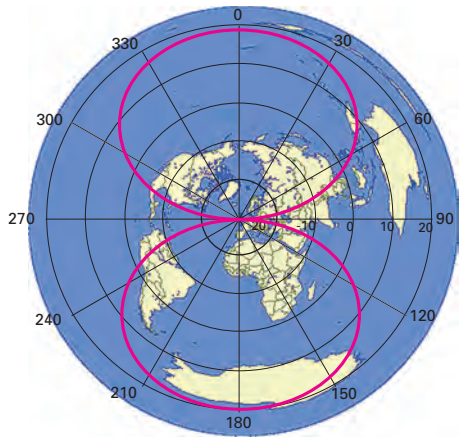


Fig. 4: With the antenna running East-West, New Zealand and Antarctica are covered, but now the pattern doesn't favour Australia.

Fig. 5: A Great Circle map shows the direction of the shortest path to anywhere else in the world, but the countries look very distorted. This map is based on path direction from UK stations to be found at the centre if this map. Great circle maps for other countries will look very different!

Initially I installed the antenna on the top of just two of the poles and fed it with 20m of RG58 coaxial feeder. On connecting this to an old 433MHz (70cm) f.m. transceiver I was quite disappointed with the results. I could just get into the GB3SD repeater between Dorchester and Weymouth some 40km (25 miles) away and I couldn't even hear GB3SZ in Bournemouth about 12km (7 miles) away.

Next, I decided to raise the height of the antenna by installing a third section. This enabled me to hear and get into GB3SZ, but it was very noisy with me. Raising the antenna again by installing a fourth section helped – I could then reliably get into both repeaters but they were still not fully quieting (there was still some noise).

I lived with set-up described for some weeks, until I did some checks on the feeder loss. In good condition, 20m of RG58 has a feeder loss of 8dB, so only about 15% of the power that the transmitter produced was getting to the antenna. I used 10W in the shack, so only about 1.5W would get to the antenna! Likewise, only about 15% of the signal received by the antenna was getting to the receiver.

By replacing the RG58 feeder with the thicker UR67 feeder, the losses dropped from 8dB to just 3dB, so that 50% of the power of the transmitter then got to the antenna and 50% of the signal received at the antenna got to the receiver.

Using the lower loss feeder, the improvements are quite dramatic. Both repeaters are now both fully quieting. In addition, I can open both repeaters reliably.

Incidentally, don't forget that as you reduce feeder loss you may find that the s.w.r. appears to increase. High feeder loss can mask a high s.w.r. in the antenna. Less of the forward power actually gets to the antenna (due to the feeder loss), and any that's reflected back down the feeder is also attenuated by the feeder loss. A double Whammy!

Antenna Polarsation

Antenna polarisation is an important

Colin's waiting to hear from You!
I like to solve problems with anything to do with amateur radio! I can answer questions and publish my findings here for the benefit of all *PW* readers.

Remember the mains supply is potentially lethal. Unless you really know what you are doing, always pull the mains plug out, do not just switch off at the wall socket, when working on equipment.

consideration on the v.h.f. bands. If you're using a vertically polarised antenna – and the station you want to work is using a horizontally polarised antenna – then you will find that you will both be very weak with each other.

If you both use the same antenna polarisation, then the signal strengths will be much stronger. You can easily prove this by making a 145MHz (2m) dipole.

Try mounting it horizontally and trying to get into your local 145MHz repeater (which all use vertical polarisation). Even if you can get into the repeater, you'll find that it is much weaker with you than if you mount the dipole vertically.

Over the years the almost universally accepted practice on the v.h.f. and u.h.f. bands is that local f.m. contacts are made using vertically polarised antennas. On the other hand s.s.b. and c.w. contacts are made using horizontally polarised antennas.

Antenna polarisation is not as important on the h.f. bands as it is on the v.h.f. and u.h.f. bands. The main reason for this is that at h.f. the polarisation of the signal is distorted once a signal has been refracted by the ionosphere.

Antenna Orientation

There is one further aspect to many antennas that's worth considering – orientation. A horizontally polarised dipole will radiate strongly at right angles to the wire. However, the radiation in the direction along the length of the wire can be quite weak. Thus a dipole running North–South will generally not give good results to the North–South.

So, *WN?* readers in the South of England for example wanting to make contacts with Scotland should mount their dipole in an East-West orientation. Conversely, readers who wish to make contacts with stations in Eastern Europe should mount their dipole North-South. (See **Figs. 3** and **4** for UK polar diagrams).

To help orientate antennas (whether they be simple dipoles or large multi-element arrays), Great Circle maps are produced. These show the world with a given location in the centre.

It's important to appreciate that the direction to many places may not be as many of us would expect. For example I expect that many of us would think that Alaska is in a broadly North West direction form the UK, whereas in reality the shortest route to Alaska from the UK is actually directly North over the North Pole (see **Fig. 5**).

If you find that the only way you can fit a dipole in your garden is in the 'wrong' orientation, you may find that by sloping it, so that one end is much higher than the other, will help. A 'sloper' dipole is shown in **Fig. 6**.

To sum up, a resonant antenna – mounted high up and orientated optimally – is a very good start for h.f. For the v.h.f. and u.h.f. bands, polarisation and low loss feeder are also important considerations.

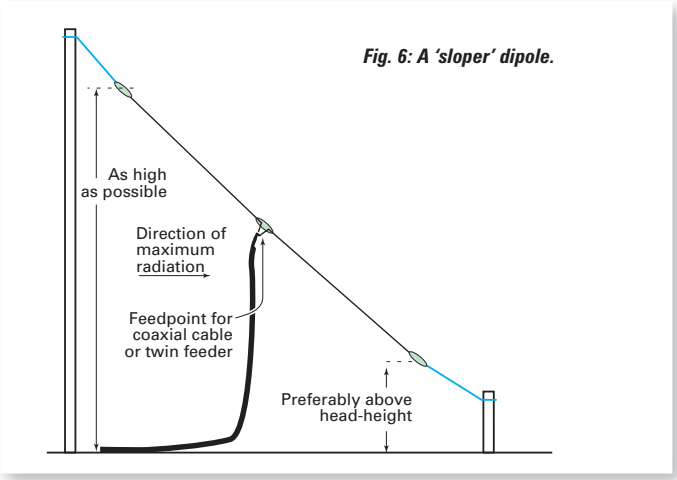


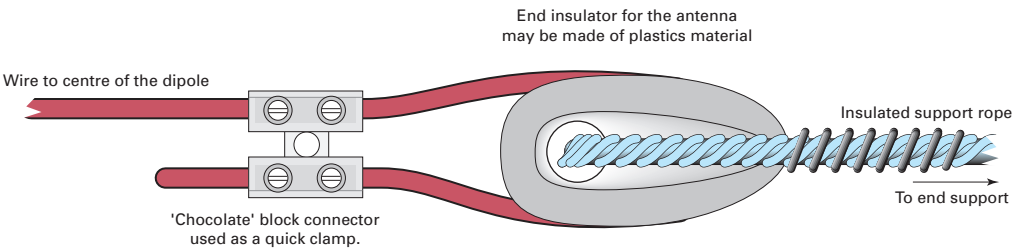
Fig. 6: A 'sloper' dipole.

I'm sure that for many *WN?* readers, it won't be possible to mount a dipole for the 3.5 MHz (80m) band at a height of 20m! Nevertheless, I think it is useful to at least have an understanding of the key factors so that a balance of compromises can be arrived at.

Next Month

Next month, I'll be looking at some practical considerations for a more permanent antenna installation, including waterproofing connections and how to get the feeder from outside back into the shack. Then *WN?* readers should be able to get plenty of contacts – if there's good propagation and activity on their chosen bands!

Whatever you are doing with antennas, please remember to carry out your work safely. You should certainly have someone else to hold any ladders you are using. Have a read through the safety sections of the Foundation, Intermediate and Advanced Licence courses – I certainly don't want to lose any *WN?* readers! ●



Thanks to all those readers who took the trouble to say that the egg-insulator, shown in the July *What Next?* column was shown being used in the 'wrong' way. It was left as shown, as the explanation was of a temporary structure, and modern plastic insulators are strong enough to handle the tension for a short time.

I've shown the correct way of using an end-insulator here, where the body of the insulator is compressed between the support rope and the wire element. Note also the use a section of 'choc-bloc' wire connector as a clamp!

www.nevadaradio.co.uk

for unbeatable deals online

SAVE £50

Alinco DJ-596
Dual band Handheld radio

Easy to use 144/430 MHz radio with optional digital voice communications. CTCSS & DCS encode + decode are standard, along with a variety of tone bursts for repeater access or selective calling.

- VHF/UHF Tx/Rx including cross-band split operation
- Extended RX: 136-174, 400-511 MHz
- 100 memory channels, any mix of UHF/VHF
- Channel steps: 5, 10, 12.5, 15, 20, 25, 30KHz
- 5 Watt output (4.5w UHF)
- VFO or Memory scan
- Optional Digital Voice board
- Clone function

~~£149~~ **£99.00**
P&P £8.00

SAVE £50

Palstar 60Amp
Switch Mode Power Supply

The Palstar SPS-9600 is a whopping 60 amp switch mode supply, with 1 - 15 volt variable output, ideal for those 200W Power hungry HF radios and amplifiers

- Output voltage: 1 to 15V DC
- 60 amp: main terminals
- Large LCD digital display
- Overload: LED indicator
- Auxillary: 5A terminals
- Rear mounted cooling fan
- Fully protected
- Dimensions: 220w x 110h x 360d mm
- Weight : 5.8kg

~~£179.95~~ **£129.00**
P&P £8.00

SAVE £20

Daiwa 801HP
SWR Power Meter

A superb top quality meter for 1.8 to 200 MHz - all that you will require in your station, for measurement of SWR, Average and Peak Power. Through bulk purchase we are offering this meter at an unbeatable price for a limited time

- Frequency: 1.8~200MHz
- Power: 20/200/2KW
- Impedance: 50 ohm
- Connectors: SO239
- Illuminated display: (13.8V DC 70mA required)
- Dimensions: 157(W) x 112(H) x 116(D)mm
- Weight: 1kg

~~£99.95~~ **£79.95**
P&P £8.00

ICOM Radios
BEST PRICE!

Icom IC-7000	mobile
Icom IC-7700	New HF+6
Icom IC-756 Pro III	HF+6 base
Icom IC-7400	base
Icom IC-703	mobile
Icom E91	handheld
Icom E92	handheld
Icom E2820	mobile

YAESU Radios
BEST PRICE!

Yaesu FT7800	mobile
Yaesu FT8800	mobile
Yaesu FT1802	mobile
Yaesu FT450	HF base
Yaesu FT450	ATU base
Yaesu FT857	mobile
Yaesu FT897	portable
Yaesu FT817	portable

Visit our web site for the very keenest prices !

order online - 24 hours a day - 7 days a week

nevada® radio

OR IF YOU PREFER CALL OUR HOTLINE 023 9231 3090

email sales@nevada.co.uk

address Unit 1, Fitzherbert Spur, Farlington, Portsmouth, PO6 1TT

showroom hours Monday - Friday 9am - 5.30pm

The Comet H422 Rotary Dipole

When I was asked by the Editor to review a rotary dipole, I wondered just what I was going to say about it – I had envisaged a piece of wire with a feeder attached! However, the Comet H422 turned out to be something very different from the antenna I had imagined!

The antenna arrived in a sturdy cardboard box and seemed quite heavy for a dipole! I unpacked it and found the contents shown in **Fig 1.** It's in fact a four-band trapped rotary dipole, intended to be mounted as a normal horizontal dipole or in a V configuration.

As this is the sort of antenna that would be considered by somebody with limited space in which to erect antennas, I decided to erect it as a V configured dipole. As a V-antenna the leaflet states that it should work well at a height of only three metres above ground.

The Comet '422 covers the 7, 14 , 21 and 28MHz bands with a voltage standing wave ratio (v.s.w.r.) of less than 1.5:1 at the centre frequency. It can handle 1kW and is fed with 50Ω coaxial cable. It's also supplied with a CBL-2000 2kW balun as standard and the traps can also handle high power.

Easy To Assemble

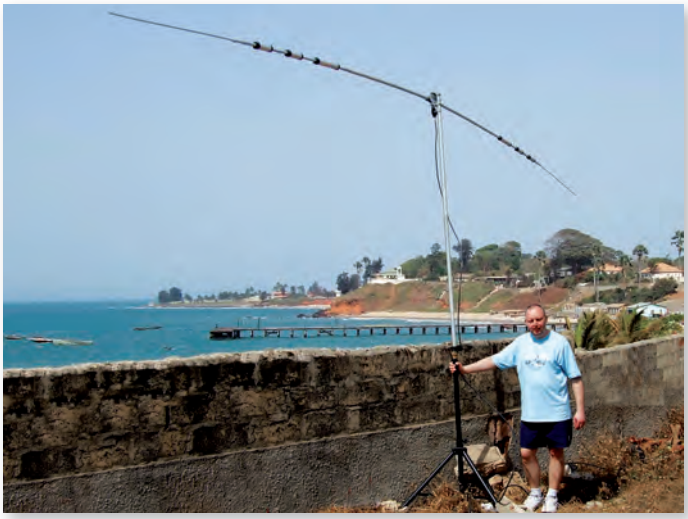
The antenna is easy to assemble and it took me only about an hour. The instructions are clear but have the usual amusing standard of Japanese–to–English translations. I had also to watch out for the fact that the 7MHz element tips are not equal lengths. For the purpose of the review I decided to set it for the c.w. sections of the bands.

Construction is good and all screws/nuts/bolts are stainless steel. The centre mounting plate is galvanised steel.

There are two main settings on the antenna, one for the c.w. end of the bands and the other for s.s.b. For the purpose of the review I decided to set it for the c.w. sections of the bands.

I mounted it on my small test tower, which when cranked down puts the dipole at about 12m(40ft). Mounting the antenna on my mast really requires two people as it becomes unwieldy trying to hold it in place and clamping it to the mast at the same time. The balun has to be mounted to the support mast just below the dipole.

There are two leads from the balun to the antenna and the balun has an SO-239 coaxial cable connector to connect it to the transmitter. However, I had a slight mishap when luffing* the tower to vertical.



Darren Collins G0TSM operated C52T in The Gambia, Africa using the Comet H422 in the purely horizontal mode recently.
(photo copyright and courtesy of G0TSM)

My hedge had grown out and the dipole became caught and the top 7MHz section became slightly bent, as can be seen from **Fig 2.** I decided to put it up at about the height that some of the newer licencees might be able to, namely 10m (30ft).

The antenna is actually just over the head unit and the mast is about 5.5m (18ft) above it with my v.h.f. verticals at the top. (Ideally it should be at the top of the stub mast on its own).

I was soon to find that the Comet 422 is an ideal h.f. antenna for restricted space locations. It's especially effective in the V configuration and the antenna shows performance on the 7, 14, 21, and 28MHz bands that belies its relatively compact size and low visual profile.

****In sailing, **luffing** refers to when a sailing vessel is steered far enough toward the direction of the wind or a sail is raised. In this case, Norfolk-based Roger G3LDI (Norfolk is the home county of **Lord Nelson**) who lives not far from the Norfolk Broads is reflecting his county's maritime heritage! **Editor**.***

Resonance Results

Next, I connected my MFJ Antenna Analyser and looked at resonance. These readings are interesting inasmuch that I had set the antenna to the c.w. portion of each band.

The results are as follows. On the 10m band the resonant frequency was 28.250MHz. The v.s.w.r. was less than 1.2 : 1 at resonance and in fact the whole 10m band is less than 2:1 (increasing only when it was over 29.7MHz.)

On the 15m band the resonant frequency was

Roger Cooke G3LDI wondered just what he was going to review until the antenna arrived from Nevada!

21.090MHz. The 2:1 bandwidth was 21.0 to 21.315MHz

On the 20m band the resonant frequency is 13.98MHz. (This is very close to the band edge and the bandwidth is slightly less on this band). On test I found the 2:1 bandwidth is viable up to 14.075MHz

On the 40m band the resonant frequency is 7.040MHz, (nicely in the c.w. section of the band). After my tests I found that the 2:1 bandwidth extends up to 7.085MHz.

Note: I would have to investigate and try to correct the results if the Comet antenna was to become a permanent installation, although they aren't too far out.

Fig. 1: The contents of the stout cardboard shipping box laid out prior to assembly.

Product information

Comet H422 Rotatable Dipole

Company: (UK Agent) Nevada Radio

Pros & Cons

Pros: Well made and easy to assemble. Ideal for the beginner and experienced operators for home installation where space is a problem and useful for portable and DXpedition work.

Cons: No WARC bands

Price: £199 plus £10 p&p.

Supplier: My thanks for the loan of the review antenna go to **Nevada Radio, Unit 1, Fitzherbet Spur, Farlington, Portsmouth, Hampshire PO6 1TT. Tel: 023 9231 3090, FAX 023 9231 3091, E-mail sales@nevada.co.uk website www.nevadaradio.co.uk**

Fig. 2: The Comet H422 in use at G3LDI – shown erected in a low 'V' format.

On The Air

On the air the '422 seemed quite lively and on 14MHz, using c.w., I worked some stations in Europe, USA and Russia, including a UA9 in Asiatic Russia. On 7MHz I worked into EU and chatted with a DL station for some time. (The 21 and 28MHz bands were dead, so no contacts there!).

However, I noticed that there were a few birdies audible on my receiver that weren't audible on my SteppIR beam. It could be due to the antenna's mounting situation and it might improve if it was in the clear and not surrounded by other antennas, bearing in mind that I'm running two computers all the time with the BBS/Cluster.

I also did a test using s.s.b. on 14.337MHz with the Ex-G net east coast USA stations, perhaps unfairly by using the '422 and my 4-element SteppIR beam, which is mounted at 33.5m (110ft). Propagation was also poor and I was expecting poor reports, **Walter K1YZW** gave me R 3 to 4 and S3 whereas on the SteppIR I was 5 and 8. **John AB4ET** in Florida gave me 5 and 7 on the beam and barely readable on the dipole. I was running 100W at the time, although the v.s.w.r. at the top of 14MHz was 4.8 : 1 so it wasn't quite a fair test and I wasn't really comparing the Comet to the beam!

If the Comet '422 was to be a permanent installation, I would use Penetrox on the joints and tape the joints too, especially where they are bolted together. The visible holes also need taping for a permanent installation.

After my on the air tests I've formed the opinion that the '422 would be a very good starter antenna covering four bands, for a new licence and a very useful addition for the more experienced operator for portable operation. It's also been used by DXpedition operators like **Darren Collins G0TSM** when he was in The Gambia C52T recently – and he was certainly putting out a good signal!

I think it's always useful to have a dipole as well as a beam, especially if you're interested in contesting, as it would be easier to work into Europe with this antenna rather than use a beam at a more elevated position with a lower angle of radiation.

The Comet 422 is certainly quite a useful antenna, showing some directivity too, and also the typical dipole end effect, is well made and easy to assemble. My thanks to Nevada for the loan and apologies to **Mike Devereux G3SED** for the bent 7MHz tip!

●

Editorial comment: *Mike Devereux G3SED, is well known for being Managing Director of Nevada Radio in Porstmouth, Hampshire and also as a very active Radio Amateur. Below, Mike accepts my invitation to comment on the Comet 422 rotatable dipole.* ***Rob G3XFD***.

Mike G3SED replies: Thank you for letting me see a copy of Roger Cooke G3LDI's review on the Comet H422 rotatable dipole, particularly as I have used one myself. At first, Roger's comparison with a beam seemed a little unfair. However, for your information I have done comparisons of an identical 3-element mono band yagi on 18MHz – one at 35ft and one at 100ft high from my QTH when developing the Trident beams – and on some paths the higher beam was 1 to 2 S-point up on the lower one! Of course, it depends on angle of arrival of signals – so sometimes the reverse was true for high angle signals on the lower antenna.

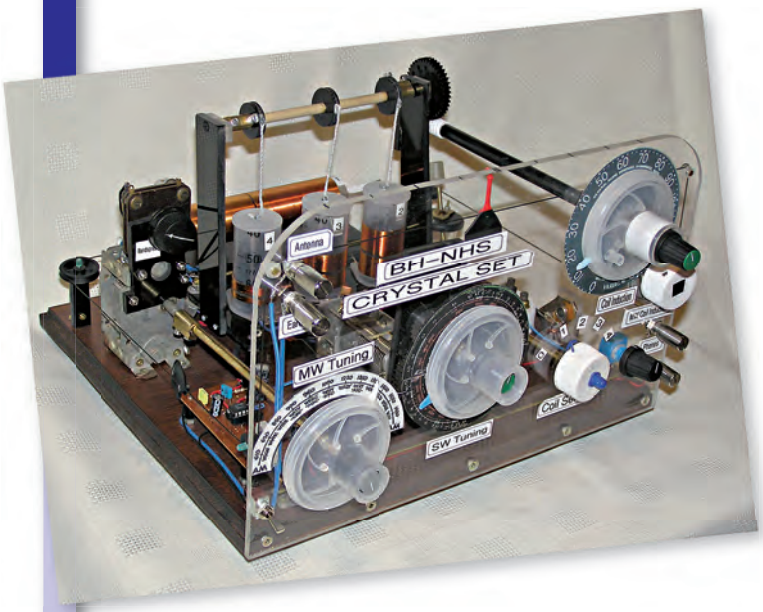
This antenna has proved itself and, as Roger mentioned himself, has been used by DXpedition operators like **Darren Collins G0TSM** when he was in The Gambia C52T recently (heading photograph) – Darren worked the world on h.f. with it and always had huge pile ups – see **www.g0tsm.com**

The point of this antenna is that it will allow anyone to get on the h.f. bands with a respectable signal either from home, operating portable or on a DXpedition easily – I've found that it's as good as a monoband wire dipole on each of its bands of operation. But of course, just the one rotable antenna covers 7, 14, 21 and 28MHz!

I found when I played with this antenna up at 55ft high it had quite large nulls off the end which was useful to cut out interference or to point the main lobe in the direction I wanted to work.

Thank you Roger G3LDI and best wishes to everyone. **Mike G3SED**.

The NHS SW/MW Vintage Crystal Set



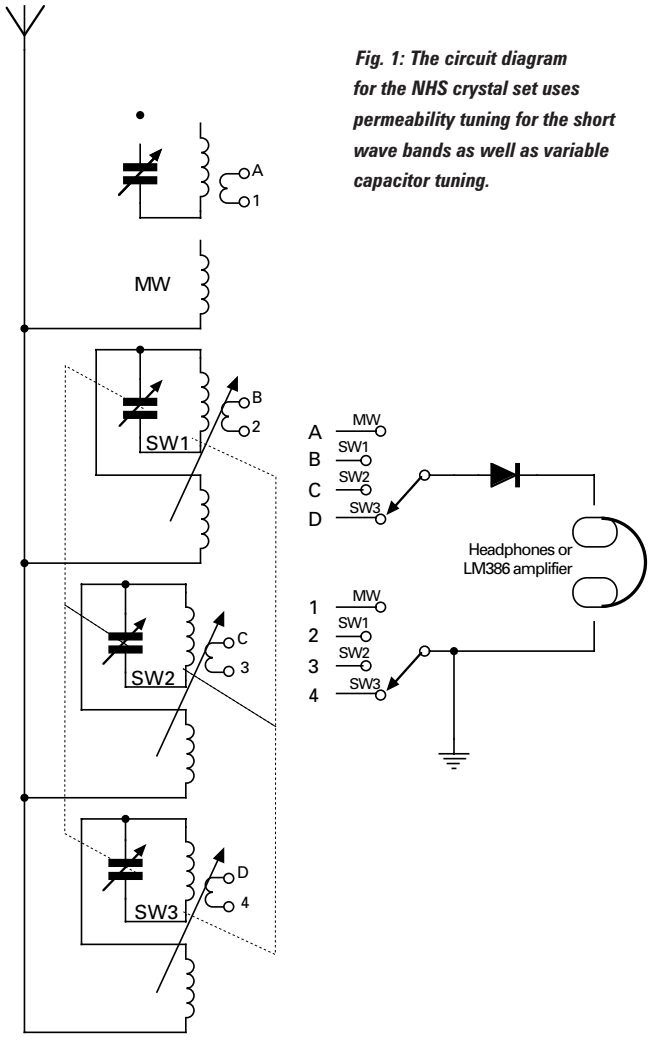


Fig. 1: The circuit diagram for the NHS crystal set uses permeability tuning for the short wave bands as well as variable capacitor tuning.

