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Practical WIRELESS

Britain's Best Selling Amateur Radio Magazine

The Walford Electronics Parrett 3.5MHz SSB Transmitter Reviewed

The Secret's Out

The Whisper mode is here to help!

The TYT UVF1

Dual-Band Hand-Held Transceiver Reviewed

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KENWOOD TS-590S JUST ARRIVED!

Excellent dynamic range, dual 500Hz and 2.7kHz roofing filters, Built-in auto ATU, 32bit floating point DSP, Digital processing IF chain, USB conectivity, Large display with dual colour backlight screen. This is not an updated TS-570, but a completely new design embodying the very best engineering crafted by Kenwood to compete with the very best. If you are a Kenwood fan, you will love this radio.

Get £50 Heil Discount Gift Voucher
On all TS-590s purchased before end of January.

160m - 6m with superb receiver inc. dual roofing filters, Auto ATU, 32 bit f/p DSP & USB PC connection. **£1489.95 D**

TEN-TEC

TenTec Quality starts at just £1499!

TenTec provide the "Sports Cars" of ham radio. Are you ready to drive one?

Meet the Jupiter-538B, a 100 Watt radio that has amazed newcomers to the TenTec range. You get a lovely large dual-colour LCD screen with adjustable parameters clearly shown. This is a real "sports car" of ham radio HF radios, with all the essential controls easily to hand. It handles strong signals with ease and its razor sharp filters and DSP provide the ideal environment for weak signal work. The QSK is lightening fast and totally quiet. You even get 5MHz as standard, and if you want an auto ATU, then we can fit the really capable TenTec unit that handles up to 10:1 VSWR! That's better than any other built-in ATU.

Check out www.hf-transceivers.co.uk

Other models in the rasnge
Omni-VII 100 Watts with ethernet control **£2499**
Orion-MKII with dual receivers. **£3899**

ICOM

ID-E880 NEW

* 2m/70cm 50W Mobile
* D-Star +D-Star Repeat Mode
* Extensive GPS Compatability
* CTCSS & DTCS + Airband Receive
* 1000+ Memories
* Detachable Head **£429.95 D**

NEW IC-9100

VHF/UHF Satellite + HF + D-Star **£TBA**

Arriving Soon
100W on HF-2m
75W on 70cms &
10W on 1296MHz
Some items optional

NEW IC-E80D

* 2m/70cm Handheld
* D-Star +D-Star Repeat Mode
* Extensive GPS Compatability
* CTCSS & DTCS + Airband Receive
* 1000+ Memories

FREE software on Icom site

In Stock Now **£314.95 D**

NEW **FIND IT CHEAPER? We'll Match it!**

IC-T70E

Dual Band 2m/70cm Handy
£159.95 D

IC-E90

Triple band 6m, 2m, 70cms.
£234.95 D

IC-E92D

A great dual band handheld woth D-Star fitted. Wide receive
£369.95 D

IC-E2820

Great dualband mobile.
£424.95 D
Fitted with UT-123 D-Star module. **£579.95**

HF Transceivers

IC-7600 New Low Price!

This HF-6m transceiver is the successor to the IC-756 series. It takes features from the flagship IC-7800 and the more recent IC-7700, putting them into a package that brings the price within reach of many more hams. ~~£3379~~ **£3199 D**

IC-7800	Deluxe HF / 50MHz All-Mode 200W Transceiver	£7999 D
IC-7700	1.8-54MHz 200W with built-in PSK-31 + keyboard	£5499 D
IC-7200	HF & 6m DSP 0.005-3335MHz wideband receive with USB port	£799 D
IC-7000	160m-70cm 100W (hf) Mobile, portable or base station	£1089 D
IC-718	160m-10m 100W transceiver that brings HF to those on a budget	£519 D

Other Radios

IC-910H	£1249 D	IC-R20	£389.95 C
IC-910HX	£1449 D	IC-R1500	£449.95 C
IC-2200H	£199 D	IC-R2500	£569.95 C
IC-R3	£389.95 C	IC-R8500	£1379 D
IC-R6	£174.95 C	IC-R9500	£9999 D

Yaesu HF Linear Amplifier

Yaesu QUADRA Bargain!

1kW Solid State

This amplifier is in immaculate condition, and boxed. It has had very little use and comes just as it would from the factory. If you are looking for a solid state linear that gives 1kW with ease and quietly, this may be what you want. **SAVE £900** on new price!
ONE ONLY! **£3499 D**

Tokyo Hy-Power HF Linear Amplifiers

HL-1.5KFX

160 - 6m
1kW Out
Auto ATU
Solid State

This is brand new and completely self contained with AC PSU. Approx.272 x 142 x 363 mm
£3559.95 D

HL-2.5KFX

160 - 6m
1.8kW Out
Auto ATU
Solid State

Brand new and completely self contained with AC PSU. Approx. 325 x 145 x 405mm
£6459.95 D

FlexRadio Systems®
Software Defined Radios

Flex-1500 5W 160m-10m

This little chap is a complete USB linked 5 Watt transceiver offering all modes and all bands with amazing receiver performance.
£599.95 D

Flex-3000 100W 160-6m

The Flex-3000 gives you a 100 Watts in a footprint around the size of a laptop PC. This 1-- Watts radio covers all ham bands and all modes. It even has a built-in ATU! An amazing price - just add PC & 13.8V!
£1299.95 D

Latest FLEX-5000A Advanced Design **£2495.95 D**

Power SDR - The Secret! All FlexRadio transceivers share the same PC SDR control software which you can freely update! This handles all the transceiver processing and offers you razor sharp variable IF filters down to 25Hz, adjustable transmit bandwidth, Full transmit EQ, Amazing DSP QRM reduction, live bandscope display, Waveform monitoring, Waterfall display and an incredible number of parameter adjustments. If you are looking for a new experience in HF operation, here it is!

YAESU
Choice of the World's top DX'ers

We still have the largest, most up to date stock of Yaesu in the UK!

NEW VX-8DE

- *Triple Band - 6m/2m/70cm*
- *Upgraded APRS features*
- *Rugged & Submersible*
- *Increased Memory*

New Low Price **£359.95 D**

VX-8GE 2m/70cm 5W + GPS Ant *New Low Price* **£349.95 D**

NEW FT-DX5000 Series!

All 3 radios offer 200W from 160m to 6m. The "D" adds SM-5000 & the "MP" adds the SM-5000 & roofing filters.

FT-DX5000	£4339 D
FT-DX5000D	£4795 D
FT-DX5000MP	£5295 D

New Mobiles In Stock Now...

FT-1900E

55W 2m Mobile with 200 memories.
£129.95 D

FT-2900E

75W 2m Mobile + 200 memories.
£139.95 D

FT-7900E

50/45W 2m/70cm Mobile + 1000 Memories.
£229.95 D

HF Transceivers

FT-2000	100 Watt HF - 6m Dual Receive with built-in PSU.	£2299.95 D
FT-2000D	200 Watt version of FT-2000 with built-in PSU.	£2899.95 D
FT-950	100W HF - 6m transceiver with DSP & Auto ATU	£1289.95 D
FT-450AT	100W HF - 6m with automatic ATU & latest updates	£699.95 D
FT-450	100W HF - 6m transceiver - great value.	£619.95 D
FT-DX9000contest	200W HF - 6m "formula one" contest machine	£4899.95 D
FT-DX9000D	Deluxe fully loaded base station	£8199.95 D
FT- DX9000MP	Amazing 400W "legal limit" radio	£8995.95 D
FT-857D	HF to 2m mobile. portable or base - up to 100W	£659.95 D
FT-817BHIDSP	Fitted with DSP module exclusive to W&S	£599.95 D

VHF Mobiles & Handhelds

FTM-350E	*NEW LOW PRICE* 2m/70cm Mobile	£469.95 D
FTM-10SE	50/40W 2m/70cms stereo FM	£299.95 D
FT-8800E	Dualband Mobile 50W / 30W	£299.95 D
FT-8900R	10/6/2m & 70cm Mobile	£359.95 D
VX-3E	2m / 70cm Handheld Wideband receive	£149.95 D
VX-7R	Waterproof dualband handy (silver / black)	£279.95 C
VX-6E	2m/70cms handy, 5W Wideband Receive	£229.95 C
FT-60E	2m/70cms, 5W handy Wideband Receive	£169.95 C

VX-3E

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

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Bob Heil's Pro-Set-6

NEW

The new Pro-Set-6 headset offers a complete new way of operation. The comfortable earpads give fatigue free listening, whilst the boom microphone can be adjusted for close speaking - just what you need for most ham contacts. But why the Pro-Set 6?

Many of todays modern radios now have EQ (equalisation) controls which allows you to finely tune the mic. preamplifier audio response to match your voice and your method of working. Bob Heil recognises this and has designed a wide response mic. insert that gives you the freedom twiddle those knobs in your transceiver and adjust the response to suit your needs.

Pro-Set-6 £114.95 C
AD-1 Rig adaptor leads £16.95 C

AOR We are UK Distributors

AR-MINI NEW LOW PRICE!

This amazing little radio covers 100kHz - 1.3GHz AM FM & WFM. 1000 memories, over 30 programmable features including CTCSS and DCS. Alphanumeric memories give meaningful channels and there is a builtin bar antenna covering 100kHz - 5MHz. Inc. NiMH pack and charger.FREE software database for PC loading via www.aorja.com. **£149.95 D**

AR-8200-MKIII

The famous scanner with the quality performance. 530kHz - 3GHz AM FM FMW & SSB. Inc batts, charger + cigar lead. If you are looking for a truly wide-band great performer this is the best in its class! **£439.95 D**

AR-8600MKII Base or Portable

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

SPECIAL OFFER £599.95 D

TG-UV2 2m/70cm Dual Bander

QUANSHENG

The TG-UV2 is a dual band 2m/70cm handheld. It covers 136.00 - 173.995 - 400 - 469.995MHz and FM broadcast 88-108MHz. The radio includes 7.2v 2Ah Li-ion battery for extended life.

- *3 Power Levels: 5W / 2.5W / 1W*
- *Steps: 5, 6.25, 10, 12.5, 20, 25, 30, 50 & 100kHz*
- *CTCSS, DCS & 1750Hz Tone*
- *Dual Watch*
- *200 Memories Alpha Numeric*
- *2 Deviation Levels*
- *2 Bandwidths*
- *CTCSS & DCS Scan*
- *Built-In LED Torch*
- *Backlit Screen*
- *PTT or VOX*

NEW

£79.95

WATSON Wireless Weather Stations

W-8681-SOLAR

NEW

W-8681 Complete Weather Station with Solar Transmitter instead of battery transmitter. **£99.95 C**

W-8681MKII Batt Transmitter £79.95 C

W-8683

Best Seller!

Compact Weather Station with external temp +humidity sensor. **£24.95 C**

W-2001

Special Offer!

5-day World forecast via internet connection!

~~£49.95~~
£24.99 C

RFSpace SDR-IQ Advanced Receiver Tunes down to 100Hz!

NEW

If you have been pondering about buying into SDR receiving, this design may be just what you have been looking for. The SDR-IQ is a high performance receiver covering 500Hz to 30MHz. It is powered directly from PC USB socket & work with Windows or Linux systems. A highly stable unit with dedicated software.
£469.95 D

New **IF-2000** SDR IF feed for FT-2000 & FT-950. Feed your transceiver IF out into an SDR receiver at 10.5MHz £219.95

KENWOOD HF Transceivers

TS-2000E £1489.95 D

The TS-2000E is the classic all-band, all-mode base station covering HF - 70cms at up to 100W. Includes dual channel receivers & DX-cluster monitor with built-in TNC.

TS-2000X +23cm **£1749 D**

TS-480HX Ideal for mobile, portable or base station. Gives a massive 200W on HF and 100W on 6m. **£849 D**

TS-480SAT This model gives 100 Watts on all bands up to 6m, but adds a built-in automatic ATU. **£749 D**

Handhelds

TH-F7E	2m/70cm 5W (2-pin Kenwood) SMA **+FREE Clip Mic**	£229.95 D
TH-K2E	2m 5W 4-Key Keypad (2-pin Ken) SMA **+FREE Headset**	£159.95 D
TH-K2ET	2m 5W 16-Key Keypad (2-pin Ken) SMA **+FREE Headset**	£165.95 D
TH-K4E	70cm 5W (2-pin Kenwood) SMA **+FREE Headset**	£159.95 D

VHF Mobiles TM-V71E £289.95 D

2m/70cm Dualband Mobile Transceiver. Features;- *Wideband Receive, Built-In Echolink, Simultaneous 2 Frequency Receive, Removeable Control Head, CTCSS Encode / Decode, 1000+ Memories, Supplied with DTMF Mic.*

TM-271E	2m FM 60W mobile. CTCSS, 200 Memories, DTMF Mic	£165.95 D
TM-D710E	2m/70cms 50/50W mobile. APRS +EchoLink, DTMF Mic	£429.95 D

bhi Special Offers!

NES10-2MK3

NEW

New DSP speaker for any receiver or transceiver.

~~£109.95~~
£99.95 C

DSPKR

10 Watt integrated DSP speaker.

~~£154.95~~
£139.95 C

NEIM-1031MKII

An in-line DSP module giving complete noise cancelling control

~~£139.95~~
£129.95 C

www.bhi-ltd.com

Watson Cross Needle Meters

NEW

These are high quality, accurate VSWR meters with large, clear display featuring X-needle movements.

