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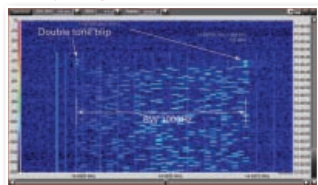
The BLA 350 Linear Amplifier Reviewed



A practical commercially made linear amplifier

Data Modes

More waterfall displays



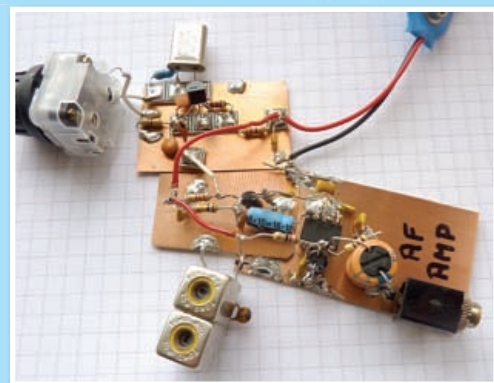
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Cleaning toggle and push button switches



The Bakelite Story

The history of a material that is prized by many vintage radio enthusiasts



Practical Way

A 'evening' receiver project using four construction boards

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Top Band in a Small Garden?

A shunt-fed loaded wire 1.8MHz vertical antenna

Antenna Advice

Antennas for the beginner and Radio Listener

Fractal Antenna Loading

A look at fractal antennas



WATERS & STANTON

Main Sponsors of the RSGB National Club of the Year

Yaesu FT-DX3000 160-2m All modes & a great full colour screen

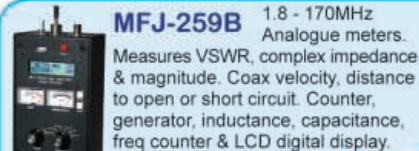


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MFJ-259B 1.8 - 170MHz Analogue meters. Measures VSWR, complex impedance & magnitude. Coax velocity, distance to open or short circuit. Counter, generator, inductance, capacitance, freq counter & LCD digital display.

£269.95 C

MFJ-269 Covers 1.8-170MHz & 415-470MHz plus 12-bit A/D for improved accuracy. Reads complex impedance, magnitude PLUS parallel resistance & reactance! Read coax specs & problems. Plus acts as generator & freq. meter. N connector. **£359.95 C**



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Builders of the Biggest and Best HF Array!

These Antennas will "outperform" anything else that you have of a similar size. They will also reduce many noise problems. Come and visit us and the designer, G0KSC, at the World EME Conference in Cambridge, 16-18th August - see: www.eme2012.com

The "LFA" Secret! The LFA is a major advancement in the development of the Yagi in recent years. The rectangular loop laid flat on the boom provides out-of-phase sections towards the element tips.

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- 6-LFA-144** 6 element 11.88dBi gain **£104.95 C**
- 8-LFA-144** 8 element 13.32dBi gain **£164.95 C**
- 9-LFA-144** 9 element 14.06dBi gain **£194.95 C**
- 10-LFA-144** 10 el. 14.73dBi gain **£227.95 C**
- 12-LFA-144** 12 el. 15.80dBi gain **£269.95 C**

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3-50-LFA 3 el. 50MHz 8.9dBi gain 20dB F/B Boom 2.14m **£119.95**
2-LFA-28 2 el. 10m 6.4dBi gain 13.5dB F/B Boom 1.28m **£159.95**
Big or small, HF or UHF, or Exposed locations: we can provide an antenna that does the job and has a guaranteed performance. All the gain, F/B, and side lobe specifications are proven, not generated in the advertising department! If you want performance and an antenna that lasts, look no further than Essex! That's the new world centre for antenna excellence.

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 performance 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 HF transceiver giving 100 Watts from 160 - 6m and includes auto ATU. **IN STOCK £779.95 D**



Jupiter-538CE 160m - 10m 100 Watts SSB CW AM FM with on-screen CW reader and socket for PC keyboard. **IN STOCK £1649.95 D**



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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 t/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 £3519.95 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**

OMNI-VII-588 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 £2699.95 D**

MFJ Auto ATUs - The BEST!

Enjoy fast, accurate & very low loss auto antenna tuning. Tunes in a second!

MFJ-925 Ideal For IC-7000/FT-857D



This compact auto ATU sits nicely under the IC-7000 or FT-857D. It's all you need for a complete automated station that will match any antenna! **£174.95 C**

MFJ-929 World's Fastest ATU



World's fastest compact auto ATU. The algorithm offers 132,072 solutions and instantly matches any antenna with near perfect VSWR. Get the best from your antenna! **£214.95 C**

MFJ-991B 300W Auto ATU



Handles 300W, fitted cross needle meter. Wide range: coax, balanced or wire. 300 Watts level matches 6-1600 Ohms, or 150 Watts with wider range of 6 - 3200 Ohms. **£214.95 C**

MFJ-928 Econo 300W Auto ATU



Here's a very economical Auto ATU. No metering, but lightning fast tuning with 20,000 memories and wide matching range. Leave it in-line and just forget about it! **£203.95 C**

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

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HF Linear Amplifiers

Alpin-100mkll 160m - 6m 1.3kW

New Low Price



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 600W power output running from a 1500volt HT line. This desktop design can easily be accommodated. 350 x 210mm Weight: 14.51kg

£899.95 D

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Radio has never been cheaper in real terms but that does not help if you are short of cash. So why not turn out all that old gear and part exchange it for what you really want. EVEN DEAD equipment has a value! Just call us on 01702 203353 or e-mail us your list of gear together with what you want to buy, at: sales@wsplc.com. We will give you an immediate quotation. That new radio is waiting.

New Kenwood TS-990S

The New FlagShip Radio From Kenwood



The new radio from Kenwood covers 160m to 6m and has an output of 5-200W. The AC supply is included and the rig even features PSK-31. It's a big desktop design and the US\$ price is expected to be \$5K - \$8K. So it is at the top end of the price range. There are no firm delivery dates yet, but it is hoped to have one working at Newark in October. PX welcome!

VHF UHF Mobiles

NEW TM-281E 2m FM 65/25W Mobile £169.95 D

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

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

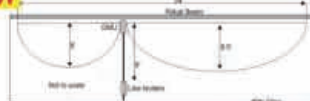
50 Watts 2m/70cms with APRS **£445.95 D**

TM-V71E

2m/70cm Mobile with Echo Link **£299.95 D**

Radio Works NEW 34ft Attic Antenna

NEW



Here's a great idea for those with a small garden or no garden! The attic is a smart alternative. It's dry, put of the wind and rain, and probably higher than you can erect an outside antenna. The above shows the antenna strung across the ridge of the roof. Coverage is 40-6m (inc WARC bands), and many internal ATUs can match it. Includes balun matching unit and antenna isolator. Ready built to go. Great value.

CW-COMPACT-40 Folded back el. 40-6m 1500W. min height 25ft inc balun & isolator. **£139.95 D**

SHORT-40 40-6m 1500W 50ft long inc balun and isolator **£134.95 D**

CW-COMPACT-80 Folded back el. 80-6m 1500W 69ft inc balun and isolator **£149.95 D**

CWS-80 Carolina Windom Special 80-6m 1500W 66ft long inc balun and isolator **£139.95 D**

CW-40 Carolina Windom 40-6m 1500W 66ft long inc balun and isolator **£121.95 D**

SHORT-160-SPECIAL 160-6m 1500W 100ft long inc balun and isolator **£147.95 D**

SHORT-80 80-6m 1500W 100ft long inc balun and isolator **£146.95 D**

Handheld Transceivers



ID-31E NEW

70cms D-Star handheld with built-in GPS, IPX7 submersible & D-Star DV mode, SD card slot, 1252 memories & 5W output. **£349.95 D**

TH-K20E & TH-K40E

Two new handies from Kenwood. "K20E" offers 5.5W output and rx from 136-174MHz. "K40" offers 5W out and rx from 400 - 470MHz. **£119.95 D each**



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



VX-6E 2m/70cms handy, 5W Wideband Receive **£214.95 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 triple band 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 & DTCSS 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. **£387.95 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! **£84.95 D**

YouKits QRP 80-40-30-20m CW Transceiver



HB-1B QRP Transceiver

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

WATSON

Made for Watson by MOCVO 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. **£54.95 C**



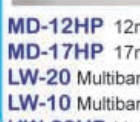
4:1-BALUN-1.5 1.5kW 1.8-30MHz A 4:1 1:1 Extra High Power 1.5KW current balun for Windom, off centre fed or folded dipoles. Reduces 200 - 300 Ohms at feed point of antenna to 50 Ohms enabling the antenna to be fed with 50 Ohm coaxial cable. **£54.95 C**



W-LINE 1:1 Line Isolator 400W 1.8-30MHz Removes RF from Coax. **£32.95 C**



1:1, 4:1-BALUN & 9:1-UNUN 400W 1.8-30MHz Can be used as centre feed point. Each model **£32.95 C**



MD-12HP 12m Mono for portable fixed station 400W CW 1:1 Balun 5.77m **£43.95 C**



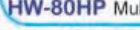
MD-17HP 17m Mono for portable fixed station 400W CW 1:1 Balun 7.95m **£43.95 C**



LW-20 Multiband HF long wire 9:1 UNUN 80-6m inc WARC 20m long 400W **£43.95 C**



LW-10 Multiband HF long wire 9:1 UNUN 40-6m inc WARC 10m long 400W **£43.95 C**



HW-80HP Multiband HF off-centre dipole 4:1 balun 80-10m 40m long 400W **£71.95 C**

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



K3 Series Transceiver

- 160 - 6m (2m*) 100W (10W*)
- SSB CW AM FM
- RTTY PSK31
- Compact and Lightweight

* Options



P3 Panadaptor

K3/100-F Built **£1999.95 D**
K3/100-K Kit **£1899.95 D**

The Affordable and Portable Elite Class Transceiver

Compact size weighing 3.6kg
Tuning steps to 1Hz
100 Memories
Stability +/- 5ppm
Antenna 50 Hms 50-239
Decode & Send Data Modes
Dual VFOs

Low level transvert I/O
Buffered IF out
IMD3 > 100dB typical
Blocking > 140dB typical
Image rejection > 70dB
Noise blanker - adjustable
8-band Rx graphic EQ

IF Shift and Width
Tx 200mW-100W (10W*)
100% Tx duty cycle all modes
True RF speech processor
Tx audio noise gate
Tx 8-band graphic EQ
SSB Tx bandwidth up to 4kHz*

Tx speech monitor
Extensive DSP
Full and semi, silent QSK
Adjust CW rise and fall time
Adjustable CW offset & sidetone
And lots more!

When you buy a K3 the journey has only just begun. You get a top performance transceiver that is becoming the favourite for DXpeditions and contests. It has a performance that would cost much more with some other brands, and you are in good company. The data modes can be run entirely without a PC. You can add a completely separate receiver, and get the P3 Panadaptor. Add an internal 10:1 VSWR ATU and sit it beside the 500W PA. Plus more to come!

K3 Options

P3 Panadaptor Kit **£709.95 D** Built **£759.95 D**
Plugs into the K3 and offers bandwidths from 200kHz down to 2kHz. Point and click instant QSY. Displays right down to noise floor.
KAT3 Internal ATU Kit **£319.95 D** Built **£369.95 D**
100W auto tune ATU that can match up to 10:1 VSWR
KRX3 Sub Receiver Kit **£599.00 D** Built **£649.95 D**
A completely independent receiver board 160 - 6m
K144XV 2m Transverter Kit **£299.95 D** Built **£349.95 D**
10W 2m high performance transverter. (FM Requires KFL3B-FM filter)

KXV3A Module Built **£129.95 D**
Offers separate Rx antenna, IF out and transvert interface
KBPF3 General Coverage Built **£169.95 D**
Provides input filtering for general coverage rx.
KPA500 Amplifier Kit **£1999.95 D** Built **£2199.95 D**
500W Linear Am 160-6m 230v AC - can be used with other radios.
KAT-500 Auto ATU Kit **£TBA** Built **£TBA**
A 500W auto at that will handle 10:1 VSWR - available in the Autumn

KPA500 500W Linear Amplifier



Built-in 230v AC supply and weighs 12kg. Super compact. Fits on any desk. Size 10 x 25 x 25 (cm) (4" x 10" x 10").

AR-8600MKII Desktop All-mode 160m-23cms Receiver



- Excellent Sensitivity
- All modes SSB CW FM AM
- Compact size
- LCD Digital Readout
- Keypad Data entry

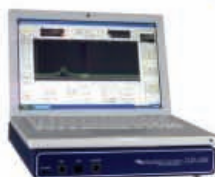
£699.95 D

Flex-3000 HF - 6m Inc. ATU



Are you missing out on the revolution? 160m - 6m with internal ATU. Live spectrum display and awesome performance.

£1379.95 D



Laptop not included

Flex-1500 HF - 6m Software Defined Radio



86dB dynamic range, 48kHz receiver display, USB cable, 5 Watts output. Low Cost Transceiver with Software Defined Radio Features and Performance This is a common theme for FlexRadio Systems' software defined radios - a focus on performance and exceptional value. And the FLEX-1500 continues that tradition for a transceiver in the sub £600 price class. A QRP radio that works perfectly with your laptop and a great driver for VHF/UHF transverting. Experience the excitement and wonderment of all modes and fantastic receiver performance for such a low price.

£579.95 D



KX3 All-Mode HF-6m 10W



KX3-F Built **£959.95 D**
KX3-K Kit **£899.95 D**

- Internal wide-range antenna tuner (ATU) & battery options; built-in speaker
- Advanced DSP provides dual watch, noise reduction, noise blanking, auto-notch, stereo audio effects
- Software-defined radio (SDR) architecture plus roofing filters (KXFL3) for excellent dynamic range
- Operates in data modes (PSK31/RTTY) with or without a PC; includes RX I/Q soundcard outputs

The revolutionary Elecraft KX3 puts the world in the palm of your hand! Despite its small size, it covers all amateur bands from 160-6 meters, operates in all modes, and has DSP-based features usually found only on larger radios.

The KX3's unique form-factor allows you to operate from anywhere. Fold out the rear tilt-feet for use on a desktop or picnic table, or add our rugged mobile mount bracket for vehicle use. For extreme portability, you can add the internal wide-range ATU, 8-AA cell battery pack with NiMH charger, and adjustable KXP33 keyer paddle. With a whip antenna, you can even operate hand-held.



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This month **Tim Kirby G4VXE** has an action-packed *World Of VHF* column and starts off with reports on some Cornish repeater and beacon antenna renewals.

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There's a strong whiff of delicious Manx Kippers in the air and the aroma heralds the entry of Carl Mason GW0VSW and his round-up of your reports in *HF Highlights*.

54 An Introduction to the 1296MHz Band

This month **Colin Redwood G6MXL** is determined to encourage his *What Next?* readers to try the 1296MHz band. Colin says that "Just because it's a microwave band – it's not difficult to start operating on 23cm!"

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Harry Leeming G3LLL says "It reaches the places other cleaners don't touch!" – and discusses the use of the well-known 'WD40' aerosol to explain what he means!

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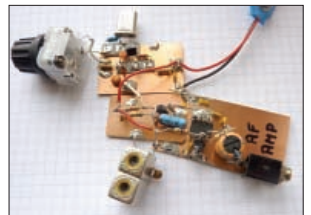
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Rob Mannion G3XFD/EI5IW's

Keylines

Rob G3XFD discusses the problems that Amateur Radio hobbyists face when hearing problems occurs – and how he is determined that his own increasing deafness won't spoil the pastime he's enjoyed for over 55 years!

During the many years I've been visiting Amateur Radio clubs, rallies and shows, I have always been aware that many hobbyists have continued to enjoy radio operating and construction despite increasing deafness. Many of the friends I have made over the years have coped well with the loss of their hearing due to age or ill-health. I have also met a number of people who have been partially deaf from birth – but have still been able to enjoy Amateur Radio.

My own hearing problems have worsened in the past few years and I now use some (extremely sophisticated) hearing aids that use digital signal processing (DSP) to overcome some of the problems. However, even though I have been wearing a prosthetic right arm for 50 years – getting used to electronic prosthetics worn inside the ears hasn't proved to be as straightforward as I thought it would be!

Even with the amazingly complex DSP software systems built into modern hearing aids – background noise (the hubbub of a club room for example with about 50 or so 'QSOs' going on at the same time!) can prove to be a difficult situation to handle. Despite this, I've found the benefits to be had from wearing hearing aids certainly outweigh the disadvantages.

As my hearing deteriorates I'm finding that it's important that I'm able to directly see the face and lips of the person I'm in conversation with – as lip reading plays

an extremely important role when hearing is impaired. I've also had to explain to a friend (a fellow Church Warden) that no hearing aid yet invented can allow me to hear her talking to me over her shoulder as she walks away (busy as usual!). She'd already commented that the hearing aids weren't helping me – but quickly saw my point that they couldn't 'hear over her shoulder'! Two-way communication requires effort at both ends of the link!

On The Air

I quickly discovered that operating on the air while wearing hearing aids proved that one of my fears was groundless – although they demonstrated another that I'd not thought of. I had been concerned that my Danish-made aids might react badly to the presence of relatively high power radio frequency (r.f.) energy. But I was very relieved to discover that they seemed impervious to the r.f. power levels I use.

However, I quickly found a problem that I hadn't imagined – when my DSP-equipped aids reacted to the sound of c.w. (Morse) being sent and received. The result was the the DSP circuitry in the prosthetics set up a 'ringing' tone effect, which I suppose is caused by the software 'searching' for the best filtering for the frequency being processed at that time. Fortunately, it's mainly apparent when I'm sending c.w. – not receiving it and adjusting the sidetone frequency helps!

Working 'phone using s.s.b. isn't usually a problem

because my aids are programmed to pass the frequencies my hearing range responds to most effectively. The same applies for operations on 70 and 144MHz using f.m. 'phone.

Unfortunately though, when conditions aren't good and the bands are busy – it can be difficult and during the last session with GB80PW I was glad of **Phil Ciotti G3XBZ's** help as he sat behind me. Phil has got elfin-like ears and they are very sensitive! (Thanks for your help Phil!).

Very often nowadays I'm on the air operating on PSK31 – enjoying the challenges this mode offers on the DX bands. I spend a lot of time talking in my work – and it's relaxing for me to let my five fingers 'do the talking'!

Many Radio Amateurs has risen to the challenge of carrying on enjoying radio as their hearing problems increase. An excellent example is **Martin F Jue K5FLU** of MFJ fame in the USA (He appeared in our *Radio Personality* feature). When he developed hearing problems – Martin got busy and designed an audio processing unit, which helped him and many others.

In the meantime I'm continuing to enjoy meeting readers – but you'll probably notice that when I meet you during club visits or at shows – I'll be concentrating on 'receiving you' by watching your lips. As I've already mentioned – two-way communication requires effort at both ends of the link!

Rob Mannion G3XFD/EI5IW

Practical Wireless

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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.

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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: rob@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.

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 call sign with your E-Mail. All letters intended for publication must be clearly marked 'For Publication'.

£20 Star Letter

Thank You & The ACF Radio Project

Dear Rob,

I would like to thank all those involved with the Bath Advanced Distance Learning Course especially my Tutor **Harry Weston M0SOP** who provided superb technical and moral support. Due to work commitments I had to take the exam early and **Geoff Brown G4WUA** from the **Wirral & District Amateur Radio Club** provided the venue at **Leasowe Lighthouse GB4LL**, an historic and interesting venue.

Geoff has successfully guided me through the Foundation Exam to M6MGB (I was his first student) and the Intermediate Exam as 2E0OAT. Without Geoff and his friendly welcome at W&DARC my initial enquiry would have remained just that. I was most impressed with the speedy turn around time of the advanced exam papers, I sat the exam on May 31st 2012 and I had my call sign M0WMD issued on June 8th 2012 – a first class service by the RSGB and Ofcom. Thank you.

My next goal is to become a registered Tutor as I hope to promote Amateur Radio to the Army Cadet Force Adult Volunteers and Cadets by organising courses at Foundation and Intermediate level to the local units that I work with. This is to compliment the military syllabus and Duke of Edinburgh's Award scheme the cadets already participate in to bring more young people into the hobby. I hope to calling "CQ SOTA CQ SOTA" on a Duke of Edinburgh's Award expedition very soon! Yours sincerely,

Rufus Binks M0WMD
Spital
Wirral
Cheshire

Office (I doubt the police would have any interest).

I've provided you with the full details of the UK company involved – but at this stage I suggest you do not publish their address, although I am happy that you publish this letter. The bottom line is surely – be wary of grey imports!

Ian McGarrigle G4JIU
Corringham
Thurrock
Essex

***Editor's comment:** I have made enquiries regarding equipment sold in the UK (and EU) that's sold with 'out of Amateur band' frequencies 'enabled' and as far as I can ascertain – it does not appear to be illegal Ian, although the whole subject seems to be a minefield of legal 'grey areas'. However, all reputable Amateur Radio businesses avoid selling such equipment. What is 100% certain is that operation outside the Amateur bands is illegal – and we should work together to ensure that the importing of equipment capable of 'working straight out of the box' outside our bands must be discouraged.*

Buying On-line & From Abroad

Dear Rob,
Page 9 of the May 2012 issue of *PW* announced the launch of the Midland CT-790 hand portable at £129.95. A search of the internet found a UK company offering the CT-790 at £105 with free delivery – so I ordered one from them instead. Delivery was prompt, less than 48 hours via DHL. So far so good!

On examination I discovered that my sample does rather more than it says on the box! The announcement says it covers 144-146MHz and 430-440 MHz. Mine however, has frequency coverage of 136MHz to 174.995MHz and 400MHz to 470.995MHz. Normally this would not

matter but mine **Transmits** over this range as well. Handy if you have a boat and a marine transmitting licence as well as an Amateur licence. But surely such a device is not legal in the UK? On arrival the paperwork shows that the company that dispatched the radio has an address in Larnaca Cyprus.

I sent an E-mail to **Nevada Radio** in Portsmouth who responded to say that the batch they have cover the Amateur bands only and have not been expanded like mine has.

As a responsible Amateur licence holder of many years experience I will not use it outside the Amateur bands but in other hands the outcome is not so sure. I intend to bring this to the attention of my local Trading Standards

The Aberdeen ARS Acknowledges On The Air Co-operation

Dear Rob,
We often hear in the Amateur Radio Press about the loutish behaviour of some of our colleagues on the air, especially during contests, or pile-ups. However, during the recent Olympic Torch WAB event my club, the Aberdeen Amateur Radio Society, put on a station in Corgarff, WAB NJ 20, in North-east Scotland. We were sure we would get a pile-up but we were keen to give operators on Foundation, Intermediate and QRP stations a fair crack of the whip, so from time to time we asked for these stations only. We were both surprised, and delighted,

that our callers kept quiet and did indeed give the lower power station a chance. I would like to pass on our thanks to them for their co-operation and for restoring our faith that we can be considerate to our fellow Radio Amateurs. Regards.

Fred Gordon GM3ALZ
Strathdon
Aberdeen
Scotland

Editor's own acknowledgement:

I'm not at surprised by the level of co-operation shown to your club activities Fred because I have recently experienced your own courtesies – which are absolutely first class themselves. When I visited you on June 7th I was met from the train and was looked after by Allan Duncan GM4ZUK and we shared a great breakfast together. Later Colin Burnet GM4TVB (President of the AARS) collected me from the excellent hotel you arranged for me and we enjoyed 'High Tea' together. The welcome received before, during and after the PW club talk was wonderful. Such an outlook reflects well on your club and I'm sure other Amateurs are aware of your superb hospitality. Thank you.

Jubilee Operations From GQ0IUE & My QSL Card

Dear Rob,
I read in the July edition of PW that you would like to see images of Jubilee QSL cards – so I have attached mine. I made the QSL design from scratch using a company called Vistaprint with info on both sides of the card. It's very simple to do really and cost me about £19 for 100 cards.

On the air I made about 200 QSOs, mainly international with my GQ call and have received a number of cards direct along with International Reply Coupons which really confused the Post Office Staff at Corsham Post Office when I went to use them (apparently Royal Mail no longer issue them but will honour any presented to them from overseas). Hope you like my card – it's basic but usable! 73

Jon Wheeler GQ0IUE
Melksham
Wiltshire

Editor's encouragement: Well done John! Any more experiences

Kangaroo Island International Lighthouse & Lightship Weekend

Dear Rob,

Myself and six other Radio Amateurs are travelling to Kangaroo Island, South Australia this year for the International Lighthouse & Lightship weekend, and we will be operating from the Cape Willoughby lighthouse.

Due to our trip, I have written a short article of our proposed trip and a powerpoint presentation for my local Radio club. As a result of researching the ILLW, I have found quite a bit of contradictory material regarding exactly which year the ILLW started. I believe it may have been 1993/1994?

From what I have read that **Anne OZ3AE** (can't find her on **QRZ.com**), wrote a letter to *Practical Wireless* (possibly circa 1994/1995) asking if there was any Amateur Radio activity from lighthouses. And it was due to this letter, that the event became international and the name changed from the Northern Lighthouse Activity Weekend, to the International Lighthouse & Lightship weekend.

Is there any way of tracking down what issue her letter appeared in, and if so, obtaining a copy? Any help you could provide would be greatly appreciated. Various websites including the ILLW site, have conflicting info and dates, and I would very much like to once and for all find out the accurate details of the event. Best wishes.

Paul Simmonds VK5PAS
Mount Barker
South Australia
simmopa@iprimus.com.au

Editor's reply: I'm sure our readers around the world will come up with some information Paul although – at the moment – I can't find any information on Anne OZ3AE, will come up with the information you need. I wish you well during the expedition!

readers? Please send your QSL cards and comments to me via **rob@pwpublishing.ltd.uk**

Viewing TV Years Ago

Dear Rob,
Several editions of PW ago, you asked for memories of watching TV in the early days. If I begin to bore, you know where the delete button is!

In November 1950 – (I remember seeing the Lord Mayor's show), – I attended a two weeks course in London and stayed with good relatives in Uxbridge. The gentleman of the house worked at GEC or Marconi I believe and had built a kit of parts available to him in his home. It was a huge wooden structure in the corner of the living room, which I think they called 'the coffin.'

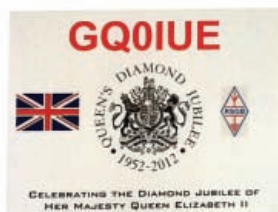
Everybody had to be ready after the meal and the washing up done and we had to be sat down at 1755hrs. There was a warming up period for the seemingly large number of valves which glowed in the dark. The small 9in screen high up in this cabinet seemed to take a long time to get to an operating brightness after switch on. All lights had to out I think.

Then came the famous mast from Alexandra Palace together with the famous tune. Sylvia Peters followed the test card and explained the programme for the night and also introduced the items. Nobody moved except for essential supplies until the station closed down at 2300 hours I think. No alternative programmes. We watched until the bright white spot disappeared, some of us full of awe and wonder.

At 82 it still has a fascination from so long ago. I am still friendly with the son of the household and we still talk about those days from time to time. He's still in Uxbridge and I'm in Bolton. Regards to you and the PW team, 73.

Malcolm Worrall M1AWC
Astley Bridge
Bolton
Greater Manchester

Editor's comment: Thanks for your memories Malcolm! The first non-VCR97 equipped TV I remember (1957) had a CRM-92 c.r.t., which was non-aluminised and had a 2V filament. I think it was the last c.r.t. manufactured in the UK without an internally rear screen-deposited reflector (the aluminising). I remember we had to watch in the dark too! Any more memories readers?



Thanks For The Meeting!

Dear Rob,
After I missed you on your May trip to the **Caithness Amateur Radio Society** in Wick, I was delighted when you E-mailed me to say you were coming up to Inverness on June 8th after your trip to the **Aberdeen Amateur Radio Society** the previous evening.