Practical construction work is enjoying a genuine renaissance at my local Bedfordshire club, the **Shefford and District Amateur Radio Society** (SADARS). Encouraged by our more 'professional' colleagues and a successful club project or two, the number of entries for the annual construction contest has grown in the last few years. The situation arose where, on the evening of this year's SADARS Golden Jubilee event, extra display tables were needed to cope with a wide variety of exhibits!

For the 'Old Timers' such as myself, it did our hearts good to see the variety and the ingenuity of the work ranging from simple lash-ups and kits to advanced microwave systems and a worthy return to complex 'metal bashing'! The best of these gained the appropriate awards but one item in particular was outstanding and, naturally, won the 'Novice Trophy' for a first time entry by a new member.

Designed By M0ZAR

The 'NHS SW/MW Crystal Set' designed and built by **Sydney Smith M0ZAR**, sat there on one of the three tables for this category and was soon surrounded by

Presentation of SADAR's 2008 'Novice Trophy' to M0ZAR (right) by Ken Amos G4YRF, Chairman of SADARS. (Photo by Peter Webb)

Victor Brand G3JNB provides a very unusual valve & vintage session as he reports on a unique example of Amateur Radio adaptation skills.

an intrigued membership. The very idea of such a vintage 'repro' set and a short wave version to boot, caught the imagination of all!

The breadboard-style set was lovingly presented with straight-line wiring, the coils had permeability tuning pistons and the front panel was reminiscent of the glorious days when listeners were invited to *Hear what the Wild Waves are saying*! Old hands gazed in rapture at this vision from the past that, nevertheless, seemed to still be relevant in the 21st century.

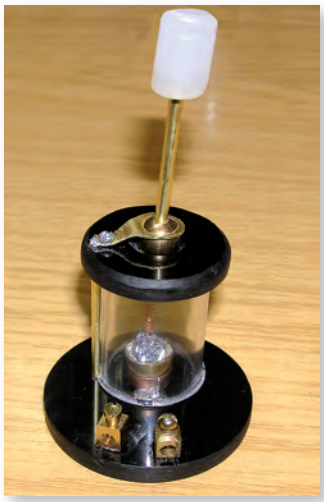
The 'solid state', new kids on the block were in awe of the example of their art that harked back to their great-grandfather's concept of a cutting-edge broadcast receiver. However, they were quietly pleased to see that a small LM386N integrated circuit (i.c.) audio amplifier had crept onto the board to help boost audio output!

Readers might think, 'A triumph of construction work, but what's so unique about it'?' Well, many of the components didn't come from an Amateur Radio junk box or, indeed, the Maplin's catalogue. In fact they were 'liberated' from the uncontaminated waste bins of the operating theatres at Bedford Hospital where Sydney is a Maxillofacial and Oral Surgeon.

Sidney spends his whole life reassembling badly injured people and he'd noticed the 'handy' looking tubes and plastic items that ended up in the rubbish bins. Any true Radio Amateur, who habitually says, 'What could I make out of that'? So, Sydney confounded his nursing staff and colleagues by retrieving some of these items and wandering off with a knowing look on his face!

Previous Existence?

"Sydney, just what did this stuff do in its previous existence?" I asked and, "just how did you come to build such a delightful repro radio?"

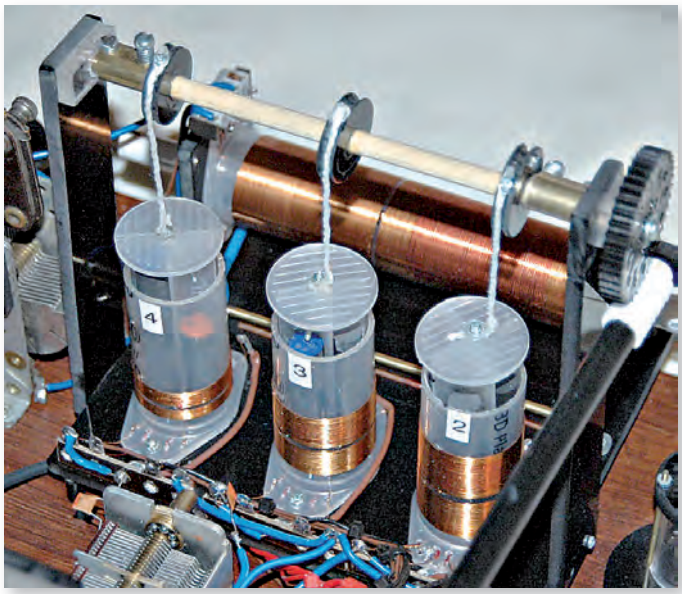


A specimen pot has become the container and cover for the Galena-based detector (diode).

Sydney quickly explained that, "I have always loved the idea of the crystal set and it seemed such a waste to see those high quality 'coil formers' going begging. I thought that I would just try to recycle some of the stuff, using it to construct a particular circuit called *The Mystery Crystal Set* by Proton that had caught my eye in an internal magazine. The very idea of presenting my colleagues with a radio made from hospital rubbish was attractive and the possibility of a medium and short wave radio set that was so 'green' that it used zero power (before I added the i.c.) was bound to cause a laugh!

"The outer tubes of 50ml (millilitre) theatre syringes were obvious coil formers and their plungers made ideal permeability tuning controls! Endotracheal air filters and small specimen jars (with a little surgery) became dials and I used some cellophane from a surgeon's visor in the medium wave coil as a guide for its ferrite core!

"Another specimen jar serves as a 'Pacent' detector and dial pointers are made from scrub finger nail cleaners and odd theatre cable ties!"



The three permeability (variable inductance) tuned short wave coils, wound on syringe bodies, sit in front of the fixed medium wave coil.

By then I was bursting with questions and asked, "Sydney, the wiring is so neat and the presentation a joy to behold. Just how did you achieve that veteran look without compromising performance?"

Amused at my reaction Syney chuckled, "Victor, it is really a con! I just used stiff diathermy wire and Superglued it to the base! The effect, however, is of a 1930 broadcast set and certainly rang a few bells at our club meeting!"

Does It Work?

At this point, I just had to ask the obvious question,"Does it work?"

"Oh yes", Sydney replied immediately and then proceeded to describe how, with a 30m wire aerial, he has heard Dutch and German a.m. stations on short waves (h.f.) and most of the local m.w. broadcasters. Apparently, the switched coils permit coverage from 530kHz right up to 9MHz!

"So, Sydney, what about the circuit itself?" I asked.

Sydney replied with a conspiritorial smile, "Proton's design was actually published way back in 1932 in the Brisbane *Sunday Mail* in Australia. A **Mr. Ken Harthun** modified it for short wave reception and I adapted it to suit my own thoughts (**Fig 1**). It seemed to me that the very idea of s.w. listening with such a set had been much neglected and so, I got to work, making changes as I went along. It really has been a wonderful experience developing the set – and to see the reaction of the Bedford Hospital team when I walked in with it and re-introduced them to their discarded junk!"

As G3JNB has been involved with home-brew club contests for over 60 years I can honestly say that in all that time I really have not seen anything like Sydney's creation! For sheer ingenuity and the creative use of pure junk, resulting in such an attractive and viable receiver, the 'NHS' surely is an all time winner in my book.

But, then, perhaps Sydney's rather special professional skills do account for the meticulous way he presented his little masterpiece? The club members at SADARS obviously thought so too and unanimously awarded him the **Novice Trophy**.

It is good to find that the true 'amateur' spirit is alive and doing well at my own club. It really is a case of, 'Nice one Sydney!' ●

rallies

Radio rallies are held throughout the UK. They're hard work to organise so visit one soon and support your clubs and organisations.

Send all your rally info to
PW Publishing Ltd.,
Arrowsmith Court,
Station Approach,
Broadstone,
Dorset BH18 8PW
E-mail: newsdesk@pwpublishing.ltd.uk

July 13th
McMichael Rally and Boot Sale
M. Standen. Tel: 01189 723 504
E-mail: g0jms@radarc.org
http://www.radarc.org/MMRally.htm
The McMichael Rally and Boot Sale will be held at Reading Rugby Football Club, Holme Park Farm Lane, Sonning Lane (B4446), Sonning on Thames, Reading RG4 6ST, just off the A4 East of Reading, Berkshire. It is a large site and the boot sale area is on level ground. There will be Special Interest Groups, computer equipment, demonstrations and lectures, catering services, a fully licensed bar and plenty of parking areas with disabled special parking on level ground. Gates open at 9.30am and admission is £2. Gates open for sellers from 8.30am. Boot Sale Pitches costs £10, no booking required. Hall traders, tables £10 pre-booked or £12 on the day.

July 25th - 27th
AMSAT-UK Colloquium
Jim Heck. Tel: (01258) 453959
http://www.uk.amsat.org/Colloquium/
AMSAT-UK will be holding their 23rd International Space Colloquium at the University of Surrey, Guildford, Surrey GU2 7XH. The event is open to all Radio Amateurs and SWLs. Either Day passes or full packages comprising overnight accommodation and meals at the University are available. An online booking service is available with PayPal, Visa and Master Card payments accepted.

July 27th
Horncastle Summer Rally
Tony Nightingale. Tel: (01507) 527835
E-mail: G3ZPU@hotmail.com
The Horncastle Summer Rally will be held at Horncastle Youth Centre, Willow Row, Horncastle LN9 6DZ. Tables cost £5 and entry for visitors is £1. The venue is all on one level, making access easier for disabled visitors. Usual refreshments will be available, including hot bacon butties. Doors open 10.30am.

Colchester RA Rally & Computer Fair
David. Tel: 0776 654 3784
E-mail: colchesterradioamateurs@hotmail.co.uk
The 40th Colchester Radio Amateurs Rally and Computer Sale will take place at St Helena School, Sheepen Rd, Colchester, Essex, CO3 3LE. Doors open 10am to 3pm for visitors and 7.30am for traders. There will be all the usual traders, including Waters and Stanton and an RSGB Bookstall, a large number of boot traders, stalls from all the usual clubs and societies and a Bring & Buy. The venue is all on one level with disabled facilities. There is ample parking in the college opposite and limited disabled parking on the field.

August 3rd
West Somerset ARC Radio Boot Sale and Rally
Bob. Tel: (01643) 863462
www.westsomerset-arc.co.uk
The West Somerset ARC Radio Boot Sale and Rally will be held at Allerford Community Hall, Hare Park, Allerford, Minehead, Somerset TA24 8HL Doors open at 10am and admission £1 with children under 16 free. Stands are £5.00 each (indoors and outside) and there will be loads of parking.

August 8th
Cockenzie & Port Seton ARC Junk Night
Bob Glasgow. Tel: 01875 811723
http://www.cpsarc.com/news.php
The Cockenzie & Port Seton ARC Junk Night will be held in the Cockenzie & Port Seton Community Centre (Main Hall). Disabled access is available and entry is £1 with all money donated to the British Heart Foundation. Bring along your own 'junk' and sell it yourself. Tables on a first come, first served basis from 6.30 to 10pm

August 10th
Flight Refuelling ARS Hamfest
Mike. Tel: (01202) 883479
E-mail: hamfest@frars.org.uk
The Flight Refuelling Hamfest will take place at Cobham Sports and Social Club Ground, Merley Park Road, Wimborne, Dorset BH21 3AA. Gates open at 10am and the admission will be £3.50.

King's Lynn ARC 19th Annual Rally and Car Boot
Ray. Tel: (01553) 671307
E-mail: ray-g3rsv@supanet.com
www.klarc.org.uk
The King's Lynn Amateur Radio Club Annual Rally and Car Boot Sale will be held at King's Lynn Caravan and Camping Park, PE33 0QR, (approx 3 miles E of King's Lynn off the A47). There will be free car parking, entry fee is £1.00, pitches £8.00 and doors open at 10am (8am for sellers). There will be trade stands, a Bring & Buy and refreshments.

August 24th
Torbay Annual Communications Fair
Dave Helliwell. Tel: (01803) 864528
E-mail: rally@tars.org.uk
www.tars.org.uk
The Torbay Annual Communications Fair will be held at Newton Abbot Race Course, Newton Abbot, Devon TQ12 3AF. Doors open at 10am for disabled visitors and 10.30am for others. There will be free parking, trade stands, a Bring & Buy and a prize draw.

August 24th
Milton Keynes Rally
Mike. Tel: (07973) 264473
www.mkars.org.uk
The Milton Keynes ARS 50th Anniversary Rally will be held at Holne Chase School, Buckingham Road, Bletchley MK3 5HP. Admission time for Traders is 8am and doors open at 9am for visitors. Admission is £2. There will be on-site catering and Morse tests with certificates available. Outdoor Pitches are £10 (or £7 in advance) and Indoor Stands are £12.00 (advance booking only).

August 25th
Huntingdonshire ARS Bank Holiday Monday Rally
Julie. Tel: 0790 505 2127
www.hunts-hams.co.uk
The Huntingdonshire ARS Bank Holiday Monday Rally will be held at St Neots Community College, Barford Rd, St Neots PE19 2SH. Doors open at 10am and entry is £1.50. There will be trade stands, a Bring & Buy and an RSGB bookstall.

Rugby Amateur Radio Rally
Tony. Tel: 07759 684411
E-mail: tonyg00ls@aol.com
www.rugbyats.co.uk
The Rugby Amateur Radio Rally will be held at Stanford Hall, Lutterworth LE17 6DH (near Rugby – just off A14). Doors open at 10am.

August 31st
Andover Radio Club Boot Sale
Terry. Tel: (01980) 629346
www.arac.co.uk
The Andover Radio Club Boot Sale will be held at Wildhern Village Hall, SP11 0JE (north of Andover) just off the A343. Starting time Vendors – 09:00 hrs Starting time Buyers/Visitors – 10:00 hrs There is car parking and entry fee is £1.

September 14th
Lincoln Hamfest
Roger. Tel: (01522) 693848
E-mail: hamfest@g5fz.co.uk
The Lincoln Short Wave Club will hold Hamfest in Lady Eastwood Hall at the Newark & Notts Showground, Lincoln Road, Winthorpe, Newark, Nottinghamshire NG24 2NY.

October 5th
Autumn Militaria, Electronics & Radio Amateur Hangar Sale
Rod Siebert. Tel: 01270 623353
www.hackgreen.co.uk
The Autumn Militaria, Electronics & Radio Amateur Hangar Sale will be held at the Hack Green Secret Nuclear Bunker, Nantwich, Cheshire CW58AP.

October 10th - 12th
RSGB HF Convention
www.rsgb.org
The RSGB HF Convention will be held at Wyboston Lakes Conference Centre, Great North Road, Wyboston, Bedfordshire MK44 3AL.

October 11th
Chesterfield Rally
Martin. Tel: (01246) 217499
E-mail: martin.briddon@ne-derbyshire.gov.uk
http://GB3EE.com The GB3EE Repeater Group Chesterfield Rally will be held at Hasland Village Hall, Eastwood Park, Hasland S41 0AY (M1 j29/30). Doors open 10am - 4pm and there will be trade stands and a Bring & Buy.

October 12th
Great Lumley AR & ES Rally
David Barclay. Tel: 0191 3888113
E-mail: m0bpm@btinternet.com
Great Lumley Amateur Radio and Electronics Society Annual Rally will be held at the Great Lumley Community Centre, Great Lumley, Front Street, Chester-le-Street, Co. Durham DH3 4JD. Doors open at 10.30am. There will be trade stands and a Bring & Buy.

David Butler's

vhf dxer

Share your news, views and reports with fellow readers. Reports to David by the last Saturday of each month please.

This month David Butler G4ASR reports of Sporadic–E openings during the month of May on the 50, 70 and 144MHz bands.

Welcome to the world above 30MHz! I'm pleased to report that propagation was very good during May with numerous Sporadic-E (Sp-E) openings on both the 50MHz and 70MHz bands. By way of variety, one auroral (Au) back-scatter opening and one event consisting of Sp-E linking into a trans-equatorial propagation (t.e.p.) path were also reported on the 50MHz band.

There were even a couple of Sp-E events on the 144MHz band, one of them into Russia and the other into Portugal. Tropospheric propagation on the 144 and 430MHz bands wasn't particularly good though with only occasional enhancements up to 1000km being reported.

The 50MHz Band

Sporadic-E propagation was reported on the 50MHz band virtually every day throughout May. It was just as if someone had thrown a switch and my records show that over 60 countries were worked from somewhere in the UK during the period!

In addition to the usual European countries were DX rarities such as CN8KD (Morocco), CU2JT (Azores), EA9IB (Melilla), ER3MM (Moldova), EX8MLE (Kyrgyzstan), J49K (Crete), OH0/PA3BAG (Aland Islands), OJ0J (Market Reef), T77GO (San Marino), TA7KA (Turkey), TF8GX (Iceland), 4L3Y (Georgia), 4X4DK (Israel), 5B4FL (Cyprus) and 7X4AN (Algeria).

One of the best days during the period was May 24th with the 50MHz band being wide open for DX contacts between 0455UTC through to 0005UTC the following day. Around 40 countries were worked from the UK and at 1536UTC a 4264km path opened up between the stations of MM0BSM (IO86) and 5U5U (Niger JK38). **Andy Foad G0FTD** (Kent JO01) mentioned that he went looking for TV signals during the opening and received broadcast stations in Hungary (49.744MHz), Italy (53.739MHz & 53.749MHz), Poland (49.749MHz), Portugal (55.249MHz), Russia (49.739MHz) and Spain (48.249MHz).

Transatlantic openings were reported on May 25th, 27th, 28th, 29th, 30th and 31st, allowing contacts up to 8000 kilometres to be made into North and South America and the Caribbean islands. Some of the stations worked from the UK included FJ5DX (St. Barthelemy), FY1FL (French Guiana), HI3TEJ (Dominican Republic), KP2A (Virgin Islands), KP4EIT, KP4YI, NP3CW, WP3UX, WP4AZT anmd WP4G (Puerto Rico), V44KAI (St. Kitts & Nevis), W1JJ (USA), YV4DDK (Venezuela), 8P9TS (Barbados) and 9Y4D (Trinidad).

The 70MHz Band

Activity on the 70MHz band has increased dramatically and it's really good to hear so many UK stations on the air. During Sporadic-E openings the activity can be very intense especially when the band opens up to Italy (I) and everyone is crammed into a 25kHz slot! That's because Italian Amateurs only have access to three 25kHz segments situated near the beacon band, the c.w./s.s.b. area and the f.m. area.

So far this year, UK 70MHz operators have reported working a number of European countries that have included Crete (J49K), Croatia (9A), Czech Republic (OK), Denmark (OZ), Estonia (ES), Faroe Islands (OY), Germany (DI2PM), Greece (SV), Ireland (EI), Luxembourg (LX), Sardinia (IS0), Sicily (IT9) and Slovenia (S5).

In addition to the countries mentioned, Radio Amateurs in Portugal (CT) were given permission on May 31st to use two segments of the Four Metre band between 70.167 - 70.2125MHz (c.w. and s.s.b.) and 70.2375-70.2875MHz (All Modes). This is very good news and follows temporary access in 2007 to frequencies around 70.620MHz, outside of the UK band.

There were a number of excellent Sp-E openings on the 70MHz band during May with 13 events occurring in the last two weeks of the month. Three openings on May 13th, 24th and 27th were particularly good and I'll now look at them in a bit more detail.

The Sp-E opening on May 13th was actually the first to be reported during the month, commencing at 1150UTC and continuing for nearly five hours before fading out around 1645UTC. The opening was quite widespread at the UK end with stations in G, GI, GM, GU and GW reporting numerous contacts into Croatia (9A), Czech Republic (OK), Italy (I), Sicily (IT9DLN) and Slovenia (S5).

Apart from beacon reception all c.w. and s.s.b. activity was crammed between 70.190 - 70.215MHz with one solitary f.m. contact being made up on 70.450MHz.

At the QTH of **Martin Shelley GW3XJQ** (Carmarthenshire IO71) s.s.b. contacts were reported with the stations of 9A1Z (JN86), 9A6Z (JN75), I0DLP (JN61), I6BQI (JN72) and S51DI (JN76). The station of **Ivan Dobnik S51DI** also mentioned hearing the GB3ANG beacon and contacting G4OBK (IO94) on s.s.b. and MW0CXH (IO71) using frequency modulation (f.m.) on 70.450MHz.

An opening on May 24th was really tremendous with the 70MHz band being open via Sp-E for 14 hours between 0830 to 2230UTC. Again all areas of the UK were able to participate with contacts being made into Croatia, Czech Republic, Denmark (OZ), Estonia (ES), Faroe Islands (OY), Germany (DI2PM), Greece (SV), Italy, Luxembourg (LX), Sardinia (IS0) and Slovenia. There was also a period of very short-skip propagation that enabled contacted to be made between stations in Scotland and those in southern England.

Unfortunately though, everyone seemed to be crowded around 70.200MHz the c.w./s.s.b. calling

Fig. 1: The 50MHz and 70MHz antennas at the QTH of J49K in Crete was being operated by Martin Platt G4XUM.

David Butler G4ASR
Yew Tree Cottage
Lower Maescoed
Herefordshire HR2 0HP
Tel: (01873) 860679
E-mail: g4asr@btinternet.com

frequency with the majority of contacts being made between 70.182 - 70.225MHz. Although Italian Amateurs are restricted to very narrow sub-bands, other countries such as 9A, ES, OK, OY, SV and S5 have much wider bands in which to operate.

Dave Edwards G7RAU (Isle of Wight IO90) reported hearing and working a number of c.w. and s.s.b. stations that included GM4JYB (IO88), I0JX (JN61), IK0BZY (JN61), IK0SMG (JN61), IW0FFK (JN61), IZ0CVK (JN61), IK1EGC (JN35), IK4PMB (JN54). The list also included IW4ARD (JN64), IW4BIF (JN64), IK5YJY (JN53), IZ5EME (JN52), I6BQI (JN72), I7CSB (JN71), OY3JE (IP62), S51DI (JN76), 9A1HCD (JN85), 9A1Z (JN86) and 9A2SB (JN95).

Alastair Campbell GM3NKG (Lanarkshire IO85) reports that using the low-power 70MHz transverter featured in this column (May 08) he worked the s.s.b. stations of LX1FX (JN35), I0DLP, IK0BZY, IK0SMG, IW0FFK, IZ0CVK, IK1EGC, IZ5EME and IZ5MAD. Other UK operators reported making contacts with the stations of ES1II/8 (KO18), ES3RF (KO29), ES5AM (KO38), IS0AWZ (JM49) and over 30 different Italian mainland stations, LX1FX (JN35), OK1XFJ/P (JO60), OK2POI (JN99), OZ3ZW and SV2DCD (KN00).

The station of DI2PM (JO30) only made a few contacts into the UK during this opening as he had to make split-frequency QSOs, transmitting on 69.950MHz and receiving signals around 70.190MHz. Having a spot frequency allocation some 50kHz below the UK band makes it very difficult to attract attention other than placing announcements on the DX Cluster or the ON4KST 70MHz Chat page that can be found at **www.on4kst.com**

The Sp-E opening on May 27th was quite interesting insofar that for three hours between 1440-1740UTC the band was open on and off to mainland Greece and the island of Crete. The station of SV2DCD was heard making many contacts into G, GM and GW but it was the appearance of J49K (KM25) that created a fair bit of excitement.

The station of J49K was actually operated by **Martin Platt G4XUM** who was there on holiday and using a Yaesu FT-847 transceiver and a Vine 50MHz/70MHz dual-band 5-element Yagi as shown in the photograph **Fig. 1**.

The 70MHz station of **David G0BHD** (Shropshire IO82) heard J49K calling "CQ" on c.w. but couldn't find his Morse key in time! However, he was able to make a cross-mode contact by using s.s.b. instead. David was using a Yaesu FT-101ZD transceiver with a matching FTV-901R transverter that included a 70MHz module and a Pye A200 amplifier running 60W into a half-wave dipole located in the loft space.

Another station to contact J49K was **Ken Eastty G3LVP** (Gloucestershire IO81). He nearly got caught out hearing what he thought was another G-station until the locator square was given and then he wondered where J49 was! A few moments of panic then ensued as Ken had to swap some cables around to allow him to transmit on 70MHz, fully expecting conditions to change before this was accomplished. Fortunately propagation didn't change and G3LVP was able to bag his best DX on the band, at 2772km, since he first became active in 1962!

During this opening on May 27th the 70MHz station of **Leo Fiskas SV2DCD** (Greece) managed to contact OY3JE (Faroe Islands IP62) on 70.205MHz s.s.b. over a path of 3060km. Leo was using a modified Yaesu FT-847 transceiver and a 9-element DK7ZB Yagi. On the following day **Jan Egholm OY3JE** worked J49K on 70.200MHz c.w. over a 3658km path. These are really tremendous results!