WCN-200 £69.95 C
* 1.8 - 160MHz * 0 - 30 / 300 / 3000W
* 600W max above 30MHz * 2x SO-239

WCN-400 £69.95 C
* 140 - 525MHz * 0 - 30 / 300 / 600W
* 2x SO-239

WCN-600 £89.95 C
** 1.8 - 525MHz * 0 - 30 / 300 / 3000W*
** 600W max above 30MHz * 2x SO-239*

Butternut Vertical Antennas

These antennas are extremely efficient and use no traps. The large, air-spaced coils are the secret, and resonant adjtments can be made at ground level.

HF-2V 80, 40m DX vertical. 9.75m, Easy erect. £289.95 D
HF-6V 80,40,30,20,15,10m self support 7.9m £389.95 D
HF-9V As HF-6V but adds 17,12 & 6m. 7.9m £449.95 D

Watson Power Supplies

Power-Max-25-NF

Slightly larger than the Power-Mite and ideal companion for any 100W radio.
£89.95 C

Power-Max-45-NF

38 Amp cont, 45 Amp Peak, Switch Mode PSU with variable voltage, V/A meters, & noise offset. **£129.95 C**

Power-Max-65-NF

65 Amp Low Noise PSU. Patented Noise Control that permits you to move any noise away from the operating frequency.
£239.95 D

W-5A 5A Analogue fixed 13.8V £29.95 C
W-10AM 10A Analogue variable £59.95 D
W-10SM 10A Switched fixed £49.95 D
W-25AM 25A Variable PSU £89.95 C

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

WATERS & STANTON

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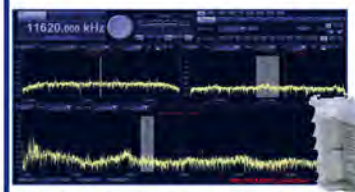
Online Catalogue
www.wsplc.com

WiNRADiO® WR-G31DDC "Excalibur"

NEW

Receiver 9kHz - 49.995MHz

Voted NEW "Number One" in RSGB Review



Meet the new industry standard receiver for serious HF work. Just plug into your PC USB port for a new experience in sensitivity and dynamic range. No hardware design can match the way that signals are extracted, demodulated and both visually and audibly reproduced. Serious DXer or casual operator, you will be amazed.

"It out-performed my 100dB HP Spectrum Analyser"

£649.95 D

WATSON Power-Mite-NF

22 Amps In Your Hands!

The famous Power Mite is small, yet rugged. It delivers more than enough power for any 100 Watt radio, is variable up to 16 Volts and has dual meters. But what really sets it apart is its NF (noise function) feature which allows you to remove any residual noise outside the ham band you are operating on. Fits easily inside a brief case or even large pocket!

£69.95 D

Watson Coax Switches

The new range of Watson coax switches offers an economical way to tidy up[your station with the low loss switches. There is a choice of SO-239 or "N" sockets and 2-way, 3-way or 4-way units. They can easily be fitted to any flat surface such as wall or table, for secure installation.

CX-SW2PL 2-way SO-239	**£26.95 C**
CX-SW2N 2-way "N"	**£32.95 C**
CX-SW3PL 3-way SO-239	**£42.95 C**
CX-SW3N 3-way "N"	**£49.95 C**
CX-SW4PL 4-way SO-239	**£59.95 C**
CX-SW4N 4-way "N"	**£69.95 C**

MFJ Radio Accessories

MFJ-929

AUTO TUNER 1.8-30MHz 200W

LCD readout, 20,000 memories, long wire & coax, radio interface.

W&S £209.95 C

MFJ-991B Auto atu 150W	**£209.95 D**
MFJ-994B Auto atu 600W	**£339.95 D**
MFJ-962D 1.5kW ATU	**£289.95 D**
MFJ-969 160m - 6m 300W	**£209.95 D**
MFJ-971 Portable ATU	**£118.95 C**
MFJ-974B Balanced ATU	**£189.95 D**
MFJ-986 3kW differential tuner	**£349.95 D**

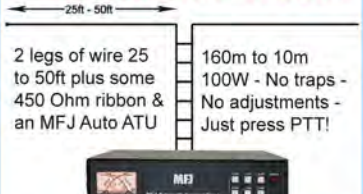
MFJ-993B

300W Auto ATU

A true "Plug & Play" Auto ATU. Covers 160m to 10m. Capable of handling up to 300W - tunes almost any antenna, has X-needle meter & digital data display.

W&S £249.95 D

Build an All-Band Antenna Indoors or Outdoors - Do It Now!



MFJ-1260 Mic control 1 in/2 out	**£99.95 C**
MFJ-1263 Mic control 2in/2 out	**£109.95 C**
MFJ-1275 Sound card adaptor	**£109.95C**
MFJ-1625 Window Ant + Tuner	**£199.95 D**
MFJ-16B01 Dipole centre SO-239	**£21.95 A**
MFJ-16C06 6x dog-bone insulators	**£4.95 A**
MFJ-16E01 300Ω end fed SO-239	**£10.95 D**
MFJ-1796 40m-2m vertical	**£239.95 D**
MFJ-1798 80m-2m vertical	**£299.95 D**
MFJ-1908H 43ft fibre glass mast	**£239.95 D**
MFJ-1922 Digital screw driver control	**£99.95 D**
MFJ-1924 Prog. screw drvr control	**£129.95 C**
MFJ-1925 ATAS-100 controller	**£72.95 C**
MFJ-202B Receiver noise bridge	**£79.95 C**
MFJ-250X 1kW dummy load (x-oil)	**£55.95 C**
MFJ-260C 300W dummy load	**£44.95 C**

MFJ-998

W&S £649.95 C

• 1.5kW SSB & CW • Digital & Analogue X-needle VSWR • 1.8 - 30MHz • 20,000 memories • Radio interfaces optional • Built-in antenna selector • Field upgradeable firmware • Auto bypass protection

MFJ-925 Compact auto tuner	**£169.95 D**
MFJ-927 200W remote auto atu	**£249.95 D**
MFJ-928 Basic auto atu	**£199.95 D**
MFJ-931 Artificial ground	**£112.95 C**
MFJ-932 Mini loop tuner	**£139.95 C**
MFJ-934 Artificial ground + ATU	**£199.95 C**
MFJ-935B Portable loop system	**£199.95 C**
MFJ-945E Mobile atu 300W	**£129.95 C**

Diamond HF Antenna

BB7V

The small space answer!

** HF 2 - 30MHz Vertical*
** No radials needed*
** 250W PEP 6.7m length*
** VSWR less than 2:1*
** Weight 2.3kg*
** 50 Ohms SO-239*

£325.95 C

Tigertronics SignaLink Interfaces

Signalink Sound Card Interfaces do not require the use of a com port to trigger PTT on the rig. SignaLink have internal links which make them compatible with most of the rigs on the market. Radio lead is supplied, state which when ordering. Extra mic leads are available.

SL-USB-4R 4-Pin Round	**£89.95 C**
SL-USB-13PDI Icom 13-Pin Din	**£94.95 C**
SL-USB-13PDK Kenwood 13-Pin	**£94.95 C**
SL-USB-8R 8-Pin Round	**£89.95 C**
SL-USB-RJ11 Modular RJ-11	**£89.95 C**
SL-USB-RJ45 Modular RJ-45	**£89.95 C**

Uniden Bearcat

UBC-30XLT

A real bargain whilst stocks last.

Frequency Range: 87.5 - 107.9MHz WFM, 108-136.9875MHz AM, 137 - 173.99MHz FM

The radio has 200 memories, LCD display and can scan at 25 channels per sec.

£59.95 C

Check full spec. of these radios @ www.wsplc.com

UBC-3500XLT

FM FMB WFM AM Frequency:
- 25-512MHz
- 806-960MHz
- 1240-1300MHz.

2500 memories, RF near signal capture, Quick keys, Scan 100 channels per sec., CTCSS & DCS, Alpha numeric tags, Data skip, Auto store, Display contrast adjust, AC adaptor/charger included.

This is the Bearcat Flag Ship radio. It pacts an amazing number of features into a small package. If you are looking for a serious VHF/UHF scanner that covers the entire spectrum and resolves all the popular analogue modes, then this is a serious contender.

£199.95 C

MFJ HF Antennas

MFJ-1792 80 - 40m

80/40 Meter vertical. Full size quarter wave radiator for 40 Meters, 10m tall. Handles 1500 Watts PEP, requires guying and radials counterpoises or ground screen. A great antenna for LF DX.

£189.95 D

MFJ-1795 40 - 10m

Only 9ft 1500 Watts

4-Band antenna, great for small gardens and portable work. 9ft tall, easily packed away in a few minutes. Yet can handle full power. Use ground mounted with earth or elevated with wire radials (not inc).

£169.95 D

MFJ-1796 40 - 2m

No Radials!

12ft High 1500W Has tiny 24 inch footprint! 40, 20, 15, 10, 6, 2m. Mount anywhere - ground level to apartments, trailers. Perfect for vacations, field day, DXpedition, camping.

£239.95 D

MFJ-1798 80 - 2m

All bands HF - VHF!

10 Bands - No Radials! Self supporting 20ft antenna gives great performance from LF to VHF inc WARC bands. Needs no radials. Mount it on a stub mast or high in the air.

£299.95 D

MFJ-269

The Antenna Analyser has been refined over the years & the MFJ-993B tells you just about everything you need to know about your antenna system - resonance, impedance, reactance & can even measure coax losses & identify the position of open & short circuits. All in a compact unit that covers 160m to 70cms. Can you afford to be without one?

W&S £349.95 C

** 1.8 -170 & 415-450MHz*
** Frequency Counter*
** LCD readout*
** SWR & impedance*
** N-socket (Ant), BNC (Counter)*
** AAx10 or ext. 12V DC*
** Size 103w x 173h x 60d mm*
** Weight 750g*

Watson VHF/UHF Antennas

VHF-UHF Verticals

W-30 2m/70cms 3/6dB length 1.15m 150W SO-239	**£49.95 C**
W-50 2m/70cms 4.5/7.2dB length 1.8m 150W SO-239	**£54.95 C**
W-300 2m/70cms 6.5/9dB length 3.1m 150W SO-239	**£74.95 D**
W-2000 6m/2m/70cms 2.15/6.2/8.4dB length 2.5m 150W	**£89.95 C**

VHF-UHF Mobile Whips

W-2LE 2m 0dBv length 0.48m	**£10.95 C**
W-285 2m 3.4dBv 1.33m	**£14.95 C**
W-77LS 2m/70cm 0/2.4dBv 0.43m	**£14.95 C**
W-770HB 2m/70cm 3/5.5dBv 1.1m	**£19.95 C**
W-7900 2m/70cm 5/7.5dBv 1.58m	**£31.95 C**
W-627 6/2/70cm 2/4.5/7.2dBv 1.6m	**£34.95 C**

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

Practical Wireless January 2011

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Front Cover

Main picture by Richard Newton G0RSN, inset picture by Phil Ciotti G3XBZ – layout magic by Steve Hunt, Art Editor.

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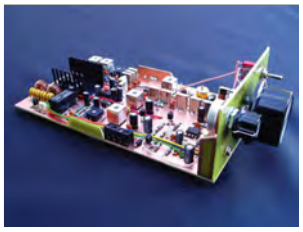

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Rob Mannion G3XFD/EI5IW's

Keylines

The Editor says the time has come for positive action to keep Band II clear of DAB radio!

Some problems facing radio communications in the UK can't be ignored – and I feel that radio hobbyists must be prepared to make a stand. After all – we have a very close relationship with a very special and fascinating branch of modern technology. So, I make no excuses for once again drawing attention to the totally impractical plans for digital audio broadcasting (DAB) – that the UK's coalition government, like their Labour predecessors, insist will be introduced on Band II.

As I prepare my first *Keylines* of 2011, there are conflicting press statements appearing literally everyday in the media regarding the enforcement of DAB on a mostly unwilling public. Indeed, newspapers reports have even gleefully emphasised a half percentage drop in the sales of DAB radio receivers – which seemingly indicate the radio listening public are losing interest in DAB radio. However, I'm left wondering just how reliable statistics are in the case of DAB radio. From the straw poll research I've carried out – it seems that many people I've met have **purchased** DAB radio receivers – but **have also given up** trying to use them because reception is so unreliable.

At this point I must re-emphasise that I'm not against digital technology use for radio and TV use. In fact, I use digital reception systems extensively – including the Internet. Using satellite TV and radio systems, I enjoy listening to BBC Radio 3, 4 and 7 via the Freesat system using properly set-up and aligned antenna systems.

However, I rarely listen to the existing Band III DAB radio transmissions because I regard that the audio reproduction is very poor (due to the reduced audio bandwith) compared to the radio services available from the terrestrial u.h.f. digital Freeview transmissions. Here, the quality of the reproduced audio on BBC Radio 3 is truly superb. Once I heard my first broadcast via Freeserve – I realised that nothing available 'off the air' to the general public equals this excellent service.

All the 'off the air' digital services I use require fixed antenna systems, correctly oriented and adjusted to the appropriate transmitter. This approach is essential for reliable reception of serially transmitted digital transmissions, minimising 'drop out' of the received audio due to propagation problems (multiple signal pathways due to topography and/or aircraft). This is why I regard the DAB radio system as being totally unsuitable for general purpose portable reception – even if it's transmitted on the relatively low frequency Band II (87.5 – 108MHz).

I offer no apologies for repeating my opinion that the major (and insurmountable) problem for the broadcasters is the fact that the vast majority of radio listening is carried out using portable Band II receivers using practical (but relatively inefficient) telescopic whip antennas. The introduction of DAB radio on Band II will – in my opinion – deprive many listeners of an essential, practical and economical to use broadcasting facility.

