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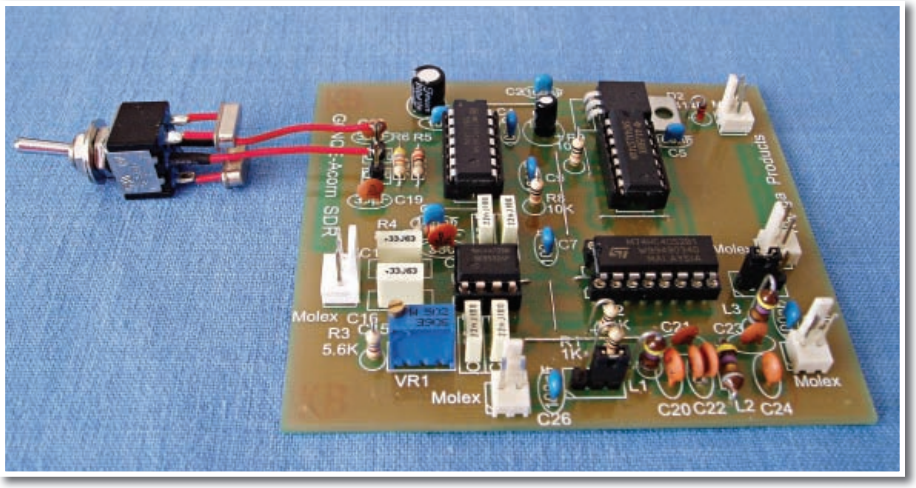
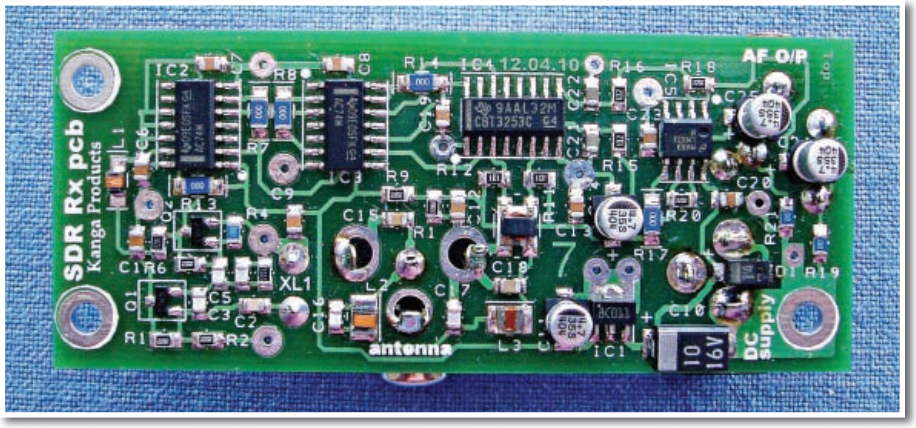
Practical WIRELESS

Britain's Best Selling Amateur Radio Magazine

Software Defined Radio Kits Reviewed



The G0NQE Acorn



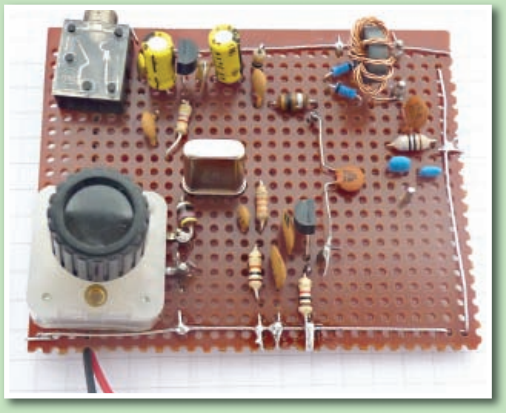
The Finningley Receiver

70MHz Contest Results

How did you do this year?

WIN

A Heil Genesis HM-12 Microphone & Lead Worth £109!



Practical Way

Build the 'Quick Receiver'

Antennas

Build a 'Keep it Simple Stupid' Delta Loop

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HF - UHF Antennas

LFA Antennas - The Ultimate in Performance!

Low Noise Designs up to 5kW with Models from 30m to 70cms

LFA (Loop Fed Antennas) Yagi antennas are the creation of **G0KSC at InnovAntennas** and represent the very best in engineering & low noise designs. The ultimate for weak signal h. **We list just a few in the range!** ***Special orders can be made.***

4 El ement 2m LFA with 29dB F/B ratio!

20m 3 El 7.5dBi F/B 14.2dB boom 4.2m 5kW vswr 1.3:1 max **£429**
17m 3 El 8.3dBi F/B 19.2dB boom 4.9m vswr 1.3:1 max 5kW **£329**
15m 4 El 9.7dBi F/B 24.8dBi boom 5.42m vswr 1.2:1 max **£499**
12m 4 El 8.49dBi F/B 23.5 dB boom 3.9m vswr 1.1:1 max **£228**
10m 3 El 7.5dBi F/B 14.2dBi boom 2.1m vswr 1.3:1 **£199**
6m 3 El 7.7dBi F/B 18.4dB boom 1.2m vswr 1.3:1 **£99**

Just a small selection of the VHF/UHF Range.

4m 3 El LFA 8.72dBi F/B 21.5dBi Boom 1.4m **£99.95**
2m 4 El LFA 9.52dBi F/B 29dBi Boom 1.2m **£74.95**
2m 6 El LFA 11.9dBi F/B 29dBi Boom 2.41m **£104.95**
2m 9 El LFA 14.1dBi F/B 26.7dBi Boom 4.4m **£194.95**
70cm 10 El LFA 14.4dBi F/B 27.85dBi Boom 1.7m **£92.95**
70cm 18 El LFA 18.1dBi F/B 37.94dBi Boom 4.3m **£174.95**
70cm 26 El LFA 19.7dBi F/B 36.15dBi Boom 6.8m **£255.95**

EME Ready Systems

We are pleased to announce that we have now installed an EME system at Hockley. This comprises four bays of 6 element 2m LFA Yagis fed by an IC-7000 plus Discovery 2m Linear and controlled by a Yaesu G5500 Ez/El rotator system. The system will be used to demonstrate both EME and regular VHF communications. With an estimated gain of around 3dB it should be possible to work the stronger stations. This is just another example of advanced communications system available exclusively from W&S.

2m Discovery 1.5kW

Yaesu G-5500 Rotator

4 x 6 element LFA Yagis

Initial Results GB-3ANG @ 600km!

The proof of any antenna system is in the results. Our compact array (shown above) enable us to hear GB3ANG almost any time of the day from Hockley in south east Essex. That's a distance of 600km. The LFA Yagis are doing there job and the loop feed system, offers an amazingly flat VSWR right across the band, whilst providing an extremely quiet listening platform. If you ant to improve your VHF/UHF DX - give the LFA system a try - Made in the UK!

HF - UHF in One Box!

YAESU **FT-897D** base or portable, this 1.8 - 440MHz transceiver is great value. 1.8 - 50MHz 100W 2m 50W 70cm 20W.
IN STOCK £819.95 D

FT-857D The great value mobile or base 1.8 - 440MHz. HF-6m 100W, 2m 50W 70cm 20W. **IN STOCK £714.95 D**

KENWOOD

The **TS-2000E** is a firm favourite for those wanting ultimate all-mode performamnce on all bands. 1.8-144MHz 100W 70cm 50W. It has the highest power on 2m & 70cms and the TS-2000X version adds 23 cms! Includes auto ATU, DX cluster facility and digital IF for superb weak signal performance. **IN STOCK £1549.95 D**

ICOM **IC-7000**

The most compact, high spec. HF-UHF transceiver available. With its lovely display and digital IF filters, it can handle all your needs - SSB CW and data. HF-6m 100W, 2m 50W and 70cms 35W. All in one lovely box. **IN STOCK £1189.95 D**

HF on a BUDGET!

YAESU **FT-450D** transceiver comes with the extra IF filter & an Auto ATU built in. 100W 160m - 6m with 3 IF filters 300Hz, 500Hz & 2.4kHz.
IN STOCK £839.95 D

ICOM **IC-718** SSB CW up to 100W from 160m-10m. You won't find a more cost effective HF radio!
IN STOCK £594.95 D

IC-7200 this 100 Watt radio covers 160m-6m and includes digital IF filters. **IN STOCK £839.95 D**

KENWOOD **TS-480SAT** A very compact HF transceiver that delivers 100 Watts from 160 - 6m and includes auto ATU.
IN STOCK £779.95 D

TEN-TEC **Jupiter-538B** 160m - 10m 100 Watts SSB CW AM FM with on-screen CW reader and socket for PC keyboard.
IN STOCK £1599.95 D

HF High Performance Transceivers

YAESU **FT-950** HF & 6m Transceiver

Step up to the FT-950 and you enter the world of advanced £1000+ class design. You get 30kHz - 56MHz Rx, Auto ATU, triple conversion Rx with 3 roofing filters, 32 bit floating point DSP, Superb dynamic range, Tx variable bandwidth and Mic EQ adjust, plus CW zero/spot feature, CW message storage etc. **IN STOCK £1264.95 D**

FT-2000 160 - 6m Transceiver

This radio is a DXers favourite and widely used for DXpeditions and contests. Covering 160m to 6m. It has all the digital features and auto ATU. Available as 100 Watt or 200 Watt version.
IN STOCK 100W £2259 D 200W £2899 D

FT-DX5000 160 - 6m Transceiver

The current Yaesu "flagship" radio, covering 160m to 6m delivering 200 Watts. ALL **IN STOCK**
FT-DX5000 Standard radio **£4635.95 D**
FT-DX5000D + SM-5000 monitor **£4939.95 D**
FT-DX5000MP + monitor & filters **£5369.95 D**

KENWOOD **TS-590S** 160m - 6m with superb receiver inc. dual roofing filters, Auto ATU, 32 bit f/p DSP & USB PC connection.

This radio has won the admiration of the radio press and hams all over the world. The best dynamic range in its class, digital IF, narrow roofing filters and auto ATU. Also FREE PC control program that can be downloaded. Exceptional value. **IN STOCK £1329.95 D**

ICOM **IC-7410** HF-6m Transceiver

This lovely new HF-6m all-mode 100W transceiver offers superb front end dynamic range, and has a 15kHz roofing filter. It also features a 36kHz DSP razor sharp filter, internal auto ATU, PC control via a USB port and speech synthesizer. **IN STOCK £1695.95 D**

IC-7600 HF Transceiver

The IC-7600 HF/50MHz transceiver is enhanced with some of the main features tried tested on the flagship IC-7700/7800 models. It is highly regarded by Amateur operators world-wide. Features inc a double conversion superheterodyne system, dual DSP units & 3kHz IF (roofing) filter. **IN STOCK £3299.95 D**

IC-7700 HF Transceiver

The IC-7700 HF/50MHz 200W transceiver shares many features with its "big brother", the world famous IC-7800. With two independent DSP units, a +40dBm 3rd order intercept point and ultra wide dynamic range to name but a few of the features.
IN STOCK £6364.95 D

TEN-TEC **OMNI-VII** HF Transceiver

Fire it up and you immediately know you are driving something different. The receiver is a delight and the transmitted audio is superb. This 100 Watt transceiver that covers 160m - 6m. Ethernet remote control ready.
IN STOCK £2599.95 D

Sofware Defined Transceivers

FLEX-1500 HF Transceiver

It works as well as it looks! This 5W transceiver covers 160m - 6m all modes. It uses the same software as the Flex-3000 and just needs a single USB cable to your PC. Software included. Enjoy amazing performance from such a low cost package. Great for SSB CW or data modes. Go portable with a laptop! **IN STOCK £589.95 D**

FLEX-3000 HF Transceiver

The 100 Watt award winning HF-6m transceiver with auto ATU. It is all you need, apart from a Windows based PC. The plug and play firewire connection makes setting up easy. Just one single FW cable to your PC. Experience a level of performance & feature packed radio, that no hardware design can match at even several times the price! More & more customers are experiencing the ultimate in flexibility, selectivity and usability. Uses Yaesu mic wiring and requires 12v at approx. 20 Amps peak. **IN STOCK £1399.95 D**

Carriage Charges: A=£4, B=£5, C=£8.50, D=£11

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HF Linear Amplifiers

Alpin-100mkII 160m - 6m 1.3kW

The Alpin 100 desktop linear will deliver up to 1.3kW output from this desktop design. It covers 160m - 6m and has full tune up protection. The panel control display tells you exactly what is happening and makes operation simple. If you are looking for something rugged with full safety features at a sensible price - this is it!

£2299.95 D

AMERITRON AL-811XCE 160m - 10m 600W

This Ameritron design gives a sensible power gain for a very reasonable price. It has a hunky built-in power supply with full monitoring of operation conditions. It uses three low cost 811A tubes to achieve the power output running from a 1500volt HT line. This desktop design can easily be accommodated. 350 x 210mm Weight: 14.51k8

£899.95 D

QRP HF Transceivers

YAESU

FT-817

A take anywhere all mode transceiver. 2.5 Watts from 1.8 - 70cms from internal batt. Or 5W from external 12v DC. This radio has stood the test of time and comes with its own battery cell pack and AC charger, plus mic. and telescopic whip. A complete all-mode all-band station.

IN STOCK £539.95 D

HB-1B HF

This little CW 80, 40, 30, 20m transceiver runs 6 Watts from ext. 12v or 4W from optional internal lithium cells. Has tunable filter 400Hz-3kHz, electronic keyer, programmable auto CQ, 30 memories, switched tuning speeds. Also receives SSB from 3.4 - 16MHz.

IN STOCK £249.95 D

High Performance Receivers

AOR *We are UK Distributors*

AR-MINI

This amazing little radio covers 100kHz - 1.3GHz AM FM & WFM. 1000 memories, over 30 programmable features inc. CTCSS & DCS. Alphanumeric memories give meaningful channels and there is a built-in bar antenna covering 100kHz - 5MHz. Inc. NiMH pack & charger. FREE software database for PC loading via h.

£169.95 D

AR-8200-MKIII

The famous scanner with the quality performance. 530kHz - 3GHz AM FM FMW & SSB. Inc batts, charger + cigar lead. If you are looking for a truly wide-band great performer this is the best in its class!

£499.95 D

AR-8600MKII Base or Portable

The AR-8600MKII is a base or portable station receiver covering 530kHz - 3GHz. All modes AM FM FMW & SSB with standard rotary tuning. Requires external 12V or optional internal batt pack. A great station accessory for general listening or extra receiver.

£699.95 D

VHF UHF Mobiles

FT-2900E

75 Watt 2m 3W Audio, CTCSS, DTMF mic & "WIRES" internet.

£142.95 D

FT-7900E

2m/70cms mobile 50/40W CTCSS, DTMF, "WIRES" internet, wide Rx

£239.95 D

FT-8800E

Dualband Mobile 50W / 30W Great Value

£343.95 D

FT-8900R

Quad band 10/6/2m/70cm FM 50W (70cm 35W)

£389.95 D

FTM-10E

2m/70cms Blue Tooth & built-in mic.

£324.95 D

FTM-350E

2m/70cm Mobile Bluetooth GPS APRS

£479.95 D

ID-E880

50 Watt Dual band 2m/70cm with D-Star and airband receive.

£439.95 D

TM-D710E

50 Watts 2m/70cms with APRS

£445.95 D

TM-V71E

2m/70cm Mobile with Echo Link

£299.95 D

Tigertronics Soundcard Adaptors

Signal Link USB

The SignaLinkTM USB combines the legendary performance of our SignaLink SL-1+ with a state of the art "built-in" low-noise soundcard. The SignaLink USB has only one USB connection to the computer, and in most cases, only one connection to the radio. Convenient front panel controls make setup and operation very easy. The SignaLink USB is fully isolated and is compatible with ALL radio Mic, Data, and Accessory Ports, and supports virtually ALL sound card Digital and Voice modes. Includes ready wired rig lead of your choice.

£89.95 C

£94.95 with 13-pin DIN

Handheld Transceivers

VX-3E 2m / 70cm Handheld Wideband receive
£169.95 D

VX-6E 2m/70cms handy, 5W Wideband Receive
£249.95 C

FT-60E 2m/70cms, 5W handy Wideband Receive
£129.95 C

VX-8GE Dualband 2m/70cm 5W + GPS Antenna
£349.95 D

VX-7R Waterproof dualband handy (silver/black)
£299.95 C

VX-8DE Triple Band 6/2m/70cm Upgraded APRS
£369.95 D

IC-E80D Dual band 2m/70cm D-Star CTCSS & DTCS GPS Compat.
£329.95 D

IC-E90 Triple band 2m 6m 70cm + wideband receive 500kHz-1GHz
£244.95 D

IC-E92D Dual band 2m/70cm waterproof fitted D-Star. Rugged radio.
£388.95 D

TH-F7E Dual band 2m/70cm + wideband receive inc. SSB
£236.95 D

TH-D72E Dual band 2m/70cm with GPS & TNC + SiRF
£426.95 D

TG-UV2 Dual band 2m/70cm with CTCSS DCS & LED torch!
£81.95 D

NEW from Kenwood!

NEW TM-281E

2m FM 65/25W Mobile Transceiver

On or off the road, Kenwood's TM-281E is a mobile radio you can always count on. As tough as nails, this MIL-STD-compliant transceiver delivers powerful performance, excellent audio clarity, and a host of advanced features.

£169.95 D

NEW TH-K20E

** TX 144-146MHz * RX 136-174MHz * 5.5W Max Output * 200 Memory channels*

£119.95 D

NEW TH-K40E

** TX 430-440MHz * RX 400-470MHz * 5W Max Output * 200 Memory channels*

£119.95 D

WATSON Made for Watson by M0CVO antennas NEW

1:1-BALUN-1.5 1.5kW 1.8-30MHz A 1:1 balun able to handle up to 1.5KW RF power. Used to feed a balanced antenna, or doublet with unbalanced feeder, reduces static on feeding.

£49.95 C

4:1-BALUN-1.5 1.5kW 1.8-30MHz A 4:1 4:1 Extra High Power 1.5KW current balun for Windom, off centre fed or folded dipoles. Reduces 200 - 300 Ohms at feed point of antenna to 50 Ohms enabling the antenna to be fed with 50 Ohm coaxial cable.

£49.95 C

W-LINE
1:1 Line Isolator 400W 1.8-30MHz Removes RF from Coax.

£29.95 C

1:1, 4:1-BALUN & 9:1-UNUN 400W 1.8-30MHz Can be used as centre feed point.

Each model **£29.95 C**

MD-12HP	12m Mono for portable fixed station 400W CW 1:1 Balun 5.77m	**£39.95 C**
MD-17HP	17m Mono for portable fixed station 400W CW 1:1 Balun 7.95m	**£39.95 C**
LW-20	Multiband HF long wire 9:1 UNUN 80-6m inc WARC 20m long 400W	**£39.95 C**
LW-10	Multiband HF long wire 9:1 UNUN 40-6m inc WARC 10m long 400W	**£39.95 C**
HW-80HP	Multiband HF off-centre dipole 4:1 balun 80-10m 40m long 400W	**£64.95 C**
HW-40HP	Multiband HF off-centre dipole 4:1 balun 80-10m 21.2m long 400W	**£39.95 C**
HW-20HP	Multiband HF off-centre dipole 4:1 balun 20-10m 10.6m long 400W	**£39.95 C**

Carriage Charges: A=£4, B=£5, C=£8.50, D=£11

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YouKits FG-01 Antenna Analyser

With Graphic Colour Display!

Get an instant Graphic display of both VSWR and impedance curves!

A graphic antenna analyser that covers the complete HF spectrum and gives a clear picture of your antenna resonance and performance. Covers 1.8 - 60MHz with adjustable scan range. Operates from battery or external 12V. Provides dual VSWR and Impedance traces. An opptional Lithium cell pack and AC charger is available - phone..

£229.95 C

MFJ Automatic HF Antenna Tuners

MFJ-927

Weather protected remote auto tuner for coax / wire ant, includes MFJ-4116 Power Injector. This enables you to power the ATU down the coax lead feeding the tuner. This is a fit and forget item.

£254.95 C

MFJ-928

If you are looking for a simple auto ATU that does the job without fuss and matches all your antennas, whether wire, coax or balanced, then this may be what you have been looking for. It is very similar to the MFJ-929 but minus the LCD readout and the manual tune buttons.

£203.95 C

MFJ-929

IntelliTuner-Compact™ lets you automatically tune any coax fed or random wire antenna 1.8-30 MHz at full 200 Watts SSB/CW. It can match 6-1600 Ohms (SWR up to 32:1) - - that's a 50% wider matching range at a higher power level than lesser competing products.

£214.95 C

MFJ-991B

World's First dual power level tuner -- Select 300 Watt SSB/CW and match 6-1600 Ohm antennas Or select 150 Watt SSB/CW and match extra wide-range 6-3200 Ohms. New 10,000 VirtualAntenna™ Memories. Like MFJ-993B, less digital SWR/ Wattmeter/ LCD display, audio SWR meter/audio feedback, antenna switch or 4:1 current balun.

£214.95 C

MFJ-994B

600 Watt Intelli-Tuner™! automatic antenna tuner with new 10,000 VirtualAntenna™ Memories. It easily handles 600 Watts SSB/CW, and matches 12-800 Ohms. This is a great companion for lower powered linear amplifiers.

£349.95 C

Watson Weather Stations

Back In Stock!

W-8683

Compact wireless weather station with external temp/ humidity sensor, pressure readings and radio controlled clock.

£25.95 C

W-8684

Indoor/outdoor wireless thermometer with clock. Large clear LCD display, ideal for home or office use.

£11.95 C

Watson Power Supplies

Power-Mite-NF

Back In Stock! The original Mini 25A PSU. 25A Peak, 22A Cont. with Noise Offset.

£79.95 C

Power-Max-45-NF

38 Amp cont, 45 Amp Peak, Switch Mode PSU with variable voltage, V/A meters, & noise offset.

£129.95 C

Power-Max-65-NF

65 Amp Low Noise PSU. Patented Noise Control that permits you to move any noise away from the operating frequency.

£239.95 D

POWER-MAX-25-NF 22A PSU £89.95 C
W-5A 5A Analogue fixed 13.8V £33.95 C
W-10AM 10A Analogue variable £64.95 D
W-10SM 10A Switched fixed £59.95 D

For More Bargains - CLICK IT!

eBay

Go to www.wsplc.com then click on the link to our ebay shop.

Watson VHF/UHF Antennas

Dual Band 2m/70cm

W-300 Base antenna 6.5/9dB 3.1m long **£89.95 D**

W-50 Base antenna 4/5/7.2dB 1.8m long **£59.95 D**

W-30 Base antenna 3/6dB 1.15m long **£49.95 D**

W-627 Triple band 6/2/70cms mobile whip with PL-259 base. 2/4.8/7dB gain. 1.6m long with foldover base. **£39.95 C**

W-7900 A smart, well constructed 2m/70cms whip with foldover base. 5/7.6dB 1.58m long. **£34.95 C**

W-3HM Hatch mount for mobile antenna. Fits all car hatch doors and mounts firmly with full angle adjustment. **£14.95 A**

W-3CK Cable kit 5m long to fit W-3HM. Low loss cable with SO-239 antenna mount & PL-259 to go to radio. **£18.95 A**

Heil Microphones

Pro-Set-Elite-6 NEW

Modelled on the ProSet-6 but adds phase reversal switch which offers a spatial awareness.

Pro-Set-Elite-6 £179.95 C
Pro-Set-Elite-IC £189.95 C
AD-1 Rig adaptor leads £22.95 C

NEW Genesis HM-12

The HM-12 Genesis mic from Heil is the latest dynamic design with cleverly sculptured frequency response to suit modern radios. If your radio has an EQ adjustment, then this is the mic to use for that distinctive, crisp, Heil sound. Then look at the price!

£69.95 C

NEW Mic Desk Stands

K-601 Foldable Tripod with clip £9.95 C
K-701 Gooseneck Desk Stand £14.95 C
K-901 Desk stand with Boom £29.95 C

Miracle Antennas

MIRACLE-WHIP

A tunable telescopic whip covering 3.5 to 460MHz. Up to 25 Watts PEP, fitted with PL-259 plug. Great for FT-817 & IC-703 or any other QRP radio.

£129.95 C

INTEREST FREE CREDIT ON ORDERS OVER £200

0%!

Beat the price increases and get the rig you want today. Telephone, come in or e-mail us to arrange. Over six months that £900 radio costs £150 per month. Over twelve months there is a £29 admin fee and your radio costs just £75 p/month!

Avair Power SWR Meters

All models have 12V backlight and include DC Cable.

AV-201 1.8-160MHz, 5/20/200/1kW **£49.95 C**
AV-400 140-525MHz 5/20/200/400W **£49.95 C**
AV-601 1.8-160MHz / 140-525MHz **£69.95 C**
AV-1000 1.8-1300MHz. **£79.95 C**

Cross Needle Models - Even Lower Prices!

AV-20 30W / 200W, 3.5-150MHz **£39.95 C**
AV-40 15W, 0-150W, 144-470MHz **£39.95 C**

Create Rotators

RC5-1 Medium Duty Rotator

*Rotating torque: 6kg/m
*Braking torque: 80kg/m
*Mast size: 48-63mm
*Vertical load 400kg
*Horizontal load 800kg
*Rotation speed: 60-150sec/50Hz *Power: 230V AC 80VA *Weight: 5kg *Cable: 7-core cable (not supplied) *Requires MC-2 lower mast clamp if mounting on pole

£619.95 D

RC5-3 £779.95 D

Same as above but with preset control.

bhi DSP Audio

NEW MINI-SWITCH

2-Way Switch Box, connect 2 radios to your bhi noise cancelling product.

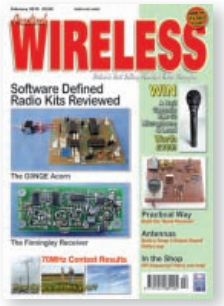
£19.95 A

NES10-2MK3

Speaker & programmable DSP unit. Dramatic noise reduction. **£99.95 C**

NEIM-1031MKII New Low Price £129.95 C
Noise Eliminating In-Line Module.
NEDSP-1061-KBD New Low Price £89.95 C
Noise Eliminating DSP module for FT-817
NEDSP-1062-KBD New Low Price £94.95 C
Noise Eliminating DSP module for speaker.
ANEM-MKII New Low Price £115.95 C
In-Line "Noise Away" amplified DSP module.
DSPKR New Low Price £139.95 C
Noise Eliminating DSP Ext. Speaker 10W.
DTNA New Low Price £139.95 C
Amplified DSP Noise Cancelling Desk Speaker.
RADIOMATE £89.95 C
Compact keypad for Yaesu FT-817/857/897.
CAT-MATE £50.95 C
Electronic Y Splitter for Yaesu CAT Interface

Carriage Charges: A=£4, B=£5, C=£8.50, D=£11



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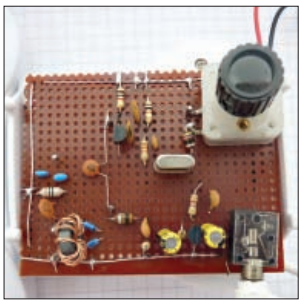

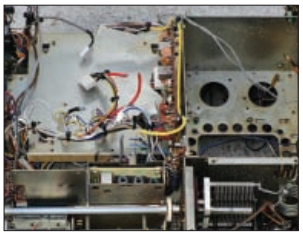

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Rob Mannion G3XFD/EI5IW's

Keylines

Rob comments on Internet communications – especially the E-mail system that we all know can bring really unwelcome – sometimes criminal – E-mails. But it can also help make great friendships.

The Internet – and especially the E-mail system – plays an extremely important role in the editing and production of *PW*. In fact nowadays **Tex Swann G1TEX** and I only receive a handful of letters each week at the Broadstone offices because the majority of correspondence comes via E-mail.

Sometime, E-mails can be annoying – particularly those from criminals trying to get my personal bank account details! However, some E-mails bring me much delight and give a real 'boost' to my faith in the human race – particularly the branch we refer to as Amateur Radio enthusiasts.

Such an E-mail came from **Rik Page**, a relatively new member of the **Grimsby Amateur Radio Society** (see Rik's letter published as the *Star Letter* in the January 2012 issue of *PW*). It arrived during an exchange of E-mails about his letter for publication, when I mentioned I was to briefly visit Cleethorpes on Saturday December 3rd 2011.

In an E-mail to Rik I shared my excitement of my planned visit to Cleethorpes on the Pathfinder Tours *Lindum Fair & Cleethorpes Coast* special charter train from Eastleigh near Southampton that was to travel via Winchester, Basingstoke, Reading, Oxford, Birmingham, Leicester, Nottingham, Lincoln, and Grimsby to Cleethorpes.

Meeting Grimsby Club Members

Within a day or so, Rik had got back to me via E-mail to ask if I would mind being met by members of his club at the Cleethorpes Coast Light Railway – the 15in narrow gauge line that runs for two miles down the coast alongside the Humber Estuary. I was delighted to accept the suggestion as Rik's letter had made it clear that the club was very welcoming.

Unfortunately, the Pathfinder Tours train was delayed on the way up on December 3rd and we were held up waiting for an extra loco to be attached not far from Grimsby. However, the weather was clear dry but cold – so I was grateful it wasn't raining! By the time we arrived at 1445 hours it was already starting to get dark and I was concerned for the Grimsby Club members as the temperature was dropping fast.

To make matters worse the coach taking us (including fellow passengers **Andy Sillence G4MYS** (left in photo) and *PW* Author **John Keeley G3RAV**) drove past the terminus of the light railway because of roadworks! Fortunately, a few members were at the station where our special train was waiting – the photo shows us posing next to the loco after we'd completed our round trip just as the light was fading.

As we posed for the photo (thanks to John G6RAV for taking it) I realised I had met some of the very friendly Club members at shows over the years. Despite the clammy cold that was descending all around us, the warmth of the welcome made me realise just how well Rik Page's letter had described his friends.

A Great Fraternity

Amateur Radio provides a great fraternity of like-minded friends and I meet them everywhere I go. And, to make up for a necessarily brief meeting (our return train had to leave at 1630 for Lincoln on time) I'm hoping to provide a *PW* visit to Grimsby in the near future. Thank you Rik and everyone else at the Grimsby Club – it was a wonderful meeting on a great day out. Happy New Year everyone!

Rob Mannion G3XFD/EI5IW

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

Tel: 0845 803 1979
Fax: 01202 659950

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

PW Publishing Website
www.pwpublishing.ltd.uk

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Directors: Stephen Hunt & Roger Hall

Subscription Administration
Webscribe
Practical Wireless Subscriptions
Unit 8, The Old Silk Mill
Brook Street
Tring
Hertfordshire HP23 5EF
pw@webscribe.co.uk
www.mysubcare.com
☎ 01442 820580
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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.

Readers' Letters

Send your letters to:

Rob Mannion, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW

E-mail: pwletters@pwpublishing.ltd.uk

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

Please note that the opinions expressed in any letter published in *PW* are those of the named correspondent whose letter has been published and they don't necessarily reflect the opinions of the Editorial staff or PW Publishing Ltd. **Editor**.

£20 Star Letter

Father Maximilian Kolbe SP3RN

Dear Editor

I think this may be of interest. A couple of Sundays ago it was mentioned in my Church that above the great door of Westminster Abbey there were some empty niches. They had been empty since the Abbey was built. It was then decided to fill them with statues of 20th century Christian Martyrs.

The first one mentioned was **Father Maximilian Kolbe** (January 8, 1894 – August 14, 1941). Father Maximilian was a Polish Roman Catholic priest incarcerated in Auschwitz concentration camp. When a family man was selected to be executed Father Maximilian volunteered to take his place. (the family man did survive the war) Father Maximilian was eventually made a saint. The point of all this? He was a Radio Amateur with the callsign SP3RN. This must be the only time a statue of a Radio Amateur will grace the outside of a major religious building. 73.

Ken Grover G3KIP
Royal Tunbridge Wells,
Kent

Editor's comment: *Thank you for the interesting letter Ken. Some years ago (before the statues were erected) my friend* ***John Doherty EI9GB*** *from Buncrana in County Donegal in Ireland, suggested in* PW *News and in the* Letters *pages that moves should be made to make Father Kolbe SP3RN the Amateur Radio Saint. This hasn't happened yet – but I'm sure that any moves to adopt Father Kolbe as our Saint will gain the support of myself and Christian Radio Amateurs around the world.*

The 'Real' Antenna At G3XFD's QTH!

Dear Rob,

It is a long time since I last contacted you, but I'm writing because I see from *PW* that at last you have put up a 'Real' antenna – i.e. a doublet. I have been using an inverted 'V' doublet for the last 41 years, a 66ft centre section about 25 ft high (the ends drop down to the garden fence which is about 5ft above ground).

At each end where it meets the fence is a home made 7MHz coaxial trap, and another 33ft of wire at each end goes round the garden fence at rather strange angles. I did try it without the traps but due to the current on 7MHz being low down it did not work very well on that band, the traps cured the problem

I use home-made open wire feeder spaced 110mm, as this is the length of the plastic mouldings I used to have access too they were guide rails for cabinet mounted circuit boards that my old company produced, and being in charge of development some happened to come my way!

The antenna seems to work well I have worked VK and ZL on 3.5MHz c.w., and my daily sked with **Brian Otter 9J2BO** in Zambia has just passed the 4500th contact since 1992. It also tunes up satisfactorily on 1.8MHz but isn't a DX antenna on that band.

My a.t.u. is the good old fashioned series or parallel tuned variety, the actual mode being selected using plug and socket connections. The main inductors – which I obtained more than 50 years ago – are of the large air spaced plug-in variety (about 4in diameter) as used in the American BC610 transmitter of wartime vintage, all made by Barker and Williamson .

I'll photograph the a.t.u. so that you can see how simple it is, the capacitors came from an old ex RAF T1154 transmitter that I scrapped years ago and the link is tuned with a twin gang 500pF ex-broadcast receiver capacitor.

I still enjoy *PW* after 64 years reading it – keep up the good work and the seasons greetings to you all. 73 to everyone at *PW*.

Mike Mills G3TEV
Chalford Hill
Stroud
Gloucester

Editor's comment: *Great to hear from you again Mike! I'm sure readers will be interested to see photographs and read about your a.t.u. and we look forward to publishing it soon. My antenna is still proving itself and I'm continually surprised how well I can hear DX station now because of the reduction in noise. The balanced twin feeder I use has proved excellent for the purpose (see* PW *November 2011) along with the MFJ-974B a.t.u. but I must acknowledge* ***Tex Swann G1TEX****'s help and encouragement by sharing some of the 100 Feeder he purchased from* ***Spectrum Communications****.*

Tony G4SJI Rescued By LAM Communications!

Dear Rob,

I usually try to be impartial when I talk about our choice of radio Amateur dealers as I have bought equipment from most of the dealers who advertise in *PW*. I've always been satisfied with my purchases and also any back-up that's been required.

However, I recently arranged to take an interested teenager on a portable radio outing as he has showing an interest in Amateur Radio. Unfortunately I managed to damage – beyond repair – the removable control head from my FT-857D a week before we were going to the site that I sometimes use at Spurn Point in East Yorkshire.