The 144MHz Band

Finally, after a long time of waiting the first 144MHz Sporadic-E opening in Europe occurred on May 24th. The good news was that it managed to make its way into southern England.

There had been activity on the 50MHz band from 0500UTC and the 70MHz band opened up a few hours later. For much of the day the maximum usable frequency (m.u.f.) was very high reaching up to 108MHz at times.

At 1519UTC the 144MHz band opened up to Poland (SP) but literally within two minutes the skip distance had changed and stations in southern England (IO90, IO91, JO01, JO02) reported hearing Russian stations (UA3) until 1545UTC when the Sp-E propagation abruptly disappeared.

Dave G7RAU, running a Yaesu FT-757 transceiver, Mutek transverter and a 12-element Yagi worked SP2JYR (JO92) and RA3LBW (KO64) at 2265km. He also heard the s.s.b. stations of SP5WCK, RA3WDK and UA3WM. **Mark Turner G4PCS** (Hertfordshire IO91) also heard SP5WCK but that station was the only

one copied during the brief 60 second opening at his QTH. **Steve Eldridge G8IZY**, also in IO91 square, heard SP2JYR and RA3LBW both at 59 on 144.300MHz but couldn't attract their attention.

A little further to the east of the UK, the station of **John Wood G4EAT** (Essex JO01) managed to work UA3WM (KO72) and hear UA3UW, both at a distance of 2355km. **Keiron Brunning M0HKB** (Suffolk JO02) contacted SP5WCK (KO12) on 144.303MHz s.s.b. and then heard the station of RA3WDK (KO81) peaking 59+ over a 2373km path but unfortunately couldn't make the contact.

Sporadic-E propagation was very good on May 27th, with the 50 and 70MHz bands open for much of the day. Around 0800UTC, a large Sp-E layer formed above the south western part of the Alps and then moved west to arrive over the Biscay gulf area. The m.u.f. then suddenly climbed very fast reaching the 144MHz band between 1102-1110UTC with the station of **Joe Kraft CT1HZE** (Portugal (IM57) making six contacts into the UK (IO82, IO91, IO92) in a relatively short Sp-E opening.

At 1430UTC a new layer formed over the Balkans and the m.u.f. reached up to 160MHz. At this time the station of RZ6BU (KN84) worked EA6VQ (JM19) and heard EA6FB at paths approaching 3000km. A few hours later stations in Belgium, France and the Netherlands experienced a tremendous opening to Crete (J49K), Greece (SV) and Turkey (TA). Although it didn't make it into the UK, a few east coast G stations did report hearing SV3CYM (KM08) at around 2300km. All in all, it was a good start to the 2008 144MHz Sp-E season!

Fig. 2: The 144MHz and 430MHz antennas at the QTH of YL3GDR.

Deadlines

That's it for this month. Keep a particular look out for openings on the 50, 70 and 144MHz bands as there are still a few weeks left of the summer Sporadic-E season. On the 50MHz band you can expect daily openings through to the end of August.

Keep a look out for transatlantic openings to North America later in the day, sometimes very late in the evening. Sp-E openings should also be observed on the 70MHz band until the end of August but less frequently than those on the 50MHz band.

You should still catch a few openings on the 144MHz band but events at this frequency are effectively over by the end of the July. Don't forget that the Perseids meteor shower peaks on Tuesday 12th August and this will create much DX activity on the v.h.f. bands. Please send me your DX reports or any other news to reach me before the last Saturday of the month. **73 David G4ASR.**

Harry Leeming's

in the shop

Harry G3LLL continues his chat about variable frequency oscillator stability and resumes by looking inside the v.f.o. itself.

Let's start this month's *In The Shop* (*ITS*) by looking at problems inside the v.f.o. itself. My approach is such when I'm sure that frequency drift or jump is not being caused by some external influence, it's time to give the v.f.o. some attention!

Excessive long-term steady drift implies that the temperature compensation is wrongly set. Correcting this can end up being somewhat of a marathon task. So, unless some budding test engineers among my *ITS* readers have plenty of patience and time, and welcome a challenge, they may do better leaving well alone. Just switch the rig on an hour or so before operating and remember you have been warned by Harry!

With some early Yaesu transceivers – such as the FT-101Mk1, Mk2, B, and E, and the FT-200 and '401 – for instance, there's a control to compensate for temperature changes as per the photo and circuit in (*ITS* June 2008). To see exactly what I'm doing while adjusting this control it's necessary to remove the bottom cover from the v.f.o. Removing the cover plates will upset the calibration but don't worry about this until the work is finished and the unit reassembled.

Zero Beat

To set the control, I need to zero beat the rig in the single sideband (s.s.b.) mode against a stable crystal oscillator in the centre of its tuning range on one of the lower frequency bands. I then have to let the v.f.o. warm up for an hour or so and note whether or the main tuning capacitor has to be increased or decreased in capacity to cancel any drift.

If, as is probably the case, the variable capacitor has to be reduced in capacity – I would need to turn the compensating split-stator capacitor so that the negative temperature coefficient (NTC) capacitor is brought more into circuit and the vanes are moved away from the normal positive temperature one. After making an adjustment it will then be necessary to let the rig cool down for about an hour, zero beat, and compare the results again as it warms up.

The process demands a lot of patience time and trial and error and is certainly not the kind of work that I would want to pay someone else to do! It can be hurried along a bit with a hair drier blowing hot or cold air but this has its problems. Small parts such as capacitors warm up and cool down quickly but large parts – such as the coil – change temperature much more slowly.

Typically, I've found that blowing a hot hair dryer on a v..f.o. will cause it to drift first in an higher frequency direction as the NTC capacitors warm up and reduce capacity. Then it will go back (lower in frequency) as the coil and other parts warm and expand.

Later Yaesu v.f.o.s didn't have adjustable compensation fitted, but the values of the relevant capacitors are set in the manufacturing process, as is shown in the circuit of the FT-101ZD/901 v.f.o. in **Fig. 1**. Perhaps it's needless for me to say that what was the correct compensation 20 years or more ago, can by now have drifted off!

The compensating capacitors are C04 and C05 and the value of these can be increased if the v.f.o. is drifting l.f. and more compensation is needed. The simplest way to do this is to try connecting one or two small NTC capacitors (of let's say 2 to 5pF) in

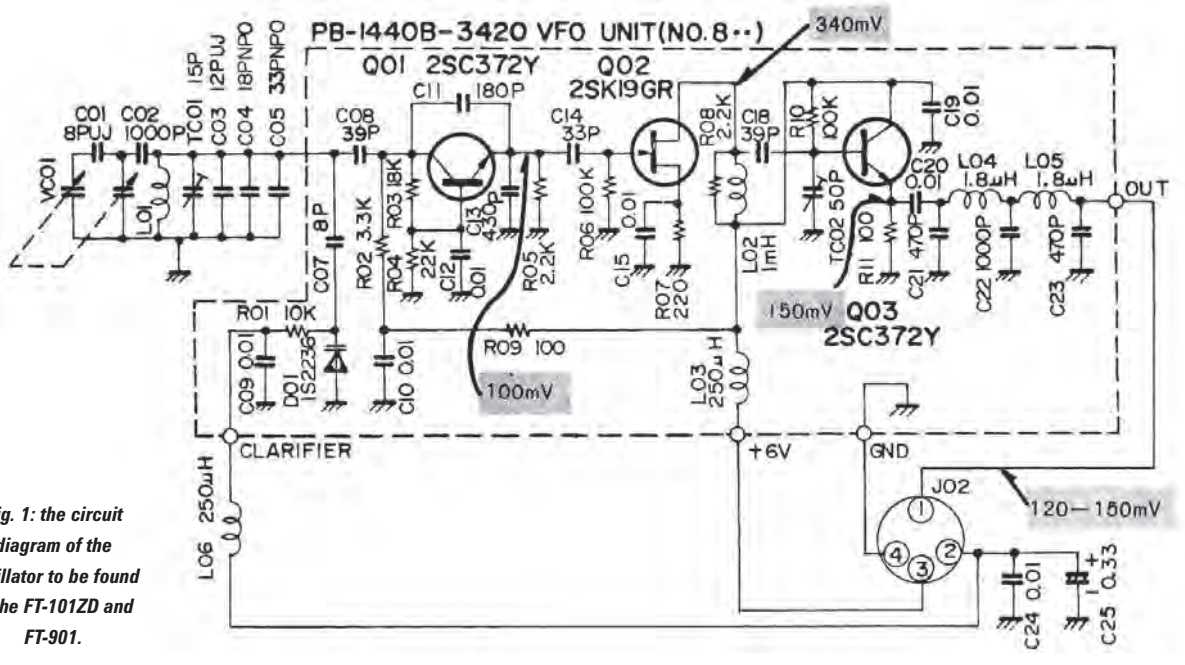


Fig. 1: the circuit diagram of the oscillator to be found in the FT-101ZD and FT-901.

parallel with them (or remove one if the drift is the other way) until the drift is cancelled out. If only a little capacity is added or removed, with luck TC01 will, when everything is reassembled, have enough range to correct the frequency error that's been caused.

Frequency Jumping

The most common causes of sudden changes of frequency are caused by factors that are actually external to the v.f.o. Simple internal mechanical faults, such as a loose screw on the printed circuit board (p.c.b.) or a dry joint, can usually be traced by gently poking around with an insulated tool such as a plastic knitting needle.

Warming and cooling parts using a soldering iron and freezing fluid can help locate electrical problems such as intermittent or noisy f.e.t.s, transistors, or other components. Tracing any fault in the later v.f.o.s (as used from the FT-901 onwards) is made very difficult, as the whole circuit board is smothered in a kind of rubbery glue.

I first tried removing the glue when I wanted to try replacing the oscillator transistor and its associated parts, in a very intermittent and wobbly v.f.o. Surprise surprise, once the glue was removed from around the oscillator transistor the fault disappeared!

At first I wrote the glue removal cure as coincidence but after 'repairing' a few v.f.o.s the same way I mentioned it in *PW*. Replies from readers listed the faults that they had cured in a variety of equipment by removing the same substance, and a suggested that whatever it was, it eventually became conductive under some circumstances!

Removing the glue, **Fig. 2** and **Fig. 3**, is very difficult but I have managed with long nosed pliers while heating it with a hair dryer or a soldering iron. In addition to attacking the circuit panel it's sometimes also necessary to remove the glue that sticks capacitors C01-C05 to the metal chassis and from around the coil.

Note: From my own experience, I found that if I hurried I will more than likely to damage components. So I suggest to readers to allow themselves a few hours and do the job slowly and carefully. Then, when you've finished working on the p.c.b. go over all the joints with a hot iron, just to be sure.

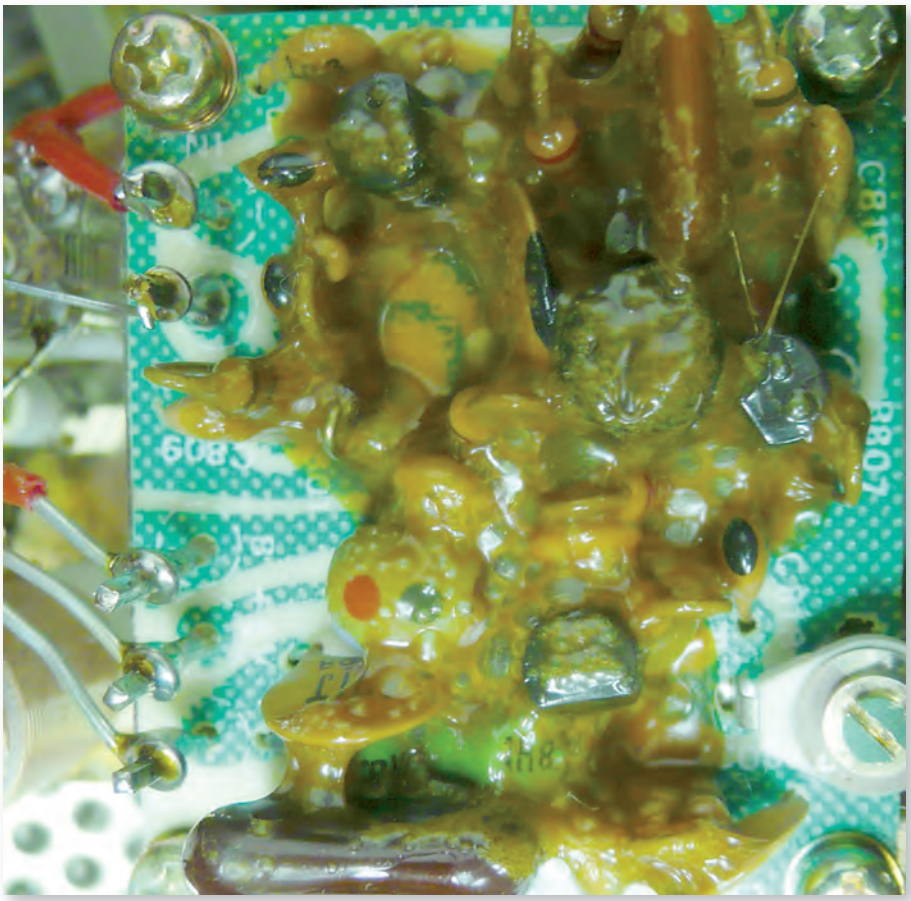


Fig. 2: The area of the oscillator as it comes from the factory with the 'glue' on many components. This seems to cause some instability after some time in operation.

Other Stability Faults

It's also possible for very small intermittent changes of voltage on the clarifier input, not readily detected on a meter, to cause the frequency to wobble. The best way to test for such problems is to disconnect the clarifier line from the v.f.o. and then to apply a steady voltage of about 3V to it.

To do the test take two 4.7kΩ resistors, connect one from the v.f.o.s clarifier input pin to the 6V rail, and the other from the input pin to chassis. Note that C25, which is mounted on the back of the 4-pin socket, can sometimes leak and cause drift. The impedances (with the clarifier switched in and out) are different, hence, if C25 is leaky, the frequency instability will be less when the clarifier is switched out than when it's in!

Famous Author Visit!

By an amazing coincidence I was at this point hammering out my column, when **Steve Anderson G0EAT**, writer of the book *Growing Up With Ginger*, appeared with his FT-101ZD, which had one of the wobbliest and intermittent v.f.o.s I have ever come across!

Steve's book is about a cat that demonstrated 'Murphy's Law' in that anything that could go wrong when he was around did – including the demolition of a 90ft mast. With Steve's rig Murphy's Law certainly applied, the v.f.o. just would not stay on frequency and everything I did seemed to only improve it a little.

The pictures show Steve's transceiver's v.f.o. board before and after my initial attempts to cure it. Even then I found it necessary to replace C25 and do everything mentioned above and in last month's column, (**no it wasn't cat hairs!**) before the very intermittent wobble, disappeared completely. As compensation Steve signed two copies of his amusing book, which manages to give quite a sensible plug for Amateur Radio, for my daughter and granddaughter.

Re-calibrating The VFO

Once a v.f.o. has been stabilised and reassembled it will need re-calibrating. Precise calibration might not be too important if the rig uses a digital display but an analogue dial needs to be accurate.

Exact calibration can be performed using the rig's in-built crystal calibrator, but rough calibration

Fig. 3: After some hard work with fine-nosed pliers and a small heat source, the glue can be removed, which often seems to improve the frequency stability.

needs first performing so as to establish that the dial is not out by a multiple of 25 or 100kHz. Not for anyone who doesn't have a signal generator: If you don't have an accurate signal generator – or a 1MHz crystal calibrator– this can be done by listening to the 40 metre band and noting that u.s.b. is used above 7.04 MHz, and RTTY and CW below this frequency.

Adjusting the calibration is similar on most rigs but I'll refer to the FT-101Z, the analogue version of the FT-101ZD, as the circuit of this is shown in Fig. 1.

First assemble the v.f.o. case and fully tighten all the screws. Next tune as far l.f. as is possible (in the case of the FT-101Z until the tuning capacitor is fully unmeshed as the v.f.o. runs 'backwards'). Set the mechanical dial behind the tuning knob at about '60', and then retune 40kHz in the h.f. direction until the dial reads '0'. This should represent 3.5, 7, or 14MHz, depending as to what band you are on. Then adjust TC01 until the calibration is correct at the l.f. end of the range using a signal generator or stations, plus the internal calibrator as above.

Once the calibration is correct at the l.f. ends of the band using – let's say 40 metres – and the crystal calibrator, check the calibration at 7.5MHz, it should be correct to within 1 to 2kHz. If it's not, note the discrepancy and slip the analogue dial round so that it is about 10kHz h.f. of the correct position, then correct the calibration once again at 7MHz, using TC01.

Next, go back to 7.5MHz and note as to whether the tracking is better or worse. Having established this try various combinations of the settings of the analogue dial, and TC01, until you find the one that produces accurate tracking right across the dial. Providing that the main tuning capacitor has not been 'got at', it should be possible to track to within 1 or 2kHz, at all points on the dial.

Harry Leeming G3LLL
The Cedars
3a Wilson Grove
Heysham
Morecambe LA3 2PQ
Tel: (07901) 932763
E-mail: G3LLL@talktalk.net

Bent Bargain Buy?

Mr. Smith came to my shop, bringing his 'bargain buy' FT-757 for repair. "It's okay on receive but there's no transmit", he told me.

Alarm bells rang immediately in my head but I said nothing, booked it in and made sure that I had a full name address and telephone number to call him. As soon as he had gone I had a look at the back of the rig and found that the serial number had disappeared! Next I looked inside and sure enough there was the lead hidden under some insulation, that I had snipped to stop it transmitting. **Peter**, a short wave listener, had asked me to do this when he had purchased it a few months previously and recently had advised me that it had been stolen.

I phoned Peter, told him the story and advised him that I was calling the police; I also asked him if he could think of a simple way that he could identify it to Mr Plod. "No problem" was his reply, "The volume control knob is slightly loose and pulls off very easily."

To cut the story short, Peter got his rig back, and Mr. Smith, apart from losing the £100 he had given at a car boot sale, found himself having to answer some rather awkward questions.

'Buyer beware' is the watchword, if a rig seems too cheap – it probably is! It doesn't matter how much is paid for something, if the item being sold doesn't belong to the person selling it – it won't be yours even though you paid for it! ●

Problems

I like to hear about problems with older equipment, particularly pre 1990 Yaesu rigs. Please E-mail me, (add some radio related term in the subject heading, to differentiate against spam), or write and enclose a stamped addressed envelope. **Remember that electricity is dangerous, if you are not familiar with safety precautions you must never work on your equipment whilst it is plugged into the mains. (Switching off at the wall socket does not necessarily make equipment safe)**

Graham Hankin's in vision

Graham Hankins G8EMX introduces his regular view of the Amateur TV

Graham Hankins G8EMX
84 Shirley Road
Acocks Green
Birmingham B27 7NA
E-mail: g8emx@tiscali.co.uk

After four months of searching, the **2008 British Amateur Television Club** (BATC) Rally and Bienniel General Meeting (BGM) will be held at the village hall, Stow-cum-Quy, near Cambridge on Sunday 5th October. Some of you may remember this is the same venue as our last rally and BGM two year ago, which attracted several good traders and an excellent Lecture Stream. Even more importantly, there is a good pub just a short staggering distance away!

I mentioned last time that we were considering the University of Bath, which was high on a hill and could access several repeaters. Unfortunately we were unable to find available dates.

However, there's also an an ATV repeater in Cambridge, so we hope to be creating activity through that repeater during the event. For those members who cannot see the Cambridge repeater, we will be video recording the lectures and distributing a DVD to all other repeater groups – so please send me your contact details – i.e. the Keeper or any other contact, although this is an ongoing request anyway.

Big Guns!

I'll also be trying to attract some 'big guns' to the lectures, for example, members of the RSGB Repeater Management Committee; Civil Aviation Authority Radar(?) but is there any lecture that our readers would like to see? Any speaker, organisation or subject? Please let me know as soon as possible. There's no guarantees but I will try! Remember - our rallies and BGM are for the members - not just to elect a committee!

All ATV repeater groups are particularly urged to attend if at all possible – we want to meet you, we want to greet you! We want to help you – if you need it – do ask! Tables will be available at which you can publicise your repeater, show photos of its hardware, bring along any current projects your group is developing or any ATV kit that you sell to local members (we are all interested) . Traders large or small will also be heavily persuaded to attend, this particularly includes the individuals who occasionally advertise within *CQ-TV*. It will be nice to see you!

And, as usual, all aspects of television are welcome to be there; vintage, broadcast – please contact me at the E-mail below. Plus yes, the world is 'going digital' so we'll be trying to arrange demonstrations of Digital ATV plus the recently introduced BATC internet streaming service! The village of Stow-Cum-Quy might never be the same again!

Arthur C Clarke

After a 'last second' rush to put an up-to-date page about the BGM into the magazine, the BATC's quarterly publication *CQ-TV* speedily arrived through members doors near the end of May. In his *Chairman's Column* **Trevor Brown G8CJS** quite rightly pays tribute to **Arthur C. Clarke** – scientific visionary, author, inventor of the communications satellite and past – President of the BATC. Arthur C. Clarke died in March aged 90 and Trevor comments: "I am pleased that for a time he was part of the BATC."

Deeper into *CQ-TV* there's a construction article for a combined Audio-Video distribution board and test card generator, written by **Brian Kelly GW6BWX**. Brian comments that: "The p.c.b. is relatively easy to build.....the only awkward component is a surface-mounted integrated circuit."

Incidentally, I'll be inviting Brian to demonstrate his board at the BGM in October. Maybe Brian will have some p.c.b.s and chips available for anyone who wants to build one themselves.

On the 'lighter' side of television, Trevor Brown writes about those 'Christmas tapes' that some companies used to produce and perhaps the best remembered (or not heard of at all) may be *White Powder Christmas* made by the BBC videotape department during a prolonged strike many years ago.

Certainly a copy of *White Powder Christmas* found its way into the BT department where I worked! On 'U-Matic' format – the professional version of Betamax – yes we are going back a bit – some of us are still watching White Powder today, transferred to DVD or on the internet via 'UTube'. Many well-known faces of the time appeared in vision, loads of 'out-takes' before that genre became broadcast anyway – but everything was produced to the fullest broadcast standards and "in the best possible taste" (aka **Kenny Everitt**). Maybe I should have taken that job in the Corporation after all…hey ho….

The BATC On-line

Meanwhile the BATC's venture into internet streaming has come on-line at **www.batc.tv** The site will allow cross repeater working from its multi screen display, will carry a library of ATV programmes and be a port for other ATV events that will be streamed from around the world.

Some readers may have already seen Camstream and other repeater streaming, so how will this site differ? The answer is that it's different because the software has been written to allow multi-user display, so that more than one repeater can be viewed at the same time allowing "CQ ATV" to be called on one repeater and others monitored for a duplex QSO. In the past using single repeater monitoring this has been possible – but only a single repeater could be monitored and delay was a major problem.

Our website, **www.batc.tv** will be located in the Telehouse, Docklands data centre and connected to a major internet pipe to minimise delays. The streamer will use flash media so the picture quality will be the very best that modern technology can provide at the present time.

If you would like to stream your repeater or have a live event coming up you would like to stream or if you have library ATV material suitable for this site, please contact **info@batc.tv** and you can be pleased to hear from you!

Carl Mason's

hf highlights

Share your news, views and reports with fellow readers. Reports to Carl by the 15th of each month please.

It's always nice to get some feedback on items mentioned in the column and the mention of Grey Line Propagation recently roused retired BBC Engineer **Wyn Mainwaring GW8AWT** in Maenordeilo, Carmarthenshire to put pen to paper. Wyn says, "I was delighted you mentioned 'Grey line' in your column especially as it seems to me that many Amateur operators today rely more on the internet for their DXing than building on there skills and using their ears to listen or operate at various times of day to get a feel for the bands. Many of these so called Radio Amateurs just look for a DXpedition or rare call on a DX cluster and expect to work the call at the first attempt".

Thanks for writing Wynn! I'm sure that there are many of you that would agree with you. Wyn and his wife **Eileen 2W1BPS** have been readers of *PW* for many years and are members of the **St. Tybie Amateur Radio Society** callsign **GC0VPR** which is a long established Amateur Radio Society affiliated to the Radio Society of Great Britain (RSGB). The club is a satellite test centre for Foundation and Intermediate Amateur Radio Licences and meetings are held on alternate Monday evenings at Llandybie Community Centre between 7-9pm and new members or visitors are always welcome!

The DX News

On to this month's DX news now and a few activities closer to home! The first of these is **Didier Bonhommeau F4ELJ** who will be active as **F4ELJ/P** from Groix Island EU-048. This island is in Morbihan, Brittany in the northwestern part of France a few kilometres of the coast off Lorient. Activity can be expected on most h.f. bands from the 19th to 26th July.