Indeed, I feel so strongly on this matter that I consider that our 'human rights' to this essential service are about to be compromised by what certainly appears to be an unthinking, unsympathetic government. My 'human rights' concerns may seem comical to those who don't appreciate how important access to the Band II radio broadcasting service is – but I feel so concerned that I'm now determined to approach the European Court of Human Rights in Strasbourg. It could be the only way to get our government to see practical sense! Watch this space!

Olympic Communications Services

The pages of *PW* aren't really the place to fully discuss my strongly felt opinions against the modern, entirely commercialised and politicalised Olympics. But I will say how much I admire the dedication of the individual athletes in their personal endeavours! However, I'm extremely concerned about the demands on radio spectrum that will come in 2012. Indeed, it seems that the 'discussions' – before the frequency 'grabs' – have started (see **http://stakeholders.ofcom.org.uk/consultations/spectrum2012/)**

Modern sporting events demand much of the radio frequency spectrum nowadays – for TV outside broadcast links, audio commentaries and so on (the list seems endless!). So, I urge everyone to read the Ofcom 'discussion document' – our frequencies must be stoutly defended!

Rob Mannion G3XFD/EI5IW

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Readers' Letters

Send your letters to:

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

£20 Star Letter

Fight Against DAB Radio In The Republic Of Ireland

Dear Rob,
Recently, the **European Broadcasting Union** (EBU) Digital Radio conference was held in Belfast, free to members with trade and public paying a fee.

Hosted jointly by the BBC and **Raidió Teilifís Éireann** (RTE), I felt my four decades service with RTE – Ireland's public service broadcaster – would allow my voice to be heard, but not so!

My Google led anti-DAB digital radio campaigning kept me out and my attempt to pay the €80 registration fee was refused.

As a retired RTE engineer myself, I have a special interest and background in radio, shared with others over the years and acknowledged in hard copy by a previous Irish communications minister.

With community, BBC, Gaelic Athletics Association (GAA) and RTE support, Irish football (GAA), was relayed across Europe on short-wave radio in pre-internet days. Supporters today include academics, politicians, radio engineers and Radio Amateurs.

At first my application to attend the Belfast Conference was accepted by the EBU in Geneva, with a welcoming note, and expressing the hope of meeting me in Belfast. Before I left for Belfast, one of my contacts thanked me for alerting him to the event, had registered and would see me there.

My Irish Senior Citizen's free pass brought me quickly from Dublin, by the International *Enterprise* express to the Europa Hotel.

The event was not overbooked and the public were admitted – having paid a fee on the day. It was an opportunity to engage – but not for me, a supporter of a newer system – **Digital Radio Mondiale** (**www.drm.org**) – which I believe will replace the older DAB system.

Sadly, my four decades service with Ireland's national broadcaster RTE did not qualify me. I was told I was not invited and could sit in the foyer. There I learned, from my previously mentioned contact, that my badge and name were at the event reception desk. Indeed, my name on the attendees list, was specially highlighted. Why?

Is my prominent opposition to the DAB digital radio system on Google, a problem for RTE?

At this late stage, RTE are launching DAB and creating a legacy problem, for the unaware and overburdened Irish tax payer as DAB+ is launched. Now retired, I lobby for an affordable, state of the art, flexible digital radio system, that crosses frontiers and can serve community stations alike - not possible with DAB or DAB+. Like those small stations for which I lobby, I was left in the lobby myself!

I returned to Dublin strengthened and reinvigorated by the (London) *Daily Telegraph* RAJAR report, that DAB sales are down last quarter by 0.5% and f.m./analogue up by 0.6%. Keep up the fight on your side of the Irish Sea Rob! Regards.

Enda O'Kane
Terenure
Dublin, Republic of Ireland

Editor's comment: *Enda and I have been correspondents for many years and he's kept me up-to-date throughout his recent attempts at trying to attend the Belfast Conference. I have also tried to contact the Conference Organisers at the BBC and RTE and have – as yet – not received a reply from either organisation. However, I received a reply from the EBU in Geneva advising me to contact the Conference Organisers direct – the BBC and RTE! So, if either broadcaster wishes to respond to Enda's letter, I would be pleased to publish their response.*

Driving & Operating

Dear Rob,
I have been reading the letters and the 'can operate/can't operate' legality debate but up to now have not been bothered as I use a headset anyway but the letter in December 2010 issue from '**James**', the recently retired Police officer, drew my attention.

In his letter James states that 'one cannot be in proper control of a car if you have one hand on the steering wheel and one hand holding a microphone'. Lets take a straw poll then. Hands up all those who drive with one hand on the steering wheel and one hand on top of the gear stick? I'm guessing that would be a large number. I'm also guessing that a large number drive quite safely with one hand on the wheel, while the other hand adjusts the radio, inserts a CD, adjusts the heater controls, etc., etc.

In other words, it's fairly common practice to use one hand on the wheel for quite a large part of driving. If it's the excuse that holding a conversation whilst driving causes accidents then a poll asking how many drivers talk to their passengers while driving would I am sure, yet again throw up a large number.

It would seem that the only people who cannot hold a conversation whilst driving are the law makers and their employees. The rest of us must be a different breed. Unfortunately, we cannot argue with the law makers' employees, we can only make our feelings know to those whom we have elected to represent us and seek a change in the law.

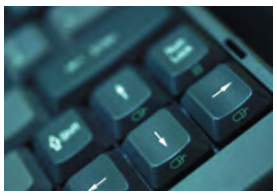
Ben Nock G4BXD
Kidderminster
Worcestershire

Tom Read's Excellent Radio Courses

Dear Rob,
I've just been reading the star letter in the December 2010 issue of *PW* and I think what **Tom Read M1EYP** is achieving at his school – the Brownhills Maths & Computing College, Stoke-on-Trent is fantastic! Not only is Tom getting more people into the hobby – but also the lending of equipment so they can get on the air is a wonderful idea and one which, I believe, could be championed by everyone in the hobby perhaps?

I've not heard of Amateur radio being taught in schools and although it probably won't ever reach the national curriculum – I still think it is a worthwhile pursuit. Who knows when I eventually gain my Advanced licence I may even follow in Tom's footsteps and see about it at my nearest school. Keep up the good work Tom! 73s
Denny Teasedale M3HSJ
Stockton on Tees
Cleveland

Editor's comment: *I fully support your sentiments Denny! Both my* PW *friend and colleague* ***Tex Swann G1TEX*** *and I have fully supported Tom's efforts in the most practical way possible (no apologies for the play on words!) by providing publicity via the magazine. I have some (much cherished but rarely used) Amateur Radio equipment that I'll be delighted to donate to the Brownhill's student Amateurs and I have no doubt that there'll be other equipment arriving at the school from the widespread* PW *fraternity. I also hope that other Teachers – with backing from other local Radio Amateurs –will also start their own radio courses. Please join me on the* Topical Talk *pages for further comment*.



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

The Silent Majority?

Dear Rob
I was most interested in your *Keylines* editorial (*PW* December 2010) because I am another of your your non-transmitting readers – we last met at the Knock Radio Rally in County Mayo a few years back when I and a friend drove over from County Dublin in typically wet and windy Irish weather! My late father took *PW* during the 1930s and even managed to get it during 'The Emergency' – which everyone else remembers as the Second World War. My father built a number of wireless sets (radio was a word he didn't use) with the help of *PW* and encouraged me to 'have a go'.

Like other *PW* readers my hobby led me into a career and I was lucky enough to be selected for training as a Wireless Technician in the RAF during the early 1950s. Whenever I was at home on leave in Monaghan I brought components with me and despite the close attention of the customs people in those days – on both sides of the Irish Sea – I never had to pay import duty on anything. I think it was because nobody knew what the parts were for! Funnily enough, it was when the *PW* stand was up next to the Knock Rally's Bring & Buy stand that we got talking. I'd brought my home-brewed general coverage set to try and sell it – but your comments and those from **John Corless EI7Q** on how well it was built, made me change my mind and it went back and I've still got it in the shack.

Not long after I left the RAF, I worked for a short time in a radio repair shop in Monaghan and saw my first TV picture as received from England on a *Practical Television* design receiver. We were fairly sure that the signal came from the Birmingham transmitter – Sutton Coldfield – because of the regional news, etc. and although by modern standards our picture was truly awful, the picture only locking for a few seconds at a time – we thought it was marvellous!

Even though the magazine that my late father started reading in the 1930s (and I have been reading since the late 1940s) has changed from being a 'radio hobby' magazine to a specialised Amateur Radio periodical, I've stuck with it because even though I have no interest in Amateur Radio transmitting – much of what appears in the magazine is still of great interest to me. In particular, I thoroughly enjoy **Harry Leeming G3LLL**'s *In The Shop* articles because his (often hilarious) experiences with his customers problems reminded me of my own daily-disasters-to-repair during 40 years of working in various TV and radio workshops. I was also very amused when Harry described lightning damaged hi-fi equipment as I've 'been there and done that'! In fact, we had two customers (living next door to each other in Swords in Dublin) who both suffered a lightning strike on their shared chimney. One semi-detached house just sustained internal wiring damage and a slightly smoke stained Sobell TV set, while next door lost their entire TV system (set and aerial) and v.h.f. radiogram. Fortunately for my employers, the set that got slightly damaged was one of our rented sets – and the destroyed equipment was originally bought from our shop and the replacements funded by insurance were purchased from us too!

Tony Nailer G4CFY's articles particularly *Doing it By Design* – is of great interest to someone like me who enjoys trying new circuits out and G4CFY's style of presentation, which is just like 'peeping over his shoulder'. In fact, I'm often relieved to see that Tony has run into the same sort of trouble I often ran into getting circuits working! But, at my age I'm more at ease with valves than transistors!

As a member of your mostly silent R-C readership I am pleased to respond to your request to hear from us. I also hope other R-Cs will write in to you to let you know what we like and don't like! Best wishes
Bernard Mangan
Balbriggan
County Dublin
Republic of Ireland

Editor's comment: *It's good to hear from you Bernard and I remember our meeting at the Knock Radio rally in County Mayo a few years ago. Having seen the quality of your constructional work I'm convinced that many Radio Amateurs (especially me) could benefit from a few hours' training from you Sir! Thanks for writing and I'm sure your kind comments will be much appreciated by Harry G3LLL and Tony G4CFY. Keep busy in your workshop Bernard!*

News & Products

Send your info to:

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

New Kenwood TS-590S Transceiver Launched

Kenwood Electronics UK Ltd. contacted *Newsdesk* with their press release detailing their new TS-590S h.f. and 50MHz all-mode base station transceiver. "Our latest Amateur Radio transceiver for the dedicated h.f. market is now launched. The new TS-590S features excellent receive performance with a high dynamic range front end. The design includes 6kHz, 2.7kHz and 500Hz roofing filters, which are built-in to the down-conversion type 1st mixer circuit.

"The roofing filters and down-conversion circuits exceed our current models' performance, especially on adjacent suppression characteristics. Other cutting-edge features include 32bit floating-point i.f. DSP for rejecting Interference, receive and transmit DSP functions, and a built-in automatic antenna tuner (also cover 50MHz band). The built-in electronic keyer including selectable Iambic A/ B modes.The TS-590S has dynamic twin cooling fans for heavy duty operation and a USB port for PC control – in addition to the serial COM port. There's also a two-colour l.c.d. display (Amber or Green) and a low-level transmitter 'DRV' terminal for 135.7 - 137.8 kHz output".

Further information from **Communications Division, Kenwood Electronics UK, Kenwood House, Dwight Road Watford, Hertfordshire WD18 9EB**. Tel: (**01923) 816444.** Website **www.kenwood-electronics.co.uk/products/comms/**

Editorial note: *Look out for the* PW *review of this transceiver – coming soon!* ***Editor****.*

Two New Designs Launch By Pro Antennas

Busy antenna designer Carl Kidd G4GTW contacted *Newsdesk* with news of his latest products: "After 10 months of durability field testing the following products are now available. The first, the Dual Beam Pro, is a rotary high frequency (h.f.) dipole measuring 5m overall. The second new model is the I-Pro Home, a vertical h.f. dipole that stands 5m tall.

"Both products incorporate the highly efficient method of capacity hat end loading as used in the well reviewed I-Pro Traveller. Both products are lightweight and easy to handle, as well as being easy to use and install. Carl G4GTW.

Further details are available from **Pro Antennas**, **3 Forsythia Close**, **Hedge End**, **Southampton**, **Hampshire SO30 4TP**.

Tel: (**01489**) **789960**

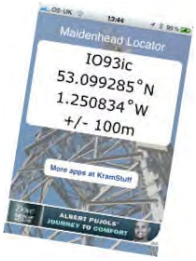
E-mail: **sales@proantennas.co.uk**

Website: **www.proantennas.co.uk**

Ham Square – For Radio Amateurs On The Move!

A number of *Practical Wireless* readers who own iPhones contacted *Newsdesk* to say how useful they'd found the Ham Square applications to be of interest. So, intrigued – *Newsdesk* then visited the Ham Square website to find out more: "Amateur Radio enthusiasts who also own an iPhone may find this new app from **Mark Turner G7LEU** quite useful – especially if they are constantly on the move.

The application *Ham Square*, uses the iPhone's built-in GPS receiver to determine the current location, and then presents that location in decimal degrees and Maidenhead Locator, i.e. it shows the current 'square'. The app is free, and available to iPhone users via the iTunes App Store as usual. Please see **www.kramstuff.com/** for more details and a screenshot.



The FOC Straight Key Weekend January 1st & 2nd 2011

The First Class Operators' Club (FOC) have announced that their Straight Key Weekend was well supported last year by both members and non members alike and the FOC Committee has agreed it can be part of the c.w. calendar again. The idea is not to have a contest – but to be active using any mechanical keys such as the semi-automatic bug, the side swiper or the 'pump' type straight key across all bands 25kHz up from the band's lower edge.