Even though you were on a private visit – you found time to chat to me over a cup of coffee. Unfortunately though, as you discovered – your train trip from Aberdeen to Inverness was very crowded because the Rock Ness pop festival was under way at Loch Ness-side.

I enjoyed our meeting and I am also going to try to get down to the Newark Hamfest later this year – combining it with a visit to my brother who lives in Doncaster. Thank you for finding time in your busy schedule to meet me and enjoy a ‘crack’ together. Best wishes.

Andy McDonald
Raigmore
Inverness
Scotland

Editor's comment: It was my pleasure Andy! In future I'll make sure I mention when I'm in an area visiting clubs – I'll be delighted to meet others in a similar way when I'm on my travels. I'm also looking forwards to meeting you at the Newark Hamfest.

The Armagh Observatory ELF Receiver

Dear Rob,
Thank you for sending me the PDF with all the details of the ELF receiver project from **James Finnegan G14FFL** – as mentioned in his letter published in the July issue of *PW*. I found that the project from James was most interesting and comprehensive. I'm also a listener although I feel I have much to contribute to the hobby.

I must also mention how surprised how quickly I received the details from you. Within three hours of E-mailing you I had them! Thank you.

Ron Haskins
Penwortham
Preston
Lancashire

Editor's comment: I hope you're successful with the project Ron. There's been quite a bit of interest and the information is still available by request for other readers.

My Personal Experience As An M3

Dear Rob

For the last 6 months I have been reading *Practical Wireless* and I wanted to share my personal experiences since becoming an M3 licence holder in October 2005. To begin with it was all rather daunting yet exciting. I was fortunate to be loaned a h.f. radio and a dipole from my tutor, **Jim Harris G4DRV**.

Before long I was getting lots of QSOs. My first “CQ” call was answered by an operator in France, F5VBX. It was a really good contact and we spoke for a good half an hour.

Eventually I bought my own radio – a Kenwood h.f. rig and an Icom v.h.f./u.h.f. set-up and enjoyed using the local repeater GB3LR.

I wanted to have an all in one set-up so I sold my radios off and put the money towards a Yaesu FT-897D. I got it when I was in America on holiday and soon set up a dipole for 20m. My tri-bander was still up and so I checked it out and plugged into it and off I went. I now have a 4m rig connected to a $\lambda/2$ with a $\lambda/4$ feed-section J-Pole antenna as well as my trusty Yaesu FT-60 hand-held.

My local club is at Newhaven Fort in East Sussex with the callsign GB2NFM, and most weekends (in the summer) you will find people on the hill at a place called Firlie Beacon. I'm usually there with my inverted-V tuned for 20m as well as my longwire. The enthusiasm and help from other operators is excellent.

It was on an occasion at the Fort that I actually sat alongside someone sending Morse code. It was **Don Wallis M0ZDW**, who was on the key. I told him that I have always wanted to learn Morse code. He printed me off the letters and numbers and said for me to get in touch with him when I knew what they were in Morse.

Three weeks later I was meeting on air on the slow Morse frequency 145.250MHz on a weekly basis. I have been doing this for at least five months and I'm slowly getting there! I have good teachers in Don M0ZDW, **Graham Moore G0IOF**, **Denzil Roden G3KXF** and **Tony Webster G4FZF**. We send Morse on audio via f.m. I find that sending is the easy bit – receiving, well....need I say more? I have a few stubborn letters that keep catching me out. But not for much longer. (I use a Czech Army straight Morse Key).

I don't worry about the limited power level – it's a challenge. Yet, when the bands are open it doesn't really matter. I have had Japan last year on 10W, JS3CTQ, Indonesia, YC6NE, and America and Canada whenever they have their beams pointing in this direction.

I constantly build home-brew antennas and read books and ask people and have a go trying things out. I was 51 in April this year and am proud to be called an Amateur Radio Operator. The M3 is a licence classification and does not represent the person as a whole. With guidance, support, experience and encouragement from the Amateur Radio community Foundation licence holders can (and do) become good radio operators. ‘Putting anyone down’ stops that process.

Thankfully people who lead in the development of radio operators are found everywhere in operators of all ages and licence class. Only once did someone express their dislike of me as a Foundation licence holder. I just changed frequencies while they were talking.

I used to be a diving instructor and there were many qualifications and levels of competency and standards that I had met along the way. However, I never lost sight of the fact that once I was underwater and diving for fun, I was just another diver like everyone else. It was a great equaliser – just like Amateur Radio.

I have always been made to feel welcome and feel part of a great bunch of people. I even get asked for advice. (Me an M3!). However, I don't regard myself as ‘an M3’ – instead I'm an Amateur Radio operator. And proud of it.

Happy DXing and thank you *PW* for being an excellent magazine. It was also a pleasure to meet you at the Kempton Park Rally recently! 73.

Mike Daniels M3ZZA
Peacehaven
East Sussex

Editor's comment: Mike I'm sure – with your attitude – you will progress steadily through the hobby and I'd like to ask you to keep me up-dated on how you get on. Personally, I think you'll find the Morse very useful – just like learning another language you'll find it opens new gateways for you on the air. Good luck!



News & Products

Send your info to:

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

E-mail: newsdesk@pwpublishing.ltd.uk

Two New Products From Martin Lynch G4HKS

Marting Lynch G4HKS from ML&S contacted *Newsdesk* with the news of two new products: "ML&S are pleased to have on show the new ACARS decoding firmware upgrade for the SBS-3. This Beta release provides internal ACARS decoding on any of the 4 SDR channels within the SBS-3 itself. **Sanderly Jeronimo**, ML&S's customer technical support manager has this on demonstration over three of the 42in screens located in the entrance to the company. Better still, the upgrade, to enable the ACARS decoding, is totally free to owners of the SBS-3.



"The second new item is the Flex radio Flex-6700. Announced at Dayton in May, the new 6000 range of 'SmartSDR' transceivers will be available later this year. ML&S will one of the first main dealers to have all three new models on display and working in store".

Best Regards

Martin Lynch

ML&S Martin Lynch & Sons Ltd.

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New RSGB General Manager

Newsdesk received the following announcement from **Dave Wilson M0OBW** the President the **Radio Society of Great Britain** (RSGB): "In November last year we informed the membership of the financial and organisational challenges that faced the RSGB and presented our vision for the future of the Society. The Board has been working on developing that strategy and is in the process of building financial, operational and governance models in preparation for consultation with staff, volunteers and members.



One clear conclusion from our work is that we will need strong, dedicated leadership for the operational activities of the Society and I am pleased to announce that **Graham Coomber G0NBI** has been appointed as General Manager of the RSGB. Graham's role will be to work with the Board to develop and implement the strategic vision and the changes needed to create a financially sound, membership responsive, Society.

Graham, who holds an MBA from the London Business School, joins us from a successful career at senior levels in Healthcare Management, including as CEO of several Health Authorities, and in consultancy assignments in South Africa. He brings experience of senior general management roles, strategic planning and transformational change.

Graham is an active Radio Amateur, with interests in both the DX and contesting arenas. He has also worked for the RAIBC (the Charity for Disabled Radio enthusiasts) and has an interest in Worked All Britain (WAB). He also holds the Greek callsign **SV0XBA**.

Commenting on his appointment Graham said, "I'm particularly pleased to be joining the Society at a time of significant change. My career has included periods of transformational change and it is at times like this that a real contribution to shaping the future can be made. I look forward to working with the staff and volunteers to confirm the RSGB as a leading light both nationally and globally in the world of Amateur Radio".

Graham takes up his appointment immediately and will initially be undergoing a short period of induction. He will work with the previous Acting General Manager, **Don Beattie G3BJ**, to ensure a progressive and smooth hand over of responsibilities.

I should like to put on record the Society's enormous gratitude to Don G3BJ for 'holding the reins' for the past 14 months.

Dave Wilson M0OBW, President, The RSGB, 3 Abbey Court, Priory Business Park, Fraser Road, Bedford MK44 3WH

Stop Press! Ofcom Authorises Use Of Parts Of 144MHz For Olympics

Colin Redwood G6MXL reports for *Newsdesk*, "On June 15th, the UK Regulator Ofcom announced that a block of frequencies in the 2m band ranging from 144.0125 to 144.1375MHz, excluding the 144.0500MHz (the c.w. calling frequency) and 144.1000MHz (Perseids Meteor Scatter c.w. Calling), will also be authorised for Olympic Games purposes in the London area only using handheld transceivers running no more than 5W. The period of this authorisation is from July 27th to August 28th 2012 only.

Other restrictions on parts of the 70cm, 13cm and 9cm bands covering a number of geographical areas and dates were detailed in the July issue of *PW*."

Editorial note: Ofcom has also reminded Amateurs with the interesting warning that their licences only permit them to exchange messages with other licenced Amateurs in the Amateur Bands!

For more information refer to the Ofcom web site at http://licensing.ofcom.org.uk/radiocommunication-licences/amateur-radio/ar_spectrum_use/

Air Cadets Exam Pass To Be Equivalent To The Foundation Licence Pass

Barry Maxwell from the **Radio Communications Foundation** reports, "The RCF is pleased to announce that agreement has been reached with the **Air Cadets Organisation (ACO)** to accept a pass in their ACO Radio Communications Foundation Equivalent examination as being equivalent to a pass in the Foundation Radio Amateur examination.

Ofcom, the UK Regulator has also accepted that the ACO FE examination syllabus meets the Radio Amateur Foundation level requirements and will issue a Radio Amateur Foundation level Licence via the **Radio Society of Great Britain (RSGB)**, on receipt of a successful Air Cadet candidate pass details.

The RCF understands that the RSGB is offering those under 21 who achieve their licence through this route a year's free membership of the Society. The vision of the RCF is to bring the benefits of radio to young people and to encourage the use of technology. The RCF is delighted with this agreement as it completely meets this objective and it is inspiring that young Air Cadets may set out on a lifetime of enjoyment of the hobby through this agreement.

The Radio Communications Foundation

The Radio Communications Foundation is a Registered Charity established in 2003 with the objectives of supporting people and projects where radio communications through the expertise of the Radio Amateur is the theme. In 2007, the Office of Communications (Ofcom) signed an agreement with the Foundation for the management of the examinations required to obtain an Amateur Radio transmitting licence. The Radio Society of Great Britain administers these examinations in accordance with standards defined by the Foundation. See www.commsfoundation.org

For further information contact **Barry Maxwell**.
secretary@commsfoundation.org



Telford's September Hamfest & PW Stand

Martyn Vincent G3UKV called *Newsdesk* to issue a reminder of their September rally, "Telford & District Amateur Radio Society have organised a radio rally at this time of year since 1978, and although attendance is less than it was in the early heyday years of rallies, hundreds of enthusiasts still come along to spend a few quid, meet old acquaintances and make new friends. We try to be a friendly, but efficient bunch of organisers, and offer something more than a series of trade stands to attract our visitors, even though we highly value traders' wares and services.

Light Communications Demonstration

This year we have invited **Stuart Wisher G8CYW** to give a presentation and demonstration of 'Light Communications' at our latest Telford HamFest. Stuart has become a guru of this form of 'wireless' communication, which doesn't even need an Ofcom licence to experiment with legally. Distances of almost 120km have been achieved this year, using modulated red light and not always requiring an entirely line-of-sight path between two experimental stations. We hope Stuart's presence will attract many more people to come to our event and enjoy his presentation – he has a high reputation as an excellent speaker.

"I ask that *PW* readers to put **Sunday September 2nd** in their diaries, especially as *PW* are booked to attend! 73. Further details from;

Martyn Vincent G3UKV

Tel: (01952) 255416

E-mail: ukv@ukv.me.uk

Elecraft Equipment To Be Imported By Waters & Stanton

Jeff Stanton G6XYU from Essex-based **Waters & Stanton PLC** announced in a press release that, "For the past several years we have approached the owner of Elecraft Inc, USA, – **Eric Swartz WA6HHQ** – at each Dayton Hamvention to be allowed to sell his fine products in the UK. Each year his product range has grown – together with our frustration – when he has chosen to sell direct only! This year our pitch was successful and we were appointed as official reseller for the UK. The popular K3 transceiver ready-built will be available from us by mid-summer."

Jeff Stanton's partner - the founder of W&S – **Peter Waters G3OJV** comments, "I built an Elecraft K2 transceiver several years ago and have always been impressed by its performance and value for money"

Jeff Stanton continued, "at W&S we are regularly asked if we can supply the latest K3 transceiver with accessories – and now we can. We plan to sell ready-



built transceivers at competitive prices with local support and then add to the range"

Note: All products now have the CE approval and the K3 100W transceiver is available now. New KX-3 QRP transceiver coming soon. A 500W lightweight solid-state linear amplifier is available now. Further details from;

Waters & Stanton PLC

Spa House

22 Main Road

Hockley

Essex SS5 4QS

Tel: (01702) 206835

FAX: (01702) 205843

E-mail: sale@wsplc.com

Website www.wsplc.com/

Geoff's Challenge At The Poole Radio Society G4PRS

Bill Coombes G4ERC, the Secretary of the **Poole Radio Society** writes, "An annual event at the Poole Radio Society G4PRS is Geoff's Challenge. This year **Geoff Fowle M0CJC** challenged members to produce a replica Paraset, the transceiver used during Second World War by the Resistance and for other covert operations. Two members, **Alan Stepney G8BLW** and **Colin Davis G0JII**, rose to the challenge and entered their version of the wartime classic, which were judged on Friday May 11th.

"Alan G8BLW used an old suitcase that he found in his loft in which he had stored relays. Into this, he built a four-valved set consisting of a three-valved transceiver and a power supply running from a 12V battery. To make it as authentic to the period as possible Alan used a vibrator type inverter circuit (typical technology of the period), a 6-0-6V, 250V transformer and an EZ91 rectifier valve to produce the high tension supply needed to power the valves. He had deliberately used a fourth valve so that he could series/parallel the heaters and use the 12V battery to power them to save wasting power through resistor droppers. He made a metal front panel that he finished with a black 'crackle enamel' and fitted a home-made Morse Key and slow motion drive to finish it off. Using a 7.030MHz crystal, he was able to produce a 1W c.w. signal into the antenna. Alan also used a set of S.G. Brown headphones to listen to the receiver. The set worked very well and was nicely finished.

"Colin Davis G0JII built his replica set in a small suitcase that he had spare. He got details of the Paraset from the Internet and made a front panel complete some ex HRO valves and he powered the heaters to make it look realistic. Inside of the case Colin had fitted a modern MFJ QRP Cub Transceiver that he had recently built. On the front panel, he fitted a slow motion drive that operated the QRP kit inside the case. He could transmit and receive on 20 metres using c.w. and it worked very well.

"Alan G8BLW won the challenge as Geoff felt he had produced a set that was the nearer to the real thing. He won the £50 annual prize construction bursary, made up of £25 from the Poole Radio Society and £25 from **Rob Mannion G3XFD**, Editor of *PW*.

"Geoff will be setting another interesting challenge for the coming year and we are waiting for details of this with bated breath!"

Further from Bill Coombes G4ERV via E-mail: secretary@g4prs.org.uk



Fig. 1: Alan Stepney G8BLW's winning entry – a modern replica of the Second World War Paraset. Judge and sponsor of Geoff's Challenge' – Geoff Fowle M0CJC told the audience that Alan had "produced a replica that was the nearest to the real thing".



Fig. 2: Colin Davis G0JII's replica Paraset even had valves with heaters that illuminate! – It is a cleverly disguised modern MFJ Cub h.f. c.w. transceiver for 14MHz, built into a modern suitcase.



Fig. 3: Chairman of the Poole Radio Society Phil Ciotti G3XBZ (left) and Geoff Fowle M0CJC (centre) present the £50 Bursary Prize and the "Geoff's Challenge" engraved glass plaque trophy presented to each winner (to be held for one year) to the 2012 winner Alan Stepney G8BLW.

Martin Lynch Offer Amateur Radio Mobile Installations At Chertsey Headquarters!

Martin Lynch G4HKS contacted Newsdesk with his latest up-date, "We are delighted to re-introduce their fitting service for all mobile transceivers or in-car accessory to customer vehicles. Installed by a professional member of the ML&S team with over 20 years of experience in automotive in-car experience, this has already proved hugely popular with customers travelling hundreds of miles to get their mobile installation fitted properly."

The work is carried out on site at Chertsey and ML&S are able to offer installation of any v.h.f., h.f. rig or in car accessory that they supply. This includes the excellent range of BlackVue in-car cameras, Pogo Alert+ GPS safety camera detectors, parking sensors and any of their Amateur Radio or commercial radio products.

The service is offered only on a by appointment basis and simple installs can range from as low as £50 for an accessory and £100 for a v.h.f. f.m. transceiver. These prices exclude VAT and any parts that may be required. For more info see their appointment page: www.hamradio.co.uk/carinstallation.php

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New Heil ProSet-3 Stereo Headset At Waters & Stanton

Peter Waters G3OJV of Waters & Stanton E-mailed *Newsdesk*, "We are now appointed as the sole UK distributors for both Heil Professional and Amateur Radio products. For professional users, we have created a new website: www.heilmicrophones.co.uk

"We are now stocking the new Heil ProSet-3 stereo headset. This is intended to offer high quality sound production and excellent acoustic isolation of external sounds. The headset folds, making it ideal for carrying around and doubling up for portable audio use. In this respect, there's a dedicated iPod lead included as well as separate straight and curly detachable leads, that can individually be plugged into the headset. The nominal impedance is 32Ω and this works well with all standard Amateur Radio equipment. Retail price is £99.95.

Regards. Peter G3OJV.

Waters & Stanton PLC

Website www.wsplc.com/



Book Review

CQ-GTQM

The Diary of a Maritime Radio Officer

by Ross Bradshaw G4DTD

Re-published by PW Publishing Ltd.

Rob Mannion G3XFD writes: **Ross Bradshaw G4DTD** is a fascinating character who has led an interesting life in radio communications! We're pleased to have recently published his story of the work he did on behalf of the Diplomatic Wireless Service in *PW* and it – for good reasons – proved to be much appreciated by our readers. Ross uses his sharp and sardonic sense of humour well in the introduction of the *Diary of a Maritime Radio Officer* and also mentions the fact that like the Dodo he is extinct. But unlike the Dodo – he has become extinct twice! This is because both his professions – that of a Maritime Radio Officer and his work as an Operator with the now closed Diplomatic Wireless Service (DWS) have now disappeared entirely. In fact, Ross can proudly claim to be an historical relic!

After a false start in his career in radio operating training and following service in the Army, Ross eventually starts his sea-going career just as the British flagged Merchant Marine fleet was just beginning its spiral of decline. Struggling with remarkably low powered (and sometimes ancient) transmitters and receivers the author soon discovers that he had something in common with Admiral Lord Nelson – in that he was seasick much of the time! In fact, I was left with a feeling of admiration for the 'Bradshaw Spirit' as he endured the *Mal de Mere*. Anyone who has suffered during passage of the English Channel, Bay of Biscay or the Pentland Firth – will know just what he went through! However, bad weather seemed to follow the author on his travels – but there were some good times too and the diary is liberally sprinkled with interesting descriptions of places seen and bypassed (and some to be avoided too!) by Ross on his travels!

The author has a decidedly 'salty' choice

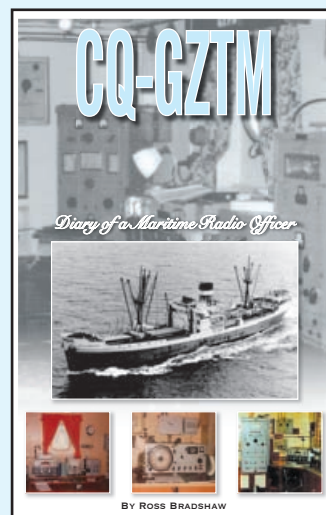
of language to accompany much of his memoirs and his strong character and forthright opinions have soaked through the account of his adventures. His buccaneering spirit shows through too – quite appropriate for someone who seems to have had a lasting fascination and intimate knowledge off the pirates and freebooters of the 'Spanish Main'.

Along with his forthright opinions and language the author keeps the reader informed of the habits and traditions of the seafarer. Both Bordellos and prostitutes make their appearances and the medical consequences (for some 'users') are also featured. This is the real story of life at sea – and no holds are barred by Ross in the telling!

On the radio operating side Ross effectively conveys the daily difficulties he encountered when he was 'deep sea' and trying to raise Portishead Radio in Somerset due to propagation conditions. Other problems – including radio operators who closed down for 'siesta time' (who were often encountered).

Alcohol – and its associated problems of 'over imbibing' during long boring periods at sea and at anchor are well chronicled. This is described with the surprising news of the demand for alcohol from Port Officials and dockside workers in supposedly 'dry' Islamic countries!

During his time at sea Ross Bradshaw encountered many different types of radio and electronic failures and overcame most of them due to his extensive technical knowledge. However, one problem he



couldn't overcome were the often 'quirky' characters operating the equipment! Sometimes the 'faults' were actually due to the 'characters' operating the equipment – and eccentric Captains were often dreaded by the Radio Officer!

Tragedy stalks the seafarer everywhere – and occasionally through his notes the author conveys the tragic loss of life when a ship

founders. Sometimes he was just a radio 'witness' but on occasions he knew either the ship or its crew and this really draws attention to the vulnerability of those at sea – even on modern ships!

Now that Merchant Navy Radio Officers have disappeared from the maritime communication scene I felt very privileged helping to prepare this fascinating insight into what sort of life it was. Full of adventure, some boredom, much bad weather, technical nightmares and incredible characters – I heartily recommend this book to our readers. It provides a great adventure in reading and **I swear I felt my computer desk move** during the Storm Force 10 weather encountered by Ross G4DTD in the Baltic Sea as I prepared the book for press!

Originally published in 1998 and re-printed in 2005, this edition has been re-designed and improved so maybe you missed it first time around or would like a new copy, it's a great read!

Priced at £16.99 – available soon from the PW Book Store – pre-order now to reserve your copy!

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Roger Cooke G3LDI takes a look at a practical commercially made linear amplifier – the first to be reviewed in *PW* for many years.

The BLA 350 Linear Amplifier



Fig. 1: The rear panel has just r.f. input and antenna connectors, both PL-259, and push to talk (p.t.t.) and ALC phono sockets, together with an adjustable potentiometer near the ALC socket.

The BLA 350 linear amplifier seems to be very popular at the moment and all imports are quickly sold out, so I was very pleased to have one to review. Even this one has to be returned to **Nevada Radio** in Portsmouth (the UK importers) as quickly as possible – so I had to make maximum use of the time I had it with me here in Norfolk.

To a G3 first licenced in 1956, a linear amplifier conjures up a picture in my mind of a large box, a hefty mains transformer, one or more large brightly glowing valves and a standard type of Pi-network for the output tuning. Indeed, I still have a linear just like that, but those days seem to be history. Most modern linear amplifiers nowadays are solid state and bear no resemblance to

the picture I've just described and the BLA 350 comes into the new 'modern' category.

Amplifier Description

The physical dimensions of are 355mm wide, 155mm high and 270mm deep. It weighs approximately 13kg (28.7lb) and runs from the 230V a.c. mains. It requires a drive level no greater than 12W for its maximum output.

Care must be taken not to run more than 14W into this linear. I think it's best suited to somebody with a lower power transceiver, such as the Yaesu FT-817 or a higher power rig where the

output power can be adjusted to 12W. It would be a nice addition for a portable station, making it capable of running a reasonable amount of power. It comes with mains lead and an adequate manual, presented in both Italian and English.

Real Advantage

One real advantage of the solid state linear is the instant use after switch-on. My valved-type linear takes three minutes to warm up before being ready for use. The old adage of "a watched pot never boils" does apply here if you need to use it to work a DX station!

The other advantage of course is the broad-band tuning, so there is no need to play with variable capacitors or C1 or 2 to worry about. Other built-in features include s.w.r. sensing, variable speed cooling fan together with a large heat-sink to protect the two m.o.s.f.e.t.s.

The outer case is black and the front panel is a pleasing shade of blue. The rear panel **Fig. 1**, has just r.f. input and antenna connectors, both PL-259, and push to talk (p.t.t.) and ALC phono sockets, together with an adjustable potentiometer near the ALC socket. I thought there would have been an earth connection, but there's not, but the linear should be earthed to the shack r.f. earth.

The front panel (**Figs. 2**) has a bandswitch and provision for either auto or manual band changing, on/off switch and a standby switch. This is essentially linear in or out, and two momentary-make switches. One selects a menu item and the other writes it into memory. There's also a light emitting diode (l.e.d.) read-out and a power meter.

There's one main printed circuit board (p.c.b.) housing the two m.o.s.f.e.t.s and a very large heat sink underneath. (See **Fig. 3**). The mains transformer is to the left and the 50V smoothing capacitors to the right of the two m.o.s.f.e.t.s. Mounted vertically on the rear panel is the processor board providing the menu selections, metering and antenna connections. The filters can be seen on the main board.

Menu Driven

Yes, the linear is menu driven! And setting up should be carried out before operating it on-air. Menu items are accessed with the amplifier switched on but in the stand-by position. This will be indicated on the l.e.d. panel display,



Fig. 2: The front panel has a bandswitch and provision for either auto or manual band changing, on/off switch and a standby switch.



Fig. 3: There's one main printed circuit board (p.c.b.) housing the two m.o.s.f.e.t.s and a very large heat sink underneath.

along with the temperature of the heat sink and the filter selection.

The menu items cycle around with continual pressing of the 'OK' button. Pressing the 'SET' key will enter sub-menus. When a modification has been made to that menu, pressing the OK button will write it into memory. In practice, it's quite intuitive and after a few attempts I found it was quite easy to find my way round the menus.

One item that must be set is the automatic level control (ALC) voltage. This is described in the handbook, but basically is accomplished by adjusting the potentiometer on the rear panel. The setting is displayed on the I.e.d. panel and should be set to 12W. This will then automatically limit the power output of the transceiver.

Other menu items include:

- Temperature toggling between Celsius and Fahrenheit.
- Internal VOX enable or disable.
- Delay timer for s.s.b. with settings of 0-100-250-500-750 and 1000ms.
- Fan speed. This can be adjusted in 9 different levels, applicable only when the temperature reaches 55°C. There is also a five second burst at high speed to clear dust, etc., when invoked.
- Two levels of backlight display.
- Default settings

Operation Simple

Using the amplifier could not be simpler.

Making sure you have no more than 12W of drive (14W maximum) and that all connections have been made properly. Set up the amplifier according to the instructions in the manual and then make sure that it's 'looking' into a 50Ω load with minimum s.w.r. It's good practice to do this at all times anyway. If you accidentally overdrive or do have

a high s.w.r., the protection circuits in the linear will let you know with either an audible tone warning or a warning display on the I.e.d. readout.

The operator should located the problem, rectify it and start again. Don't try to run with an apparent fault!

If the temperature of the heat sink reaches 80°C the amplifier will shut down and the fan will increase to full speed. It will then not operate again until the temperature drops below 60°C. There will be a warning on the I.e.d. readout that the temperature is over 80°C.

The amplifier doesn't 'like' an s.w.r. of more than 3:1 and a warning of that will appear if that's the case. So, do try to ensure that all your antennas have an s.w.r. better than 1.5:1.

On-Air Tests

For my on-air tests I conducted evaluations on several bands with local stations whose views I value and found that with 12W of drive I was getting around 330W output and producing

around 13-14 dB gain. This is consistent with the specifications and it ran quite happily at that level for some time with the temperature increasing to only 35°C.

The cooling fan stayed at the one level all the time and I found that to be very quiet indeed. In fact it was not much more than the level of the fan in my desk-top computer. The case – after being on-air – wasn't unduly hot either.

Looking for inter modulation distortion (IMD) products or 'whiskers' on the other sideband at that power level, they were found to be at least 30dB down – so they were quite acceptable. On c.w. it performed equally as well, with no clicks or thumps, etc. I also used it on the Ex-G net on 14MHz (20m) and 21MHz (15m) when it performed flawlessly.