Another Frenchman operating slightly further from home is **Jean-Bernard F4EOH** who will be active as **EY8/F4EOH** from Dushanbe, formally known as Stalinabad, the capital city of Tajikistan until the end of August. Look for him on 14MHz s.s.b. and QSL via the operator's instructions.

Italian operators **Alex Pochi IK8YFU** and **Giovanna Lumicisi IZ8FEV** will be active as either **IG9/homecall** and **IG9/IQ8PP** from Lampedusa Island AF-018, IIA AG-001 from the 27th July until the 2nd August. This island is the largest of the Pelagie islands, which includes Linosa and Lampione and is located in the Mediterranean Sea between Malta and Tunis. You can expect to find them on the usual IOTA frequencies.

Charles Wilmott M0OXO and **Nigel Wears M0NJW** will be using the call **GB8LMI** on Les Minquiers Island EU-099, an Island that consists mainly of rock, reef and sand and lies approximately 19km (12 miles) south of the island of Jersey, making it the most southerly British European territory.

Charles and Nigel will operate between the 23rd and 29th of July and also be active in the Islands On The Air (IOTA) Contest as **MJ0X**. The QSL route will be via M3ZYZ and updates are available at **www.gb8lmi.co.uk/**

This year's IOTA contest runs from the 26th to 27th July and some of the announced expeditions that will be operating in it can be found at **www.ng3k.com/Misc/iota2008.html**

Special Calls & Awards

There are a few special event stations to look out for over the next few months and the first of these is based in China. Despite the devastating earthquake Five Beijing Olympic Games special event stations will be active until the 17th September and each will represent the five colours of the Olympic flag. The calls are **BT1OB** for blue (Beibei), **BT1OJ** black (Jingjing), **BT1OH** for red (Huanhuan), **BT1OY** (for yellow (Yingying) and **BT1ON** for green (Nini).

The QSL manager is **Zheng Feng BA4EG** and a card is good via the bureau or direct to **552-39-502 Zao Zhuang Lu, Shanghai 200136, China** and an award will be made available though details have yet to be given. Check out **www.bj2008ses.com.cn** for further information and updates.

Continuing the 'games' theme and based in Hong Kong will be the call **VR2S** which will be used by the Hong Kong Island Scouts to promote the Olympic equestrian event and will run until the 15th August. All QSLs should go via **VR2HKS**.

Also keep an ear open for **VR2008O,** operated by the **Hong Kong Amateur Radio DX Association** with activity expected on 7MHz and up using mainly s.s.b., RTTY and PSK31. A QSL will only be available direct via **Charlie C.M. HO VR2XMT, PO Box 900, Fanling Post Office, Hong Kong.**

In Malaysia, The Communications and Multimedia Commission has issued 18 special callsigns to celebrate 100 Years of Scouting in

Carl Mason GW0VSW
2, Golwg-y-Bryn,
Woodland Road,
Skewen,
Neath Port Talbot,
SA10 6SP
Tel: 01792 501176
E-Mail: gw0vsw@btinternet.com

that country. The calls are 9M1CSA, 9M1CSB, 9M1CSC, 9M1CSD, 9M1CSF, 9M1CSI, 9M1CSJ, 9M1CSK, 9M1CSM, 9M1CSN, 9M1CSP (Penang Island AS-015), 9M1CSR, 9M1CST, 9M1CSW, 9M1CSY and 9M1CSZ in West Malaysia as well as 9M1CSQ and 9M1CSS in East Malaysia.

The special Malaysian calls will be active until the end of December and especially during JOTA events. The first of these was the **Malaysia Jamboree On The Air**, held in mid-May. The Asia Pacific JOTA and the World JOTA will follow on 2nd to 3rd of August and the 18th to 19th of October.

The national Malaysian Society, **MARTS**, will provide a QSL Bureau service for all of the 9M1CSx stations. Readers may also be interested to know that the society offers an award called the **Worked All Malaysia Award,** which is open to anyone who has worked and confirmed ten 9M2 contacts and one each with 9M6 and 9M8 calls.

The award and endorsements are issued for s.s.b., c.w., RTTY QSOs on single or mixed bands using a single or mixed modes and just requires a certified list of your QSLs and $5. Applications should be sent to **Eshee Razak 9M2FK, MARTS Awards Manager, PO Box 13, 10700 Penang, Malaysia**. Further information on MARTS can be found at **www.marts.org.my/**

New Band Privileges

Two countries have recently been allocated new portions of the h.f. bands. The first of these is Italy where their Amateurs are now authorised to use the higher end of 7MHz. As of the 13th May they were allowed to use 7.1 to 7.2MHz on a secondary basis using a total radiated power not exceeding 250W e.i.r.p.

The second country with band changes is Japan where effective from the 28th April, Amateur operators have gained more privileges on the 3.5MHz band. They are now allowed to operate within the following frequencies: 3.5 to 3.575MHz, 3.599-3.612MHz (new), 3.680 -3.687MHz (new), 3.702-3.716MHz (new), 3.745-3.770MHz, 3745-3747 kHz, 3754-3770 kHz (new) and 3.791-3.805MHz.

New QSL Information

There's just enough space for some QSL information now and readers may not be aware that the RSGB QSL Bureau has now moved from Potters Bar in Hertfordshire. The new address for this service is now **PO Box 5, Halifax, West Yorksire HX1 9JR**.

A regular call worked by our reporters is that of **George Beasley 5B4AGC** who is now no longer the QSL manager for the Pafos Radio Club. George is due to leave Cyprus and return to the UK, so the new manager for the calls 5B4PRC, C4EU and C4EURO is **Barry Carter 5B4AHO, PO Box 79, Pegeia, 8560 Paphos, Cyprus**. (Don't worry if cards have already been sent cards via the bureau to 5B4AGC as these will automatically be forwarded to 5B4AHO).

Reader Reports

On to readers' reports now and the first of these is from **Eric Masters G0KRT** in Worcester Park, Surrey. Eric has been using QRP once again on 7MHz and lists c.w. stations SM7NGH/P (Sweden) 1945, OE9GWI (Austria) also QRP at 1949, IK5SRD (Italy) 2009 and F5VLY (France) at 2056UTC using a Kenwood TS-570DG running 5W into a modified W3EDP antenna.

Also on the 7MHz band was **Ted Trowell G2HKU** on the Isle of Sheppy who used 'the key' once again and his Ten Tec OMNI V at 70W to a G5RV logging R1FJT (Franz Josef Land) EU-019 at 2100 and slightly later 3B8MM (Mauritius) AF-049 at 2135UTC (QSL via DL6UAA). Unfortunately Ted has not been too well lately and is considering setting up a small station besides his bed which will enable him to get on air more often.

In East Finchley, North London **Martin Addison 2E0MCA** has had, "quite a good month" finding the bands in reasonable shape. His long list of voice contacts includes OE2008XQC (Austria) the club station of Documentary Archives Radio Communications and QSL Collection at 0521 QSL via OE1WHC, LA9TJA (Norway), IY1TTM (Italy) 0602, IA5/IW5ELA (Italy) on Elba Island EU-028 at 0609. Also legged were OK7GU (Czech Republic) 0634, F5NLX/P (France) 0749, SM6NT (Sweden) 0751, HB2008RL/P (Switzerland) a EURO 2008 call at 0803, DL1ECU/P (Germany) on Hallig Langeness Island EU-042 at 0905. Next came EI6JP (Ireland) EU-115 at 0946 and later SP9LJD (Poland) 1903, 9A70LPC (Croatia) a special call for the return of Lippizaner Stallions from Serbia at 1926. Martin then worked OH6IO (Finland) 2016, UT1WR (Ukraine) 2023 and E74EBL (Bosnia-Herzegovina) Akademski Radio Klub at 2107UTC, all contacts were achieved using a Yaesu FT-2000 with Heil headset and up to 50W output to a half size G5RV antenna.

Moving up to 10MHz, Eric G0KRT worked c.w. station RV9DC (Asiatic Russia) at 1612 using 100W. Meanwhile Ted G2HKU worked JA1LZR (Japan) in Tokyo and ZB2FK (Gibraltar) around 2110UTC

The 14MHz Band

The 14MHz band was in reasonable shape this month and provided **Martyn Medcalf M3VAM** in

Chelmsford, Essex with some interesting contacts. He managed a few more voice contacts including S51A (Slovenia) 1105, EB7DX (Spain) 1127, RX8AM (European Russia) 1134, K1LZ (U.S.A.) Krassimir in Natick, Massachusetts at 1143, F5VJK (France) 1229. Also worked was VE3EJ (Canada) John in Grassie, Ontario at 1236, then came 9A4D (Croatia) the call of the Radio Club Daruvar at 1306, UW8I (Ukraine) 1336 QSL via UT2IZ at 1336. Then Martyn worked OM3BH (Slovak republic) 1341 and YO22HATO (Romania) at 1427UTC using his Icom IC-746, SGC-237 auto tuner into a half-sized G5RV antenna.

The 7MHz band was also used by Ted G2HKU who lists c.w. calls W7SW (USA) in Sun City West, Arizona and 4S7DXG (Sri Lanka) around 1600. Later at 2000UTC HK4CZE (Columbia), 7X7AN (Algeria), PP5BI (Brazil), ZP6CW (Paraguay), CE/VE7SV (Chile) and FM5CD (Martinique) NA-107 all made the log.

Back in London Martin 2E0MCA logged s.s.b. stations HG1841I (Hungary), a special call for 100 years of Hungarian Independence at 0809, then came IR8PS (Italy) 1202 an Antarctic call QSL via I8ACB, HB2008EM (Switzerland) 1219. Martin then worked TM5EL (France) on EU-107 at 1255, LZ08KM (Bulgaria) 1331, 4U1VIC (Austria) the United Nations in Vienna at 1350, then came 5D0IPY (Morocco) a special call for International Polar Year at 1650, A47RS (Oman) 1702, YO4NA (Romania) 1704 and TA7KA (Turkey) 1835UTC.

The 24 & 28MHz Bands

On 24MHz Eric G0KRT used 100W to have s.s.b. QSOs with SQ99LOM (Poland) 1552 and M0SHA at 1557UTC.

The 28MHz band seems to have been in good shape for a change. **Andy Foad G0FTD** in Whitstable, Kent took his Yaesu FT-817 down to the beach one afternoon with a home-brew 1.5m whip and using just 5W c.w. worked S57H (Slovenia), HA5DP (Hungary), SN5F (Poland), IW2F (Italy), OM0MM (Slovak Republic). Also logged were 9A4W (Croatia), YU3A (Serbia) QSL via YT7TY, EA9EU (Ceuta & Melilla), T97M (Bosnia-Herzegovina), EA7OT (Spain) and YL2KO (Latvia). Excellent going with such a simple station! Andy also operated /M with his friend **Paul Rigden 2E0GTB** using a Icom IC-7000 and 80W to a mobile whip and was surprised to be called by **Robert Bartlett HP3FTD** (Panama) at 2000UTC whose US callsign was W8FTD!!!

Martin 2E0MCA also tried the 24MHz band and found OZ1GCT (Denmark) on Bornholm Island EU-030 at 1319, IZ6GSO (Italy) 1323, LY1TR (Lithuania) 1328, OZ2PBS (Denmark) 1333. Then came SP9YDX (Poland) 1338, S57S (Slovenia) 1358, EA6/DL1KBQ (Balearic Islands) on Formentera Island EU-004 at 1404, YT2RX (Serbia) 1511, OE2008XOB (Austria) 1526 and OK1GI (Czech Republic) at 1618UTC.

Back in Worcester park Eric G0KRT managed OE2008C (Austria) the club station HQ AMRS (Austrian Military Radio Society) at 1342. Next he worked SP9TCC (Poland) at 1351, EB7DX (Spain) 1530and YT2RX (Serbia) 1450UTC all worked using s.s.b at 100W.

Signing Off

It's interesting to see that there were no reports for the low bands this month and not much activity heard on 18 and 21MHz according to Ted G2HKU and Martin 2E0MCA. The deep QSB being the main problem throughout the day as signals were heard but died away before a QSO could be made! Yet the 28MHz band was open for some time with good propagation in mid-afternoon with plenty of stations to work!

It always amazes me just how well some of the simpler home or mobile antennas work and the DX they can pull in if the conditions are right. Antenna restrictions should not hinder your h.f. operating and with a little ingenuity you could be active on almost all the bands with very little effort.

Once again my thanks to all our reporters for their logs and to **Mauro Pregliasco I1JQJ/KB2TJM** Editor of the *425 DX Newsletter* for all the DX information. Until next time I wish you all good DX.

73, Carl GW0VSW

Radioworld

Communications

KENWOOD

NEW TM-D710E
Dual-Band Mobile
VHF/UHF - £395.00

TS-480SAT - HF&6m 100W.. £679.00.
TS-480HX - HF & 6m 200W.. £765.00.
TS-2000 - HF/6/2/70cms.... £1285.00.
TS-2000X-HF/6/2/70/23cm £1599.95.
TM-G707-Dual Band Mobile £265.00.
TM-V7E - 2m/70cm's..... £359.00.
TH-F7E - 2mtrs/70cm's..... £189.00.
THG-7IE-Dual Band Handy £178.00.
TM-271E-2m/FM Mobile TX/RX £149.95.
TM-V71E - VHF/UHF Trx .....£269.95.

ICOM
2 YEAR WARRANTY

ICOM IC-E92
Built-in
DSTAR
£319.95

NEW IC-7700 HF & 6m Base £3999.95
IC-7800-2 HF/50MHz 200W.....£6400.00.
IC-756PRO3 - HF/50MHz .....£1695.00.
IC-7400 - HF 6m/2m 100W.....£979.00.
IC-7000 - HF/6m/2m/70cm's.....£799.00.
IC-718 - HF 100W.....£439.95.
IC-910H - 2M 100W/70cm 75W £1074.00.
IC-E7 - Mini Dual-Band Handy...£149.00.
IC-E91 - Top Flight Handheld....£239.95.
IC-706M2G - All-Mode TX/RX ....£599.00.
IC-E90 - 2m/6m/70cm Handheld £199.00.
IC-E2820 Dualband VHF/UHF £379.00.

YAESU
Choice of the World's top DX'ers™

FT-950 HF Transceiver.....£895.00.
FTM-10E - VHF/UHF tx/rx .... £248.99.
FT-897D - HF/6m/2m/70cm...£509.00.
FT-817ND - 1.8-430MHz 5W..£349.00.
FT-857D - HF/6m/2m/70cm's £435.00.
Special Price - Limited Stock
FT-7800E - 2m/70cm mobile. £169.00.
FT-8800E - 2m/70cm mobile..£219.00.
FT-8900 - 10m/6m/2m/70cm..£249.00.
FT-1802E - 2m 50W mobile...£99.95.
FT-2800M - 2m 65W mobile...£129.00.
VX-7R - 6m/2m/70cm handy..£188.00.
VX-6E - 2m/70cm handheld...£169.00.
VX-3E - 2m/70cm handheld...£122.95.
VX-127 - 70cm handheld 5W...£99.95.
VX-170 - 2m handheld 5W.....£109.00.
FT-60E - DB *limited Stock*..£129.00.
FT-450 - HF/6m transceiver - £529.00.
FT-450AT HF/6m transceiver £595.95

YAESU FT-2000 - £1695.00
FT-2000D 200W - £2399.00

MFJ

MFJ-989D 1500W Auto ATU..£329.95.
MFJ-986C 3Kw HF.....£299.95.
MFJ-991B Auto Intellituner....£159.95.
MFJ-976 1500w ATU .....£379.95.
MFJ-969 300w Rollercoaster £149.95.
MFJ-962D 1.5Kw Inductor....£249.95.
MFJ-949E 300w W/D-Load....£119.95.
MFJ-948 300w HF.....£109.95.
MFJ-945E Mobile .....£99.95.
MFJ-941E 300w .....£99.95.
MFJ-934 ATU+AG .....£179.95.
MFJ-921 2m ATU.....£79.95.
MFJ-924 70cms .....£79.95.
MFJ-914 Extender .....£69.95.
MFJ-901B 200w Versa tuner...£74.95.

MFJ-259Z, Batteries, Loop & charger.
£239.95.

Reads SWR + Resistance(R) & Reactance(X) or Magnitude(Z) & Phase(degrees). Coax loss(dB), Coax cable length & Distance to fault. plus more.

Analysers

MFJ-249B 1.8-170 Dig.....£219.95.
MFJ-259B 1.8-170 .....£199.95.
MFJ-269 HF/VHF/UHF .....£269.95.
MFJ-201 grid dip meter.....£119.95.
MFJ-269PRO 1.8-170&430-520 £319.95.

Dummy Loads

MFJ-250 1kw Oil filled .....£69.95.
MFJ-250X 1KW without oil ....£49.95.
MFJ-260C 300w PL259 .....£39.95.
MFJ-260CN 300w N-Type .....£44.95.
MFJ-264 1.5kw PL259 .....£59.95.
MFJ-264N 1.5kw N-Type .....£69.95.
MFJ-267 Load/VSWR .....£149.95.

RigExpert

RigExpert Standard.....£119.00
RigExpert Plus £159.00
AA-200 Antenna Analyzer.....£259.00

New lower prices on..

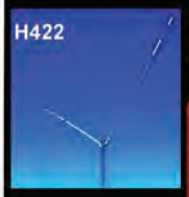
HEIL SOUND

PR-781-PTT deluxe base mic...£99.95.
Pro-Set-Plus Headset .....£132.95.
Pro-Set-Plus-IC Headset .....£139.95.
Pro-Set-HC-4/5 Headset .....£84.95.
Pro-Set-HC-IC Headset .....£94.95.
Goldline GM-4 Stick mic .....£89.95.
Goldline GM-5 Stick mic .....£89.95.
HM-4 Handy mic w/HC-4 insert £59.95.
HM-5 Handy mic w/HC-5 insert £59.95.
HM-IC Handy mic + Icom insert £59.95.
HM-10-4 Hand mic + HC-4 .....£56.95.
HM-10-5 Hand mic + HC-5 .....£56.95.
Traveller-817 Yaesu headset.
(traveller headsets require leads)

Tigertronics
Grants Pass, Oregon

SL-USB-13PDI 13pin DIN for Icom..£84.95
SL-USB-13PDK 13pin Kenwood....£84.95
SL-USB-4R 4pin round mic cable..£79.95
SL-USB-5PD 5 pin round mic cable. £79.95
SL-USB-6PMD 6pin miniDIN(Yaesu)£79.95
SL-USB-8PD 8pin mini DIN.. .....£79.95

COMET



Comet H422 - High power 1Kw, 4 Band Rotary V Dipole. Frequencies : 7,14,21,28 Mhz
£189.00

CHA250B broadband vertical, covers 80-6m, no gaps £295.95.

Comet V-250 3.5-54MHz Max 200w. Ideal for limited space £199.00.

GP-6 High Gain Dualband Co-Linear 2/70cm. Max 200w £85.95

GP-15 Tri-Band 2/6/70 Fibreglass Antenna. Max 150w £89.95

WATSON

POWER-MITE NF Watson 22A, £59.95

W-25AM 25A Supply.....£89.95.
W-10AM 10A Supply .....£59.95.
W-5A 5A Supply .....£29.95.
W-3A 3A Supply .....£22.95.
W-25SM 25A Supply .....£79.95.
W-10SM 10A Supply .....£49.95.

WATSON

W-30 2/70 Base .....£29.95.
W-50 2/70 Base .....£39.95.
W-300 2/70 Base .....£49.95.
W-2000 6/2/70 Base .....£59.95.
WBV-70 4m 1/2 Wave Base..£39.95.

Butternut | BENCHER, INC.

Butternut HF-2V 40/80m .....£249.95.
Butternut HF-6V 80-10m .....£334.95.
Butternut HF-9V 80-6m .....£389.95.
Butternut HF-5B 20-10m .....£389.95.
30-MRK 30m ad for HF2V .....£114.95.
A-17-12 17&12 ad for HF6V .....£59.95.
A-6 6m ad for HF6V-X .....£19.95.
TBR-160S 160m HF2/6/9V .....£139.95.

HUSTLER

Hustler 5-BTV .....£179.95.
Hustler 4-BTV .....£149.95.
Hustler 6-BTV .....£199.95.
Hustler RM-10 10m resonator ....£19.95.

PALSTAR

AT-1KP Digital Display .....£289.95.
AT-1500CV 1500w ATU .....£389.95.
AT-2k 2000W ATU .....£389.00.
AT4K 2500 Watt ATU ..... £649.95.
AT5K 3500 Watt ATU ..... £849.95.

Miracle Antenna

Miracle Whip .....£99.95.
Miracle Ducker IL .....£99.95.
Miracle Ducker PL .....£99.95.
Miracle Whip TL .....£129.95.

AUTO TUNERS

AT-1000 Pro

1KW Auto ATU - 1.8-54MHz - 1-8 secs Tune - Approx SWR Rating of 10:1
£399.95

LDG Z-100

100w Auto ATU - 1.8-54MHz - 0.5 - 6 secs
£115.00

DM-7800 *NEW*

Dual meter system made exclusively for the IC-7800. This will give you a true analogue meter
£139.00

FT-METER

Plug-and-play FT-meter, specifically designed for the Yaesu FT-857 and FT-897. Gives you an analogue meter.
£38.00

LDG AT-100Pro

100w Auto ATU - 1.8-54MHz 1-5 seconds Tune - 2 Pos Ant switch
£169.95

LDG baluns

1:1 or 4:1 Balun - Covers 1.8 - 30Mhz Power rating 200w
£29.95

LDG ELECTRONICS

The world's best Auto Tuners!

LDG ELECTRONICS

TONNA

Tonna 20505 6m 5el	£89.95
Tonna 20809 2m 9el	£54.95
Tonna 20811 2m 11el	£79.95
Tonna 20817 2m 17el	£99.95
Tonna 20909 70cm 9el	£45.95
Tonna 20919 70cm 19el	£59.95
Tonna 20921 70cm 21el	£74.95
Tonna 20635 23cm 35el	£64.95
Tonna 20655 23cm 55el	£89.95
Tonna 20745 13cm 25el	£69.95

West Mountain Radio

RIGblaster Pro	£209.95
RIGblaster Plus Serial	£119.95
RIGblaster Plus USB	£129.95
Nomic 8P	£59.95
Nomic RJ	£59.95
M4-CBL RG45/4Pin lead	£13.95
RIGRunner 10way 12v distribution board	£119.95

MasterCard VISA VISA Electron SWITCH SOLO

DIAMOND ANTENNA

HF10FX 10m Mobile	£39.95
HF15FX 15m Mobile	£39.95
HF20FX 20m Mobile	£39.95
HF40FX 40m Mobile	£39.95
HF80FX 80m Mobile	£44.95
CR8900 10/6/2/70	£69.95
CP6 Base 6m-80m	£219.95
X50 Base 2/70	£54.95
X200N Base 2/70	£84.95
X300 Base 2/70	£89.95
X700H Base 2/70	£249.95

AMERITRON

AL-811XCE 10-160m 600w	£699.95
AL-811HXCE 10-160m 800w	£799.95
ALS600X Solid State 10-160m 600w	£1149.95
AL-1500XCE 10-160m 1.5KW	£2595.00
AL-1200XCE 10-160m 1.5KW	£2499.95
AL-82XCE 10-160m 1.5KW	£2399.95

RADIO WORKS

CW-160 160-10m (252ft)	£129.95
CWS-160 160-10m (133ft)	£124.95
CW-80 80-10m (133ft)	£99.95
CWS-80 80-10m (66ft)	£109.95
CW-40 40-10m (66ft)	£89.95
CW-40+ 40-10m (66ft)	£99.95
CW-20 20-10m (34ft)	£89.95
G5RV+ 80-10m	£59.95
Radioworld G5RV Fullsize	£29.95
Radioworld G5RV Halfsize	£27.95

SGC

SGC-230 200Watts

£399.95

SGC-230 HF	£399.95
SGC-231 HF+6m	£349.95
SGC-235 HF-500w	£989.95
SGC-237 HF+6m	£269.95
SGC-237 Porta	£499.95
SGC-237 PCB	£259.95
SGC-239 HF	£189.95
MAC-200	£249.95

Rotators

YAESU

G-2800SDX Rotator	£999.95
G-450C Rotator	£299.00
G-550C Rotator	£249.00
G-650C Rotator	£339.00
G-1000DXC Rotator	£419.00
G-5500C Rotator	£449.00
AR3000XL Light Duty	£54.95

Feeders & Wire

RG-213 Military Spec High grade 50 Ohm coaxial Cable

£79.95 per 100m Drum

RG58U	£0.60 per Metre
RG8 Super	£0.80 per Metre
RG213	£1.00 per Metre
W103 Westflex	£1.50 per Metre
RG-8 75 Metre Drum Special	£39.95
Flexweave 50m Flex	£29.95
Flexweave-PVC-50 50m	£39.95
Enamelled Copper Wire 50m	£17.95
Hard Drawn Copper Wire 50m	£19.95

Rotator Cable: - Color coded Cable

3 core	£0.60 per Metre
7 core	£1.00 per Metre
8 core	£1.50 per Metre

DC Connecting Cable

5A DC Cable	£0.50 per Metre
10A DC Cable	£0.75 per Metre
20A DC Cable	£1.00 per Metre
25A DC Cable	£1.10 per Metre

TGM Antennas *Mini Beams*

** Call for prices on TGM upgrade kits.*

MQ-24SR 6-20m 2el	£379.95
MQ-34SR 6-20m 3el	£489.95
MQ-1 6-20m 2el	£329.95
MQ-26 6-20m 2el	£409.95
MQ-26SR 6-20m 2el + EH	£439.95
MQ-36SR 6-20m + Dir	£579.95

CUSHCRAFT

X-7 - 20/15/10 7EL Yagi	£699.95
A3S - 20/15/10 3EL Yagi	£469.95
A4S - 20/15/10 Yagi	£569.95
A3WS - 12/17 3EL Yagi	£379.95
ASL-2010 13-32MHz Log	£799.95
MA5B - Mini Beam	£369.95
D-3 - 20/15/10 Dipole	£249.95
R-6000 - 6Band Vertical	£299.95
R-8 - 40-6m Verical	£449.95
MA5V - 10/20m Vertical	£239.95

Second Hand List.