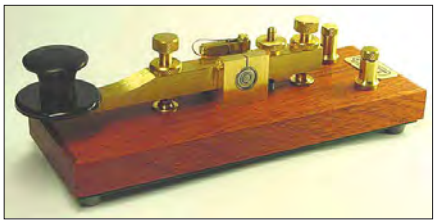
Whilst many operators use an electronic keyer, there are still a sizeable number who are proficient on the older style keys and FOC recognises the value of preserving these old, but still valuable skills.

The weekend of January 1st and 2nd 2011 has been suggested as fairly free again with no major contests on the bands and Radio Amateurs are invited to join FOC on all bands with their straight key, bug key or any other mechanical keying device! (We leave it up to you!)

The timing will follow the FOC BWQP event timing and start at 0000z and finish at 2359z over the Saturday and Sunday weekend. There are no prescribed operating bands or times – we just ask you to be active as band conditions permit. It would be helpful if CW club editors could put this information on club reflectors.

Please send your comments on contacts and working conditions to **G3VTT** by E-mail at **g3vtt@aol.com** or post to them (address below) before the end of January. A log is not needed but comments about the types of keys heard and the best 'fist' would make interesting reading. The FOC public Website please visit **www.g4foc.org**

Colin Turner G3VTT
30 Marsh Crescent
High Halstow
Rochester
Kent ME3 8TJ



Free Public Lecture at Bodleian Library

The first Douglas Byrne G3KPO Marconi Lecture, to be delivered by Professor Peter Scott (University of Reading), and will be held at the Museum of the History of Science, Broad Street, Oxford OX1 3AZ (Tel: 01685 277 280), on Tuesday March 1st 2011 at 5:30 to 6:30pm. The subject of the lecture will be, 'The sources of competitive advantage and innovation in the interwar British radio industry'. Entrance is free to the lecture and the reception following in the (nearby) Bodleian Library. For further information please make contact via E-mail: bookcentre@bodleian.ox.ac.uk

Research Funding & Radio History

Funding for research into any aspect of the history of radio communication is available for scholars to spend time with the Marconi Archive at the Bodleian Library, Oxford holding a collection of objects held at the Museum of Science, Oxford. The vast archive, occupying some 400 linear metres of shelving, includes personal papers of **Guglielmo Marconi** and business records relating to the radio industry up to the late 20th century.

Objects in the collection include devices from early experiments in transmission. Thanks to a grant from the Wireless Preservation Society in memory of its founder, **Douglas Byrne G3KPO**, the Bodleian Library is able to offer a fellowship each year to support a scholar in residence consulting these collections.

The first fellowship was awarded this year to Professor Peter Scott, of the Henley Business School, University of Reading, for research into competitive advantage and innovation in the interwar British radio industry. Professor Scott will deliver the first Douglas Byrne Marconi Lecture on March 1st, 2011. The Marconi Collection was donated to the University of Oxford by Marconi plc in December 2004. A catalogue of the archive, funded by the Wireless Preservation Society, is available online from the Bodleian Library. A catalogue of the objects can be found on the website of the Museum of the History of Science.

Of especial interest are the records relating to the RMS *Titanic* disaster in 1912. The role played by wireless telegraphy in saving lives during this tragic event is well documented in the archive, which features the logs of ships' radio operators recording the first and last distress signals from the *Titanic* as well as thousands of other messages exchanged before, during and after the emergency.

Besides documents relating to Marconi and his Wireless Telegraph Company, there are records of numerous other electronic and electrical engineering companies, all of which were ultimately absorbed into the General Electric Company (GEC) which in 1999 changed its own name to Marconi. For details of funding and how to apply for the Douglas Byrne Marconi Fellowship at the Bodleian L brary, visit the library website at **www.bodley.ox.ac.uk** or write to: **Fellowships**, **Centre for the Study of the Book**, **Bodleian Library**, **Oxford OX1 3BG**. Applications for the 2011 fellowship must be submitted by December 31st, 2010.

The Bodleian Library in Oxford.

The Bodleian Library website, Marconi Archive can be found on : **www.bodley.ox.ac.uk/dept/scwmss/wmss/online/modern/marconi/marconi.html** The Museum of the History of Science website, Marconi Collection can be found at **www.mhs.ox.ac.uk/marconi/collection/**

Chilean Amateur Radio Club Celebrating Mine Rescue

Millions of TV viewers around the globe watched the successful rescue of the 33 Chilean copper miners on October 13th – and the worldwide sigh of relief was almost tangible! To further celebrate the amazing rescue – a truly international effort – Chilean Amateur Radio operators from the **Radio Club de Copiapo** are now active as **XR33M** now and until the end of December 2010. Listen out for operations to be on all bands from 3.5 to 21MHz s.s.b.(Please QSL directly to **CE3BBC**).

Also, look for the Radio Club de Copiapo team members to be active during the ARRL 10 metre Contest (December 11-12th).

Website **www.ce3aa.cl/** (in Spanish - but website translations are available)

All Change At Bristol ARC!

It's 'all change in the Bristol area – and that doesn't mean trains at Isambard Brunel's Temple Meads railway Station! Instead, after the November retirement of the **South Bristol Amateur Radio Club** (SBARC) Hon. Secretary – **Len Barker G4RZY** – the new Club Secretary is Andrew **Jenner G7KNA**. Everyone at the SBARC wishes Len G4RZY in his 'retirement' and hopes he can find more time for his hobby! The club also wish Andrew G7KNA 'good fortune' in his new post. Andrew's address is: **24 The Willows**, **Nailsea**, **Bristol BS48 1JQ**. Tel: (01275) **857381**. E-mail **g7kna@uksn.org**

Walter Farrar G3ESP Well known PW Author A Silent Key

The *PW* Editor pays tribute to a remarkable man with many talents – who was a much valued author and friend based in Pontefract, West Yorkshire – with a very special reason for the 'ESP' letters in his callsign.

Rob G3XFD writes: Unusually this year I hadn't heard much from Walter Farrar G3ESP and hearing from the Pontefract Club his antennas were looking a bit battered, I wrote to him to catch up with the news and we were soon chatting on the 'phone and hearing that he was, "rather tired but getting better". However, when he didn't arrive at the *PW* stand at the Newark Amateur Radio show in early October, I knew something wrong.

After the Newark show I received an E-mail from **Paul Farrar**, Walter's son who is a retired Army Officer, "*Sadly, I must report that my father died on Sunday October 24th 2010 in Pontefract General Infirmary where he had been for a couple of weeks following a fall at home. His death came as a surprise to us all (and the staff on the Ward). But then again he was just five hours short of his 91st birthday, and I suppose at that age, anything can happen. Although no-one from the family was with him at the time (it was very sudden), I had fortunately travelled up from Hampshire on Tuesday 19th, when I saw him for the last time. Regards,* ***Paul***."

Walter was cremated after a service at Pontefract Crematorium on Tuesday November 2nd 2010. Members of the **Pontefract & District Amateur Radio Society** attended, to say farewell, together with my friend and P&DARS member **Nigel Ferguson G0BPK** who was also representing *PW* on my behalf.

The story of Walter G3ESP's life is quite remarkable – and even his callsign represented his extensive interest and fluency in Esperanto (hence ESP) – the modern International language, that was developed as a way of uniting people around the world in one common – politically neutral – tongue. Knowing a little about Esperanto and its peaceful aims – I was still immensely surprised to learn from Walter that Esperanto was despised – indeed illegal – in many countries before and during the Second World War. Walter explained to me that the letters ESP in his callsign was to honour the many Esperanto speakers who died in the infamous Concentration Camps during the Second World War.

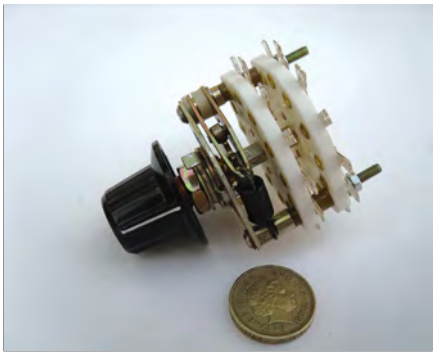
Walter G3ESP was involved with the wartime airborne ground-mapping radar H2S system in Christchurch in Hampshire (now in Dorset), where he met his future wife. The H2S radar got its name because Professor Lindemann (Winston Churchill's main Scientific Advisor) commented, 'the idea stinks' – so some wag gave it the chemical formula for hydrogen sulphide – the stink bomb gas!

Well known for his practical projects in *PW* and a great supporter of the G-QRP Club, Walter G3ESP was another 'hidden hero' who didn't talk much about his special work during the Second World War. Amateur Radio will miss this amazingly clever, quiet and unassuming man – and I'm proud to have known and worked with him. My sympathies go to his son John and the family. **G3XFD**.

Stop Press!

Finding that Ceramic Switch – Spectrum Solves The Problem!

Regular *PW* author Tony Nailer G4CFY is also the proprietor of Dorchester-based Spectrum Communications and much appreciates the problems Amateur Radio constructors have in finding specialist components. Indeed, one of the most difficult to find items nowadays are the high quality ceramic switches required for antenna tuners.



Tony contacted *Newsdesk* just as we were passing for press with the news. "After a long search I've found a source of high quality ceramic switches, (see photo). I've now got new stocks of a high quality high power capability ceramic rotary switch, two wafers each 2-pole 5-way. They're suitable for linear amplifiers or antenna tuning units (a.t.u.s) at power handling **in excess** of the legal limit. An initial order of switches was made following requests from *PW* readers after I mentioned them in *Technical for the Terrified* in October issue. I'm pleased to say that they're 'now readily available at very reasonable prices.

Further details from **Spectrum Communications**, **12 Weatherbury Way**, **Dorchester**, **Dorset DT1 2EF**. Tel: (**01305) 262250**. E-mail **tony@spectrumcomms.co.uk** Website **www.spectrumcomms.co.uk**

Training the Trainers at Jersey Amateur Radio Society

Rob Luscombe MJ0RZD contacted *Newsdesk* with the latest Amateur Radio up-date from the Channel Islands.

Brian Reay G8OSN during the Train the Trainers evening.

Rob MJ0RZD writes: "With ever increasing workloads, trying to share time with family and the other things that tend to take over, making a commitment to training new or existing amateurs through the three levels of the Amateur radio exams can be a problem. The two Phils (**Phil Daniels GJ4CBQ** and **Phil Taylor MJ0JER**) and club president **Mike Turner GJ0PDJ** have given sterling service at the **Jersey Amateur Radio Society** (JARS) for a number of years but it has proved harder and harder in recent times to find the time to dedicate to training.

"Fortunately, **Mathieu Roche MJ0ASP** has recently stepped into the breech and is currently teaching four club members the Morse code – but it has been apparent that training in Jersey has needed a boost. The RSGB's Jersey Deputy Regional Manager and club secretary **Rob Luscombe MJ0RZD** contacted the RSGB to see if some help and support could be obtained. They sent RSGB Board Member **Brian Reay G8OSN** to give some much needed support and run a 'Train the Trainers' (TtT) course on Saturday 23rd October 2010. The event was well attended with seven club members present, five of whom are now registering with the RSGB to become new accredited trainers. The members concerned are: **Peter Bertram GJ8PVL**, **Ian Meade GJ7DNJ**, **Michael Brown 2J0SZI, Claus-Dieter Paland MJ1CYD** and **Rob Luscombe MJ0RZD**. Additionally, the existing trainers – **Mike Turner GJ0PDJ** and **Phil Daniels GJ4CBQ –** are now TtT accredited and will continue as club trainers at the Jersey Amateur Radio Society. For any enquiries regarding the Foundation, Intermediate or Advanced exams or even for morse training please contact the club via Rob Luscombe MJ0RZD via E-mail at: **mj0rzd@robluscombe.com**

See the Jersey Amateur Radio Society at **www.radioclubs.net/gj3dvc/**

The Jersey Amateur Radio Repeater Group at **www.radioclubs.net/gb3gj/**

Brian Reay G8OSN, assisted by Rob Luscombe MJ0RZD.

The TYT UVF1
Dual Band Hand-Held Transceiver

Richard Newton G0RSN is a specialist in using hand-held transceivers – and had a surprise with an interesting rig from China!

Two views of the sides of the rig, a dual coaxial socketed microphone connection is under the upper 'flap' on the side of the left hand rig.

When the Editor Rob G3XFD at *PW* asked me to take a look at a fully functional dual band rig that was on sale, brand new for less than £100, I thought he was pulling my leg. But he wasn't! It seems that the world market is being introduced to some rather inexpensive Chinese rigs that are challenging our preconceptions about what a radio should cost.

So, what about the quality I hear you ask? Intrigued myself, so I eagerly agreed to look the Dual-band hand-held from a manufacturer called TYT, with the model number is the UVF1.

First Impressions

My first impressions of the rig were far better than I had anticipated. Indeed, it was well presented in a neat box, was supplied with a carry strap, belt clip and a rather smart, thin helical antenna. In fact, I was really impressed with the antenna, it was very well made and had a really solid SMA fitting that gave a really positive connection to the SMA fitting on the top of the transceiver.

I was pleased to see that the rig was decent size and the case is ergonomically designed in black plastic. This has a good solid feel to it and the battery is sleek and conforms to the overall feel and shape of the radio making it a delight to hold and operate. The rig measures 115 x 55 x 31mm and sits comfortably in the hand. The transceiver is supplied with a 7.4V Li-Ion battery.

The only thing about the look of the rig that did cause a slight intake of breath – was the very shiny silver grill that sits behind the horizontal gaps on the front panel. At first this seemed just a bit tacky (if I'm honest), but the more I got to know the rig and the more I learned about it and operated it, the more I found myself forgiving this one slight fashion error. However, it's said that' beauty is in the eye of the beholder' and it may well be that others would find silver grill a real plus point.