Minor Criticism

There was only one minor criticism I had and that was on c.w. There's no QSK or even semi break-in provided on the linear amplifier. This is due to the switching times of the change-over relays. So, it's necessary to put the transceiver into transmit before sending c.w., enabling the linear's relay time to switch.

Other than that, it does exactly what it says on the box! I think it's an ideal linear for those with lower power transceivers if they wish to use more power at times. There are no tuning controls to adjust and in the Auto mode, selection of the filters for each band is automatic – so there's no need to use the band switch.

I would say it is good value for money and with a price tag of around £600 including the Government's Vodka And Tonic increase (VAT) plus the free p&p from Nevada, it represents around £2 per Watt, which isn't bad at all. My thanks to Nevada for the loan of the linear for review. 73 de Roger, G3LDI

Manufacturer's Specifications

Frequency range: 1.5 - 30 MHz in six switchable ranges.

Supply 110 or 230/240 V.

Input power 1 - 12W.

Output power: 250-300W.

All modes (a.m., c.w., s.s.b., f.m. and RTTY).

300W Output using a pair of SD2941-10 m.o.s.f.e.t.s., producing efficient, low distortion and linear r.f. power, using a 50V drain voltage.

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Quiet variable-speed cooling system.

Front panel I.e.d.s and I.c.d. display.

Manual or automatic band selection.

Possibility to customise many options.

Fan speed is regulated by temperature sensors, together with a large heat-sink assuring a minimum of noise for maximum cooling.

Fractal Antenna Loading

John Heys G3BDQ takes a look at fractal antennas. Perhaps he was also intrigued at the BBC2 Coast programme where they looked at the length of the UK's coastline using the fractal geometry method – it's a lot of coastline packed into a small space!

After reading a report of **Professor Nathan 'Chip' Cohen W1YYW's** experiments using antennas designed around fractal geometry I made a reduced size dipole for 28 MHz. This was in 1998. My 2.13m (7ft) antenna worked beautifully when suspended above my first floor landing just outside the shack door.

Amazingly it allowed me an s.s.b. QSO with the designer himself who was using a fractal quad beam. I wrote about this in the November 1999 issue of *Practical Wireless*, and that 28MHz chat was perhaps the first Transatlantic fractal to fractal antenna contact.

My present h.f. antenna is a grounded long wire, a design that I have gradually developed over the years and which works beautifully from 1.8 to 50MHz. The far end of the wire descends vertically for about 10.66m (35ft) which is the height of my end support pole. I have a good earth system with buried chicken wire and other wires in the garden hedges and it's essential for an efficient antenna allowing good DX working on 1.8MHz.

The radio frequency (r.f.) current in the vertical down section of the long wire antenna contributes most of the low angle radiation needed for long distance communication. I have also introduced some top loading capacitance at the far end of the horizontal section of

the antenna which has increased the antenna current in the vertical section.

Fractal Loading

Through the summer of 2010 I decided to try out some fractal loading of the 10.66m vertical wire and the experiment has proved to be a success with the DX now being heard and contacted with greater ease.

I have had better signal reports and some of the 'Pile-ups' have been more easily cracked. Fractals Perhaps the simplest examples of fractal geometry are the 'zig-zag' built up from a series of linearly arranged triangles, and also linearly arranged rectangles. The former are the basis of what are called 'von Koch' fractal curves and the rectangles are known as 'Minkowski boxes', see three variations in **Fig. 1**.

By replacing my single wire vertical that connects to ground with a vertical section built up from a series of equilateral triangles, the wire in the down-lead doubled in length. I actually used just 30 300mm (1ft) triangles and so ended up with a total wire length of 19.8m (65ft). The rectangular fractal pattern was not used, for each rectangular section would have to be spaced some distance from its neighbours.

Additionally, the cubic sections would be physically unstable and easily distort

in shape over a period of time. In this I'm bearing in mind the boisterous weather conditions that occur so often at my QTH near Hastings that's very close to the coast.

Complete Replacement

The complete replacement of my vertical earthed wire down-lead by a new fractal version only took me a total of around six or seven hours spread at over two days. This was accomplished by an 87 year-old (Me!) working alone – so I think younger and 'more flexible' chaps could have done the job in just one day, or perhaps less.

A vertical length of strong Nylon or Polypropylene cord supports my 30 triangles (see **Fig. 2**). The triangle aren't totally enclosed as they consist of two wire sides, the third side being the cord. Each triangle has sides 300mm (1ft) long which were made up with 16s.w.g. (1.6mm) or 18s.w.g. (1.2mm) hard-drawn copper. To make up the assembly the cord was stretched out and secured at each end at a height convenient to work at without too much bending or stooping.

My poor old back hates stooping

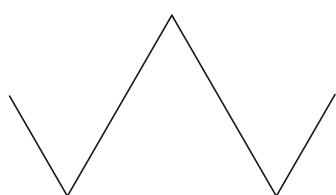


Fig.1a: A basic von Koch fractal curve showing it as part of an equilateral triangle.

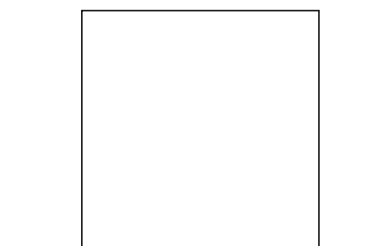


Fig. 1b: A rectangular 'Minkowski Box' fractal.

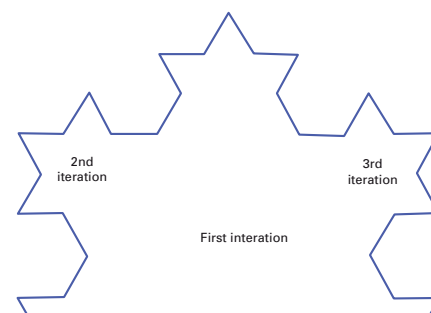


Fig. 1c: The von Koch 'snowflake' fractal figure. The outside boundary is four times the length across the base. This shape is often used as fractal u.h.f. antenna design.

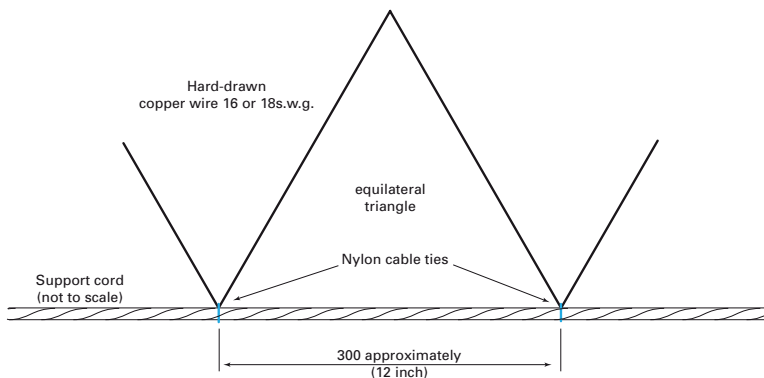


Fig. 2: A drawing to explain how the individual fractal elements are connected. It shows just one of the 30 triangles used on G3BDQ's vertical wire system.

more than anything else, and if this problem is ignored, it responds in a painful manner! I used a black marker pen to indicate points spaced out at 300mm (1ft) intervals where the wire was to be secured to the cord. I worked gradually from end to end bending and fixing the wire in place with black cable ties, three to each fixing position.

One tie held the wire securely and the other two were fixed on either side to prevent any movement of the wire. Good strong pulls of the ties were made with help of pliers.

Further Points

I match my antenna with an elderly Japanese-made

antenna tuning unit (a.t.u.) and my total wire length is around 65m (212ft), a length that's not critical for it is not self-resonant. This makes things much easier than when making an antenna that demands considerable 'cut-and-try' to obtain resonance. My a.t.u.

then does the matching for me when I experiment with the antenna length.

A horizontal doublet antenna could be half normal length on its lowest frequency of operation if each leg was made up with a linear fractal sequence.

The efficiency would not, be quite so high but it would still be an effective radiator on **all bands** using tuned feeders to a balanced a.t.u.

My earlier article on my introduction to fractals didn't prompt much of a response from the readers. So I hope this article will stimulate some reader activity and experimentation. I would be pleased to learn of any such work! ●



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Q-TEK TRI-MAGMOUNT

Very heavy duty. Available:- SO-259 or 3/8 - specify. **£44.99**

Top Band in a Small Garden?

Why not try it? Stuart Craigen G4GTX describes a shunt-fed loaded wire 1.8MHz vertical antenna for small gardens.

This project began with the age-old problem of how to develop a 'Top Band' (1.8MHz) antenna, capable of radiating a good ground wave signal while being effective at over 300km from a postage stamp garden!

The book *Vertical Antennas* by William Orr W6SAI provided a lot of helpful information on the shunt feeding of vertical aerials. Many of the designs, however, were based on the use of copper pipe as the radiating element.

For Top Band the height of such a design would have been totally

impractical for a very small garden, so I decided to see if a shunt-fed Top Band vertical could be developed using wire! It could. But the length of the antenna would be increased because of the difference in radius between the copper pipe and antenna wire.

The resulting antenna (Fig. 1), which looks like a capital 'G' from the side, can put down an impressive ground wave signal and has enabled me to receive 5&9 reports from Oban, Aberdeen, the South Coast, Switzerland and even a 5&9 report from a short wave listener in Italy!

Drainpipe & Antenna Wire

The antenna is constructed from grey 50.8mm (2in) plastic drainpipe and antenna wire. For a vertical antenna to work effectively, good earthing is essential. At ground level two 1.21m (4ft) ground rods coupled to a quarter wave counterpoise and some radials buried under the lawn provide the earthing for the vertical. Adding extra radials would in all probability increase the efficiency of the vertical antenna. Attached to the rods is the shunt coil L2.

The shunt-feed coil consists of seven turns of antenna wire wound on a 50.8mm (2in) former. The coaxial cable from the transmitter is connected across the shunt coil - inner to the top and braid to the earthy side. This coil provides a convenient and efficient 50Ω match to the coaxial cable. The length of the wire from the shunt coil to the loading coil is 9.144m (30ft).

The loading coil L1 consists of 30 turns of antenna wire wound on a 50.8mm (2in) former. Beyond the loading coil, the wire passes through an insulator attached to the 6.1m (20ft) support pole at about 1.525m (5ft) and then through another insulator at the

Fig. 1: Diagram and layout of the shunt-fed 1.8MHz (160m) vertical antenna at the G4GTX station. The radials can be placed wherever it's convenient to fit them in and remain out of the way of feet, pets, or inquisitive children

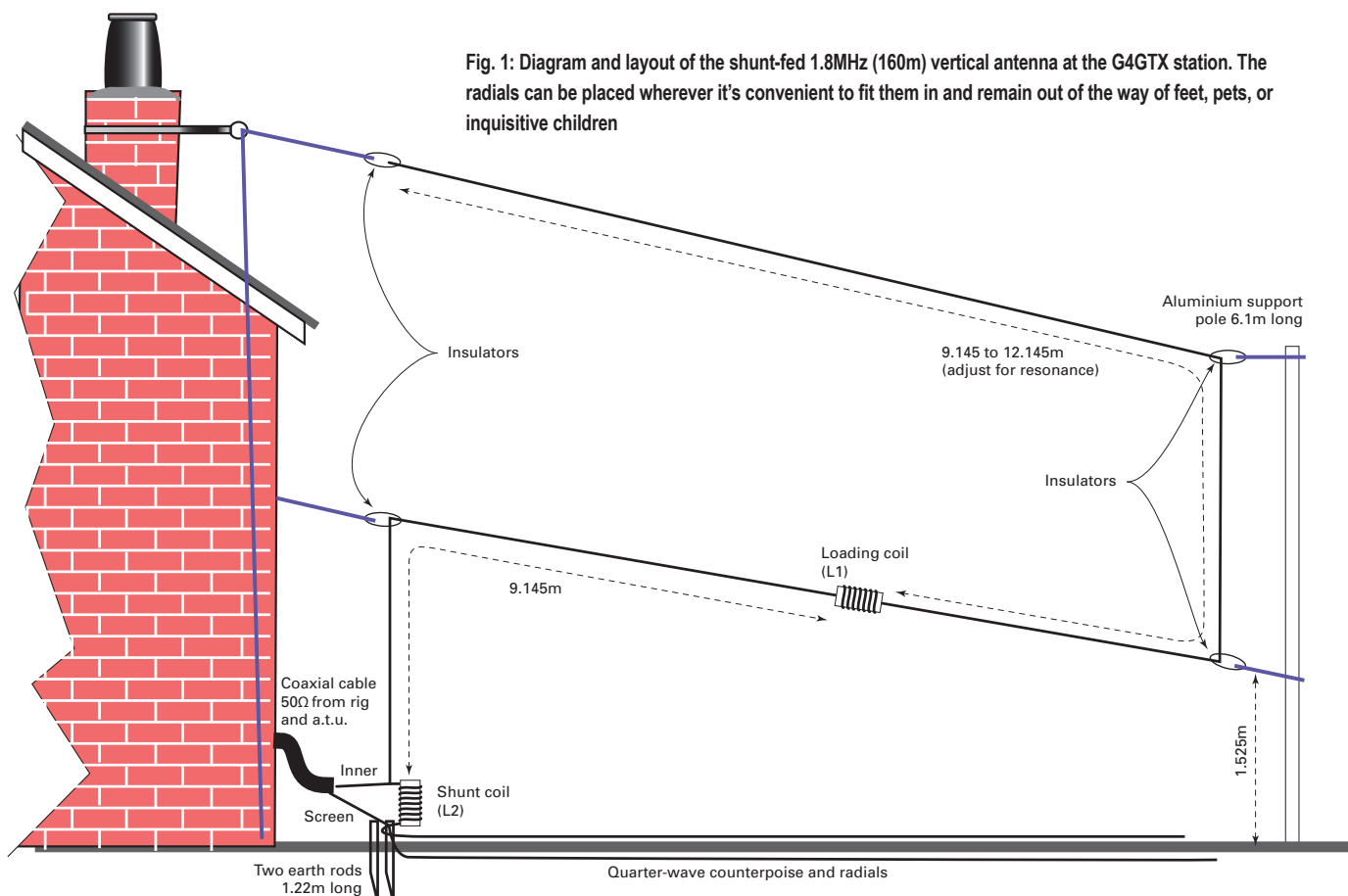




Fig. 2: View of the shunt coil, coaxial cable feed and earthing rods. The coil consists of seven turns of antenna wire wound on a 50.8mm (2in) former. Some form of weather protection will probably be needed.

top of the support pole, ending at an insulator attached to the chimney stack. In the interests of safety, this was fitted by a professional rigger. He also fitted a halyard with pulley and length of cord to enable the antenna to be easily lowered for tuning purposes.

Tuning The Antenna

To tune the vertical to resonance, I used an antenna noise bridge – a useful tool in any shack! Alternatively, an antenna analyser could be used to check the resonant frequency. If neither of these is available, the length of the antenna can be adjusted to resonance with the aid of an inline s.w.r. meter. To do this, the length of the wire beyond the loading coil is adjusted.

I found that a length of 10.67m (35ft) brought a 1:1 s.w.r. on 1.950MHz with no a.t.u. but this will depend to a greater extent on the individual installation and layout of the antenna. An a.t.u. can be used to flatten the s.w.r. at the band edges. With no a.t.u. in circuit, I can obtain a useable s.w.r. between 1.900 and 1.960MHz.

One advantage with this antenna system is that all the r.f. currents are out in the garden and not in the shack, as sometimes happens when using end-fed wires. The total outlay was very modest – some grey plastic drainpipe available from DIY stores, some lightweight antenna wire and two earth rods!



Fig. 3: Close-up view of the shunt coil. The coaxial cable from the transmitter is connected across the shunt coil - inner to the end out to the loading coil and top. The braid connects to the earthy side, going to the ground spikes and radials.

Does It work?

The antenna has shown itself capable over the years of putting down a strong local groundwave signal while enabling regular night-time contacts from the North of England to Exeter in the past. Contacts have been made to Norfolk and to Aberdeen mid-morning during the winter months! No electromagnetic compatibility (EMC) difficulties have been encountered over that period either.

When compared to the 25.6m (84ft) end-fed wire or W3EDP antenna, which I also use on 'Top Band', certain

outcomes were evident. I found that with distances of under 300km the 25.6m (84ft) wire provided the better signal on both transmit and receive but at distances of over 300km the shunt-fed vertical was clearly in the lead.

Although the length of my garden is only some 7m to the boundary fence, this shunt-fed loaded vertical antenna has, over the years, enabled many long distance contacts from a very small suburban garden.

If you want to work Top Band from a small garden, then this might just do the trick for you, too! ●



Fig. 4: The loading coil, L1 consists of 30 turns of antenna wire wound on a 50.8mm (2in) former and is placed 9.145m from the 'top' of the shunt coil. The outer end of the antenna has its length trimmed to give resonance of the whole system. As it might vary between about 9 and 12m a little experimentation will be needed. Some form of weather protection will probably be needed.



Antenna Advice

In his *Technical For The Terrified* column, Tony Nailer G4CFY opens up the subject of antennas for the beginner and Radio Listener.

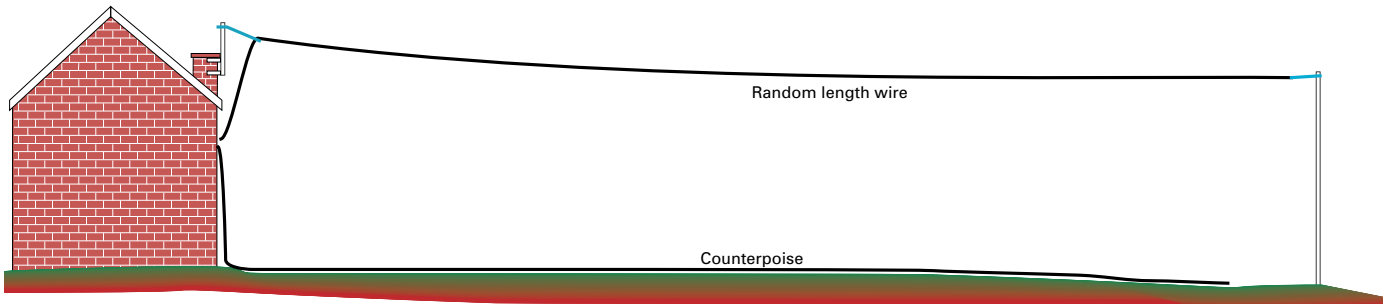


Fig. 1: A simple random length of wire as an antenna. It's most effective at a frequency where the overall length is just under a quarter-wave long. At other frequencies an a.t.u. will improve things.

The response of the Radio Listener readers of the May issue of *PW* to the *Doing it by Design* article on a Short Random Wire Antenna Tuning Unit – was such that I realise they have been neglected in recent years.

Clearly there's quite a large readership of *PW* by Listeners and more basic theory and practical articles need to be aimed at them. Maybe the sub heading of the magazine should change to 'For the Radio Constructor, Amateur & Listener'?

Frequencies & Wavelengths

Many older domestic radios included Long Wave from 100kHz to 500kHz, Medium Wave from 500kHz to 1.5MHz and Short wave from 1.5MHz to 30MHz. Often there were marks on the dial designating broadcast zones such as '49 metres'.

The technical classification of the radio spectrum is broken into sections each covering a decade of frequencies. These are; Very Low Frequency (v.l.f.) from 3kHz to 30kHz, Low Frequency (l.f.) 30kHz to 300kHz, Medium Frequency (m.f.) 300kHz to 3MHz, High Frequency (h.f.) 3MHz to 30MHz, Very High Frequency (v.h.f.) 30MHz to 300MHz, Ultra High Frequency (u.h.f.) 300MHz to 3GHz and Super High Frequency (s.h.f.) 3GHz to 30GHz.

The choice of the number '3' as the divider between each group is because the velocity of light is 300,000,000m per second. The product of frequency and wavelength for a signal in air or in space gives the velocity of light. This means that the velocity of light divided by the frequency gives the wavelength in metres. Likewise the velocity of light divided by the wavelength gives the frequency in cycles per second, which has given the unit reference of Hertz, after Heinrich Hertz who did much early work on electromagnetic waves.

Using this information the corresponding wavelengths for the different classifications are: v.l.f. 100,000–10,000 metres, l.f. is 10,000–1,000m, m.f. is 1,000–100m, h.f. 100–10m, v.h.f. 10–1m, u.h.f. 1m to 100mm, and s.h.f. 100mm to 10mm.

Random Wire Antenna

The simplest antenna for a specific frequency is a single wire coming directly to the centre pin of the receiver antenna socket or first to an antenna tuning unit. Due to the way waves

form on the wire it will be most effective if it is just under a quarter of a wavelength long.

Generally the speed of conduction of electrons in a single wire supported above ground will be between 95% and 98% of the speed of light. So it's necessary to cut the antenna wire to about 96.5% of a quarter-wavelength to optimise reception on a particular frequency.

For other frequencies an antenna tuning unit (a.t.u.) is required to change the effective electrical length to optimise reception as required. The illustration, **Fig. 1**, shows such an antenna together with an 'earth' wire to improve ground effect and this is often referred to as a counterpoise.

Practical LF & MF Antennas

You may already have realised that to pick up Radio 4 on the Long Wave band at 198kHz properly, will require a quarter-wave length of wire, some 375m long! However, not many people are lucky enough to have a plot long enough to put up such an antenna run. Furthermore a dipole for that frequency is double that length!

Fortunately, there are two ways that signals can be launched into the air or extracted from it. One is by means of the electrostatic field for which the single wire or the dipole are effective. The other is by means of the electromagnetic field, which requires a large coil or solenoid.

A fairly large frame, made with two crossed timbers, with a number of turns wound around it and resonated by means of a parallel variable capacitor, will effectively extract signal at the resonant frequency. One end of the winding together with the capacitor can be grounded and the signal to go to the receiver, tapped off at say one turn from the grounded end.

The frame antenna works but can be quite noisy. A better solution is for the frame coil and resonating capacitor not to be ground referenced and for the receiver's signal to be extracted by means of a single-turn secondary winding.

Another solution is to use a ferrite rod with a coil, wound onto a former, which is secured on it. I'm fairly sure most people are familiar with the ferrite rod antenna found in portable radios.

The ferrite rod 'attracts' or concentrates, the

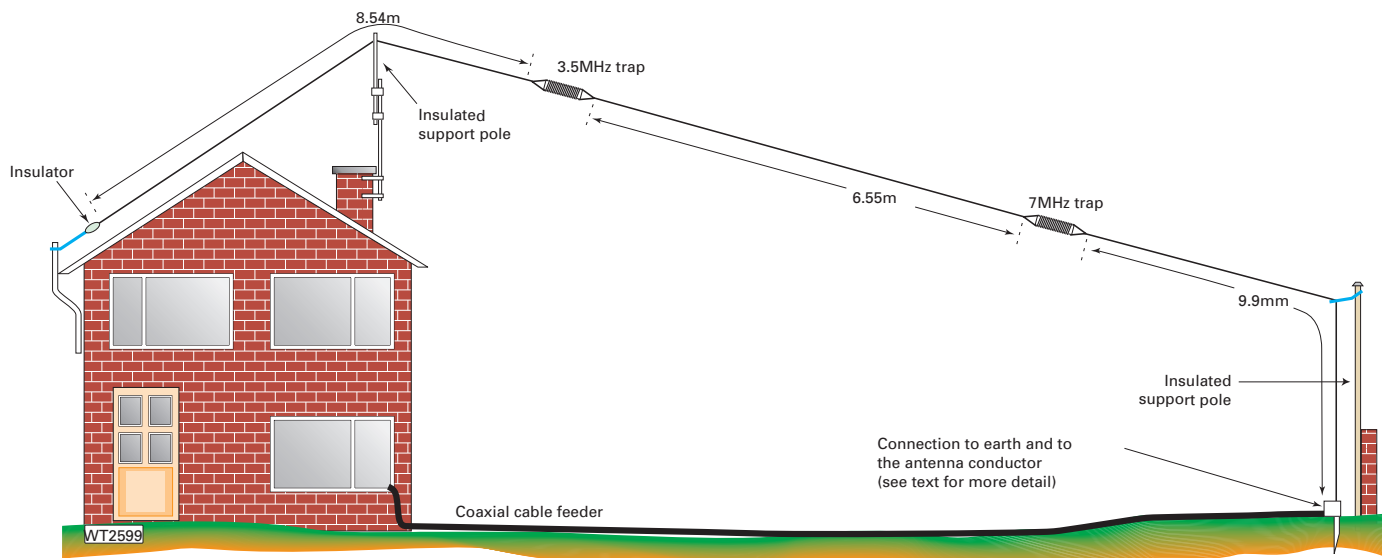


Fig. 2: Similar to the random length antenna, the inverter-L has a specific size for the bands used, and has two 'traps' to isolate the outer sections at higher frequencies. It has three fundamental resonant frequencies and at least 5 harmonic resonant frequencies in the h.f spectrum.

electromagnetic wave passing through it, which in turn induces current in the resonant coil. Normally a small secondary winding link, is used to extract the signal to the input of the receiver electronics.

Top Band Inverted-L

The 1.8-2.0MHz (160m) Amateur Radio allocation is usually known as 'Top Band' because it has the highest metre wavelength. A single wire antenna 96.5% of a quarter-wavelength for this band is 38.09m (125 feet) long. This can be made with the feedpoint at ground level then a vertical section and the remainder horizontal. Such an arrangement is called an Inverted-L.

First, a substantial earth stake is driven into the ground, at the bottom of the garden, about a metre from the support pole. A coupling box with a coaxial socket and a 4mm terminal post is attached to the ground stake. The coaxial feed-line connects to the coupling box and so does the lug on the end of the wire aerial. This runs up to a dog-bone insulator at the corner

where the horizontal section comes back to be supported at the house.

The overall element length can be reduced to about 25m by the addition of a couple of traps in the wire, a 7.1MHz trap at 9.9m from the feed-point and a 3.65MHz resonant trap a further 6.55m along and then a final length of 8.54m. See Fig. 2.

An 3.65MHz Inverted-L

A single trapped version of the Inverted-L antenna has a 9.9m first section to a 7.1MHz trap, and a further 6.55m. Again, part of the first section is vertical, so this antenna with say 7.3m (24 feet) vertical and 9.1m (30 feet) horizontal can fit into quite a small garden and be fully resonant on 3.65MHz and other h.f. bands. See Fig. 3.