Quality Used Equipment, 3 Month Warranty.
Best prices paid on your used equipment.

Amplifiers
Yaesu FL-7000 HF Linear Amplifier £1,299.00
Yaesu VL-1000 QUADRA Amplifier £2,499.00
Mirage B-108 2m Linear Amplifier £129.00
Tokyo HY-Power HL-37VSX RF £69.00
Yaesu FL-2100 All-mode HF amplifier £299.00
Alinco ELH-730G 30W linear amplifier £59.00
Yaesu FL-2050 amp £99.00
Analyzers + SWR meters
Comet CD-270D Meter £49.00
Diamond SX-200 Meter £49.00
Daiwa SW-110A 1.8-150MHz £40.00
Maldol Mr-2000 VHF/UHF SWR £40.00
MFJ-269 Digital Antenna Analyser £199.00
Antenna Tuners
Z-100 Autotuner £97.87
MFJ-921 VHF 200 Watt ATU £50.00
MFJ-948 Antenna Tuner £89.00
MFJ-949E Manual ATU £99.95
Kenwood AT-230 ATU £169.00
MFJ-941E Versa Tuner £79.00
SGC SG-230 Auto ATU £259.00
MFJ-945E Mobile ATU £69.00
Icom AH-4 Automatic ATU £229.00
Yaesu FC-30 Antenna Tuner Unit £149.00
MFJ-989D 1500W ATU £279.00
Icom AT-150 Auto antenna tuning unit £169.00
Antennae
A3S Cushcraft 3-Element Tribander £300.00
4-BTV HUSTLER 40-10m Vertical 1kW £109.00
CB
Cobra 200 GTL DX 10 Meter £195.00
Ranger RCI 2950DX 10 - 12m £189.00
DAB Radio
Gemini 49 Digital Radio £40.00
Data Comms
Kamtronics KAM Multimode TNC £140.00
AEA PK-900 £199.00
AEA PK-12 Packet Terminal £69.00
Kantronics KPC-3+ TNC £129.00
MCL1100 EasyReader £59.00
AEA PK-232MBX £120.00
DC/Cig adapter cables
E-DC-5B Cigar Lighter Cable with Filter £10.00
Frequency Counter/finder
SCOUT Frequency Counter/Finder £175.00
Handheld Transceivers
Icom IC-W31E Dual Bander £160.00
Kenwood TH-G71E Dualband Handie £129.00
Kenwood TH-K2ET 2m with keypad £99.00
Yaesu FT-41R Handheld Transceiver £120.00
Yaesu FT-470R Dual Band Handheld £129.00
Kenwood TH-F7E £169.00
Yaesu VX-7R Silver Tri-band Handy £159.00
Icom IC-T7E Dual Band Handy £139.00
Alinco DJ-G5 Dual Band Handy £139.00
FT-60E Yaesu 2m / 70cm FM 5W £99.00
Yaesu FT-50R Handy. £99.00
TH-K4ET Kenwood Handy with keypad £99.00
IC-E90 6m / 2m / 70cm Handheld £169.00
IC-E91 Icom 2m/70cm Handheld £210.00
HF Transceivers
Yaesu FT-100 £399.00
Icom IC-703 HF / 6m £379.00
Icom IC-736 HF 6 £699.00
Kenwood TS-120V 10W HF Mobile £220.00
Yaesu FT-920AF HF / 6M Base £899.00
Kenwood TS-570D HF Transceiver £475.00
Icom IC-756 £699.00
Yaesu FT-920 £799.00
Icom IC-706mk1 £289.00
Yaesu FT-767GX £599.00
Kenwood TS-680S HF / 6m £399.00
Kenwood TS-950SD HF Transceiver £899.00
Yaesu FT-890AT HF Transceiver £425.00
Kenwood TS-850S /AT £699.00
Icom IC-740 HF Transceiver £389.00
IC-R71E HF Receiver £349.00
Yaesu FT-767GX HF, 6m/2m/70cms £699.00
Yaesu FT-990 /AC £799.00
Kenwood TS-690SAT HF -6m £549.00
Alinco DX-77E HF Transceiver £379.00
Yaesu FT-1000MP Mark -V Field £1,199.00
Icom IC-765 HF Base Transceiver £799.00
Yaesu FT-107M HF Base Transceiver £299.00
Kenwood TS-570DG/E £675.00
Icom IC-706MkII Mobile Transceiver £399.00
Icom IC-775DSP HF Base £1,499.00
Trio (Kenwood) TS-830S £325.00
Yaesu FT-1000 "CLASSIC" HF £1,399.00
Yaesu FT-902DM HF transceiver £325.00
Icom IC-718 HF Transceiver £359.00
Icom IC-756ProII HF / 6m Transceiver £999.00
Icom IC-746 HF/6m Transceiver £649.00
Yaesu FT-840 HF Transceiver £299.00
Icom IC-751 HF Transceiver £400.00
Icom IC-735 HF all mode transceiver £299.00
IC-756PRO-MKIII Icom HF + 6m Trx £1,599.00
Icom IC-706MKIIG £499.00
Icom IC-781 Amateur HF transceiver £1,495.00
Yaesu FT-2000 100W with int. psup £1,299.00
Kenwood TS-940SAT £575.00
Yaesu FT-2000D 200watts £1,800.00
IC-7400 HF, 6m & 2m transceiver £899.00
IC-756PRO-MKIII Icom HF + 6m Trx £1,499.00
Kenwood TS-870S HF Transceiver £799.00
Kenwood TS-850S /AT £699.00
Kenwood TS-570DG/E £549.00
Alinco DX-77E HF Transceiver £379.00
Icom IC-718 HF Transceiver £359.00
Icom IC-736 HF 6 £699.00
Icom IC-746 HF/6m Transceiver £649.00
Kenwood TS-570D HF Transceiver £525.00
Yaesu FT-847 HF-6-2-70 Base £799.00
Yaesu FT-897D Multiband Portable £449.00
Mics and Speakers
SP-23 Kenwood Base Speaker £50.00
Kenwood MC-80 Base Mic £50.00
Kenwood MC-85 Base Mic £99.00
Yaesu MW-1 Remote Control Mic £60.00
Yaesu MD-100 Desktop Microphone £79.00
Kenwood MC-60A £75.00
Yaesu MD-1 Desktop Microphone £75.00
Yaesu MD-200 Desktop Microphone £175.00
NEUMANN U 87 Ai condenser mic £1,100.00
MFJ-382 Deluxe Amplified Speaker £30.00
SMC-34 Speaker/Mic with Volume Control £20.38
HM-133 Remote Control Mic for IC-E208 £46.77
MH-34B4B Speaker/Microphone £15.00
MC-90 Desk Mic for DSP £149.00
Alinco EMS-8 - Speaker Microphone £10.00
Other
Heil BM-10-5 Headset £50.00
Kenwood MB-201 £20.00
MFJ-9015 15m cw Trx £84.26
Standard C-156E 2m Handheld £125.00
Timewave PK-12 Packet £99.00
Yaesu NC70 Battery Charger £60.00
DCW-15B Sequencer for 2m, 70cm £55.00
Daiwa CNA-1001 £149.00
M/Mods 144/100 £119.00
Snooper S5-R Safety Alert System £119.95
FRT-7700 £69.00
Comet CF-BPF6 £25.00
EDC-16B adapter £9.99
SMC 150PL Dummy Load £29.00
Kenwood VS-2 Voice Synthesizer £40.00
Timewave DSP-59+ Filter £129.00
OptoElectronics X Sweeper £1,199.00
CX-201 Diecast Coax Switch £10.00
Yaesu FV-101DM Digital Memory VFO £199.00
MFJ-781 DSP filter £89.00
AOR ARD9000 Digital Voice Interface. £129.00
Revex W540 140 - 525MHz 200W £40.00
Kenwood TH-47E 430-440 MHz £79.00
FL-223 9MHz Filter SSB narrow 1.9kHz £40.00
FL-100 9MHz Filter narrow 500Hz £40.00
Magnum S-9 Multi Mode. £175.00
Icom PS-85 Icom 20A 13.8V Switch Mode £130.00
KSC-14 Fast Charger for TH-22E £76.55
MB-12M - Mobile Mounting bracket £10.00
MB-62 Mobile Mounting Bracket £12.72
MFJ-901B £60.00
TOKYO VHF-HF-TRANSVERTER £199.00
Yaesu FV-101B - External VFO £99.00
Yaesu SP-101 - Speaker £79.00
PMR446
Challenge PMR160 - 2 x 446Mhz handheld transceivers £25.00
Power supplies
Icom PS-125 £195.00
Bnos 20AMP PSU £89.00
Kenwood PS-30 PSU £89.00
Microset PT 135 PSU £120.00
Palstar PS-30N PSU £75.00
Icom PS-55 Power Supply £99.00
Yaesu FP-757HD Power Supply £139.00
Kenwood PS-430 Power Supply £109.00
Microset PC2S 30 Power Supply £99.00
Watson W-25AM Power Supply £75.00
PT-50A Microset 50A 13.5V PSU £238.26
PT-1012 Microset 12A 13.5 PSU £93.57
SEC-1223 SEC 23A 13.8V Switch Mode £85.06
Receivers
Fujion F-2000A Finder £99.00
Icom IC-R72 Receiver £399.00
Target HF3 HF3 RX £99.00
Yaesu FR-101 HF RX £399.00
Yaesu FRG-8800 RX £220.00
Trio (Kenwood) R-600 HF Receiver £129.00
Icom IC-R5 Receiver £99.00
AOR AR-1500 Wideband Receiver £89.00
Alinco DJ-X2000 Intelligent Receiver £230.00
AOR AR-2002 Receiver £199.00
Realistic DX394 HF Receiver £119.00
Icom IC-R8500 Receiver £849.00
AOR AR-3000A Wideband Receiver £450.00
AOR AR-7030+ HF Receiver £699.00
Yaesu FRG-7700 HF Receiver £199.00
JRC NRD-525 HF Receiver £399.00
AR5000+3 £950.00
AR-5000A+3 AOR Wide band all mode Receiver £1,299.00
Sanyo DSB-WS1000 (Worldspace digital receiver) £99.00
ICOM IC-R100 HF/VHF/UHF receiver £129.00
Kenwood VC-20 VHF Converter £175.00
Scanners
Bearcat UBC-278 CLT Scanner £99.00
Bearcat UBC-9000 Scanner £179.00
Icom IC-R3 Hand held Scanner £250.00
Bearcat BC780XLT £179.00
Yupiteru MVT-7000 £129.00
Yupiteru MVT-3300EU Scanner £99.00
Bearcat UBC-3300XLT Scanner £129.00
Yupiteru MVT-9000 MK2 Scanner £220.00
AOR AR8000 £139.00
Realistic Pro-43 Scanner £89.00
Yaesu VR-5000 Scanning Receiver £389.00
AOR AR-8200 Mk II £199.00
Yupiteru VT-125 Air Band Scanner £99.00
UNIDEN UBC-3000 Hand Scanner £129.00
PSR-282 GRE Handheld Scanner £76.55
UBC-280 XLT Handheld Scanner £109.00
AOR 8200 Mk I £220.00
Realistic Pro-2004 - receiver / scanner £89.00
UBC-785XLT Uniden-Bearcat Base Scanner 25-1300MHz £149.00
USC-230 Uniden-Bearcat ScanCat 230 £69.00
Albrecht AE105H - "Sport scan" scanner £59.00
Uniden UBC-180XLT scanning receiver £99.00
Alinco DJ-X7 - Handheld receiver. £69.00
GRE PSR 295 Handheld Scanner £89.00
VHF/UHF Transceivers
Alinco DR-605 2 / 70cm £175.00
Kenwood TM-255E 2m Mobile £329.00
Icom IC-490E 70cms Mobile £250.00
Icom IC-910HX 2 / 70 /23cms Base £999.00
Kenwood TR-9000 2m Multi mode £220.00
Kenwood TS-271E £165.00
Kenwood TMG 707 2m 70cm mobile £139.00
FT-290R 2m Multi mode £150.00
Trio TR-9130 2m multi mode £220.00
Yaesu FT-7800 2/70 mobile £139.00
Yaesu FT-8100R 2m / 70cms Mobile Transceiver £220.00
Yaesu FT-847 HF-6-2-70 Base £799.00
Yaesu FTV-1000 200 W Transverter £450.00
Yaesu FT-790 £159.00
Alinco DR-M06 £109.00
Yaesu FT-736R 2m/70cm Base £599.00
Icom IC-2725E £165.00
FT-2800M 2m Mobile £115.00
Yaesu FT-817 Portable Transceiver £289.00
IC-7400 HF, 6m & 2m transceiver £899.00
Hora C-150 2m FM Handheld £79.00
Kenwood TR-751E 2m Multi-mode £299.00
Yaesu FT-290MkII 2m Multi-mode £250.00
Yaesu FT-736R 6m+23cms £899.00
Yaesu FT-690R II 6m transceiver £275.00
Kenwood TM-V7E Mobile £250.00
Yaesu FT-2800M 2m FM transceiver £119.00
Kenwood TW-4000D Dual Band £129.00
Kenwood TM-D700E Mobile £299.00
Yaesu FT-7100M Dual Band Mobile £159.00
Yaesu FT-736R 6m, 2m & 70cm Base £699.00
Yaesu FT-1500M 2m FM transceiver £109.00
Kenwood TS-790E Base / Mobile £799.00
Yaesu FT-817ND 5W Transceiver £289.00
Kenwood TS-2000 Transceiver £999.00
Kenwood TM-G707E Mobile £159.00
Yaesu FT-897D Transceiver £499.00
Kenwood TM-702E VHF/UHF £175.00
Kenwood TR-251E 144-146 MHz £120.00
Icom IC-229H 144-146 MHz £119.00
Kenwood TS-700G £199.00
Yaesu FT-1802E Transceiver £89.00
Yaesu FT-2500M VHF transceiver £99.00
AKD 2001 VHF FM transceiver £69.00
Kenwood TR-9130 VHF transceiver £249.00
AKD 7003 70cms FM transceiver £99.00
Yaesu FT-726R VHF Base £299.00
Kenwood/Trio TR-2300 portapack £99.00
IC-910-HX Dual Band + 23cm Sat Trx £893.62
Yaesu FTM-10E Transceiver £199.00
Kenwood TR-751E VHF Transceiver £275.00
TM-V71E - VHF/UHF Mobile . £219.00

We are Premier UK Dealers for ICOM, Kenwood & Yaesu.
Full UK Warranty.

www.radioworld.co.uk

34 - 38 - 42 Brook Lane, Great Wyrley, Walsall WS6 6BQ

TEL: 01922 414 796. FAX: 01922 417 829.

We also accept PayPal

skype at radioworld_UK.

Ben Nock's

valve & vintage

Ben Nock G4BXD took advantage of a brief spell of good weather to test several new arrivals at the 'Kidderminster Kollection'.

A big hello once again as I open the doors to the *Valve and Vintage* (V&V) shop for August! It's been a good few weeks for the Kidderminster Kollection and some interesting German Second World War sets and the odd Eddystone or two have arrived. But this month I'll describe the recent addition of several military man-pack radios that have been delivered.

Many military radio collectors like the idea of man-packs. There's always the thought we will rush off into the hills and sit working the DX while chomping on the buttered scones, although in reality, military man-packs are not as great as they first sound! Being military, weight never seems to be a consideration. It might well take three men to carry the complete radio kit, not a problem when you have an army to employ– but for a single, unfit, overweight civilian, well, it can get too much!

Then there is the fact that 10W or so to a short whip does not go far. So, to work any distance the operator will need a pole or two and a few feet of wire, cable, guys, pegs, radials, etc., again all adding to the weight.

Fig. 1: The PRC-74 operating controls.

Battery Problem

Then there's the battery problem! The man-pack battery (when new) might have lasted 20 hours or so, but that's for short military type messages not prolonged Amateur Radio QSOs!

Nowadays though, with old batteries (if they're available), or new Nicads fitted in their place it's amazing just how quick they run down when out in the field.

So, the modern user either needs to carry extra battery packs – again, this isn't a problem if a three tonne truck is available – or fit sockets on the set so external batteries can be fitted, all adding to the weight once more.

Finally, there's the tuning as many military sets employ dial-up tuning, that is they have six or more knobs to set the frequency. Not a problem when the frequency is allocated on a military net – but trying to tune around the band can really hurt the fingers as I know from blistering experience!

However, even after mentioning all the problems for the modern

Fig. 2: View showing the PRC-74's modular construction internally.

Ben Nock G4BXD
62 Cobden Street
Kidderminster
Worcestershire DY11 6RP
E-mail: military1944@aol.com

Fig. 3: The SEG-15D, with a clean front panel layout.

Fig. 4: The BDR-510C, with the solid construction on this set clearly visible.

user, readers will realise I'm one of the collectors who loves the military man-pack despite all its failings! So it was really nice when three new ones arrived for the Kidderminster Kollection in a very short space of time. An American PRC-74 arrived along with an East German SEG-15D and a Belgian BDR-510C. A search on the Internet throws up loads of info on the '74 and 15D but very little on the '510.

The American PRC-74

This PRC-74 man-pack, **Fig. 1**, has a really exciting history as it was widely used in Vietnam during the conflict there and I have found some interesting information and pictures on the web detailing its use. Basically, the set tunes 2 to 18MHz and puts out a good 15W of upper side band (u.s.b.) or Morse (c.w.) signal from a 12 – 15V battery supply.

The series started with the PRC-74 that tuned 2 to 12 MHz, the 74A had a similar range while the 74B and 74C tuned up to 18MHz. Various battery boxes were available and allowed for different battery combinations, one box even taking several wet cells. Other boxes used Ni-cads and various pre-packed units.

Although the transmitter generates u.s.b., the unit can be altered for l.s.b. in a couple of ways. The best method is to replace the internal filter, these are available but finding one is hard. The other method is to shift the carrier oscillator, presently on 1750kHz to the other side of the existing filter and make it about 1747kHz. The latter method would throw out the frequency calibration but there's a way of correcting the error. The photograph, **Fig. 2**, shows the internal layout of the set.

On the one sunny day we seem to have had so far this summer (at time of writing this) in Kidderminster, I took the set to a nearby hill. Using just the whip antenna, I heard USA, Japan, Africa and many European station whilst working several Europeans and a couple of Scandinavians with good reports on 14MHz. On the next sunny day I intend to take a pole and some wire with me.

East German SEG-15D

The East German SEG-15D set tunes 2 to 12MHz although it can easily be modified to tune up to 15MHz thus adding the 20 metre band coverage. The set, **Fig. 3**, generates 3 or 15W of amplitude modulation (a.m.), l.s.b., u.s.b or c.w. signal from a 24V battery supply. By the way, its model number is derived from SendEmpfangGerate, or transmitting receiving equipment, 15 for 15W of course and the D stands for digital.

This set was manufactured by the East Berlin company RFT VEB Funkwerk Kopenick between about 1975 and 1988. It was intended for both military and civilian use, including – apparently – the infamous Stasi secret police.

The set has at least three battery boxes, one taking Ni-cads, one to power the set from an external 12 or 24V supply as in a vehicle for instance and a mains power unit running of 220V. Luckily, my set came with all three boxes, so I'm well covered and there's also a mention on the Internet about a hand generator as well.

The set is very easy to use, the tuning controls are quite light – probably too light for serious military use – but very easy on the fingers when tuning round an Amateur band. Output is either to a telescopic whip or a BNC type 50Ω socket. A large roller coaster tunes the r.f. output to the antenna, with the panel meter showing either battery state or the output tuning.

There's a very good German web site which details many modifications for this set including the frequency extension. I intend to fit this mod at a later stage to give access to the 14MHz band.

With the mains power unit and the external amplified loudspeaker fitted the set works well as a shack mounted transceiver and I've made several good contacts. The set's lightweight construction, light gauge metal, little reinforcing, makes it look somewhat amateurish compared to the solid make up of the PRC-74.

The BDR-510C

The BDR-510C is made by MBLE in Belgium and the set tunes 2 to 12MHz and generates 10W of a.m., c.w., u.s.b. signal from a 12-15V battery supply. I acquired this set, **Fig. 4**, along with its

mobile/base station unit. This includes an a.c./d.c. power supply running off 240V mains or 12 or 24V d.c. supply which also has an audio amplifier and speaker fitted and a charger for the set's internal batteries.

For mobile use the man-pack sits in a very secure frame and connects to the base unit via two plugs. One plug carries the charging voltage for the internal batteries with the other connecting the set's audio, receive and transmit to the base units amplifier. The handset can be connected to the base unit in this role. There are two sockets for the handset on the man-pack, one is marked 'whisper' and allows the operator to speak very quietly whilst still generating full output.

Unfortunately, despite several searches on the Internet and communications with several Belgian Amateurs – including a club for ex-MBLE employees – I can't locate any circuit information on the set but did find a little background information. The set is also known as a BE/PRC-1012; Non-US made back-pack HF USB/CW/AM transceiver. Designed by MBLE as the BDR-500 series, PRC-1012 is the NATO designation for that equipment.

The PRC-1012 is similar in design, technology and purpose to the US PRC-74. Apparently, it lagged the 74's development by about five years but incorporated some improvements which allowed more flexibility.

Two versions of the BDR-500 series are known, the first, BDR-510, tunes 2-12MHz in 1kHz steps with an r.f. power output of 10W. The later – improved – BDR-550 tunes 2-18MHz in 100Hz steps, with an r.f. power output of 4 or 15W. Luckily, the set I acquired is fully working and very nice to use. Again, come a sunny day I intend to try the set out in the field with a decent antenna! The photographs in **Fig. 5** and **6** show the relative sizes of the three units.

And Finally

Well that's about it for this stint in the V&V shop. I hope you've enjoyed the selection I have bought you and there are more pictures at **www.qsl.net/g4bxd** As always I can be contacted directly at: **62 Cobden Street, Kidderminster, Worcestershire DY11 6RP**, or via E-mail at **military1944@aol.com** Cheerio for now!