But to be fair – I also have to say that the build quality of the rig really surprised me. And although I know it sounds like prejudice – but I really wasn't expecting something that felt and looked so good!

The box also contained a 'sit in' charger pod and wall plug power supply. This power supply is plugged into a normal 240V a.c. outlet and then delivers 12V d.c. to the 'sit in' charger pod.

The rig is also supplied with a 12V d.c. lead for the car cigar lighter socket;

however there is no facility to plug this directly into the rig. What this appears to give you is the flexibility of charging the rig it in the charger pod either from mains electric or a 12V supply. The 'sit in' charger has an indicator light that will glow red while charging and green when charging is complete.

I was initially concerned that the rig itself does not have any way to connect it to external power, however this concern was allayed when I found out that you can get an optional extra that clips to the radio in place of the battery and this has a wandering lead on it that can be plugged into a power supply or car cigar lighter.

The other fact that mitigated my initial concern was that having operated this rig for several weeks I found the battery to be extremely efficient and it never let me down. The rig has two power settings, 500mW and 5W and seemed to happily run on high power for ages – giving me hours of on air and monitoring fun between charges.

The User Manual

The rig is also supplied with a rather glossy user manual, and although I wouldn't wish to say this book was useless – that would be far too unkind as it was of some use. However, I would say that I learned to use this rig despite the book!

Perhaps I'm being a little unkind– – but it would be fair to say that the information in the book is extremely basic and written in something that looks like English and sounds like English if you read it out loud. But as for making sense, well it takes a bit of getting used to!

I must, having made this observation immediately spring to the defence of the rig and TYT. Yes the book **is basic** but the rig is actually simple to use, at the beginning it seems a bit strange – but once you have get used to how the menu is designed and get the hang of the TYT way of doing things it becomes more and more easy to work out.

A couple of things did stump me – so I did a Google search and found some on line forums. On these forums I found that a lady from TYT had actually answered some questions and had left an E-mail address. So, I thought I would try out the after sales service one may expect.

So, I E-mailed the lady asking about how to activate the 1750kHz tone, plus a couple of other little things – and I got a response 10 minutes after I E-mailed! Not an auto-response but a proper answer to my question. Now that gives me real confidence about the company!

Having started to get to grips with the way this radio worked I decided to start to get to know the radio and see what features it had to offer.

Impressive Frequency Coverage

The UVF1 transceiver offers an impressive frequency coverage, it receives on the Band II f.m. broadcast radio band in wide band f.m. (w.b.f.m.) between 70 and 108MHz. It also then covers the following public mobile radio and Amateur Radio bands, 136 to 174MHz, 350 to 390MHz, 400 to 470MHz. It's also capable of tuning in pre-set tuning steps of either, 5, 6.25, 10, 12.5, 25, 37.5, 50, or 100kHz.

The rig offers 128 memories that can be labelled with alpha numeric tag. You can also put in your own power on message into the rig, when I turned the rig on for the first time there was a tell-tell sign that someone had being playing before I picked the rig up from the *PW* offices, I was greeted by the rig talking to me, yes it actually talks, "Power On" the rig said and the display lit up with 'G3XFD'*.

The rig continues to talk to you, announcing what features you are

Comment

Mike Deverux G3SED replies: "Thanks Richard – A good balanced review! In fact **Phil Jeffery** (my commercial manager) has just come back from visiting TYT in Hong Kong. We will be working with them in the next few months to improve the English handbook, so watch this space!

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Even a simple external antenna can give an improvement in range over the in-built antenna – even after the coaxial cable losses are taken into account.

selecting and what numbers you are pressing, this can be disabled but may be a real bonus for operators who are sight impaired.

Without much ado I was off through the menu to see what I could see. The rig is packed full of features such as full CTCSS and DCS squelch control with the ability to search in coming signals to identify the tone being used.

Not guilty Sir! I think it must have been set for us by the suppliers.* ***Editor**.*

Great For Mobile

The rig has it's own voice operated transmit function or VOX, a great feature for mobile working with a headset. It also has a time out timer, a power saving feature on receive and a fully programmable shift offset of between 0.000 and 99.995MHz. Additionally, there are three separate scan modes – and it also has a voice scrambler built in!

I first used the rig as a receiver while on duty with **St. John's Ambulance Brigade** at the recent Great Dorset Steam Fair. I decided to use the out of band receive function and listen to the St John's frequencies – as I'm the County Radio Officer for the Brigade, I wanted to monitor the radio traffic and decided it would be a good way to put the rig to the test.

After using it at the show – I was really impressed with the rig's received audio, it was really clear. And while monitoring the repeater I was able to use a really great feature (which I love to see on any rig) and that's the ability to easily check the reverse frequency.

A real plus point with this radio was that TYT had put a lot of the really useful menu features on the key pad as shortcuts. These were clearly labelled and easy to use. The only two exceptions to this were the access to the broadcast band receive function, which was accessed by pressing the menu button, then the monitor button on the side of the rig, together with the 1750kHz tone – which was accessed by pressing the call button for more than two seconds.

When I was in my caravan during the evening at the show, I decided to see what the broadcast radio receiver was like. So, I tuned to *Steam Fair FM* on 87.9MHz, the community radio station set up for the Steam Fair, what a great audio! The BBC Radio 2 on 88.5MHz was just as good, I was really impressed!

I was also able to have some hand-held contacts with other mateurs on the (huge) site using 145MHz simplex frequencies. Day-to-day contacts were had with my brother **William G7GMZ** and my wife, **Diane M3HJN**. The rig received favourable reports and became my daily working companion.

Dual-Band Feature

Using the full dual-band features of the transceiver I was able to monitor a St John's v.h.f frequency on one band – and another v.h.f Amateur frequency on the other band, giving me the best of both worlds.

The rig allows you to monitor one band at a time or both bands at the same time; this is controllable via the menu. Likewise you could just as easily monitor two u.h.f frequencies or one v.h.f and one u.h.f. frequency.

When I got home I decided to put the rig through its paces while connected to external antennas. First I used a CDV-JRC clip dipole from Panorama Antennas, I just clipped this to the gutter on the bungalow and took the coaxial cable through the window and operated the rig from inside.

Using this set up I worked **Richard Ayley G6AKG/M** on his way to work. I first contacted Richard while he was mobile on Fleets Bridge Flyover in Poole. This is only a distance of about 13 km (8 miles) as the crow flies – but a large section of high land called Canford Heath is in between us – and it represented a really decent contact in the circumstances. Richard was using a 7/λ whip and putting out more than my 5W, I could therefore hear him better than he could hear me.

In fact, I have to just say again just how impressed I am with the received audio quality on the UVF1 – it was really impressive, on broadcast radio, when listening to Marine band and on Amateur bands. Altogether it did a great job.

Richard G6AKG had reported that my audio wasn't good at all at first, he reported a strange noise on the background and that it was a bit thin – but said it was readable and perfectly adequate. Concerned (as I'd been playing around with the rig's settings) I just re-set the rig – put it back to factory defaults and tried again.

The response was immediate. "That's better!" Richard exclaimed. (I'm still not sure what setting I'd changed but suffice to say all was well in the end!).

The fact that I had remedied the problem was confirmed during a contact with Alistair, **Macrae M3XQM/M**, he was mobile at Ashley Heath near Ringwood just a couple of miles up the road from me, when asked for a report on the audio he said, "very punchy Richard, very clear, very crisp, not very basey, just right for mobiles!".

Alistair had called in to give a report while I was chatting to **Terry Harlow M3TFW** who is situated about 10km (6 miles) away from me in Poole. Terry is a regular contact for me when I am to-and-from work and he was kind enough to also comment on the audio from the UVF1, he said, "It's doing very well Richard. Your speech is coming through extremely well."

Pleased with these reports I decided to try connecting the UVF1 to my main antenna, a WX2 collinear at about 10m above ground level. I decided to see if the 5W from the hand-held would get me into the GB3DR repeater on 145.7375 MHz, situated near Weymouth about 50km (30 miles) away from me. I connected the rig and set the Continuous Tone Coded Squelch System (CTCSS) to 71.9Hz and called through and received an immediate reply from a 2E0 station from Plymouth in Devon.

The 2E0 operator (details withheld in the RSGB *Yearbook*) commented that the audio as 'quiet but good'. I then found that connecting a Kenwood speaker microphone to the UVF1 helped and the Plymouth-based station said the slightly louder audio was better.

Really Pleased!

I was really pleased with the on air tests of the UVF1 as the rig performed extremely well. I was especially impressed with the way in which the rig seemed to be easily as sensitive as any other rig I have used. Indeed, it was unlike so many other hand-helds I've owned – yet it did n't get overwhelmed when connected to a high gain external antenna.

I was really impressed with the transceiver's features. However, I doubt many of us would use some of them – such as voice scrambling but it's all there with fully functional dual-band operability. After about a day using the rig I was flying around the menu with ease and finding more and more features. Additionally, after a quick search of the Internet I found that there's free programming software available for the rig on a download – but an optional cable is required.

When making a decision about this rig – I think you just have to look at what you get for your money. My first dual-band rig cost me over £500 in the early 1990s and I'm truly amazed that you get all the facilities offered by the UVF1 for under £100! Unbelievable! It represents fantastic value for money. My thanks go to Nevada Radio in Portsmouth for the loan of the review unit, which costs £99.95 plus £4.95 p&p.

PW

The Secret's Out

The Whisper mode is here to help!

You've heard the rumours – now read 'Whisper' the full story!

David Dix G8LZE explains how to contribute to a worldwide propagation experiment

So, what's behind "Whisper – the full story?" Well, in this article I'm aiming to share the news about a unique initiative – the Weak Signal Propagation Reporter, WSPR (pronounced 'whisper'), which is a simple way to take part in radio propagation experiments.

I had seen reference to WSPR several times – but it was only a year ago that I found time to investigate further and the discoveries made during my 'voyage' have both surprised and fascinated me.

Starting with zero knowledge of WSPR I had to embark on a process of research and learning, the result is this feature which I hope will inspire you to take part in this great experiment. And you should be ready to take part less than one hour after finishing reading the article!

What Exactly Is WSPR?

In fact, *WSPR* is also a software application written by **Joe Taylor K1JT** – the Nobel Prize-winning scientist from Princeton University – who also originated the WSJT application used by Radio Amateurs for both meteor scatter and Earth-Moon-Earth (EME) communication. The programme is designed for sending and receiving low-power transmissions to test propagation paths on the medium frequency (m.f.) and high frequency (h.f.) bands.

The WSPR mode uses frequency shift keying (FSK) to transmit the sender's callsign, Maidenhead locator and output power level in an encoded format, with error correction, during a two minute transmit period. Remarkably – by using a very small shift at a very slow rate the transmit bandwidth is a tiny 6Hz!

Following the transmit period the *WSPR* software then 'listens' for signals. It can detect transmissions buried in noise at a very low level, around -29dB (well below the human hearing threshold of -18dB).

The software continues the transmit and receive sequence automatically normally cycling at a single two minute transmit period every ten minutes. If the software detects and decodes another WSPR mode transmission it will display the received data and also, should you enable the feature and have an Internet connection, automatically upload the data, or 'spot', to a central database. If you look at the database you will be surprised what propagation is possible even when a band appears 'dead'!

What Equipment Is Needed?

By this time, you'll probably asking the question, "What equipment do I need?" In answering – I think you'll be most likely to have everything you need already, especially if you already run other data modes such as PSK31 – apart from several items of software. Here's a list of what you'll need:

- An s.s.b. receiver or transceiver and antenna.
- A computer running the *Windows*, *Linux*, *FreeBSD*, or *OS X* operating system.
- A 1.5GHz or faster CPU and at least 100MB of available RAM.
- A monitor with at least 800x600 resolution.
- A sound card supported by your operating system and capable of a 48kHz sampling rate.
- To transmit as well as receive, an interface using a serial port to key your push to talk (p.t.t.). line. *Linux* and *FreeBSD* versions can also use a parallel port for PTT. Alternatively, you can use VOX control.
- Audio connection(s) between receiver/transceiver and sound card.
- A means for synchronising your computer clock to co-ordinated universal time – usually referred to as UTC.
- The *WSPR* software compatible with your operating system

If you don't already run other data modes then the only extra item you are likely to require is an interface unit between your transceiver and the computer. This interface isolates the two devices and controls the transmit function.

Please don't be tempted to make direct connections between your transceiver and computer! Such actions can lead to unpredictability of operation at best – and a very large repair bill at worst if anything goes wrong!

If you fancy a bit of work with the soldering iron the interface is a fairly simple item to build and *PW* published details of such an interface in its February 2009 issue – and a complete kit of parts is available from Spectrum Communications **www.spectrumcomms.co.uk/**. Alternatively, there are many sources of ready-built data interfaces and I use those produced by **Johnny Melvin G3LIV www.g3liv.co.uk** which have served me well for many years.

So, you have your transceiver and computer connected via an interface – you'll then need to download two pieces of software.

The Software

The first piece of the necessary software accurately sychronises the clock inside your computer to an external atomic clock standard. The accuracy of your computer clock is vital – if it's wrong by more than about two seconds the decoding will not work. An Internet search will locate several programs but one of the most widely used is *Dimension 4* which may be found and downloaded free, for personal use, at **www.thinkman.com/dimension4/**

Follow the install instructions on the site. **Note:** It's a good idea to put *Dimension 4* in your start up group so that your computer clock sychronises every time you boot your computer.

The second piece of software is the *WSPR* program itself. Again the software is free of charge and may be found at **http://physics.princeton.edu/pulsar/K1JT/wspr.html** Once downloaded, follow the install instructions on the web site.