Dipole Antenna

The dipole is comprised of two 96.5% quarter-wavelengths with a central feed-point. It should be connected to low

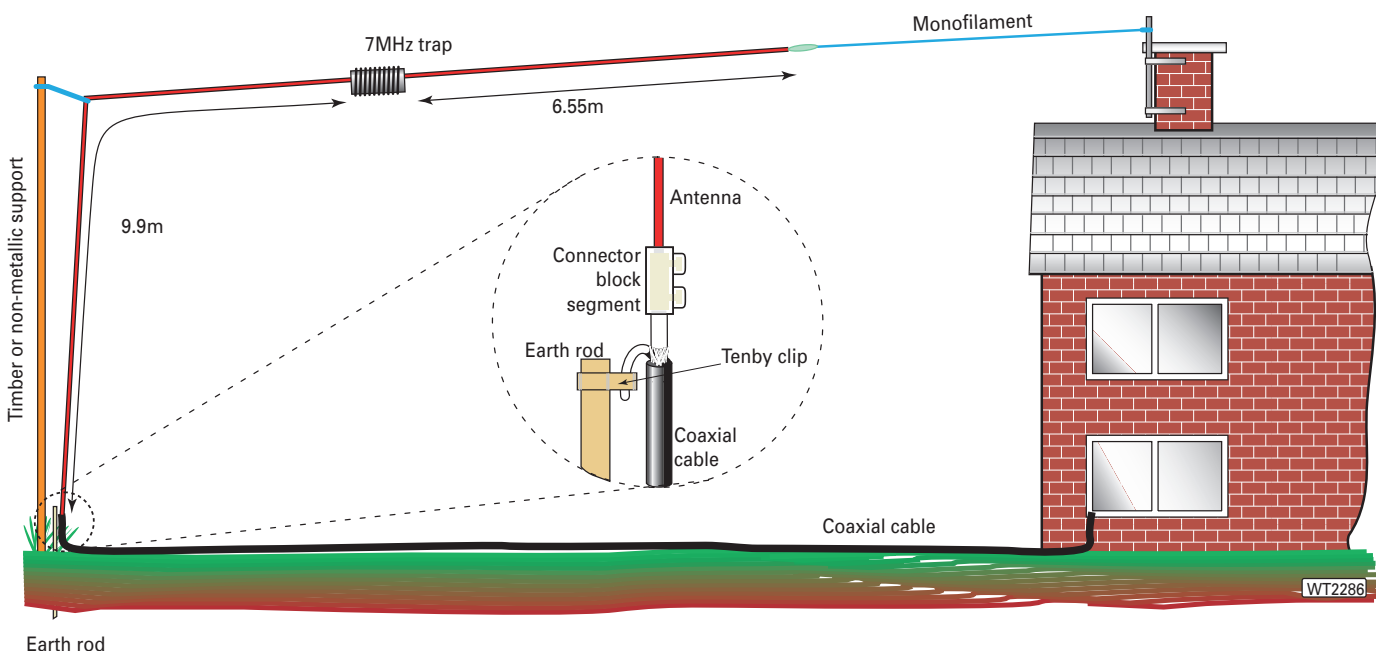


Fig. 3: An antenna that's similar to Fig. 2, but this time it has only two fundamental resonant frequencies – but also has five harmonic resonant frequencies in the h.f. spectrum.

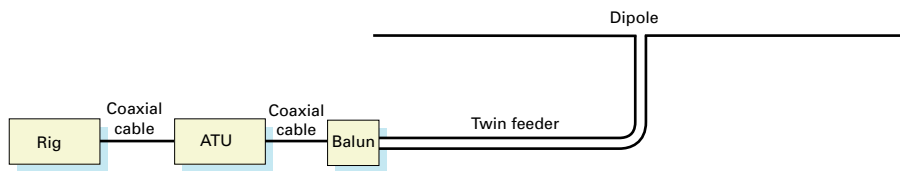


Fig. 4: A dipole antenna. This is resonant on one band and fed with balanced twin feeder providing a system with the lowest local noise pick-up.

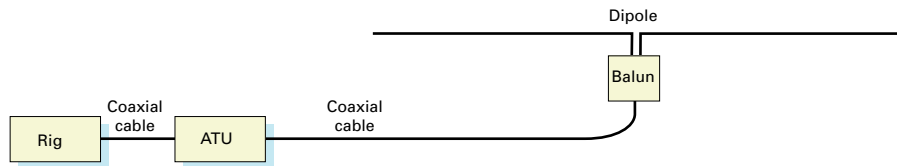


Fig. 5: A dipole fed with coaxial cable up to the feed-point will have a higher local noise pick-up than the antenna of Fig. 4.

impedance balanced twin feeder all the way to the shack. The feeder can go directly to a balanced line antenna tuning unit or to a 1:1 'balanced to unbalanced' transformer, to convert to coaxial cable. This arrangement is shown in Fig. 4.

It's quite popular to use a balun at the feed-point and then coaxial cable all the way to the shack, as shown in Fig 5. This is a very bad option in these days of high noise levels, as coaxial cable, due to its unbalanced nature, picks up about 0.5dB per metre more noise than low impedance close spaced balanced twin feeder.

Multi-Band Dipoles

At progressively higher frequencies as the wavelength become shorter and dipole antennas become practical. One popular antenna is the **G5RV** at 32.3m (106ft) length and uses a 10m length of 300Ω twin feeder from the feed-point hanging vertically downwards and then connects directly into 50Ω coaxial cable, as shown in Fig. 6.

The antenna is driven from an unbalanced antenna tuning unit (a.t.u) and uses proportions of the 300Ω feeder as part of the resonant length to suit the required frequency of operation.

An alternative type of dipole suitable for the amateur bands is the 104 feet long trapped dipole. This uses a single 7.1MHz resonant trap in each top wire at 10m from the feed-point.

Originally developed by **Chester Buchanan W3DZZ** and subsequently manufactured by many people around the World including **Richard Holman G2DYM**. (See Fig. 7).

I purchased the business from Richard on his retirement in 2006 and the further development of this antenna has been an education to me. The G2DYM traps subsequently made using coaxial cable differed from the original values of capacitance and inductance used by W3DZZ. I found that the top wire lengths suited the American Amateur bands and together with the different traps required longer inners and shorter outers to produce the required resonance on the European bands.

Antennas For VHF & UHF

Many Radio Amateurs normally use horizontal polarisation for long range, weak signal work. Otherwise vertical polarisation is used for work through repeaters, which works well in conjunction with mobiles or hand-held rigs.

In the v.h.f. range 30 to 300MHz there are Amateur bands at 50, 70, and 144MHz. At u.h.f. there are the 430-440, 1240-1325 and the 2310-2450MHz bands. For v.h.f. broadcasts, there's 88-108MHz. For v.h.f. Marine use, 156-162MHz, and private mobile radio 163-175MHz, also predominantly using vertical polarisation.

Above 100MHz, where a quarter wavelength is 750mm or

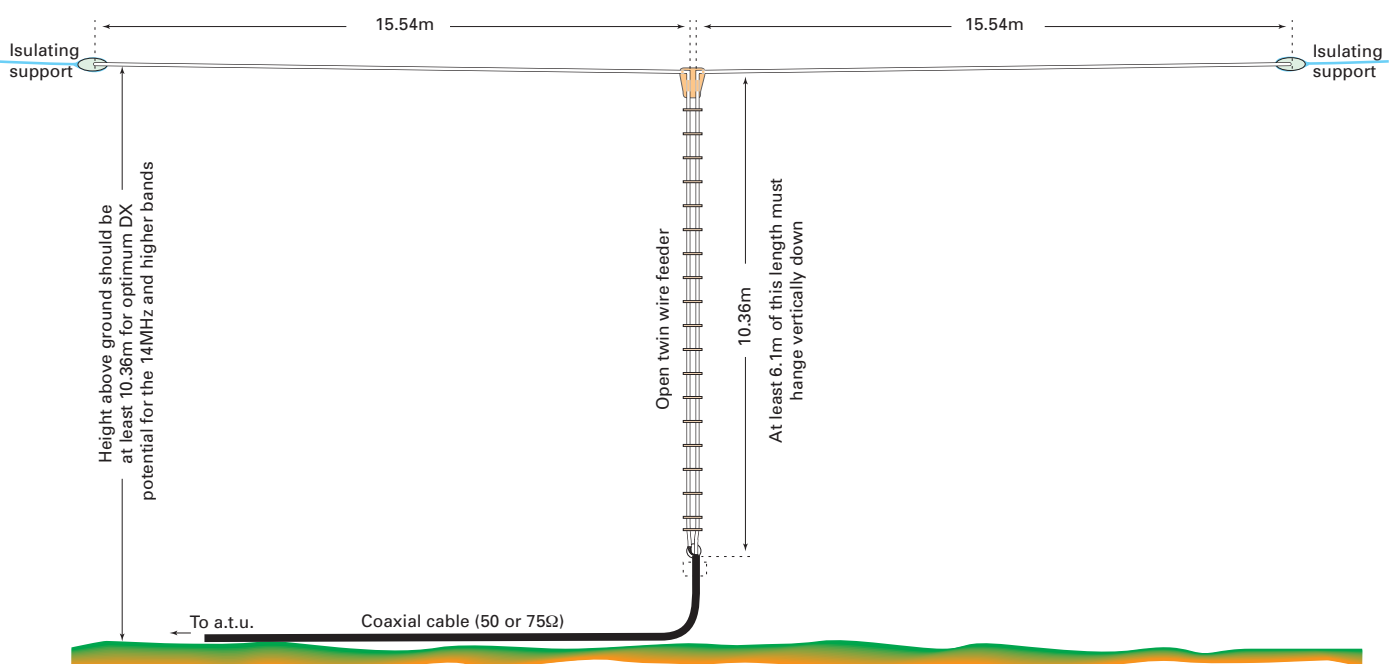


Fig. 6: Although somewhat different to Louis Varney G5RV's original design, this is the most usual version of the G5RV antenna and is most effective on the pre-WARC bands.

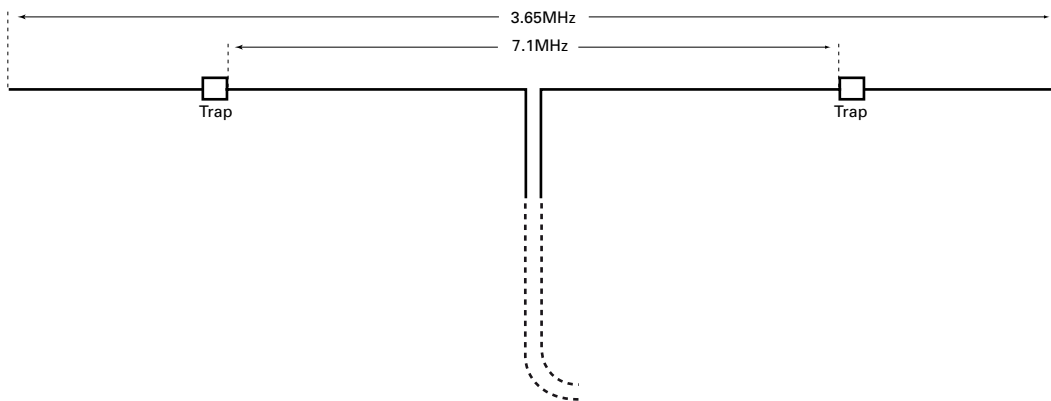


Fig. 7: A multi-band trapped dipole has two fundamental resonant frequencies and harmonic resonance on five h.f. bands.

less, it's common for vertical antennas to be electrically made three quarters of a wavelength long. This may be achieved using a five-eighths ($5\lambda/8$) physical length together with a coil making up the other one eighth. It's quite common to see taxis with a one metre whip with a four turn open wound coil at the bottom. That's a typical $5\lambda/8$ wave antenna.

Single element quarter-wave and three quarter-wave verticals require a ground plane, either provided by a vehicle's body or in the form of a number of radials. Otherwise a tubular dipole can be mounted vertically with the coaxial inner to the top element and the braid to the lower one.

A further development of this idea is the Slim Jim antenna developed by the late **Fred Judd G2BCX**. Essentially it's a quarter-wave long U-shaped section with an inverted half-wave fold-over section above it. One arm of the lower section continues into the upper section while the other arm is separated by about 25mm from the upper half-wave section. The feeder couples in part way up the quarter-wave section.

An earlier version of the Slim Jim was a quarter-wave U-shape with a half-wave rod continuing up from one arm. It was generally known as a J-pole, but Fred's version is really more like squashed letter 'G'. A variant of this can be constructed using 300Ω ribbon twin-feeder, and the Slim G marketed by Garex Electronics is of this type.

Airband & Weather Antennas

Antennas for the airband of 118 to 137MHz are usually vertically polarised, though for aircraft overhead they would be more effective using crossed dipoles. Similarly, for weather satellite 137 to 138MHz the antenna needs to work for reception from all points of the compass and overhead as well. This is most easily achieved using two crossed dipoles.

One element of each horizontal dipole is linked using a quarter-wave length of coaxial cable, taking into account a velocity factor. The linking cable being quarter-wave long provides a phase shift of 90° matching the offset of the two dipoles. On 137MHz in a 50Ω system the phasing cable can be 365mm of RG174. For a 75Ω system using semi-airspaced or foam dielectric cable the length required is 438mm.

The Radio World Above 470MHz

The existing analogue television stations in the range 470-900MHz are nearly all gone and are being replaced by digital

services operating in the same region. Scanners and scanning antennas and pre-amplifiers often quote 25-1300MHz operating ranges.

In practice a whip or 'rubber duck' antenna on a handheld scanner will not be very effective down at 25MHz. So, a scanner may only be reasonably efficient at 50MHz and up. In the television bands between 470-900MHz the scanner is of little use.

Beyond 900MHz there are many signals, which are digitally encoded and cannot normally be decoded. The Amateur Radio 1.2GHz (23cm) band is occasionally occupied by pre-arrangement made on either the 145MHz or the 433MHz bands. Signals beamed from one Amateur to another are very narrow beam-width and not easily intercepted.

Advice To Listeners

My advice to listeners, is to use long random wire for l.f. and m.f. together with a high Q receiving type a.t.u. For h.f. use an Inverted-L driven with coaxial cable or a trapped dipole for the Amateur bands, or a dipole with low impedance feeder and a balanced a.t.u. For apartment and flat dwellers use window frame antenna or wires run around all four corners of the radio room, or use an active antenna.

Above 30MHz I recommend using a quarter-wave vertical or three quarter-wave vertical together with ground plane elements, or a tubular dipole. A Yagi is particularly useful to 'home-in' on distant signals from specific locations. Have antennas cut for specific frequencies of interest. Don't bother with anything above 470MHz unless you have a particular interest that's both possible and practical.

Finally

Finally – there's no such thing as a high-gain very wide-band antenna. Don't believe all you read in the adverts! Only multi-element or multi-wavelength antennas have gain. Anything shorter than a quarter-wave (vertical) or shorter than a half-wave will have 'loss' compared to a dipole.

I hope this will help *PW* Listener readers to choose the best antenna for their needs. ●

If I can help further I may be contacted by E-mail at: tony@pwpublishing.ltd.uk Cheerio for now!

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SEE PAGE 72

STEALTH ANTENNAS

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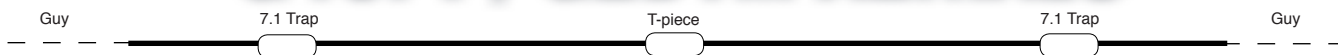


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The Bakelite Story

Geoff Keeling delves into the history of Bakelite – a material that was once despised by many as being just a ‘common’ plastic – which has now become prized by some vintage radio enthusiasts who specialise in collecting sets with Bakelite cabinets.

Do you remember those beautiful radios from the 1930s, 1940s, and 1950s?

Many of them had attractive cases made from Bakelite. It's just a 100 years since Dr. Leo Baekeland took out USA Patent Number 942,699 for Bakelite, beating an English rival by one day!

By the beginning of the 20th Century the electrical industries were expanding and the search was on for a cheaper and more effective insulating material than shellac. Shellac was an expensive naturally occurring resin that was secreted by the lac insect ‘*Kerria Lacca*’ in the forests of Assam and Thailand. It

required 300,000 insects to produce one kilogram. Whoever succeeded in finding a suitable plastic would become very rich.

Born In Belgium

Dr Baekeland was born in Ghent, Belgium in 1863 and had already made his fortune by creating a photographic paper and then selling the rights to the Eastman Kodak Company. Scientists had been developing plastics for 40 years and between 1902 - 1907, in his home laboratory, Leo Baekeland developed a process of applying heat

and pressure to carbolic acid and formaldehyde (both readily available synthetic components) leading to Bakelite becoming the first material to be made entirely by man.

The sticky resin could be moulded and was therefore ideal for mass production. It's electrically non-conductive and heat resistant. The age of plastics had truly arrived! In 1910 recording cylinders produced by the Edison Electric Company were being made of Bakelite.

In the 1920s radio cabinets made of Bakelite began to appear in Britain.



Fig. 1: The Bush DAC90 – typical of the Bakelite-cased radio receivers many of us will remember. Photo courtesy of Ben Nock G4BXD.



Fig. 2: The GEC 5445 is an example of how manufacturers could 'disguise' the Bakelite. This elegant receiver – at first glance – appears to be fabricated from polished wood but is in fact a high quality Bakelite casing. Photo courtesy of Stef Niewiadomski.

The plastic began to replace much more expensive wooden cases – important in the United States during the depression years – and making them more widely available at a cost of US\$10 rather than hundreds of dollars.

The material was ideally suited to the Art Deco style of the times. Leo Baekeland marketed the material as having a thousand uses and may not have been far wrong. *Time Magazine* carried an article in September 1924 with the cover headlines quoting "It will not burn – it will not melt."

Decline Of Ivory

With the decline in ivory available from Elephants, manufacturers of billiard balls challenged inventors to come up with an alternative. Celluloid was created but it was unstable and myth has it that the balls sometimes exploded during play! Step in Bakelite as a replacement!

Bakelite began to appear in almost every area of modern life. In the 1920s and 1930s aeroplane propellers, cameras, clocks, buttons, cigarette lighters, vacuum flasks, clarinets and

spectacle frames were just some of the objects it was used for. It was also used in machine guns and guitars. Later it was of course widely used for radio and then television cases. All of these are now highly collectable as people rediscover the unique beauty of the material.

Despite its versatility, Bakelite had two main weaknesses. It was brittle, so to overcome this sawdust was added as a filler. The other problem was colour. Ox blood was used as a pigmentation aid in the early days. Unfortunately ultra violet light caused fading and so much of what we see today has turned brown, or white has turned into a creamy colour.

Bizarrely, the largest objects ever to be made from Bakelite were coffins! Just five of them were made at Eagle Works Bakelite in Manchester around 1938. Obviously unsuitable for cremation, there's another problem – unlike wood the material is impermeable so the corpse would take much longer to decompose. You can see one of the coffins at the Bakelite Museum in Somerset* (See address

panel) which has the largest collection of vintage plastics in Britain.

It was also famously used as a floor covering for the dance scenes with Fred Astaire and Ginger Rogers in perhaps their most famous and well loved film

Top Hat.

Part of the casing for the bouncing bombs, used in the Second World War, was also made from Bakelite. Jewellery was also popular. In fact Andy Warhol had a massive collection stored across several warehouses.

Highly Coloured

Eventually plastic could be produced in bright colours and this signalled the decline in use of Bakelite. However, it's still used today in disc brake cylinders, electrical plugs, saucepan handles, electric guitars and saxophone mouthpieces.

"But" you may ask, "How can you identify Bakelite?" The answer is that it's usually heavier than modern plastic. There will be no moulding lines and in hot water it will smell fishy or acidic. Rub it with your thumb, it will smell of carbolic acid. Aaaaah the memories! ●

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Rallies

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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.

JULY

July 15th

The McMichael Rally

The McMichael Rally and Boot Sale will be held at the Reading Rugby Football Club, Holme Park, Sonning Lane, Reading RG4 6ST. The doors will open at 9.30am and admission will cost £2.00. There will be talk-in, free car parking, trade stands, a car boot sale, special interest groups, a prize draw, a licensed bar and catering will be available.

Pete G8FRC

Tel: 01189 695697

www.mcmichaelrally.org.uk

July 15th

QRP in the Country*

QRP in the Country 2012 will be held at Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ. There will be trade stands, special interest groups and family attractions. The event will be held outdoors if the weather is good or inside the farm barns if it's bad.

Tim Walford G3PCJ

E-mail: walfor@globalnet.co.uk

July 27th/29th

The Lithuanian Hamfest

The Lithuanian Hamfest 2012 will be held by the Lithuanian Amateur Radio Society at the Surviliskis Village, Kedainiai, Lithuania.

Rolandas

Tel: 00 370 657 57373

E-mail: ly4q@lrmld.lt

http://lrmld.lt/saskrydis_en.htm

July 29th

The Horncastle Summer Rally

The Horncastle Summer 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

July 29th

Blind Veterans UK Rally

The Blind Veterans UK (formerly St Dunstan's) Radio and Computer Rally will be held at St Dunstan's, Ovingdean, Brighton, East Sussex BN2 7BS. The doors will open at 10.30am and admission will cost £2.00. There will be talk-in, car parking, trade stands and catering will be available.

Eddie

Tel: 01273 300772

E-mail:

eddie@zamboodle.demon.co.uk

AUGUST

August 5th

The Chippenham Radio Boot Sale

The Chippenham & District Amateur Radio Club Radio Boot Sale will be held at the Chippenham Sea Cadet Headquarters, off Long Close, Chippenham – approximate postcode SN15 3JZ. The Radio Boot Sale (£5.00 per boot) will start at 9.00am and admission will cost £1.00 (under 16s are free). There will be talk-in on 145.500MHz, parking for visitors is on site (do not park in Long Close) and light refreshments will be available. The Radio Boot Sale flyer and a map can be downloaded from the club website. <http://www.g3vre.org.uk/Bootsale.pdf>

August 5th

The Great Eastern Radio Rally

The King's Lynn Amateur Radio Club 23rd Great Eastern Radio Rally will be held at the Gaywood Community Centre, Gayton Road, King's Lynn PE30 4EF. The doors will open at 10.00am and admission will cost £2.00. There will be trade stands, a car boot sale (pitches from £8.00) and catering will be available. In addition, a campsite is available by prior arrangement.

Ray G3RSV

Tel: 01553 849700

E-Mail: ray-g3rsv@supanet.com

www.klarc.org.uk

August 5th

The Lorn Radio Amateur Rally

The Lorn Radio Amateur Club Rally will be held at the Crianlarich Village Hall, Main Street, Crianlarich, near Oban, Perthshire FK20 8QN. The doors will open at 10.30am and admission will cost £1.00. There will be trade stands, a notice board for private sales, a prize draw and catering will be available.

GMOERV

E-mail: gm0erv@sky.com

www.gm0lra.freeuk.com

August 10th

The 19th Mini Rally Night

The Cockenzie and Port Seton Amateur Radio Club 19th Annual Mini Rally Night will be held in the main hall at Port Seton Community Centre, South Seton Park, Port Seton, Prestonpans EH32 0BQ. It's an opportunity to bring along your own junk and sell it yourself. The event runs between 6.30pm and 9.30pm and admission costs £2.00, tables will be available on a first come first served basis.

<http://cpsarc.com>

August 12th

The Flight Refuelling Hamfest*

The Flight Refuelling Amateur Radio Society Hamfest will be held at the Cobham Sports and Social Club Ground, Merley, Nr Wimborne, Dorset BH21 3DA. The doors will open at 10.00am and admission will cost £3.50 (under 14s are free). There will be talk-

in on S22, car parking, trade stands, a car boot sale, a licensed bar and catering will be available.

Mike M0MJS

Tel: 01202 883479

E-mail: hamfest@frars.org.uk

www.frars.org.uk

August 17th/18th

15th International EME Conference

The UK Microwave Group (in conjunction with the RSGB) will be hosting the 15th International Earth Moon Earth (EME) Conference at Churchill College, Cambridge. Further details can be found on the conference website.

www.eme2012.com

August 19th

The Rugby Rally

The Rugby (Princethorpe) Annual Radio Rally will be held at Princethorpe College, Princethorpe, Rugby CV23 9PX – suggested SatNav postcode CV23 9PY. The doors will be open between 10.00am and 4.00pm and admission will cost £2.00. There will be talk-in on 145.550MHz (GB5RRR) and on Channel RB06 via GB3ME. There will be car parking and catering. Pitches cost £10.00 if pre-booked before August 11th and £14.00 on the day.

Tony G0OLS

Tel: 07759 684411

E-mail: rally@rugbyats.co.uk

www.rugbyats.co.uk

August 26th

The Milton Keynes Rally

The Milton Keynes Amateur Radio Society Rally will be held at Bletchley Park, Sherwood Drive, Bletchley, Milton Keynes MK3 6EB. The doors will open at 9.30am and admission will cost £2.00 (under 14s cost £0.50). Please note there is no on site car parking available for the rally. However, limited on street parking is available locally and there is a multi-storey car park at Bletchley Station. There will be trade stands, a car boot sale, special interest groups, an RSGB bookstall and catering will be available. Why not make this a family day and visit the Bletchley Park Museum too?

www.mkars.org.uk/mkars/rally

August 27th

The Huntingdonshire Rally

The Huntingdonshire Amateur Radio Society Rally will be held at the St Neots Community College, Barford Road, Eynesbury, St Neots PE19 2SH. The doors will open at 10.00am and admission will cost £2.00. There will be talk-in on S22 (V44), car parking, trade stands, a Bring & Buy, a car boot sale, catering and facilities for the disabled.

Clive Burchell G3NKK

Tel: 01480 810473

E-mail: clive.burchell@btinternet.com

www.mkars.org.uk/mkars/rally

SEPTEMBER

September 2nd

The Andover Boot Sale

The Andover Radio Amateur Club will be holding their autumn Radio and Computer Boot Sale at Wildhern Village Hall, just north of Andover on Grid reference SU350510, post code SP11 0JE. The doors will open at 10.00am and admission will cost £1.50. Indoor tables cost £8.00, outdoor pitches cost £6.00 and sellers will have access to the site from 9.00am. Refreshments will be available and there will be facilities for the disabled.

David G4YVM

Tel: 07749 199453

E-mail: aracsec@hotmail.co.uk

www.arac.org.uk

September 2nd

The Telford Hamfest*

The Telford Hamfest will be held at the Ingenuity Technology Centre, Coalbrookdale, Telford TF8 7DU. The doors will open at 10.30am. There will be talk-in on S22 and 433.200MHz (GB3TF), free car parking, trade stands, special interest groups, lectures and family attractions.

Martyn G3UKV

Tel: 01952 255416

www.telfordhamfest.co.uk

September 9th

The Friskney Rally

The Friskney & East Lincolnshire Communications Club Rally will be held at the The Friskney Village Hall, Church Road, Friskney, Lincolnshire PE22 8RR (6.5 miles south of Skegness).

Bren 2E0BDS

Tel: 01754 820060

Ian Donnelly 2E0XOD

Tel: 07554 362020

E-mail: felccc@btinternet.com

www.felccc.com

September 15th/16th

The AMSAT-UK Space Colloquium

The AMSAT-UK Space Colloquium 2012 will be held at the Holiday Inn, Guildford GU2 7XZ. The event will include a full lecture programme, a Gala dinner on the Saturday evening along with a fund raising auction, the AMSAT shop and GB4FUN.

www.uk.amsat.org

September 16th

The Torbay Communications Fair

The Torbay Annual Communications Fair will be held at Newton Abbot Racecourse, Newton Abbot, Devon TQ12 3AF. The doors will open at 10.00am (9.30am for the disabled) and admission will cost £2.00. There will be trade stands, a Bring & Buy, an RSGB bookstall, catering and facilities for the disabled.

Mike Dixon

Tel: 01803 557941

E-mail: rally@tars.org.uk



An Evening Project

This month in *Carrying on the Practical Way* the Rev. George Dobbs G3RJV describes an 'evening project' – which will delight his keen band of readers after they've read the appropriate quote!

Good art is not what it looks like but what it does.

Roy Adzak. Sculptor, Photographer and Painter. (1927 to 1987)

Welcome to *Carrying on the Practical Way* (CotPW) where I'm starting by reminding readers that Amateur Radio constructors are a mixed bunch! Some only build

kits; others would consider this 'painting by numbers', some only build analogue projects, others only build digital circuits.

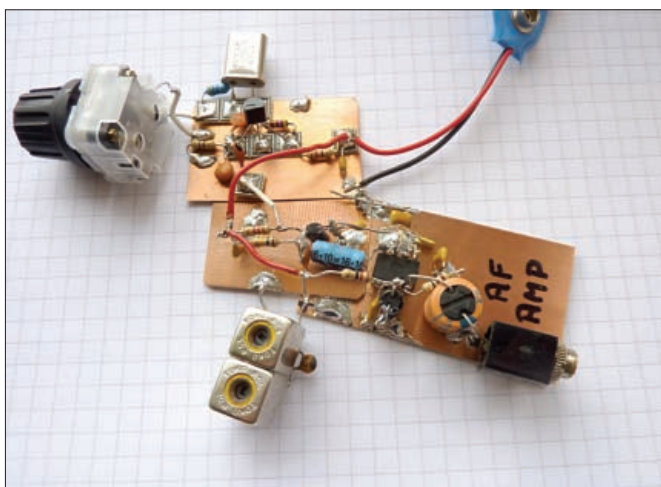
Some use only home-made equipment – most have some commercial equipment but also build some equipment. However, I think that perhaps the biggest divide between constructors is that between the 'tidy' and 'untidy builders'.