I then called **LAM Communications** in Barnsley and explained to **David Workman M0XIT** what I had done, he asked me to hold the line and I could hear him explaining to **Lee Marsh M0LAM** what had happened and the outcome was truly unbelievable! The next day a replacement head unit arrived in the post marked 'Free of Charge' the kind gesture made the trip out to Spurn Point even more enjoyable. (Pity the Cafe was closed!!!). My thanks go to LAM Communications for making it possible in such a short space of time with the donation of the head unit for my FT-857D Regards to all.
Tony Harris G4SJI
Withernsea
East Yorkshire

More PME Experiences

Dear Editor,
Your reader **Mike Stewart G4RNW** (*Letters PW*) is half right in his solution to the potential problem with discontinuities in the neutral supply. Living in an area with lots of overhead wires and frequent power failures (because of trees) the solution that I use is a current circuit breaker in my shack's r.f. earth with a 240V indicator lamp wired across the circuit breaker. If the breaker trips through excessive current the lamp acts a current limiting device and indicates a fault condition. The fault that's rare for most people has happened to me on more than one occasion. Hope that this helps. Best regards.
David Lee G4UHJ
Pillowell
Lydney
Gloucestershire

***Editor's** comments: Your approach seems to be eminently sensible and practical David. I would like to hear from other readers who have used similar techniques to share them with us. However, I must say that we seem to suffer far more power failures at my Bournemouth QTH than we ever suffered in Badcaul in Little Loch Broom, in Wester Ross in Scotland, where I operated as GM3XFD. This was despite the fact our very long (stub end fed) 11kV single phase supply route passed over extremely exposed mountainsides and through forests that were often subjected to severe gales!*

Tolerance Towards Newcomers & Some Positive Feed-back

Dear Rob
There have been a few letters on and off about the experiences of new Licence holders on the Amateur bands, and I thought you my like to hear some positive feed-back.

I gained my M6AIV callsign a year ago, and the first contact I made on 70cm has, as it turned out, become a good friend, he helped me to get started with an h.f. station, advice, bits and bobs he didn't need, etc., far too generous for his own good! Now a year down the line I have several contacts I would call friends and many other regular contacts on the air, some of which I have been fortunate to meet.

It has, and continues to be, a very positive and rewarding pastime, yes you do meet the odd 'Character' in all walks of life....this hobby in no exception... but they are, I would say rare.

One thing I would add, having an M3 or M6 call doesn't mean that the holder has a certain level of knowledge or skill in the hobby. I have been involved in radio in some form or another since I was about 14 years' old, back in 1974, and that along with all the help I have received has been invaluable.

Oh and a word on contests, perhaps tolerance on both sides of the argument is needed, and as a QRP operator at the moment (using a FT-817) many stations seem very pleased to work a low power station with simple antennas when they are putting out many more Watts! Perhaps we should all turn the wick down a bit from time to time? 73. to all.
Tony Barrett M6AIV
Liverton
Newton Abbot
Devon

Reading Material At The Dentist's Surgery

Dear Rob,
Several years ago there was quite a bit of correspondence in the *Letters* pages of *PW* regarding leaving copies (read, of course) of the magazine in Doctor's and Dentist's waiting rooms to provide some technical reading and perhaps encourage more people into the hobby.

I decided to leave several back issues of *PW* at my Dentist's surgery – and it had an unexpected effect because the Dentist himself 'phoned me (I'd asked if I could leave them) to ask more about *PW*. He was interested in what aspects of the hobby I enjoyed because he'd been interested himself in radio when he was at school and his son was enjoying simple electronics kit building.

Since then I have met the Dentist several times at the local Scout Group where my Grandson attends. Both my Grandson and the Dentist's son Brian have taken their Communications Badge tests (successful) and hopefully they'll be taking their Foundation Exams soon.

I felt quite proud when I brought Sam and Brian to meet you and **Tex G1TEX** at the Newark Show in October last. Sam and Brian also enjoyed taking part in the Scout's JOTA weekend together. I think that leaving my *PW* copies in the surgery led to a friendship for Brian and Sam. I think it was very worthwhile and I have more news on their progress in the hobby progress at the next Newark Show. Best wishes.
Sam Brown
South Wigston
Leicester
Leicestershire

***Editor's thanks:** I think we should issue you with a special achievements badge Sam! Thank you for encouraging newcomers to the hobby and I hope you keep up your good work!*

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

Send your info to:

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

New Mini Switch Box From bhi

West Sussex based bhi have just launched a low-cost compact two-way Mini Switch box called the bhi Mini Switch. The bhi press release from **Graham Somerville** states that, "The bhi Mini Switch enables the user to connect two radios to their bhi DSP noise canceling speaker or in-line unit. This means that you don't have to keep disconnecting cables each time you want to use a different radio with your bhi product."

The bhi Mini Switch is priced at £19.95 including VAT plus £3.50 p&p packing. It is available from bhi direct, or any of their authorised dealers, details can be found on the bhi website.

bhi Ltd
PO Box 318
Burgess Hill
West Sussex RH15 9NR
Tel: (**01444**) **870333**
E-mail: **graham@bhi-ltd.com**
www.bhi-ltd.com

InnovAntennas' New Factory & Products

Justin Johnson G0KSC of InnovAntennas contacted *Newsdesk*: reporting, "We have a number of new products being released for the New Year as well as a shiny new factory to show off too! I've enclosed a photo of part of our new factory with a colleague drilling booms on one of our small mills.

Inside InnovAntennas' new factory on Canvey Island in Essex.

"This month – December 2011 – has been our biggest sales month so far with more than 60 antennas sold and it's not yet over! On the saw horses are 20 x 11el 144MHz LFA Yagis, 4 x 6.8m LFA2 Yagis for 50MHz and 2 x 8el 50MHz LFA2 Yagis, all heading outside of the UK! Enquiries from *PW* readers are always welcome!"

Justin Johnson G0KSC
InnovAntennas Ltd.
Unit 1, Point Industrial Estate Point Road,
Canvey Island, Essex SS8 7TJ
Tel: (**0800**) **0124 205**
E-mail: **justin@innovantennas.com**
Website: **www.InnovAntennas.com**

Bargain Baofeng Arrives At LAM Communications

Newsdesk received an interesting E-mail from **Lee Marsh M0LAM** of **LAM Communications in Barnsley**: "Hi *PW*, I'm E-mailing you to let you know we have a brand new product from China. We are the Baofeng importer and distributor see **www.baofeng.co.uk/** The new rig is the **Baofeng UV-3R MkII** and operates on v.h.f./u.h.f. – 144 and 430MHz bands.

"We have also begun modifying each transceiver so it does not produce any additional harmonics, which has been reported in the past. We are retailing them for £49.95 with a 12 month warranty. I believe there are other unmodified models being sold and these transceivers are not covered by Baofeng UK warranty and aren't an official UK source. Here is a link to our web site with the product information – **www.lamcommunications.net/shop/index.php?cPath=21_25_104**

"We also have a number of new antennas; The City Windom which is an end-fed Windom now in stock. Here are two links to two different models **www.lamcommunications.net/shop/product_info.php?cPath=78_79&products_id=797** and **www.lamcommunications.net/shop/product_info.php?cPath=78_79&products_id=798**

"We trust that these items will be of interest to *PW* readers. Best regards", Lee Marsh M0LAM.

LAM Communications Ltd.
52 Sheffield Road
Hoyland Common
Barnsley
South Yorkshire S74 0DQ
Tel: (**01226**) **361700**
E-mail: **lamcomms@hotmail.com**
Website: **http://www.lamcommunications.net/shop/**

Stop Press News

Tim Kirby G4VXE – our v.h.f. columnist will be reviewing the Baofeng UV-3R MkII in PW *very soon. Watch this space!* ***Editor.***

New Range Of Italian Amplifiers

Mike Deveruex G3SED contacted *Newsdesk* with his latest product information. "I'm pleased to advise that Nevada has been appointed a dealer for RM Electronics (Italy), who make a range of h.f. mobile and base amplifiers for the Amateur Radio market. Top of their range is the new BLA-1000 1kW solid state base amplifier covering 1.8 to 55MHz (see photo) which is now available from Nevada Radio

"With instant switch on, two antenna outputs, automatic band selection and a quiet variable speed cooling system, the amplifier is fully featured and will sell for £2799.95

"I'm sure this will be of interest to your readers. Regards Mike G3SED." Further information from:
Nevada Radio
Unit 1 Fitzherbert Spur
Farlington
Portsmouth
Hampshire PO6 1TT
Tel: (**02392**) **313095**
FAX: (**02392**) **313091**
E-mail: **sales@nevada.co.uk**
Website: **www.nevada.co.uk**

Anytone 28MHz Transceiver Winner

The Anytone 28MHz multimode transceiver competition – jointly presented by **Nevada** and *PW* – has been won by **David Ackrill G0DJA**, of Bolsover in Derbyshire. David has been notified. Our thanks also go to the large number of readers who entered the competition and to **Mike Devereux G3SED** of Nevada for donating the prize. **Editor**.

On The Air – Celebrating *PW's* 80 Years

Practical Wireless Editor **Rob Mannion G3XFD** will be celebrating the 80th year of *PW* throughout 2012 – the magazine was first published in 1932 – by operating from home under his own callsign. Rob will be airing **G3XFD** on *PW*'s publication day – the 2nd Thursday of each month.

Rob writes, "I had hoped to obtain a Special Event callsign to celebrate *PW*'s 80th year of publication but this hasn't been possible, as there's been no response from Ofcom. However, I'm planning to be on the air throughout each publication day from my home, operating mainly on 3.5 and 7MHz using s.s.b. I shall also be operating on PSK31 and will announce the times for operations on this mode while I'm on the air with s.s.b. **Phil Ciotti G3XBZ** will be helping out and we'll be taking turns on the air throughout the day and we hope to work as many *PW* readers on the air as possible throughout the year. A special QSL card will be produced and the QSL route will be direct only to my QTH, **1 Spencer Road, Bournemouth, Dorset BH1 3TE**. Please don't forget to mark your envelope to **Rob Mannion G3XFD (QSL)** and include an s.a.e. with a 1st class stamp for the return of your QSL card. Amateurs outside the UK will be advised on the way to get their QSL card (if required) during the QSO. Phil and I look forward to chatting to you! **Rob G3XFD**.

Martin Lynch G4HKS Celebrates 21 Years Trading

Martin Lynch G4HKS contacted *Newsdesk* – rather out of breath – with the announcement, "I've attached an image for you from the open day – me holding an enormous cake celebrating 21 years of trading, hence me being out of puff!

"The 21st Birthday Hog Roast – Sponsored by **Kenwood Electronics UK**, **Icom UK** and **Yaesu UK** – was well attended and fortunately the weather was rather better than last year – there was no snow!

"On show was the new range of h.f. linear amplifiers from **Alpha,** along with the latest hand-held transceiver from **Wouxun**, the KG-UVD6D plus the huge display of new and used products from dozens of Martin Lynch & Sons Ltd.'s international suppliers. All three main manufacturers were on hand to answer questions on past, present and even future products – especially the new flagship h.f. base station due from Kenwood next year. My wife **Jennifer** and son **Henry** handed out many hundreds of cups of hot tea and coffee. The Hog Roast was – as always – a huge success as indeed were the bacon butties for those who arrived early. Here's to the next 21 years! Best Regards"
Martin Lynch G4HKS
Martin Lynch & Sons Ltd.
Outline House
73 Guildford Street
Chertsey
Surrey KT16 9AS
Tel: (**01932**) **567333**
FAX: (**01932**) **567222**
E-mail: **Martin@MLandS.co.uk**
Web: **www.MLandS.co.uk**

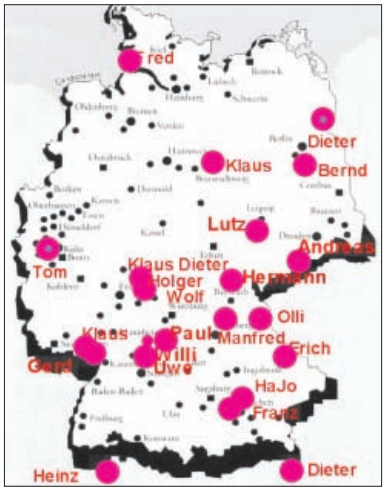
Martin will need a big appetite for this cake! Actually, he shared it with everyone at the 21st year anniversary open day event. Photograph courtesy of Mike Richards G4WNC.

Bowood Electronics Kits & Bits For *PW* PIC Project

Will Outram M6WIL (aka 'Will 'O' The North') of Chesterfield-based **Bowood Electronics** contacted *Newsdesk* with a reminder; "Further to our conversation regarding **Phil Cadman G4JCP** and the *PW* PIC Battery Monitor project (published in the January 2012 issue of *PW*) I'm happy for you to name Bowood Electronics Ltd. as a supplier for the programmed pic chip (PIC16F690-I/P) on its own or we can also supply the complete kit of parts including the programmed chip. The costs are as follows:

The PIC16F690-I/P (not programmed)costs £1.99 + £1.65 p&p, the PIC16F690-I/P (programmed) costs £2.99 + £1.65 p&p, the complete kit inc. programmed PIC but no enclosure £8.95 + £1.65 p&p.
For those readers people wishing to program their own chips the source codes are available from Phil Cadman G4JCP (E-mail **g4jcp@btinternet.com**). Kind Regards M6WIL (Will 'O' The North)."
Bowood Electronics Limited, Unit 10, Boythorpe Business Park, Dock Walk, Chesterfield, Derbyshire S40 2QR
Tel: **(01246) 200 222** E-mail: **sales@bowood-electronics.co.uk** Website: **www.bowood-electronics.co.uk/**

The G QRP DL Convention Waldsassen New Fun Run 2012



Deiter Klaschka DL2BQD contacted *Newsdesk* with some interesting news about the planned G QRP DL Convention and 'Fun Run' in the spring. He writes, "Preparing our annual G-QRP-DL meeting 2012 in Waldsassen, Germany. Waldsassen is a town in the district of Tirschenreuth, bordering the Czech Republic in the Upper Palatinate, Bavaria. We would like to invite all Radio Amateurs to take part in a QRP radio activity which follows the idea of The Yeovil ARC QRP Fun Run. In this way we will also try to keep this wonderful traditional idea alive. We acknowledge with thanks to the **Yeovil Amateur Radio Club** (YARC) in Somerset, England – especially **Derek Bowden M0WOB** and YARC friends), giving permission for us to use the term 'Fun Run'.

Details of the DL Fun Run: When: Monday March 26th to Friday March 31st, 1800 to 2000 hours UTC. Frequencies 3.560 and 7.030MHz ±10kHz Contacts; All stations may be worked once each evening on each band. Bonus-Stations will operate randomly each evening for one hour on each band.

Map with QTHs of a fairly regular group meeting every Mondays on 3.568MHz as WS, (Waldsassen session).

Call CQ FR (Fun Run)
***Scoring*:**
Each QSO with another QRP station scores 10 points.
Each QSO with a Bonus station scores 25 points.
Each QSO with a QR0 station scores 3 points.

***Bonus Station*:** DL0VLP will be active every evening from a different part of DL operated by different operators. Please, listen for his name. **Note:** Another Bonus Station might be one of the G QRP club members. See the info on G QRP list on-line at **http://www.gqrp.com/**

Exchange: RST/ Serial Number/output power/Name e.g. 559/234/4/Derek

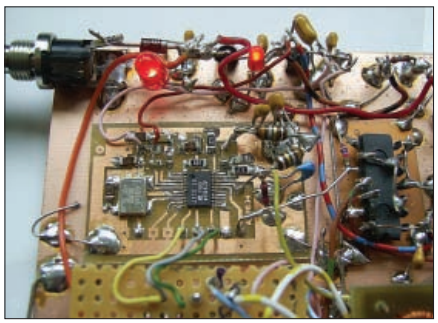
Serial Number: The three figure number must start at any random number of your choice not less than 100 and must be increased by one for each QSO throughout the whole contest. The Bonus Station will commence at 001 each evening, with all leading zeros being sent.

Entry sheets: Please send logs only via E-mail in text format or other readable formats to **Bernd Kernbaum DK3WX dk3wx@darc.de** or **Klaus Schreiber DJ7JE** via **k-d.schreiber@t-online.de** Submitted logs should be in the format; Date, Time, Band, Callsign, sent RST, received RST, Remarks and Score. Separate log sheets for each day. Participants will be awarded for the highest score for each evening and also for the highest overall total score for three evenings. Certificates will be presented at the G-QRP-DL Convention, April 2012 and will be published on the G-QRP-DL Website **http://www.g-qrp-dl.de/**

***SWL Section*:** All listeners' (s.w.l.) reports will be appreciated and the best reports will earn a certificate. Please don't hesitate to use (slow speed c.w. (QRS). A little time to chat is always welcome! Queries to myself via **dl2bqd@swschwedt.de**

Good luck in the Fun Run!
Dieter.

Part of the DL G QRP group posing for their photo at the Waldsassen Convention.



The rig is the ELBC 80 by Fred Heusy DJ3KK. It's a PIC-based transceiver.

Working c.w. by candlelight! Members of the DL G QRP Club enjoying QRP c.w. helped by low outpout candlepower!

Worcester – The Source Of New Radio Amateurs!

Worcester Radio Amateurs Association contacted *Newsdesk* with the latest news of their latest successful Amateur Radio candidates. It really does seem that Worcester is becoming 'the Source' of new entrants – or should that be Worcester – Source of new entrants? **Rich Moles M0UVA** reports, "We wish to congratulate the latest candidates who passed their foundation exam. From left to right in the photo are **Terry Harris M6BHA**, **Steve Harris M6WFO** (Terry's dad), **Brett Pearson M6BHX**, **Terry Chapman M6BGZ** and **Peter Troth M6PMT**.

"Tutored by **Pete Badham G0WXJ** WRAA Chairman and Head Tutor, the class enjoyed a relaxed and informative weekend. This is the latest of what we hope will continue to be a successful format allowing candidates to gain their licences. Please keep an eye out for other courses and activities on our club website **www.wraa.co.uk**

"The WRAA will be operating for Thinking Day on The Air February 18th to 19th from **The Perdiswell Young People's Leisure Club**, **Perdiswell Park**, **Droitwich Road**, **Worcester WR3 7SN**."

Rich Moles M0UVA (Secretary), **Worcester Radio Amateurs Association**
Tel: **(07796) 934970** E-mail: **secretary@m0zoo.co.uk** Website: **www.wraa.co.uk/**

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TH-K2E Single band 2m **£164.95**
TH-K4E Single band 70cm **£164.95**

Mobiles

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TM-V71E Dual band 2/70cm with EchoLink RX 118-524MHz & 800-1300MHz, 50 Watts **£299.95**
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Base

TS-590S HF & 6m 100W all mode transceiver **£1,339.95**
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TS-480SAT HF/6m 100 Watts Transceiver **£779.95**

Accessories

PS-60 25amp power supply unit ideal for the new TS-590S **£329.95**
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Handhelds

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KG-679E Superb single band 2m **£59.95**

Accessories

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WO/PSO-110 Programming software **£20.49**
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TYT

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Accessories

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HT-90E 2m single band transceiver with full 5 watts output just **£59.95**
The HT-90E is a brilliant compact radio, perfect for beginners to the hobby. Comes complete with battery, belt clip, antenna, and rapid charger all for under £60 quid! Everything you need to get on air is in the box!

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Mobiles

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Base

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IC-7800 HF/6m All mode 200 Watts Icom flagship radio **£8,999.99**
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IC-7600 HF/6m 100 Watts successor to the IC-756 ..... **£3,299.99**
IC-7410 HF to 6m 100W all-mode **£1,695.95**
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QUANSHENG

TG-UV2 dual band 2/70cm 5 Watts with 200 memories ..... **Only £81.95**
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VX-6E Dual band 2/70cm RX 1.8-222/420-998MHz, 5 Watts output **£249.95**
FT-60E Special offer ~~£179.95~~ ..... now **£129.95** massive £50.00 saving
VX-3E Dual band 2/70cm RX 0.5-999MHz, 3 Watts output **£169.95**
VX-170E Last few at this price **£99.95**
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Base

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FT-950 HF/6m 100 watt transceiver with DSP & ATU RX 30kHz – 56MHz **£1,259.95**
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YG8-2 2 metre 8 Element (Boom 125") (Gain 12dBd) **£79.95**
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YG3-4 4 metre 3 Element (Boom 45") (Gain 8dBd) **£69.95**
YG5-4 4 metre 5 Element (Boom 104") (Gain 10dBd) **£79.95**
YG3-6 6 metre 3 Element (Boom 72") (Gain 7.5dBd) **£69.95**
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The ZL special gives you a massive gain for the smallest boom length ... no wonder they are our best selling yagi's!

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Brilliant 2 element beams ... ideal for portable use

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G5RV-FSF Full Size Original High Quality Flexweave Version, 102ft Long, 10-80 Metres **£39.95**
G5RV-HSP Half Size Original PVC Coated Flexweave Version, 51ft Long, 10-40 Metres **£39.95**
G5RV-FSP Full Size Original PVC Coated Flexweave Version, 102ft Long, 10-80 Metres **£44.95**
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Accessories

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MTD-2 (2 BAND) FREQ:40-80 Mtrs LENGTH: 20Mtrs POWER:1000 Watts **£79.95**
MTD-3 (3 BAND) FREQ:40-80-160 Mtrs LENGTH: 32.5m POWER: 1000 Watts **£129.95**
MTD-4 (3 BAND) FREQ: 12-17-30 Mtrs LENGTH: 10.5m POWER: 1000 Watts **£69.95**
MTD-5 (5 BAND) FREQ: 10-15-20-40-80 Mtrs LENGTH: 20m POWER:1000 Watts **£119.95**

(MTD-5 is a crossed dipole with 4 legs)

MOONRAKER Multiband Mobile

Why buy loads of different antennas when Moonraker has one to cover all! SPX series has a unique fly lead and socket for quick band changing

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SPX-300S 9 Band plug n' go mobile, 6/10/12/15/17/20/30/40/80m, Length 165cm, High Power 200W,PL259 fitting **£59.95**
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ATOM-AT5 5 Band mobile 40/15/6/2/70cm, Length just 130cm, 200W (2/70) 120W (40-6M) PL259 fitting, (great antenna, great price and no band changing, one antenna, five bands) **£69.95**
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Diamond performance from the superb Diamond factory

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A144S5R 2m 5 Elements, Power 50W, Gain 9.1dBi, Boom Length 95cm **£59.95**
A430S15R 70cm 15 Elements, Power 50W, Gain 14.8dBi, Boom Length 224cm **£79.95**
A430S10R 70cm 10 Elements, Power 50W, Gain 13.1dBi, Boom length 119cm. **£59.95**

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Get great results with the Moonraker range of HF mobiles ! ... from as little as £17.95!

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ATOM-20S 14MHz, Length 130cm, PL259 fitting (compact design) **£24.95**
ATOM-40S 7.0MHz, Length 165cm, PL259 fitting (compact design) ... **£26.95**
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You've have always wanted antennas without radials, without the compromise of performance – well now you can.

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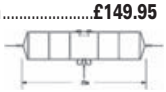
MR700	2/70cm, Gain 0/3.0dBd, Length 50cm, 3/8 fitting	**£9.95**
MR777	2/70cm, Gain 2.8/4.8dBd, Length 150cm, 3/8 fitting	**£19.95**
MRQ525	2/70cm, Gain 0.5/3.2dBd, Length 43cm, PL259 fitting (high quality)	**£19.95**
MRQ500	2/70cm, Gain 3.2/5.8dBd, Length 95cm, PL259 fitting (high quality)	**£26.95**
MRQ750	2/70cm, Gain 5.5/8.0dBd, Length 150cm, PL259 fitting (high quality)	**£36.95**
MR2 POWER ROD	2/70cm, Gain 3.5/6.5dBd, Length 50cm, PL259 fitting (fibreglass colinear)	**£26.95**
MR3 POWER ROD	2/70cm, Gain 2.0/3.5dBd, Length 50cm, PL259 fitting (fibreglass colinear)	**£32.95**
MRQ800	6/2/70cm Gain 3.0dBi/5.0/7.5dBdBd, Length 150cm, PL259 fitting (high quality)	**£39.95**
MRQ273	2/70/23cm Gain 3.5/5.5/7.5dBdBd, Length 85cm, PL259 fitting (high quality)	**£49.95**

MOONRAKER Dual and Triband Colinear Verticals

Diamond quality – Moonraker prices ! These high gain antennas have been pre-tuned for your convenience, easy to use, easy to install, and a choice of connection ... look no further

SQBM200P 2/70cm, Gain 4.5/7.5dBd, RX 25-2000MHz, Length 155cm, SO239 ..... **£54.95**
SQBM200N 2/70cm, Gain 4.5/7.5dBd, RX 25-2000MHz, Length 155cm, N-Type **£59.95**
SQBM500P 2/70cm, Gain 6.8/9.2dBd, RX 25-2000MHz, Length 250cm, SO239 ..... **£74.95**
SQBM500N 2/70cm, Gain 6.8/9.2dBd, RX 25-2000MHz, Length 250cm, N-Type **£79.95**
SQBM800N 2/70cm, Gain 8.5/12.5dBd, RX 25-2000MHz, Length 520cm, N-Type **£139.95**
SQBM1000P 6/2/70cm, Gain 3.0/6.2/8.4dBd, RX 25-2000MHz, Length 250cm, SO239 ..... **£84.95**
SQBM1000N 6/2/70cm, Gain 3.0/6.2/8.4dBd, RX 25-2000MHz, Length 250cm, N-Type **£89.95**
SQBM223N 2/70/23cm, Gain 4.5/7.5/12.5dBd, RX 25-2000MHz, Length 155cm, N-Type **£74.95**

MOONRAKER MTD-300 2-30M Broadband wire dipole antenna £149.95



The MTD-300 broadband dipole antenna is designed to provide optimum performance over a wide frequency range and is very easy to assemble and use.

● Frequency 2-30MHz ● Radiator length: 25m (82ft) ● Type: Terminated Folded Dipole ● Radiation: directional ● Feedline: 50 Ohm coax (30m) ● Connector: SO239 ● SWR: <2.0:1 to <3.0:1 depending on factors ● No transmatch required ● Power: 150W (PEP) ● Spreaders: 46cm (18in) ● Weight 3.1kg.

HUSTLER HF Verticals

Brilliant HF antennas that can be ground mounted if required which in todays limited space is a popular option. Also extra trap tuning is also available to get that perfect match if required.

Hustler 4-BTV 4 Bands 40-10m 1000W Length 6.52m Weight 6.8kg **£189.95**
Hustler 5-BTV 5 Bands 80-10m 1000W Length 7.64m Weight 7.7kg **£229.95**
Hustler 6-BTV 6 Bands 80-10m 1000W Length 7.30m Weight 7.5kg **£269.95**

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CHAMELEON ANTENNA

All models now available from stock – for further information please visit **www.moonraker.eu** or call for more details.

MOONRAKER GP2500

All Band HF Vertical

This is the perfect answer for anyone with limited space and requires no radials. Covering 80 through to 6M with a VSWR below 1.5:1!

Frequency 3.5-57MHz without tuner, Power 250 Watts, Length 7.13M

All at an amazing £229.95!

NEW GP2500F fibreglass version now in stock **£279.95**

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Open Mon-Thur 9-6pm Fri 9-4pm

Two Software Defined Radio Kits

We convinced Phil Ciotti G3XBZ – a keen constructor – to get his soldering iron out and tackle the G0NQE Acorn and Finningley 3.5MHz SDR kits from Kanga Products.

Review One
The G0NQE Acorn

Many people have either seen or heard of a software defined radio (SDR) that can range from the commercially available high specification types to the home built devices for the experimenter. In this latter category, you'll find the Softrock series of SDRs is perhaps the most well known. These simple receivers have given many constructors an introduction to this recent technology.

Kanga Products are now marketing two differing SDR kits for the home constructor. Both of these cover sections of the 3.5MHz (80m) single sideband (s.s.b.) section of the band. They're designed for two types of constructor – one kits uses 'standard' components, with leads and holes in the single-sided printed circuit board (p.c.b.). The other kit uses a double-sided board using surface mount devices (SMD), which tend to be rather small, needing more attention when building.

A PC & Sound Card

Unlike a 'normal' radio, you'll also need a PC with a sound-card, because after the two mixers, the functions of an SDR are all carried out in the computer's sound-card. The displayed bandwidth, centred around the midpoint is just under the actual sampling rate of the sound-card.

So, a sound-card operating at 48 or 96kHz sampling rate, is needed to have a complete system. The fortunate will have a sound-card capable of 192kHz sampling, giving a displayed bandwidth of around 150-160kHz or slightly more.

The G0NQE Acorn

As it's the 'simpler' project, I'll start with the Acorn receiver, which has its roots in a project created by **Colin Wilkinson G0NQE** for the **Pontefract & District Amateur Radio Society** – where it proved to be a great success. A number of them were built and used by various club members.

Colin's idea was that the Acorn could become the heart of a multi-band transceiver, by add-on boards. Two crystals are supplied with the basic Acorn kit, to give coverage across more of the 3.5MHz s.s.b. section of the band. By changing both the crystals and the band-pass filter operation on a different band is possible.

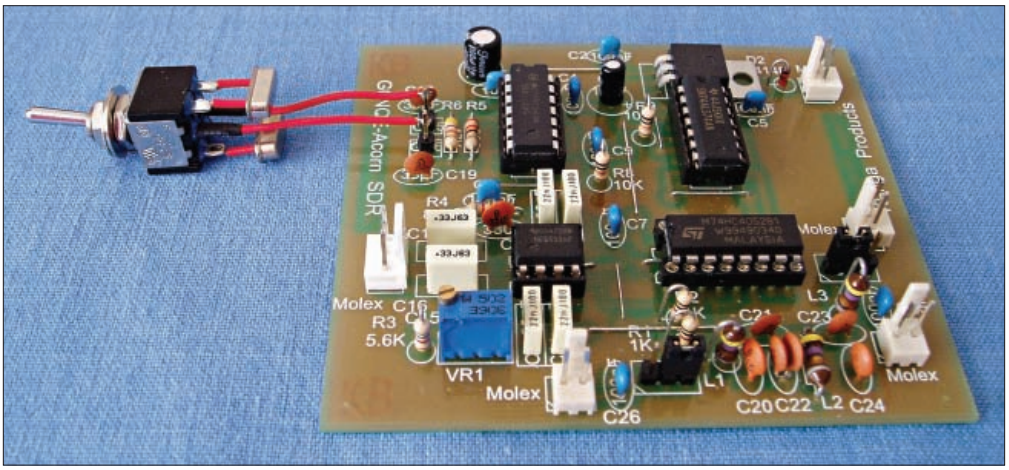
The Acorn SDR is designed for those, who are unsure about their abilities with surface mount components as it uses components with leads and is built on a single sided printed circuit board (p.c.b.). The kit is supplied with all the components and instructions to build the complete receiver. The kit even contained wire for the links to be added to the board, though I have some difficulties as I'll explain later.

The p.c.b. itself measures 88 by 76mm and is made from the usual 1.6mm thick glass fibre material. On the solder side green resist is applied to ease the problem of solder bridges. The component side has white silk screening to aid component placement.

The assembly instructions contain an enlarged view of the component side, which is also of further help. I found the instructions to be very easy to read, with the printing more than adequate in size. There are six stages involved to complete the receiver, with a test of the 5V regulator at the end of the third stage.

When trying to fit the supplied tinned copper wire link wires to the board, I found that they would not go through the p.c.b. This was due to the diameter of the wire for the links being too large. Substituting a smaller gauge of wire solved this issue.

The instructions do however, warn that the Molex connectors are a tight fit into the board. I can only agree with this, as a fair amount of 'persuasion' had to be applied! But they eventually submitted to pressure. It's these connectors that become the links in and



The G0NQE Acorn SDR is designed to become the heart of and SDR transceiver with add-on boards. Note the two l.o. crystals on the switch.

out to planned boards to transform the Acorn into a transceiver.

Overall, the component density for the kit, is not high, so a novice constructor should be able to build this receiver without too much difficulty. And I think this is an ideal kit for someone wanting to build their first piece of SDR hardware. It would perhaps, also be suitable for those of us whose eyesight isn't what it used to be.

On powering up the kit for the first time, and with a 12V d.c. supply connected, a current consumption of 26mA was measured without any additional equipment connected. This was below the value of approximately 30mA stated in the instructions.

Commissioning The Receiver

Commissioning the receiver involved connecting it to the computer via a stereo 3.5mm lead with plugs at either end. A 12V d.c. power supply and an antenna, suitable for the 3.5MHz band, are also required.

The stereo 3.5mm plug at the computer end is inserted into the Line–in socket. This lead carries the information for the computer program to decode. Note that the 3.5mm jacks must be stereo – mono types will not work at all.

Suitable Programs

Before I could try the receiver a suitable software program had to be installed on my computer. Fortunately, the *Winrad*, *KGK* and *Rocky* programs are all available as free downloads from the Internet, so any of these will work with the Acorn.

Using The Acorn

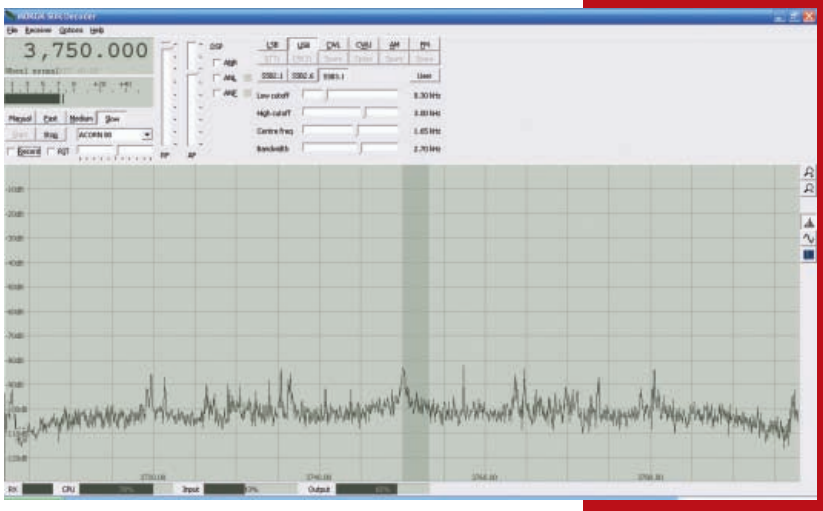
After downloading, and installing, the software, I started with the *Winrad* 'front panel' displayed on the computer screen. The Acorn receiver was switched on and signals were heard. To get an accurate frequency readout the displayed local oscillator frequency had to be changed to '03750' in the top right hand corner of the window.

With any sound-card based SDR the best performance can only be obtained by careful adjustment of the parameters. Optimising the performance proved to be no exception to this, consequently I spent a lot of time trying different settings. One of the biggest improvements came when the PC's microphone input was muted, so reducing a source of extraneous noise!