Getting To Know The Software

Once installed on your computer and when the *WSPR* software starts, just before the main program window opens, a smaller window with a black background will open. It looks very much like a 'DOS' window – but it isn't! If you have problems there may be error messages displayed there. You can ignore this window and you may minimise the window – but don't close it.

The main window looks like **Fig. 1** and is split into several main areas. Under the main drop down menus at the top of the screen are two panels separated by a scale. The left hand panel will contain a kind of waterfall signal display where you'll be able to see traces of any received transmissions. The right hand panel will contain the callsign of any decoded received transmission in a band map format. The scale in between will be used to set the precise transmit frequency.

Beneath the waterfall are two sliders for adjusting brightness and contrast of the *WSPR* display and to their right is a checkbox. This enables any received spots to be sent to the central database – as long as you are connected to the Internet! Under this, receive and transmit frequency information is displayed together with a slider to adjust the transmit/receive ratio, the default being 20%.

There's also a 'Special' box containing an 'Idle' checkbox and a 'Tune' button. And at the bottom of the window, apart from displaying the current date and time, there's an area that displays the complete decoded data.

Setting Up The Software

Next, you'll have to set up the software. The first task is to enter station and configuration information. From the main menu bar select 'Setup' and then 'Station parameters' from the dropdown. You will be then presented with a new small screen that looks like **Fig. 2**.

Then, enter your callsign and full six character Maidenhead locator in the top two boxes. In the following two boxes you'll need to select the audio input and output path. The last two boxes of the upper section set your transceivers and interface method of enabling transmit.

The one empty field yet to be completed is the 'Power' section where your transmitter's output level needs to be indicated, in dBm. This will not actually set your transceiver's output power – but the software will encode this information and send it as part of the transmission. For those not familiar with dBm **Table 1** gives the correlation between output power in Watts and dBm.

The CAT Control

Leave the CAT control option un-checked until you are successfully receiving and sending spots. If you then wish to activate this feature it's fully documented in the program's Help files. Then close the station parameters window, and the information entered will auto-save.

Receiving Your First Spot

The best band to test out your system is 10MHz (30 metres) as this has the highest level of WSPR Mode activity. From the main menu bar select the 'Band' tab and check the 30m band from the drop down list. If 'Idle' is checked, un-check it. Then move the 'TX fraction' slider to 0%.

The top 'Frequencies' window should show 10.138700MHz. Tune your transceiver to this exact frequency and make sure that u.s.b. mode is selected.

At the very bottom right corner of the window you should see an information box, tinted red, displaying the message 'Waiting to start'. You should now wait! And when the cycle time is right this box will turn green and display the message 'Receiving'.

At this point a small section at the bottom of the window on the left will display 'Rx noise' with a value in dB. Adjust your soundcard record level until this value reads 0dB. There will be variations day-by-day in this setting, but as long as the Rx noise level is ±5dB then you should still be able to receive and decode spots. Now you just have to wait again!

The waterfall panel should progressively turn from black to blue, from right to left, as time proceeds and the waterfall advances. Streaks, indicating received signals, should start to appear on the waterfall and a band map should build up in the panel to the right. The spot detail window should also start displaying information and after a minimum of 10 minutes you should see a screen similar to **Fig. 3**.

The information in the spot detail window is the time the spot was sent in UTC, the receive level in dB, the time offset (against the ideal time), the frequency in MHz, the drift rate in Hz per minute and the sender's callsign, Maidenhead locator and power level in dBm.

If you have an Internet connection you can now check the 'Upload spots' box and make your own contribution to this great propagation experiment.

To view your own, and other contribuors' spots, you should log into the main WSPR web site, **http://wsprnet.org/drupal/** On your first visit you'll need to create a **free** account which only takes a matter of seconds. Once you have your account you can see what spots are being received and sent in from all over the world, using the site 'Database' menu option. There's a filter if you want to monitor what is happening on just one band.

Note: I recommend that you take some time to investigate the wealth of information on the rest of the web site. I expect you will get a few surprises when you see the spots being received!

Want to try another band? Just change the selection from the 'Band' dropdown menu, tune your transceiver to the frequency indicated by the 'Dial' frequency and make sure your are in u.s.b. mode even on 3.5MHz and 1.8MHz.

So if you can hear them, can they hear you?

Transmitting Your Own Spot

Before transmitting your own spot it must be stressed that the WSPR mode **is not a beacon**, it's a mode of transmission and UK Amateur Radio Licence conditions require the Licence holder to be present and in control of the equipment while it's running. **Note:** Many users tend to have WSPR running in the shack whilst they are busy doing other tasks or monitoring or transmitting on other bands with another transceiver.

As with most data modes, before transmitting, any speech processing should be turned off (as should any audio filtering). The transceiver and any antenna tuning unit (a.t.u.) should be adjusted for the proposed transmit frequency just as you would for any other mode of transmission.

The transmit frequency is set by double left clicking your mouse on a clear space in the waterfall. You will be asked to confirm your selection.

Next, move the 'Tx fraction' slider to the 20% position and check the 'Idle' box. The 'Tune' button will probably be 'greyed out' but if you wait – up to a maximum of two minutes – then the red tinted 'Waiting to start' message will appear in the information box at the bottom right hand corner of the screen. The 'Tune' button will then become active.

With the transceiver power level set to that indicated in the Station parameters, click on the 'Tune' button to start transmission and adjust the audio output level from the soundcard until the automatic level control (ALC)

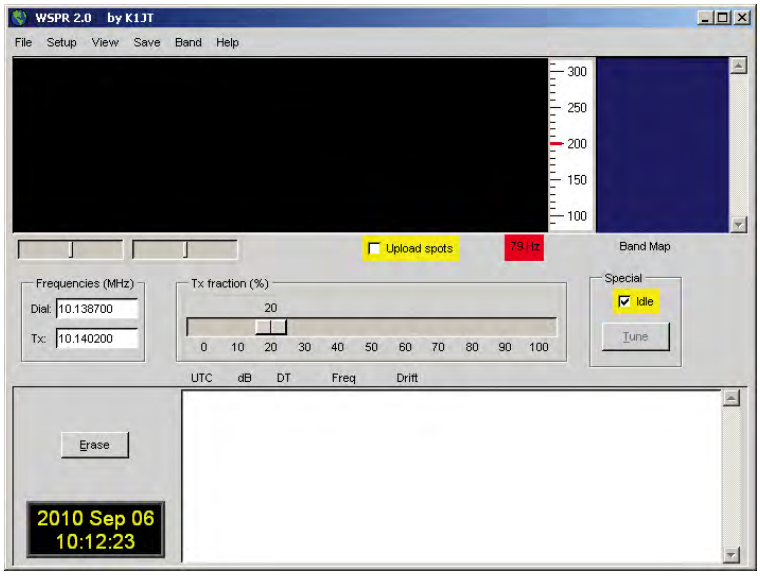

Fig. 1: The main window of the *WSPR* software is split into several main areas.

is just inactive. This adjustment should, of course, be carried out with a dummy load connected not the antenna!

After your adjustments have been made, reconnect the antenna and uncheck the 'Idle' box. Then wait! After a maximum of two minutes the software will start its automatic receive and transmit sequence. Depending on where in the cycle you unchecked the 'Idle' box, but within ten minutes, the two minute transmit period should start.

Once the transmit function is activated make sure you are radiating power with a 1500Hz modulated tone. The information box will then become yellow and contain the message 'Txing' and your callsign, first four characters of your locator and output power. At the end of the transmit period the information box will turn green and display the 'Receiving' message. While the software is running it will continue to cycle listening for eight minutes and transmitting for two.

After a couple of transmit periods you should log into the main WSPR web site and see if your spot has been received by anyone. If all has gone well you'll then be a member of the WSPR network and be part of this great worldwide propagation experiment!

I can almost guarantee that – if you use WSPR for a while – you'll get a few surprises. I left the software running overnight (I was, of course, there in the shack!) on 7MHz with just 1W to a vertical antenna and I'd received reports from all five continents by the morning!

Increasingly Used

Although originally designed for use on the m.f. and h.f. bands an increasing number of people are using the software for experimenting on the v.h.f. and even u.h.f. bands. Recently I set WSPR running on a 'dead' 50MHz band and within an hour my spot was reported from Estonia!

So, no excuses, it 's easy to do, just download the software and forget the whispering voice – pass it on (indeed - shout the news) that the WSPR mode and software is a exciting development we could all use! **PW**

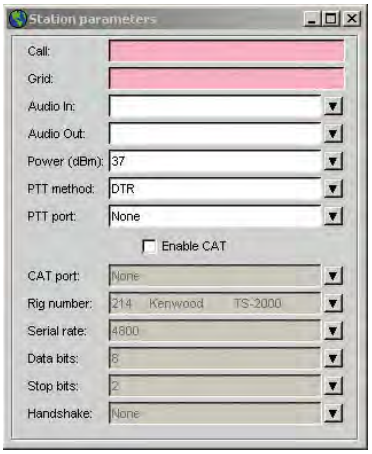

Fig. 2: Your first task when starting with *WSPR*, is to enter station and configuration information into this screen area.

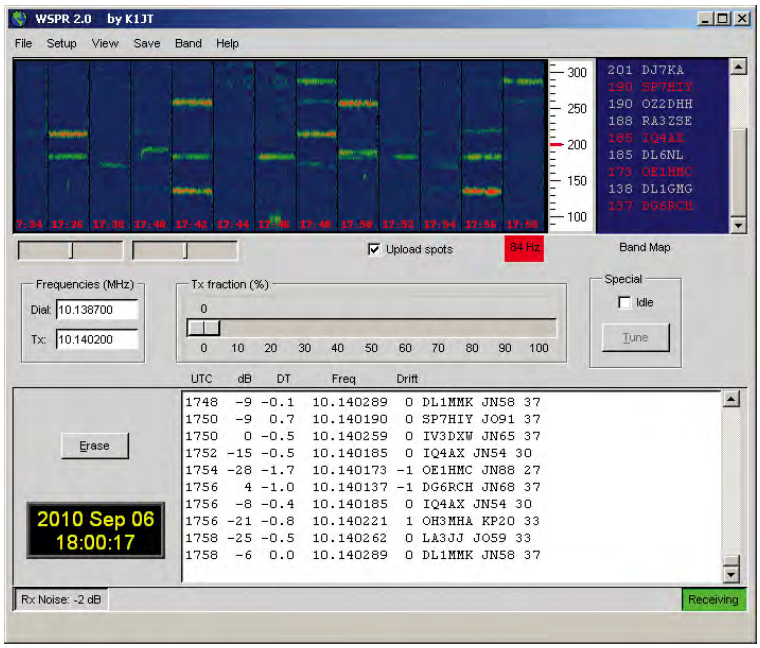

Fig. 3: After an initial 10 minute, or so, delay there should be some spot details should start, with a screen similar to this.

Table 1: Power levels given in dBm.

dBm	Watts
0	0.001
3	0.002
7	0.005
10	0.01
13	0.02
17	0.05
20	0.1
23	0.2
27	0.5
30	1
33	2
37	5
40	10
43	20
47	50
50	100
53	200
57	500
60	1000

The default is 37dBm or 5W.

The author, David Dix G8LZE.

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YG5-2 2 metre 5 Element (Boom 63") (Gain 10dBd) **£49.95**
YG8-2 2 metre 8 Element (Boom 125") (Gain 12dBd) **£69.95**
YG11-2 2 metre 11 Element (Boom 185") (Gain 13dBd) **£99.95**
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YG5-4 4 metre 5 Element (Boom 104") (Gain 10dBd) **£69.95**
YG3-6 6 metre 3 Element (Boom 72") (Gain 7.5dBd) **£64.95**
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HLP-6 6 metre (size approx 800mm square) **£39.95**

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G5RV-FSS Standard Full Size Enamelled Version, 102ft Long, 10-80 Metres **£24.95**
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G5RV-HSH Half Size Hard Drawn Version, pre-stretched, 51ft Long, 10-40 Metres **£24.95**
G5RV-FSH Full Size Hard Drawn Version, pre-stretched, 102ft Long, 10-80 Metres **£29.95**
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G5RV-FSX Full Size Deluxe Version with 450 Ohm ladder, 102ft Long, 10-80 Metres..... **£49.95**

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Commercial quality trapped wire dipoles that resonate, so require no ATU!