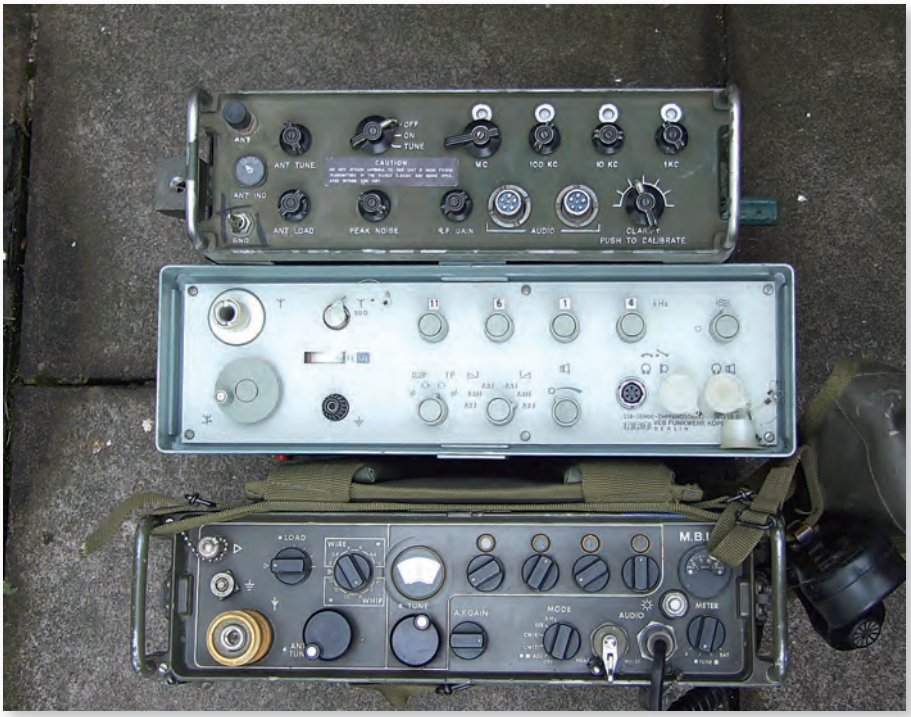


Fig. 5: The three sets photographed for size and layout comparison.

Fig. 6: This month's rigs photographed side-by-side to illustrate the different heights of the three sets.

TRADERS TABLE

The equipment for sale on this page is secondhand or ex-demonstration

Disclaimer

Advertisements from traders for equipment that is illegal to possess, use or which cannot be licensed in the U.K, will not be accepted. While the publishers will give whatever assistance they can to readers or buyers having complaints, under no circumstance will the magazine accept liability for non-receipt of goods ordered, late delivery or faults in manufacture.

SHORTWAVE SHOP LTD

01202 490099

TRANCEIVERS

ICOM IC718 Ex Demo £399
KENWOOD TS 870 HF £795
KENWOOD TS 480 ..... £599
JST 135 + PSU + TUNER + SPEAKER £499
ICOM IC-706 MkI £225
ICOM IC-290 + TONO 35W AMP £145
KENWOOD TR 751E £225
TRIO TR 9000 2m MULTIMODE £175
YAESU FT 920 ..... £599
KENWOOD TK3103 PMR446 x 8 c/w CHARGERS £400

RECEIVERS

BPL CELESTE WORLD SPACE ..... £POA
ICOM IC8500 ..... £695
ICOM IC-R10 with ACC £190
JRC NRD-535 Full Filtered £425
AOR AR8200 Mk I £225
AOR AR8600 Mk II NC EM8200 ..... £495
BEARCAT UBC 278 BASE EX DEM £139
BEARCAT UBC 3000XLT EX DEM £185
YUPITERU MVT 125 VHF Airband £75
YUPITERU MVT 3300 ..... £99
AMI DIGI SAT RX ASR WS201 ..... £129
SANGEAN AT818 ..... £85
YAESU VR120D £120
YAESU VR5000 ..... £POA
GRE PSR 225 ..... £159
GRE PSR 216 ..... £75
ALINCO DJX3 ..... £70

ACCESSORIES

TOUCH SCREEN WEATHER STATION £79
ICOM AT180 ATU £225
ICOM SP-6 ..... £65
ICOM AH7000 DISCONE £85
GLOBAL AT1000 ATU £60
KPC-2 TNC £85
PACCOMM TINY-2 ..... £85
YAESU SP 980 ..... £59
GARMIN GPS III c/w Acc + Mapping CD £89
TNC 320 ..... £POA
WATSON W25SM PSU £59
DAIWA CN620A 1kw POWER/SWR £65
KENWOOD PS53 ..... £145
KENWOOD MC60 ..... £95
MFJ 432 VOICE KEYER £175
MFJ 1020C ACTIVE ANT £69
RAYCOM 35W AMP £40
KENWOOD MB11 MOUNT ..... £POA
MFJ 986 3k TUNER £185
WELZ SP-220 SWR/PWR METER £65
SAKA 8" TFT LCD TV EX DEM £95
KENWOOD LF 30A LOW PASS FILTER £30
ICOM BC133 (2 of) Drop In Charger inc PSU ..... £OFFERS

NEVADA

023-9231 3090

TRANSCEIVERS

ALINCO DJC7 HANDY TRANSCEIVER £149
ICOM 756PRO III HF/6M W/ATU/DST £1599
YAESU FT1000MP BASE W/DSP & ATU £949

HANDHELD SCANNERS

ALINCO DJX2 AM/FM/WFM RADIO £79
ALINCO DJX3 ALL MODE SCANNER £85
BEARCAT 68XLT HANDHELD SCANNER £55
BEARCAT 120XLT 100MEM AM/FM £79
BEARCAT 180XLT H/HELD SCANNER £109
BEARCAT 3000XLT AM/FM/WFM £110
YUPITERU MVT9000 MK II ALL MODE £215

CB RADIO

MIDLAND 98+ MOBILE CB TRANSCVR £69

ACCESSORIES

AMDAT ADC60 FREQ. STD CLOCK £99
BENCHER KEYER £59
DIAMOND CX401 4WAY ANT SWITCH £32
ICOM AT160 COAXIAL AUTO ATU £179
ICOM SM20 DESKTOP £90
KENT STRAIGHT KEY £29
KENWOOD PS30M 20A POWER SUPPLY £110
MFJ 784 DSP FILTER £129
MFJ 784B DIGITAL NOISE FILTER £149
MFJ 971 PORTABLE ATU £49
PAKRATT 232 DATA TERMINAL/LEADS £99
PALSTAR AT1500CV ATU £199
PALSTAR PS04 2-4A POWER SUPPLY £14
TOYO SA450 ANTENNA SWITCH £17
UNIROSS CHARGER & BATTERIES £12
VCI PM30 2KW POWER METER £69
YAESU MH35A2B SPEAKER MIC £19
ZETAGI M27 ANTENNA MATCHER £20

B-GRADE ITEMS

ALINCO DJX2000 ALL MODE /H SCANNER £250
ALINCO DJ496 UHF HANDHELD TX £69
BEARCAT 69XLT HANDHELD SCANNER £49
BEARCAT 92XLT HANDHELD SCANNER £89
BEARCAT 3500XLT CLOSE CALL SCANNER £129
BEARCAT 230XLT SCANNER £79
BEARCAT 72XLT CLOSE CALL SCANNER £69
BPL CELESTE WORLDSPACE/FM RADIO £29
ETON SOUND 102 DAB/FM W/iPod DOCK £99
GENUS GEO DAB/ALARM RADIO £29
GOODMANS GPS280 DAB/CD STEREO £69
INTEK M790 MOBILE TRANSCEIVER £85
ITEC CUBE DAB CLOCK RADIO £29
MAYCOM AR108 AIRBAND/MARINE H/H £54
NEVADA ND210E DAB RADIO £39
NEVADA SINFONIE DAB (BLACK) £49
NEVADA SINFONIE DAB (WHITE) £49
NEVADA SINFONIE DAB (BLUE) £49
PERSTEL DR301 DAB/FM SD SLOT £125
PERSTEL DR201 DAB/MP3 PERSONAL £39
PERSTEL DR101 PERSONAL DAB £49
PRESIDENT HARRY 80 CH CB RADIO £69
PURE TEMPUS 1XT DAB RADIO £49
YAESU VR120 AM/FM/WFM H/HELD £99
ZETAGI HP1000 TRANSMATCH £49

WATERS & STANTON

01702 206835

Kantronics KAM Multimode Data TNC £55
SEC 1212 13.8V Switch Mode Regulated 12A (max) PSU £45
Mirage RC-1 Linear Remote Control Unit for Power, Mode & Preamp with 25' of cable £29
Kantronics KAM-98 Multimode Digital Data Controller with Pactor, GTOR, AMTEXT & NMEA-0183 GPS £89
Alinco DJ-X7 100kHz-1300MHz AM, FM, WFM Hand Held Receiver 1000Ch + 8.33kHz step £79
Uniden UBC-68XLT 66-512MHz (with gaps) FM Receiver 80Ch. 4 x AA or 12V DC £59
SSE PSU-101 Desk Stand with 2 x 12V DC outputs 240V AC £29
Realistic Pro-43 68-999MHz (with gaps) AM,FM Hand Held Receiver 200Ch £69
Optoelectronics Digital Scout 60MHz-2.6GHz Digital Frequency Counter + Field Strength, Reactive Tuning & 1000 Memories £259
Steepletone MBR-2000 Portable FM Stereo,MW & SW Radio 20ch .. £14
Realistic Pro-43 68-999MHz (with gaps) AM,FM Hand Held Receiver 200Ch £69
Oregon Scientific BA-312E Radio Controlled Clock with Temperature and Weather Forecast £19
Garmin GPS-II plus 12Ch. 500 Waypoints,BackTrack £79
Icom IC-R10 500kHz-1300MHz All Mode Hand Held Receiver 1000Ch. + RS-232 ..... £149
Icom IC-2000H 2m FM Mobile Transceiver 50W, 10W + Alphanumeric Memories £119
Uniden UBC-60XLT 66-512MHz (with gaps) FM Hand Held Receiver 80Ch. 4 x AA cells £55
Diamond SX-600 1.8-525MHz 200W SWR,PWR meter + 2 sensors £99
Tokyo HX-240 HF Transverter 3.5-28MHz with 2m IF 40W £125
LDG AT-1000 1.8-54MHz Automatic ATU 6-800 ohm 1000W max (100W 6m) with X-Needle Meter 12V at 1A £279
Radio Shack Pro-528 25-1300MHz (with gaps) AM,FM Hand Held Receiver + Trunk Traking 1000Ch.Alpha & PC input £69
Optoelectronics M-1 10Hz-2.4GHz Frequency Counter + AC Adapter £119
Watson W-10SM 12V 10A (max) Switch-Mode PSU £35
Yupiteru MVT-7300EU 521kHz-1320MHz All Mode Hand Held Receiver 1000Ch. + 8.33kHz step £139
Zetagi V2 2-Way Antenna Switch £9
SGC SG-235 1.8-30MHz Microprocessor controled ATU 500W with SmartLock pro Controller £499
MFJ MFJ-993RC Remote Control Unit for MFJ-993 Auto Tuner £25
Yaesu FT-890 HF All Mode Transceiver with Gen.Cov. RX 100W 12V £499
MFJ MFJ-1026 All Mode QRM Eliminator with Active Antenna £115
M.Modules MML144/30-LS 2m 1-3W in, 30W out Linear with Preamp £69
Sony NV-U70T GPS Navigation System + Europe Map Database, Touch Screen, Traffic Info, 1GB memory £199
AOR AR-8000 500kHz-1300MHz All Mode Hand Held Receiver 1000Ch. £149
Palstar R-30 1KHz-30MHz AM, SSB Communications Receiver £379
Hi-Mound Manipulator Morse Paddle Key £39
Alinco DJ-X2000 100kHz-2150MHz All Mode Hand Held Receiver + CTCSS, Alpha 2000Ch. £189
MFJ MFJ-956 Shortwave Preselector £39
MFJ MFJ-202B 1-100MHz Receive Noise Bridge £45
Diamond SX-200 1.8-200MHZ SWR,PWR meter 200W £49
Revex P-300E 12V 30A (max) Over Volts/Current Protected PSU £79
Icom SP-21 Matching Extension Speaker £59
Icom IC-746 HF,6m,2m All Mode Base Transceiver + Auto ATU, Gen. Cov. 12V £699
Kenwood TS-2000X HF,6m,2m,70cm & 23cm All Mode Transceiver + Auto ATU & DSP £1,299
WinRadio WR-G313i 9kHz-30MHz All Mode PCI Internal Computer Controlled Communications Receiver £479
WinRadio WR-ADS-Full Advanced Digital Suite Option for G3 series receivers £99
Kenwood PS-50 13.8V 20.5A Matching PSU £99
Icom IC-R8500 100kHz-2GHz All Mode Communications Receiver 1000ch. 12V + PSU £749
Kenwood IF-232C RS 232 Interface for Kenwood transceivers £59

WATERS & STANTON

01702 206835

Microset PT-1012 13.5V 10A (12A max) stabilized PSU £49
Yaesu FP-700 13.5V Matching PSU with Extension Speaker £89
West Mountain Radio RB/M8/C RigBlaster 8pin Cable Sound Card Data Interface £49
Yaesu FT-726R 2m,70cm + 10m All Mode Base Transceiver 10W Mains £399
Alinco DX-70TH HF,6m All Mode Mobile/Base Transceiver with Gen. Cov. & CTCSS 100W (HF & 6m) 12V £329
Kenwood TS-570D G HF All Mode Base Transceiver with Gen. Cov. + ATU & DSP filter 100W 12V £599
Kenwood TS-570D HF All Mode Base Transceiver with Gen. Cov. + ATU & DSP filter 100W 12V £569
Icom IC-R8500 100kHz-2GHz All Mode Communications Receiver 1000ch. 12V + PSU £749
Kent KSKA Brass Straight Morse Key on Wood Base £45
Kenwood TM-G707E 2m,70cm FM Mobile Transceiver 50W,35W + Full CTCSS & Remote Head feature £149
Watson W-10AM 12V Variable Regulated 10A PSU with Meters £39
Icom IC-746 HF,6m,2m All Mode Base Transceiver + Auto ATU, Gen. Cov. 12V £699
MultiCOM PMR-1000TX PMR446 Licence Free 446MHz Base Transceiver 4 x AA (not supplied) with charger £39
Yaesu ADMS-2H Programming Software and Serial Cable for FT-8900 ..... £25
Lowe HF-150 30kHz-30MHz All Mode Base/Portable Receiver 12V + psu £199
Target HF-3 Target 0-30MHz 12V Receiver £99
Yaesu FRT-7700 150kHz-30MHz Receive ATU for FRG-7700/8800 ..... £99
Microwave M MML144/100-S 2m 10W in, 100W out Linear with Preamp £99
Uniden UBC-105XLT 25-960MHz (with gaps) AM,FM + 8.33Mhz step 100Ch £55
GRE PSR-282 66-512MHz (with gaps) AM, FM Hand Held Receiver + 8.33MHz 200Ch. 4 x AA cells £59
GRE PSR-282 66-512MHz (with gaps) AM, FM Hand Held Receiver + 8.33MHz 200Ch. 4 x AA cells £59
Yaesu CT-58 Quadra Lead interface cable for FT-100 ..... £19
Kenwood MC-60 Electret Desk Mic with Preamp, Dual Impedence .. £89
Kenwood TS-570D G HF All Mode Base Transceiver with Gen. Cov. + ATU & DSP filter 100W 12V £599
Flex Radio SDR-1000-100 PC Controlled HF All Mode Transceiver + Gen Cov RX, DSP filtering, 100W 12V £599
Kenwood TS-570D G HF All Mode Base Transceiver with Gen. Cov. + ATU & DSP filter 100W 12V £599
Bhi NES10-2 Noise Eliminating Extension Speaker with Audio Out 12V £69
Icom IC-U82 70cm FM H/Held Transceiver with CTCSS, DTMF keypad, Ni-CD & charger £99
Watson W-25SM 12V 22A (25A max) Switch Mode PSU £55
Icom IC-PCR1500 10kHz-3300MHz All Mode PC Controlled Receiver with USB 12V + psu £239
Global AT-2000 150kHz-30MHz SWL ATU with Q selector £69
Kenwood TS-870S HF All Mode Base Transceiver with Gen. Cov. + ATU & DSP in the IF, 100W 12V £899
Kenwood TS-450S AT HF Base Transceiver with Gen.Cov. RX & Automatic ATU 12V £349
Yaesu FT-920AF HF, 6m All Mode Base Transceiver + Auto ATU, Gen. Cov. FM option & AM Filter 100W 12V £789
Yaesu FT-1000MP mkV Deluxe HF Base Transceiver + Gen.Cov. , ATU & DSP filters 200W inc FP-29 30V psu £1,199
Icom PS-85 13.8V 20A (max) Matching PSU £129
SGC Speaker 52-20 Extension Speaker for SG-2000DSP £49
AOR AR-3000A plus 100kHz-2036MHz Enhanced All Mode Communications Receiver 400Ch. 12V + psu £529
Uniden UBC-780XLT 25-1300MHz AM, FM, WFM Desk/Mobile Receiver + Trunk Tracking 500Ch. 12V + psu £149
Maycom AR-108 108-180MHz AM,FM 99Ch. Mini Hand Held Receiver 2 x AA or 3V DC £40
Kenwood TH-78E 2m/70cm FM H/Held with Full Duplex £99
Yaesu FT-847 HF,6m,2m,70cm All Mode Transceiver with Audio DSP & Gen.Cov. 12V £529

RADIOWORLD

01922 414796

Yaesu VL-1000 QUADRA 1kW HF + 6m Linear Amplifier £2499
Yaesu FT-2000D 200watts £1800
IC-756PRO-MKIII Icom HF + 6m Trx £1599
Icom IC-775DSP HF Base Transceiver £1499
IC-756PRO-MKIII Icom HF + 6m Trx £1499
Icom IC-781 Amateur HF transceiver £1495
Yaesu FT-1000 "CLASSIC" HF Transceiver £1399
Yaesu FL-7000 HF Linear Amplifier £1299
Yaesu FT-2000 IN STOCK 100W with internal power supp £1299
AR-5000A+3 AOR Wide band all mode Receiver £1299
Yaesu FT-1000MP Mark -V Field £1199
OptoElectronics X Sweeper £1199
NEUMANN U 87 Ai condenser microphone £1100
Icom IC-756ProII HF / 6m Transceiver £999
Icom IC-910HX 2 / 70 /23cms Base £999
Kenwood TS-2000 All Mode Multibander Transceiver £999
AR5000+3 is a 'feature loaded' version £950
Yaesu FT-920AF HF / 6M Base £899
Kenwood TS-950SD HF Transceiver £899
IC-7400 HF, 6m & 2m transceiver £899
IC-7400 HF, 6m & 2m transceiver £899
Yaesu FT-736R Multi- Band Transceiver+6m+23cms £899
IC-910-HX Dual Band + 23cm Sat Trx £893.62
Icom IC-R8500 Receiver £849
Yaesu FT-920 ..... £799
Yaesu FT-990 /AC £799
Icom IC-765 HF Base Transceiver £799
Kenwood TS-870S HF Transceiver £799
Yaesu FT-847 HF-6-2-70 Base £799
Yaesu FT-847 HF-6-2-70 Base £799
Kenwood TS-790E Dual-Band Base / Mobile Transceiver £799
Icom IC-736 HF 6 ..... £699
Icom IC-756 ..... £699
Kenwood TS-850S /AT £699
Yaesu FT-767GX HF, 6m & 2m & 70cms transceiver £699
Kenwood TS-850S /AT £699
Icom IC-736 HF 6 ..... £699
AOR AR-7030+ HF Receiver £699
Yaesu FT-736R 6m, 2m & 70cm Base £699
Kenwood TS-570DG/E £675
Icom IC-746 HF/6m Transceiver £649
Icom IC-746 HF/6m Transceiver £649
Yaesu FT-767GX £599
Yaesu FT-736R 2m/70cm Base Multimode £599
Kenwood TS-940SAT £575
Kenwood TS-690SAT HF -6m Transceiver £549
Kenwood TS-570DG/E £549
Kenwood TS-570D HF Transceiver £525
Icom IC-706MKIIG £499
Yaesu FT-897D Multiband Portable Transceiver £499
Kenwood TS-570D HF Transceiver £475
AOR AR-3000A Wideband Receiver £450
Yaesu FTV-1000 200 W Transverter £450
Yaesu FT-897D Multiband Portable Transceiver £449
Yaesu FT-890AT HF Transceiver £425
Icom IC-751 HF Transceiver £400
Yaesu FT-100 ..... £399
Kenwood TS-680S HF / 6m £399
Icom IC-706MkII Mobile Transceiver £399
ICOM IC-737 Hall band transceiver £399
Icom IC-R72 Receiver £399
Yaesu FR-101 HF RX £399
JRC NRD-525 HF Receiver £399
Icom IC-740 HF Transceiver £389
Yaesu VR-5000 Scanning Receiver £389
Icom IC-703 HF / 6m £379
Alinco DX-77E HF Transceiver £379
Alinco DX-77E HF Transceiver £379
Icom IC-718 HF Transceiver £359
Icom IC-718 HF Transceiver £359
IC-R71E HF Receiver £349
Kenwood TM-255E 2m Mobile £329
Trio (Kenwood) TS-830S £325
Yaesu FT-902DM HF transceiver £325
A3S Cushcraft 3-Element Tribander £300

Classified Ads

To advertise on this page see the booking form below.

DISCLAIMER Some of the products offered for sale in advertisements in this magazine may have been obtained from abroad or from unauthorised sources. *Practical Wireless* advises readers contemplating mail order to enquire whether the products are suitable for use in the UK and have full after-sales back-up available. The publishers of *Practical Wireless* wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.

Aerials

GAREX ELECTRONICS VHF/UHF accessories and aerials, PMR equipment and spares. www.garex.co.uk Tel: 0771 4198 374 PO Box 52, Exeter EX4 5FD.

G2DYM/G4CFY AERIALS Custom made low noise, low TVI dipoles and trap dipoles. PVC covered stranded wire and 75 ohm feeder properly made-off. Epoxy potted traps. Centre piece and dog-bone insulators included. Spectrum Communications. Tel 01305 262 250. www.spectrumcomms.co.uk

For sale

Qtz x-tals 455kHz to 150MHz Std 10.106, 10.245, 10.7, 11.155MHz £1.00/unit. Callg 3.56, 7.030, 21.06, 28.06 £1.00/unit. 1.4MHz fltrs £14.00. 10.7MHz 10kHz fltrs £3.25 P&P £1.00 + VAT.
IQ Electo 0208 391 0545. vincent@jakomin.fsnet.co.uk

Valves

VALVES:- OVER 50000 STOCKED Ham, Vintage, Military, Audio. SAE for FREE list to: Wilson Valves, (Jim Fish G4MH), 28 Banks Ave., Golcar, Huddersfield, West Yorks HD7 4LZ. Tel: 01484 654650/649380/650725. Mobile:- 07733 283084. E-mail: wilsonv@zoo.co.uk Visa etc. Fast & personal service.

VALVES AND ALLIED COMPONENTS IN STOCK Ring for free list. Valves/ books/magazines wanted. Geoff Davies (Radio). Tel: 01788 574774.

TOP PRICES PAID
for all your valves, tubes, semi-conductors and ICs.
Langrex
Unit 4, Daux Road, Billingshurst, W. Sussex RH14 9SJ
TEL: 01403 785600. FAX: 01403 785656.
www.langrex.co.uk

Repairs

REPAIRS TO ALL AMATEUR AND VINTAGE Rx/Tx Cost effective service. Phone or call in for details. Kent Rigs, 52 Salisbury Road, Chatham, Kent ME4 5NN. Tel: 07903 023437.

QSL cards

FULL COLOUR QSL CARDS for all your QSL needs. Shirts and caps with callsigns and also ham cartoons by GW3COI. For free samples contact Chris M0DOL. E-mail: qslers@aol.com P.O. Box 184 Northampton NN3 9JH.

Whilst prices of goods shown in advertisements are correct at the time of going to press, readers are advised to check both prices and availability of goods with the advertiser before ordering from non-current issues of the magazine.

ORDER FORM FOR CLASSIFIED ADS

PLEASE WRITE IN BLOCK CAPITALS

The prepaid rate for classified advertisements is 42 pence per word (minimum 12 words), box number 70p extra. Semi-display setting £13.90 per single column centimetre (minimum 3cm). Please add 17.5% VAT to the total. All cheques, postal orders, etc., to be made payable to PW Publishing Ltd. Advertisements, together with remittance, should be sent to the Classified Advertisement Dept., Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: 0845 803 1979, Fax: 01202 659950.

Please insert this advertisement in the ..... **issue of** *Practical Wireless* (if you do not specify an issue we will insert it in the next available issue of *PW*) for ..... insertion/s. I enclose Cheque/P.O. for £.....(42p per word, 12 minimum, please add 17.5% VAT to total).

Name: .....

Address:.....

.....

.....

.....

Telephone No.:.....

Box Number @ 70p: Tick if appropriate ☐

Category heading:.....

Please photocopy this form or write on a separate sheet if you prefer

BARGAIN BASEMENT

SEND YOUR ADVERT TO:-

***PRACTICAL WIRELESS*, BARGAIN BASEMENT, ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW**

For your advert in Bargain Basement please remember to include your dated, coloured corner flash from this page along with your entry.