Many evenings were spent using the Acorn and it gave a good account of itself during this time, with many stations both in the UK and across Europe clearly received.

Before Starting Soldering!

Before you start soldering, I recommend that all the components are checked for quantity and their value. It is wise to read the assembly instructions carefully and then enjoy the construction as it progresses.



Offering a screen display somewhere in between Winrad and Rocky, M0KGK's SDR decoding program has all the functions needed for operations.

Acorn SDR

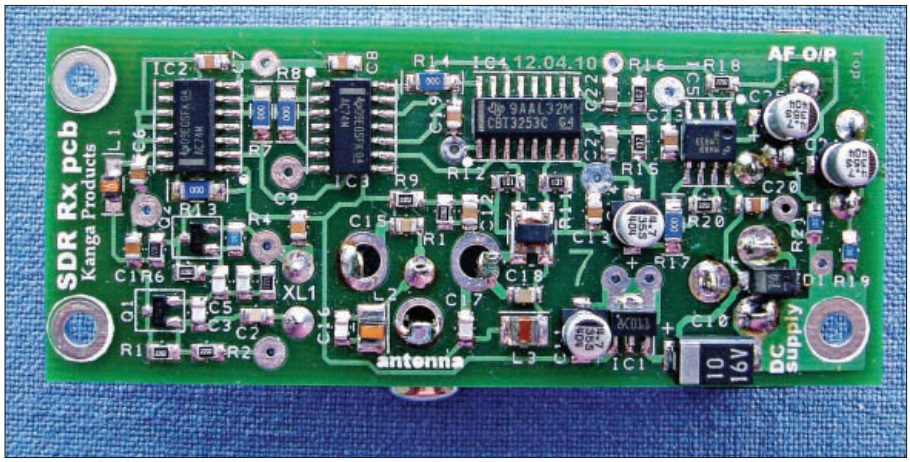
Pros:
Ideal introduction to SDR
With two l.o. crystals covers more of the band.

Cons:
Minor niggle with the links

The Acorn kit can be successfully built by the majority of constructors, even if a little assistance is required by some who may be more recent converts to home-brew.

Dennis Anderson G6YBC of Kanga Products commented:
Thanks for the opportunity to see the reviews. The instructions are being re-written in light of various comments that have been made since I re-launched this kit under the Kanga name.

One such comment is as Phil has mentioned, and that is the wire links. This happened when I had the board mastered, which was a tidying up exercise and added green solder resist. The instructions will state "Due to a manufacturing fault - "please use a 1mm drill and gently enlarge the hole".



Using only a single crystal for the l.o. the Finningley is a more compact board – due to the use of surface mount components throughout.

Review Two
The Finningley Receiver

The Finningley SDR receiver was introduced at the 2010 Finningley Microwave Roundtable. It's purpose was two–fold, the first of which, was to familiarise constructors with the surface mount device (SMD) method of building circuits. And secondly, it was to investigate the possibility of incorporating SDRs into microwave equipment.

The Finningley 3.5MHz receiver, unlike the Acorn, utilises surface mount technology (SMT) in its construction. This receiver has a double sided p.c.b. although one side is dedicated as a ground-plane.

Bernie Wright G4HJW, along with **Kevin Avery G3AAF**, kindly gave Kanga Products permission to produce this kit. Also agreement was reached with **Tony Parks KB9YIG** for Kanga Products to produce The "Finningley" 80m SDR Receiver.

Please note: This kit is not supported by Tony Parks or others within the Softrock group. Please use the links provided within the instructions to obtain further information. The p.c.b. for the Finningley, itself measures 79 by 33mm and is made from glass fibre material. Both sides of the board have a good quality green solder resist and the component side has white silk screen printing, indicating the positioning the various items.

The assembly instructions are to be downloaded from the Kanga website, as they're not supplied in the kit. This may seem odd at first, but the reason became clear as construction started. When all the resistors of one value are soldered to the board they are given a colour code that can be identified within the instructions. The next value of resistor is given a different colour and so on.

The colour coding of the assembly instructions works very well on a computer screen, but for obvious reasons is more difficult to read on a black and white printed sheet of paper. As the instructions are quite extensive, a set of colour printed instruction sheets could well have pushed up the kit's price.

The construction sequence has been thought out to allow plenty of room for soldering, so there are no access problems for the following component placements. As the components are all surface mount types, construction should be carried out carefully over a period of several hours, most likely with a few breaks in between.

If in doubt of your abilities with SMDs, take advice from club members or friends who have tried this method before. It's quite possible to manage construction with modest equipment – but it should be approached in an organised way to complete it successfully.

Phil's method of working on the surface mount board of the Finningley SDR kit.

Construction Hints

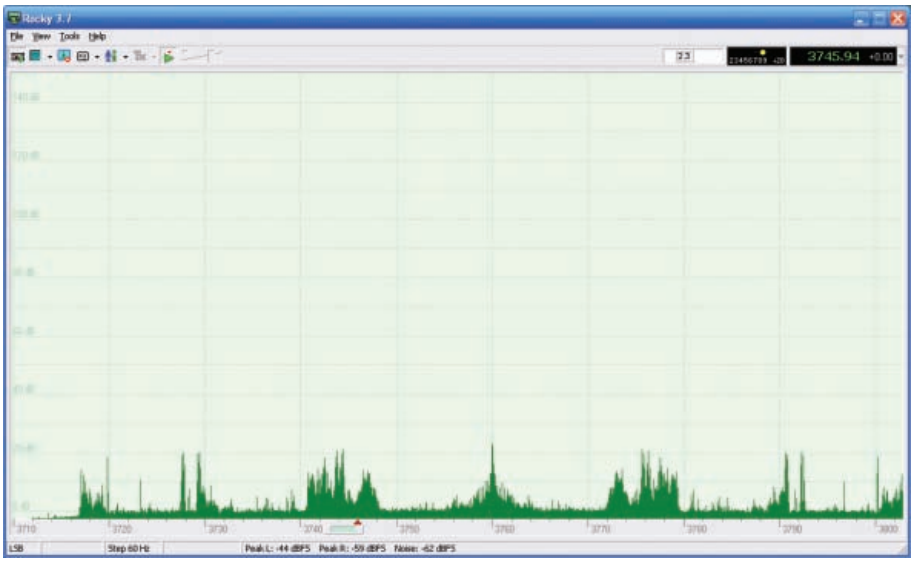
Next – some construction hints! The Finningley, although using surface mount components has good spacing to allow the assembly to be undertaken with confidence. There have been many articles written about SMD assembly techniques – but my own set-up for this is quite a simple one.

A small bench vice has its jaws covered with insulating tape to protect the p.c.b. edges. The vice is laid horizontally on the bench and the board is clamped tight. Used in this way, the vice can be rotated through 360° allowing full access to all the components.

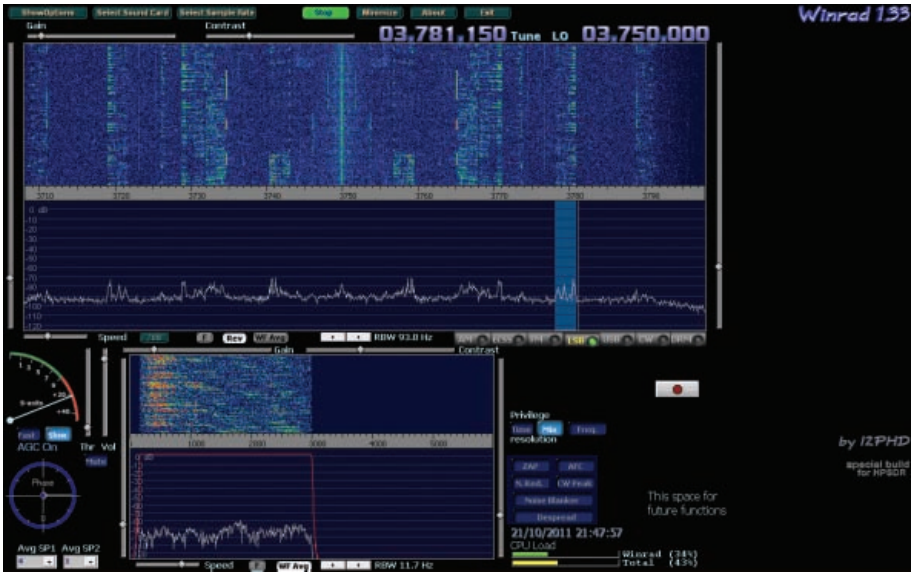
For component handling I use a pair of fine pointed tweezers, using just enough pressure to grip and move the parts into place. Soldering is accomplished using thin solder of approximately 28s.w.g. To help in placing components on the p.c.b. a magnifying bench light is used as well as my normal spectacles.

De-soldering braid assists if you have to remove a component (perhaps, having put it in the wrong place). **Note:** I've found a normal solder sucker too violent in its action, often 'hoovering-up' the component as well!

Although surface mount construction may seem daunting at first, like most things in life, it does become easier with practice. After assembly and connecting to a current limited bench supply, the current consumption was measured. The Finningley receiver consumed around 20mA – taking



A rather more simplistic display when using the Rocky v3.7 software.



The Winrad software offers the more comprehensive display of the three programs looked at by Phil.

slightly less than the from Acorn receiver from the supply.

Commissioning Method

The method of commissioning the Finningley receiver is identical to the Acorn receiver, as the same software is used. All that's needed is a stereo 3.5mm lead with plugs at either end, a 12V regulated d.c. power supply and an antenna suitable for the 3.5MHz band. The stereo 3.5mm plug at the computer end is inserted into the Line–in socket on the sound-card.

The Finningley On Air

I tested the Finningley using both the *Winrad* and *KGK* software. I found that only minor changes were made to the sound-card settings to obtain equal performance to that obtained when testing the Acorn receiver. The *KGK* software gave very similar results to that of the *Winrad*, the only difference being a changed layout of the front panel display.

Finninley Comments

The Finningley kit is ideal for those requiring more of a challenge in construction and I feel it meets this objective well. I particularly liked the colour coding system used for the component placement.

Both kits are available from Kanga Products Ltd. who are to be congratulated on these two SDR kits. They're just two from their range of kits available at shows, via their website or postal address.

The Finningley costs £16.50 and the G0NQE Acorn SDR kit costs £19.50. Further details from:

Kanga Products Ltd.
142 Tyldesley Road
Atherton
Greater Manchester
M46 9AB
Tel: (**01942**) **887155**
Mobile: (**07715**) **748493**
Website:
www.kanga-products.co.uk/

Finningley SDR

Pros:
Ideal introduction to SMD technology, as it's not too complicated a kit.

Cons:
None, but nimble fingers are helpful!

General Comments

Just a few general comments for both projects. Both receivers performed well, but you will need to alter your sound-card settings for the best results. How much, and what adjustments are available will vary with each machine and software combination.

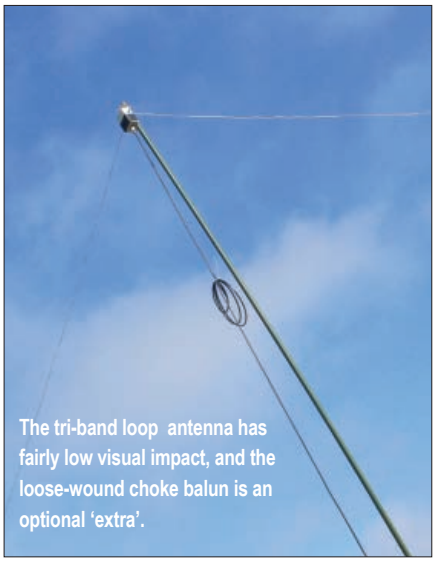
I used my lap-top computer during the listening periods, this has a 1.6GHz processor and a Gigabyte of main memory, although somewhat more modest PCs or 'Netbooks' should work as well. Most of the hard-work is carried out in the sound-card. The actual bandwidth displayed is a function of the sampling rate of the sound-card itself, rather than the receiver.

Any of the SDR programms mentioned ran successfully using *Windows XP*, so the choice is a personal one. There are also SDR programs available for both the Macintosh and Linux operation systems that should work equally well.

Either of these kits are suitable for the practical assessment used in the intermediate licence exam course. Although the Acorn is probably the one that I'd recommend for less experienced students.

I feel that both the G0NQE Acorn and the Finningley meet their respective objectives, and both represent good value for money.

Ray Howes G4OWY's Antenna Workshop
PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW
E-Mail: antennas@pwpublishing.ltd.uk



The tri-band loop antenna has fairly low visual impact, and the loose-wound choke balun is an optional 'extra'.

A 3-Band 'Keep it Simple Stupid' Delta Loop

Ray Howes G4OWY describes a simple Delta loop system that he's managed to get to work successfully on three bands. The Delta loop is often overlooked and it can prove very effective – so why not try one yourself?

Over the years I've been active in the hobby, I've found that I can get a lot of mileage out of extremely simple wire antennas. Tri-band, quad-band or whatever. It seems as if any old piece of wire can be almost fashioned into any imagined shape and size and be made to work on any band of your hearts desire. It often seems as a miraculous invention – when it works!

What's more important however, is that most, if not all simple wire antennas, are very inexpensive and easy to assemble. So described here is a Keep it Simple Stupid (KISS) antenna just like that.

The antenna sort of tumbled out of my head one sunny day while I was day-dreaming about my one of my favourite topics; how to operate on several high frequency (h.f.) bands – with one antenna? And now that the upper h.f. bands (particularly, 21 and 28MHz (15 and 10m) appear to be perking up on a daily basis, I remembered reading long ago that some clever fellow had built himself a Delta loop which operated on three bands.

Not The Usual Delta Loop

Now of course, the three band version wasn't the usual Delta Loop configuration. By that, I mean just a length of wire cut appropriately, and fashioned into a triangular shape and fed at the bottom end by 50Ω coaxial cable. No, on the contrary, what it was in this case was 21.6m (71ft) of wire (insulated) fed at the apex with a 4.1 balance-to-unbalanced (balun) transformer, 7.1m (23ft) or so on each side. At least I think that's what the measurements were!

Anyway, it was getting late and my wife was banging the dinner-gong to announce that eating time was imminent. So I decided to leave further research into what the actual measurements were until the next day.

Next day, having retrieved one of my old antenna scribble pads, I found exactly what I was looking for. There, on one of the dog-eared pages, almost indiscernible (I'd written the info in pencil), I could just make out a rough sketch of the Delta loop mentioned here.

Fortunately, I could also just about read what the measurements were, and it was my handwriting! The actual measurements were 21.85m (71ft 7in) in total wire length (I still think in imperial though!). This then works out to 7.28m (23ft 9in) – so I wasn't that far off. I only wish I could remember wedding anniversaries and birthdays so easily as I can remember antenna measurements!

Also on that dog-eared page was that other piece of the missing puzzle, where I'd actually seen it all those years ago. It looks as if was gleaned from an old issue of *World Radio News*? No doubt, someone somewhere out there will remember it! I probably just jotted the relevant details down on the pad and then forgot about it, hoping one day to put it together, but never did. Until now, that is.

Balanced To Unbalanced

As I've already mentioned, the Delta Loop antenna will need a 4.1 balun transformer. Luckily, I had one of these to hand. I purchased several of them at some long forgotten radio-rally for about £5 each. Today however, this type of balun is in the £30 to £40 ball-park. Expensive!

Fortunately, the cost of the wire is minimal or nothing and you get to operate on three h.f. bands too! You could, of course, just stick to the single band Delta Loop, which means you won't need to splash out the cash for a 4.1 balun. If so, just feed it at the bottom with coaxial cable or 300Ω feeder via an antenna tuning unit (a.t.u.). And it won't take up so much space either – at least not on 28MHz.

There again, you could make a 4.1 balun instead. Perhaps using a design published in one of the many antenna construction books and *HF Antennas For All Locations*, written by **Les Moxon G6XN** and published by the RSGB, is good place to start. In passing, I briefly met Les G6XN once at a Longleat Radio Rally. He was a very nice man and was always a font of antenna wisdom.

Straightforward Construction

The actual construction of this antenna is, as you've probably guessed, very straightforward. I supported the apex of the Delta loop to a 1.8m length of copper-tubing, which I secured to the top of a 6m high plastic pole **Fig. 1**.

The balun was attached to the support pole via several layers of water-resistant gaffer-tape. The gaffer-tape was also used to secure the balun to the top of the plastic pole. All that was left to do was to fix the two top wires of the Delta Loop to the balun connectors, attach the coaxial cable and hoist up the pole (which was put into an already prepared hole).

Next, I carefully formed the desired shape using a couple of insulators which I'd already looped through the wire. I had already prepared a length of rope which was also looped through the other holes of the insulators (I used those dog-boned shaped insulators which have a hole on

each end). The rope was used to pull the wires into the familiar triangular shape of the Delta Loop described here and tied off at two fixing points.

If you've measured the wire correctly (I didn't, it was a foot (300+mm) too long and I'll blame my silly error on my tools!). When the wire is finally pulled to its Delta configuration – via the two ropes – all sides should be 7.28m (23ft 9 in). If not, you'll have to get the measuring tape out again, like I had to do.

At my QTH in Weymouth, Dorset, the support pole is placed alongside the garden path. I did this because I needed at least 4.5m or so either side of the scaffold pole to tie off the ropes. When the antenna isn't in use, all I have to do is undo the two restraining ropes and lift the scaffold pole out of its hole. And it keeps my better-half very happy too!

How Did It Work?

So, readers are probably wondering "How did it work out?" The answer is an immediate "Very well"! In the first week of operation, I'd worked all around Europe into Canada and the USA, on all three bands. All QSOs were achieved with 10W single sideband (s.s.b.).

Signal reports were in the main, much better than I usually receive on my vertical or my other outdoor loops – not unexpected of course. The only thing of concern was that the standing wave ration (s.w.r.) on 21MHz was slightly higher than I expected at around 2.5.1.

On 14MHz band the s.w.r. was a reasonable compromise. However, up on 28MHz the s.w.r. was near unity across most of the band. Anyway, an a.t.u. will probably sort out the 21MHz s.w.r. problem, as it did with my antenna. So, whoever originally designed this antenna – they designed a very good one!

Three Delta Loops?

Now, I must confess that I've not tried this myself (yet). But, if you are fortunate and have a couple of very tall supports and can hang a sturdy rope between them – you could in theory, suspend three Delta Loops spaced evenly along its length. Then, the middle loop would act as a reflector* with each outer delta-loop independently fed with coaxial cable. In so doing, dependent on which way the loops are orientated, it should be possible to work either North or South or East or West.

Directivity would be at hand. Whether the unused loop would interact with the other two is probable. But at least it would be worth an experimental hour or two one sunny afternoon with nothing else better to do. Besides, where could you buy a beam-type radiator for the price of a roll

Fig. 1: The overall layout of Ray's delta loop for the three bands of 14, 21 and 28MHz, A tuner/matcher will be needed for best matching.

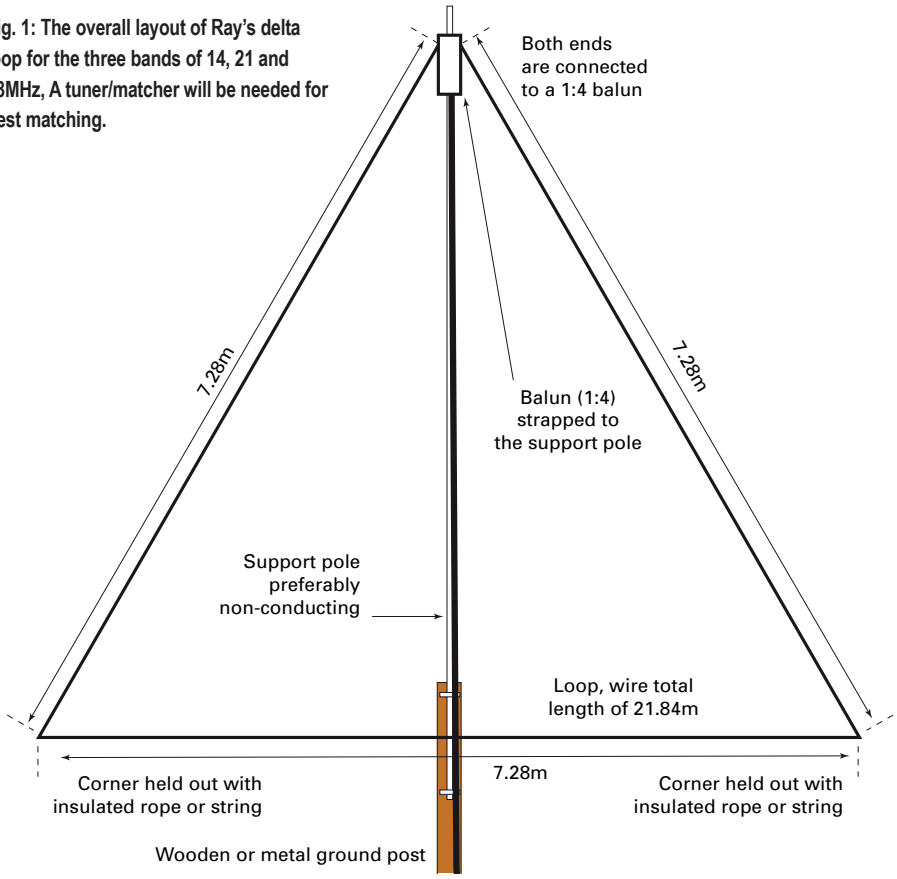


Fig. 2: a closer look at the bottom of the 1:4 step-up balun, which Ray bought some time ago before they went up in price significantly.

of bell-wire? My last two rolls of bell-wire (500 feet on each roll) cost me the grand sum of £5.00. I wouldn't advise running a kilowatt through it though! So please keep the linear at the off position if you decide to suck it and see.

***Editor's note**: It's important to remember that – very usefully – a reflector used with a Delta Loop does not need to be tuned to act as a reflector – although the efficiency as a reflector increases as the tuning approaches the frequency of the driven element. In recent years I've used a separate Delta Loop on 24 and 28MHz on the same assembly (Yacht sail fashion, as published in* PW, *with the bottom of the triangle fabricated from bamboo with the wire element taped to it). When operating on 28MHz the front-to-back ratio is quite effective (around 2 S-points when using the 24MHz Delta Loop as a parasitic (non-driven)reflector. The front-to-back ratio is slightly less (at around 1 S-point) when I operated on 24MHz, using the 28MHz Delta Loop as a parasitic reflector. Still very worthwhile when the directivity of the loop is taken into account.* ***G3XFD**.*

Star Performer!

There's absolutely no doubt in my opinion that this type of antenna is a star performer. It's almost simplicity itself. It's cheap, it's easy to build and it works! And what's more, just like a dipole, you can hang it horizontally as well as vertical. It's multi-functional performer.

By and large, all loops – for many people, the jury is still out on the magnetic variety but they do work and of course, being small, they're not prone to gobbling up lots of real estate – are extremely effective h.f. antennas. The only downside is their relative size for the lower h.f. bands, although they can be bent to fit the available space where appropriate.

And importantly – Delta Loops tend to be almost 'invisible' if they're hidden around fairly tall trees using (for example) thin wire. Perhaps the perfect stealth type antenna?

So, I'm sure if you build a Delta Loop you won't be disappointed. Finally, not unsurprisingly, the internet is chock-full of info regarding these star performers. Just tap in 'loop antennas' in the search box). I urge you to check it out and prepare to be amazed, just as I was when I began using them many years ago. A Delta Loop might be the only antenna you ever need. ●

Feature

The *PW* Contests Adjudicator Colin Redwood G6MXL presents the results of the 2011 event. How did you do this year?

The Third *Practical Wireless* 70MHz Contest

Results 2011

Editor's acknowledgements: *My grateful thanks go to Colin Redwood G6MXL for his hard work organising both PW v.h.f. events and writing his monthly* What Next? *column Colin's certainly dedicated! The 70MHz Contest is establishing itself now and I thank everyone involved for their support.* ***Rob G3XFD****.*

The 16 entrants to the 3nd *Practical Wireless* 70MHz Low Power contest on Sunday September 25th 2011 made a total of 264 valid contacts with 126 different stations in 21 different squares. The number of entries and number of contacts are well up in comparison with 2010. Radio conditions were variable, and many stations complained of a lack of activity.

Low Power Section Winner

The low power section winner is **Ron Price GW4EVX/P**, who operated from the summit of Foel Fenlli in IO83JD, in Wales. Ron operated both s.s.b. and f.m. On s.s.b, Ron used a Yaesu FT-817 transceiver with a Spectrum Communications transverter. On f.m, he used a Wouxon hand-held and a half-wave vertical antenna.

Open Section Winner

The open section winner by a considerable margin is the **Guildford & District Radio Society** (G&DRS) **G5RS/P**, operating from Woods Corner, 20km NNE from Eastbourne, East Sussex in JO00EW at a height of 170m ASL.

The G&DRS equipment included a Yaesu FT-707 h.f. transceiver with a

Table 1: Leading Stations

Description	Name/Team	Callsign
Low-Power Winner	Ron Price	GW4EVX/P
Open Winner	Guildford & District Radio Society	G5RS/P
Leading Single Operator	Ron Price	GW4EVX/P
Leading Multi-Operator	Guildford & District Radio Society	G5RS/P
Leading English Station	Guildford & District Radio Society	G5RS/P
Leading Welsh Station	Ron Price	GW4EVX/P
Leading Scottish Station	Andy Anderson	GM4JR

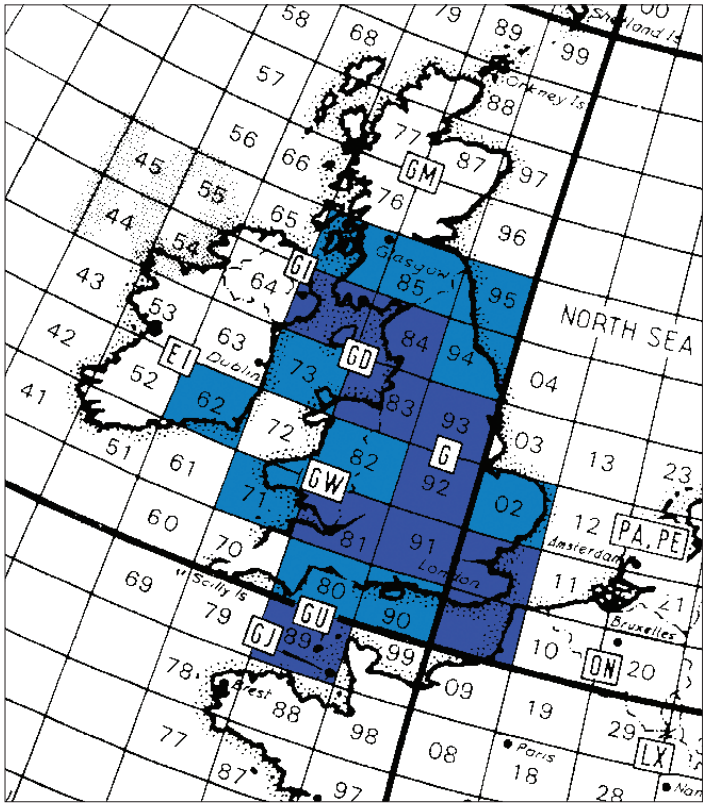


Fig. 1: Map showing locator squares of stations that entered (in dark blue) and other stations worked (light blue).

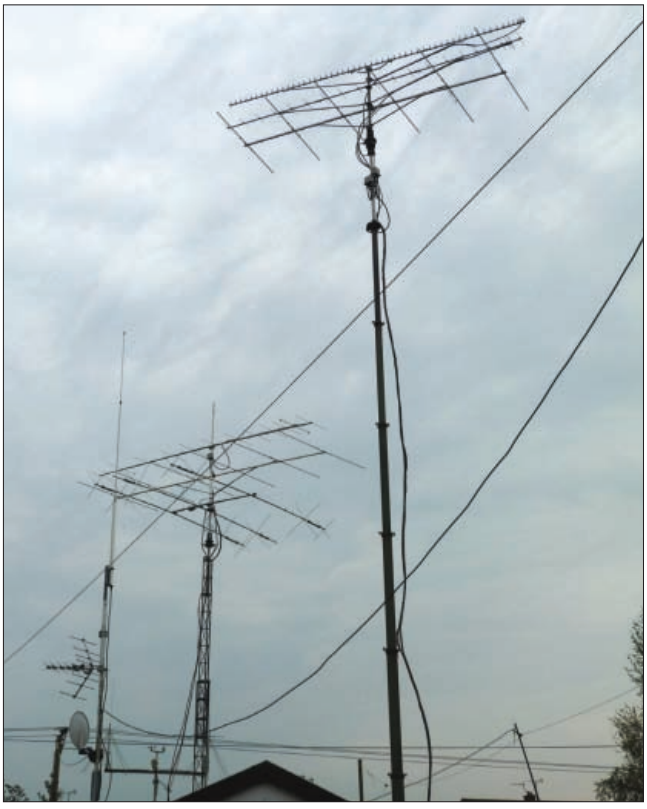


Fig. 2: The antennas at Andy GM4JR's station. The 6-element 70MHz antenna is the lowest on the mast nearest the camera with a 21-element Yagi for 432MHz and a 55-element Yagi for 1296MHz above it.

Fig. 3: The impressive operating position at GM4JR.

Microwave Modules transverter and a 4CX250B power amplifier, feeding an 8-element Yagi antenna at 15.25m (50ft) above ground. This excellent set-up helped the team work stations in EI, G, GU GM, GW.

Full details of the results can be found in the tables in this article. As usual, certificates will be sent to all the leading stations and the leaders in each square.

The Weather 2011

In comparison with the *PW* 144MHz QRP contest back in June, the weather was generally very kind to entrants, in fact it was certainly more like a June day than the last weekend of September. The Guildford Society described the weather as "Fab".

I certainly would agree with that statement, as down in Somerset, I found the thick clouds that were covering the Quantock Hills in the morning lifted to give a wonderfully sunny afternoon, with just a gentle breeze to keep the log sheets fluttering.

However, further north, it was not so good. **John Dowling GD0TFG,** reported, "Very windy from SW (again) and occasional rain, fun and games getting the antenna up and down! Better sport than the 'End-to-End' walking race that passed by my QTH, wind and rain on the nose, a lot of soggy bunnies!"

Enjoyment The Contest

The **Ossett Amateur Radio Operators** told me that they "Enjoyed the contest very much!"

More Activity

Radio conditions were variable, and although there was certainly more activity than in 2010, many stations commented on a low level of activity. **Eddie Ashburner G0EHV**, thought, "Conditions during the contest were nothing special with a fair bit of QSB. Activity level was poor, there were lots of missing call signs I would have expected to hear. No Es and nothing worked outside of the UK.

Andy Anderson GM4JR, says that he found: "The weather was fine, about 15°C, light wind (15mph average),

Fig. 4: The antenna used by adjudicator Colin Redwood G6MXL.

pressure steady at 1009mb (Rel). Radio conditions were actually quite good compared to normal. Some light QSB made things difficult at times (failed to complete contact with G4BZP and a difficult one with G6ZBO later).” He continued “I’ve never worked so few stations in any v.h.f. contest. I average about 30/35 stations per 4m contest in RSGB contests.

Lots of stations I would expect to hear were simply not there. Others, like myself, threw in the towel early. I heard no one after 1423UTC not a peep. Watching the cluster and the lack of spots (5 all day) highlighted the lack of activity. During same time I worked 100+ stations on 10m in the gaps on RTTY! Hopefully better next time with more activity!”

Ann Stevens G8NVI, submitted the entry from **Mike Stevens G8CUL**, and thought it was “Very poor, lack of activity!” She was sorry that they, “Lost GM4IGS right at the end!”

David Rumbold G4RYV, says “I stuck with it! Conditions flat with a high local noise level on the band. A pity about the low level of activity, but as the contest is relatively new this may be expected. Also due to the lack of 70MHz on many rigs. The one that got away! I heard GU6EFB calling very strong signals at this QTH but he did not hear me calling him though I tried many times.

Also thought I heard a station from EI at one point. Urban noise seems to be a limiting factor in working distant stations. Well that’s it for another year, I look forward to next year’s Contests. Many thanks to the team at *PW* for these events.”

Fig. 5: Adjudicator Colin Redwood G6MXL sets up his station on the Quantock Hills.

Keith Le Boutillier GU6EFB, says that, “Activity was almost non-existent only two stations worked one heard but not worked. Called for a long period on different beam headings but no joy, either very few participants or they can’t be bothered to beam south. Even the DX Cluster only had 8 spots for the whole period.”

First Hour

What is very apparent – is that most contacts were made during the first hour.

Table 2: *PW* 70MHz Low Power Results Table 2011.

Pos	Call	Name	QSOs	Squares	Score	Locator
1	GW4EVX/P	Ron Price	41	13	533	IO83JD
2	G0WRS/P	Warrington Radio Club	5	5	25	IO83QJ
3	G4CLB	Chris Brown	5	3	15	IO91RO
3	G0OIW/P	Mark Palmer	5	3	15	IO91MP
3	GD0TFG/P	John Dowling	5	3	15	IO74PC

Table 3: *PW* 70MHz Open Section Results Table 2011.

Pos	Call	Name	QSOs	Squares	Score	Locator
1	G5RS/P	Guildford & District Radio Society	47	15	705	JO00EW
2	G8CUL	Mike Stevens	32	13	416	IO91JO
2	G3NYY/P	Walt Davidson	32	13	416	IO92BA
4	G0EHV/P	Eddie Ashburner	29	14	406	IO84XT
5	M0ORO/P	Ossett Amateur Radio Operators	29	9	261	IO93AO
6	GM4JR	Andy Anderson	11	8	88	IO85FB
7	GW3RDB/P	Hoover Radio Club	9	5	45	IO81HR
8	G4RYV	David Rumbold	8	5	40	IO91OI
9	G4FKI	Dave Thorpe	3	3	9	IO92SA
10	GU6EFB	Keith Le Boutillier	2	2	4	IN89RK
11	M0RHV/P	Weston-Super-Mare Big Wheel Contest Group	1	1	1	IO81MI

For example low power winner GW4EVX and open section winning station G5RS/P had both worked over 60% of their total contacts in the first hour.

Adjudicator Check Log

For the first time since I took over adjudicating the *PW* contests from **Neill Taylor G4HLX**, I managed to get on the air for a couple of hours. Technical problems with my station limited my ability to transmit, but I managed to work a couple of stations over reasonable distances plus a further got-away and heard several more. I submitted a checklog. Many thanks also for a check log go to **David Proctor M0IOK**, who operated from IO93VT.

Logging Accuracy

Logging accuracy was generally much better than on the *PW* 144MHz QRP contest. Few '/P' errors were noted. Just one station appeared to make use of c.w. in addition to other modes to gain a few extra points or a multiplier.

Power Limit

Last year feed-back from non-participants and some participants suggested that the 10W power limit for the contest was discouraging participation, especially from more outlying areas. As a result in 2011 the contest was split into two sections.

This year there were entries from England, Wales, Scotland, Isle of Man, and the Channel Islands, although none from EI or GI, although at least one station was active from EI.