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

(MTD-5 is a crossed di-pole with 4 legs)

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SPX-200S 6 Band plug n' go mobile, 6/10/15/20/40/80m, Length 130cm, Power 120W, PL259 fitting **£44.95**
SPX-300 9 Band plug n' go mobile, 6/10/12/15/17/20/30/40/80m, Length 165cm, High Power 200W, 3/8th fitting **£54.95**
SPX-300S 9 Band plug n' go mobile, 6/10/12/15/17/20/30/40/80m, Length 165cm, High Power 200W,PL259 fitting **£59.95**
AMPRO-MB6 6 Band mobile 6/10/15/20/40/80m, length 220cm, 200W, 3/8th fitting, (great for static use or even home base – can tune on four bands at once) **£69.95**
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ATOM-AT5 5 Band mobile 40/15/6/2/70cm, Length just 130cm, 200W (2/70) 120W (40-6M) PL259 fitting, (great antenna, great price and no band changing, one antenna, five bands) **£69.95**
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A144S5RR 2m 5 Elements, Power 50W, Gain 9.1dBi, Boom Length 95cm **£45.95**
A430S15R 70cm 15 Elements, Power 50W, Gain 14.8dBi, Boom Length 224cm **£65.95**
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AMPRO-15 21MHz, Length 220cm, 38th fitting (slimline design) **£17.95**
AMPRO-17 18MHz, Length 220cm, 38th fitting (slimline design) **£17.95**
AMPRO-20 14MHz, Length 220cm, 38th fitting (slimline design) **£17.95**
AMPRO-30 10MHz, Length 220cm, 38th fitting (slimline design) **£17.95**
AMPRO-40 7.0MHz, Length 220cm, 38 h fitting (slimline design) **£17.95**
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ATOM-40S 7.0MHz, Length 165cm, PL259 fitting (compact design) ... **£26.95**
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SQBM1010P 6/2/70cm, Gain 1.5/2.0/5.0dBd, RX25-2000MHz, Length 140cm, SO239 fitting **£79.95**
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MR2 POWER ROD	2/70cm, Gain 3.5/6.5dBd, Length 50cm, PL259 fitting (fibreglass colinear)	**£24.95**
MR3 POWER ROD	2/70cm, Gain 2.0/3.5dBd, Length 50cm, PL259 fitting (fibreglass colinear)	**£29.95**
MRQ800	6/2/70cm Gain 3.0dBi/5.0/7.5dBdBd, Length 150cm, PL259 fitting (high quality)	**£39.95**
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SQBM200N	2/70cm, Gain 4.5/7.5dBd, RX 25-2000MHz, Length 155cm, N-Type	**£59.95**
SQBM500P	2/70cm, Gain 6.8/9.2dBd, RX 25-2000MHz, Length 250cm, SO239	**£64.95**
SQBM500N	2/70cm, Gain 6.8/9.2dBd, RX 25-2000MHz, Length 250cm, N-Type	**£69.95**
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SQBM1000P	6/2/70cm, Gain 3.0/6.2/8.4dBd, RX 25-2000MHz, Length 250cm, SO239	**£79.95**
SQBM1000N	6/2/70cm, Gain 3.0/6.2/8.4dBd, RX 25-2000MHz, Length 250cm, N-Type	**£84.95**
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CHAMELEON™ ANTENNA

The CHAMELEON V1 HF/VHF/UHF Multiband AntennaTM is a revolutionary antenna that stands at a mere 8.5 feet tall and contains a unique trap coil design. This antenna is ideally designed for mobile, portable or base station purposes were limited space is a concern.

Frequency Range: 80/60/40/30/20/17/15/12/11/10/6M + 2M/1.25M/70cm (144MHz - 500MHz) + USAF MARS/CAP (3.3MHz, 4.5MHz & 7.6MHz) **£279.95**

GP2500

All Band HF Vertical

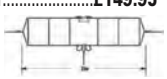
This is the perfect answer for anyone with limited space and requires no radials. Covering 80 through to 6M with a VSWR below 1.5:1!

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

All at an amazing £199.95!

NEW GP2500F fibreglass version now in stock **£249.95**

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



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

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

HUSTLER

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

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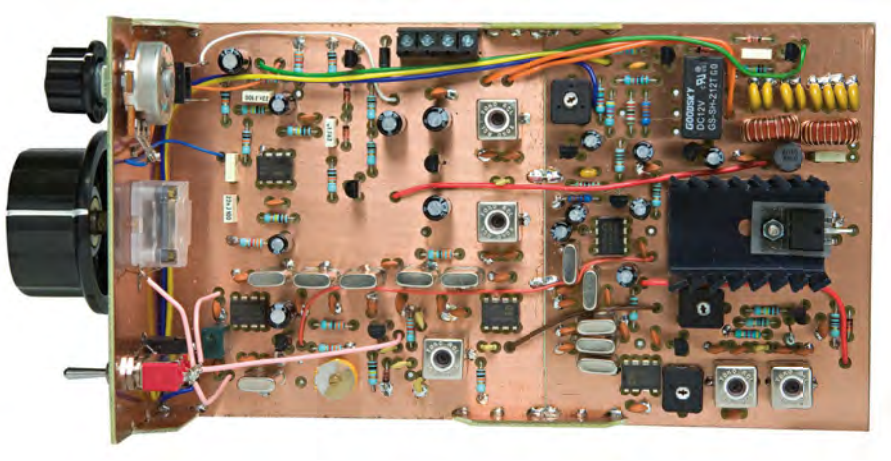
The Walford Electronics Parrett 3.5MHz SSB Transmitter

Keen constructor Phil Ciotti G3XBZ enjoyed assembling the *Parrett* 3.5MHz s.s.b. transmitter kit, companion to the Tone receiver.

In a recent edition of *PW* (the December 2010 issue) I built, and reviewed, the Walford Electronics *Tone* receiver for the 3.5MHz (80 metre) band. To compliment this Tim Walford G3PCJ has designed the *Parrett* single sideband (s.s.b.) transmitter.

The Parrett will produce 1.5W of radio frequency (r.f.) power using a 13.8V direct current (d.c.) power supply. It's a single conversion design using a 6MHz intermediate frequency (i.f.) and uses the oscillator signals from the Tone receiver. In use the Parrett transmitter is joined to the rear edge of the Tone receiver and can't be used as a 'stand alone' transmitter.



The completed *Parrett* transmitter attaches to the rear of its companion *Tone* receiver.

Kit & Bits

All the components required to complete the kit are supplied, so there are no extras to purchase.

The instructions are printed on double-sided A4 paper. They start with a technical description of the Parrett, continuing to construction and testing. Also included are helpful hints on getting the best performance from the transmitter.

The printed circuit board (p.c.b.) is of double-sided construction with a ground-plane on the component side. Countersunk holes allow the component leads to pass through the board without shorting to the ground plane. The p.c.b. measures 100mm wide by 80mm deep.

Two toroids in the transmitter output filter have to be wound and the enamelled wire for these is provided.

The Assembly Process

The assembly process follows the same methods to those of the Tone receiver (see December 2010 *PW*). The Walford Electronic 'open style' of construction is in evidence again with the Parrett kit. Only components with leads are used and sensitive items were contained in an anti-static bag.

As usual I cross-referenced the supplied components with the parts list and found all was as stated with no errors. Whilst waiting for the soldering iron to heat up, the instructions were read several times.

To aid assembly, a grid reference system is used to help locate component positioning. Some of the items require a soldered joint on the ground plane side of the p.c.b. and these are clearly identified – both in the instructions and also on the parts lay-out drawing.

Tim's suggested 'build a section, then test it, before moving to the next area method of construction' was followed during assembly. The Parrett p.c.b. was joined to the Tone receiver at an early stage assembling the kit – and the extra time I took to make sure both boards were level was time well spent!

A pre-drilled hole in the front panel of the receiver accepts a 3.5mm stereo socket, this being the microphone and push-to-talk (p.t.t.) inputs. To help get better access to wire the socket, I very carefully removed the range switch from the front panel. It's advisable to support the polyvaricon connection while this is being done to avoid any damage.

During the early testing stages I used a multimeter and a general coverage receiver. Component density is higher on the Parrett receiver p.c.b., so I took care to ensure that no damage occurred to fitted parts whilst soldering the next one in place.

Incidentally, I found that it was very interesting to hear the different stages, from the a.f. at the microphone amplifier stage, onwards to the production of double side band (d.s.b.) and eventually the final single side band (s.s.b.)

When fitting the power amplifier (p.a.) transistor I noted that the insulating washer didn't need any heatsink compound to be applied. So, no more sticky fingers! Before soldering the transistor leads I ensured that everything was well seated, with no strain on them. Note: Setting the bias current on this transistor needed careful adjustment.

I fitted the low pass filter components last and the inductors were wound on the toroids and soldered in place. Finally, two wire links from the antenna change over relay completed the construction phase of the project.

In House Testing

Before using the Parrett/Tone combination on my antenna system I tried some in house testing. A dummy load and combined power/s.w.r.

meter were connected to the rig, and I monitored the results on an 80m receiver.

Using a 13.8V d.c. power supply the transmitter gave the quoted 1.5W output. The r.f. output was also monitored using an oscilloscope and this showed a nice clean waveform.

During these initial trials I heard my voice coming from the headphones*, when the a.f. gain control was set at a high level, whilst transmitting. I then had a telephone conversation with Tim Walford G3PCJ, during which he explained the technical reason for this. Yes, it could be improved, but the increase in cost of extra component. I thanked Tim for his time and patience in answering the query and resumed the tests.

***Editorial note:** During a visit to Phil's home to see how he was getting on with the project after telephoning Tim, I then wore the same headphones and evaluated the situation for myself. Personally, I found it reassuring to hear my voice – with very reasonable quality reproduction – as the rig transmitted. I then listened to Phil's voice on the headphones as he transmitted and found the reproduction to be of good quality, ideal for monitoring. So, I regard the process as being a useful bonus!* ***Rob G3XFD**.*

On The Air Tests

After Rob G3XFD's visit, we arranged a sked to conduct a cross town trial. We used 144MHz as a talk-back facility in case of difficulty while we were using 3.5MHz. This was a wise decision because although we could hear each other, the signals were not that strong on our respective 80m dipoles – even when Rob raised his output power from 1.5W up to around 80W.

Trying again later in the day the same results were obtained on 3.5MHz. We've both noticed this effect in the past when trying similar experiments with other low power equipment. As a result we've come to the conclusion that there's an h.f. 'Black Hole' between our homes in Bournemouth!

The following day, I called 'CQ' and was rewarded with a reply from **Peter Edwards GW8ARR**, who gave his location as Knighton in mid-Wales. He gave me a report of RS5+5/6 with clear, rounded audio. Peter had heard of the Parrett and was interested to listen to one being used.

Derek Holmes GW3JSV, who was located in Welshpool further north than Peter, joined us, reporting that my signal was 5+8 with him and clear audio as well.

Peter Lonsdale G3PVX, in Ottery St. Mary near Exeter, Devon then called in to say I was 5+6, a good signal considering the low power. Finally, I worked **Graham Munden G3NIL**, who gave a report of 5+9 from his location near to me in Bournemouth. Shortly afterwards all these stations reported changes in frequency from my transmissions. So, not wishing to upset their QSO I thanked them for the reports they'd given me and went QRT.

The microphone I used during these tests was a Kenwood hand-held type with the usual 8-pin round connector fitted. I had made up a very short adaptor lead from this 8-pin connector to the 3.5mm stereo plug for the *Parrett* transmitter. Because the large connector ended up touching the front panel when the microphone was handled – this caused the change in frequency to occur. A longer patch lead quickly cured the problem and the drift ceased immediately.

All You Need!

The *Parrett* transmitter kit contains all you need to complete the project. The components used are of good quality and easily identified. The p.c.b. has good sized pads to solder on, and like the Tone p.c.b., has lacquer applied to protect the bright copper finish.

The instructions are clear and precise and, if followed correctly, will produce a working unit. Additionally, I think that for those constructors who want to delve into the technical aspect of s.s.b. generation, the *Parrett* provides a very helpful insight into how this is achieved. When the two kits, the *Tone* and *Parrett*, are joined together the result is a simple but effective transceiver.

I enjoyed building, and using the rig and it gave great satisfaction to achieve 100 mile-plus QSOs with 1.5W transmitter. Both kits provide value for money and they are a good introduction to home built equipment. **Note:** A 10W linear amplifier is available from [illegible] G3PCJ if you require more r.f. output power.

All the QSOs were achieved using my ZS6BKW antenna (an optimised version of the G5RV) mou[illegible]ted at eight metres hig[illegible] and I believe this repre[illegible]ents a typical Amateur [illegible]adio installation. I thoro[illegible]ighly enjoyed working on both kit[illegible] and my thanks go to Tim G3PCJ at [illegible]alford Electronics for providing the *Tone* /*Parrett* combination kits for review. **PW**

Tim Walford G3PCJ comments:

My decision to ignore the low level audio on transmit, which is not bad enough to cause any audio instability, saved adding another resistor value – minimising the number of different parts helps to keep the cost down! If anybody does find it annoying, it can be easily cured using the spare TR relay contacts. I am glad Phil enjoyed building these kits and the subsequent QSOs; they just show what can be done with low power and simple rigs under the right conditions! Tim G3PCJ

Pros

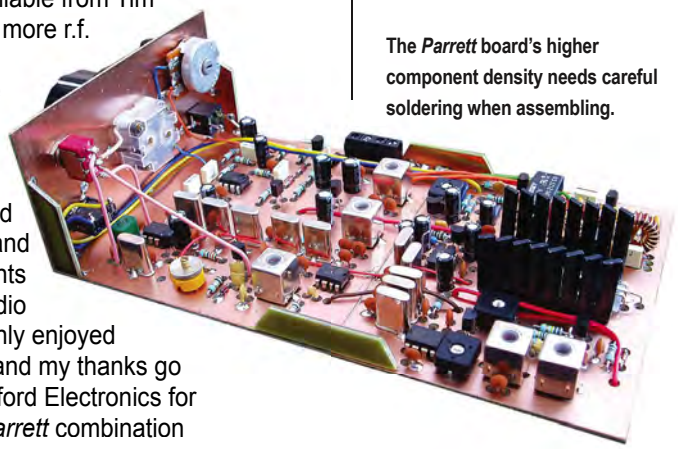
A well presented kit, precise instructions, good introduction to home built s.s.b. transmitters.

Cons

This is not a criticism – but do take extra care when soldering around the more compact areas of the *Parrett* p.c.b.

Kits & Bits

Because the *Parrett* uses the *Tone's* oscillators, you need both kits to transmit. Together they cost £75. If you have built a *Tone* receiver already, the *Parrett* costs £35. The optional 10W Linear is £24, with p&P at £3, and £3 extra if payment is by Paypal.
See The Walford Electronics website at **www.users.globalnet.co.uk/~walfor Walford Electronics**, **Upton Bridge Farm**, **Long Sutton**, **Langport**, **Somerset TA10 9NJ**. Tel: (**01458**) **241224**.