Bargain Basement rules - £4 per advert

Please write your advert **clearly** in **BLOCK CAPITALS** up to a maximum of **30 words**, plus **12 words f**or your contact details on the form provided and send -it together with the dated corner flash and your **payment of £4 (subscribers** can place their advert **free of charge** as long as they provide their **subs number and corner flash),** cheques should be made payable to **PW Publishing Ltd.**, credit card payments also accepted.

Send your advert to **Bargain Basement, Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW** or E-mail your advert to **peter@pwpublishing.ltd.uk** (If you don't want to include your credit card details on your E-mail, just 'phone us on **0845 803 1979**.

Please help us to help you by preparing your advert carefully. Any advert which contains **??** marks indicates that the advertiseing dept. could not read/interpret the wording.

Please avoid FAXing your advert - it could delay publication.

Advertisements from traders or for equipment that it is illegal to possess, use or which cannot be licensed in the UK, will not be accepted. **No responsibility will be taken for errors and no correspondence will be entered into on any decision taken by the Editor on any of these conditions.**

You should state clearly in your advert whether equipment is professionally built, home-brewed or modified.

The Publishers of *Practical Wireless* also wish to point out that it is the responsibility of the buyer to ascertain the suitability of goods offered for purchase.

FOR SALE

960 MAGAZINES includes Practical Wireless, Electronics Today International, Ham Radio, Radio Electronics. Oscilloscope DT12-5 Marconi instrument. Old army tel old signal generator. Sangamo Western model, lots more to see. collectors of old electronic gadgets welcome. Tel: 0113 232 0325 (Leeds).

BC342 AND PCR RECEIVERS both mains PSUs, working. R1155N, all original condition with wartime aircraft DF loop, twin needle meter. Best offers please? Demonstrations to callers, post at cost. Tel: Jim G4XWD 01562 745585. E-mail: jandr@macunlimited.net (Kidderminster).

COIL WINDER with winding counter, hand operated. Professionally built, £80. Tel: Ted G0BOC 02380 868030 (Southampton).

JRC NRD 535 almost mint condition, bandwidth control and RTTY boards fitted, box and manual, £425 o.n.o. Uniden UBC 9000XLT good working condition, offers. Tel: Steve 01582 503806 (Luton).

KENWOOD TS-570D boxed, as new. YS-88SN filter fitted. Matching Kenwood SP-23 speaker, microphone and manual, £410 plus postage. Tel: Gordon 01724 734742 (North Lincs).

KENWOOD TS-50 HF transceiver and AT-50 auto ATU with manual. Picture by e-mail, £450 o.n.o. Tel: Tony G3XYD 07910 362918 or 0239 250 3401 (Gosport).

KW-2000B classic transceiver. Complete with PSU and instruction manual. In working order, sensible offers please. Tel: 01248 410748, evenings (Anglesey).

RACAL RA-1792 faulty spares/repair, £75. Trio Kenwood R-1000 HF receiver, £95. AOR AR8200 W/B scanner, £50. AEA PK-232MBX data controller, £50. 100 + various amateur service manuals, £50. Buyer collects. Tel: Peter G3UFI 01424 753949 (East Sussex).

YAESU FT-857D DSP HF/UHF/VHF transceiver. Yaesu FC-30 auto ATU + separation kit. Yaesu DTMF mic, brand new. All original boxes, immaculate condition.
Rarely used, £450 + carriage.
May p/x. Tel: 07946 153362.
E-mail: darcycon1@hotmail.co.uk (Teeside).

WANTED

CHARGER FOR STANDARD C-178 2m/70cms hand-held transceiver. Will buy complete rig and charger if transceiver okay. 1982 UK callbook urgently required.
Tel: Ray 0777 649 5381 after 6pm please (Dorset).

COPY OF FREE *Practical Wireless* Blueprint... December 1963. Copy of free *Practical Wireless* Blueprint... December 1964. E-mail: gm3bkc@aol.com

DATA on operating circuitry for Dekatron tubes. Write Mr. F. W. Hall, 38 Elmbank Way, Hanwell, London W7 3DG.

DRAKE R-8B must be in good working order. Also, technical manual for Drake R-8B.
Tel: 01753 646802 anytime (Stoke Poges, Bucks).

OLD HALF INCH FERRITE RODS must be half inch, 12.7mm, in diameter and be six inches long or more. Will pay very good money for the rods. Tel: Peter Tankard 0114 2316321 between 9am and 9pm (Sheffield).

Bargain Basement order form

Please insert this advertisement in the next available issue of Practical Wireless.

☐ **For Sale** ☐ **Wanted** ☐ **Exchange**

PLEASE NOTE: as a security measure, you must include your house number and postcode.

Name .....

Address .....

.....

..... Post code .....

Telephone Number .....

PLEASE WRITE IN BLOCK CAPITALS

CARD NUMBER

VISA SWITCH AMERICAN EXPRESS MasterCard

Signature..... Security number

LAST THREE DIGITS ON THE BACK OF THE CARD

Switch issue number (if on card) .....

Start date of card..... Expiry date of card.....

My Subs Number is.....(or mailer label) .....

		(30)	

CONTACT DETAILS FOR ADVERT. Please only write in the contact details you wish to be published with your advert, ie. do you want your name & address, or just your telephone number? Your advert, you decide! **PLEASE - No FAXed Ads!** (12)

B.B. Aug '08

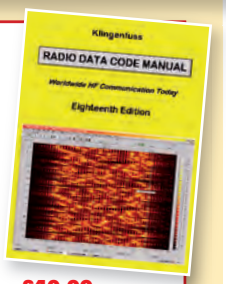
THE PW PUBLISHING
RADIO BOOKSTORE

mail order...huge range in stock...fast delivery...

RADIO DATA CODE MANUAL

Worldwide HF Communication Today

The totally revised new edition has, again, more than 600 pages with 131 new graphics and screenshots.



This is the standard international reference book for COMINT ELINT MASINT SIGINT and considered indispensable for the identification of really exotic HF radio stations. This manual is used worldwide by intelligence and radio monitoring services for training and operation.

£40.00

NEW IN STOCK NOW

IN STOCK NOW

THE POCKET UK & IRELAND AIRBAND FREQUENCY GUIDE

Contents: Alphabetical listing of Airfields and their frequencies, ICAO Airfield Designator, Decode Airline & Company Operations Frequencies, 2 Letter Airline Prefixes, 3 Letter Airline Prefixes, Civil Aircraft HF (SSB) Frequencies, Complete Numerical Frequency Listing. Abbreviations, Phonetic Alphabet & Morse Code.
100 pages A6 (10.5 x 15 cm) Spiral Bound Laminated Cover

£4.99

THE UK & IRELAND FLIGHT ROUTES 2008

Godfrey manning believes this book will fill the gap left by the superb but now out of print Flight Routings - see Sky High on page 17 of this issue.

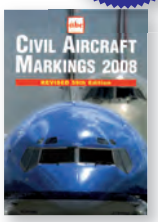
- A5 spiral bound.
- Around 200 airline companies, including charter flights from British and Irish Airports.
- Thousands of flights with flight number, point of departure, times of arrival & departure and type of aircraft.
- Selection of overflights between Europe and the Americas.
- Flight numbers both company & ATC (where available).
- The ideal companion for both listeners and RadarBox & SBS users.
- Find where flights originate and terminate.
- Days of flight (frequency of flights).
- Around 250 pages.

£12.95

NEW IN STOCK NOW

NEW IN STOCK NOW

CIVIL AIRCRAFT MARKINGS 2008



This popular annual guide has been fully revised to include the many changes that have affected registrations of civil aircraft in Britain over the past 12 months and continues to be the most widely respected and authoritative guide to the aircraft on the British register.
Fully comprehensive, the book also includes microlights, balloons, radio frequencies, airline flight codes and much else. Apart from featuring those civil aircraft registered in Britain, the book also includes the registrations of most civil airliners likely to be seen at British airports.

£9.99

NEW IN STOCK NOW

MILITARY AIRCRAFT MARKINGS 2008

This new edition of abc Military Aircraft Markings has been fully revised to include the many changes that have affected military aircraft serials over the past year. This annual edition covers all the latest developments that have affected military aviation throughout the world and will appeal to all aviation enthusiasts who need the most up to date information available. One of the best selling military aviation titles published annually, the book provides comprehensive coverage of all elements of British airpower. abc Military Aircraft Markings also deals with military aircraft from other countries which are likely to be seen in the British Isles

£9.99

	Pages	Price
AIRBAND		
● NEW IN STOCK **THE UK & IRELAND FLIGHT ROUTES 2008** (Seldec)	275	£12.95
● NEW **CIVIL AIRCRAFT MARKINGS 2008** Alan S Wright. (abc)	436	£9.99
● NEW **MILITARY AIRCRAFT MARKINGS 2008** Howard Curtis. (abc)	226	£9.99
● NEW **AIRWAVES 2008** (Photavia)	144	£11.50
● NEW **CALLSIGN 2008.** (Photavia)	111	£11.50
● **DIRECTORY OF AIRCRAFT SELCALS** 8th edition. (Seldec)	205 PLUS CD	£15.95
● NEW IN STOCK **HF AIRBAND FREQUENCY GUIDE** (Seldec)	225	£14.75
● **NORTH ATLANTIC WAYPOINT ATLAS** (Seldec)	50	£9.50
● BACK IN STOCK **AIRBAND RADIO GUIDE** 6th Edition (abc)	122	£8.99
● SORRY, OUT OF STOCK **AIRBAND RADIO HANDBOOK** David Smith (Sutton)	190	£12.99
● SORRY, OUT OF STOCK **INTERNATIONAL AIRBAND RADIO HANDBOOK** David Smith (Sutton)	192	£9.99
● BACK IN STOCK **AIR TRAFFIC CONTROL** 9th Edition (abc)	112	£8.99
● SORRY, OUT OF STOCK **AIRWAVES SELCAL – CIVIL & MILITARY DIRECTORY** (Photavia)	176	£11.95
● **FLIGHT ROUTINGS 2006.** T.T. Williams & S.J. Williams	200	£10.00
● **ATLANTIC TRANSITION CHART** High (AERAD) Now split in to two charts making it much easier to read!	1020x520mm	£13.00
● **ATLANTIC TRANSITION CHART** High/Low (AERAD) Now split in to two charts making it much easier to read!	1020x520mm	£13.00
● **BRITISH ISLES LOW ALTITUDE CHART** (AERAD)	1020x520mm	£13.00
● **HIGH ALTITUDE ATLANTIC TRANSITION CHART** (AERAD)	1020x520mm	£13.00
Scanning & Frequency Guides		
● NEW **RADIO LISTENERS GUIDE 2008**	160	£5.95
● IN STOCK **HF MARINE FREQUENCY LIST.** (Seldec)	225	£14.75
● **LISTENING TO LONGWAVE** Kevin Carey	100	£5.95
● **THE POCKET UK & IRELAND AIRBAND GUIDE** 2007-2008 (Seldec)	100	£4.99
● **THE POCKET UK & IRELAND VHF MARINE FREQUENCY GUIDE.** (Seldec)	108	£4.99
● **SCANNERS 5** B. Robertson & P. Rouse	245	£9.95
● **BUYING A USED SHORT WAVE RECEIVER** 4th Edition. F. Osterman.	78	£4.95
● **KLINGENFUSS GUIDE TO UTILITY STATIONS 2007**	604	£33.00
● NEW **KLINGENFUSS SHORTWAVE FREQUENCY GUIDE 2008**	478	£28.00
● NEW **KLINGENFUSS SHORTWAVE FREQUENCIES CD 2008**		£21.00
● NEW – IN STOCK NOW **KLINGENFUSS RADIO DATA CODE MANUAL** 18th Edition	600	£40.00
● OUT OF STOCK **PASSPORT TO WORLD BAND RADIO 2008** (IBS)	592	£17.50
● **UK SCANNING DIRECTORY** - 9th edition (PW Publishing)	544	£19.75
● LOW PRICE **WORLD RADIO TV HANDBOOK 2008** (WRTH)	672	£18.00
Antennas/Transmission Lines/Propagation		
● **EVEN MORE OUT OF THIN AIR** (PW Publishing)	80	£6.75
● **SIMPLE & FUN ANTENNAS FOR HAMS** (ARRL)	256	£16.99
● **25 SIMPLE INDOOR & WINDOW AERIALS** E.M. Noll (Babani)	50	£1.75
● **25 SIMPLE TROPICAL & MW BAND AERIALS** E.M. Noll (Babani)	54	£1.75

You can see full descriptions of all these books & order securely on-line at www.mysubcare.com see the magazine's related products section. Also, see www.pwpublishing.ltd.uk/bookstore/books.html for full descriptions of all these books.

	Pages	Price
● **AN INTRODUCTION TO RADIO WAVE PROPAGATION** J.G. Lee. (Babani)	116	£3.95
● **ANTENNA FILE** (RSGB)	285	£18.99
● **ANTENNA TOOLKIT 2 (INC. CDROM)** Joseph Carr	256	£28.99
● **ANTENNA TOPICS** Pat Hawker G3VA (RSGB)	384	£18.99
● **BACKYARD ANTENNAS** Peter Dodd G3LDO (RSGB)	200	£18.95
● **NEW ARRL ANTENNA BOOK** 21st edition, INC CD (ARRL)	944	£30.99
● **EXPERIMENTAL ANTENNA TOPICS** H.C. Wright	72	£3.50
● **HF ANTENNA COLLECTION** Edited by Erwin David G4LQI. (RSGB)	233	£19.95
● **HF ANTENNAS FOR ALL LOCATIONS** 2nd edition. Les Moxon G6XN. (RSGB)	322	£19.99
● **INTERNATIONAL ANTENNA COLLECTION** G. Brown M5ACN. (RSGB)	250	£12.95
● **INTERNATIONAL ANTENNA COLLECTION 2.** G. Brown M5ACN. (RSGB)	200	£12.95
● **PRACTICAL ANTENNAS FOR NOVICES** John Heys	58	£7.99
● **PRACTICAL WIRE ANTENNAS 2** Ian Poole G3YWX	172	£11.99
● **RADIO PROPAGATION PRINCIPLES & PRACTICE** Ian Poole G3YWX	102	£14.95
● **SIMPLE AND FUN ANTENNAS FOR HAMS** (ARRL)	200	£16.99
● **OUT OF PRINT VHF UHF ANTENNAS** Ian Poole (RSGB)	128	£13.99
● **SORRY, OUT OF STOCK WIRE ANTENNA CLASSICS** (ARRL)	200	£10.50
● **MORE WIRE ANTENNA CLASSICS** VOL 2. (ARRL)	200	£12.50

Beginners/Licence/Manuals

● **NEW 3rd Edition ADVANCE! THE FULL LICENCE MANUAL** Alan Betts G0HIQ & Steve Hartley G0FUW. (RSGB)	104	£11.99
● **AMATEUR RADIO EXPLAINED** Ian Poole G3YWX. (RSGB)	80	£5.79
● **AN INTRODUCTION TO AMATEUR RADIO** I.D. Poole. (Babani)	150	£4.99
● **DISCOVER DXING.** 3rd edition. J. Zondlo	96	£6.95
● **NEW 5th edition FOUNDATION LICENCE NOW!** Alan Betts G0HIQ. (RSGB)	32	£4.99
● **HF AMATEUR RADIO** Ian Poole G3YWX. (RSGB)	128	£15.99
● **NEW 4th Edition INTERMEDIATE LICENCE – BUILDING ON THE FOUNDATION** Steve Hartley G0FUW. (RSGB)	76	£6.99
● **NOVICE RADIO AMATEURS EXAMINATION HANDBOOK** I.D. Poole. (Babani)	150	£4.95
● **PRACTICAL RECEIVERS FOR BEGINNERS** John Case GW4HWR (RSGB)	165	£14.99
● **SECRET OF LEARNING MORSE CODE** Mark Francis. (Spa)	84	£6.95
● **MORSE CODE FOR RADIO AMATEURS.** (RSGB)	32 inc. CD	£7.99

Design & Construction

● **OUT OF PRINT COIL DESIGN & CONSTRUCTION MANUAL** (Babani)	106	£3.99
● **CIRCUIT OVERLOAD** (RSGB)	504	£18.99
● **PRACTICAL PROJECTS** G. Brown M5ACN. (RSGB)	208	£13.95
● **PROJECTS FOR RADIO AMATEURS & SWL** R.A. Penfold. (Babani)	92	£3.95
● **RADIO & ELECTRONICS COOKBOOK** (RSGB-Newnes)	320	£19.99
● **RF COMPONENTS & CIRCUITS** Joe Carr. (RSGB-Newnes)	416	£25.99
● **THE ART OF SOLDERING** R. Brewster. (Babani)	84	£3.99
● **THE SUPERHET RADIO HANDBOOK** I.D. Poole. (Babani)	104	£4.95

Shack Essentials

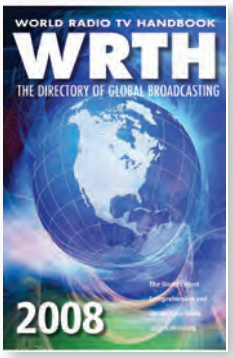
● **NEW ARRL HANDBOOK** 85th edition inc CD. (ARRL)	Huge!	£30.99

THE RADIO LISTENER'S GUIDE 2008

Frequencies and transmitter information for all BBC and commercial radio stations, plus DAB digital transmitter details. Radio Reviews Independent reviews of analogue and DAB digital radios. News from BBC and commercial radio stations. Digital Radio (DAB) The latest news and information. Sky and Freeview radio information and channel lists. Advice How to get the best from your radio.
160 pages.

£5.95

NEW IN STOCK NOW



WORLD RADIO TV HANDBOOK 2008 EDITION

The 62nd edition of the best selling directory of global broadcasting on LW, MW, SW and FM.
The Features section this year includes a detailed look at Rebuilding a Racal RA1792, the history of two contrasting stations: Falklands Radio and Radio for Peace in Zimbabwe, our Digital Update, and completely updated SW site maps.

The remaining pages are, as usual, full of information on:
- National and International broadcasts and broadcasters
- Clandestine and other target broadcasters
- MW and SW frequency listings
- Equipment reviews and articles
- Terrestrial TV by country
- Extensive Reference section

NOW ONLY £18.00!

NEW LOW PRICE!

NEW IN STOCK NOW

AIRWAVES 2008

The complete civil and military HF/VHF/UHF aviation frequency directory.
The most comprehensive and up-to-date airband frequency directory, including the extensive UHF frequency changes of the past two years.
Over 1400 new frequencies and amendments since the mass UHF changes of January 2006.

£11.50

CALLSIGN 2008

The new 2008, fully updated, edition of this popular civil and military aviation callsign directory with a large number of additions, amendments, confirmations and deletions.

A5 size and spiral bound for ease of use, Callsign 2008 contains thousands of civil and military aviation callsigns, making the book a very useful publication for the airband enthusiast.

£11.50

FOUNDATION LICENCE NOW!

A 32-page soft-covered book that takes you through the syllabus, reinforcing what you will learn on the Foundation Course. The course has been designed and introduced for people of all ages and abilities. To take the course you need no formal qualifications. £4.99.

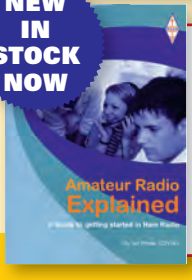
INTERMEDIATE LICENCE. BUILDING ON THE FOUNDATION.

The second course book in the RSGB's series is structured to progressively obtaining an Amateur Intermediate Licence. It contains practical exercises, broken down into half-hour worksheets. The ideal companion book for all Amateur Radio Intermediate Licence students. £6.99.

ADVANCE! THE FULL LICENCE MANUAL.

This is the third book in a course structured to obtain an Amateur Radio Licence. Advance is the final stage in gaining the full licence and has been updated to suit the new syllabus structure. Broken down into logical sections, it's presented in an easy-to-understand way, making it perfect for home study. £11.99.

NEW IN STOCK NOW



AMATEUR RADIO EXPLAINED

Written by well-known author and radio amateur Ian Poole, G3YWX, this book provides the ideal introduction to the wonderful world of amateur radio. Amateur Radio Explained is for people first taking an interest in amateur radio and those ready to move on from Foundation level. Written in a readable and easy-to-understand fashion, Amateur Radio Explained is the perfect introduction to the exciting world of amateur radio. 80 pages.

£5.79

THE PW PUBLISHING LTD
RADIO BOOKSTORE

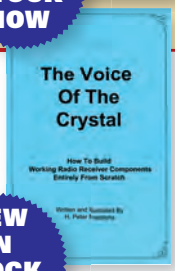
mail order...huge range in stock...fast delivery...

NEW IN STOCK NOW

INSTRUMENTS OF AMPLIFICATION

Rob Mannion G3XFD writes: Peter Friedrichs has written a truly superb book but has chosen a title that really hides its 'light' under the proverbial bushel! Armed with the book an interested constructor can literally build a radio from scratch anywhere! Perhaps a better title could have been *Desert Island Radio for the Shipwrecked* because everything from simple earphones, detectors and mechanical amplifier to home made valves (tubes) and transistors. If you enjoy Rough Science on BBC2 you'll love this book! **Very highly recommended**.

£14.95



NEW IN STOCK NOW

VOICE OF THE CRYSTAL

185 pages of practical information on the fabrication of electronic components suitable for use in building crystal radio sets. Basic theory and simple analysis is combined with dozens of examples of historical practice, work by contemporary experimenters, and construction details for many instruments fabricated by the author himself.

£11.95

RADIO PIONEERS 1945

Discover the history of the Veteran Wireless Operators Association and the Amateur Radio Relay League. See some of the early wireless catalogues and amateur stations. Get a brief but to-the-point chronology of radio developments to 1925. You get pictures of early tubes, Poulsen in his lab, Marconi parabolic reflectors, a Fessenden alternator and more. The history is brief, fast reading, but informative. You'll read about the personalities and discover what they did.

£7.95

The Pocket UK & Ireland VHF Marine Frequency Guide.

This handy, small, ring-bound book lists the frequencies and channel numbers for marinas and ports all around the UK and Ireland. The list runs alphabetically by region, with separate lists for ports, marinas and inland waterways. There are also helpful sections on both the HM and Irish Coastguard, including when to listen to weather forecasts. At the back of the book is the complete list of channel numbers, their equivalent frequency and notes on their use, which means it doesn't matter whether you are using a scanner or a marine receiver you can find the stations you are looking for. 108 pages.

£4.99

HF MARINE BAND FREQUENCY LIST

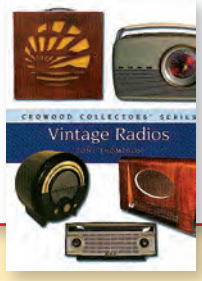
The new HF Marine Band Frequency List is our latest publication for listeners with a general interest or a particular interest in Marine Radio. Listed are frequencies of Civil, Military & Government shipping on the HF bands throughout the world. In addition to an extensive frequency list covering from 1.5 - 30MHz (with MF shipping, yes the 500kHz band is still in use!) the book includes sections on antennas, receivers, including DX tuners, with chapters on decoding RTTY, SITOR, CW, FAX and other modes.
225 pages, wire spiral "lay-flat" bound with colour covers.

£14.75

VINTAGE RADIOS

This book tells the collector and the armchair wireless enthusiast everything there is to know about classic radios from the 1920s to the end of the 1960s. All the important makes and models are discussed and the author also covers buying and selling, care and restoration and many other topics, including foreign radios and radio-related ephemera. Illustrated with many colour photographs, this is the perfect collector's companion to the fascinating hobby. 208 pages.