Date & Time

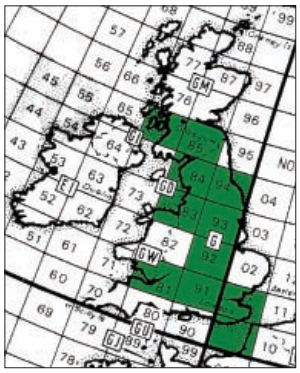
The change of rules for 2011 appears to have been well received, with no adverse comments from any entrants this year. The change of date also appears to have worked well. This leaves the timing, where one station asked for an earlier start and another requested a later start.

The 2012 Contest

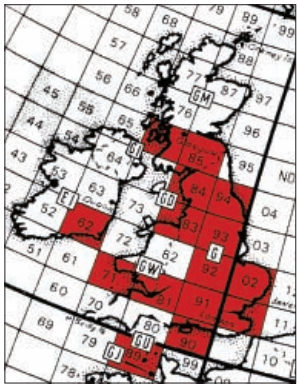
The 2012 *PW* 70MHz Contest is provisionally booked for Sunday September 23rd 2012. I'm expecting the rules for the 2012 *PW* Contest to appear in the September 2012 issue due in the shops mid-August 2012.

Congratulations & Thanks

Congratulations to the 2011 winners and on behalf of all entrants a big "Thank you" to all stations that participated. Let's all hope that support for the contest will continue to improve in 2012. ●



Map showing the claimed squares worked by Ron Price GW4EVX/P, the leading low power station operating from IO83 square.



Map showing the claimed squares worked by the Guildford and District Radio Society G5RS/P, the leading open section station operating from JO00 square.

Table 4: Square Winners

Square	Name	Call	No. entries
IN89	Keith Le Boutillier	GU6EFB	1
IO74	John Dowling	GD0TFG/P	1
IO81	Hoover Radio Club	GW3RDB/P	2
IO83	Ron Price	GW4EVX/P	2
IO84	Eddie Ashburner	G0EHV/P	1
IO85	Andy Anderson	GM4JR	1
IO91	Mike Stevens	G8CUL	4
IO92	Walt Davidson	G3NYY/P	2
IO93	Ossett Amateur Radio Operators	M0ORO/P	1
JO00	Guildford & District Radio Society	G5RS/P	1

Transceiver	Antenna	Ht. a.s.l.
Yaesu FT-817 + Spectrum TVTR (s.s.b.) Wouxun	3-ele Yagi plus half wave vertical	515
Yaseu FT-817 + MM TVTR	3-ele Yagi	21
Spec. Comms TVTR + TS570	Halo	8
Wouxun KG-699E Hand-held	half wave vertical on 4m pole	260
Philips FM-1000	Vert. Slim Jim made from 450Ω ribbon	150

Transceiver	Antenna	Ht. a.s.l.
Yaesu FT-707 + MM TVTR + 4CX250B Amplifier	8-ele Yagi	170
Kenwood TS-940S plus TVTR	6-ele	60
Yaesu FT-817ND + Spectrum xvtr + solid st	4-ele Vine Yagi	5
Yaesu FT-847, home brew power amplifier.	5-ele Yagi	490
Yaesu FT-817 + Spectrum TVTR	5-ele Vine Yagi	463
Yaesu FT-450 + Spectrum TVTR + TE 0610G	6-ele Yagi	32
Phillips 1000	Dipole	457
Icom IC-706 Mk1 + Spectrum TVTR	5-ele Home-brew DK7ZB Yagi	66
Yaesu FT-847	3-ele Yagi	40
Yaesu FT-847 160W	5-ele Yagi	100
Ascom SE550	Vertical	77

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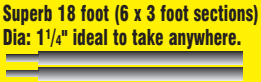

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SDR Introduction Continued

Fast Fourier Transforms

Having covered most of the basic theory In last month's *Data Modes* column, Mike Richards G4WNC, looks at Jean Fourier's legacy and the SDR techniques themselves.

Welcome to this month's *Data Modes* (*DM*) where I'm continuing to look at Software Defined Radio (SDR). Those of you with an interest in software defined radio (SDR), will doubtless have heard the Fast Fourier Transforms (FFT) term mentioned countless times and been baffled by it!

Hopefully, via *DM,* I can give you an insight into what these are and why they're so important to SDR. The concepts and mathematics of Fourier transforms were first shown in a paper by French mathematician Jean Fourier way back in 1822.

Jean Fourier's work formed part of a paper on heat flow, where he observed that some functions can be represented by a series of sines at multiples of the function. Putting that into simpler terms, this means that a complex waveform can be created from a number of sine waves. If you would like to see a practical demonstration of a complex waveform and it's components, take a look at the following web applet to be found at: **www.falstad.com/fourier/**

I've shown a screen grab in **Fig. 1**. Choose a square or a triangle waveform and then play around with the levels of the component sine waves to see the results. And the quotation *"One picture paints a thousand words"* will prove itself!

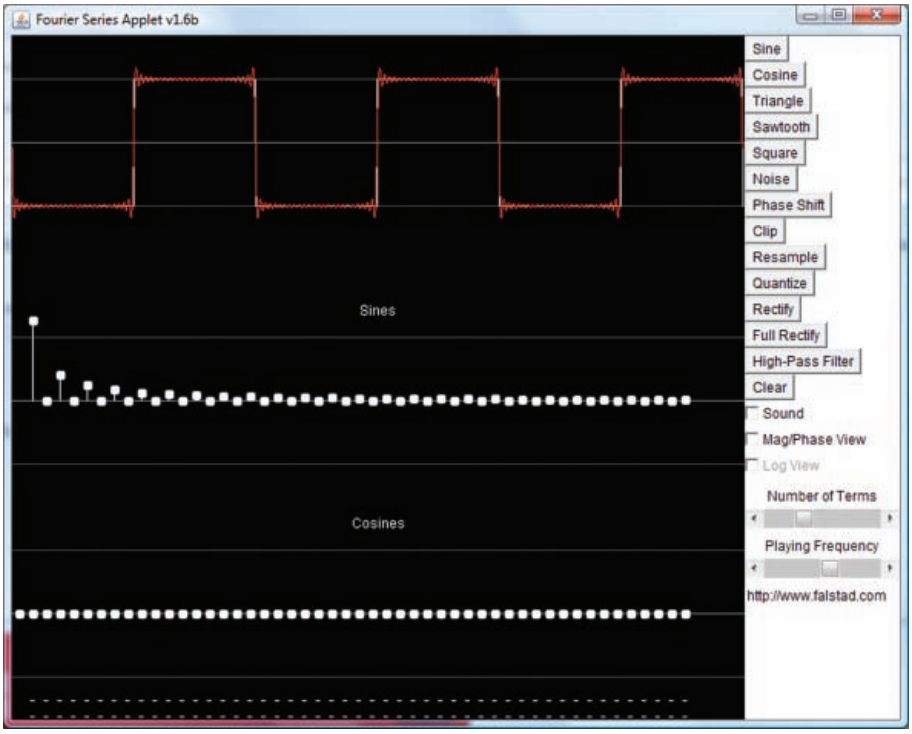

Fig. 1: Java applet illustrating the Fourier series.

The examples on the website show very clearly how you can construct a complex waveform by combining sine waves in exactly the right proportion. This process is reversible, so you can extract the sine wave components of a complex waveform by examining the Fourier series. This is known as a discrete Fourier transform but is generally too slow for communications work.

The solution to the lack of speed of discrete Fourier transforms, is to use a different algorithm known as a Fast Fourier Transform (FFT). The use of FFTs is now standardised throughout the signal processing business and many designers use the well proven FFT routines that are built into the Intel IPP software library.

Why Are FFTs Important?

If you recall from last month's *DM*, the information coming from the digitisation process in the SDR is a stream of in-phase and quadrature (IQ) data that represents the signal we want to receive. One of the first useful things would be a spectrum display so we have a visual representation of our signal. This is an ideal task for an FFT as we can use this routine to split the incoming complex signal into its separate frequency components and show them on the display.

The spectrum display routine works by splitting each signal sample into a number of very narrow-band 'bins' and then measuring the contents of each bin. These measurements can be used to feed the spectrum display and another type of display called a 'waterfall' display, which represents the spectrum display over a period of time.

The FFT bins are rather like banks of very narrow band filters and are often used to create the SDR receiver filters. By using reverse FFTs it's possible to convert a bandwidth shape into a real high performance filter. You can play with a digital filter in another web applet to be found at: **www.falstad.com/dfilter/** I've shown a screengrab from the website in **Fig. 2.** That's enough theory for this time!

Practical SDR

Now we'll get on with the practicalities of SDR. The first thing you'll notice

about SDR systems is that the hardware itself has few, if any, controls. This is because all the control is handled in the specialised SDR software.

The good news is that most of the software is free and works with an assortment of receivers. This means you can experiment to find the software that suits your needs and upgrade to add more features.

Software control is the big advantage of SDR over conventional receiver technology. Whereas many conventional receivers present the listener with a single frequency, all SDRs provide a panoramic view of a band of frequencies and often use 'mouse clicks' to tune. This is a very different approach to the familiar silky smooth rotation of a tuning knob so, as a technique it can take some getting used to by most of us!

Direct Conversion SDR

One of the simplest ways to create an SDR receiver is to use the direct conversion (DC) technique. This is where the incoming r.f. signal is mixed with a local oscillator of the same frequency to produce what's known as a baseband signal. You could quite rightly observe that this is the same technique as a normal c.w. or s.s.b. direct conversion receiver.

However, there is an important difference as we need to produce IQ outputs as opposed to a single audio signal. To do this, we apply the r.f. signal to two identical mixers fed by the same local oscillator, except that the local oscillator feed to the Q mixer is delayed by 90° (see **Fig. 3**).

The output from the DC mixer combination is a base-band IQ signal. By base-band I mean a signal the signal originates from 0Hz – so let's next look at an example. Suppose we want to receive a signal of 14.2MHz. The local oscillator would be set to 14.2MHz and the output from the mixer would be the sum and difference signals. So a 100Hz tone on the 14.2MHz carrier would appear at +100Hz (14.2001-14.2) and 28.4001MHz (14.2001+14.2).

While it's possible to create a DC IQ signal using conventional mixers, there's one system that is particularly effective and can be found in most direct conversion SDRs. This is the Tayloe switching mixer – or product detector – designed by **Dan Tayloe N7VE**.

The Tayloe product detector is extremely simple and features a conversion loss of less than 1dB. It also offers a very high 3rd-order intercept point. Because it's not a conventional mixer the detector only outputs the difference signal so, there is no sum signal to filter out. The frequency range can extend to at least 10GHz so you'll realise that the Tayloe mixer is an impressive design.

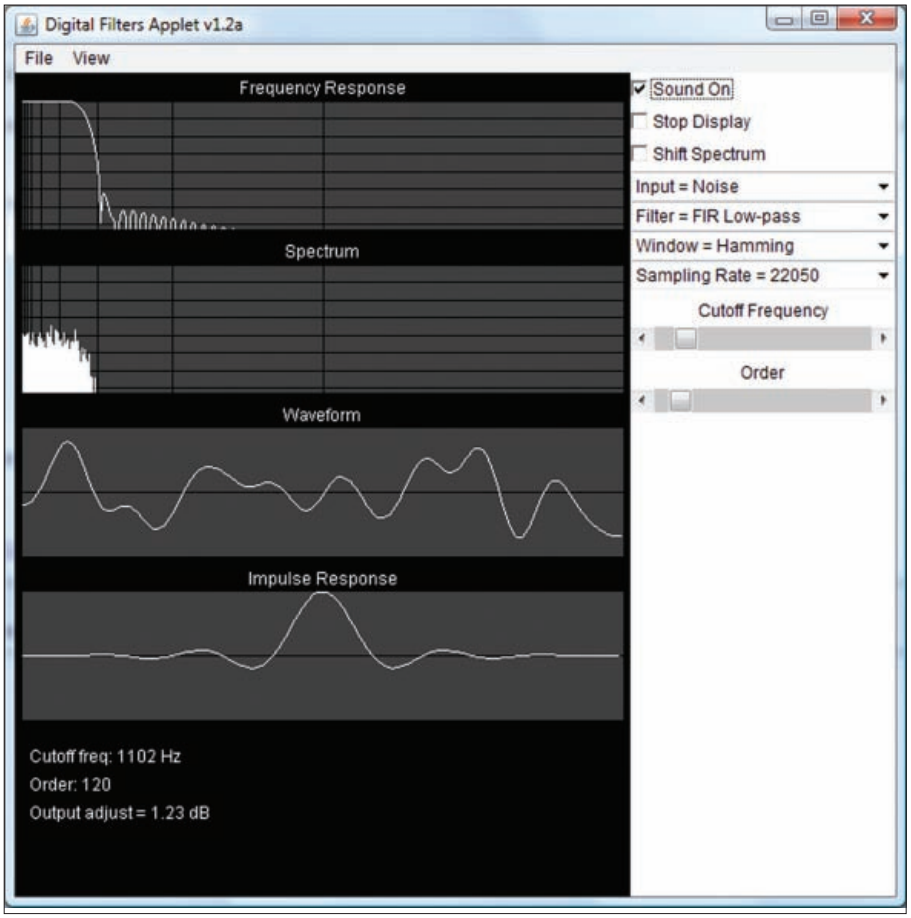

Fig. 2: Java applet where you can experiment with a digital filter.

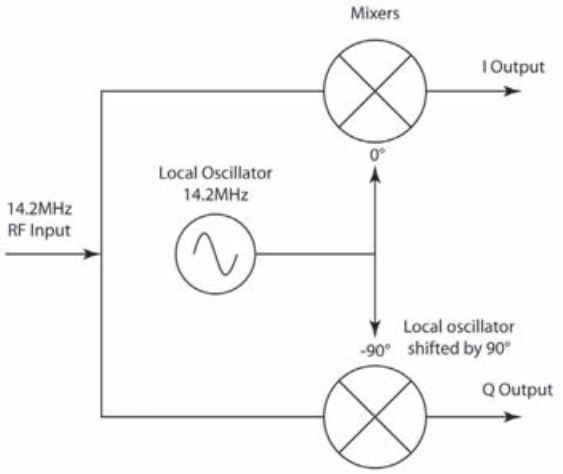

Fig. 3: Basic direct conversion SDR configuration.

The theory of operation of a Tayloe mixer is also remarkably simple and the best way to understand it is to think of the detector as a four-pole rotary switch with the r.f. signal connected to the wiper. The switch is then set to complete one revolution for each cycle of the incoming r.f. signal.

Each pole of the switch has a capacitor connected to it, and this is charged by the incoming signal but only whilst the rotating wiper is in contact. As a result, the capacitors connected to the four poles contain a sample of the signal at 0°, 90°, 180° and 270°.

By adding the 0° and 180° connections we can create the 'I' signal and by combining the 90° and 270° samples we create the 'Q' signal. I've shown an illustration of the process in **Fig. 4**. Clearly, it's not practical to achieve this with a mechanical switch, so electronic switches are employed and many modern implementations use the 4066 quad bilateral c.m.o.s. analogue switch integrated circuit (i.c.).

In order to make the switches operate at the correct time, the local oscillator (l.o.) has to runs at four times the required carrier frequency and is applied to the switch via a 4-stage Johnson counter as shown in the timing diagram of **Fig. 5**. A Johnson counter is a specially configured shift register where the first l.o. cycle sets output A to 1 the second sets output B to 1 and so

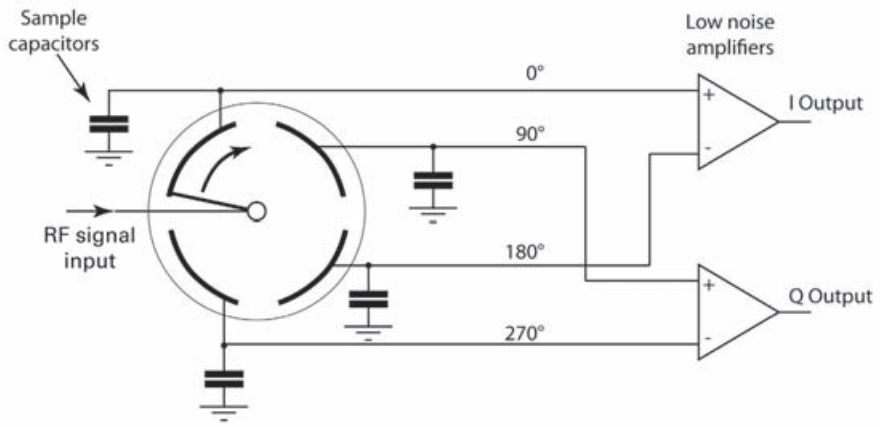

Fig. 4: Illustration of the ingenious Tayloe Product Detector.

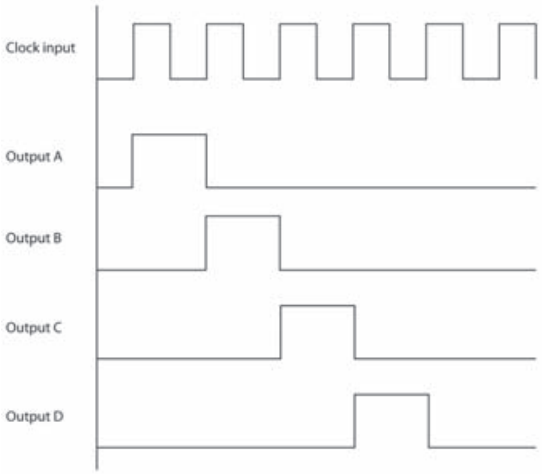

Fig. 5: Chart showing how a Johnson Counter generates control signals for the Tayloe switches.

on. Each output is a single pulse at one quarter of the l.o. signal.

The outputs of the Johnson counter are connected to the 4066 switch to control the sampling switches, directing the incoming r.f. signal. Finally, the outputs from the switches are combined and amplified by a pair of low noise operational amplifier i.c.s (opamps) to produce the required IQ output.

Note: Despite the use of digital circuitry to help process the r.f. signal, the IQ outputs are still analogue signals at this stage.

In simple designs these outputs can be sent to a computer sound card for digitising and processing by the SDR software. The only snag with this approach is that there are lots of different sound-cards out there so the results can vary from computer to computer. In some of the more modern SDR implementations a sound-card and USB driver are included on the board.

Sample Rate Confusion & DC Bandwidth

One area that often confuses people new to SDR, is the bandwidth of the DC receiver. So, I'll try and explain it here. Remember, the IQ signal from our DC receiver is analogue and has to be applied to a sound-card for digitisation.

All sound-cards have a range of sample rates that they can use. The basic rule (Nyquist) is that the sample rate has to be set at slightly more than twice the highest frequency that you want to process. For audio signal that means setting the sample rate at a minimum of 44kHz for Hi-Fi sound. However, as computers prefer to work in 8-bit multiples, 48kHz and multiples, such as 96kHz and 192kHz are often employed.

Getting back to our SDR example, if we apply our direct converted IQ signals (using 14.2MHz l.o.) to the left and right channels of the sound-card using a sample rate of 48kHz we could expect to be able to receive signals between 14.2MHz and 14.224MHz, i.e. up to 24kHz above 14.2MHz.

By manipulating the IQ signals it's also possible to receive the band that stretches 24kHz below 14.2MHz. This manipulation of the signals means the total bandwidth available is 48kHz wide centred on 14.2MHz. Within the SDR software, the IQ signals are further processed to minimise images between the upper and lower ranges and so effectively provide continuous tuning of the full 48kHz bandwidth.

In operation, the software can often be 'tweaked' for improvement, as the image rejection works best when both I and Q signals have absolutely identical level and phase characteristics. One common side effect of using sound-cards for IQ processing is a central spur in the tuning display. This is due to a combination of noise and the sound-card filters that cut off signals below about 10Hz. These filters can cause phase and amplitude differences between the I and Q channels that result in a visible spur.

In the better systems this spur can be reduced to levels close to the noise floor on the h.f. bands. So to summarise, you can expect the tunable bandwidth of a direct conversion SDR receiver to be approximately the same as the sound-card's sample rate.

Local Oscillators For DC Receivers

For single band operation the simplest way to provide the local oscillator is to use a crystal oscillator. This is the approach used by the very successful SoftRock and Soft66 series of SDR systems. The downside of this approach is that you have to choose your crystal carefully so that the limited receiver bandwidth covers your area of interest.

A better solution for modern designs is to make use of the excellent programmable crystal oscillator by Silicon Labs, the Si570. This is a pretty incredible, self-contained, 8-pin chip that can generate accurate frequencies in 1Hz steps between 10MHz and 945MHz!

Programming is handled over a simple two-wire interface and the output is a square wave – just what we need to drive the Johnson counter in a DC SDR. Prices for the Si570 start at around £14 for the 200MHz version – so they are a very economical solution.

Spectrum Digitisation

The development of high speed analogue to digital converters has meant that it is now possible to digitise the entire h.f. spectrum in one hit! However, as I explained in last month's *Data Modes* the result is a very high speed data stream that has to be processed in a specialist Field Programmable Gate Array (FPGA).

As a result, the FGPA is generally confined to commercial implementations of SDR with the WiNRADiO range being a good example. Some of the more advanced systems use a combination of superhet front ends and wide-band ADCs to deliver incredible performance.

I've run out of space this time, but next month, I'll continue with a look at SDR software and how to use it. But in the mean time, if you'd like to try out this method, have a look at the two receiver kits assembled by **Phil Chiotti G3XBZ** that appear elsewhere in this magazine. ●

Competition Time

Win a Heil Genesis HM-12 Microphone and Lead in our free competition!

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Just answer the three simple questions and send your entry in!

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Bob Heil took time out to visit the production line to catch an HM-12 microphone as it came off the production line. You could win an HM-12 in our simple competition!

The Competition

To enter our simple competition all you have to do is answer three simple questions. Unusually however, instead of referring to a review in *PW* – this time you'll have to research the simple answers yourself! The answers are freely available from a number of sources – including the Internet. Once you have found the three answers – fill in the entry form and send it in to the address shown at the bottom of the page.

Photocopies of the competition page are acceptable. But, if you photocopy the competition page **you must also cut off and send the corner flash coupon**. Entries without the corner flash coupons will be disqualified. Only one entry per household is permitted. Completed entries with sufficient postage (Freepost entries will not be accepted) must arrive at the *PW* offices by Monday 20th February 2012.

The HM-12 Microphone will be awarded to the first entry – with all three questions answered correctly – to be drawn and the winner will be notified by the Editor. The Editor's decision will be final and no correspondence will be entered into. Good luck!

Question 1: In which country was Bob Heil born?

Question 2: Where is Bob Heil's company based?

Question 3: What is Bob Heil's Amateur Radio callsign?

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.....

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IMPROVED 4001 FM TRANSCEIVER. 70.2500 to 70.4875MHz in 20 channels in 12.5kHz steps. Now with improved audio quality and really effective noise squelch to give quite background effective weak signal reception. RF output 5W/25W switchable. Can also be preset to 1W/10W, approved for use by M3 and M6 operators. Sensitivity better than 250hV for 20dB SINAD. Audio output 500mW. Supply requirement 13.5V DC 4A on high 1.5A on low TX, 130mA on RX. **Price £172.50 including delivery.**

SLIM G 144-146MHz TRANSMIT & RECEIVE AERIAL. Previously called the GAREX JIMP and is essentially a portable version of the Slim Jim. The gain is 1.8dBd, which on 2m is 12dBd better than a 150mm rubber duck. The main element is 300 Ohm twin feeder with a matching section housed in a watertight housing. There is 4m of coax cable with a choice of BNC, or PL259 connectors. The 2m version is 1.55m (61") long and folds down to 25cm (10"). **Price £20.00 plus £3.50 P&P.**

INTERFERENCE FILTERS. Bandpass filter 85-110MHz for car radio or domestic VHF FM band interference suppression. Stopband below 30MHz -50dB, and above 300MHz -40dB. Type BPF-100. **Price £12.00 plus £2 P&P.** High pass filter for television use with passband above 450MHz and stopband of -60dB from DC to 200MHz, type HPF-450, **Price £12.00 plus £2.00 P&P.** Very high specification television high pass filter with passband above 500MHz. Particularly useful to reduce 70cm and TETRA interference. Type HPF-500. **Price £25.00 plus £2.50 P&P.**

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TRAP DIPOLE for 80/40/20/15//&10m. 106 feet long. Supplied with 70 feet of low impedance twin feeder. 600W rated. Low TVI and low noise. 2 S-points quieter than a G5RV with same feeder length. PVC covered wires with lugs. Regular duty £164.50, strong £182.50, inc. carriage.

TWIN FEEDER 100 Ohm, 2kW rated, 24/0.2 in individual polyethylene sheaths with an outer cover of polyethylene. Solid construction to avoid water ingress. Good flexibility to overcome work hardening and fracture. Typically 0.5dB/m quieter than wide spaced 300 and 450 Ohm feeder and coax. Loss 0.04dB/m at 10MHz. 75p/metre plus £3 P&P. 100m drum. £70 inc P&P.

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Tony Nailer G4CFY's Technical for the Terrified
PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW
E-mail: tony@pwpublishing.ltd.uk

Separating the Wheat from the Chaff!

In his *Technical for the Terrified* column this month Tony Nailer G4CFY, explores curing BCI and TVI.

This month in *Technical for The Terrified* (*T4T*) I'll continue the theme of filters by considering the problems associated with interference to v.h.f. broadcast reception in Band-II and Band-III and to TV Band IV and and V. This topic is suddenly of great interest to me as I've having taken over Garex Electronics who'd bought the rights to the AKD Interference filters in 2003.

Radio broadcasts at v.h.f. are Band II between 88 and 108MHz for analogue wide-band f.m. and Band III between 207 and 216MHz for Digital Audio Broadcasting (DAB). Television broadcasts in any area are presently arranged in groups in Bands IV and V between the limits of 450MHz and 900MHz.

Types Of Interference

Interference falls into four specific types or categories. The first type of interference being where a transmission has not been adequately filtered. And so, harmonics of that transmission actually fall within the broadcast reception band.

The second category of interference, is where a sufficiently strong transmission signal, though of itself 'clean', is creating harmonics due to dissimilar metals or corrosion in metalwork nearby the transmitting station. These secondary signals are then effectively transmitted at the same time as the original.

The third category of interference, is where the transmission is being picked up by the receive antenna or its down lead and saturating the receiver's first r.f. amplifier in the system. This amplifier, often will be either a masthead amplifier or distribution amplifier inside the loft space.

The fourth and final category of interference is where a transmission is strong enough, or close enough to a building, to be picked up and propagated around mains cabling.

The First Category

Looking more closely at the first category of interference, it's the form that's directly within the control of the transmitting station. These days it's relatively rare for Radio Amateurs to produce too many 'out of band signals', as the majority use commercially manufactured transmitters and amplifiers, which include adequate harmonic filtering.

However, out of band signals are likely to occur in Citizen's Band (CB) stations, where amplifiers, (linears or 'burners') are used. Many of these have inadequate, or perhaps don't have any low-pass filtering at all. In the early days of CB in the UK (illegal) amplitude modulation was used (legal CB was limited to narrow band f.m.), which was readily picked up and demodulated by any nearby class B audio amplifiers.

Early commonly used CB amplifiers were often single-transistor stages, which when being heavily overloaded, producing a 'fir-tree forest' of harmonic outputs on a spectrum analyser display. However, these days the majority of CB amplifiers use push-pull m.o.s.f.e.t.s that are not easily

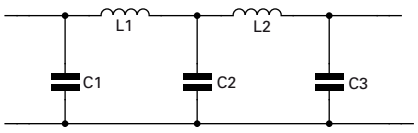


Fig. 1: A double π-section low-pass filter, changes of component values, can drammatically change the parmaters of the filter. See Figs. 2 and 3.

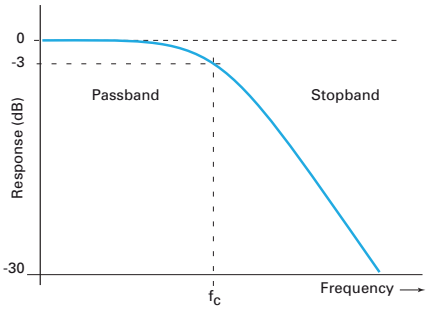


Fig. 2: The filter of Fig. 1 with values chosen to create the Butterworth characteristic. For such a filter, a cut-off of 108MHz will only attenuate 216MHz by about 12dB.

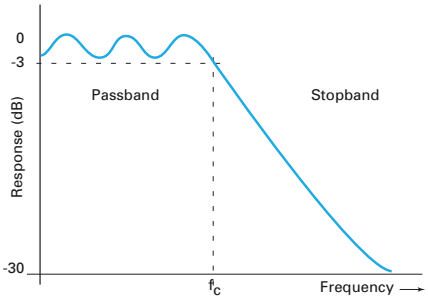


Fig. 3: A Chebychev characteristic filter has a a sharper cut-off slope than the Butterworth filter of Fig. 2.

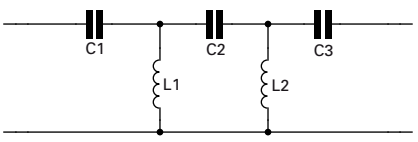


Fig. 4: Reversing the positions of the capacitors, and inductors, gives a filter with a high-pass characteristic. See Figs. 5 and 6 for variations.

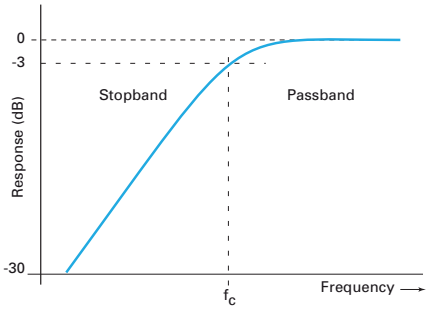


Fig. 5: A Butterworth characteristic high-pass filter with it's fairly gentle roll-off with frequency, but with a flat response within the pass-band.

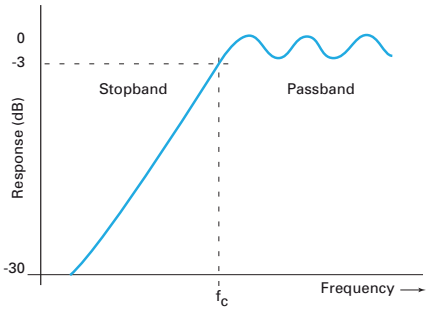


Fig. 6: The Chebechev High-pass filter has a much faster roll-off with frequency than the filter of Fig. 5, at the expense of ripple response within the pass-band.

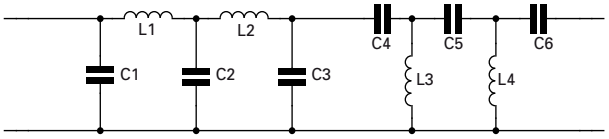


Fig. 7: Combining the filters of Fig. 1 and 4 to create a band-pass filter.

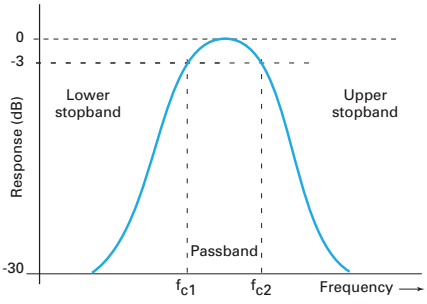


Fig. 8: When the two filters are combined as in Fig. 7, this form of frequency response is created.

overdriven and only produce odd-order harmonics.

Let's look at harmonics next and three times the frequency of signals in the CB bands from 26.965 to 27.991MHz are just under 81MHz to almost 84MHz, which is below the v.h.f. broadcast Band II. Multiples of five times the same CB band frequencies gives harmonics that fall in the 134.8 to 140MHz range, which is above the broadcast band but is then in part of the aeronautical communications band of 118-137MHz.

Unfortunately the 50MHz (6m) Amateur band from 50-52MHz has a second harmonic between 100 and 104MHz and is liable to cause interference unless well filtered.

The Second Category

The second category of spurious signal generation was more common years ago, when old metal gutters and water down-pipes were in widespread use. Generation of spurii can occur anywhere in the near field of the transmitting antenna with poor joints in the antenna tower and couplings. It can even occur in nearby old and corroded TV antenna installations.

Less common – but still likely – are corroded joints between steel water tanks and brass, or copper pipe fittings. Such spurii are relatively easily found using a portable receiver and a handheld antenna to search for the source of the offending harmonic.

The Third Category

The third category of spurious signals due to saturation is becoming a growing problem, due to the increase in properties being converted into flats or built as block of flats. These invariably include a basic Band II dipole – or in fringe areas a 3-element Yagi plus a television antenna – both feeding into a loft amplifier and distribution system.

It's also now common for homes to have several rooms equipped with televisions, all fed from the loft distribution system. Cheap distribution amplifiers only include the simplest of filtering that's unable to reject strong signals on nearby frequencies. The strong signal then saturates the amplifier, which then loses gain at the wanted broadcast frequency as well as acting as a mixer for all incoming signals.

The test to determine if it's the distribution system that's at fault, first check to see if interference is equally suffered by all occupants of rooms or flats. If not, then it's likely the signal is being picked-up on downleads from the amplifier to the individual rooms.

Solving the problem of interference to Band II from Amateur transmissions on 70MHz or 145MHz isn't easy. The lower band edge of Band II at 88MHz is only 1.25 times 70MHz. Likewise 145MHz is only 1.34 times the upper band edge of Band II at 108MHz.

A simple notch filter in the broadcast antenna feeder tuned to the Amateur transmission will not be sharp enough to only attenuate the unwanted signal. Unfortunately, it will also seriously attenuate the wanted one as well.

Filter Options

Next, I'll look at filter options. A double π-section low-pass filter, as shown in **Fig. 1**, with a Butterworth characteristic as shown in **Fig. 2**, and a cut-off at 108MHz will only attenuate 216MHz by about 12dB. By deliberately mismatching the circuit by under-loading it, the stop-band is improved at the expense of ripple in the pass-band, **Fig. 3**.

Swapping the inductors and capacitors round we can create a high-pass filter as shown in **Fig. 4**, with the either the Butterworth, **Fig. 5**, or the Chebyschev characteristics **Fig. 6**. The Butterworth filter with a cut-off at 88MHz, will only attenuate a signal at 44MHz, which is half the bottom band edge, by about 12dB. No good at all!

The high-pass filter can also have different characteristics, as seen in Figs. 5 and 6. The table of 5-element Chebychev filters given on page 30.29 of the 1996 edition of the *ARRL Handbook* and it reveals that with filter number 8, (filter with a cut-off at 108MHz) will only be 3dB down at 150MHz and 20dB down at 216MHz.

The above filtering problem was put to me recently and the solution was a bandpass filter, made up by combining two 5-branch Elliptic high-pass and low-pass filters, as shown in **Fig. 7**, with its frequency response shown in **Fig. 8**.