I'm most certainly an 'untidy' constructor. My approach is normally to build a project in the quickest, most convenient, manner. My excuse is often that I wish to test the design and if it works, then rebuild it in a smarter and more aesthetically pleasing form. In practice that rarely, if ever, happens. I've built it and it works – so why do it again!

Pictures Of Projects

From time-to-time readers send me pictures of projects they have built from this column and in almost every example, they are neater and better looking than my prototypes! I do admire finely crafted electronic projects. My old radio friend **George Burt GM3OXX**, constructs equipment that is like jewelry – it works well and is a pleasure to the eye.

George makes beautiful individually



crafted cases for his projects. My metalwork has been described as "aluminum GBH" (grievous bodily harm)! My priorities seem to be 1 – it works, 2 – I am pleased with the results ... and then about number 27 – it looks good.

Recently, I was to talk to a small group of would-be radio constructors about construction techniques that did not involve the use of printed circuit boards (p.c.b.s). I decided to build some small boards to illustrate various construction techniques and to show how easy it was to build a simple receiver in one evening. Regular readers will remember that I've described one evening projects (OEPs) several times in this column.

The OEPs have been popular. There is something satisfying about starting from scratch and, at the end of an evening, going to bed knowing that you have built something that works. So, this month I'll discuss the building of simple project boards and how to make a simple direct conversion (DC) receiver in one evening.

The completed receiver certainly lives up to my reputation for untidy construction as is well illustrated by the photograph of my first working version! It's both untidy and ugly but it works!

Like all sensible "test as you go" projects I'll begin with the output stages. For this I used the LM386 integrated circuit (i.c.); a device sometimes criticised for being noisy and, at times, unstable. In spite of this, I've usually had good results from the LM386.

It's a versatile audio amplifier. The gain is set internally at 20 – but it can be increased to 200 by adding a capacitor between pins 1 and 5.

The current drain is low making it ideal for battery operation and the standard version of the chip can supply well over 500mW to an 8Ω speaker. Perhaps its main advantage for simple projects like this is that it's very easy to obtain and very cheap; a complete audio amplifier for as little as 40p! The circuit for the amplifier is shown in **Fig. 1**.

I decided to build the audio amplifier using the 'dead bug' technique. In this method the chip is mounted on its back with the pins pointing upwards – looking like a dead bug. The pins are then used as soldering points for their associated components. By mounting the chip over a small piece of copper clad board (blank p.c.b. material), this provides a ground-plane for the grounded connections in the circuit. The photograph shows how this works in practice.

But please be wary! Because the chip is upside-down, the pin numbering

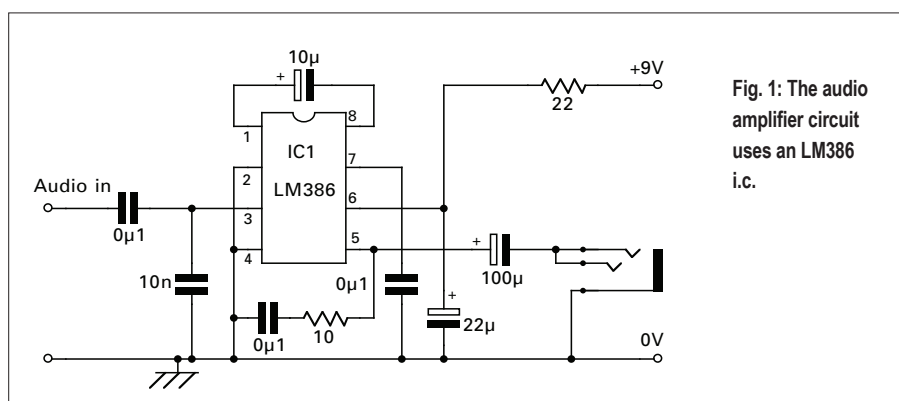


Fig. 1: The audio amplifier circuit uses an LM386 i.c.

goes the other way around the chip casing. It's easy (as I've discovered) to connect components to the wrong pins. This problem is perhaps more acute for experienced constructors who have to forget their habitual numbering of the pins.

The easiest way to avoid the problem is to draw a little sketch showing which components go to which upside-down pins and follow this in the construction. The illustration in **Fig. 2**, shows such a layout, both diagrammatically and pictorially. Pins are numbered as if they point upwards and the associated parts are shown coming from the pins and parts grounded as appropriate.

Testing The Board

To test the board, the 9V supply is connected. A slight hiss should be heard in the headphones or loudspeaker. Note that Fig.1 shows a stereo socket wired as a mono output for the use of stereo headphones or 'ear bud' type 'phones. Alternatively two leads can be used to directly connect a small loudspeaker. Placing a finger on the input should produce a hum at the output.

It's a good idea to build the local oscillator next as this board can also be tested individually. I used a variable crystal oscillator (VXO) built in the 'Manhattan' style. In Manhattan construction, sometimes called 'Pad' construction (Paddy board in Australia!) small pads are glued to a copper clad base board. These are insulated from the copper ground-plane and form soldering pads to mount the components.

My prototype used commercial pads made by QRPme in the USA but pads can easily be made from scrap p.c.b. material. The pads are attached to the copper surface using Cyanoacrylate adhesive. I have described how to do this several times in this column; the main advice is that very little of the glue is required and the pad should be held firmly down for at least 20 seconds for a secure bond.

Incidentally, I wonder how many readers know that **Harry Wesley Coover Junior**, the inventor of 'Super Glue' (Cyanoacrylate adhesive), died at his home in Tennessee in March 2011, aged 94? Like many great inventions, it was discovered through a mistake. Coover finally got recognition for his invention when President Barack Obama honoured him in 2010 with the National Medal of Science. Back to the plot.....

The VXO Circuit

The VXO circuit is shown in **Fig. 3**. – it's for the 7MHz (40m) band although it could be scaled up or down for other bands. In fact it's the VXO, that I used a

few years ago when I did an update of the classic 'Twofer' transmitter. It uses a crystal on the QRP calling frequency of 7.030MHz – these are available from a number of suppliers including the G QRP Club.

The variable capacitor is one half of a 140+60pF Polyvaricon capacitor and again these are available from several suppliers. This capacitor, with the inductor L1, enables the oscillator frequency to be varied a little. The amount of frequency shift depends upon the nominal frequency of the crystal and individual samples of crystal. I

make no numeric promises – but the shift should be in the order of a few kiloHertz.

The VXO is a useful way of making a stable high frequency oscillator without the problems often associated with a full variable frequency oscillator (v.f.o.). It's advisable to use temperature stable capacitors, such as n.p.o. or polystyrene types, for C1 and C2.

The VXO can be tested by applying a frequency counter to the output. Readers lacking a frequency counter can check the the oscillator by listening for it on a receiver. Set the receiver onto the s.s.b. or c.w. mode, or, in some cases, switch on the receiver b.f.o. (beat frequency oscillator).

Next, connect a short wire (much less than a metre is plenty) to the output to serve as a radiating antenna. Tune the receiver around 7.030MHz and you should pick up the signal from the VXO. If all is well, the most difficult bits of the receiver are done!

The Mixer

A crucial part of any direct conversion receiver is the mixer. This accepts the local oscillator – the VXO in this case –

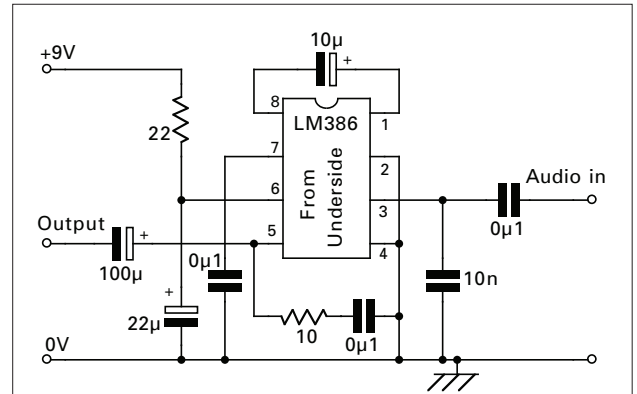


Fig. 2: (a) Illustrating the 'dead bug' style of construction. (b) contrast the stylised layout with the picture shown here.



and the radio input signals and mixes them. The sum and difference outputs of these signals produce an audio output of the signals around 7.030MHz. Yes – **you do hear all the signals twice** in a DC receiver. There are keen debates about the best circuits for radio frequency mixing – especially in DC receivers.

There are many sophisticated – and sometimes complex – designs for a DC receiver mixers. But, true to this basic little project, I used one of the simplest circuits. Several years ago I discussed simple field effect transistor (f.e.t.) mixers – some of which came from the work of **Miguel Angelo Bartié PY2OHH**. At that time I made a note of a simple bipolar transistor mixer from Miguel. I've never tried the circuit, but thought it might work in this project.

The circuit is shown in **Fig. 4**, is very simple and even offers some gain in the receiver. The radio frequency (r.f.) input is applied to the base of the transistor and the local oscillator (VXO) is applied to the collector. **Note:** The mixer still works with the signals applied the other way round, but with slightly worse results.

The audio output is taken from the

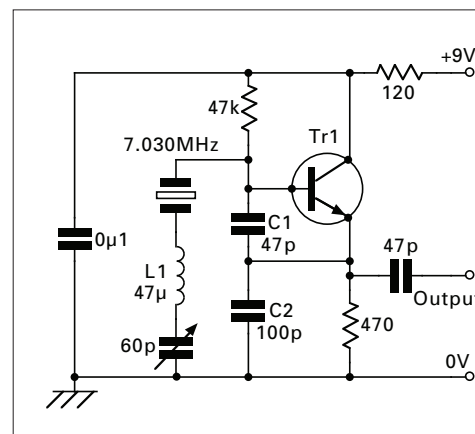
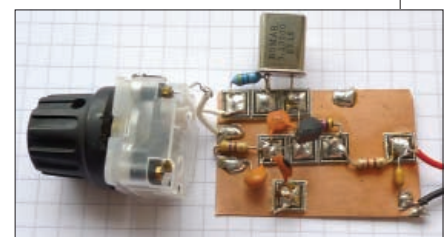


Fig. 3: The variable crystal oscillator (VXO) circuit and the picture of a suitable layout.



emitter of the transistor. I used a 2N3904 transistor but many other common n.p.n. types such as the 2N2222 would work in the circuit.

I chose to build this little circuit using ugly construction. Again, this method uses a copper clad board as a ground-plane over which the parts are mounted. The leads that are grounded in the circuit diagram are soldered directly to the copper ground-plane.

The grounded components serve as mechanical supports for the rest of the components, connected as per the circuit diagram. If additional supports are needed for components that don't connect to a grounded component, high value resistors (2.2M Ω or higher) can be soldered to the copper surface and used as stand-off anchor points. The method can be seen in the photograph.

The project didn't require the use of extra stand-off supports. It's a quick and easy way to build a circuit; ideal for experimentation. I have frequently used it for complete projects.

Audio Amplifier Gain

In this simple receiver, the gain is provided by the audio amplifier, with a little help from the mixer. Gain is important but so is selectivity – this is the ability of the receiver to select a desired signal from other nearby signals. In this receiver the selectivity is provided by input tuned circuits in the form of a band-pass filter.

The band-pass filter I used is shown in Fig. 5. It's built around commercial coils in the **Spectrum Communications** 10K HF range. The filter design is shown in Fig. 5 (a). I have included values for four common Amateur bands should readers wish to try bands other than 7MHz.

The filter has two tuned circuits, T1/C1 and T2/C3 loosely top coupled by a small capacitor, C2. I have been building band-pass filters of this design for many years with success. The tuned circuits T1 and T2 have adjustable cores for tuning the filter. The filters as shown for 50 Ω impedance in and out; a common configuration in receiver design. The high impedance output version of the circuit is used and Fig 5 shows how to connect the filter for our little receiver.

The output is taken from the top of the tuned winding for a better match into the mixer. The tuned winding is the side of the coil with three connections; the centre connection is unused. The input does use the low impedance winding (the side with two connections) assuming that the antenna input will be at low impedance (common practice). Note that I have also shown an input gain control or attenuator.

There's no volume control on the audio stages and adjusting the gain at

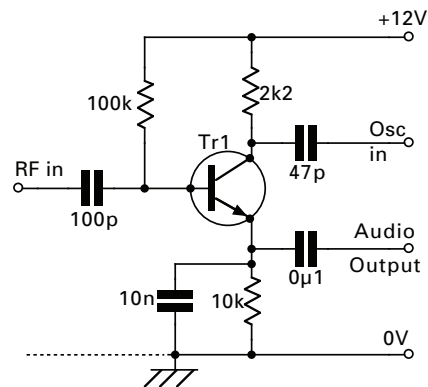


Fig. 4: The circuit of the mixer used in G3RJV's DC receiver and the picture of George's layout.

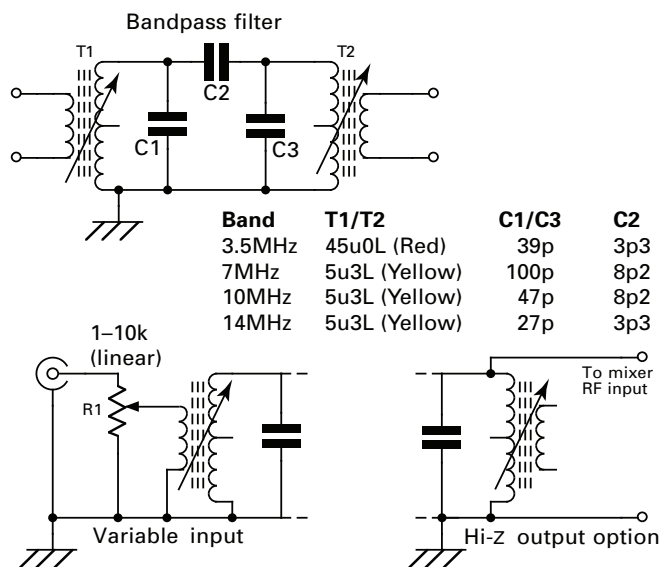
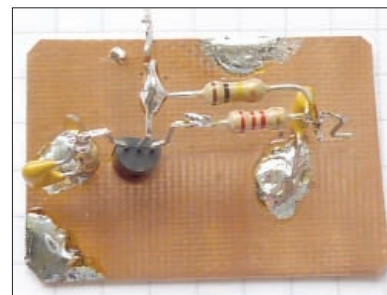
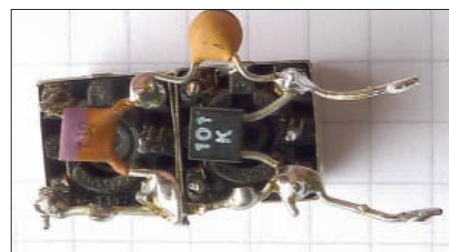


Fig. 5: The band pass circuits, along with alternative input and output connection, used in the DC receiver. The photograph is a pin-on view of the simple version.



the input works well in simple receivers. The resistor R1 should be a linear track potentiometer with a value in the order of 1 to 10k Ω . As my ugly prototype picture shows, I didn't bother with a gain control in my test version.

Construction of the band-pass filter was by simple point-to-point wiring. I simply connected the filter by using the leads on the capacitors with a little extra wire for the ground connection. The diagram input and output designations show how to interconnect the little boards to make up the complete receiver. Don't forget to join up all the ground connection.

When testing the receiver, the first task is to peak the band-pass filter for best results. Begin by adjusting the core of T2 for maximum signal strength and then adjust T1 for any improvement. **Note:**

There's interaction between the coils and it pays to adjust T1 and T2, alternately, several times.

There you have it – a receiver in one evening using four construction techniques; Dead Bug, Manhattan, Ugly and Point to Point. Does it work? Well it certainly did for me. Using my modest W3EDP antenna with its associated antenna tuner I heard many stations on 7MHz. Nothing outside Europe but I didn't spend enough time listening.

Incidentally, you may be asking yourself, "Why is Manhattan construction so called?" The term was first coined by **Chuck Adams K7QO**. When he saw all the components pointing upwards from the pads on the board, he said, "That looks like the Manhattan skyline".

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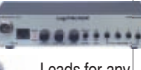
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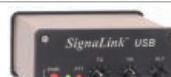


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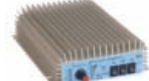
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Mike Richards G3WNC's Data Modes

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More Over The Waterfall

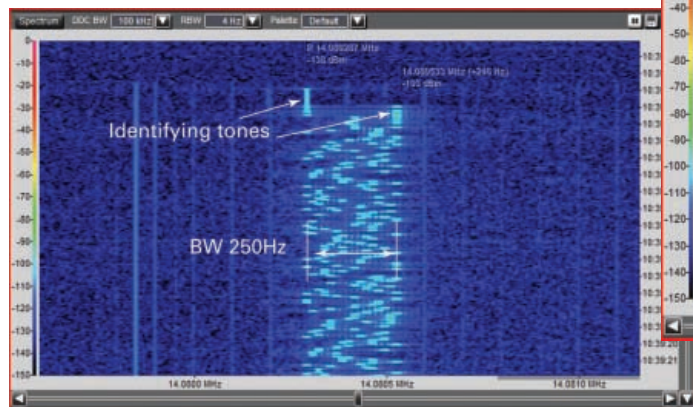
After last month's display of the various data signals on a waterfall display, Mike Richards G4WNC continues looking at some other modes.

Welcome to *Data Modes (DM)* – and because last month's pictorial look at data signals went down so well – I've continued with a few more this month. The more advanced and complex data modes require a little more skill in order to identify the critical differences between signals.

However, modern waterfall displays simplify the task and I have been able to identify a unique waterfall visible characteristic for every mode so far. See how you get on with this batch and please let me know if you want any other modes included.

Or perhaps, you've discovered a better way to identify signals from a waterfall or spectrum display. If so, let us know!

Fig. 1: The MFSK16 mode showing the staggered start tones.



Identifying MFSK

There are a number of Multiple Frequency Shift Keying (MFSK) variants on the bands and whilst they are similar, there are subtle differences that help positive identification. I've shown traces for MFSK16 to 64 in Figs 1, 2 and 3.

As with PSK signals there are small 'horns' at the start that are caused by the start-up tone sequence. These horns are subtly different from BPSK as they are staggered with the low frequency (l.f.) horn appearing first. This is easy to spot in MFSK16 but becomes increasingly difficult as the speed increases. With each of these three traces, the bandwidth increases in-line with the data speed.

The MT63 Mode

The MT63 mode is a more advanced mode employing BPSK and FEC techniques which produce a waterfall trace that is very different to most Amateur data signals. The illustrations of Figs 4, 5 and 6 show MT63 at 500Hz, 100Hz and 2000Hz bandwidth.

As you can see the signal produces a very even block pattern on the display with different bandwidths corresponding to varying data rates.

The Olivia Mode

The Olivia mode is a very effective mode for use in poor signal conditions and is another MFSK variant. As you

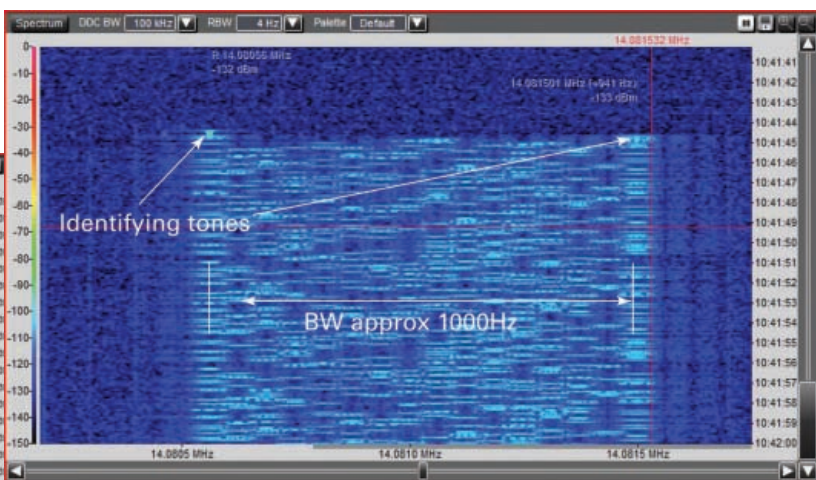


Fig. 3: The MFSK64 mode – here the start tones more difficult to spot.

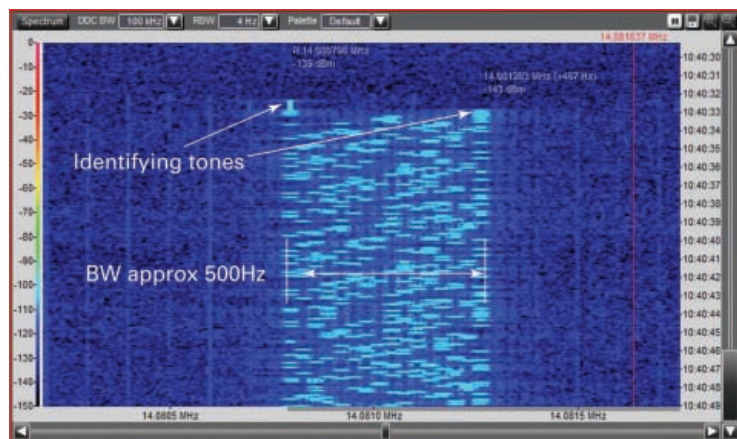


Fig. 2: The MFSK32 mode as seen on the display.

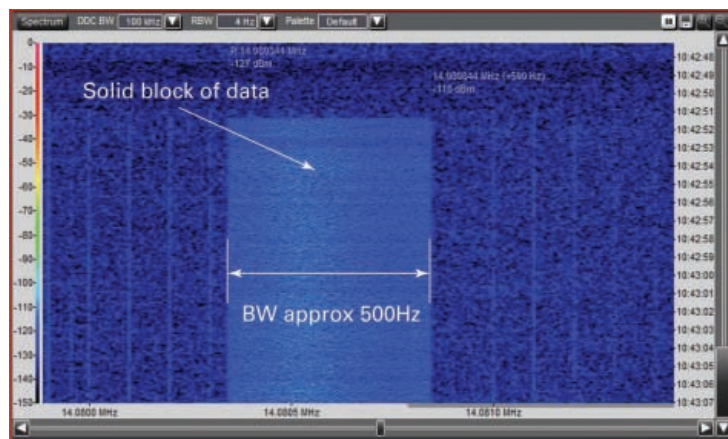


Fig. 4: The MT63 mode 500 signal.

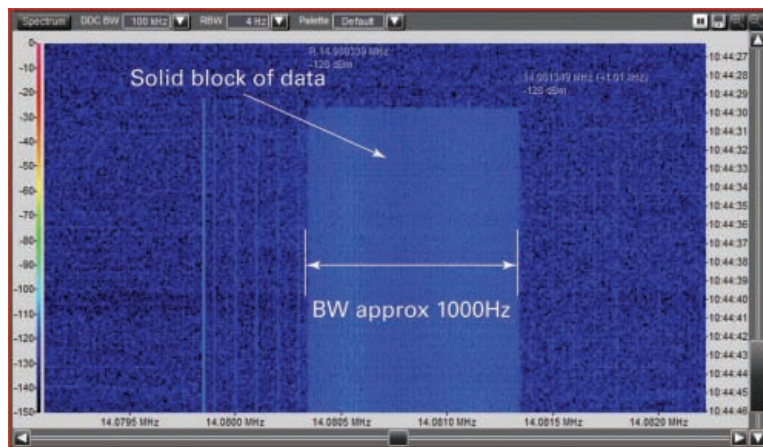


Fig. 5: The MT63 mode 1000 signal.

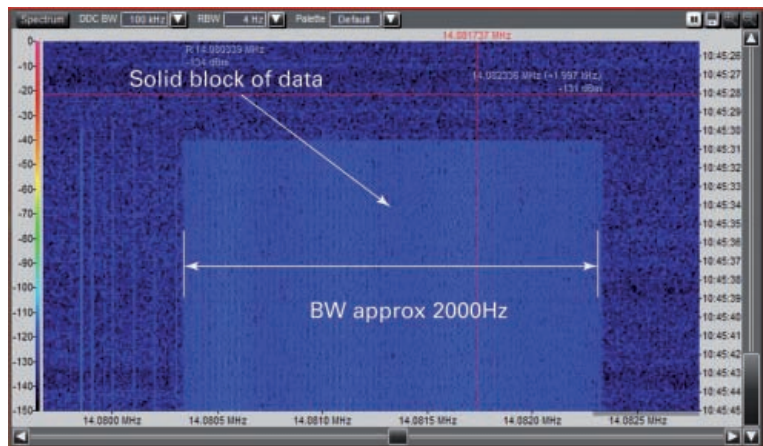


Fig. 6: The MT63 mode 2000 signal.

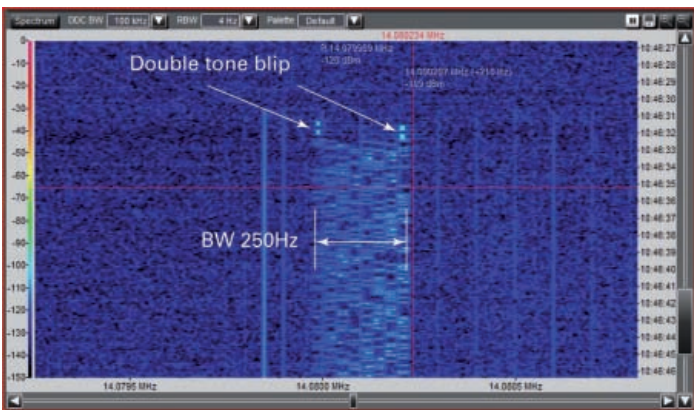


Fig. 7: The Olivia 16 mode showing the double blip start tone.

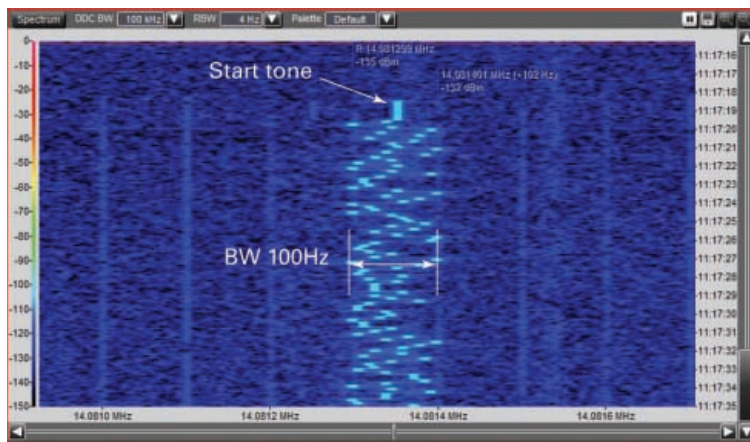


Fig. 11: The ROS 7-100 mode showing the central start tone.

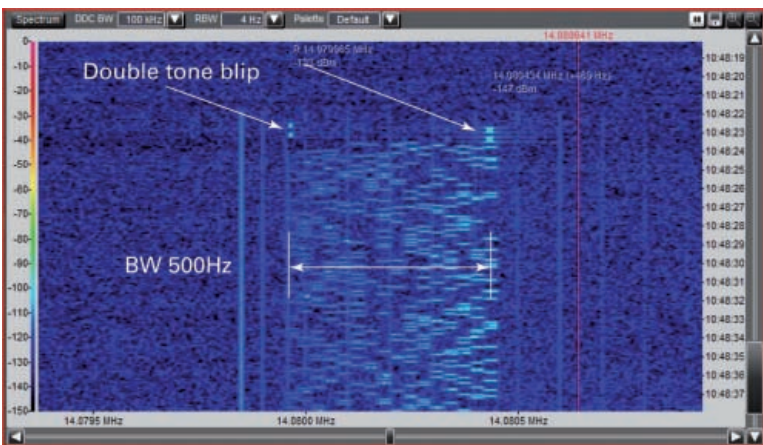


Fig. 8: The Olivia 32 mode signal.