£19.95



Binders

PRACTICAL WIRELESS **OR** ***RADIOUSER*** £10.00

	Pages	Price
● **DXPEDITIONING - BEHIND THE SCENES FOR RADIO AMATEURS WORLDWIDE** N Cheadle & S Telenius Lowe	180	£6.95
● **THE RIG GUIDE** S W White. (RSGB)	88	£3.99
● **AMATEUR RADIO ESSENTIALS** G. Brown. (RSGB)	288	£25.99
● **AMATEUR RADIO ASTRONOMY** J. Fielding. (RSGB)	330	£16.99
● **AMATEUR RADIO MOBILE HANDBOOK** P. Dodd. (RSGB)	114	£14.99
● **AMATEUR RADIO (VALUE) LOGBOOK** (RSGB)	80	£4.95
● **AMATEUR RADIO ON THE MOVE** (ARRL)	170	£14.99
● **ARRL OPERATING MANUAL** 8th Edition. (WSL)	420	£19.99
● **CALLSEEKER PLUS 2008 - CALLSIGN LISTING CD & More**		£14.99
● **DIGITAL MODES FOR ALL OCCASIONS** Murray Greenman (RSGB)	208	£16.95
● **GREAT CIRCLE MAP** (PWP)	400 x 400mm	£1.50
● **LF TODAY - GUIDE TO SUCCESS 136kHz** M Dennison. (RSGB)	128	£11.95
● **LOW PROFILE AMATEUR RADIO** 2nd edition. (ARRL)	64	£14.99
● **RADIO AMATEURS WORLD ATLAS** (A4)	23	£12.00
● **RSGB AMATEUR RADIO OPERATING MANUAL** (RSGB)	224	£19.95
● **RSGB PREFIX GUIDE**. 8th edition. (RSGB)	34	£8.95
● OUT OF STOCK **RSGB YEARBOOK** 2008 edition. (RSGB)	512	£18.99
● NEW **RSGB RADIO COMMUNICATIONS HANDBOOK + CD** 9th Edition. (RSGB)	800	£29.99

QRP

● IN STOCK NOW **More QRP Power** (ARRL)	176	£16.99
● **LOW POWER COMMUNICATIONS**. 2nd edition. (ARRL)	240	£14.99
● **LOW POWER SCRAPBOOK** (RSGB)	320	£12.99
● **QRP BASICS**. George Dobbs G3RJV. (RSGB)	204	£14.99

VHF & Higher

● **ALL ABOUT VHF AMATEUR RADIO** W. I. Orr W6SAI. (ARRL)	163	£8.95
● **GUIDE TO VHF/UHF AMATEUR RADIO** Ian Poole G3YWX. (RSGB)	180	£9.99
● NEW **VHF/UHF HANDBOOK** Andy Barter G8ATD. (RSGB)	302	£14.99

Historical

● NEW in stock soon **INSTRUMENTS OF AMPLIFICATION** HP 'Pete' Friedrichs	300	£14.95
● NEW in stock **RADIO PIONEERS 1945** (Lindsay)	64	£7.95
● **FJ CAMM - THE PRACTICAL MAN** (RSGB)	110	£10.99
● **VINTAGE RADIOS** (Crowood)	208	£19.95
● **1940s AMATEUR RADIO BOX SET** (RSGB) 6 book set	450	£15.99
● **AMATEUR RADIO - A BEGINNERS GUIDE** (1940 REPRINT) (Lindsay Publications). Douglas Fortune W9UVC	156	£7.70
● **MARCONI'S ATLANTIC LEAP (H/B)** Gordon Bussey. (Marconi)	96	£6.99
● NEW LOW PRICE **RADIO & RADIO OPERATORS FROM SPARKS TO SATELLITES** (Package with Swedish hardback book, English spiral-bound translation and CD with printable PDF files) Birgitta Guftafsson	255	£15.00
● **THE SAGA OF MARCONI OSRAM VALVE** B. Vyse & G. Jessop	346	£25.00

Crystal Sets

● **CRYSTAL RECEIVING SETS & HOW TO MAKE THEM** (Lindsay)	124	£8.95
● NEW in stock **VOICE OF THE CRYSTAL** (Pete Friedrichs)	185	£11.95

Electronics

● **ELECTRONIC PROJECT BUILDING FOR BEGINNERS** (Babani)	110	£4.99
● **GETTING THE MOST FROM YOUR MULTIMETER** (Babani)	102	£4.99
● **HOW TO USE OSCILLOSCOPES & OTHER TEST EQUIPMENT** (Babani)	110	£4.99

You can order securely on-line at

www.mysubcare.com

see the magazine's related products section.

HOW TO ORDER

Telephone: 0845 803 1979

Call the Bookstore, Monday to Friday 9am to 4pm.

We can often send your book the very same day, if we can, or the next day if we miss the post!

Outside these hours your order will be recorded on an answerphone.

Post: Write to the Bookstore, remembering to include your name, address, daytime telephone number and payment details (Sterling please - cash not accepted. **Cheques made payable to PW Publishing Ltd.**), at: **Bookstore, PW Publishing Ltd., Broadstone, Dorset BH18 8PW.**

Fax: If you wish to FAX your order to us please mark it for the attention of the Bookstore and send it to: 01202 659950

E-mail: bookstore@pwpublishing.ltd.uk

Order Securely on-line: www.mysubcare.com

Photocopies & Back Issues: To order a back Issue, please call the Order Line to check availability. We can photocopy articles from issues that are not available - we have a Review List going back years!

	Current Issue	*Back Issues*
Practical Wireless	£3.50 (inc P&P)	£5.00 (inc P&P)
RadioUser	£3.50 (inc P&P)	£5.00 (inc P&P)

Photocopies / Reprints (per article): £3.00 (inc P&P).

Overseas: Please add £1.00 to the above prices.

E&OE

order form

80/80

Photocopies are acceptable

Please try to order from an up-to-date magazine to ensure correct prices and availability.

..... Price (£).....

..... Price (£).....

..... Price (£).....

..... Price (£).....

..... Price (£).....

..... Price (£).....

..... Price (£).....

..... Price (£).....

Total cost of books ordered:..... Price (£).....

Postage & Packing charges: Please remember to add P&P to your order. (£) .....

UK: £1.75 P&P for one item, £3.30 for two or more

Overseas Europe:
£3.00 P&P for one, £5.50 for two, £2 extra per item for three or more

Overseas Rest of World:
£5.00 P&P for one, £10.00 for two, £2 extra per item for three or more

Total cost of order including postage **£**.....

Send this completed form to:

Bookstore, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW

Payment Details. Please note: For security purposes, you must include your house number and postcode.

Name.....

Address.....

.....

.....

Postcode .....

Telephone (Daytime) .....

I enclose my Cheque/Postal Order for £.....

Please note: Cheques MUST made payable to PW Publishing Ltd. and please write your cheque guarantee card number on the reverse.

or please debit my Mastercard/Visa/Amex

Expiry Date ..... Security No.

or please debit my Maestro/Solo

Expiry Date ..... Security No.

Start date ..... Issue No (if on card).....

Signature.....

Orders are normally despatched by return of post but please allow 28 days for delivery. Prices correct at the time of going to press.

Please note: all payments must be made in Sterling, cash not accepted.

SUBSCRIBE

to *Practical Wireless*

- Never miss an issue
- Have it delivered to your door
- Subscribers get their copies before they reach the shops
- ***PW*** is Britain's best selling Amateur Radio magazine

To order a subscription please contact our subscription agency:

Practical Wireless Subscriptions
PO Box 464
Berkhamsted
Hertfordshire HP4 2UR. UK

Credit Card Orders taken on:
(01442) 879097
between 9am - 5pm. Outside these hours your order will be recorded on an answering machine.
FAX Orders taken on **(01442) 872279**

Internet orders can be placed at:
www.mysubcare.com
or via e-mail to: **pw@webscribe.co.uk**

Please note cheques should be made payable to PW PUBLISHING LTD and CASH is NOT accepted by ourselves or Webscribe.

Subscription Rates

PW 1 Year		
UK	£38	☐
Europe	£47	☐
ROW	£57	☐
PW 2 Year		
UK	£73	☐
Europe	£89	☐
ROW	£108	☐
PW 3 Year		
UK	£104	☐
Europe	£130	☐
ROW	£161	☐
Joint PW & RU 1 Year		
UK	£73	☐
Europe	£89	☐
ROW	£108	☐
2 Year		
UK	£138	☐
Europe	£170	☐
ROW	£207	☐
3 Year		
UK	£197	☐
Europe	£246	☐
ROW	£307	☐

Joint subscriptions now available - Save £££s

On-line facilities are available as well as the usual way to pay by cheque, postal order and credit card.

Order a new subscription online
Simply pay with a credit card on-line using our secure server.

Check the status of a subscription online
Existing subscribers can now log in to their own accounts and see how many issues they have left to run.

Update your details online
If you move or change your personal details, you can now update them on-line without having to write in to let us know.

Renew an existing subscription online
We've made renewing easier too. Everything you need to renew is now available on-line as well as by regular mail. (Subscribers still get a reminder in the post when it's time to renew).

I wish to order a one/two/three year subscription to **practical wireless** *starting with the.....issue.*
I wish to order a joint one/two/three year subscription to **practical wireless** *and* **radiouser** *starting with the.....issue.*

Payment Details

I enclose my Cheque/Postal Order* for £.....
made payable to PW Publishing Ltd.
or please debit my MasterCard/Visa/Amex* card No.

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

Security Number: ☐☐☐

MasterCard VISA AMERICAN EXPRESS Expiry Date.....

or please debit my Switch card No.

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐

SWITCH Security Number: ☐☐☐

Start Date.....Switch Issue Number (if on card).....
Switch Expiry Date.....

Signature.....

Name.....
Address.....
.....
.....
.....
Postcode.....
Daytime Tel. No.....

Please note: For security purposes, you must include your house number and postcode.

Orders are normally despatched by return of post but please allow 28 days for delivery. Prices correct at time of going to press. E&OE.

Please note: All payments must be made in Sterling.
Cash not accepted.
Cheques made payable to PW Publishing Ltd.

**Delete as necessary. Photocopies of this page are acceptable*

Rob Mannion's

topical talk

This month, Rob discuss feedback received from readers who have reacted to the July *Keylines* editorial.

As I mentioned in the *Keylines* editorial, I'm devoting most of this month's *Topical Talk* to discuss a number of letters and E-mails (for my own attention and not for publication) received from readers reacting to last month's *Keylines*. However, before I write further I must say that several of my correspondents (I've already replied to everyone personally) seem to have misunderstood the word 'Elite' and the term 'Elitist'.

Because of the confusion, I checked in my dictionaries and what I regard as the simplest definition comes from my copy of the *Oxford English Dictionary* (12 volumes photographically reduced to two volumes). Here the word 'Elite' is described as meaning 'chosen' and the term 'Elitist' is used to describe an action/or someone who regards themselves as being 'chosen' – with all its connotations!

Several of my correspondents had also obviously become confused between 'Elitist' and 'Specialist', thinking – it seems – that 'Elitist' actually referred to someone who is a 'Specialist'. However, I'm sure I actually used the term 'Specialist' correctly, because I think that is the term that more than adequately describes what we are – specialists in radio and an Elitist is something else entirely!

Additionally, two readers wrote in to make it perfectly clear that they didn't think that our hobby was a 'populist' pastime and I was mistaken in believing it was! Again, I think that by misinterpreting my editorial, my correspondents had assumed that I think that our hobby is 'populist'. Both writers then went on to berate the Foundation Licence (FL) system as an attempt to lower standards of Amateur Radio, rather than seeing the FL as an entry to our hobby.

In fact, as I pointed out in my reply letters, Amateur Radio – and hobby radio in general – has always been a minority interest. Even in the days when *PW* was weekly and selling well over 100,000 copies a week in the early 1930s – the very figure I mentioned clearly indicates that in comparison with the then UK population – **radio hobbists were a minority**!

As I prepared *Topical Talk,* I thought I'd support my opinions with the National Census results from 1931 (it's carried out every 10 years). However, the information had been destroyed in the Second World War and the 1941 Census was abandoned because of the conflict, although the statistics I've managed to find estimate that in the early 1930s the UK population was around 46 million people.

The population figures I obtained proved again – more than adequately in my opinion – that even in the exciting early days of radio – when compared to the circulation figures of radio magazines – **we were a minority even then!** I'm also of the opinion that our interests are unlikely to become 'populist'. Although, of course, by encouraging those with a fledging interest we can help them build a foundation of knowledge that will eventually lead to a lifetime interest. We may never know that the M3 we've helped today, may be the microwave specialist in the future – perhaps a case of a specialist specialising?

Meeting People

While on the subject of our hobby and welcoming anyone interested, a recent experience came to mind. This year – as I briefly mentioned in *Keylines* – I had the pleasure of having **Freddie Robinson** my eldest grandson helping me during the *PW* G4HLX 144MHz QRP Contest.

Because the **Poole Amateur Radio Club** were using the hill-top picnic site at Povington Hill, and another Amateur was using the alternative hill-top car park, we used a convenient lay-by between the two sites.

During the day a number of vehicles turned into the parking area and – obviously interested in seeing my mast and antenna – several people approached Freddie to ask him what was going on. Freddie explained what we were doing and after the initial contact, several visitors came over to watch and ask me more questions about Amateur Radio. Later, it dawned on me that without Freddie's help – the ice probably wouldn't have been broken and contact not made! So, I recommend a keen young assistant on contest days!

Rob Mannion G3XFD/EI5IW

YOUR SPECIALIST & LOCAL DEALERS

BERKSHIRE

ELITE INTERFACES LTD
Elite House, 5 Trafford Road
Reading RG1 8JP
Tel: 01189 584600 Fax: 01189 584900
www.eliteinterfaces.com
We have taken over the production and support of **Linear Amp UK**. Manufacturers and suppliers of top quality HF and VHF valve amplifiers and antenna tuning units.
Repairs of most make of amplifier undertaken

DORSET

PW Publishing Ltd
have a wonderful selection of radio based books and magazines
We can also supply a copy of most individual reviews that you may have read in past editions of *Radio Active*, *Short Wave Magazine* and *Practical Wireless* magazine
Tel: 0845 803 1979

ESSEX

WATERS & STANTON PLC
Spa House, 22 Main Road, Hockley
Essex SS5 4QS
Tel: (01702) 206835/204965
Fax: (01702) 205843
Web: http//www.waters-and-stanton.co.uk
E-mail: sales@wsplc.demon.co.uk
Open 9am to 5 30pm Monday to Saturday inclusive.
Main agents – all brands
Phone/Fax for free price list

MID GLAMORGAN

SANDPIPER AERIAL TECHNOLOGY
Unit 5, Enterprise House, Cwmbach Industrial Estate, Aberdare,
Mid Glamorgan CF44 0AE
Tel: (01685) 870425 Fax:(01685) 876104
A full range of transmitting & receiving antennas available for the amateur commercial market.
www.sandpiperaerials.co.uk
e-mail: sales@sandpiperaerials.co.uk

SOUTHWEST & WALES

QSL COMMUNICATIONS
● For all amateur radio and listener needs.
● New and secondhand equipment.
● Part exchange welcome.
Unit 6, Worle Industrial Centre, Coker Road, Worle, Weston-Super-Mare BS22 6BX
Tel/Fax: (01934) 512757

SCOTLAND

JAYCEE ELECTRONICS LTD
20 Woodside Way, Glenrothes, Fife KY7 5DF
Tel: (01592) 756962 (Day or Night)
Fax No. (01592) 610451
New opening hours: Tuesday-Friday 9am to 5pm. Saturday 9am to 4pm. Closed Sunday & Monday.
KENWOOD, YAESU & ICOM APPROVED DEALERS
A good stock of new and secondhand equipment always in stock

SCOTLAND

TENNAMAST SCOTLAND LTD
Masts from 25ft - 40ft
Adapt-A-Mast
(01505) 503824
81 Mains Road, Beith,
Ayrshire KA15 2HT
E-mail: nbrown@tennamast.com
Web site: www.tennamast.com

SOUTH YORKSHIRE

LAM Communications
71 Hoyland Road, Hoyland Common
Barnsley, South Yorks S74 0LT
www.lamcommunications.net
E-mail: lamcommunications.net
Tel: 01226 361 700
Specialists in amateur radio equipment, new and second hand. Scanners, receivers, C.B. radio, and taxi. We buy, se l and broker equipment and w ll part exchange.
Opening times:- Monday 12.00noon to 17.00hrs
Tuesday - Friday 10.00hrs to 17.00hrs. Saturday 10.00hrs to 15.00hrs
Special viewing times can be arranged w th Lee We also accept Switch/Visa Cash/Cheques

YORKSHIRE

LEEDS AMATEUR RADIO LTD
SUPERSLAB CB CENTRE
The home of GB3YW operating on 145.7875MHz. CTCSS 82.5Hz
★ The complete radio suppliers ★
Contact Steve Pounder
BRADFORD ROAD, EAST ARDSLEY,
NR. WAKEFIELD WF3 2DN
Tel: 0113-252 4586 Fax: 0113-253 6621

WEST SUSSEX

Adur Communications
PO Box 2047,
Steyning BN44 3XJ.
Tel: (01903) 879526
E-mail: service@durcomms.com
Repairs and alignment to all amateur and commercial radio equipment.

Telephone
0845 803 1979
to advertise in
Practical Wireless

INDEX TO ADVERTISERS

Adur Communications 61
Andover Amateur Radio Club 71
bhi 61
Birkett, J 71
Bowood Electronics 71
G3RCQ Communications 61
Kit Radio Company 71
LAM Communications 34
Martin Lynch & Sons 23, 24, 25
Moonraker 14, 15, 16
Nevada 47, 83
RadioUser 53
Radioworld 66, 67
Spectrum Communications 41, 65
Sycom 71
Tetra Communications 65
The Shortwave Shop 65
VHF Communications 65
Waters & Stanton 2, 3, 4

Just ask!

The best way to ensure you receive every issue of Practical Wireless and/or RadioUser is to place an order with your local newsagent. Once set up, your copy of *Practical Wireless* and/or *RadioUser* will be held for you to collect, saving you the time and the frustration of having to search the newstand. Some newsagents may even offer a home delivery service making it even easier to obtain your copy. So don't miss an issue, simply complete the form opposite and take to your local newsagent today.

Keep a look out for the logo and next time you visit your newsagent remember to Just Ask! about obtaining copies of your chosen magazines.

Please reserve/deliver* a copy of ..... on a regular basis,

commencing with the ..... issue. *delete as appropriate

Title/Mr/Mrs/Ms .....

First name ..... Surname .....

Address .....

.....

..... Postcode .....

Daytime Telephone No: .....

ALINCO dependable power
wherever you need it.....

£99.95
£8 P&P

- Input voltage 230VAC
- Output voltage (5 - 15) VDC variable
- Output voltage variation less than 2%
- Triple Protection:
  - Short-circuit,
  - Automatic current
  - Over-temperature
- Output current 30A (max), 25A (continuous)
- Size: 190(W) - 69(H) - 181(D)mm
- Weight: Approx 2.5kg with UK Mains cord

DM-330MW 30 Amp Switching Power Supply

The DM330MW Power Supply was designed especially for the UK market. It is ideal for communications equipment with its low noise, light weight and reliability. A patented Noise Offset Circuit allows you to change the switching frequency through a front panel control. This neat control lets you move the switching frequency to eliminate interference should it occur on a spot frequency. The Power supply provides a 5-15V DC variable output voltage and delivers up to 25amps, (30A peak). The DM330MW is the sensible choice for Dxpeditions, travel, holiday or just space saving home shack use.

dependable radios
wherever you need them....

THIS MONTH'S SPECIAL OFFER
£50 OFF

£199.00
£8 P&P

£499.00
£8 P&P

DX-70TH
HF + 6M Mobile/Base Transceiver

This proven performer is great for on-the-go radio fun with a removable, remote mount control head, big display, wide choice of operator parameters and full QSK CW operation. It features 100 Watts output and a 'no nonsense' design that's easy to use. It also offers 'All mode' performance on HF band including the 6m 'magic band'. Makes a compact desktop HF too! Its so affordable and easy to operate, why not get two DX-70's - one for home and one for the car? Then, you'll always be ready for HF excitement!

Winter SPECIAL
DX70TH WITH FREE BASE MIC WORTH £59.95

DR-635 Dual Band 'Feature packed' Mobile!

Enjoy VHF/UHF radio this summer with Alinco's feature packed Mobile transceiver. With a removeable head and extended receive capabilites it's an ideal Summer radio. When you're not talking to friends listen to Airband, Marine radio or your favourite FM radio station.

- Removeable head
- Large Multi Colour display
- Full duplex with 2 receivers gives true VHF/VHF and UHF/UHF reception plus VHF/UHF and UHF/VHF
- 200 Memory Channels
- Power VHF: 50/20/5 Watts, UHF 35/20/5Watts
- Optional - 1200/9600 packet (with EJ-50U)
- Optional - Digital Voice Comms (with EJ-47U)
- Optional - DTMF Microphone (EMS-57)
- CTCSS &DCS encode and decode
- CTCSS and DCS scan
- Programmable VFO and Memory Scan modes
- TCXO Oscillator fitted
- Ignition key activated power on/off feature

£289.95
£8 P&P

EDX-2
Automatic Wire Antenna Tuner

Tunes 160-10 meters (amateur bands) in seconds and mates with DX-70 or DX-77 HF transceivers. Can be mounted outdoors and used for base/mobile/marine.
• 160m coverage requires min 12m length antenna

HFM-1

- Covers: 3.5 - 30MHz when used with EDX-2 auto ATU)
- Length: 2.7 metres

£59.95
As this antenna exceeds standard shipping length please call for quote

DJ-195
VHF Handheld
£99.95

DJ596
Dual Band Handheld
£149.95

DJ-V5
Dual Band Handheld
£129.95

DJ-V17
2m Waterproof Handheld
£129.95

DR135
VHF Mobile
£129.95

DJ-X2000
The "Intelligent" Scanning Receiver
~~£299.95~~
£279.00

NEW! DJ-X30
Pocket sized, 100kHz - 1.3GHz!
£119.00

nevada® radio

Unit 1 Fitzherbert Spur Farlington Portsmouth PO6 1TT

For full details go to our website: www.nevadaradio.co.uk

UK Importers & Distributors of Alinco

phone 023 9231 3090 email sales@nevada.co.uk fax 023 9231 3091

Introducing the Yaesu FT-950 Transceiver

Direct lineage from the legendary FT DX 9000 and FT-2000

HF/50 MHz 100 W Transceiver

FT-950

Recommended Retail Price

£999.00 inc VAT

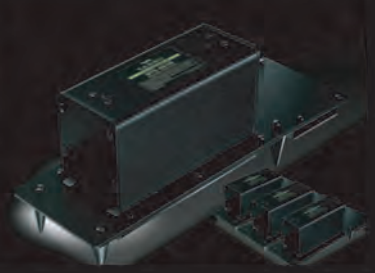
- Triple-conversion super-heterodyne receiver architecture, using 69.450 MHz 1st IF
- Eight narrow, band-pass filters in the RF stage eliminate out of band interference and protect the powerful 1st IF
- 1st IF 3 kHz Roofing filter included
- High-speed Direct Digital Synthesizer (DDS) and high-spec Digital PLL for outstanding Local Oscillator performance
- Original YAESU IF DSP advanced design, provides comfortable and effective reception. IF SHIFT / IF WIDTH / CONTOUR / NOTCH / DNR
- DSP enhancement of Transmit SSB/AM signal quality with Parametric Microphone Equalizer and Speech Processor
- Built-in high stability TCXO (0.5 ppm at room temperature)
- Built-in automatic antenna tuner ATU, with 100 memories
- Powerful CW operating capabilities for CW enthusiasts including CW Zero-in and CW Spot features
- Five Voice Message memories, with the optional DVS-6 unit
- Large Multi-colour VFD (Vacuum Fluorescent Display)
- Optional Data Management Unit (DMU-2000) permits display of various operating conditions, transceiver status and station logging.
- Optional RF μ-Tune Ultra Sharp Preselector System for 160 m, 80/40 m and 30/20 m Bands

Optional, YAESU Exclusive, Fully-Automatic -Tuning Preselector System!

Fully automatic, Ultra-sharp, External μ-Tuning Preselector (optional) features a 1.1" (28 mm) Coil for High Q

On the lower Amateur bands, strong signal voltages can impinge on a receiver and create noise and intermod that can cover up the weak signals you're trying to pull through. YAESU engineers developed the μ (Mu) Tuning system for the FT DX 9000/FT-2000, which is now available as an option for the FT-950. There are three modules available, the MTU-160, MTU-80/40, and MTU-30/20); these may be connected externally, using the optional base kit, with no internal modification required.

When the μ-Tuning module is engaged, the VRF system is bypassed, but the fixed Bandpass Filters are still in the received signal path.



Optional External Data Management Unit (DMU-2000) Provides Many Display Capabilities

Enjoy the ultimate in operating ease by adding the DMU-2000!

Enjoy the same displays that are available with the FT DX 9000 and FT-2000: Band Scope, Audio Scope, X-Y Oscilloscope, World Clock, Rotator Control, Extensive Transceiver Status Displays, and Station Logging Capability. These extensive functions are displayed on your user-supplied computer monitor.

Shown with after-market keyer paddle, keyboard, and monitor (not supplied).

DMU-2000
Data Management Unit (option)

For the latest Yaesu news, visit us on the Internet:
http://www.yaesu.co.uk

Specifications subject to change without notice. Some accessories and/or options may be standard in some areas. Frequency coverage may differ in some countries. Check with your local Yaesu dealer for specific details.

YAESU
Choice of the World's top DX'ers