It's possible, by adding resonating capacitors, to the inductors of Figs. 1 and 4, to improve the stop-band response. The low-pass version is is shown in **Fig. 9** with its characteristic 'notches' are shown in **Fig. 10**. The modified high-pass filter with series resonating capacitors added is shown in **Fig. 11**, and its characteristic 'notches' in **Fig. 12**.

The filter I created, followed the circuit of Fig. 7, the resulting pass-band of the filter is from 80 to 109MHz, with an insertion loss of only 2dB. The high side attenuation is 30dB at 144MHz and a stop-band (As) of –50dB from 280MHz to 680MHz and –40dB 680MHz to 1000MHz. On the low side the

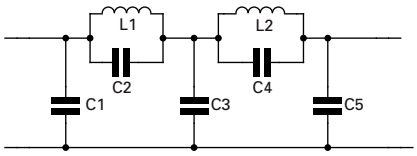


Fig. 9: Adding parallel capacitors to the two series inductors of the filter of Fig. 1, to create the five-branch 'Elliptic' low-pass filter.

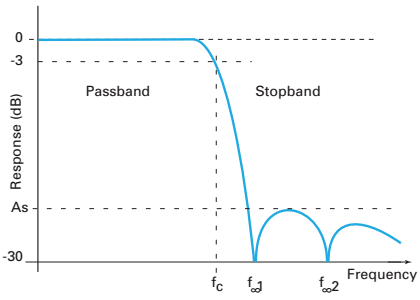


Fig. 10: The parallel capacitors to the coils, in effect, add two 'notches' to the filter's stop-band.

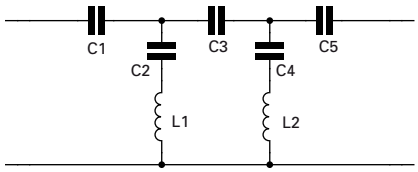


Fig. 11: Changes to the filter of Fig. 4, to change the circuit into a five-branch high-pass version. Note that the two added capacitors, are now in series with the inductors.

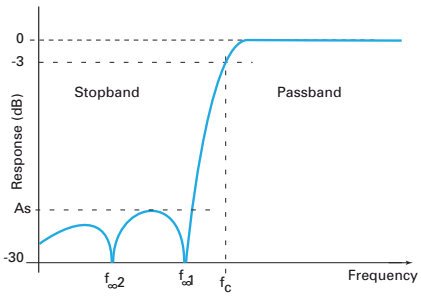


Fig. 12: Like the filter of Fig, 9, this high-pass filter also has 'notches' in the stop-band response.

attenuation is -30dB at 70MHz and a low side stop-band (As) of –40dB from d.c. to 65MHz.

Television Interference

Alleviating the third category of interference to televisions, is not too difficult with respect to transmissions at h.f., 50, 70 or even 144MHz. With the bottom edge of the TV band (Band IV) at about 450MHz this is over three times a transmission at 145MHz. A two-section high-pass filter can achieve a stop-band from d.c. to 200MHz at –60dB clearing all problems from the frequencies just listed.

Interference is likely to TV masthead and distribution amplifiers from TETRA radio transmissions in the 400MHz band and from Amateur transmission on the 433MHz band. As determined previously where the ratios of the frequencies of wanted to unwanted signals are small, it's not easy to effect a solution.

Fortunately, amongst the filter types I've inherited from AKD and Garex is a metal-boxed filter comprising a printed circuit board (p.c.b.) with six coupled tuned lines. The cut-off is about 500MHz, so it might cause attenuation of TV signals on the lowest channels but it provides a serious attenuation of about –40dB to 433MHz signals.

The Fourth Category

The fourth category – mains-borne interference – is best cured by re-siting the antenna as far away as possible from the cabling. This separation is best done by elevating the transmitting antenna, so the low angle radiation does not couple into the mains cables. If this isn't an option, then all susceptible equipment will need ferrite filters on the mains leads to prevent the unwanted signals entering the enclosures.

If the signal getting into the mains, is coming from a coaxial cable fed dipole then the first step is to install a balance-to-unbalanced (balun) transformer. Then the coaxial cable feeder should be replaced with low impedance twin feeder.

Note: Despite assurances from clever people that coaxial cable doesn't radiate due to the enclosed magnetic field, experience and evidence run contrary to that claim. Remember that the transmitted signal passes up to the antenna via the coaxial cable and if it **is** emitting a field – it starts right there in the shack.

Interference To DAB

I haven't addressed the issue of interference to DAB radio (transmitted on Band III at the moment) – but we can be sure that it will be affected. The relationship between 145MHz and 201MHz is about 1.4:1 so the design of a high-pass filter will not be too demanding. A 5-element Chebychev filter should do the job satisfactorily.

On the high side of DAB, the Amateur 70cm band 433MHz is twice 216MHz – so again a low-pass filter at 216MHz will easily attenuate any unwanted transmissions. Generally though, I don't think DAB is really a rapidly expanding market and maybe if the typical listener is living in peace with an analogue f.m. radio, perhaps DAB will fade away!

On the other hand, I don't think the question of f.m./DAB is being driven by logic, quality or power consumption, but by politics. Eventually, like the analogue TV service, the government will just switch off what the public were quite content with, because it drives the economy!

Component Values

I will not give examples here of how the values of all the components are calculated because tables for the various types of filter are published in a number of books, including the *ARRL Handbook*. The tables are usually 'normalised' to 1MHz and for a nominal frequency of 50Ω. It's usually easiest to look down the tables till you find a frequency, which is related by factors of 10 to the desired cut-off.

If the required frequency is 100 times that for a particular filter then simply divide the values of capacitance and inductance by 100. To change to another impedance than 50Ω, say 75Ω, then divide capacitance values by 1.5 and increase inductance values by 1.5. That's all there is to it!

Improved Understanding?

I hope that this article has improved understanding of interference issues and the requirements of different filters to achieve the necessary result. Filters and filtering are important aspects to radio communication and a thorough understanding of them is vital for good equipment design.

If you wish to contact me regarding this article you may do so using **tony@pwpublishing.ltd.uk** Cheerio for now.
Tony G4CFY. ●

Rev. George Dobbs G3RJV's Carrying on the Practical Way
PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW
E-Mail: pracway@pwpublishing.ltd.uk

Found for a Pound!

The Rev. George Dobbs G3RJV has discovered the fascinatingly cheap world of the 'Pound Shop' with the help of a Swedish friend – and ends up building 'The Quick Receiver'.

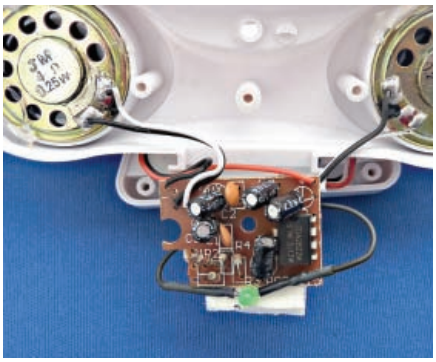
"The most frequently asked question in our stores is:
'How much is this?',"
Jim McCarthy, Chief Executive of Poundland.

Welcome to *Carrying on the Practical Way* (*CotPW*) where several times in past editions of this column I've mentioned Johnny Apell SM7UCZ. Johnny is an avid radio constructor who has shared many ideas with me, including some that I've passed on to *PW* readers.

Once again, last October, Johnny attended the **G QRP Club**'s convention. On his visits to England Johnny often follows up on his other interests of canals and steam trains.

This time around, I discovered yet another SM7UCZ interest; that of visiting British 'Pound shops'! He had visited a couple of the (too) many Pound shops in the centre of Rochdale and his bargain buy was a pair of amplified stereo loudspeakers. For his Pound he received a fold-down pair of speakers complete with stereo amplifier and a jack plug designed to fit an MP3 player or small games console.

Sharing a glass of red wine and some Swedish sausage with Johnny and his wife **Birgitta** in their hotel room we had the chance to examine their bargain piece of technology. It contained a pair of 30mm diameter 0.25W (250mW) 4Ω loudspeakers with plastic diaphragms. Not in the first league of Hi-Fi speakers – but useful little items!



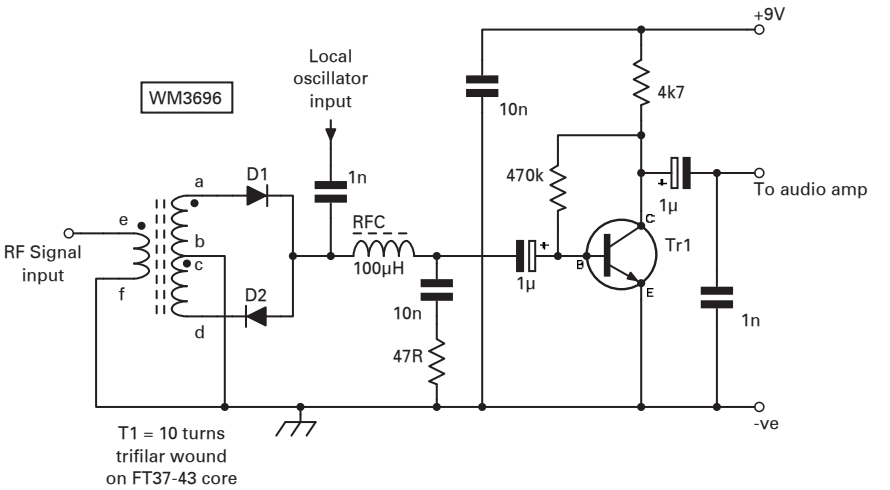
The TDA2822 Chip

A small printed circuit board (p.c.b.) held the stereo amplifier based on the TDA2822 audio integrated circuit (i.c.) chip. The TDA2822 is a relatively common audio amplifier chip capable of about 1W of output from each channel when powered by 12V. The pound shop amplifier is powered by 3V from two AAA cell batteries. Data sheets suggest this would probably produce about 250mW output from each channel.

Johnny and I agreed that he had good value for his Pound! So much so that I visited the Pound shop later and bought two of the amplifier systems. One to pull apart for the small speakers and amplifier and the other to use for "something".

As regular readers of this column know, I enjoy 'electronic doodling' – taking a few parts, some circuit ideas and enjoying an evening of soldering. So I set myself the challenge of converting the amplified speaker into an Amateur Radio project in an evening.

Readers may not be able to find the same bargain – but there are plenty of other amplified loudspeakers to be found at very low prices. Gathering together circuitry that I have used before, I managed, in one (long) evening session, to produce a simple



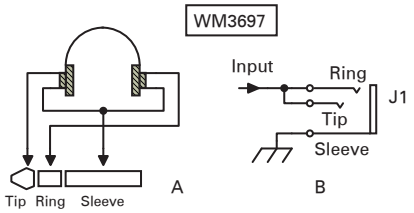


Fig. 1: The Quick Receiver circuit used by George G3RJV and how to wire up stereo headphones to the mono output.

direct conversion (DC) receiver to monitor the QRP calling frequency on the 7MHz (40m) band.

Special Purpose Receiver

In the G QRP Club's journal *Sprat* for autumn 1985, **Wes Hayward W7ZOI** described a *Special Purpose Receiver*. This was a very simple circuit using three transistors and a couple of diodes to form a singly balanced product detector and small audio amplifier. The idea being that this set up could form the basis of a simple receiver that would work at any frequency determined by a local oscillator.

I first built the circuit to monitor a single sideband (s.s.b.) signal at a frequency of 9MHz in a project I was building. At that time I was lacking a receiver that covered 9MHz but the *Special Purpose Receiver* unit with a 9MHz crystal oscillator enabled me to have a Special Purpose receiver dedicated to 9MHz. My version was even simpler than the one described by W7ZOI and I called it 'The Quick Receiver'.

I used only one stage of audio amplification after the product detector. It was designed to feed an external audio amplifier, making it a good choice for use with the pound shop amplifier. The circuit is shown in **Fig. 1**.

The diodes, D1 and D2, form the singly balanced product detector. The product detector is really a frequency mixer circuit with two inputs; the radio frequency (r.f.) input and a local oscillator signal. The output products from the mixer include the audible sidebands from the input signal; a classic direct conversion receiver.

The inductor T1 is a trifilliar wound transformer on an FT37-43 ferrite toroidal core. Winding this transformer does require some care and a little dexterity. The diagram, Fig., 1 shows that T1 is make up of three windings with a dot on the diagram indicating the start of each winding. A trifilliar winding consists of three wires twisted together and wound as if they were one wire.

Note: It's **vital** that the wires are connected exactly as shown in Fig. 1. The diagram in **Fig. 2** shows how T1 is made and how it's connected.

I used 32 s.w.g. enamelled wire for the winding and 10 turns are required and each time the three twisted wires go through the centre of the core counts as one turn. The diagram, Fig. 2, designates the three sections of the transformer as **a** to **b**, **c** to **d** and **e** to **f**. It's important to identify the correct ends of each wire as when the twisted wires are wound on the core, three wires will emerge from each end of the core.

The enamel coating must be scraped from the ends of the six wires and the exposed copper tinned with solder. If the wires are splayed out as shown in Fig. 2, a continuity tester (or a low resistance range on a multi-meter) can be used to identify the start and end of each winding. Position the wires so that **a** to **b**, **c** to **d** and **e** to **f** are aligned as shown. This will be a great help when connecting each wire to the appropriate place in the circuit.

The diodes D1 and D2 in Fig. 1 are used in a balanced configuration. Common silicon diodes such as the 1N914 or 1N4148 may be used but ideally a matched pair of diodes would give the best results. Diodes can be matched using the circuit in **Fig.3**, suggested by **Todd Gale VE7BPO** and others. It measures the forward voltage drop across the diode using a low voltage reading voltmeter.

Allow a few seconds for the diode to warm up before taking the reading. Naturally, diodes of the same type are more likely to match, as are the same type of diode from the same manufacturer. Schottky diodes, with their low voltage drop, will also give better results. Having said that, I have achieved good results in this circuit by using unmatched diodes of the same type.

After some simple r.f. de-coupling, the audio signal goes to a single stage pre-amplifier using a bipolar transistor Tr1. The transistor used for Tr1 can be almost any common small signal device. I used the 2N3904 because I have lots of them but the 2N2222 and many other transistors would do the job. The little Pound shop amplifier has a stereo input and the output from the audio pre-amplifier in Fig. 1 is a mono output.

Assuming that nothing complicated is happening at the input of the amplifier, it should be possible to connect the pre-amplifier output to both sides of the amplifier input. This means wiring up a stereo jack socket to put the pre-amplifier output into both channels of the amplifier.

The diagram in Fig. 1, shows the usual wiring for a stereo jack plug. I've shown the stereo jack plug connections to stereo headphones as this is a simple illustration of what's connected to what on a stereo jack. From there, we can work out how to wire a stereo socket to

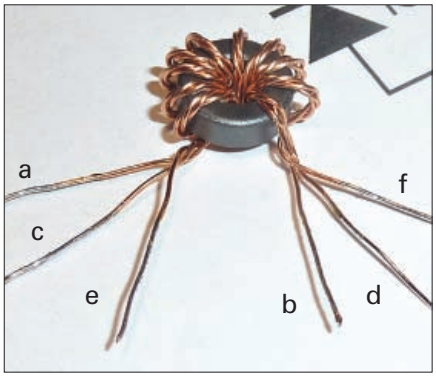


Fig. 2: The winding details of transformer T1.

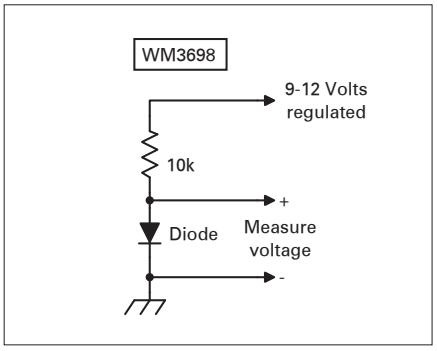


Fig. 3: A diode matching circuit suggested by Todd Gale VE7BPO.

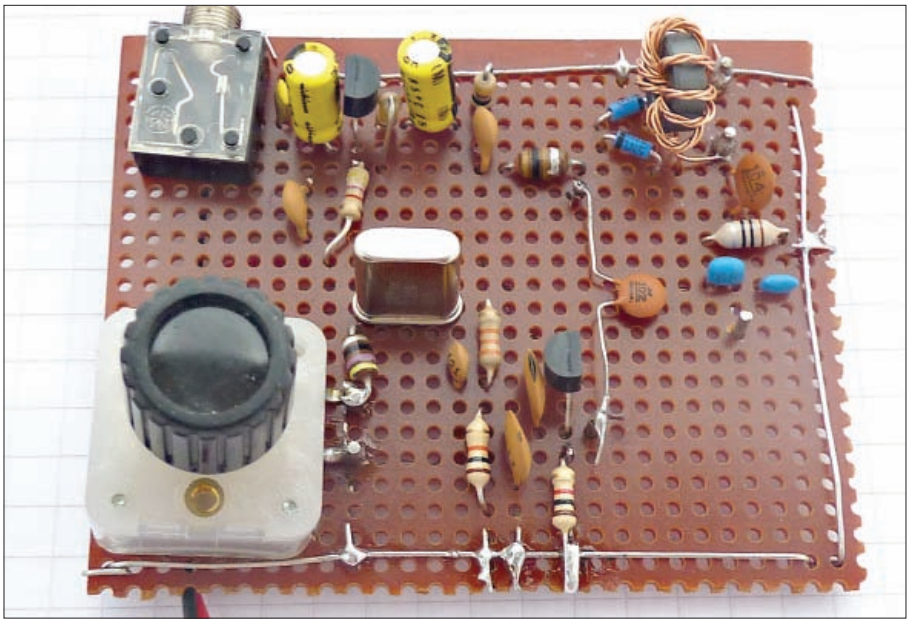


Fig. 4: George used Perf-board for the Quick Receiver.

feed both inputs of the amplifier.

The ground goes to the 'sleeve' and the output of the pre-amplifier goes to both the 'tip' and the 'ring'. To identify the appropriate connections on the stereo jack socket, plug in the stereo jack plug and see which terminations go to the sleeve, ring and tip.

The Basic Receiver

I built the basic Quick Receiver on 70x60mm piece of perf-board as shown in the photograph. Perf-board is an insulated phenolic board with a matrix of holes spaced at 0.1in. Component leads are pushed through the holes in the board with interconnections on the underside in the manner of printed circuit board (p.c.b.) tracks.

Note: The 70mm by 60mm board just fits in the flat space on the front of the Pound shop amplified speakers.

The interconnections can be made using surplus lead lengths on the components or by adding tinned copper wire leads. I've used this construction method for many previous projects in *PW,* although in more recent times I have favoured the 'Manhattan' construction method using insulated pads.

The Quick Receiver arrangement is worth keeping as built. It can easily be converted into a rudimentary DC receiver at any chosen frequency. To test the receiver I used my signal generator as a local oscillator and connected an antenna to the r.f. signal input. Although the tuning rate of the oscillator was very coarse and I had no input tuned circuit at the antenna, I was able to hear stations on the 3.5 and 7MHz amateur bands by tuning the signal generator to the appropriate frequencies.

Handy Item

A simple receiver that can tune any frequency generated by an oscillator is quite a handy item of test equipment to detect signals. Note that the inputs can be changed around with the oscillator connected to T1. Depending on the oscillator source and the signal to be monitored this could be a better arrangement. So – we already have a useful board to have in the test equipment armoury…..built in one evening!

Later that evening I decided to add a local oscillator and some input tuning. The diagram, **Fig. 5**, shows a simple variable crystal oscillator (VXO) operating on 7.03MHz; the QRP calling frequency on the 40m band. This does require the use of a fundamental crystal on 7.030MHz but there are several

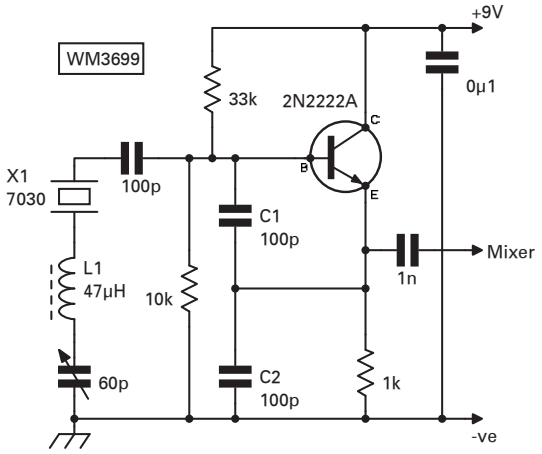


Fig. 5: A simple VXO circuit that can be used with the Quick Receiver.

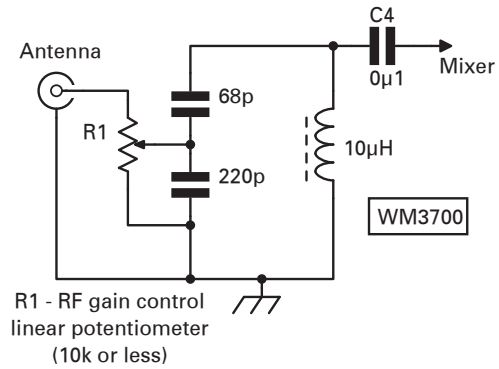


Fig. 6: A very basic antenna input circuit for G3RJV's Quick Receiver.

sources of fundamental crystals for the QRP calling frequencies.

I opted for a VXO rather than a variable frequency oscillator (v.f.o.) simply because it's easier to build and offers a more frequency stable signal, albeit with a limited range, without recourse to buffer amplifiers and rigid mechanical construction. The oscillator will tune a few kHz either side of the crystal frequency. The variable capacitor, a 60pF polyvaricon type, can move the frequency higher and the inductor, L1, moves it lower. The inductor, L1, is commercial moulded radial inductor with a value of 47µH (microHenries). The values given are for 7MHz but **Table 1** suggests values for three Amateur bands.

Antenna Input

To complete the receiver, I've shown a very basic antenna input circuit in **Fig. 6**. This is a real minimalist approach to input tuning. A 10µH moulded inductor provides a single tuned circuit with 68pF and 220pF series connected capacitors. The series capacitors drop the input impedance to give a better match for most types of antenna input available in Amateur Radio stations.

Table 1

Band	L1	C1/C2
3.5MHz	100µH	220pF
7MHz	47H	100pF
14MHz	15H	47pF

The potentiometer, R1, acts as an r.f. gain control. It's a linear track potentiometer and a 1kΩ linear potentiometer would work well here – but they are difficult to find so I used a 10kΩ pot. Any value in the 1 to 10kΩ range will do the job. All the gain in this simple receiver comes from the audio stages and there is advantage in retaining full audio gain and using an r.f. gain control to achieve the desired signal level.

Some attenuation at the input of a receiver also helps to reduce cross modulation and broadcast breakthrough. Rather oddly, in spite of its simplicity, this little circuit really did help on the 7MHz band with many powerful broadcast stations lurking in the wings.

I certainly can't claim that this is the best receiver I have ever built. But it does work and it was built in very little time – and used the Pound shop amplifier! If nothing else, it's worth building the basic Quick Receiver board as something to place on a workshop shelf until its time comes as a useful little board. ●

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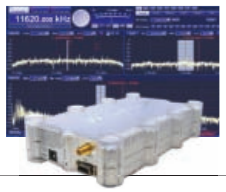

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Ben Nock G4BXD's Valve & Vintage
62 Cobden Street Kidderminster Worcestershire DY11 6RP
E-mail: military1944@aol.com

Boxes of Surprises for Ben!

Ben Nock G4BXD has been busy moving home in the last few months and – as he and YL Gloria have been settling in – they've had a few surprises!

A very big welcome to *Valve & Vintage* (*V&V*) and a happy New Year from the 'Kidderminster Kollection'. I'm well into the laying out of the collection in its new home and I have amazed myself at the number of items I have managed to pack away into cardboard boxes over the years!

It's been a great delight opening some of the boxes and finding long forgotten treasures, even simple things like microphones for a particular set, or the right headphones for another. It will take quite some time though before all the boxes are opened and the parts reunited with their correct sets.

German 28 & 50MHz Transceiver

One of the boxes I recently opened had a German-made transceiver in it, which I had obtained quite some time ago but which had been packed up for transit.

The SEM-35 man-pack, **Fig. 1,** is a solid state set covering 26 to 69.95MHz in 50kHz steps.

The large frequency steps do mean the set is not that versatile, but it still can be used on the 28 and 50MHz (10 and 6m bands). The set is frequency modulated (f.m.) with a power output of 150mW or 1W.

The SEM-35 is a back-pack radio but it can be fitted into a carrier and used in vehicles, drawing power from the vehicle battery and using an automatic antenna tuner unit (a.a.t.u.) and vehicle mounted whip. In the back-pack role there are two antennas, a long sectional whip for the lower frequencies and a tape measure type blade for the higher frequencies.

The receiver section of the set is double conversion, the first intermediate frequency (i.f.) is 11.5MHz and the second i.f. is 470kHz. There are two 'front ends' in the set, each with its permeability tuned circuits.

Fig. 1: The SEM-35 transceiver, simple clean lines and controls.

The tuned circuits are selected by the range knob and the antenna mounting has a clever feature. The long whip is switched to the low band tuner while the blade (if used) is switched to the higher band tuner. If no whip is fitted the input is directed to a front mounted BNC socket.

When I purchased the set it was under the (in)famous 'Yes, it's working fine' promise. Needless to say, when I tried the set there was no transmitted audio, the carbon microphone insert was well past its 'use by' date.

The insert in the H-33F/PT handset is very small, maybe an inch across, so finding a replacement would be difficult. As I contemplated what to do I recalled a trick I used when modifying modern Airlite headsets for use in the small aircraft I used to fly.

The radios in the light aircraft used carbon microphones so on the newer headsets I used a small piece of Veroboard with an Electret insert, one transistor, two resistors and a capacitor to provide a carbon insert replacement. Luckily, transmitters using a carbon insert provide a voltage which is supplied across the insert and measuring that voltage in the SEM-35 handset – I found it was about 5V, more than enough to power the little amplifier, **Fig. 2**.

Having built the small unit on the Veroboard strip, the handset fortunately had a suitable space in the bottom in which to place the board, **Fig. 3**. This allowed me to screw the outer cover back onto the handset and restore modulation to the transmitter.

While the basic circuit does work I feel I can do better – so I'll be trying an improved circuit shortly and present you the details of my trials in a future edition. The SEM-35 is simple to use and at least covers two of the Amateur bands but I must say that the power-to-weight ratio of the set is very poor. So in my opinion it's not a set you should go out of your way, or pocket, to obtain, unless you're specifically looking for one.

Direction Finding

In another box I found an interesting little direction finding, or DF loop antenna. The unit, an AT-339/PRC was intended to be used with the American

PRC8-9-10 radios on a frequency of 36 to 55MHz. The unit, **Fig. 4**, has a folding antenna section that is opened out and the end of one leg plugs into the end of the other leg to form the loop.

The controls of the loop, **Fig. 5**, consist of **Tuning**, **Sense** or **Normal** and an **Attenuator**. In use, the loop is tuned to the required frequency in the normal mode. The loop is then rotated to get a deep null on the station being received.

The null gives the direction of the transmitter but – because this is parallel to the loop this direction can be either forward or to the rear of the loop. The switch is then placed in the sense position and by rotating a quarter turn either way the position of the transmitter can be determined as being in front or behind the loop.

Once the general direction of the station is found the operator could 'home' in on it by careful rotation of the loop, using the attenuator to reduce signal strength as required. Though it was produced to go with the PRC8 to 10 sets, the loop can be used on any set with a BNC connector, such as the SEM-35 and by using this system I now know the location of a local baby monitor on 49MHz!

Displaying Heavy Equipment

Back to the display problems next. As many of you will know there's one really evident drawback with military sets – well two drawbacks really...the size and weight! Many sets are 20kg, or more in weight while being three or four times the size of a modern 'plastic' radio. So, when you are trying to display several sets you can be looking at a mass of over 100kg and a bench or shelf of 2–3m long.

I noticed I had several receivers designed for rack mounting, which have metal plates or an extra wide front plate with holes or notches down the edge. I thought it would be ideal to replace a 3m long bench with a floor space of just 508 x 508mm or so. Luckily, I noticed some racking being advertised fairly locally and there was a nice unit some 1.8m tall. With another bit of luck it just went in the back of our car with the rear seats down!

The rack needed a good clean, a rub down with a wire brush and a coat of paint, green of course! I then installed the rack in one corner squeezed in between the wall and the WS53 transmitter and proceeded to 'populate' the rack with the suitable receivers.

Lifting the heavy sets into the rack and fixing the bolts was easy at the bottom but got progressively harder the

Fig. 2: The Electret replacement amplifier (right) built by Ben G4BXD using Veroboard.

Fig. 3: The H-33F/PF handset showing the space for the microphone.

Fig. 4: The hand-held loop antenna – with it, Ben located a nearby baby alarm on 49MHz!

higher up I went. Adjustable straps are a great help in holding up the rear of the set so the bottom bolts can be inserted at the front. The rack, **Fig. 6**, worked very well and soon I had six quite heavy sets installed with just the minimum of floor space used.

Starting at the bottom of Fig. 6, there's the CZC-46209, part of the American made RCH equipment for shore or marine installation, tuning 80-560kHz and 1.9-24MHz, also known as AN/SRR-3 Radio receiving set, 11 valves, 533 x 533mm (21 x 21 x 14in, and 48kg (106lb). I have yet to restore this set. Above it is the National NC-240S receiver, with 12 valves, covering 49kHz to 30MHz and a mere 27kg (60lb) in weight.

Next is an old favourite, the National HRO-M 9-valved receiver, famed for its plug-in coil packs, giving a great tuning range of 50kHz to 30MHz and the odd tuning dial where you have to read off a chart on each coil pack to see what frequency your receiving on. There's a great web site for the HRO: **www.radioblvd.com/National%20HRO.htm** with loads of great information.

Above the HRO I mounted my SP-600-JX-14, or rather the R-542 military version of this nice Hammarlund double conversion 540kHz to 54MHz receiver. Above that is the very well known RA-17 by Racal, another 30kg, and finally another Racal, the RA-1772 receiver. I have another rack mountable set, an Australian AR-7 but annoyingly the gap left in the rack was about 10mm too small to fit it in!

I wanted to be able to turn on a set so visitors could tune around. I felt the valved sets would take too long to warm up so the I plugged the RA-1772 into the mains and connected a short length of wire, maybe 2m long, to the antenna socket. I turned on the set and tuned around 14MHz and was flabbergasted to hear a ZL2 station booming out of the speaker, loud and clear. I think I shall be removing my main 40m long doublet and replacing it with a short length of wire draped down the back of the radiator to work the DX!

And Finally

Well readers, that's about it for this stint at 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** and more pictures of the progress in the museum layout in the 'Museum status' page. As always I can be contacted by E-mail, but now at my new E-mail address **ben@radiomuseum.plus.com** Cheerio for now and a belated happy New Year! ●

Fig. 5: Close-up view of the controls of the hand-held loop.

Fig. 6: The Receiver rack at the re-located and newly-commissioned 'Kidderminster Kollection'.

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Rallies

Radio rallies are held throughout the UK. They're hard work to organise so visit one soon and support your clubs and organisations. PW Publishing Ltd. is attending at rallies marked *. Please check with the organisers that the rally is 'on' before leaving home.