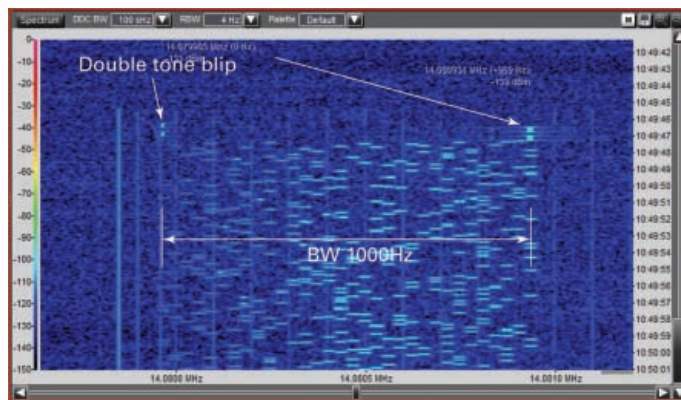


Fig. 9: The Olivia 64 mode signal.

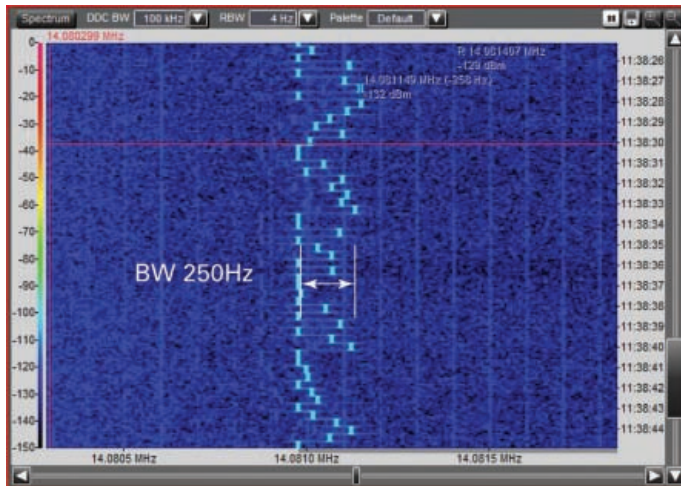


Fig. 10: The JT65HF mode – displaying a slow speed MFSK pattern.

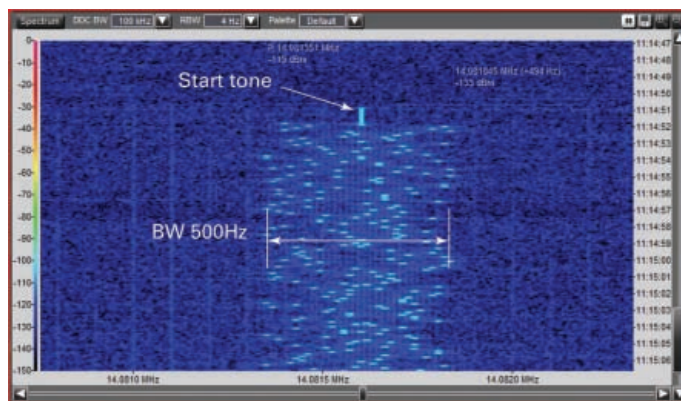


Fig. 12: The ROS 16-500 mode – with the same central start tone.

can see from **Fig.s 7, 8 and 9** the traces are very similar to MFSK, but the Olivia signals feature a double-tone blip at the start of each transmission. This is the key to positive identification of this mode.

The JT65HF Mode

Another very popular MFSK mode for extremely poor signal condition is JT65HF. And as you can see from the waterfall display in **Fig. 10**, this produces a very low speed MFSK like signal – so it's easy to spot.

The ROS Mode

Although controversial at times, the ROS mode has proven itself to be very effective over poor signal paths. You can see from **Fig.s 11 and 12**, that it looks very similar to many other MFSK signals, but the differentiator on the waterfall display is the burst of tone in the centre of the tone range. This occurs on all speed and bandwidth variants and is unique to ROS.

The V4Chat/Winmor Mode

The V4Chat/Winmore mode is a relatively new ARQ based data mode designed as an open-source contender to Pactor. But it can be used for either normal typed QSOs in V4Chat guise or for mailbox access as Winmor.

The signal comprises of variable length bursts of data but each burst has a short synchronising signal sent at the beginning that shows two small horns (see **Fig. 13**).

Well, that's all the data modes that I have illustrations for at present. I wonder if you know of others, or perhaps, have other, perhaps better ideas of identifying the various types? So, it's over to you, the readers, for comments! Let me now return to the *Virtual Audio Cable* software that I mentioned last time.

Virtual Audio Cable (VAC)

Last month I introduced you to Eugene Muzychenko's VAC software that's used to route audio data between applications running under the *Windows* operating system. As we use an ever more increasing amount of software for our radio stations, the ability to route signals in the digital domain becomes increasingly important.

However, the traditional method of interconnection with jack leads and multiple soundcards is both expensive and introduces unnecessary analogue to digital conversions.

Eugene Muzychenko's VAC software behaves rather like a soundcard with multiple, common inputs and outputs

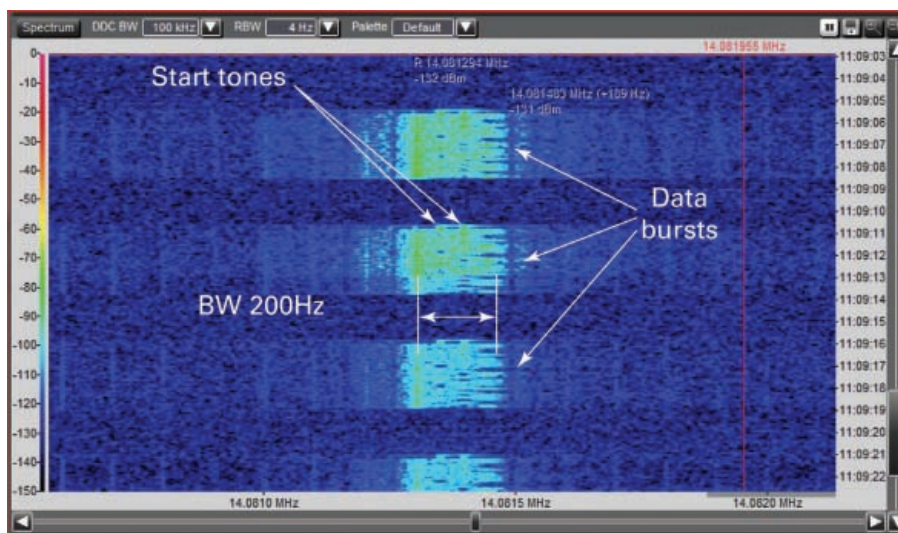


Fig. 13: The V4Chat ARQ mode.

so, that you can send the output of your software defined radio (SDR) receiver into the VAC. Then from VAC's output, you can take multiple outputs to feed a speaker for monitoring, a decoder, an audio analyser, a sound recorder and as many other items as you like.

You can also have multiple cables running each of which is entirely separate but has the same multiple connection facility.

Audio Repeater

One particularly useful accessory that is supplied with the VAC software is the Audio Repeater. This feature provides the capability to patch any input to any output device. In a typical application, you would have an SDR output, connected to a VAC and your decoder and analyser software connected to the VAC.

However, that doesn't give you a way to listen to the signal through your speakers. This is where the Audio Repeater function comes in, as you set the input to the VAC and direct the

output to your computer speakers. The Audio Repeater is extremely versatile and can patch any input device to any output device. As you can see from **Fig. 14**, you can also make a number of parameter changes to alter the sample rate/size of the transfer plus you can route the signal to a wide range of surround sound options.

When the Audio Repeater is running, a queue monitor is displayed that shows how the Repeater is coping with the workload plus it has an **overflow/underflow** indicator to warn you if it's struggling. Below each selected channel there's a handy bar-graph that shows the signal level for each active channel.

As with the VAC, you can run multiple instances of the Audio Repeater to support more complex installations. This really is an exceptionally useful program and well worth the US\$25 registration cost. In case you missed it last time, here's the web address: <http://software.muzychenko.net/eng/vac.htm> See you next month!

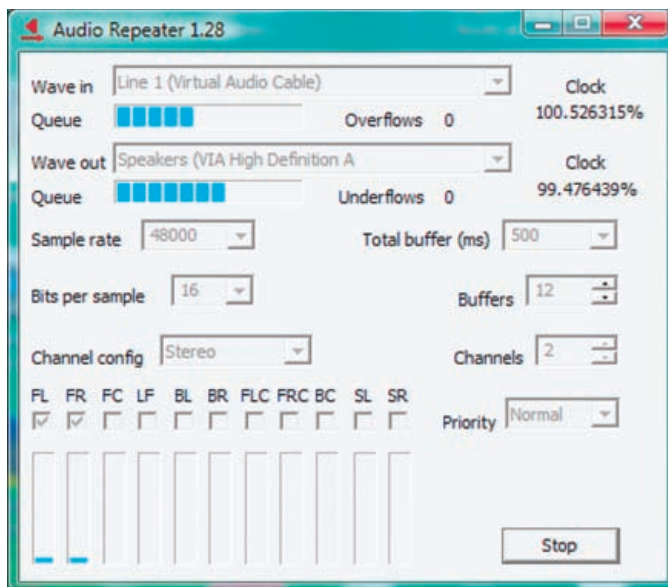


Fig. 14: The Audio Repeater feature of VAC in action.



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Beacon and Repeater News

This month Tim Kirby G4VXE has an action-packed column and starts off with reports on some Cornish repeater and beacon antenna renewals.

Welcome to the *World of VHF* (WoVHF)! And I'm starting with an update from **Roger Gregory G4OCO**, who wrote in to me with news from the Mid Cornwall Beacon and Repeater Group. He wrote "On Saturday May 26th 2012, members of the Mid Cornwall Beacon And Repeater Group replaced the antennas for some of our beacons, the original antennas were over 20 years old and giving some concern about how they were ageing".

Roger included a photo showing all of the antennas on their mast

(IO70OJ) at Hensbarrow Downs in central Cornwall. The 50MHz dipole is at the top of the mast, and the 70MHz three element beam is located at the second landing, 144MHz 3-element beam at the first landing and with the 432MHz 8-element beam further down the mast.

Roger says that the APRS digipeater is hopefully going to be re-commissioned and in support of the local community "Cornwall Search And Rescue", shortly to be joined by Air Training Corps (ATC) Cadets.

Roger asks for people to look at their web site www.mcbarg.co.uk and to consider making a donation to keep the beacons going, which can easily be done through the website. Thanks for the news Roger!

Shropshire Net

Al Richards G7RHF wrote in to me with details of a weekly net that runs on the GB3VM repeater each Wednesday evening at 2100 local time. The GB3VM repeater is located at the Woofferton short wave transmitter site (formerly owned by the BBC and now owned by the **Babcock International Group** that now transmit the BBC's World Service programmes) and has excellent coverage of the Shropshire, Worcestershire, Herefordshire and Welsh Marches area. It even reaches Gloucestershire. The output is on 145.6125MHz.

The net has attracted considerable activity and anyone within range is very welcome and encouraged to join in. Al particularly wants to thank **Glyn Jones G4AIJ** **Dave Porter G4OYX** for their efforts looking after GB3VM and also GB3VN on 430MHz. The GB3VM and GB3VN repeaters are very well sited and have the possibility to be heard over a very wide area. Why not have a listen and see if you can hear them – if you can, be sure to let me – and the repeater keepers know!

Isle Of Mull DXpedition

Gavin Nesbitt M1BXF wrote with an interesting report from the Camb-Hams DXpedition to Mull which was active between April 28th and May 5th. The group operated from a rented cottage near Bunessan, in locator square IO66, using the callsign GS3PYE/P.

Gavin writes, "For the week we managed 389 QSO on bands above h.f. The QSOs break down as 50MHz; 253 QSOs – 120 s.s.b., 78 c.w, 55 JT6m, with a total of 105 squares and 27 DXCCs, 70MHz; 45 QSOs – 6 s.s.b., 1 JT6m, 38 FSK441 with a total of 29 locators and 12 DXCCs, 144MHz;



3A2MW, Z31RM, VP9GE, TF3ML/P, T77C, 9Y4D, MJ/EI9FBB and 4X4DX.

Mark was pleased to work JX9JKA (IQ50) on May 29th following a PSK31 QSO with GM4ZMK – which sounds like a multi-hop Es opening. Evening openings to the Caribbean have occurred on several evenings, with 9Y, FG, FM, FY and VY worked – with KP4A and KP4EIT being huge signals. Mark says that the QSO with OH2LE brought his DXCC total for 2012 up to 75 – an excellent haul Mark!

Paul Bowen M0PNN has made some nice Es QSOs throughout the month, highlights being SV5BYR (KM46) and CT8/K0RUI (HM68) on May 8th, ZQ2FK on May 12th but the real highlight was ZS6WN (KG46) worked on May 15th with a combination of Es and Trans-Equatorial propagation (t.e.p.).

Philip Oakley G0BVD (Great Torrington, Devon) has had a good month with lots of Es QSOs. May 15th was Phil's first good Es opening, with 10 QSOs to Italy and Spain. On May 28th, Phil completed 16 QSOs with Spain, Italy, Germany, Austria, Sweden, Czech Republic and Polish stations. Next day on May 29th, Phil completed another 15 QSOs to Spain, Serbia, Poland, Slovenia, Austria with the highlight being EA6/M0DLL (JN20). Phil caught another opening to Italy, Hungary and Spain – including EA5OM/M (IM99) on May 30th.

Phil was disappointed to miss out on FM5AD (FK94) and TF3ML/P who were S9 on his vertical, but he wasn't able to 'crack' the pile-ups.

Here at **G4VXE** it's been great to get in on a few Es openings – there seem to have been quite a few good ones so far. Contacts of note have been May 10th; ZQ2B (IM76) and EA5/DH6KAW (JM08); May 18th ZQ2FK (IM76); May 26th EA8BWY (IL18); May 27th IQ7AF/P (JM99), IS0BSR/IS0 (JN40), OH5XO (KP41) and June 3rd EA7AJR/P (IM66) and ZQ2FK (IM76). All worked using the FT-847 (100W) and a V2000 vertical. While I was out on a local hilltop with the FT-817 and a whip antenna, it was good to hear the GB3MCB beacon from St. Austell in Cornwall (IO70) coming in. I can't hear it from home – but it's easy copy from a quiet location even with a simple antenna.

The 70MHz Band

Dave Robinson WW2R (Dallas, Texas) who will soon be moving back to the UK as G4FRE once again, reports that the WX9XRU/B beacon from Virginia, beamed at Europe is active on



The mast carrying the GB3MCB beacon antennas on Hensbarrow Downs in Cornwall.

70.005MHz for the Es season. Dave reports that the beacon was switched on the afternoon of May 26th and that he heard it, off the back of the beam in Texas the following day on a dipole, over a path of 1626km.

Here at **G4VXE**, I have been delighted to catch some Es openings, even with my very simple system of around 8W to a vertical antenna. On May 15th around 1300z, I worked IK0SMG (JN61) and IK5YJY (JN53). Later in the day around 1600z, I could hear a weak Italian on 70.200MHz and was struggling with him, when I was delighted to be called by CT1FJC (IM57) and then continued to work IZ5EME (JN52) and I0DLP (JN61). On May 26th, the band was good into Spain and Portugal quite early (1000z) and I worked EA7HG (IM87), CT1DIZ (IM58) and EA7KB (IM67).

Finally, on May 29th, just before the RSGB 70MHz activity contest, I worked EA5EF (IM99). I'm hoping to make some improvements to my 70MHz system soon, but in the meantime, I am delighted to be making some interesting Es contacts.

Mark Marment CT1FJC says that his new 6-element Yagi antenna has been working well, with the best DX on the new antenna being OK1TEH at 2350km. Mark found a nice opening to GM and GI on May 29th, working GM4FVM, GM4FZH, GM4IGS and GI4SNA.

The 144MHz Band

Pete Goodhall 2E0SQL (Oxford) conducted some interesting tests with **Andy Smith M0VKG** (Rothwell) on May 19th. The plan was to work

each other on every mode that they could. They worked on JT65A, JT65B, FSK441, PSL31, PSK63, PSK125, ISCAT and CW. Pete and Andy noticed some interesting scatter effects which made quite a difference to data modes decoding at times. They found that the best mode seemed to be ISCAT. Intriguingly, the two modes that they weren't able to work on were s.s.b. or Hellschreiber!

Pete says that on May 27th he worked M1ELK/M on the Ridgeway and his father, **Paul Goodhall M3JFM** (Oxford) while Pete was out cycling on Boars Hill, near the city. Pete says that he was using his new VX-8GE hand-held which he enjoys using for both voice and APRS contacts – he's ridden over 160km (100 miles) on his bike, using it as a mobile rig so far.

Jon Wheeler G0IUE reports that the GB3JB repeater came back on the air on May 27th from Willoughby Hedge just off the A303. Whilst a new tower is awaited, the antenna is about 6m lower than before and running purely from electrical power generated by the wind turbine. It seems to be working well and there are lots of people calling through it from as far afield as Dorset and South Gloucestershire. Jon sends his thanks to the team of G3ZXX, G0AYD and his son Sam and Matthew M6XBX who helped re-activate the repeater.

Paul Bowen M0PNN made a couple of nice contacts during the RSGB 144MHz UK Activity contest on May 1st, working MM0GPZ/P (IO85) and G4FZN/P (IO94).

Satellite Reports

'Up' to the satellites next and Pete Goodhall 2E0SQL has had a good month and worked some new 'wet' grid squares activated by UT1FG/MM. Other new callsigns worked this month have been; via FO-29 satellite: G5RR (IO93), F4DJH, UT1FG/MM (JO37, HO96, HO85), G3XAP (JO02), UX7LT and DL1BL; via the VO-52 satellite: DF9DX (JO31), DF7PX (JO72); via the AO-27 satellite 2E1EBX (JO02) and M6DNU/P (IO93) and via SO-50 IZ0CGV (JN61), UT1FG/MM (HO52).

Pete says that he's just got an Arrow satellite antenna which he's planning to take out portable to work from some different squares during the summer. He's already tested it from the local sports field to work through AO-27. He also says that it would be great to hear some more activity. Remember, you don't need a complicated transceiver for this, a dual-band hand-held will do the job very nicely. See you next month!

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Don't forget – all reports to Carl by the 15th of each month please!

An Unusual Gift from the Isle of Man!

There's a strong whiff of delicious Manx Kippers in the air and the aroma heralds the entry of Carl Masons GW0VSW and his round-up of your h.f. activities.

Some unusual things, **Fig. 1**, arrive in the post, but nothing quite like the package that arrived this month. I took delivery of some Manx Kippers produced by the Island Company Deveraus, www.isleofmankippers.com/ a family run business established in 1884, kindly sent to me by **Robert Taylor** on the Isle of Man. Why Kippers? Well, after reading my story of the broken Morse key a few issues ago Robert wrote to me asking if I had found a key and what I would recommend.

As I had already sourced donor parts for my original key I sent him a spare metal version of the old Army Mark 8. Robert was more than pleased with this as it had the same feel as the keys he had used during his time in the Army and combined with a MFJ buzzer purchased from Nevada the code is gradually coming back to him.

The kippers were sent as a "thank

you" and very nice they were too. Good luck with the Morse Robert and many thanks for the kippers. They were superb!

The Fists Celebration

The international Morse preservation Society, the **FISTS CW Club**, is celebrating its silver Jubilee Year (1987-2012) this year. Founded by the late **George Longden G3ZQS** the society supports the use, preservation and education of Morse code. The club is devoted exclusively to c.w. operators, c.w. operating and people who are passionate about Morse code. Over the past 25 years has expanded and now has many members located all over the world.

To mark the occasion FISTS is holding a week of activity between September 2nd and 8th and will be offering 'non-members' an award for

the highest scoring entrant. The silver jubilee activity is not designed to be a contest style week. It's more a leisurely event where c.w. enthusiasts can take part and be welcomed by the current members at whatever speed you feel most comfortable with and should provide an ideal opportunity for those of you that wish to try out your Morse.

A "Founders award" will be issued to the highest scoring FISTS member. If 50 members or more are worked during the activity certificates of merit endorsing the achievement will be given and for the first time entries will be welcomed from non-members.

Activity is on all bands except the WARC bands (10, 18 and 24MHz) and scoring is as follows, 10 points for a FISTS HQ station GX0IPX, GX3ZQS, MX5IPX, VK2FDU, ZL6FF, JL3YMV, KN0WCW, 3 points for a FISTS Affiliated Club Station, 2 points for a Fists Member and 1 point for a Non-member. Logs should include DATE/CALL/NAME/QTH/QRG/TIME/FIST number or non-member and points claimed.

Entries can be sent to **Robert Walker M0BPT, FISTS, PO Box 6743, Tipton, West Midlands DY4 4AU** or by E-mail to m0bpt@yahoo.co.uk in Excel/csv/tabbed MS Word document format if possible. More information can be found on the society's website at www.fists.co.uk

Islands Activity

The Shiant Islands are a small group of islands in the Hebrides, in North West Scotland and lie 6km (4 miles) or so off the coast of Lewis and about 19km (12 miles) from the northern tip of Skye. Helpful PW reader **Douglas Maxwell GM0ELP** wrote in to say that he will be part of a team using the call **GB5SI** operating from Shiant Island EU-112 between July 15th to the 22nd.

Ten operators will be running two stations comprising Elecraft K3s with linear amplifiers and mostly vertical antennas set up on the beach. The Islands have a large population of seabirds, and are also home to a colony of Black Rats, which it's said may originally have come ashore from a shipwreck. And apparently, apart from one or two small islands in Scotland's Firth of Forth, the Shiant Islands are the only place in the UK where the black rat – or ship's rat – can still be found!

Amateur Radio activity can be



Fig. 1: Carl says the Manx kippers were wonderful!

expected on all h.f. bands using c.w., s.s.b. and RTTY and the team hope to work as many PW readers as possible. The QSL route is via MM0BQI.

The V55B DXpeditions

The DXpedition, **Fig. 2**, to Namibia by **David Hutchinson G14FUM**, his wife **Gillian G18MIV**, **Richard White G14DOH** and **Karl Voelker DM3BJ** proved to be a success. The team flew out to Cape Town in early March and after spending a few days sightseeing hired a Nissan X-Trail for the 500km drive to Oranjemund arriving on March 18th. The team used V5/Homecall for the first week using the shack of Andre Pretorius V51B – who uses a Flex5000A software defined transceiver.

Using the Flex rig meant a rather steep learning curve to familiarise themselves with the transceiver before they operated as V55B for the CQ WPX SSB contest. Altogether 1748 QSOs were made during the weekend with 100 countries including Gabon, Hong Kong, Israel, Mongolia, Nigeria, Reunion Island, St. Kitts, USA, Uruguay and Zambia. There are some videos of the team's activities at: www.youtube.com/user/mirtna60/videos and photographs can be found at: <http://travel.webshots.com/slideshow/582514650zGHabX>

The DX News

On to some DX news now, and Anacapa Island NA-144, which is a small volcanic island located about 18km (11 miles) off the coast of Port Hueneme, California, in Ventura County. The United States Coast Guard built a light beacon there in 1912 and a light station in 1932 – which was the last lighthouse to be built by the United States Lighthouse Service. **Jeff Hall W6UX** and other five operators will be active from here as **W6UX/P** from around 2200hrs July 27th until 1200UTC on June 29th including the IOTA Contest (The last full weekend in July). Look for them on 7, 14, 21 and 28MHz and also 10MHz Friday July 27th only. QSL via W6UX.

To celebrate the 200th anniversary of the Patriotic War of 1812, or the French invasion of Russia, a special callsign **R200V**, **Fig. 3**, will be active until September 12th from various historical places in the regions of Smolensk and Moscow. A QSL is good via RK3LO through the bureau, LoTW and eQSL.

Your Reports

On to your reports now and there's a lot to fit in this month! Once again it's the logbook from **Eric Masters G0KRT** in



Fig. 2: The V55B QSL card. The DXpedition to Namibia by David Hutchinson G14FUM, his wife Gillian G18MIV, Richard White G14DOH and Karl Voelker DM3BJ proved to be a success.



Fig. 3: To celebrate the 200th anniversary of the Patriotic War of 1812 and Napoleon's invasion of Russia, the special callsign R200V will be active until September 12th from various historical places in the regions of Smolensk and Moscow.



Fig. 5: Tom Ruddell 2I0TJR received this QSL from P4871ARU for a 14MHz QSO.



Fig. 6: Owen Williams G0PHY worked JX9JKA (Jan Mayen) and received this QSL card.

Worcester Park, Surrey who starts us off as he tried 3.5MHz s.s.b. working F6EHP (France) at 1923 and with c.w. S52UW (Slovenia) at 2259UTC using a Kenwood TS-570 and modified W3EDP antenna tuned with an SG-230 smart tuner. The 7MHz conditions "were not great" but using s.s.b. and 100W again

he worked a string of Dutch stations including PD1HP at 1822 followed by OZ7TM (Denmark) Nordjylland Island EU-171 at 1907UTC QSL via DL1TM.

The special callsign **GB2BHM** (Benholm Mill), **Fig. 4**, was aired by former Radio Officer **Norman Mackenzie GM3WIJ** and members of the **Aberdeen ARS**. This callsign was re-issued in 2009 to the society for their Benholm Mill (National Mills Weekend) Special Event Station. The station comprised a Kenwood TS-570D and a full size 3.5MHz loop with operations mainly on 7MHz from a tent close to the mill.

With temperatures hitting almost 25°C in the shade the team did well to work nearly 200 stations over the weekend with their log containing many UK calls plus SA6BID (Sweden) 1018, ON5JE (Belgium) 1123, DM2LI (Germany) 1236, PA2TT (Netherlands) 1250 and EI3FW (Ireland) EU-115 at 1323UTC. Further details on the Aberdeen ARS can be found at www.radioclubs.net/aars/ and QSL cards for QSOs from 2009 onwards should be sent to **Lewis Donaldson GM4AJR**.

The 14 & 18MHz Bands

On the 14MHz band in Portadown, County Armagh was **Tom Ruddell 2I0TJR**, who used his Kenwood TS-570DGE and 50W s.s.b. into a home-brewed vertical antenna 3.7m (12ft) above ground. He logged VK2LAW (Australia) OC-001 at 0700, A41MX (Oman) 2142 (QSL via EB7DX), A65EE (United Arab Emirates) 2147 (QSL via IZ8CLM). Then came LW3DN (Argentina) 2232 (QSL via EA5KB), VO1TX (Canada) 2251, and CE1VIL (Chile) 2304.

Next came P4871ARU (ARUBA), **Fig. 5**, SA-036 at 2330 celebrating the International Amateur Radio Union's, (IARU) 87th Anniversary and the first time that Aruba has issued a 4 digit prefix (P487) and a 4 letter suffix (IARU). The QSL route is direct only to P43E, PO Box 614, Oranjestad, Aruba.

In Devon **Andy Adams 2E0KMP** – living near Exeter – decided to get up early and try and work his first Australian station OC-001. Calling "CQ" for nearly half an hour Andy was surprised to hear someone ask if the frequency was in use at 0637 as he was about to QSY to 18MHz. Replying that it was, the station identified itself as **VK2IZI Neil Hawkesford** (formerly G0UYI) who had moved to Bilpin, NSW in 2003. He was 5&8 with Andy who received the same report using 50W from a Yaesu FT-450D and Pro beam antenna fixed in an East/West position.