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

JANUARY 2012

January 15th
The Dover Rally
The eighth Dover Amateur Radio Club Rally will be held at the Whitfield Village Hall, Sandwich Road, Whitfield, Dover CT16 3LY. The doors will open between 9.30am and 1.00pm and admission will cost £1.50. There will be talk-in via GB3KS, trade stands, a Bring & Buy and catering.
Ian Keyser G3ROO
Tel: 01304 821588
www.doverradiorally.com

January 15th
The Red Rose Radio Rally
The Red Rose Winter Radio Rally will be held at the George H Carnall Leisure Centre, Kingsway Park M41 7FJ (M60 junction 9, opposite the Trafford Centre). The doors will be open from 11.00am to 3.00pm. There will be free car parking, trade stands, a Bring & Buy, special interest groups, an RSGB bookstall, catering, licensed bar and facilities for the disabled.
Steve
Tel: 07502 295141
www.wmrc.org.uk/carnall.htm

January 29th
The Horncastle Winter Rally
The Horncastle Winter Rally will be held at the Horncastle Youth Centre, Willow Road, Cagthorpe, Horncastle, Lincolnshire LN9 6DZ. The doors will open at 10.30am and admission will cost £1.50. There will be free car parking, catering and facilities for the disabled. Tables cost £5.00 and power will be free.
Tony G3ZPU
Tel: 01507 527835
E-mail: G3ZPU@yahoo.co.uk

FEBRUARY

February 5th
The Canvey Rally
The 27th Canvey Radio and Electronics Rally will be held at the Paddocks Community Centre, Long Road, Canvey Island, Essex SS8 0JA (the southern end of A130). The doors will open at 10.30am and there will be free parking, trade stands, catering and facilities for the disabled.
Dave G4UVJ
Tel: 01268 697978 (evenings)
E-mail: rally@southessex-ars.co.uk
www.southessex-ars.co.uk

February 5th
The RadioActive Show
The Mid Cheshire Amateur Radio Society will be hosting the RadioActive Show at the Civic Hall, Nantwich, Cheshire CW5 5DG. The doors will open at 10.30am and admission will cost £3.00. There will be car parking (50 pence for the whole day), trade stands, a Bring & Buy, exhibitors tables and catering.
Simon Chettle G8ATB
Tel: 01270 841506
www.midcars.org

February 10th/12th
The Orlando Hamcation®
The Orlando Hamcation® and Computer Show will held at the Central Florida Fairgrounds, 4603 West Colonial Drive, Orlando, Florida 32808. The doors will be open between noon and 6.00pm on Friday, 9.00am to 5.00pm on Saturday and 9.00am to 2.00pm on Sunday. There will be free car parking, talk-in, trade stands, a flea market, a car boot sale, lectures, special interest groups, family attractions and a prize draw.
E-mail: info@hamcation.com
www.hamcation.com

February 12th
The Harwell Rally
The Harwell Radio and Electronics Rally will be held at the Didcot Leisure Centre, Mereland Road, Didcot OX11 8AY. The doors will open at 10.30am (10.15am for the disabled) and admission will cost £2.50 (under 12s are free). There will be talk-in on S22 (V44), free car parking, trade stands, a flea market, special interest groups, catering, a licensed bar and facilities for the disabled.
Ann G8NVI
Tel: 01235 816379
E-mail: ann.stevens@btinternet.com
www.g3pia.org.uk

February 12th
The Northern Cross Rally
The Northern Cross Rally, organised in association with the Wakefield and District Radio Society, will be held at the Thornes Park Athletic Stadium, Horbury Road, Wakefield, WF2 8TY. The doors will open at 10.30am (10.15am for the disabled) and admission will cost £3.00. There will be free car parking, trade stands, a Bring & Buy (booking-in from 10.15am), catering and facilities for the disabled. In addition, there will be a miniature steam railway in the afternoon (weather permitting).
Ken 2E0SSQ
Tel: 07900 563117 (before 8.00pm please)
E-mail: 2e0ssq@wdrs.org.uk
www.northerncrossrally.com

February 26th
The Rainham Radio Rally
The Rainham Radio Rally will be held at Rainham School for Girls, Derwent Way, Rainham, Kent ME8 0BX. The doors will open at 10.00am. There will be talk-in and catering will be available.
Trevor G6YLW
Tel: 07717 678795
E-mail: trev@wig1.co.uk

February 26th
The Swansea Rally
The Swansea Amateur Radio Society Rally will be held at the Court Herbert Sports Centre, Neath Abbey, Neath, SA10 7BE. The doors will open at 10.30am and admission will cost £2.00. There will be free car parking, trade stands, a Bring & Buy, special interest groups and catering will be available.
Roger GW4HSH
Tel: 01792 404422
www.radioclubs.net/swanseaars

MARCH

March 4th
The Cambridge Radio Rally
The Cambridge and District Amateur Radio Club Rally will be held at the Wood Green, King's Bush Farm, London Road, Godmanchester, Cambridgeshire PE29 2NH. The doors will open at 10.00am and admission will cost £3.00. There will be talk-in on S22, trade stands, a Bring & Buy, special interest groups, family attractions, catering, licensed bar and facilities for the disabled.
John G0GKP
Tel: 01954 200072
E-mail: j.bonner@ntlworld.com
www.cdarc.co.uk

March 4th
The Exeter Radio
The Exeter Radio and Electronics Rally will be held at the America Hall, De La Rue Way, Pinhoe, Exeter EX4 8PW. The doors will open at 10.30am (10.15am for the disabled) and admission will cost £2.00. There will be trade stands, a Bring & Buy and catering will be available.
Pete G3ZVI
Tel: 07714 198374
E-mail: g3zvi@yahoo.co.uk

March 10th
The National Radio Flea Market
The Foundation Amateur Radio Club Bossche (BRAC) will be hosting the Dutch National Radio Flea Market at the Autotron Rosmalen, Graafsebaan 133, Rosmalen 5248, The Netherlands. The doors will open at 9.00am and admission will cost

€7.00. There will be talk-in on S20 (V40), trade stands, a flea market, special interest groups and catering will be available.
E-mail: info@radiovlooienmarkt.nl
www.radiovlooienmarkt.nl

March 11th
The Wythall Rally
The Wythall Radio Club Radio and Computer Rally will be held at the Woodrush Sports Centre, Shawhurst Lane, Hollywood, Nr. Wythall, Birmingham B47 5JW. The doors will be open between 10.00am and 3.00pm and admission will cost £2.50. There will be talk-in on S22 (V44), car parking, trade stands, a Bring & Buy and catering will be available.
Chris G0EYO
Tel: 07710 412819
E-mail:
g0eyo@blueyonder.co.uk
www.wrcrally.co.uk

March 25th
The Spring Hangar Sale
The Spring Militaria, Electronics and Radio Amateur Hangar Sale will be held at the Hack Green Secret Nuclear Bunker, Nantwich, Cheshire CW5 8AL. The doors will open at 10.00am and admission will be £2.50. There will be civil, military and vintage radio equipment plus vehicle spares and more.
Rod Siebert
Tel: 01270 623353
E-mail: coldwatr@hackgreen.co.uk
www.hackgreen.co.uk

APRIL

April 1st
The South Gloucestershire Radio Rally
The South Gloucestershire Amateur Radio Rally will be held at the Scout Activity Centre, Woodhouse Park, Almondsbury, Bristol BS32 4LX. The doors will open at 10.00am. There will be talk-in on S22 (V44), car parking, a Bring & Buy, a car boot sale, catering and facilities for the disabled.
Stan Goodwin G0RYM
Tel: 07833 517370
E-mail:
SouthGlosRadioRallyCoordinator@gmail.com
www.southglosradiorally.org.uk

April 1st
The Lough Erne Rally
The Lough Erne Amateur Radio Club will host the Enniskillen Amateur Radio Show at The Share Holiday Village, Smith's Strand, Lisnaskea, Co. Fermanagh BT92 0EQ. The venue is on the shores of Upper Lough Erne and can be accessed via the Shannon-Erne Waterway. The doors open at 11.30am and there will be car parking, trade stands, a Bring & Buy, catering, a licenced bar and facilities for the disabled.
Iain
Tel: 02866 326693
E-mail: iain@learc.eu
www.loughernerradioclub.co.uk

April 15th
The Norbreck Rally*
The 50th Northern Amateur Radio Societies Association Exhibition (formerly known as the Blackpool Rally) will be held at the Norbreck Castle Hotel Exhibition Centre, on Queens Promenade, North Shore, Blackpool FY2 9AA. The doors will open at 11.00am (10.45am for the disabled) and admission will cost £5.00 (under 14s are free). There will be talk-in, car parking, trade stands, a Bring & Buy, special interest groups, a licensed bar, catering and facilities for the disabled.
Dave M0OBW
Tel: 01270 761608
E-mail:
dwilson@btinternet.com
www.narsa.org.uk

April 15th
The Cambridge Rally
The Cambridgeshire Repeater Group Rally will be held at the Foxton Village Hall, Hardman Road, Foxton, Cambridge CB22 6RN. The doors open at 10.00am (7.00am for traders) and admission will cost £2.00. There will be talk-in on S22, trade stands, a Bring & Buy, catering and facilities for the disabled.
Lawrence M0LCM
Tel: 01223 711840
E-mail: rally2012@cambridgerepeaters.net
www.cambridgerepeaters.net

April 22nd
The Yeovil QRP Convention
The 28th Yeovil QRP Convention will be held at the Digby Hall, Hound Street, Sherborne, Dorset DT9 3AA (adjoining the central shopping car park). The doors open at 9.30am and there will be talk-in on S22, car parking, trade stands, a Bring & Buy, lectures, catering and facilities for the disabled.
Derek M0WOB
Tel: 01935 414452
E-mail: yarc-contact@tiscali.co.uk

MAY

May 6th
The Dambusters Rally
The Dambusters Radio Rally will be held at the Thorpe Camp Visitor Centre, Tattershal Thorpe, Nr. Coningsby, Lincolnshire LN4 4PE. The doors open at 10.00am and admission will cost £3.00 (under 12s are free). There will be talk-in on S22 (GB3FR), free car parking, trade stands (pitches will be free but their size will be limited if they are not pre-booked), a car boot sale and catering will be available. In addition, there is an RAF Heritage Centre on site.
E-mail: tcrm@hotmail.co.uk
www.qsl.net/gb4tcm/dambusters.html

May 7th
The Dartmoor Rally
The Dartmoor Radio Club Rally will be held at Tavistock College, Crowndale Road, Tavistock, Devon PL19 8DD. The doors will open at 10.30am (10.15am for the disabled) and admission will cost £2.00. There will be free car parking, trade stands, a Bring & Buy, special interest groups, catering and facilities for the disabled. **Viv**
Tel: 01752 823427
E-mail: vivwatsondrc@aol.com

May 18th/20th
The Dayton Hamvention®
The Dayton Hamvention® will be held at the Hara Arena, 1001 Shiloh Springs Road. Dayton, Ohio, 45415 USA. A three-day pass costs purchased in advance costs $20 or $25 on the door. There will be free parking behind the Salem Mall, trade stands, a flea market, a car boot sale, lectures, special interest groups, a prize draw, catering and facilities for the disabled.
www.hamvention.org

JUNE

June 2nd
Mini Ham Radio Convention
The Central Scotland Mini Ham Radio Convention will be held at Crofthead Farm Community Education Centre, Templar Rise, Livingston EH54 6DG. The doors will open at 10.00am (9.50am for the disabled). There will be trade stands, a flea market, a Bring & Buy, lectures, an RSGB bookstall, a prize draw and catering will be available.
http://uk.groups.yahoo.com/group/cshrc

June 3rd
The Spalding Rally
The Spalding and District Amateur Radio Society Annual Rally will be held at the Sir John Gleed Technology School, Halmer Gardens, Spalding, Lincolnshire PE11 2EF. The doors will open at 10.00am. There will be free car parking, trade stands, a car boot sale and catering will be available.
John G4NBR
Tel: 07946 302815
E-mail: rally-secretary@sdars.org.uk
www.sdars.org.uk

June 17th
The Newbury Rally
The 25th Newbury Radio Rally and Boot Sale will be held at the Newbury Showground, Priors Court, Hermitage, Thatcham, Berkshire RG18 9QZ (next to M4 J13). The gates will open at 9.00am and admission will cost £2.00. There will be talk-in on S22 (V44), free car parking, trade stands, a big display area with amateur radio stations, exhibitions and special interest groups, a flea market, catering and facilities for the disabled. Sellers will have access to the site from 8.00am and pitches will cost £10.
E-mail:
rally@nadars.org.uk
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Beacons and Bands

Tim Kirby G4VXE has more reports of lower v.h.f. band transmissions from the USA – and rounds off with your regular reports in his regular *World of VHF* column.

I'm pleased you've turned to the *World of VHF* (*WoVHF*) pages to join in the fun above 30MHz – you're very welcome! We start off this time with some more interesting feed-back from **Richard Gosnell G4MUF** in Royal Wootton Bassett, Wiltshire, who has been listening for the GB3RAL beacons on 40, 50, 60 and 70MHz. The GB3RAL beacon – located at Harwell, near Didcot – has a signal on 40.050, 50.050, 60.050 and 70.050MHz. Richard couldn't hear them and asked if I could check they were on air (they are!).

However, my recollection is that the beacon antennas are vertically polarised, so they may not be ideal for monitoring on tropo/ground wave. Despite this, for those of you reading the column from outside the UK. it may well be worth scanning these frequencies if you can when the maximum usable frequency (m.u.f) is high in this direction to find out if you can hear them.

In last month's column, I mentioned that Richard had been hearing the New York Fire Department around 33MHz when conditions are good. He has been continuing to scan in this area. He has discovered that there are 30 channels; 33.420MHz to 33.980MHz in 20kHz steps. Richard found that listening over the course of a few days nearly all the channels are still in use.

Based on the time zone that the stations were in, Richard surmises that they were all based on the East Coast, being GMT-5 hours. However, it's probably safe to assume that there are other users of these channels further west and hopefully these will be heard when F2 conditions improve still further.

Although these frequencies are not in the Amateur bands, they give a useful indication of the m.u.f and conditions in general, which may be advantageous for looking for 50MHz openings. In particular **Jim Rabbitts GM8LFB** (Wick, Caithness in Scotland) says that he looks forward to the Solar Flux going above 200 – which is a useful (although not exact) milestone of when 50MHz F2 propagation will take place.

More On CTCSS

David Perry G4YVM (Salisbury, Wiltshire) wrote for the first time to say, *"I'm writing to say that I think the introduction of the CTCSS codes for repeater access did nothing but harm to these devices in my humble opinion. I was first licenced as G8YJI back in about 1980 and used to use repeaters a lot with my then modest couple of watts (later, with the addition of a VB power amp, a blistering 10W!) and a quarter wave antenna stuck to a radiator.*

"The ability to whistle up more than one – BM and MP shared a frequency, if memory serves – was both useful and exciting but never, ever a problem. Even listening to a repeater being inadvertently accessed was never a problem: the locals could always over ride the weak signal if they needed to and the 'foreign' callsign was often welcome interest.

"Now even driving around the country and working repeaters is harder to do as unless the code is known I can't access and even if I know the tone code I can't enter it easily whilst driving. All in all quite unsatisfactory in my opinion."

Thanks for you E-mail David! Certainly I can echo David's thoughts about having to set the tone whilst you're driving! You really can't do it safely while on the move, thus it's generally difficult to call in on a repeater which you just hear 'out of the blue'. Having said that, I normally try a call through without CTCSS and sometimes this is successful.

David concludes by saying, *"Maybe it's just me, but I can only see the negative side to CTCSS and no positives whatsoever. I long for the times when a simple tone burst or, that beautiful phrase, 'glissando whistle', would open up a new and previously hidden world!"*

New Reader & APRS

Jerry Taylor KD0BIK (Denver, Colorado in the USA) is a new subscriber to *Practical Wireless* – welcome Jerry! He's put together an excellent APRS mobile set-up which is very similar to the functionality described in the recent AvMap Geosat 6 review. Jerry uses a Garmin Nuvi 350 GPS along with an Argent Data Systems Tracker 2 (OT2m) interfaced to his Yaesu 144MHz mobile rig.

Using this set-up, Jerry can send his position data to the APRS network, but equally he can see APRS beacons

An idyllic location for a DXpedition, on the beach at Kiritimati, just 1°N of the equator in the Pacific ocean.
Picture courtesy of Michael DG1CMZ

displayed on his GPS display. What's also nice is that any APRS messages sent to Jerry, at KD0BIK-9 will be displayed on his GPS screen (Go on!....I encourage you, If you're on APRS, send Jerry a message now, to say you read about his system!).

Incidentally, Jerry is the presenter and producer of the enormously successful *Practical Amateur Radio* podcast which you may well find of interest. You can find Jerry's podcasts on iTunes or through **http://myamateurradio.com**

The 50MHz Band

Ronald Pincho ZB2B (Gibraltar) has still been finding the occasional TEP opening to South America and worked a small pile-up of stations on November 10th around 2200z. Stations worked were PY2XB (GG60), PY5XX (GG53), PY5HOT (GG46), PY2SRB (GG48), PY2OI (GG66), LU5FF (FF99), PU1KGG (GG87) and 6V7Q (IK14). Ronald was using his new Ranger 5054 DX-100 rig, running 50W. He says the rig performs well and he is delighted with it.

Mark Marment CT1FJC (Portugal) says that TEP to Africa is there most days, as it is into South America in the evening. The stations of 9L0W and EL2WS have been some of the most consistently active. Mark caught a brief Es opening to the Southern UK and France on November 5th, working G4ENZ (IO81), F4EJW (IN78), GW7SMV (IO81) and F6EOQ (IN78). The station of OA4TT (FH16) who was sorked later on November 5th in the South American TEP opening – was a new one for Mark. Other contacts of note were FY1FL on November 9th, Z24EA on November 11th and ZD8ZZ on November 17th.

It was good to talk to **Justin Snow G4TSH** (Twickenham, Middlesex) shortly after he returned from Kiritimati as part of the Five Star DXers Association DXpedition operating as T32C. A full discussion of their operation is more appropriate to **Carl GW0VSW**'s *HF Highlights*, however the team were active on 50MHz. Many readers will know that despite much planning and preparation, the container packed with the team's equipment and antennas failed to reach the island, so the team had to source and hand-carry all the equipment themselves.

One of the group's major sponsors, Yaesu, kindly came up with 10 Yaesu FT-450Ds that the team could use. Justin told me how well these rigs performed and had special praise for how well they had worked on 50MHz and that the receiver was particularly sensitive.

A little spartan as an operating position, but with such surroundings as was found on Christmas Island (Kiritimati) running T32C, who cares? Picture courtesy of Michael Zuerch DG1CMZ

Looking back from the beach to the antennas in front of the operations hut during the T32C DXpedition. Picture courtesy of Michael DG1CMZ

I asked **Michael Zuerch DG1CMZ** who was one of the main 50MHz operators, along with **Mike Chamberlain G3WPH** (Wargrave, Berkshire) for his impressions of 50MHz from T32. Mike writes, "*We made 103 terrestrial QSOs from Christmas Island, most of them with the USA. We had only one very good opening to the USA during the week of 50MHz operation. The QSOs were made across the southern states to Florida and the west coast up to Washington state.*

"The path to Hawaii was open more often. We had several short and weak openings towards South America, yielding contacts with Argentina, Paraguay and Brazil. Best DX was a PY2 at around 12500km. And FK8CP was worked twice. Our beacon was heard in JA and VK, but only weakly and for very short periods of time, so unfortunately, no QSOs were made to either of those countries.

*"Christmas Island is situated at 1° north, so literally it is **on** the equator. We felt that the TEP openings were shooting over our head. I never had the feeling that we were actually using TEP-propagation. I think it was more a combination F2 and Es.*

"Moonbounce was very successful considering that 50MHz was initially going to be abandoned after container loss. The tower and elevation gear was made from materials begged or borrowed locally. We completed with seven stations via the moon, including G8BCG and three other European stations. We copied more than 15 different stations via the moon.

"Our feeling was that we heard much better than we were heard. We probably missed the low loss coaxial cable and connectors together with the 3dB from the Yaesu Quadra amplifiers, which were all in the container. Unfortunately our one 50MHz amplifier blew up the day before the best moon conditions!

"So, we probably missed a couple of QSOs, since the QSO rate seemed to increase daily via the moon towards the optimum conditions around 23rd October. We copied three G stations; G8BCG, G4FUF and G4IGO. The QSO with G4FUF was almost complete and

we just missed the final RRR from him, but sadly we never received them after a c-Flare on the sun blacked out communication via the moon three quarters of the way through the QSO. A couple of hours later the amplifier failed during a South American session."

Really interesting, Michael and thank you too for the fascinating photos of the T32C 50MHz operation!

The 6M8GJ antenna at sunset, which comes early in the evening when you're on the equator. Picture courtesy of Michael DG1CMZ

The 70MHz Band

Bob White G0AGO (Harlow, Essex) has one of the Wouxun KG-UVD1PL dual band 70/144MHz rigs and has had a bit more success on 70MHz than I did during the period when I reviewed the rig! Bob found that he could operate through the MB7FM parrot repeater at Tring at a distance of approximately 51km (32 miles) while he was using the rig and the supplied whip antenna.

Bob says that the replayed signal is somewhat noisy but is readable. And, of course, in this situation, other stations may well be hearing Bob's transmission clearer as the return signal to Harlow will have twice the amount of noise on it.

Mike Hall M0MGH (Worksop, Nottinghamshire) has another suggestion regarding the whip antenna supplied with the rig. He says, *"I have the 70MHz rig and use the Comet SMA99 telescopic antenna. I attach it using a F/F SMA adapter and a tap washer to make it more mechanically sound with the radio. If you extend the antenna to its fullest you get a ¼ wave 4m antenna. For v.h.f use it should be set to about 500mm. There is a label on the antenna to tell you where to set it to.*

"On 70MHz it works a dream. I once sat in my shack (upstairs) and I could easily talk to ***Martin Fearn M0ZMF*** *in Retford, over a distance about 18km (11 miles). He said it sounded like I was on the base station."* Mike also recommends the use of the external handset microphone with the Wouxun as he feels it gives a superior tone.

Thanks to both Bob and Mike for their very useful feedback which I'm delighted to pass on.

The 144MHz Band

Here at **G4VXE** (Oxfordshire) the best contacts of the month were on the evening of November 26th. I saw a message on Twitter from **John Worsnop G4BAO** (Cambridgeshire) that the G3PYE club station had just worked F5ICN (JN03) over a distance of 1000km. I didn't really expect to be able to make a QSO, but popped up to the shack anyway.

To my surprise and pleasure, I could hear F5ICN at around 5/3 working one of my local friends, **Neil Whiting G4BRK**. Once Neil had finished, I called F5ICN and was delighted to exchange reports. Later on in the evening, I also worked F6GNJ (JN08). As usual, there have been a few relatively local openings over the month, with a variety of repeaters logged which I don't normally hear: November 9th GB3SR (Brighton), GB3VT (Stoke on Trent); November 15th GB3HS (Humberside), GB3SR (Brighton), GB3BB (Brecon Beacons), GB3HH (Buxton) , November 19th GB3DA (Danbury). GB3MH (West Sussex) and November 20th GB3CO (Corby) and GB3SH (Southampton).

Gavin Nesbitt M1BXF (Trumpington, Cambridgeshire) made some interesting tropo QSOs through the month. Best DX during a session on November 10th was OZ1HXM at over 700km, with ON5NY, DL1EJG, PA0BUS and F0FIG all worked outside the UK. Gavin notes that this was the same evening that **John Regnault G4SWX (**Woodbridge, Suffolk) was working into the St Petersburg area of Russia (UA1).

Gavin told me that most of the stations that John worked were **just** perceptible in his receiver, but Gavin is 90km inland from G4SWX. It's amazing the difference that a sea path will make. On November 12th Gavin had a fair few QSOs into mainland Europe, mostly East and North East at distances of around 500km. On November 26/27th Gavin caught the opening to the South of France with F1EIT, F5ICN and F4CWN all worked at distances over 900km.

Peter Goodhall 2E0SQL (Oxford, Oxfordshire) enjoyed the RSGB UK Activity Contest and worked F8BRK (IN99), M0MCV (JO01), G0MBA (JO01), G4IRC (JO02) and G3PYE/P (JO02).

The 432MHz Band

Jonathan Kempster M5AEO (East London) continues to monitor the f.m. repeater section of the bands and like me finds the propagation changes daily. The GB3HR repeater in Harrow can vary between S1 and S2 up to S8. Jon wonders how this can be over such a short path. He wonders if it can be caused by leaves on trees or weather?

Certainly I find wet leaves are particularly 'absorbent' to r.f. at 433MHz. There are parts of my commute where I struggle to access GB3TD on 433MHz when it has been raining whereas the path is better on a dry day.

Gavin Nesbitt M1BXF and **Peter Goodhall 2E0SQL** have been conducting some interesting experiments using the WSJT modes on 432MHz between them and have already noticed substantial Doppler shift caused by aircraft scatter – which is sufficient to prevent the software from decoding the signals.

Satellite Operation

Peter Goodhall 2E0SQL had another successful month. On AO-51 Peter worked RA3OW (KO91), PA3GAN (JO21), G4HBI (IO83), IZ4RYS/1 (JN44) and on SO-50 EI5EV (IO62) and UT1EQ (KO67). Peter says that at the time of writing AO-51 seems to be in trouble again and only operates in sunlight at reduced power. On VO-52 Peter worked DK5XD (JO53), DL5MCI (JO46) and on AO-7 many stations including ES5TR, UR5BFX (KN29), UA9CS (MO06) and G1WPR (IO92).

That's It!

Well, a busy column this month and that's it for this time. Keep the E-mails coming in – I really enjoy hearing from you all. Happy New Year. Tim G4VXE. ●

Carl Mason GW0VSW's HF Highlights
2 Golwg-y-Bryn, Woodland Road, Skewen, Neath, Port Talbot SA10 6SP
Tel: (01792) 380822
E-mail: gw0vsw@btinternet.com

Radio And Rails

Carl Mason GW0VSW says there's a railway theme to start his *HF Highlights* column this month and it's also bursting with your reports! All reports to Carl by the 15th of the month please!

Welcome to *HF Highlights* (*HFH*) and I begin this month with a railway theme and news of a special event (I was tempted to put 'station' in here). It's to be run through out the year by **Mark Proctor G1PIE**, his XYL **Pam 2E1HQY** and father **Jack G0FQN** who live in Preston, Lancashire.

The callsign **GB50WVR** will be aired for the first time on February 10th to celebrate 50 years of the **Keighley & Worth Valley Railway Preservation Society www.kwvr.co.uk/** which is based at Haworth, West Yorkshire.

The society was formed in 1962 to preserve the branch line, which had been closed by British Railways in 1961. The line is about 8km (5 miles) long served the mills and villages in the Worth Valley and is now a heritage railway line running from Keighley to Oxenhope. It connects to the national rail network line at Keighley railway station and is currently one of only two heritage railways that operate a whole branch line in its original form. The other being the Ecclesbourne Valley Railway in Derbyshire.

Pam 2E1HQY will be acting as the QSL manager for this and two other calls, **GB4WLR** for the **West Lancashire Light Railway** and **GB4SCL** for the **Settle & Carlisle** line on air for Her Majesty Queen Elizabeth's Diamond Jubilee trains on June 6th. The team look forward to working as many *PW* readers as possible during the year and some rather nice QSL cards will be available if you do.

Mark is also a keen member of the **British Railways ARS** and details of this can be found at **www.brars.info/** Membership of the society is open to employees of British railway companies and railway enthusiasts anywhere who have an interest in any aspect of Amateur Radio. The BRARS Secretary is *PW* regular **Colin Topping GM6HGW**.

Jack G0FQN and Pam 2E1HQY operating at an outside location for railway themed special event 'station' GB50WVR. Photo by Mark Proctor G1PIE, Pam's 'other half'.

The DX News

On to some DX news now and first to the Indian Ocean where **Bert Rojas CX3AN** and **Mario Decia CX4CR** will be active as **8Q7HU** from the Maldives (AS-013) from January 25th until February 5th. They plan to operate s.s.b., c.w. and digital modes on all h.f. bands and you can QSL via CX3AN.

The **Kafue National Park**, established in 1924 is the largest national park in Zambia and covers an area about the size of Wales in the UK. It's from here that **Niko Safaric S53A** will be active again as **9J3A** until November 30th 2012. His main activities will take place during the CQ WW CW Contest which runs over the weekend January 27-29th 2012, as either a SOSB on 28MHz or a SOAB entry, low power. The QSL is via S57S direct and the (preferred route) is through the bureau.

Japanese operator **Take JG8NQJ** will be active again as **JG8NQJ/JD1** from Minamitorishima or Marcus Island OC-073 an isolated Japanese coral atoll in the northwestern Pacific Ocean until mid-March this year. Activity can be expected on most h.f. bands and the QSL route is via the bureau or direct to JA8CJY.

A team of Amateurs will be active from Kiritimati or Christmas Island OC-024, a raised coral atoll in the Pacific Ocean in the northern Line Islands and part of the Republic of Kiribati between the January 17th and February 2nd. The team will be using the following callsigns, AC8W will be **T32WW**, K8AQM - **T32TR**, KB8TXZ - **T32TX** and KG8CO - **T32CO** all QSL'd via KB8TXZ with N8LJ - **T32LJ** QSL via K8ESQ and VO1AU - **T32AU** QSL via VO1MX.

The six team members will all operate s.s.b. and c.w. while T32WW and T32CO will operate some RTTY and PSK on all the h.f. bands. The team will also have a group effort in the CQ WW 160m CW Contest as **T32XX** QSL via KB8TXZ. You may recall that during the Cold War nuclear tests were

conducted in the region by the United Kingdom in the late 1950s and then by the United States in 1962.

During these tests the Islanders were not evacuated and subsequently British, New Zealand and Fijian servicemen and local Islanders have claimed to have suffered from exposure to radiation from these blasts. The entire island is now a wildlife sanctuary and access to some parts of the Island is restricted. As well as its flora and fauna it is well known for its excellent bird watching and there is also excellent Bonefish fishing (Bonefish are considered to be among the world's premier 'fly' game fish and highly sought after by anglers).

Your Reports

On to your reports now and the first is from **Eric Masters G0KRT** in Worcester Park, Surrey who used his Kenwood TS-570 at 100W. This was used with a modified W3EDP antenna, which was tuned with an SG-230 smart tuner on the 3.5MHz band working s.s.b. stations SP9GTK (Poland) 1716, OT5A (Belgium) 1724, OJ0X (Market Reef) EU-053 at 2103, TF3ZA (Iceland) EU-021 at 2109 and LN9Z (Norway) at 2123UTC.

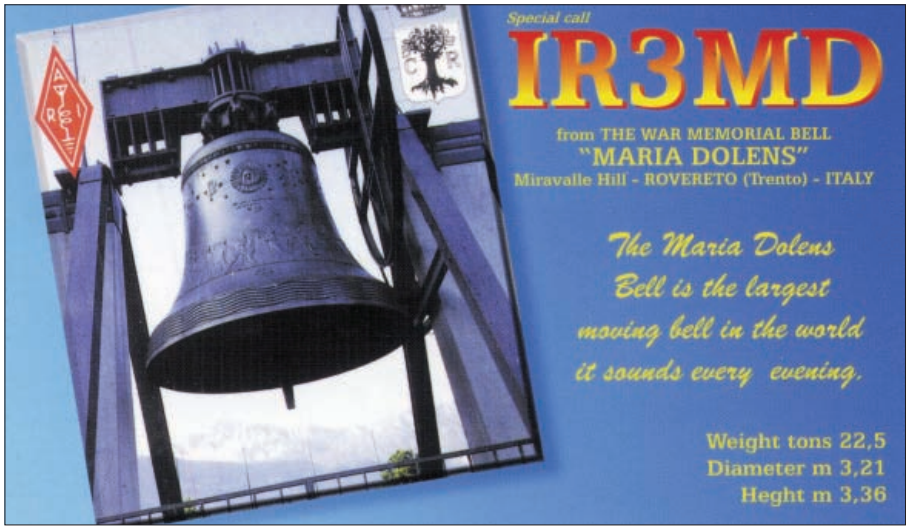
The 7MHz band is where **George Davis G3ICO** in Yeovil, Somerdset used 'the key' to work LZ11PPE (Bulgaria) in honour of Bulgarian Saint **P**repodobna **P**etka **E**pivatska at 1426, VP5/WA2VYA (Turks & Caicos Islands) NA-002 at 1402, OY1CT (Faroe Islands) EU-018) 1439, VK6DXI (Australia) OC-001 in Mindarie, Perth at 1454, VE7IG (Canada). He also worked LZ1685PDB for his 10th Bulgarian Saint this year and the final contact needed for his Diploma. All contacts were made using an Elecraft K2 at 5W to a doublet antenna.

Also on this band was **Owen Williams G0PHY** in Biggleswade, Bedfordshire who has, for his 60th birthday treated himself to a Yaesu FT-2000D. This together with a quarter-wave inverted 'L' provided 100W s.s.b. QSOs with P40W (Aruba) SA-036 at 0550 (QSL via N2MM) and YV5AW (Venezuela) at 0601.

The 14MHz Band

A move to the 14MHz band gave Owen some more DX as 6V7Q (Senegal) at 0733 (QSL via F8IJV), then T32C (East Kiribati) OC-024 at 0847 the FSDXA DXpedition to Christmas Island (QSL via G3NUG) and HI3TEJ (Dominican Republic) at 1121UTC.

Once again **Bill Ward 2E0BWX** in Edwinstowe, Nottinghamshire used a variety of modes for his report and



stations logged using 10W PSK31 included IN3GNV (Italy) 1114 and YO3IF (Romania) at 1814 while JT65 found HA8ZI (Hungary) 1105 and SP6MLT (Poland) at 1116UTC. All were achieved using a Icom IC-7400 and Pro whip antenna.

In Farnborough, Hampshire **Tom Hutton G0HUT** had been looking out for the special Italian call IR3MD for the 'Bell of the Fallen' mentioned in my December 2011 column. He finally found and worked it with PSK31 at 1433UTC QSL via IZ2GOT using a Yaesu FT-450AT at 30W to a Cobra vertical antenna.

To Oxfordshire now, and **David Bambrook 2E0DAB** who lives near Bicester. Running s.s.b. at 40W from a Yaesu FT-747GX and indoor dipole antenna he worked IN3LQB (Italy) 1210, EA2KK/P (Spain) 1211, E77A (Bosnia & Herzegovina) 1410, HF36POL (Poland) 1411UTC QSL via SP9YI.

There were more s.s.b. contacts for **Peter Leng ZL4TE** in Cambridge, New Zealand who logged LS1D (Argentina) at 0624 (QSL via LW9EOC), then came 3D2T (Fiji) OC-016 at 0657 (QSL via VK4FW), EI2CN (Ireland) EU-115 at 0843 and KH7X (Hawaii) OC-019 at 0850UTC (QSL via K2PF).All were achived using a Yaesu FT-1000MP Mark V, running 400W and a Cushcraft AV-3 antenna.

The 18MHz Band

In Kidderminster, Worcestershire **Elgin Mackinlay M0ELG** has been using his home-brew 3-band rotary dipole again on the 18MHz band. His 100W s.s.b. contacts included UA9YK (Asiatic Russia) 0953, HL2DNN (South Korea) 1028, HB0/SP7VC (Liechtenstein) 1120, EY7AJ (Tajikistan) 1625 and AE7KI (USA) ex VK2APG in Chewelah, Washington State USA at 1728UTC.

The 21 & 24MHz Bands

On to 21MHz next and to Sutton Coldfield, West Midlands where **Maynard Beddard M1EGX** has been experimenting with a small magnetic loop based on the design featured in the article 'The Easy Loop 14' by **Maurizo Marti IV3XAZ** published in the November 2011 *PW* – and so far he's been very pleased with it. The antenna was hung on the curtain rail of his shack and with just 50W s.s.b. he was working into Europe, Africa and his best DX so far - he worked **William Gann N4HID** in Bowling Green, Kentucky USA for a 5/7 report.

However, Maynard changed back to his dipole for this report and using a Yaesu FT-920 running between 100 and 200W s.s.b. worked CO6LC (Cuba) NA-115 at 1055, YC8AHH (Indonesia) 1505 (QSL via EA7FTR) then A61ZX (United Arab Emirates) 1510 (QSL via IZ8CLM). Then came OD5PY (Lebanon) at 1705 (QSL via KU9C), D44AC (Cape Verde) AF-005 and PP5BS (Brazil) at 2300UTC.

Using s.s.b. again, Owen G0PHY logged A73A (Qatar) 0836 QSL via EA7FTR, JM1LPN (Japan) 0851, EY8MM (Tajikistan) 0853 QSL via K1BV, AA4V/P/VP9 (Bermuda) NA-005 at 1759 and KL7RA (Alaska) at 1813UTC.

The QRP transmissions from Eric G0KRT worked well on the 24MHz band as his c.w. signal was heard by YL2UZ (Latvia) 1314, LZ3LD (Bulgaria)

1334, YO6BV (Romania) 1347, 4L1MA (Georgia) 1400 (QSL via ON4RU), RZ1OK (European Russia), ER1DA (Moldova) 1527 and best DX K2TQC (USA) in Jamesville, New York, USA at 1530.

George G3ICO also used 5W working CM2IR (Cuba) NA-015 at 1627 and PJ7/W4BUW (Sint Maarten) NA-105 at 1917 and Elgin M0ELG used 100W s.s.b. to work 5B4AIF (Cyprus) AS-004 at 1211, EY7AJ (Tajikistan) at 1625 and K3RA (USA) in Elkridge, Maryland at 1900UTC.

The 28MHz Band

The 28MHz band has been in reasonable shape again this month. Bill 2E0BWX tried s.s.b. for a time working EA7IQQ (Spain) 1120, HA0NAR (Hungary) 1125, Gerald Burns K1GUP (USA) in Carmel, Maine USA at1140, 4Z5RR (Israel) at 1155 and IZ8EFD (Italy) at 1208. He was running 50W while PSK31 contacts included OH3SW (Finland) 1153 and UB1AAG (European Russia) 1200UTC.

In Locharbriggs, Dumfries in Scotland, **Jim Pedley GM7TUD** used a Kenwood TS-590 and 100W into a 4-element mono-bander and enjoyed some time operating and even picked up a few IOTAs on the way. He ended up logging voice contacts with BV1OO (Taiwan) AS-020 at 0732 (FM), JG8TDZ (Japan) Hokkaido Island AS-078 at 0837, UA0FOO (Asiatic Russia) Sakalin Island AS-018 at 0839, VR2CB (Hong Kong) Carl Baier (ex G0FYG) at 0902, AH0J (Northern Mariana Islands) OC-036 at 0910. Then came RI1FJI (Franz Josef Land) EU-019 at 1538 QSL RX3MM, KL7YK (Alaska) 1545, 3XY1D (Guinea) at 1557 (QSL via DL7DF). Then he worked 4C1JPG (Mexico) 1623 and VE7GLX (Canada) Vancouver Island NA-036 at 1859UTC.

Finally, **Michael Hall M0MGH** in Worksop, Nottinghamshire was using his Kenwood TS-2000X at 5W to an indoor trap dipole and was copied in most parts of the USA, Canada, Australia and FR1GZ (Reunion) AF-016 at 1230 and VK6KRR (Australia) in Perth at 1238UTC. Mike sent in a few tips for those of you that use or want to try WSPR and says, “Make sure that the receive noise level is as close to 0db as possible”. You can do this by setting the a.f. output level to the lowest possible setting that works. Switch off your pre-amplifier (especially in Kenwood models) and reduce r.f. gain to get to that 0db level. I know it sounds crazy but it’s the signal-to-noise ratio that has to be right for it to work properly.

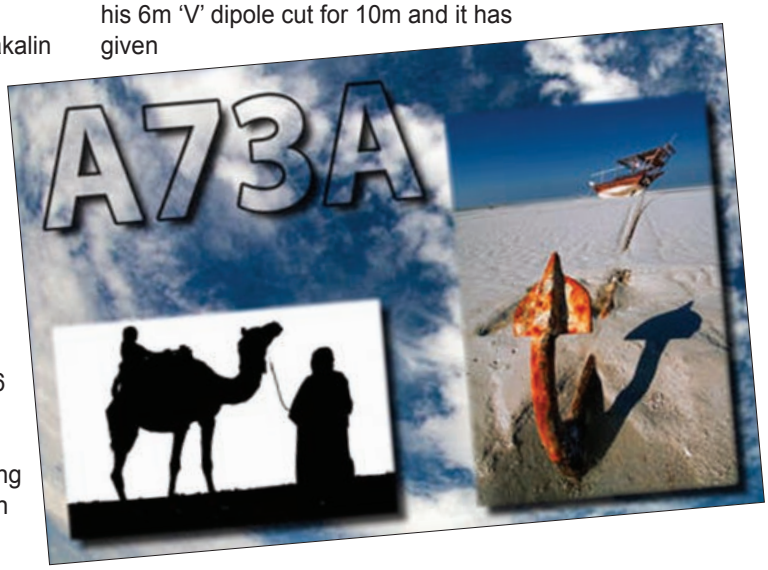
“Make sure that there is no DSP running or receive equaliser. Your a.g.c. is optional as the signal occupies only 200Hz bandwidth though I tend to leave mine on but for the lower h.f bands but this is not essential. When choosing a band to work on, first look at the WSPR net website and check out the ‘Activity’ page and for best DX and look for the ‘rare ones’ where there are the most users on that band.

“Then check out the ‘Map’ page on that band to see what the propagation paths are like. If you see a lot of long paths with many users on that band then that’s where you should be. Preferably use 5W or even less. Many operators only use milliwatts as using more power or ‘cheating’ only creates interference to other users.

“Do not hop about the bands too fast before the program has uploaded your results or you will get the wrong contacts on the wrong band listed in the results which helps no one. Finally, be thoughtful when setting the transmitter ‘%’, as a setting of no more than 25% is more than enough to get great results”.

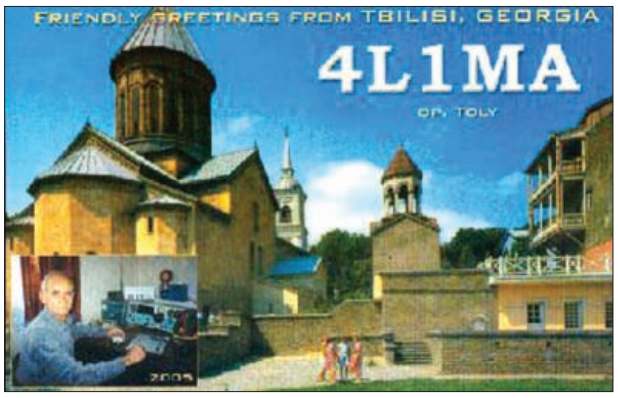
Thanks for that Mike! The WSPR mode is a great way to see the effectiveness of several antennas as you can switch between them to see just what works best for the DX.

Incidentally, Mike has tried this using his 6m ‘V’ dipole cut for 10m and it has given him a few surprise results. You can read more and download the latest software for the Weak Signal Propagation Reporter Net at **http://wsprnet.org/drupal/**



Signing Off

Well that’s it for this month. Once again the higher bands have been working well at various times during the day and nearly all our reporters have enjoyed at least some DX on them. Although in better shape the noise levels on them continue to be rather high for the most part making operating rather difficult. As usual my thanks go to **Maurio Pregliasco I1JQJ/KB2TJM** editor of the ***425 DX Newsletter*** for all the DX information and to all our reporters for their logs. Until next month I wish you all good DX and a very Happy New Year. 73, Carl GW0VSW. ●



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MFJ-260C 300w PL259 .....£45.95
MFJ-260CN 300w N-Type £54.95
MFJ-264 1.5kw PL259 .....£77.95
MFJ-264N 1.5kw N-Type £84.95
MFJ-267 Load/VSWR £162.95

RigExpert ®

AA-500 analyser 5 to 500 MHz .. £574.00.
AA-54 HF ANALYZER ..... £322.96.
RigExpert AA-230 ..... £514.95.
AA-230PRO ..... £574.95.
RigExpert AA-30 - HF Analyzer .. £274.95.
RigExpert AA-520 Analyzer .....£574.95.
RigExpert Plus .....£262.95.
RigExpert Standard .....£190.95.

HEIL SOUND Microphones & Headsets

PR-781-PTT deluxe base mic...£169.96.
Pro-Set-Plus Headset .....£224.95.
Pro-Set-Plus-IC Headset .....£239.95.
Pro-Set-IC Headset .....£159.95.
Goldline GM-4 Stick mic .....£149.95.
Goldline GM-5.1 Stick mic .....£149.95.
HM-4 Handy mic w/HC-4 insert £82.95.
HM-IC Handy mic + Icom insert £99.95.
HM-10-4 Hand mic + HC-4 .....£79.95.
PR-20 hand microphone £129.95
PR-30 hand microphone ..... £229.95.
PR-40 hand microphone ..... £269.95.
Pro-Set-Elite with HC6 ..... £179.95.
Pro-Set-Elite-IC with HC-6 ..... £189.95.
Pro-Set-6 with HC-6 ..... £149.95.
HM-Pro mic ..... £99.95.
Pro-Set Media ..... £129.95.
AD-1 adapters from ..... £22.95.
CC-1XLR leads from ..... £37.96.

COMET

CHA250B broadband vertical, covers 80-6m, no gaps ..... £349.95.
GP-6 High Gain Dualband CoLinear 2/70cm Max 200w ..... £119.95.
GP-15 Tri-Band 2/6/70 Fibreglass Antenna. Max 150w ..... £129.95.
GP-9 highgain dualband co-linear...£169.95.

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SL-USB-13PDI 13pin DIN Icom £94.95
SL-USB-13PDK 13pin Kenwood £94.95
SL-USB-4R 4pin round mic cable £89.95
SL-USB-5PD 5 pin round mic cable £89.95
SL-USB-6PMD 6pin m/DINYaesu £94.95
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POWER-MITE NF 22A peak £79.95
W-25AM 25A Supply £99.95
W-10AM 10A Supply £64.95
W-5A 5A Supply £33.95
W-10SM 10A Supply £59.95
W-30 2/70 Base £49.95
W-50 2/70 Base £59.95
W-300 2/70 Base £89.95
W-2000 6/2/70 Base £89.95

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Butternut HF-2V 40/80m £299.95
Butternut HF-6V 80-10m £399.95
Butternut HF-9V 80-6m £459.95
Butternut HF-5B 20-10m £469.95
STR-II radial kit £159.95

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Hustler 5-BTV £229.95
Hustler 4-BTV £189.95
Hustler 6-BTV £269.95
Hustler RM-10 10m resonator £21.99
MO-1 mobile mast section £39.95
MO-2 mobile mast section £39.95
MO-3 mobile mast section £29.95
MO-4 mobile mast section £27.95

PALSTAR

AT-1500DT 1500w ATU £534.95
AT-2K 2000W ATU £594.95
AT- Auto 1500 Watt ATU £1129.95
AT5K 3500 Watt ATU £999.95
DL-5K 5kw dummy load £424.95

Miracle Antenna

Miracle Whip QRP allband £129.95
Miracle Ducker IL ATU..... £139.95
Miracle Ducker PL for HF £139.95
Miracle Ducker TL HF/VHF/UHF ... £139.95

AT-1000 Pro

1KW Auto ATU - 1.8-54MHz - 1-8 secs Tune - Approx SWR Rating of 10:1

£499.00

Z-100 Plus

125w Auto ATU - 1.8-54MHz - 0.1 - 6 secs

£134.99

DM-7800

Made exclusively for the IC-7800. This will give you a true analogue meter

£136.00

AT-100 Pro II ..... £184.95.
AT-200Pro ..... £209.95.
AT-897+ ..... £178.00.
KT-100 ..... £173.00.
AT-600Pro ..... £295.00.
YT-450 ..... £224.00.
Z-11ProII ..... £159.00.
YT-100 ..... £177.00.
FT-Meter ..... £44.00.

Z-817 ATU

ATU specific for FT-817 Uses CAT / ACC port Powered by batteries 0.1 - 20w : 1.8 - 54MHz

£119.00

LDG IT-100

Icom ATU 125w Auto ATU - 1.8-54MHz 0.1-6 seconds Tune

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LDG RBA 1:1&4:1

1:1 or 4:1 Balun - Covers 1.8 - 30Mhz Power rating 200w

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Radioworld - the longest-running LDG dealer in the UK!!

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Tonna 220505 6m 5el ..... £118.95.
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Tonna 220919 70cm 19el ..... £94.95.
Tonna 220921 70cm 21el .....£119.95.
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Tonna 220655 23cm 55el ..... £119.05.
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RIGblaster Pro ..... £299.95.
RIGblaster Plus USB ..... £159.95.
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RIGRunner 10way 12v distribution board £159.95.
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CBA/AMP/240 CBA-II Amplifier ..... £719.95.
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HF10FX 10m Mobile ..... £49.95.
HF15FX 15m Mobile ..... £49.95.
HF20FX 20m Mobile ..... £49.95.
HF40FX 40m Mobile ..... £49.95.
HF80FX 80m Mobile ..... £52.95.
CR8900 10/6/2/70 ..... £119.95.
CP6 Base 6m-80m ..... £369.00.
X50 Base 2/70 ..... £69.95.
X200N Base 2/70 ..... £99.95.
X300 Base 2/70 ..... £109.95.
X7000 Base 2/70/23 ..... £199.00.

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AL-811XCE 10-160m 600w £899.95
AL-811HXCE 10-160m 800w £1099.95
ALS600X Solid State 10-160m 600w £1499.95
AL-1500XCE 10-160m 1.5KW £3799.95
AL-1200XCE 10-160m 1.5KW £3499.95
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CW-160 160-10m (252ft) £165.95
CWS-160 160-10m (133ft) ... £159.95
CW-80 80-10m (133ft) £134.95
CWS-80 80-10m (66ft) £152.95
CW-40 40-10m (66ft) £121.95
CW-40+ 40-10m (66ft) £142.95
CW-20 20-10m (34ft) £104.95
G5RV+ 80-10m £82.95
G5RV-XF Fullsize £71.95
G5RV-XH Halfsize £56.95

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SGC-230 HF..... £529.95
SGC-500 HF £1399.95
SGC-235 HF-500w £1199.95
SGC-237 HF+6m £309.95
SGC-237 Porta £559.95
SGC-237 PCB £349.95
SGC-239 HF..... £199.95
MAC-200 ..... £279.95

Rotators

G-2800SDX Rotator ..... £897.95.
G-450C Rotator ..... £345.00.
G-550C Rotator ..... £255.00.
G-650C Rotator ..... £395.00.
G-1000DXC Rotator ..... £499.95.
G-5500C Rotator ..... £649.95.
AR-303X Hy-Gain rotator.....£99.95.

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Flexweave-PVC-50 50m £40.95
Enamelled Copper Wire 50m . £17.95
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3 core ..... £0.80 per Metre
7 core ..... £1.30 per Metre
8 core ..... £2.00 per Metre

DC Connecting Cable
10A DC Cable ..... £0.50 per Metre
15A DC Cable ..... £0.65 per Metre
25A DC Cable ..... £0.90 per Metre
40A DC Cable ..... £1.35 per Metre

FlexRadio Systems

SoftWare Defined Radios

FLEX-1500 SDR Transceiver... £579.95
FLEX-3000 SDR £1299.95
FLEX-5000A Transceiver £2495.95
FLEX-5000A-ATU £2795.95

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Self-contained, solid state

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Cushcraft

X-7 - 20/15/10 7EL Yagi. .... £899.95.
A3S - 20/15/10 3EL Yagi .....£629.95.
A4S - 20/15/10 Yagi .....£699.95.
A3WS - 12/17 3EL Yagi .....£499.95.
ASL-2010 13-32MHz Log ..£999.95.
MA5B - Mini Beam .....£529.95.
D-3 - 20/15/10 Dipole .....£359.95.
R-6000 - 6Band Vertical ... £449.95.
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Quality Used Equipment, 3 Month Warranty. Best prices paid for your used equipment.

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Alinco DJ-X3 £89.00
EDC-16B adapter £9.99
Trio (Kenwood) YK-88C 1F Filter £49.00
WELZ DL-600 Dummy Load £68.95
50-Watt Dummy Load £56.95
TS-711/811PX Interface £59.95
Kenwood YK-88S SSB Filter £49.00
Snooper S5-R Safety Alert System £119.95
SGC MAC-200 Antenna Controller Auto-Tuner £229.00
MFJ-931 Artificial Ground £85.00
Microset SR-200 2m 200w £319.00
AOR ARD9000 Digital Voice Interface. £126.31
Midland 48 Plus Multi £69.00
DRU-2 Digital recording unit. £80.00
MFJ-1817 2m/70cm Telescopic Rubber Duck £22.00
CSC-83 Soft Carry Case for FT-817ND £15.00
Icom PS-85 Icom 20A 13.8V Switch Mode £159.00
YSK-7800 Seperation lead for FT-7800 £30.00
SC-8200 Soft Case for AR-8200-8200-S2 £10.00
ICOM FL-63A - CW Filter £50.00
Kenwood FM-430 - fm unit for TS-430 / TS-430S £59.00
SC-45 Soft Case for TH-G71E £10.00
CASE FOR KENWOOD TH-47 £10.00
010-10117-02 Garmin GPSCarry Case £5.00
HS-800/PRO High Sierra Standard Control Box £75.00
HMC-3 Vox Headset £20.00
Host Master II £20.00
Eton S-350 Field Radio £65.00
VC-10 VHF converter for R-2000 £99.95
Rigblaster Plus £89.00
CSC-88 Soft Case for VX-7R £10.00
Bremi BRL-5 - 3-way switch with 5Watt dummy load £20.00
JD Model 151 - TVI Low Pass Filter £10.00
Archer Antenna Discharge Unit £15.00
Yaesu SC-1 Station Console £89.00
Dee Comm Dummy Load £69.00
BRV-1 Mirror Mount £10.00
Yaesu CSC-92 soft case with integral belt clip VX-3E £10.00
60W Max Dummy Load £35.00
300W Max Dummy Load £79.00
Drake DL-300 Dummy Load £50.00
FNB-78 Internal Ni-MH Battery Pack for FT897 £79.00
MMB-80 Mobile Mounting Bracket for FT897 £14.00
MTU-30/20 RF u-tuning Unit C £500.00
MTU-80/40 RF u-tuning Unit B £500.00
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SC-37 Soft Case £6.00
SC-41 Soft Case £6.00
Diamond DL1000 Load £99.00
Philips HC8349 Wireless Rechargeable Headphones £25.00
MAG-BM145PL £14.95
MFJ-332B BNC Magmount £15.95
FM-747 for FT840, FT-747 etc. £69.00
FL-53A 455kHz Filter CW narrow 250Hz £125.00
SU-1 Barometric Pressure Sensor Unit for VX-7R £29.95
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TI-30D 15-Watt Load £20.00
Hansen DL-20 15-Watt Load £20.00
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FM Wide Modification Kit for FRG-8800 £60.00
AirNav RadarBox-Pro 2010 £269.00
Heathkit IM-5217 Meter £30.00
ESC-44 Soft Case for DJ-X30 £10.00
CSC-73 Soft Case for VX-5R £7.00
LC-152A Leatherette Carry Case for IC-E90 £10.00
WRP-1300 Pre-Amp £29.95
MMB-M11 Multi-angle mounting bracket £17.00
Yaesu FAS-1-4R - Remote Antenna Selector £119.00
BC-139 Desktop Fast Charger incl. BC-06 for IC-E90 £50.00
CP-19 Cigarette Lighter (DC-DC converter built in) £22.00
LC-163 Soft Leatherette Carry Case for IC-E91 £12.00
Icom EX-766 interface unit for IC-901 £129.00
FBA-23 Drycell Case for VX-7R £15.00
ADMS-1G Programming Software for VX-7R £30.00
NDH-518 Memory Unit £149.00
AOR ARD-2 ACARS/Navtex Decoder £299.00
Yaesu YH-55 Headphones £34.95
CD-15A Desktop Rapid Charger for VX-7R £15.00
Yaesu SP-5 speaker £119.00
WinRadio Trunking option software £49.00
FV-102DM digital Memory VFO £179.00
CT-62 CAT Interface Cable for FT-857D, FT-817ND £25.00
OPC-1443 (IC-7000) SEPARATION CABLES £28.00
Kenwood VC-H1 Interactive Visual Communicator £199.00
Roller Coster Inductor (Unused) £89.00
Roller Coaster Inductor (Surplus) £99.00
Differential Capacitor (Unused) £89.00
520pF Medium Spaced Variable Capacitor £59.00
Large 1-Pole 9-Way Switch £59.00
Large 1-Pole 9-Way Shorting Switch £59.00
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Kenwood VB-2200GX 2M Amplifier £79.00
Kenwood TL-120 HF Amplifier £129.00
MML 144/30-LS 2m 30W Amplifier £89.00
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YW-3 SWR meter £30.00
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PALSTAR PM2000AM Mobile Watt Meter £120.00
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PALSTAR PM2000A Wattmeter £120.00
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Antenna
MFJ-914 £65.00
EZ-TUNE-7000IBOX High Sierra Control box £85.00
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Amo 40m EH Antenna £99.95
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MFJ-1786X Magnetic Loop Antenna £350.00
CWS-80 Radio Works Caro-lina Windom 80 Special £80.00
A3-WS Cushcraft 3-Element Tribander (WARC) £349.00
MFJ-1798 10-band Vertical all band Antenna £229.00
ATX-1080-bnc Multi band antenna 80 to 6m £30.00
BWD-90 Barker & Williamson Commercial Antenna 1.8-30 £275.00
Antenna Tuners
MFJ-969 ATU £159.00
LDG Z-11 QRP ATU £99.00
MFJ-962D Versa Tuner £239.00
Yaesu FC-30 Antenna Tuner Unit £189.00
LDG AT-897 Autotuner £149.00
Kenwood AT-200 antenna tuner £139.00
Vectronics VC-300D Tuner with LED PEP Meter £199.00
MFJ-924 MFJ UHF ATU £85.00
MFJ-994 Automatic ATU £255.00
Capco SPC-100 300W ATU £95.00
AT-897Plus Autotuner £149.00
Books
Icom IC-R20 manual in Italian £5.00
AERAD Chart 1994 £2.00
Air Band Radio Handbook 8th Edition £5.00
Air Band Radio Guide 6th Edition £5.00
Airwaves 2007 £8.00
ARRL Handbook 1985 £10.00
Usborne Audio and Radio Book £5.00
BBC Radio Transmitting Stations 1993-94 £5.00
BBC Radio Transmitting Stations Spring 1990 £5.00
Beginners Guide To Packet Radio £5.00
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IBA Guide to TV and Radio 1990 £2.00
Microcomputers in Amateur Radio £5.00
PM3055-57 Oscilloscope Manual £5.00
Packet Radio Primer £5.00
Radio Amateur Operator's Handbook £5.00
"Radio" by Tucker & Wilkinson Vol-2 £5.00
"Radio" by Tucker & Wilkinson Vol-3 £5.00
Radio Servicing Vol-4 £5.00
RAE Revision Notes £5.00
R&EW Amateurs Handbook Vol 1, 2 & 3 £4.00
RSGB IOTA Directory 2000 £5.00
UK Scanning Directory 4th Edition £5.00
UK Scanning Directory 2nd Edition £5.00
"Calling Shanwick" £5.00
"49 The Thyristor Book" £5.00
UK Scanning Directory 6th Edition £5.00
USA Radio Amateur Callbook 1986 £5.00
VHF Communications Magazine 1975 £5.00
WRTV Handbook 36th Edition £5.00
WRTV Handbook 1987 Edition £5.00
WRTV Handbook 40th Anniversary Edition £5.00
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RSGB Amateur Radio Operating Manual £5.00
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Scanners 4 Book £5.00
RSGB 1994 Call Book £10.00
International Listings 1994 Call Book £10.00
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Lodestar SWR-2T SWR Meter £15.00
Emperor Ninja CB £69.00
Lodestar SWR-2S SWR Meter £15.00
CB SWR Meter £15.00
Maycom EM-27 CB Transceiver £55.00
DX-5000 K-PO - AM/FM/SSB 10/11m Mobile £189.00
Midland Port-A-Pak 27MHz FM CB £78.95
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Gemini 46 Digital Radio £39.00
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Kamtronics KAM Multimode TNC £129.00
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ICS AMT-2 Terminal Unit £49.00
Kantronics KPC-9612 £200.00
USB 56K MODEM £10.00
MFJ-1278b DSP Multimode Data Controller £249.00
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NC-386 Ni-Cd Battery Charger £20.00
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Revex D24 duplexer 1.6-150 MHz £22.00
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Bremi BRL-10 - TVI Low Pass filter 27MHz £10.00
AEC LP-30 - Low Pass Filter £15.00
Packer TVI Filter £9.95
Vanco HF Low Pass Filter £14.95
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SCOUT Optoelectronics Frequency Counter/Finder £175.00
Watson FC-128 Frequency Counter £69.00
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Yaesu VX-7R Silver Tri-band Handy £259.00
Icom IC-T8E £159.00
Yaesu VX-7R black Tri-Band Handy £229.00
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FDC-450A 70cm Handheld £79.00
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Quansheng 2m Handheld £69.00
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Kenwood BT-11 Battery Case £18.00
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Alinco DJ-S41 UHF Handheld £58.75
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Jingtong JT-308 70cm Handheld £49.00
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Yaesu FNB-102LI 7.4V 1800mAh battery £40.00
Yaesu CD-41 - Rapid Charger Requires NC-86U £10.00
Yaesu CSC-93 soft case £9.00
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Kenwood TS-120V 10W HF Mobile £220.00
Icom IC-735 £299.00
Kenwood TS-570DG/E HF transceiver £599.00
IC-R71E HF Receiver £329.00
Icom IC-718 HF All Band Transceiver £459.00
Yaesu FT-840 HF Transceiver £399.00
Icom IC-751 HF Transceiver £450.00
IC-756PRO-MKIII Icom HF + 6m Trx £1,575.00
Yaesu FT-2000 100W with internal power supp £1,599.00
Kenwood TS-430S HF Transceiver 100W output £299.00
Yaesu FT-757GX MKI £299.00
Yaesu FT-2000D 200watts £1,950.00
Kenwood TS-850S /AT £699.00
Icom IC-746 HF/6m Transceiver £675.00
Midland Alan 98 Plus CB Tranceiver £49.00
Yaesu FT-690R II £275.00
IC-7200 HF Transceiver £649.00
IC-706 MK2 £499.00
Alinco DX-SR8 HF transceiver HF, 100W all mode £529.00
ICOM MB-117 - Carrying Handle for IC-7200 £10.00
MFJ-9410 10 Meter SSB Adventure Radio £220.00
Kenwood TS-120S HF Transceiver £240.00
Mics and Speakers
Kenwood MC-85 Base Mic £119.00
Yaesu MD-100 Desktop Microphone £95.00
SM-20 Deluxe Base Station Desk Mic £114.95
SMC-34 Speaker/Microphone with Volume Control £21.63
HM-133 Remote Control Microphone for IC-E208 £52.46
Alinco EMS-8 - Speaker Microphone £10.00
SMC-33 Speaker/Microphone with 3 Function Buttons £15.00
BH1 NES10-2 DSP Speaker £79.00
Yaesu MH-57A4B Speaker/microphone for VX-7R £20.00
EMS-47 Remote Control Hand Speaker/mic direct VFO in £15.00
Yaesu MH-32 Speaker-Mic £15.00
MFJ-295 £12.95
YM-24A Speaker Microphone £25.00
Yaesu MH-12A2B speaker-microphone £15.00
QS-112Y4S Watson Handheld Speaker Mic £10.00
Sharman's DM-300 Speaker Mic (Kenwood) £12.00
HM-131L GS Style Speaker/mic for IC-T3H £20.00
Icom HM-70 Speaker Microphone £20.00
HM-75A Spkr/Mic with Up/Dwn for IC-M3EURO £30.00
SMC-32 Compact Speaker/Microphone £14.00
Speaker Mic for Kenwood £10.00
Speaker Mic (Yaesu VX-1 etc.) £9.00
Speaker Mic (Icom Two Pin) £9.00
Sharman's Speaker Mic (Icom Two Pin) £9.00
RS Dynamic Stick Microphone £39.95
Sharman DM-100 Speaker Microphone £10.00
Sharman DM-200 speaker microphone to fit Motorola £8.00
QS-110Y Speaker / Microphone to fit Yaesu £8.00
Morse keys / tutors
MFJ-418 Pocket Morse Tutor £75.00
NATO Morse Key £199.00
MFJ-451X Morse Interface (no keyboard) £85.00
MFJ-268 Soft Leather Case for MFJ-418 £9.96
Kent Keyer £79.00
Icom EX-243 Keyer £59.00
Kent Single Paddle Morse Key £55.00
Himound HK-702 £89.00
Himound HK-704 £60.00
WWII Marconi Air Ministry D-Type Key - POA
WWII Marconi Wireless Telegraphy Company Key - POA
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Bnos 20AMP PSU £99.00
Kenwood PS-30 PSU £89.00
Adonis AM-708E £129.00
Yaesu FP-30 power supply for the FT-897 £179.00
PT-1012 Microset 12A 13.5 PSU £109.96
Icom PS-125 £270.00
Kenwood PS-20 - Low power PSU £69.00
Seif PS-134,DC power supply £20.00
Farnell G-12 £59.00
B.N.O.S 12amp power supply £59.00
W-SA Watson SA 13.8V fixed power supply unit £27.50
Yaesu FP-8 PSU £69.00
Apollo CB-35 PSU £20.00
Altai RPS-1203 £20.00
Mini Power Supply £14.95
Drae 24 Amp PSU £99.00
GZV-4000 Diamond 40A Switch Mode £165.00
Yaesu FP-80A DC power supply £69.00
MFJ-4103 FTB17 Switch Mode £30.00
Receivers
Icom IC-R72 Receiver £399.00
Yaesu FRG-8800 £275.00
AOR AR-7030 HF receiver £499.00
Icom IC-R5 Receiver £129.00
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Colin Redwood G6MXL's What Next?
PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW
E-Mail: what.next@pwpublishing.ltd.uk

Diagnosing Faults

Colin Helps With Trouble Shooting!

In *What Next?* this month, Colin Redwood G6MXL passes on some vital tips on finding those annoying faults!

Welcome to *What's Next?* (*WN?*) where this month I'm going to look at trouble shooting. If for some reason your station appears not to be working as you expect, it is helpful to make a few basic checks to try to isolate the fault as far as you can, before attempting any repair. To illustrate this I've decided to take a recent practical example in the hope that this will bring out a number of useful tips.

Along with many *PW* readers, I decided to participate in the *Practical Wireless* 70MHz Contest on Sunday September 25th 2011. I should point out that, as the Contest Adjudicator I treat my own log as a check log – so I don't appear in the overall results tables.

I set up my station (**Fig. 1**) at a site on the Quantock Hills in North Somerset, which I hadn't used before. The site, at about 330m above sea level, had a clear take-off in several directions, with much of the coast of South Wales visible, and an unobstructed take-off to the East. I thought this would prove to be a reasonable v.h.f. site.

Fig. 1: The 70MHz station that Colin G6MXL set up on the Quantock Hills in Somerset.

The Equipment

The equipment I used, was a Yaesu FT-817 transceiver on the lowest power setting with internal batteries (but with an external gel-cell battery available), an old Microwave Modules transverter from 144 to 70MHz, a Spectrum Communications 70MHz power amplifier and pre-amplifier.

The 70MHz output from the power amplifier fed a 20m length of RG213 coaxial cable feeder connected to a 5-element 70MHz Yagi antenna. The transverter was powered by a gel-cell battery, with a separate gel-cell battery supplying power for the power amplifier and pre-amplifier (**Fig. 2**).

I had short (approximately 1m long) patch leads between the equipment. I needed an adaptor on the end of nearly every patch lead and the main feeder as they mostly had the wrong connectors on them for the piece of equipment in question!

The direct current (d.c.) power supply lead for the transverter was still terminated in bare wires from the days when I used to use it at home connected to a mains power supply unit (p.s.u.). So I used short 'croc-clip' to 'croc-clip' leads to go between the lead and the gel cell battery, doing my best to separate them to prevent a possible short circuit.

I heard just five stations and managed to have full contest exchanges with just two stations and a 'got-away' with a third. As I was receiving and hearing much higher serial numbers being exchanged by others, I expected to hear and work more stations. So, I suspected there was a problem with my station.

Fig. 3: Close-up photograph of the box where the feeder connects to the antenna. Note the stray wire from the shield that appears to be almost touching the centre conductor.

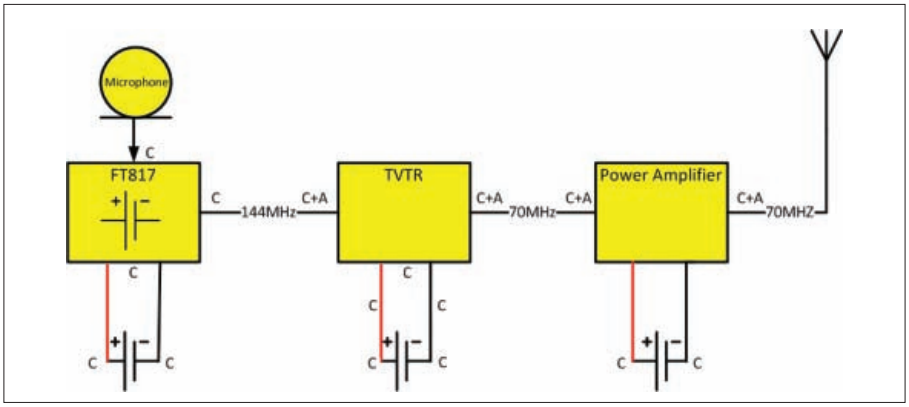


Fig. 2: A diagram showing the main components of the 70MHz station. 'C' represents a connection. 'A' represents an adaptor.

Unfortunately, I'd neglected to take even the most basic test gear with me. Worse still I didn't take any additional patch leads, that I could have at least substituted in an attempt to find the fault.

Where To Start?

So, where should I start my investigations? I decided to take a very systematic approach. First I would check the power supplies, secondly the antenna system, and finally the equipment and leads in-between each stage.

From experience, this approach has worked well for me over the years. I had in my mind that there could be more than one 'fault', and that there might be a number of areas where I could improve matters, even if there wasn't a fault as such.

Experience of so many things electrical has taught that it always pays to check power supplies. "Is it plugged in and is the switch at the mains socket on?," is a standard check for just about every electrical appliance.

As I mentioned earlier, I used three separate gel-cell batteries. A few weeks later, without having used the batteries in the mean time, I measured each of them with no load, and then again with a 22Ω 10W resistor as a load, which would draw about 600mA (I=V/R so I=12.5V/22Ω = 0.57A or 570mA). I used a wire wound resistor rated at 10W (Power = 12.5V x 0.57A (570mA) = 7.1W). Measurements were taken with a small digital multi-meter. The results are shown in **Table 1**.

After several weeks of no use, all three batteries were showing voltages between 12 and 13V with nothing connected to them apart from a digital multi-meter. With about 600mA being drawn, the battery voltages all dropped, but still remained above 12V.

The specification for the transverter calls for 12.5V at 2.1A – so there are no real concerns. Furthermore, the resistor certainly got warm!

Whilst I intend to make further checks on the batteries once I have re-charged them, I decided that they were unlikely to be the main cause of the lack of contacts. The fact that I made any contacts at all and heard other stations tends to confirm this. I decided to turn my attention to the antenna system.

Antenna System

An antenna system covers everything from the feeder and connectors between the last 'active' stage (the power amplifier in my case) and the antenna itself. There are a number of things to check.

Let's look at the list: Is the coaxial cable connector on the 'shack' end of the feeder correctly fitted?

Is the feeder in good condition? Is the feeder low-loss at the frequency in question?

1: Is the feeder connected to the antenna correctly?

2: Is the antenna correctly matched? Is the feeder damaged?

3: Is the antenna correctly assembled?

4: Is the antenna actually resonant on 70MHz?

Any one of these tests 'failing' might explain (at least in part) the problems I had making contacts.

I started my checks of the antenna system by opening the cover of the feed-point box, where the feeder connects to the antenna. A few years ago, I removed some of the metalwork inside the plastic box, as it had become rusty from water ingress from the outside.

Fig. 4: Corrosion on the end of the matching rod – before cleaning (left), and after cleaning (right).

On this occasion, when I opened the box, at first sight, everything seemed to be in order. Nothing looked damp, and both the centre conductor and screen looked copper coloured and not the dreaded green or black colour that indicates corrosion due to moisture.

I was just about to do some end-to-end checks on the feeder when I noticed a single fine strand of the screen of the coaxial cable wasn't soldered with the rest of the screen to one side of the driven element. Instead this single strand was extremely close to and perhaps even touching the centre core of the coaxial cable (**Fig. 3**). If this was intermittently shorting-out the feeder, it would certainly explain quite a lot, including the fact that I did work some stations when there was no short circuit!

I continued with my investigations and measured the centre core of the coax for continuity, likewise the screen. I also checked that there was no short between the centre core and the screen. Then I made a visual check of the full length of the feeder, looking for any signs of damage to the outer *pvc* sleeve, which might have allowed moisture to get it.

I also checked that the PL-259 plug on the end of the antenna was firmly attached. Whilst I have seen better, and a lot worse, it seemed to be sufficiently well attached not to be a problem. This was confirmed when some later measurements stayed the same when I tried to move it.