Fig. 7: Ray Tarling 2E0TEM worked 4S7BRG (Sri Lanka) on 21MHz PSK31 and received this colourful QSL.

and dipole antenna to work PP5BS (Brazil) 1242, A71AM (Qatar) 1503, VU2DX (India) 1515 and YB1LZ (Indonesia) 1525. Next came A61ZX (United Arab Emirates)

1535, 9H1KZ (Malta) EU-023 at 1545, HZ1TT (Saudi Arabia) 1755 and 9V1SV (Singapore) AS-019 at 1822UTC. Maynard was running 100W.

In Athens, Greece, **Panos Dadis SV1GRN** logged F5LPL/P (France) 1245, EK97KE (Armenia) 1312, SM6ORP (Sweden) 1351 with PSK31 while his s.s.b. found EI2HS (Ireland) EU-115 1352 and HZ1OS (Saudi Arabia) at 1355UTC. Panos was using a Icom IC-756ProIII and Sandpiper MV-10 vertical antenna

Also on the band was Owen G0PHY who had s.s.b. QSOs with 5N7M



Fig. 8: The QSO card sent by CE2WZ following a QSO with Steve M0SAS.



Fig. 9: Steve Wellon's Jubilee callsign, MQ0SAS QSL card.



Fig. 10: The ZW1X QSL card received by George G3ICO following a 28MHz s.s.b. QSO.

A short while after ZLs were heard with reasonable signal strengths but by that time the UK was waking up and Andy's power was no match for some of the larger stations. A few days later VK7ROY in Tasmania made his log at 0644UTC – yet another ex-UK operator **Roy Brown M0FFD**.

In Biggleswade, Bedfordshire **Owen Williams G0PHY** used a Yaesu FT-2000 and 100W to a dipole antenna to work WS7X (USA) in Westhaven, Utah at 0520 and JX9JKA (Jan Mayen), **Fig. 6**, EU-022 at 1326 (QSL via LA9JKA).

The 18MHz band provided **George Davis G3ICO** in Yeovil with a large number of stations in North America including N3WT (USA) in Jefferson, Maryland at 1449, KG9N (USA) in Congerville, Illinois at 1502 and later E21EJC (Thailand) at 1824UTC. George was on the key using an Elecraft K2 at QRP at 5W to a doublet antenna.

Operating /P from Keswick, Cumbria was **David Fower M0FAZ** who was very pleased to work W1RAB (USA) in Foster City, California at 1525UTC running a Yaesu FT-857 and 100W s.s.b. to a Yaesu ATAS-120 antenna mounted on his car. The 'Active Tuning Antenna System' is approximately 1.6m (5.25ft) high and provides David with h.f. coverage on the 7, 14, 21 and 28MHz bands with automatic motorised tuning. It utilises control signals from the transceiver's microprocessor, which is received via the coaxial cable to the ATAS-120's internal motor. This then adjusts the radiator length for best s.w.r.

In Edwinstowe, Nottinghamshire **Bill Ward 2E0BWX** used PSK31 to work IW3EIA (Italy) 0928, OE3IPW (Austria) 1004, EA2KR (Spain) 1020, UA3ICN (European Russia) 1715, 9A1CCB (Croatia) 1728 and HA1ZM (Hungary) at 1814 using a Icom IC-7400 and 30W to a Pro Whip antenna.

The 21MHz Band

The 21MHz band was favoured by **Maynard Beddard M1EGX** (Sutton Coldfield, Wset Midlands) who used a Yaesu FT-920 and Heil microphone

(Nigeria) 0652 (QSL via OM3CGN), 7O6T (Yemen) 1919 (QSL via UA3DX) and HD2A (Ecuador) at 2110 (QSL direct only to Contest Team, HD2A at PO Box 09 01 5999, Guayaquil, Ecuador.

Meanwhile Eric G0KRT logged a new country YF5PQM on the microphone at 1743UTC.

The next report comes from **Stuart Payne M0HBI** in Telford, Shropshire, who operated portable from Carding Mill Valley, Shropshire and worked W4TJF (USA) in Fancy Gap, Virginia using an Yaesu FT-897D with FC-30 auto tuner and 90W to a Watson Ranger-9 antenna on the boot of his car. So far, this QSO makes this Stuart's farthest contact to date (well done Stuart!).

In Bath, Somerset, **Ray Tarling 2E0TEM** has been enjoying some PSK31 operating using his Icom IC-706MkIIIG and 30W to an M0CVO single-band dipole mounted in his loft. It's working well as he logged YB7HL (Indonesia) 1836 and 4S7BRG (Sri Lanka), **Fig. 7**, at 1859 (QSL via LZ3HI), LU2DC (Argentina) 1916 and PU4ISA (Brazil) at 1936UTC. Ray is now working towards his 'M0' call with the help of **Steve Hartley G0FUW** – who is internationally known for his Buildathons and training expertise.

The 28MHz Band

Finally, the 28MHz band provided **Steve Wellon** operating with the Jubilee callsign **MQ0SAS** – **Figs. 8 and 9** – from his QTH in Worcester (Worcestershire) with a PSK31 contact with CE2WZ at 1743UTC running 20W from an Icom IC-756PRO and Cushcraft MA5B mini-beam.

The 5W QRP of George G3IXO, **Fig. 10**, found ZW1X (Brazil) at 1814 while 100W s.s.b. from Eric G0KRT worked 5B4AHY (Cyprus) AS-004 at 1341 and OD5NH (Lebanon) at 1425UTC.

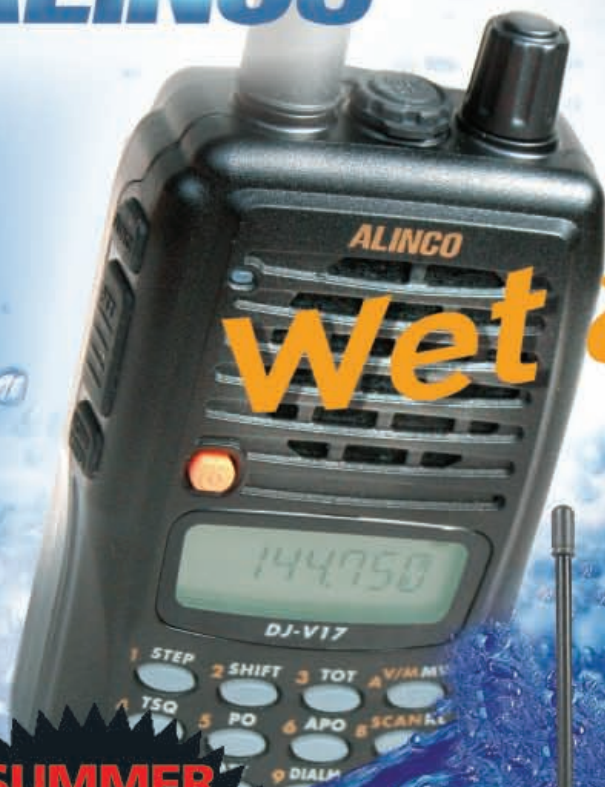
That's Your Lot!

That's your lot for this month and I hope I managed to fit you all in! 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 time I wish you all good DX. 73, Carl GW0VSW. ●

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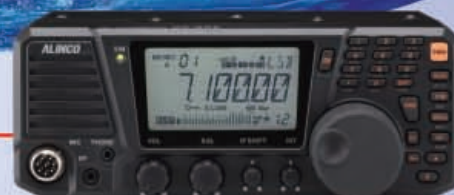
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An Introduction to the 1296MHz Band

This month Colin Redwood G6MXL is determined to encourage his *What Next?* readers to try the 1296MHz band. Colin says that “Just because it’s a microwave band – it’s not difficult to start operating on 23cm”!

Talking to other Radio Amateurs I get the impression that many think that just because the 1296MHz (23cm) band is a microwave band, it must be difficult to get started. However, although 30 years ago, they may have had a point – nowadays there’s enough equipment readily available for the 1296MHz band that this really shouldn’t put off an avid explorer! I should also remind readers that the band is only available in the UK to Amateurs holding either Intermediate or Advanced Licences.

Equipment For 1296MHz

Multi-mode base stations and transverters are available in both, ready-assembled and kit versions. There are also a number of multi-band, multi-mode rigs to choose from.

Antennas are also available with gains well in excess of 10dBd in compact multi-element designs and suitable feeder is obtainable from many suppliers. Later I’ll describe how I started on the band, and the sort of DX that can be worked, even from surprisingly poor sites. Contacts aren’t just line of sight!

Mobile & Hand-Held Equipment

Over the years, Icom, Kenwood and Yaesu have all produced frequency modulated (f.m.) mobile and hand-held transceivers. These can



Fig. 2: Kenwood’s TS-2000X transceiver includes the 23cm band as standard.

occasionally be picked up at second-hand bargain prices. I reviewed the Alinco DJ-G7E 144/430/1200MHz triple-band f.m. hand-held transceiver

(Fig. 1) in the October 2009 issue of *PW*, which I believe is the only 23cm hand-held currently on the market in the UK.

Icom have produced a couple of dedicated 1296MHz multi-mode transceivers over the years, as well as an optional 23cm module for some of their transceivers. There were also optional 23cm

Although most imported transceivers don’t cover the full UK allocation, this really isn’t a problem. This is because they all cover at least the ‘core’ part of the band between 1296 and 1298MHz where most narrow band f.m. activity takes place.

Using Transverters

A cheap way to get on the band is to buy or build a transverter. A transverter allows a 144MHz transceiver to operate on 1296MHz, by adding the 144MHz signal to a local oscillator running at 1152MHz. On receive the transverter ‘subtracts’ 1152MHz from the 1296MHz signal to produce a 144MHz intermediate frequency (i.f.) to connect to a 144MHz transceiver. The choice of transverters is even bigger than black boxes.

Some transverters are completely ready for use (Fig. 3) while others require radio frequency (r.f.) relays to switch the 1296MHz antenna between



Fig. 1: The Alinco DJ-G7E 144/430/1200MHz triple band f.m. hand-held transceiver, which was reviewed in the October 2009 issue of *PW*.



Fig. 3: A current 1296MHz transverter from Kuhne in Germany.

transmit and receive. There are also kit designs available for the home constructor and I think that with a little care, most constructors should be able to build a suitable kit.

The amount of setting up varies from next to none to extensive tweaking, depending on the design. Most designs use small surface mounting devices (SMD), which will require a fine soldering iron and careful soldering.

A useful technique with transverters is to mount them close to the antenna, so that most of the feeder is at the 144MHz intermediate frequency (i.f.). This way, feeder losses at 1296MHz can be minimised. I used this approach for some years with an old Microwave Modules transverter (Fig. 4) located in a garden shed at the base of my antenna mast some 20m from the shack indoors. With this and a single 23-element antenna, I made several contacts over 600km with less than 1W of r.f. at the antenna.

If you decide to try this approach, don't forget that you will also need to provide a supply of 13.8V d.c. to the transverter. Also – make sure that you use a well screened feeder on 144MHz. Otherwise strong local 144MHz stations will break through and you won't know whether you are working the station on 2m or 23cm!

Antenna Gain

At 1296MHz, antennas offer a useful amount of gain in quite compact designs. Most antennas are very directional and this is probably the single most important aspect of operating on the band that any newcomer to the band needs to get to grips with. Fortunately, there are plenty



Fig. 4: A Microwave Modules transverter from the 1980s.

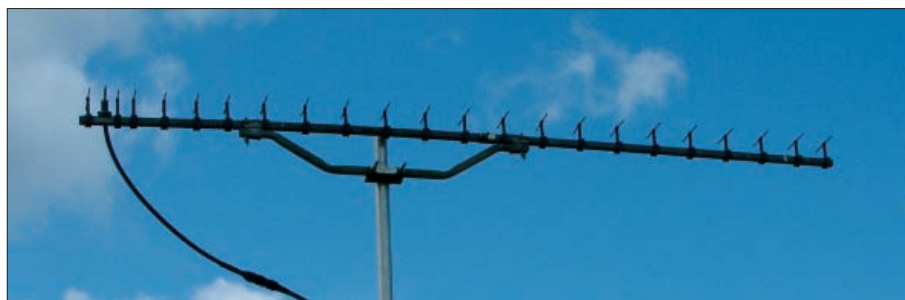


Fig. 5: Tonna's 23-element antenna is small and lightweight.

of antennas to choose from. Amongst the most popular are those made by the French firm Tonna (F9FT).

When choosing an antenna for the band, make sure it covers the part of the band that you are particularly interested in. For example the 23-element model from Tonna (Fig. 5) is available in two versions, one for satellite work around 1255MHz, and the other for normal DX operating around 1296MHz.

My advice is – don't skimp on the antenna. They are sufficiently small to enable many stations to install two or four antennas. Incidentally, Tonna

antennas for the band even come with a suitable length of feeder to connect to a two or four-way power divider. A worthwhile saving can be made by purchasing four antennas with stacking frame and power divider as a complete package.

As an alternative to buying an antenna, you may like to look through the articles by **John Cooke GM8TOI** in the January, February and October 2011 issues of *PW*, which should certainly provide food for thought if you like the idea of constructing your own antenna.

With such directional antennas, you'll certainly need to be able to rotate them. I would strongly recommend mounting your 1296MHz antenna on the same mast and in the same direction as your 144MHz and 432MHz antennas. In many cases a DX station

can be worked on 144 or 432MHz, by checking that both sets of antennas are pointing at each other on a lower band before trying on 1296MHz.

Feeder Loss

Feeder loss on 1296MHz can be quite significant. It's easy to lose over half of your signals (both ways) through feeder loss. It therefore pays to use good quality low loss feeder. I would suggest that UR67 should be considered the absolute minimum, if new feeder is to be purchased. Depending on the length of run, an even better feeder such as the Westlake 103, Ecoflex15plus or

Heliac should be seriously considered.

In comparison with the lower v.h.f. and u.h.f. bands, it's very expensive to generate power at 1296MHz. Don't forget that it's almost always cheaper to use better feeder than try to make up for feeder losses with more power. Reducing feeder loss is also a 'big win' when receiving!

Connector Advice

While on the subject of feeders, I would like to encourage readers to use the 'N' type connectors for 23cm and higher bands – and for interconnections in the shack you may wish to use BNC connectors. From experience I know that many PL259 plugs don't perform well at 23cm.

Signal Sources

Nowadays, we have a number of sources of signals on the 23cm band. In addition to a number of beacons, there are also voice repeaters. Note that in common with virtually all signals on the band, some of the voice repeaters use horizontally polarised signals. When not in use for relaying signals, the voice repeaters normally operate in a beacon mode.

In addition to the obvious sources of signals, you may still find some packet radio links on the band. Even if you're not in range of any other signals on the band, you may well be in range of a packet link. **Note:** Most of these links were generally designed exclusively for message forwarding and not for end-user connection.

Amateur Television

In addition to the various voice and data modes I've already mentioned, Amateur Television (ATV) is a major user of the 24cm band. Almost all ATV on the 24cm band uses f.m. and like broadcast television, is increasingly using digital encoding.

The band is large enough to allow several colour television signals to be transmitted in-band simultaneously, thereby permitting the use of television repeaters. To get a 'flavour' of ATV I recommend you have a look at **Graham Hankins G8EMX's** *In Vision* column that appears on alternate months in *PW*.

Making Contacts On 23cm

If you have a good v.h.f. and u.h.f. location, you can call "CQ" on 24cm and wait for stations to return to you. When calling "CQ", make sure you give clear information about your location, so that other stations know in which direction to point their beams.

If like me you don't live on a hill top, you will probably not make many contacts just by calling "CQ". I've found that most of my contacts come from working a station on 432MHz and then enquiring whether the station also has 23cm. It can also help to call "CQ" on 432MHz mentioning that you also have 1296MHz.

If you can work a station with reasonable ease on 70cm, then it's usually worth a try on 23cm. You really do have to believe that you'll make the contact otherwise you won't try hard enough!

Before you QSY (change frequency) to 23cm, there are a number of things you can do to increase your chances of making a successful 23cm QSO. You need to make sure that both stations' 432MHz antennas are 'peaked' on each other. Then agree a frequency on 23cm.

You should also agree who is to transmit first, and what action you will take if you don't hear each other (e.g. QSY back to 432MHz after two minutes). As a general rule, I would suggest that the best equipped station should transmit first.

Careful Listening

If you are listening, listen very carefully. Any disturbance in the noise is of interest. Be prepared to tune a little either side of the nominated frequency. Some older transverters tend to drift, so check up to 10kHz either side of the nominated frequency. Remember that listening is the real skill of the Radio Amateur!

If you're transmitting, assume that the other station is struggling to copy you. Try transmitting a constant c.w. tone. (Investing in a simple key just for this purpose could be money well spent, even if you aren't a Morse operator!).

Once you have established a contact, nudge your antenna either side to peak the other station's signal, preferably while the other station has their beam stationary and is transmitting a steady tone. It's amazing how strong a signal in

the noise can become with careful tuning and peaking of beams.

If you don't succeed at the first attempt, don't give up! Remember there's a station transmitting on your beam heading, on your frequency and wanting to work you. If you still don't establish contact, return to your previously agreed 432MHz frequency and agree what action to take.

Change only one thing at a time. Don't rotate the antenna and tune together. Check again that your beams really were lined up on 432MHz. It's amazing how many contacts are made on a side lobe of 432MHz Yagi!

If you really can't make a contact, go back to 432MHz and get details of any regular 'skeds' or other activity the station at the other end has. If there are better conditions another day, you'll then know when and where to look for this station.

Successful Contact

As contacts aren't as plentiful on 23cm as they are on the lower bands, make sure you exchange all the details about the QSO accurately. If the signals are weak or suffering from fading (QSB), repeat the details several times, making sure you give a realistic report. Don't rush things – you're unlikely to have a pile up waiting to work you!

Band Awards

Like most other bands, there are awards for QSOs on the 1296MHz band.

The **UK Microwave Group** <http://www.microwavers.org> administer microwave awards. The basic award starts at just 5 locator squares. As a rule stations are keen to exchange QSL cards where either side of the QSO needs a card for an award.

Feeling Encouraged?

I hope that I have given you some encouragement to try the 1296MHz band. It's large enough to support almost all modes of transmission and there's plenty of scope for experimentation. It's also a great way to hone your operating techniques. I look forward to working you on the band and in a future issue I will be looking at some other microwave bands.

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SEE PAGE 74

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It Reaches the Places Other Cleaners Don't Touch!

Harry Leeming G3LLL says "A number of people have expressed surprise that I have mentioned 'WD40' in the same sentence as 'switch cleaner'!" and sets out to explain what he means!



If the toggle or push-button switches start to cause problems, how do you clean them effectively?

Welcome to this edition of *In The Shop (ITS)* where I look back to my days on the workbench of my Amateur Radio shop – Holdings – based in the north west of England. And it's where I was often dealing with switches.

The switches on the earliest production runs of the FT-101ZD seemed to cause no trouble. But, perhaps because Yaesu changed their switch supplier (after the Mark 3 had been around for a few years), the **Internal/External VFO**, and the **Clarifier** push-button switches started giving trouble.

Customers would complain that their rigs either drifted, or jumped in frequency by a few hundred Hz, and I soon found that touching the push buttons gently would precipitate this. I tried my normal method of cleaning the switches with Servisol Aero Klene

and Super 10, but to no avail. So I then ordered some new switches and started to fit them whenever I had the problem. A rather time consuming and expensive repair!

Harry's Impulse!

On impulse one day, just before replacing a switch, I decided to give WD-40 a try. It couldn't make the switch any worse, as it was already designated for replacement – but to my surprise it completely cured the problem! Since then I have often used it on any Yaesu push button and slide switches that couldn't be cured using my normal method of cleaning.

I know nothing of the chemistry of WD-40*, and so to be on the safe side once the switch is working correctly, I then usually wash the WD40 off with Aero Klene, and add a little Super 10

to lubricate it. I wouldn't advocate using WD40 as a standard cleaner, but I tend to use it as a 'cleaner of last resort'.

A few months ago I was asked to look at an FT-101B, which had been acquired very cheaply at a rally. It appeared to have been used for years by a heavy smoker and then dumped in the corner of a dusty garage. My first thought was that it was not worth bothering with but it seemed a shame to scrap the rig. So I agreed the terms to have a go "when I had nothing else to do – if it was left with me for about 6 months".

I switched off the valve heaters, connected it to a Variac transformer, and gradually increased the voltage over a couple of hours. The S-meter then would register intermittently if the calibrator was switched on and the band change switch was 'wobbled' slightly, but no sound came out of the speaker unless I held the mode switch hard against its end stop.

I tried cleaning the mode switch with normal switch cleaner, but it was still intermittent. Out came the WD-40, which I sprayed over the mode switch and I then proceeded to operate it back and forward for a few minutes. The mode switch was then perfectly okay and while all the other switches were still intermittent – the rig operated on receive to some extent.

It seemed like the transceiver was repairable but as it had been so filthy I decided that normal switch cleaner would not work. So I treated all the switches to a dose of WD-40 and operated each them quickly for a few minutes. Next I cleaned them again with Aero Klene and Super 10, and 'lo and behold' the receiver worked quite reasonably!

I then replaced C13 and C131, the power amplifier (p.a.) valves grid coupling capacitors, switched on the heaters and it even transmitted at low power. Unfortunately, I had no more time to spare and it's now waiting on the bench for further 'treatment'. I'll let you know how the patient progresses in a future issue.

***Editorial note:** The Wikipedia entry for WD40 states, "WD-40 is the trademark name of an American-made water-displacing spray. It was developed in 1953 by Norm Larsen, founder of the Rocket Chemical Company, San Diego, California. It was originally designed to repel water and

prevent corrosion, and later was found to have numerous household uses. The acronym WD-40 stands for "Water Displacement – 40th Attempt". See <http://en.wikipedia.org/wiki/WD-40>

Keep it Simple Stupid

Things seem to get more and more complicated, it becomes 'technology for technology's sake', and occasionally it needs someone like the **Rev. George Dobbs G3RJV** to remind us that things do not have to be so. While the phrase 'Kiss' is often used in relation to design and construction, people seem to forget it when it comes to repairs!

'Ted' sent me an E-mail about his hand-held rig. "Sometimes when I press the push-to-talk (p.t.t.) control the rig won't transmit". He continued, "It can't be a faulty p.t.t. switch, as the trouble occurs even when I use an external microphone, could it be the phase locked loop?"

In thinking about an answer I surmised "Well yes it **could** be anything, but the most likely cause of the trouble would be a bad connection, and high on the possibilities list was a dirty relay. So, on my advice he cleaned the relay, adjusted its contacts and all was well.

"It won't transmit": The first rule when trying to trace any fault is "Use your eyes and your ears". I remember when I was a lad our 'wireless' stopped working and my dad removed the back to see if all the valves were 'lighting up'. He wasn't well versed in electronics – but it would seem that he had more idea than some Radio Amateurs!

Several times I have been contacted by owners of FT-101, or an FT101ZD with the complaint, "It doesn't transmit, and I can't get a reading on the I/C meter".

And – sure as eggs are eggs – when I ask them "Are the p.a. valve heaters glowing?", they have never checked!

It doesn't need me to tell you that a valve will not operate if there's no voltage on the heater, and checking that there is a glow inside the valve is simple enough – but why should there be no voltage? Well to start answering that questions – I can say there are quite a few possible causes.

On the back of most Yaesu valved rigs is an 11-pin auxiliary socket into which an 11-pin plug fits. This plug has a link between pins 1 and 2, which completes the heater circuit, the plug can be removed if you want to 'kill' the transmitter, or you may use it to attach a linear amplifier or another piece of ancillary equipment. Amazingly, I've discovered over the years that quite a few rigs are taken for repair, when all that's wrong is that this plug or the link is missing.

The valve heaters take a fair current and hence the heater switch takes quite a load – and it's known to fail. This is quite a simple fault to trace but as obtaining and swapping the heater switch can prove difficult, many users opt for shorting it out. If you do this and still want to disable the transmitter occasionally, all you have to do is remove the plug I've mentioned.

On the FT-101ZD the heater supply

to the p.a. valves also passes through a relay mounted on the rectifier board. The relay contacts can fail, or more frequently the printed circuit board (p.c.b.) bringing the heater supply to the relay can fuse. When tracing faults on this board be sure to disconnect the mains, wait a few minutes and then to discharge the 900V supply!

Note: If you never operate the rig from 12V the relay isn't needed and the simplest answer to this problem is to take the relay out of circuit and hard wire the heater supply.

Split Band Operation & ATUs

A lot of modern rigs have a facility which enables split-band operation, so that you can transmit on (let's say) say 3.5MHz (80m), and receive on 1.8MHz (160m). If you accidentally engage this feature and try and work the local 'Top Band' net, you may be so busy attempting to tune up the antenna tuning unit (a.t.u.), that you not notice that your rig while receiving on 1.8MHz is actually transmitting on 3.5MHz. This kind of thing happens particularly when using equipment that you're not familiar with, or after someone else has been playing with the controls.

Rigs made within the last 20 years can be a quite complex 'box of tricks', with circuitry which very few people fully understand – but this doesn't necessarily mean that they are impossible to repair. Surprisingly most faults, even on the most elaborate equipment, are relatively simple.

I once asked the chief service engineer of a large importer "What is the most common problem with modern equipment?" He didn't even have to think and came up with the instant reply, "The operator!"

I agreed! Hundreds of rigs are returned as faulty when all that is wrong is that a control is wrongly set. If you run into trouble a good first move is to blow the dust off the handbook, and then to set all the controls as indicated in the early pages of the operating instructions. In this process you may well find that a switch which you never ever touch, has somehow got itself pressed!

Old Multi-mode Rig

'Alan' brought his rather old 144MHz multi-mode base station rig into me complete with the original microphone. He explained that in the single sideband (s.s.b.) mode he could only get one or two watts out, unless he shouted and that on f.m. the locals complained that his audio was weak and muffled. When I got time to look at the rig it was

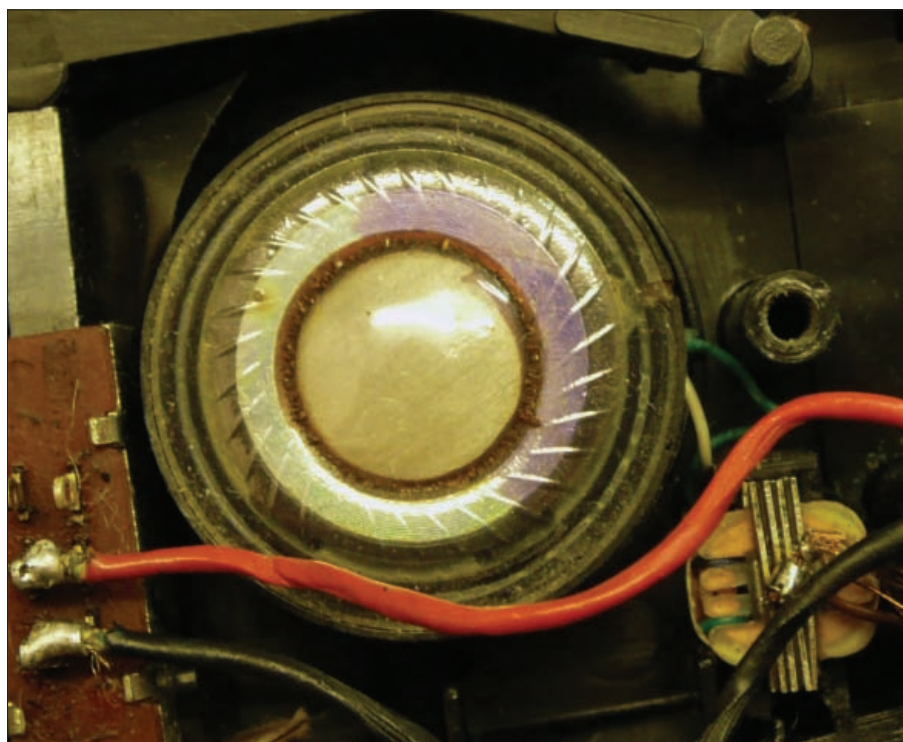


Fig. 1: The type of moving coil microphone that had caused 'Joe' so much problem with distorted and muffled speech.

obviously very low in transmitted audio – so the first thing I did was to check the transmitter microphone input sensitivity and audio response, i.e. I plugged in a new microphone.