In the back garden, I continued to check the antenna and noted that the clips that connect the driven element to the matching rod and the rod itself were all corroded (**Fig. 4**). I did a quick continuity check on the rod and found that I was getting open circuit readings. I doubt if I'd ever cleaned the clips or the matching rod in 15 years!

Out came an old screwdriver, some wire wool and a load of 'elbow grease' and I cleaned the matching rod and the clips. A subsequent test showed

Table 1: Results of the off and on-load voltages tests for the three batteries.

Battery	Equipment	Off-Load Voltage	Voltage with 600m.a. being drawn
1	FT-817	12.78	12.40
2	MM Transverter	12.25	12.05
3	Spectrum p.a.	12.83	12.25

Fig. 5: Measurements of the s.w.r. of the 70MHz Yagi using an MFJ-259B Antenna Analyser.

continuity – so a second antenna fault had been found and fixed.

A further check with an antenna analyser showed a standing wave ratio (s.w.r.) of 1.3:1 and an impedance of about 60Ω (**Fig 5**). I did get better results at around 69MHz, suggesting that perhaps the driven element might be a fraction too long. As I have had good performance from the antenna on 70MHz on previous occasions, I decided not to risk making changes. That is – until I could test the antenna in a better environment than perched on top of the rotary washing line in the back garden!

Main Suspicions

One of my main suspicions was that I would find a suspect connection. After all there were so many! I decided that I would check all leads and their associated connectors. For each r.f. patch lead, I checked for continuity of the centre core, followed by continuity of the shield. Then I checked for a short circuit between the centre core and the shield.

Only if each patch lead passed the three tests, then following a visual test and a check that the plugs were firmly attached to the feeder at each end, would I consider it to be in reasonable condition. And all the patch leads were okay. I intend to build a better arrangement for testing leads to enable better testing for intermittent connections. (I'll be describing this in *WN?* soon).

The Transceiver Next!

I then moved on to the transceiver. Using some tested r.f. patch leads, I connected the antenna socket to a power meter, and the antenna side of the power meter to a 50Ω dummy load.

When I made some r.f. power measurements, I was somewhat surprised to find that my FT-817ND was producing higher power than I was expecting on the lowest power setting.

My power meter was showing somewhere between 700mW and 800mW (instead of the expected 500mW) – over double the 300mW specified for my transverter. Apart from this, I have used my FT-817ND enough times before and after the 70MHz contest to be pretty certain that it's otherwise working as expected.

The Transverter

Having checked the transceiver, my attention next moved to the Microwave Modules transverter (**Fig. 6**). I had heard the relays changing over when I was out in the field, so I wasn't expecting to find problems here. Nevertheless, I felt it important to check that the transverter was reliably switching from receive to transmit when using upper side band. It does this by detecting the presence of 144MHz on the intermediate frequency (i.f.) socket. The second thing I wanted to check was the 70MHz output power on transmit.

Back home, I could still hear the relays changing over, but initially I was disappointed with the 70MHz power output. The best I was getting was about 4W (instead of the expected 8W). Then I remembered that the power meter I was using was designed for 144MHz to 430MHz.

Substituting a power meter that covers 70MHz, I measured output power at 70MHz of about 7 or 8W – which was certainly more realistic, and the same as I measured using the same power meter some years ago. The other thing I noted was the increase in receive noise when I connected power to the transverter, suggesting that the receive side was probably working. So overall, the transverter was behaving more or less as expected.

Power Amplifier & Pre-Amplifier

I'd left testing the power amplifier and pre-amplifier to last. The main reason for this was that the pre-amplifier had performed exactly as I'd expected out in the field. I could hear the relays click-over when I went to transmit and there was no reason to suspect anything wrong. Testing back home confirmed this, with a useful increase in power output being measured between input and output on transmit.

Propagation Explanation?

An additional explanation of my lack of contacts may have been propagation. At a height of 300m or so, I could have been above a duct and therefore missed out on some contacts.

Additionally, the 70MHz (4m) band is notorious for heavy fading (QSB). These propagation effects can't be recreated in a 'test' situation – but I don't think that they could fully explain my low number of contacts.

Fig. 6: The Microwave Modules 144 to 70MHz transverter.

Methodical Approach

When fault finding, it's a good idea to do so with a methodical approach – and avoid making assumptions about anything. A simple multimeter together with a low value, high power resistor is useful for checking batteries on load. Also, don't forget that a dummy load and r.f. power meter is really handy for checking transmitters, transverters and power amplifiers.

It pays to check all antenna joints and connections for corrosion. Measure everything you can using suitable measuring equipment – sometimes the results are not what you expected! Just listening for relays clicking over and changes in noise levels can provide useful indicators.

Next Month

Next month, having described how I found and corrected the faults with my 70MHz station, I'll move on to look at some of the improvements I made in addition to correcting the faults. I will also describe the Feeder Tester that I built to check that connectors are correctly fitted to coaxial cable feeder. ●

Harry Leeming G3LLL's In the Shop
The Cedars, 3a Wilson Grove, Heysham, Morecambe LA3 2PQ
Tel: (07901) 932763 E-mail: G3LLL@talktalk.net

Off Frequency? Harry Can Help!

Harry Leeming G3LLL passes on the vast experience he gained when he ran a very busy Amateur Radio and general electronics shop in the north west of England.

I'm pleased to welcome you all to *In The Shop* (*ITS*) where I look back at my time running Holdings in Blackburn, Lancashire. I came across some unusual faults during my working career.

'**Ted**' recently E-mailed me to say that he was having complaints that he was 'Off frequency'. And I'm sure that at some time or other most of us have been told that we are incorrectly netted and that the frequency we are transmitting on, is not exactly the same as that of the station we're in contact with. So, let's look at the problems involved and how they can be overcome.

If your rig is fitted with a digital display and this doesn't change when you press the push-to-talk (p.t.t.) switch on the microphone, it's more than likely that the problem lies with the other station. But if you haven't got a digital display, how can you check?

Free Running VFO

All the older none-synthesised rigs – such as the FT-101 series – have a free running variable frequency oscillator (v.f.o.). Obviously, for correct operation this has to run at the same frequency on transmit as it does on receive – and should also be at the same frequency with the clarifier set half way, as it is with it switched off.

On some rigs – such as the FT-101Z, (The non-digital version of the FT-101ZD) the clarifier control also operates in the transmit mode and so the centre frequency of this must also be correct. Typically. the alignment instructions will point you to the correct adjustments and then state something like, *"The transmit and receive frequencies should coincide, if not adjust VR -x,y or z"*. Frankly not a lot of help!

I've heard quite a few stations operating unwanted 'split frequency', while a friend has tried to guide them over the air into making adjustments so as to get their transmit and receive frequencies to coincide. It usually sounds like a non-driver trying to direct a reversing lorry into a narrow entrance and often results in the transmit-receive split being even worse!

At this point you may be tempted to think that loads of technical ability and plenty of test equipment are needed to perform this operation correctly. And so it might, if you do it the way some makers suggest – but if you go about it the best way, it really is quite simple!

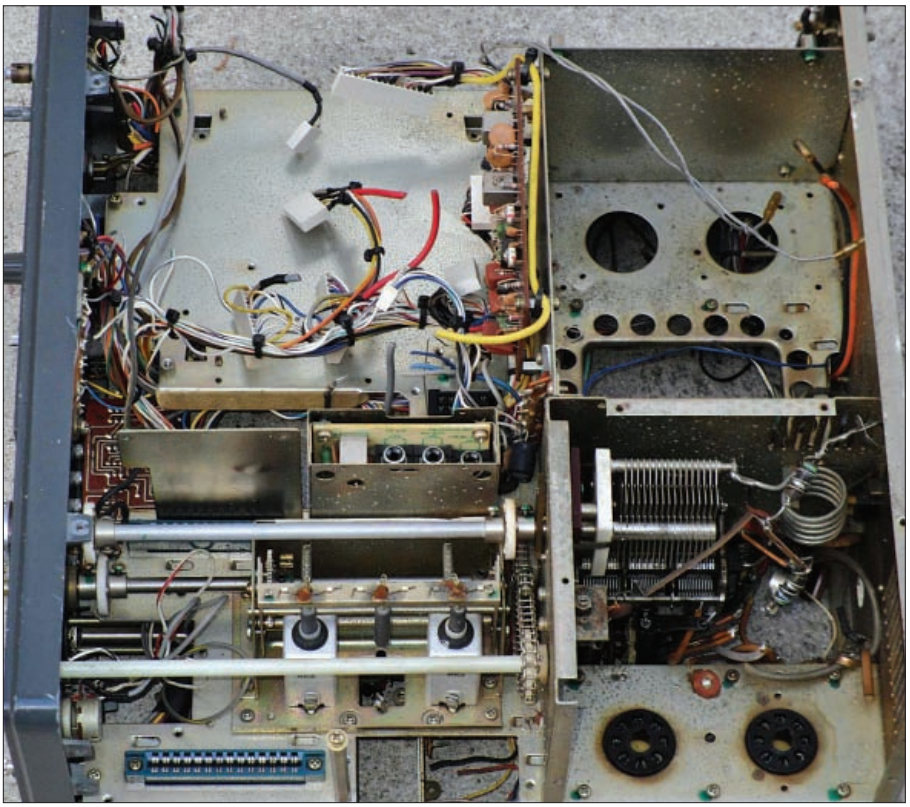
The tuning range of v.f.o.s usually tune over a range of about 5-600kHz somewhere in the 5-10MHz region, and a quick glance at the block diagram in your manual will tell you the exact frequency range. With the FT-101E for example, the range is 8.7 to 9.2MHz, and the only piece of test equipment you'll need is a stable c.w. or s.s.b. receiver that covers the v.f.o. (under test) frequency range. (If you don't happen to have one, don't just borrow a receiver – get the owner to bring it round, and help you!).

Once you have everything set, fire up your rig – but leave the heaters off so that it cannot transmit. If it's a solid state rig set the drive at minimum and connect a dummy load.

To start the operation connect a short length of coaxial cable to the antenna socket of the receiver and on the end of this attach a few inches of well insulated wire. Then position the insulated wire near to your rig's v.f.o. and tune this to about the half-way point on the dial with the **Clarifier** off. You should be able to pick up the v.f.o. on the receiver, and in the case of the FT-101E, this will be at about 9MHz.

To confirm that you have the correct signal, alter the v.f.o. tuning slightly and the pitch of the beat note in the receiver should alter. Next, before trying to carry out any adjustments, try gently touching an insulated probe* at any switches

It might seem to be easy to just change the p.a. valves, but it's prudent to carry out a few voltage checks at the same time.



This rig ended up being scrapped– just because the owner swapped the p.a. valves without doing some simple checks.

or relays in the clarifier circuit to make sure that they are not intermittent, and ensure that the VFO's frequency is stable.

With the clarifier still switched off, when you press the p.t.t. on the microphone the beat note should not alter. If it shifts by more than– let's say 200Hz – when you go over to transmit, either you have a fault or some adjustment is required, so have look at your manual. Rigs such as the FT-902 and the FT-101ZD don't have an adjustment, and so on one these rigs only a fault can cause this problem.

***Note:** An ideal and safe tool for this job is a good quality plastic chopstick. I always save mine when visiting the local Chinese restaurant!* ***Editor**.*

The FT-101 Series

On the old FT-101 series from the Mark 1 to the FT-101E, VR4 (marked '**Freq**' on the regulator unit) is the one to adjust and the FT-401 adjustment is also marked the same. You need to gently turn this – or whatever adjustment is listed in the alignment section of the manual – until the beat note pitch is identical in either mode.

Once you've got the rig transmitting and receiving on the same frequency, go back to receive and check that with the clarifier control at its centre position, the beat note is the same as it is with the clarifier switched off. If it's not there will usually be an adjustable pre-set potentiometer near to the terminals on the Clarifier control potentiometer (it's often suspended in the wiring), which will correct this.

Otherwise if you can't find an adjustment, and the discrepancy is small, you can cheat. This is achieved by loosening the screw on the clarifier knob and moving it round a little.

Some adjustments can interact! Next, you'll have to just double check that, with the Clarifier control set halfway, or switched off, you have the same beat note in both the transmit and receive modes. If it's so – you've finished! If anyone then accuses you of transmitting and receiving on two different frequencies, you could suggest that they purchase a copy of *PW* and check their own rig!

Good News For FT-208 Owners!

I often received E-mails asking if I have any batteries left for the FT-208, but I have been unable to help. However, **Dave Williams** tells me that they are available from **COMBAT- Alexander** at **346 Ashton Road**, **Oldham OL8 3HF**. E-mail **sales@combatalexander.co.uk** I hope this information will rescue someone.

More 'Harry's History'

By the late 1970s both the photographic and Hi-Fi sides of the family business in Blackburn were suffering from a rise in costs and competition from the discount houses. So I decided to concentrate my electronics department more on Amateur Radio. By this time we had two children, and we were finding it difficult to make ends meet.

Fortunately I was offered the job of teaching the City & Guilds Amateur Radio course at the local technical College. And whilst previously I hadn't taught anything apart from a Sunday School class, I jumped at the chance. The pay, by my standards, was quite fabulous and while talking for a couple of hours, after a full day at work at the shop, was hard going, I stuck at it for about six years. It helped us financially, and promoted the Amateur Radio side of the business.

Teaching really makes you think, and many times as I prepared a talk about something, which previously I thought that I'd understood, I found that I had to do quite a bit of reading to clarify matters in my own mind. (The same applies when writing for *PW*!) The experience was extremely interesting, and my students ranged from a high flying business executive with a string of letters after his name, who 'knew it all' and failed the exam, to people in their 80s with no technical background who worked hard and got through with flying colours.

Some of the students had specialist knowledge in various aspects of electronics, and I was always willing to learn. I don't know if things have changed due to the modern demand for air conditioning in summer, but when I was discussing component ratings, a 'mature student' told the class that the overhead cables on the national grid, were only intended to handle their maximum load in winter. Apparently they relied on being cooled by cold air and so as maximum load only occurred on cold winter days, they were rated with this in mind!

The main problem with teaching at the tech was that I was expected to know how the college administration ran. After about six weeks I collard one of the full time teachers and asked when I would be paid, it transpired that I had to fill in a claims form, but no one had told me.

As the term progressed I became concerned about the date of the exam, and as to how students entered, so I went and enquired at the Tech office. A rather snooty lady said "Ask your teacher", to which I replied "I am the teacher, and no one has told me". As it turned out it was lucky that I asked, as the deadline for registering for the exam was fast approaching.

Being a technical college meant that no expense was spared; the heating system was really 'cutting edge', with

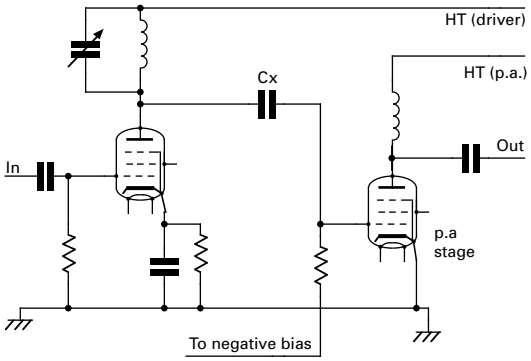


Fig. 1: If CX leaks or goes short it can cause extensive damage.

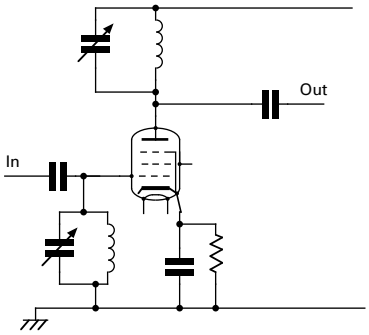


Fig. 3: Why is this circuit not used in the i.f. or r.f. stages of a receiver? Answer next time.

very hot water flowing round large black pipes. There was no way of turning it down and so if I wanted my students to stay awake, the first thing I had to do when entering the classroom, was to throw the windows wide open, even in mid-winter.

It's a Small World

In September 2011 Brenda and I had a holiday in one of the warm, quiet, and comfortable self-catering Lodges at Flowerburn near Rosemarkie, about 15 miles north of Inverness on the Black Isle not far from the main TV transmitter.

Just before setting off I contacted the Editor to let him know that I would be away for a couple of weeks, and Rob G3XFD told me that at one time he had worked in the IBA department responsible for u.h.f. TV coverage in the Highlands.

When we arrived I found to my surprise that three engineers from Portsmouth in Hampshire were occupying the lodge next to ours. They were visiting the Black Isle for a few weeks while they removed the old analogue equipment from the TV transmitters, presumably equipment which Rob and his colleagues had helped to plan, install and maintain?*

I didn't take any Amateur Radio equipment with me but the site is well elevated with an open path across the Moray Firth to the south. There are high trees, and plenty of space and the owner told me that an Amateur does visit regularly with a whole collection of antenna systems, now I wonder if Brenda.....?

**My work mostly involved Service Area planning investigations Harry. I really admired the station engineering staff's work – many of them were Radio Amateurs.*

Neutralisation & Replacing PA Valves

I still get quite a lot of queries about neutralising valves – so it's probably worth going over a few points **again**. Firstly, don't even think of trying to set up a valve p.a. stage unless you have a proper 50Ω dummy load, trying to adjust things whilst connected to an antenna, or any reactive load such as a lamp, will get you nowhere.

Fig. 2: This capacitor could be well past its 'use by' date, better to check carefully before using it.

Next, be sure that the p.a. valves you're using are suitable for use in a transmitter. Many of the earlier rigs such as the FT-101 Mark 1/B and E use television line output valves, most of which are okay – but some are definitely not. The American RCA company for example, marketed an 'improved' version of the 6JS6C which was intended to be more reliable when it was worked hard in television sets.

To achieve greater reliability the RCA's version of the valve had its cooling re-designed and small heat-dissipating fins were welded on to the control grid supports. Line output valves normally have only to handle frequencies just above the audio range and so this was great as far as the TV sets were concerned. But the extra inter-electrode capacity this modification introduced then caused problems if any attempt was made to use them as r.f. amplifiers.

I fitted a pair in an FT-101 and as they warmed up the set went into violent oscillation – even while it was in the receive mode. I had to switch off quickly as the p.a. stage was flashing over.

Customer '**Peter**' told me, "*I was having trouble, and so I fitted my spare pair of p.a. valves, there was a smell of burning and a cloud of smoke".*

I've often heard this story and have subsequently had to consign what had been a good rig to the scrap heap. So, my advice is that before you replace a pair of p.a. valves – do double check that all the voltages on the valve pins, especially the negative voltage on the control grids, are correct.

Almost all rigs that use valves in the final stages have a small capacitor that couples the signal from the anode of the driver valve to the control grid of the p.a. valves – see **Fig. 1**. If a rig is put back into use after a gap of a year or so, this component can almost be relied upon to leak or go short circuit, especially if it looks like the one shown in **Fig. 2**.

The p.a. valves are only prevented from flowing a disastrous amount of current, by the existence of a negative voltage on their control grid, when this capacitor fails a large positive voltage is applied, and the results can be catastrophic. Brand new p.a. valves will pass more current than old ones, and under these circumstances fitting them can turn a perfectly good rig into junk.

If the voltages are okay and the rig has no faults, simply swap your p.a. valves for an identical pair of the same make. You should then have no problem touching up the neutralisation adjustment. However, as I mentioned in the August 2011 issue, things are more critical at the h.f. end of the range. So, always start with the rig on 3.5MHz and then work gradually h.f.

I'll be discussing other possible neutralisation problems next month. But before then – take a look at **Fig. 3**, and see if you can spot why this circuit wouldn't function satisfactorily in the r.f. or i.f. stages of a receiver. See you next month! ●

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).

Roger Cooke G3LDI's Morse Mode
PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW
E-mail: roger@g3ldi.co.uk Packet: g3ldi@gb7ldi.#35.gbr.eu

Up the Creek Without a Paddle?

In this edition of *Morse Mode* Roger Cooke G3LDI discusses paddle keys and a new design that's made close by in his native Norfolk.

Fig. 1: The single-lever paddle key from Peter Raven G4KLM.

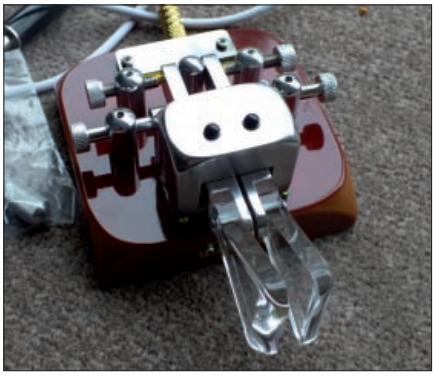


Fig. 2: Peter Raven G4KLM also produces a dual-lever paddle key too.

Welcome to the world of Amateur Radio on the key – *Morse Mode* (*MM*)! There are quite a number of different Morse 'paddle' keys on the market, and some have a very good reputation.

Some paddle keys are made to an extremely high finish and also come with a price tag to match. So, it's refreshing to see a new model in the market place, especially when it has been made by a local friend **Peter Raven G4KLM**.

Peter has come back into Amateur Radio again after several years of doing other things and has become very enthusiastic about Morse. Having an engineering background he decided to make a paddle and asked me if I would try it for him.

The Single & Twin Lever

The photograph **Fig, 1,** shows the single lever paddle and the photo, **Fig. 2** the twin lever. These example are prototypes and refinements will be made in future models.

Each paddle is hand made and as you can see from the pictures, they're made to a very high standard. The base is made from Tufnol™ (made from phenolic resin and woven cotton or linen fabric) and has been polish finished. The base is filled with a block of lead and each paddle weighs several pounds. They have non-slip base which really does stick to the desk.

I find it difficult to use the dual lever type of paddle, but using the single lever, it was pleasant to use, did not move around and was very sensitive in operation. Both models use magnets for 'springs' but Peter will be making a single lever using real springs which he says will make the action more positive. These will be adjustable and they both have a plate onto which a callsign can be engraved.

Refinements include providing each paddle with a fixed keying lead, fine-thread adjusting screws, a tool to secure the adjustments when made and providing the round or rectangular base for either key. Another nice touch is that the finger plates can be clear, opaque or one of several different colours to further personalise the paddle. They will also be available at a very competitive price. If you are interested in owning one of these, contact Peter G4KLM via E-mail to start with, at: **peter@zs757.plus.com**

Help With Morse

Hopefully some of you can assist with a request for some Morse help that came via an E-mail from **Ian Fulton G4XFC**, near Market Rasen in Licolnshire who said: "I have started a directory of experienced Morse operators to help any learners in their area at: **www.themorsecrusade.g5fz.co.uk/directory-of-mentors/**

"I would like to hear from any experienced Morse operators willing to help and be listed in the directory for their area. Could you please contact me if you are interested. 73 Ian Fulton G4XFC **ian@gm4xfc.plus.com** Webmaster **www.g5fz.co.uk** and **www.themorsecrusade.g5fz.co.uk** Member of Fists #13276, CTC, RAOTA & RSGB, RSGB Registered Morse Code Assessor"

Ambassador Programme

The next item came from **Steve Cocks G4ZUL** from **The Essex CW Amateur Radio Club (ECWARC)** and their **Ambassador Programme**.

"The Essex CW Amateur Radio Club (ECWARC) aims to try and connect with more members via local clubs. To this end, they are looking to appoint so called 'Ambassadors' for the c.w. mode in as many clubs as possible who will be aware of ECWARC and be able to disseminate c.w. related news in both directions.

"More details will be published on the news section of the ECWARC website. The club has recently joined the online social media network Twitter and occasionally Tweets about club activities and other related c.w. matters. If you want to follow this then the Twitter ID is (unsurprisingly) **@ecwarc** You can also let us know what c.w. activity you are doing via this mode.

"The regular ECWARC club nets on 3.542MHz ± QRM at 7.30pm local time continue on the first Wednesday of each month. Net control will rotate amongst members. On all other Wednesdays, a slower speed QRS net will be delivered on an ad-hoc basis when possible.

"It's hoped that those starting out may pluck up courage to join in the sessions for practice and that more experienced members will slow down and assist the newcomers". For further information please visit the club's website: **www.essexcw.org.uk**

Happy New Year!

That's it for this time – happy New Year, 73 and 'May the Morse be with you'! Roger G3LDI.

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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.

Bargain Basement adverts will now cost £5 per advert (subscribers still free) and will also be published in *RadioUser*, our sister magazine, unless requested otherwise.

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FAIRHAVEN RD-500 radio database professional receiver. 0/1750MHz no gaps and in good working condition. Any inspection welcome. Manual, power supply and remote control, no box, £225.
Tel: 01253 699839 (Blackpool).
E-mail: a.hulme66@btinternet.com

JANE'S MILLITARY COMMUNICATIONS £25 or WHY.
Tel: John G8BXO 01769 573382 (Devon).

KENWOOD TS-570DGE in good condition, boxed, manual. Phone to arrange a 'sked' to hear the same 'on-air', £450 ONO.
Tel: John Nash 01842 878669 (Norfolk area).

REALISTIC DX-394 u.s.b., a.m., c.w., general coverage communication receiver, £55.
Tel: Bob 01908 511709 (Milton Keynes).

SET OF HUSTLER MOBILE ANTENNAE MO1 vertical element plus short vertical and RM80, RM40, RM30, RM20, RM10 plus 3 way adaptor, instructions and carrying case. £150 Plus carriage, or collect, Cumbria. Portable aluminium antenna baseplate, 29cm square, four copper earth spikes plus lead terminated in a threaded mobile mount. (heavy). £30 plus carriage.
Email: g0tak@kencomp.net

TWO SMALL OSCILLOSCOPES hand or bench use. Velleman 12MHz BW, HPS-50. New, £150. Thandar Ex-Sinclair 1970/80, 10MHz BW. 1.5" CRT, SC110A, in good working order, £70. Postage included, UK. Tel: Mr Lucas 07829 751514 (Jersey, Channel Isles).

YAESU FRG-100 receiver, £200. Tel: John 01763 853608 (North Herts/South Cambs).

YAESU VR-500 RECEIVER FM/AM/SSB. 100kHz-1300MHz, boxed with instructions. Hardly used, £100 o.n.o.
Tel: Dennis G4NIF 01594 563316 evening or 01594 565565 work. (Gloucestershire).

YAESU FT-817ND £350. Yaesu FT-7800E, £130. Watson PSU Power Max 25-NF, £30. Watson W-420 SWR power meter, £20. Ralistic DX-394 receiver, £70.
Tel: Tony 01782 785124 (Stoke on Trent).

YUPITERU MVT-7100 hand-held scanner. Coverage 530-1650MHz. Complete with instructions, charger, desk stand and box. as new, little used due to sight loss, £130 including postage. Tel: Stuart 01535 635898 after 6pm.

WANTED

FL-50B TRANSMITTER in good working order to match my FR-50B receiver.
Tel Ross G4DTD: 01726 891320.

HAVE YOU GOT an unused Kenwood ATU 230. Idle, surplus to requirements. In good order. If so please contact me.
Tel: GW4XKE QTHR 029 205 12959 (Nr. Cardff).
E-mail: johnny-e@ic24.net

INFORMATION AND SCHEMATIC for Ambit (Cirkit) FM6Tx ISS2 PCB. Design believed by G3WPO possibly as a Worthing Radio Club project (A.K.A Wopobox). Any information, parts or details welcome.
E-mail: g4ipz@g4ipz.com

LOOPS FOR AOR LA-350 antenna. Medium wave and short wave required.
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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.
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USER MANUAL or photocopy for 1970 Grundig Satellit 2000 receiver.
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WIRELESS FOR THE WARRIOR volume four book.
Tel: John G8BXO 01769 573382 (Devon).

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Tel: 0208 391 0545.
E-mail: vincentvoy@hotmail.co.uk

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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 20% 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.

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YAESU FTC740A 4M TRANSCEIVER....£69
YAESU FT897 TRANS C/W ACCS....£849

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Heil	HTSS	Traveller Single Sided Headset + Boom Microphone & PTT control	£49
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Diamond	SX-400	140-525MHz 200W SWR,PWR meter	£75
Uniden	UBC-92XLT	25-960MHz (with gaps) AM,FM Hand Held Receiver + "CloseCall" 200Ch.	£79
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Kenwood	AT-50	1.8-30MHz 100W Matching Automatic ATU	£219
Microset	PT-105A	12V 5A (max) Protected Stabilized PSU	£35
Yaesu	VC-24	Lightweight VOX Headset + PTT & 3.5mm 4-pole Threaded Connector	£39
Yaesu	YSK-7800	Remote Mounting Kit for FT-7800 & FT-7900	£25
Yaesu	FT-950	HF, 6m All Mode Transceiver + Gen Cov, Auto ATU & DSP Audio filters 100W 12V DC	£949
AKD	AKD-4001	4m FM Mobile Transceiver Channelised 25W	£99
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Alinco	DX-70TH	HF,6m All Mode Mobile/Base Transceiver with Gen.Cov. & CTCSS 100W (HF & 6m) 12V	£429
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Icom	IC-R5	150kHz-1300MHz AM,FM & WFM Hand Held Receiver 1000Ch. + Nicads	£149
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Kenwood	TS-2000E	HF,6m,2m,70cm All Mode Transceiver + Gen.Cov., Auto ATU & DSP	£1,449
Kenwood	TS-2000X	HF,6m,2m,70cm & 23cm All Mode Transceiver + Auto ATU & DSP	£1,699
Icom	IC-E208	2m,70cm FM Mobile Transceiver 50W,35W + CTCSS, DTMF mic (Remote Head)	£219
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RADIOWORLD

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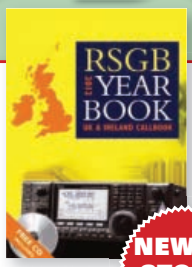

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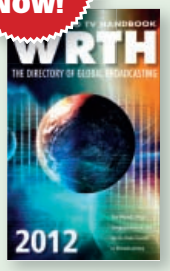

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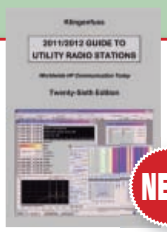

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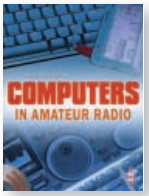

Radio amateurs have always been quick to embrace changes to their hobby to make operating easier or provide something extra. Computers are no exception and they have become essential tools to get the job done quicker and easier than ever before. But there is much that can be done with a computer and many are simply not aware of the huge potential they offer. Computers in Amateur Radio sets out to provide an insight into the wide range of amateur radio uses for the humble home computer.

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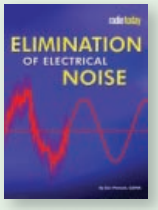

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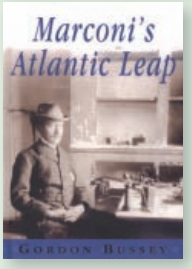

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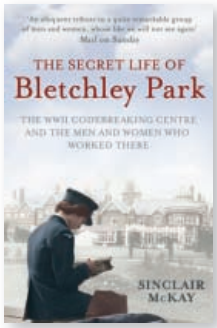

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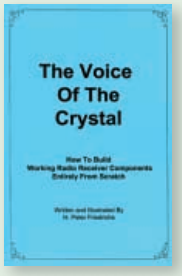

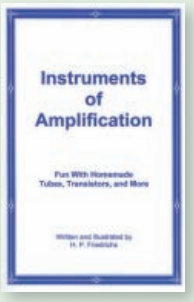

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Rob Mannion G3XFD writes: Peter Friedrichs has written a truly superb book but has chosen a title that really hides its 'light' under the proverbial bushel! Armed with the book an interested constructor can literally build a radio from scratch anywhere! 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**.

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Rob Mannion G3XFD/EI5IW's

Topical Talk

The Editor discusses the on-going search for the 'Magic' antennas after having some 50 year-old memories revived by a letter from Mike Mills G3TEV.

An effective antenna is of major importance to a successful Amateur Radio station and the letter this month from my friend Mike Mills G3TEV from Stroud in Gloucestershire emphasises this point. Incidentally, Mike was the author of the fascinating article about **J R Davies**, the author of the very popular *Radio Constructor* magazine's *In Your Workshop* featuring Smithy and Dick's electronics adventures for many enjoyable years.

The fact that everyone is looking for 'The' (perhaps 'Magic') solution to their own antenna problems led to a standing joke in the *PW* offices. Anyone who has shown an interest in writing an article on antennas has been told the joke – and I'll now share it with everyone.

It goes like this, "When it comes to antennas – everyone is looking for the antenna design that will work from d.c. to light, have 100dB gain in all directions, will fit in your hand and most importantly – cost very little!"

However, if we sit back and think about the 'joke' – it has a hint of reality. Everyone, and I mean everyone, dreams about (and sometimes tries to produce) the 'ultimate' antenna! However, speaking for myself I've got to say that my own attempts have always had to bear in mind my personal circumstance, garden size and the tolerance of my wife **Carol** who has put up with 'dangling wires' for nearly four decades!

Magic Antennas In The 1950s

Mind you, the search for 'Magic Antennas' goes back to the 1950s in my experience. One memorable incident involved my late Father **Bernard (Bob) Mannion** who was a skilled Civil Engineer. And although a clever man – I wish I had his natural ability with complex mathematics – he was once cleverly tricked into buying a 'Magic Antenna' at the annual Southampton Show, which was held on the city's huge 'Common' park.

I'll set the scene: it was in the late 1950s and Dad – with Rob and brothers in tow, stopped in front of an open air stand where two men – with assistants (some others were undoubtedly hidden in the audience) were cleverly demonstrating their 'product'. They were selling a 'Magic' antenna system that apparently worked.

The 'Barker' (the lead salesman) – I can still remember him standing on a little platform – well over 50 years later, waved the product around, extolling its virtues. The 'act' ended when he plugged the very short lead into the rear of a large table set sized valved radio (I think they may have used a battery powered set or had a generator nearby). The radio then burst into life – astounding everyone at the clarity of the reception.

Remember that most long and medium wave sets in those days had external antenna sockets. Even placing a damp finger on to the antenna socket would have provided reasonable reception in most cases. Placing a short screwdriver into the socket would probably have been as successful and cheaper!

Because of the 'Magic' effect the 'Barker' and his team immediately started selling the 'antennas' at 15 shilling (15s, equivalent to 75p nowadays but remember that petrol was about five shillings (25p) a gallon then). The antennas sold like hot cakes!

Many Years Later

Many years later when my parents moved house, we came across the 'Magic Antenna' and Dad and I laughed about it. He'd hidden his purchase as soon as we arrived home because it was quickly obvious that it consisted of a fairly low µF value capacitor in a plastic sleeve (military surplus I expect, costing pennies in those days) shorted out by a length of soft annealed iron florist's wire, with a short length of *pvc* wire and a wander plug at the other end.

Even with his limited knowledge of electronics Dad had quickly realised it was a con trick and we both enjoyed a chuckle together, many years after the event. However, I've never forgotten the 'Magic Antenna' and the fact that in 2012 most of us are still looking for its equivalent on the Amateur bands and – while enjoying my hobby and experimenting – I'll carry on trying to find the 'Magic' antenna for use at G3XFD, although I realise that if I ever find it – it will never fit in my hand and work from d.c. to light!

Rob Mannion G3XFD/EI5IW

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