With the new microphone the rig was then perfectly okay and so I had a quick look at the inside of Alan's microphone. Everything looked in order at a glance – but when I turned round the microphone capsule, I was somewhat surprised to spot a bubble behind the dome shaped diaphragm. On further examination I found the microphone capsule was obviously full of liquid and I wondered what to do, as it was similar to the one shown in the photo **Fig. 1**, and it seemed to be a sealed unit.

I popped it on to a central heating radiator for a few hours to see if it would dry out but it didn't! It looked like Alan was going to have to buy a new microphone but as I was now was now at the 'kill or cure' stage, I took the smallest drill bit I had and drilled a hole in the centre of the microphone's diaphragm. Out came a flood of liquid and the microphone and rig then worked as normal. To be sure I left it on a radiator for a couple of days and then phoned 'Alan', to try and get some explanation.

It transpired that he operated from a shed in the garden and that he didn't switch the heat on until he went in. He

would walk in, fire up his rig which was stone cold and start waffling into the microphone almost straight away. His warm breath condensed on the cold microphone and over a few months the liquid had built up. I advised him to store the rig and the microphone in the house and he's never had any more trouble!

The Fault Doesn't Exist!

When dealing with customers I found it was sometimes difficult trying to explain to them that the 'fault' they were complaining about doesn't exist! I stopped selling the cheaper scanners as I learnt by experience that they attracted the 'wrong' type of customer into the shop, I did however still handle the more 'up-market' hand-held wide-band receivers, such as those sold by AOR, but this still caused the odd problem with non-technical customers.

'Joe' thought he would move up market and purchased an AOR 8000 multi-mode 'scanner'. Within a week he was on the 'phone complaining that it was 'very deaf'. Previously he had listened to dozens of stations just above 400MHz on his Tandy unit but now he couldn't hear any of them.

Most of the older 'cheap and cheerful' scanners had a 10.7MHz intermediate frequency (i.f.) and very little image rejection. They sounded quite lively because they received

most stations twice – if a station was transmitting on 432MHz, they would also pick it up at $2 \times 10.7\text{MHz}$ lower in frequency i.e. 410.6MHz, and also at the correct frequency.

The AOR units, of course, had a much higher i.f. frequency and they didn't have this image problem. So, unlike the cheaper units, they only received each station once and so they **seemed** to only received half as many stations. It was difficult enough trying to get this across to those with some technical knowledge – but it was very hard work with those with no background at all in radio or electronics.

That's it for this month, see you next time – 73 Harry. ●

Problems

I like to hear about problems with older equipment, particularly pre-1990 Yaesu rigs. Please email 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.

Radio Spectrum under threat!

As users of the Spectrum, the issue is simple: PLA devices are causing interference and if we don't do something now we might not have a hobby take part in – it's that serious. We have created a Spectrum Defence Fund – not just to fight the PLT issue but other threats as and when they come up.

The Spectrum Defence fund is made up from donations from individuals and organisations with an interest in protecting the Radio Spectrum from noise, interference, and other issues that may affect licensed Amateur Radio Operation and Short Wave Listening. It is used to cover the cost of challenging the regulators of the spectrum (Ofcom, EU etc) over threats to spectrum noise level.

We are looking to our administration (Ofcom) to protect our interests, which it is their statutory duty. There are other challenges ahead and the fund will be used only to protect the Spectrum when and where we need to do so. This is a long term project and all monies donated will be 'ring fenced' for these actions alone.

If every amateur in the UK pledged £10 to the Spectrum Defence Fund we'd probably have enough to fight the cause and so we need your donations (no matter how small) to help us meet the threat.

Please help amateur radio and the radio spectrum by donating to the fund today!



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- **Competition** Win one of five pairs of adult tickets to the RAFA Shoreham Airshow
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- **Airband News** David Smith reports on the Eurocontrol aircraft identification programme, the centralised allocation of Mode-S Hex codes and the provision of two new 'listening out' squawks
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- **Mode-S – Virtual Radar** Pat Carty reports on a new remotely locatable USB stick size decoder with Ethernet connectivity and provides an explanation for some erroneous Mode-S Hex codes
- **Airshows** Our roundup of Airshows in July
- **Radio Related Websites** Chrissy Brand brings you links to radio related e-books, blogs, online papers and apps to improve your pronunciation
- **Book Review** Georg Wiessala reviews the latest edition of the Ultimate Scanning Guide with listings by Mike Richards
- **Kinetic SBS-3** Pat Carty reviews the SBS-3 which offers a dedicated 1090MHz receiver, two software defined radio tuners, digital and audio streaming, connectivity via USB or Ethernet and decoders for ADS-B, ACARS and AIS
- **Off the Record** Oscar muses on the golden age of free radio
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Russian Equipment on 70MHz

Proudly wearing his shiny new Curator's badge – it's Ben Nock G4BXD from the Military Wireless Museum in Kidderminster, Worcestershire who is 'on duty' at the counter of *PW's* vintage 'shop' this month!

A big "Hello" once again from **The Military Wireless Museum** in Kidderminster and I welcome you to my turn manning the *PW Valve & Vintage (V&V)* 'shop'! Things have been moving along quite nicely, numerous visitors have already been welcomed and I have received some encouraging comments on the collection to date.

More work is needed though, an extension to the display area is planned and better display shelving needs to be created. So, in the meantime, let's get on with this month's column!

Russians & The 70MHz Band

Following on from my May 2012 column and the 70MHz (4m) band theme, I've been experimenting with the Russian man-pack, the R-159, which has a tuning range of 30 to 76MHz. Unlike

many military very high frequency (v.h.f.) radios that only have 25kHz steps the R-159, see **Fig. 1**, allows tuning in 1kHz steps so the rig can tune those odd frequencies on the 50MHz (6m) band – the 51.51MHz frequency for example.

On the 4m band the calling frequency for frequency modulated (f.m.) transceivers is 70.450MHz with channels either 12.5 or 25kHz either side. Having had the radio monitoring the calling frequency for a while using just its own whip antenna I knew it was capable of receiving quite well. I managed to find a suitable plastic dipole fixing centre and fitted it with two lengths of aluminium rod to make a half-wave dipole on 70.45MHz. This was then mounted at about 6m above ground level (a.g.l. on one of the

antenna poles I have on site here.

The R-159's manual states that it has an output of 10W – but despite this I'm getting just 8W indicated on my power meter even with a full 13V on the set. Nevertheless, with just the 8W I have managed numerous contacts with good reports on the audio from the Russian set's original carbon microphone. I've also managed to work several Summits On The Air (SOTA) portable stations as far away as south Wales and the Pennine mountain range!

The only modification I have carried out to the R-159 is to alter a spare headset I had and bring the received audio out to a loudspeaker because wearing the headphones was quite tiring on my ears! Incidentally, there's no volume control on the set, although it might have some form of automatic



Fig. 1: The tuning controls of the R-159 transceiver.

level circuitry though and the audio to the speaker is never excessive even on the strongest of signals.

While playing with the TRC-552, which I mentioned last time, that I had noticed the two small plastic screw covers visible above the two knobs in Fig. 4 of that article (p65 of the May 2012 *PW*). Unscrewing them, I found a switch in the left-hand side and a single slotted shaft in the other.

The four-position switch selects between 25 and 50kHz deviation on transmit and receive either with, or without the tone squelch operating. But adjusting the single slotted shaft both on transmit or receive has no noticeable effect so I'm still non the wiser as to its function.

As most 4m f.m. users are running ex-PMR radios there has been quite a bit of surprise when I tell the other station in the QSO that I'm using a Russian made military man-pack. In fact, the activity on 4m and the opening up of the band to quite a few other countries has given me thoughts about constructing a small beam, perhaps a 3-element Yagi type, that should increase my range and allow me to explore the band further.

The British R-103 Receiver

I'm titling this section as the 'British R-103' as there's also a Canadian made R-103 receiver obtainable on the surplus market. During the time we were moving the collection I found I had two of these cute little receivers – but each had slight differences. The Reception Set R103, **Fig. 2**, is a small short wave receiver designed for – amongst other uses – as a monitoring receiver in the British Army's non-combat vehicles such as staff cars.

The fairly basic single conversion receiver design appears to date from the start or slightly before the outbreak of the Second World War. The receiver covers the frequency range 1.7 - 7.5MHz in two switched bands and is tuned by the widely used (at the time) 'Muirhead' type drive to which is attached a directly calibrated engraved tuning dial. The radio was powered from a separate 12V vibrator supply, the power supply box also housed the loudspeaker for the set.

The receiver is a seven-valve conventional single conversion superhet, consisting of a single radio frequency (r.f.) amplifier, a mixer/local oscillator, two intermediate frequency (i.f.) amplifier stages, a detector/automatic gain control (a.g.c.) and audio pre-amplifier, an audio output stage, and a beat frequency oscillator (b.f.o.) stage.

The two examples of the R-103 I



Fig. 2: The two R-103 receivers, note the 'magic eye' tuning indicator on the lower set.



Fig. 3: The Polish OP3 receiver and battery box.

have are serial number 1890 made by PR&T C. and 1018 made by MRO Ltd. They differ in that the PR&T version had had the b.f.o. removed and a tuning indicator fitted. I'm assuming the need to monitor Morse code signals was found to be unnecessary in a staff car role – hence the set's updating.

Polish Resistance

A very recent addition to the clandestine side of the collection here at the museum – is a very small receiver that was designed by and used by members of the Polish resistance working in England during the occupation of their country by the Germans. There's a great deal of information on the web about the Polish theatre of operations – but I think a basic overview would be helpful to V&V readers.

For example, in Poland during the German occupation it was forbidden

for civilians to have any radio receiver. Therefore, there was a need therefore for a small clandestine receiver in particular when the 'VI' Bureau of the Polish General Staff operating in London wanted to send coded messages to the resistance or 'Home Army' through the broadcasting station *Wawer*, a transmitter operating in the UK and beaming towards Poland.

The requirement was met by the Receiver OP3 designed and produced by the Polish Military Workshops in Stanmore, North West London. The receiver, **Fig. 3**, is a four-valved single conversion superhet design tuning 500kHz to 1.5MHz and 2 to 12MHz in three bands all told. It can receive standard 'phone traffic as well as Morse code signals, a small switch when operated caused the i.f. stage to self oscillate.

The set plugs into a separate battery

box containing a 1.5 and 60V dry battery. Low impedance headphones would have been supplied with the set along with a length of insulated wire to act as the antenna.

On the side of the receiver case is an instruction plate giving directions in Polish – specifically for operators unfamiliar with radio operation. Instructions include: Connect aerial (approx. eight metre length) to socket A, ground to Z, headphones to T. Insert plug in battery box. Set switch ZAKR (band switch) onto wanted band, 500kHz to 1.5MHz, 2 - 5 MHz or 5 - 12MHz. (There are three ranges on the tuning dial visible through the curved lens on the set, **Fig. 4**). Tuning is done using the knob marked 'STR'



Fig. 4: The three tuning scales.

or Strojenie (Polish for "Tuning"). Telephony: push button GR home, adjust strength of reception with knob SILA (volume). Telegraphy: pull button GR. To shut the receiver down remove plug from battery box.

As can be seen from the internal view of the set, **Fig. 5**, the Polish workshops and designers did an excellent job of miniaturisation at a time when components were so big. Indeed, the workshops produced some of the most miniature and clever designs of the war – including the AP7 unit.

The AP7 unit which was two boxes, each the same size as the OP3, creating a 3W transmitter-receiver



Fig. 6: The four valves and the b.f.o. switch (the two contacts and the metal shaft to the right of the centre valve).

combination. The four valves and the i.f. transformers are shown in **Fig. 6**, the small push-switch for Morse reception is visible just below the blue resistor.

The Polish AP4, AP5 and BP5 sets were also wonders of design and miniaturisation, the BP5 transmitter

was capable of producing up to 50W of output. **Louis Meulstee's** great work, *Wireless for the Warrior* Volume 4 gives great detail of these sets and is worth a read for those interested in the subject.

And Finally!

Well readers, that's about it for my latest stint at the V&V 'shop'. I hope you have enjoyed the selection I have bought you and there are more pictures at www.militarywirelessmuseum.co.uk and more pictures of the progress in the museum layout in the 'Museum status' page. As always I can be contacted at ben@radiomuseum.plus.com Cheerio for now!

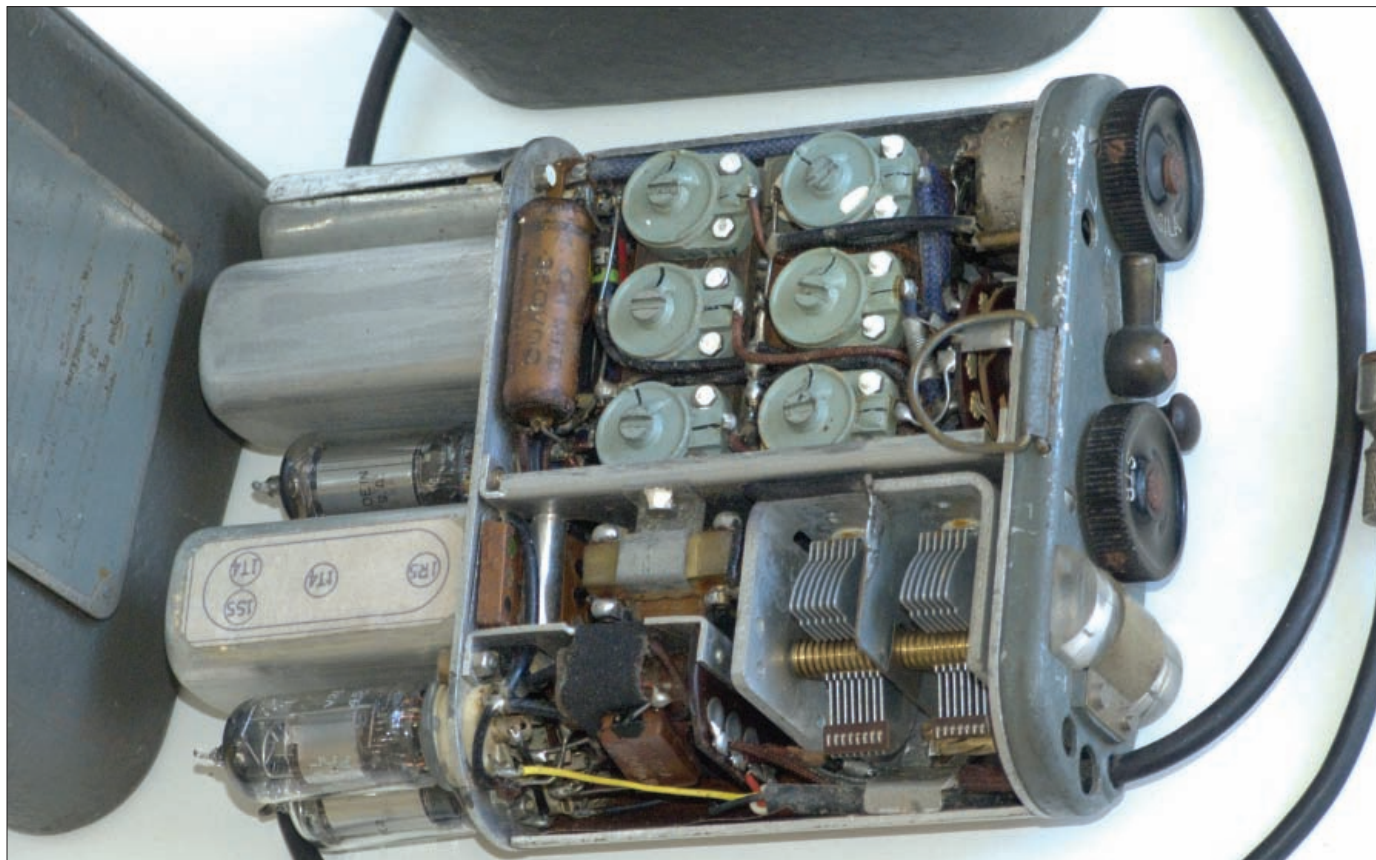


Fig. 5: Inside the OP3, "Compact or what?" asks Ben G4BXD.

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The Morse Mode

Roger Cooke G3LDI brings the world of c.w. to *PW* once again!

Welcome to the world of Amateur Radio on the key – *Morse Mode (MM)*. And I'm pleased to start with the news that one more volunteer has joined the GB2CW schedule, both as an Instructor and as an Assessor. I welcome **Geoffrey Hanson G4CPA** who'll be instructing on 144MHz in the Crosshills area of North Yorkshire on Monday evenings at 2100 to 2200 UTC. Hopefully Geoff will receive lots of support and I wish him well with the scheme!

We really need to see an expansion in other parts of the UK too but despite pleading my case in the *CDXC* magazine and also in *PW*, the response is sadly very low. If the newcomers to our hobby are going to learn Morse, they need instruction and it really is satisfying to see progress and help somebody on the way to working some DX on c.w.

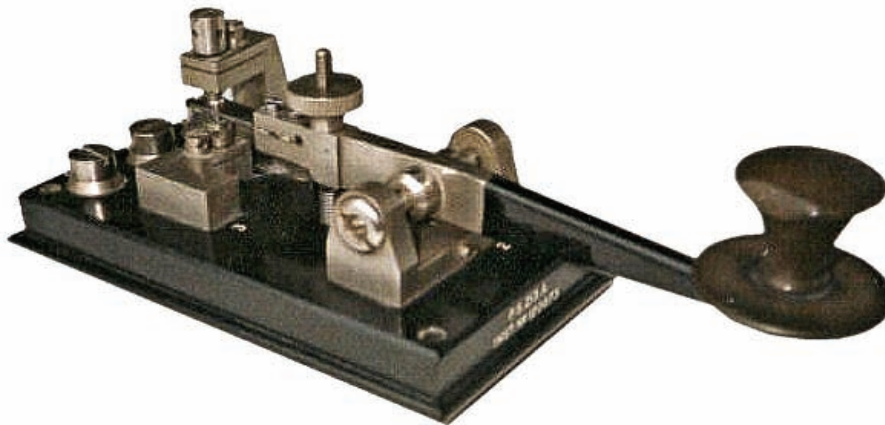
Please think about giving just an hour a week and 'doing your bit' as they say! If you decide to have a go, E-mail me and I will help. As the co-ordinator of the GB2CW scheme, all I need is your RSGB membership number, full name and address and the days/times you would like to help, mostly on v.h.f. using f.m.

More Morse Comments

I've also received a letter from **Gareth Warriner 2E0BKW**, in which he says that he's been interested in c.w. for over a year now and passed his 12w.p.m. at the Newark Hamfest and is aiming for higher speeds. I wonder if his Instructors would like to become involved in GB2CW? We would love to have you on-board.

It has been some time since I covered the basics of the Morse mode, so at the risk of repeating myself, perhaps this might help you start. For those with absolutely no knowledge of Morse, starting from scratch can be slightly daunting. However, there are a limited number of characters you have to commit to memory and it's then just a matter of the time that you put in each evening.

Turning up on one evening a week is wasting everybody's time. You must be



A Portishead straight key, similar to this one sold for £568 on eBay recently. Wow! Good luck to the seller, wish I had one to sell!

prepared to devote at least 30 minutes per day of practice at home. You could start by buying a book, (mine is still available from the RSGB) and following the suggestions in there. If you take the alphabet, numbers from 0 – 9, about four punctuation characters that makes a maximum of 40 characters to learn.

The easiest way to do that is to make 40 small cards. Put the character on one side and on the other the Morse code equivalent in di-dah fashion. For example, V on one side and di-di-di-dah on the other. Whatever way you pull the cards out of your pocket, translate as fast as you can and then go on to another.

Join a class, preferably on the air, where you can gradually build up a receiving speed relative to the amount of practice you do. You should practice, then do some more practice, and after that do some more practice!

The course will probably take a few months, but you'll be surprised how you will soon be receiving 20w.p.m. c.w. Then is the time to learn all the abbreviations and (on a one-to-one basis) learn how to send. Please **do not** send Morse without being taught properly.

So, that's it in a nutshell. I hope that might have encouraged some newcomers to the mode, because it really is an enjoyable mode to use.

Computerised Morse

I received a letter from **Dave Gemmell ZS6AAW** from South Africa, expressing

his concern at computerised Morse. It was in relation to the CQ WW CW contest. Apparently Dave saw a picture of somebody sitting in front of a keyboard and transceiver with no Morse key in sight. This is what Dave said: "Can you hazard a guess and quote, roughly, what percentage of c.w. enthusiasts send and receive using a computer? 'Guessing' by the log sheets there must be hundreds of fans around the world. It would be interesting to find out just how many send with a key/paddle but receive using a computer. I doubt whether anyone sends with a computer – but I'm sure they'll receive by ear!"

Thanks for your letter Dave! Well actually that's just how most people – including me – do operate a c.w. contest. I use *N1MM*, a popular contest/logging program, and I use the computer to send and I receive the c.w. myself. I also have a paddle beside the keyboard to insert a personal comment should I wish to do so.

In my last Morse Mode, I covered a program called *CW-GET*, used by some of those students who require some support in a contest because their speed may not be up to that often used in contests. I think that that the figure must now be close to 100% of those entering a contest, who are using a computer. Perhaps somebody might like to conduct a survey? 73 and May the Morse be with you!
Roger G3LDI.

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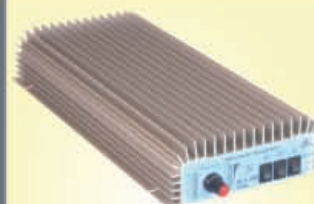
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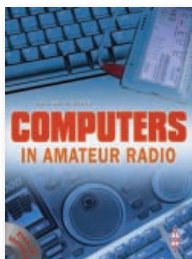
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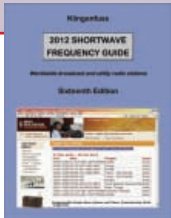
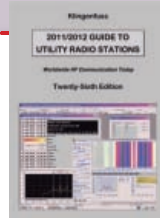
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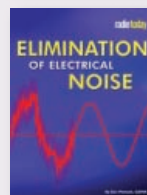


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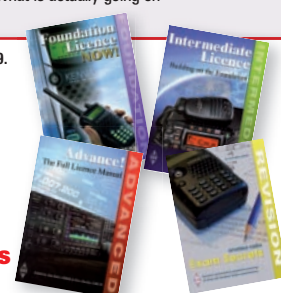
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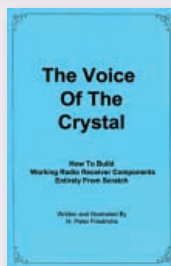


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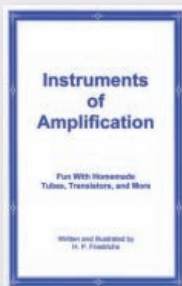
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Rob Mannion G3XFD/EI5IW's

Topical Talk

Rob discusses topics raised by correspondents in this month's *Letters* pages and how he feels some clubs "hide their (bright) lights under bushels".

I have already briefly mentioned my visit to the **Aberdeen Amateur Radio Society (AARS)** in my Editorial comment on the *Letters* pages – and if you've read my comment you'll see that I thoroughly enjoyed the trip. However, along with the enjoyment of the actual trip, I was also greatly encouraged by the number of 'rising' new Amateurs I've been meeting recently.

By 'rising' I'm referring to those people who have only recently joined our hobby and are progressing through the various training schemes – hopefully leading to (in many cases) the Full Licence classification.

I'm not hesitating to raise the topic of 'new entrants' into Amateur Radio once again because **it's so important** and is a subject of great concern to many hobbyists. Listening in on the Amateur bands, having QSOs and talking to friends, leads me to believe that there's a great deal of unwarranted despondency regarding the future of our hobby. However, from my own travels and from the people I meet, I know that **we are experiencing a steady flow** of keen new Radio Amateurs into the hobby – and I'm 100% confident I'm correct here.

Despite my confidence, the flow of new entrants into our hobby could never be described as a flood – although on the other hand (apart from the years after the Second World War) – we've never had a 'flood' of newcomers arriving. Instead, there's been a steady trickle, which I now regard as being a reliable 'source'!

During my visit to the AARS, I met one very

pleasant young man who entered the hobby via motor sports marshalling. He ended up regularly driving over 100 miles to get to his Foundation Course – a long way south of Aberdeen. He's now progressing through Amateur Radio and is a keen member of the the club.

Yet another relatively recent newcomer to the hobby, was **Dennis Cowie 2M0DWC**, who described how he first entered Amateur Radio and how the club has helped him progress from the Foundation Licence to the Intermediate Licence. This charming man and I ended up having quite a chat and I was delighted when he won the one year subscription to *PW* that had been donated by **PW Publishing Ltd.**, for the raffle held during the evening.

Yes, I came away from the Aberdeen ARS feeling confident that any new Radio Amateur would be encouraged by the club. If I lived in Aberdeen myself I would certainly be a member!

Encouraging Letters

This month we have particularly good examples of letters from *PW* readers who have been helped on their way into the Amateur Radio hobby. The letter from **Rufus Binks M0WMD** was of great interest to me. It's good to know that both the **Army Cadet Force (ACF)** and the **Air Training Corps (ATC)** – see the news pages this month – are active in our hobby.

Mike Daniels M3ZZA's letter particularly encouraged me! I know several keen Radio Amateurs like him – they are absolutely enveloped in our hobby and with the help of more

experienced Radio Amateurs they are progressing through the hobby. Additionally, many of them – like **Mike M3ZZA** himself – are passing on knowledge from their own backgrounds, whether it be from professional or sporting/hobby skills.

As a former (very much 'beached' whale nowadays!) sub-aqua diver myself I know that Mike will have much experience and knowledge to pass on to fellow Radio Amateurs. I've always considered that that any Tutor also learns much from someone they are teaching. It's certainly a two-way process.

Publicity Is Important

The only possible area where I have personal doubts regarding local Amateur Radio Clubs is publicity – an extremely important matter that's often overlooked. Indeed, I've often considered that many club 'hide their (bright) light under bushels' and seem to miss many opportunities to let their local community know what they're doing and where they're doing it!

I'm sure that poor local publicity – and neglected club websites – often hinder otherwise healthy and active clubs. Indeed, I've often met relatively new Amateurs who only learned about their local clubs after travelling considerable distances to attend Foundation Courses elsewhere. But don't despair – I'm sure we can do something positive and I shall return to this subject in the very near future.

Rob Mannion G3XFD/EI5IW

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Review – An APRS Plug-in For The Kenwood TMD-710

Tim Kirby G4VXE – our v.h.f. specialist author – tries out the Green Light Labs GPS-710. Tim discovers it's a simple and useful GPS system that plugs directly into the Kenwood TMD-710 allowing your APRS activity to be fully 'location aware'.

Next Band Up!

Join **John Cooke GM80TI** as he goes to the 'next band up' – to the '2.3GHz band' – in his fascinating adventures on the microwave bands. If you've never been quite sure about joining in the fun on microwaves – John's enthusiasm will give you the important extra 'shove' on to the bands!

The Pifco Radiometer

Godfrey Manning G4GLM remembers the useful – and ubiquitous – test meter marketed by Pifco. Many of us would have liked one but couldn't spare the pocket money! If you've got one hidden away it might be time to look for it as they're now quite collectable!

The Survivor Transceiver

Ross Bradshaw G4DTD never had to use the Survivor emergency marine transceiver 'in earnest' during his time at sea – but he finds the technology was interesting, rugged and quite heavy!

Doing it By Design

Tony Nailer G4CFY finalises his new noise bridge design. This project has been keenly anticipated by one magazine Editor – who can't wait to build his version to use it on his own antennas to get the best antenna settings for the GB80PW transmissions!

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