The *Parrett* board's higher component density needs careful soldering when assembling.

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HF TRANCEIVERS

FT-817 ND

HF + 6m + 2m + 70cms. Incl's battery/charger + antennas. Optional case £22. Extra spare battery £49.99

OUR PRICE **£479.99**

STAR BUY - FT-817ND + extra battery + case..... £535.99

FT-857D DSP

HF + 6m + 2m + 70cm.

OUR PRICE **£629.99**

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Includes DSP

OUR PRICE **£719.99**

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HF + 6m/IF DSP

FT-450 only £599.99
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FT-450AT £689.99
FT-450AT + MS-1228 ... £739.99

FT-950

HF + 6m IF DSP

OUR PRICE **£1219.99**

OR WITH NISSEI PS-300 **£1309.99**

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FT-2000 (100W HF + 6m)..... £2150.99
FT-2000 + matching speaker.. £2249.99

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FT-2000D (200W)..... £2659.99
FT-2000D + SP-2000..... £2759.99

YAESU FP-1030

Superb, high quality Yaesu. 30 amp PSU with variable voltage & multiple outlets. Fully metered & protected professional power supply.

£149.99

SP-2000

External speaker + audio filters. features a large 4.7"/120mm speaker along with a 3-selection hi-cut and 2 section low cut. Dual switched input + headphone socket.

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MD-200

Broadcast quality dynamic mic. It sounds & looks superb. Fits 8-pin round & 8-pin modular radios. (Optional 6-pin modular adapter £19.99)

XMAS SPECIAL **£219.99**

Yaesu MD-100A8X..... £119.99

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HF + 6m + 2m + 70cm. Superb IF DSP. Colour display.

£1049.00

or IC-7000 + MS-1228 £1089.00

IC-9100 new HF to 23cm... £phone

TS-2000E

HF + 6m + 2m + 70cm. Not only is this Kenwood's top machine with IF DSP, it also uses cutting-edge technology in a streamlined package.

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FT-5000DX (above + monitor). £4749.99
FT-5000DX (above + filters) ... £5149.99

PSUs

NISSEI PS-300

Features: ★ Over voltage protection ★ Short circuit current limited ★ Twin illuminated meters ★ Variable voltage (3-15V) latches 13.8V ★ Additional "push clip" DC power sockets at rear. Dim'ns: 256(W) x 135(H) x 280(D)mm. A truly professionally made unit built to outlast most PSUs.

30 AMP/12 VOLT PSU

TRUE 'LINEAR' PSU

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28A at 13.8V yet under 2kgs. (H 57mm, W 174mm, D 200mm approx). Fully voltage protected. Cigar socket & extra sockets at front/rear. Ultra slim.

NISSEI HAVE BECOME RENOWNED FOR PUTTING QUALITY FIRST, YET MAINTAINING A GOOD PRICING STRUCTURE. A TRULY SUPERB POWER SUPPLY UNIT

'Smallest version to date' now with cigar socket.

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Includes built-in extention speaker

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"Linear power supply". 30A @ 13.8V. 1-15V variable. Diamond quality PSU

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Power-Mite NF 22amp..... £69.95
Power max (25A) £89.95
Power max (45) £115.00
Power max (65) £225.00
W-10AM 25A (linear)..... £59.95
W-25AM £89.99

ANTENNAS

DIAMOND V-2000

6m + 2m + 70cm. 2 section (2.5m long) PL-259 fitting.

Superb quality

£124.99

INTRUDER II

11 band (80-10 6/2/70cm). PL-259 fitting. Colapses to 95cm (~ 3 ft).

£37.99
(2 for £70.00)

NEW INTRUDER III

13 band (80-10/6/2). PL-259 fitting. Includes WARC bands. 13 band version of Intruder II.

£49.99
(2 for £95.00)

ATAS-120A

Military spec mobile antenna – superbly made. Covers HF + 6m + 2m + 70cm. *Fully automatic. (*certain Yaesu radios).

OUR PRICE **£269.99**

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A superb (diamond quality) 6 band trap vertical antenna with trap radials – "rotary" trap system allows "flat wall" mounting. 80m/40m/20m/15m/10m/6m. 200W SSB, HT 4.6m (15ft tall).

SEND SAE FOR DATA SHEET

XMAS SPECIAL **£279.99**

VHF/UHF TX

YAESU VX-8E

6m/2m/70cm. "APRS" with Rx:- 0.5-1GHz. Incl's battery & chgr.

FREE EXTRA BATTERY THIS MONTH

XMAS SPECIAL **£299.99**

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6m/2m70cm + wide RX. An amazing 6W water proof hand-held. Case £19.99. Spk mic £32.99. Cigar lead £24.99. BNC adapter £6.00.

Silver **£259.99**

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2m FM handie (keypad). Incl's batt/charger. **£99.99**

YAESU FT-2900 R/E

Latest 2m FM (75W) mobile. Built like a tank. Incl's DTMF mic

£135.00

YAESU FT-7900 R/E

Latest commercial built 2m/70cm mobile + wide Rx. (Incl's DTMF mic)

£229.99

YAESU FT-7800E

2m/70cm + wide Rx. (50W/35W) includes DT, MF, mic.

BRAND NEW. LAST ONE

In-car kit £30.00. Extra DC lead £15.00

£219.99

YAESU FT-8900 R

10m + 6m + 2m + 70cm. (up to 50W).

+ FREE 6m/2m/70cm mobile antenna

Includes DTMF mic + wideband receive

£359.99

ACCS

MFJ-259B ANALYSER

1.8-170MHz

£259.99

Case 259B £29.99

MFJ-269B ANALYSER

1.8-170MHz + 70cm

£339.99

Dip Coils 259/269£29.99 Case 269B £29.99

MFJ-269 pro version £369.99
MFJ-260C 300W dummy load £49.99
MFJ-264 1.5kW dummy load..... £79.99
MFJ-969 Rollercoaster ATU (300W) £199.99
MFJ-962D 1.5kW (metered) antenna tuner..... our price £269.99
MFJ-994B (600W) intelli tuner £319.99

MFJ-993B INTELLITUNER

Fully automatic (1.8-30MHz). 300W SSB.

Easy to use ATU. SALE PRICE **£239.99**

MFJ-949E

SALE PRICE **£174.99**

● 1.8-30MHz 300W ATU ● Large cross needle meter ● 30/300W PEP power meter ● VSWR ● 3-way antenna selector ● Internal balun + dummy load.

SGC BARGAINS

SGC MAC-200 New auto tuner 1.8-54MHz (200W) wire, vertical, dipole. You name it. (5 selectable outputs).

£289.99

SGC-239 Mini tower ATU (1.8-30MHz) £199.99
SGC-237 HF+6m Tuner..... £309.99
SGC-230 (HF-200W) ATU..... £449.99
SGC-Smart lock (specify model)..... £69.99

GIZMOS

ALINCO DJ-596E

2m + 70cm Handie. Includes nickle metal N.M.H.I and charger.

Includes free speaker mic

ONLY **£99.99**

KENWOOD TH-F7E

2m/70cm Tx. Rx: 0.1-1000MHz (AM/WFM/FM/SSB). Incl's battery pack (Lion) + charger.

Includes free speaker mic

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D-308B DELUXE DESK MIC

(with up/down). Many amateurs (over 4000) have been pleased with it's performance. Includes 8-pin round Yaesu mic lead. Icom/Kenwood & other leads available. Phone (£19.99 each). Replacement foam windshield £3.00 + P&P.

Back in stock – 8-pin modular 8-pin round Yaesu adapter £19.99

£79.99

WINRADIO EXCALIBUR

9kHZ-50MHz (all mode) receiver with spectrum analyser. Most manufacurers try to follow standards - WINRADIO sets them! WR-G3100C pack includes:- receiver + software + PSU + USB cable + BNC adapter. Requires PC.

ALL THIS FOR **£649.99**

ETON SATELLIT 750

0.1-30MHz SSB/AM 88-108MHz (FM stereo) 118-137MHz airband/rotary antenna. 1000 mems/rotary tuning/ wide-narrow filters & more.

+ FREE HD-1010 headphones

£299.99

BUTTERNUT VERTICALS

HF-2V (80/40m).....£279.99
HF-6V (80/40/30/20/15/10m).....£375.00
HF-9V (as HF-6V + 17/12 & 6m).....£425.00

TONNA YAGIS

22089 9ele 2m.....£79.99
220811 11ele 2m.....£109.99
220817 17 ele 2m.....£139.95
220818 9ele 2m XD.....£129.95
220921 21ele 70cm.....£109.00
2208938 9ele 70cm XD.....£135.99

NEW NOISE FILTER!

A superb TDK 'snap fix' ferrite clamp for use in Radio/TV/ Mains/PC/Phone etc. *Simply close shut over cables and notice the difference!* Will fit cables up to 13mm diameter. Ideal on power supply leads/mic leads/audio leads/phone leads.

2 for £13.99 or 5 for £32.99 (P&P £4.00)

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RS-402 125-525MHz (200W) ..... £49.95 P&P £6.50
TM-3000 1.8-60MHz (3kW) Incls mod meter ..... £69.95 P&P £6.50
RS-40 144/430MHz Pocket PWR/SWR..... £34.99 P&P £5
DL-30 diamond dummy load (100W max) ..... £29.99 P&P £5

HEAVY DUTY SWAGED MAST SET

New extra heavy duty 2" mast set. 4 sections x 5½ foot slot together.

£79.99 each. TWO FOR £135.99 DEL £15.00

NEW SWAGED MAST SETS

20 foot mast. 1½" – 4 x 5 foot sections. (Swaged) **£49.99**

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18 foot (1½" dia).
18 foot – 6 x 3 foot (1½") slot together ally sections.

£44.99 each. TWO FOR £79.99 DEL £13.00

NEW CAR BOOT MAST SET

Superb 18 foot (6 x 3 foot sections) that slot together.
Dia: 1¼" ideal to take anywhere. **£43.99**

2 for £74.99 del £13.00

HANGING PULLEY

Heavy duty die-cast hanging pulley. Hook and go!

£24.99

MAST HEAD PULLEY

A simple to fit but very handy mast pulley with rope guides to avoid tangling.
(Fits up to 2" mast) **£12.99** + P&P £4.50
30m pack (4.4mm) nylon guy rope £15.00
132m roll 4.4m nylon guy (480Kg b/f) ..... £45.00 Del £7.50

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Pulley will hang freely and take most rope up to 6mm. (Wall bracket not supplied).

£12.99 + P&P £4.50

Wall bracket, screws not supplied. Simply screw to outside wall and hang pulley on WALL BRACKET £2.99 P&P £1.00

30m pack (4.4mm) nylon guy (480kg).....£15.00
132m (4.4mm) nylon guy (480Kg) £45.00

BARGAIN WINCH

500kg brake winch. BARGAIN PRICE **£89.99** Del £10.00
(Now includes cable grip)
Winch wall bracket..... £22.99

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Connectors	Length	Price (£4.50 P&P)
PL-259 - PL-259	0.6m	£11.99
PL-259 - PL-259	1m	£14.99
PL-259 - PL-259	4m	£19.99
PL-259 - PL-259	20m	£49.99
BNC - BNC	1m	£12.99

MT-3302

Heavy duty universal mount.
Includes 5m cable **£29.99**

MT-6601

Adjustable roof rack/window bar mount

£19.99

LIMITED STOCK

10m PNEUMATIC MAST

We have a small quantity of "military spec" pump-up masts (part of a Government order). All brand new in a crate and supplied with cover (close HT ≈ 6 foot). Anodised green finish.
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(Can be hand operated or by compressor/foot pump)

10m MAST, ONLY **£1089.99**

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CW-160S	(160-10m) 40m long.....	£149.95 P&P £10.00
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CW-80S	(80-10m) 20m long.....	£149.99 P&P £10.00
CW-40	(40-10m) 20m long.....	£119.99 P&P £10.00
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CUSHCRAFT BARGAINS *Delivery £15.00*

MA5B	Mini beam 10, 12, 15, 17, 20m.....	WOW £469.99
A4S	4 ele beam (10 - 20m).....	£649.99
A3S	3 ele beam (10-20m).....	WOW £549.99
R-8E	Vertical (40 - 6m) "special".....	SPECIAL £499.99

Q-TEK PENETRATOR

"We've sold 100s all over Europe"

★ 1.8 - 60MHz HF vertical ★ 15 foot high ★ No ATU or ground radials required ★ (200W PEP).

SEND SAE FOR LEAFLET **£215.99**

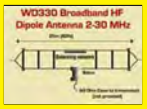
NEW Wire Penetrator 50ft long (1.8-70MHz).....£189.99

W-8010 DIAMOND SHORTENED DIPOLE

80-10m & only 19.2m long! (Up to 1.2kW) Includes 1:1 Balun. Bargain. Superb Japanese quality antenna system.

£169.99

NEW DIAMOND WD-330



Amazing performance. Twin folded dipole. 2-30MHz – and it really works. No ATU required (25mts long). Supplied with 30 mtr PL-259 feeder – ready to go. If you want great transmission, look no where else. Japanees quality made product WOW **£199.99**

Q-TEK INDUCTORS

80mtr inductors + wire to convert ½ size G5RV into full size. (Adds 8ft either end).....£34.99 P&P £4.00 (a pair)

TRAPS BACK IN STOCK

BALUNS & TRAPS (1kW)

Baluns 1:1 or 4:1 or 6:1 .....£39.99 each P&P £4
Traps 80m or 40m or 20m or 15m.....£39.99 pair P&P £5

DOUBLE THICK FERRITE RINGS

A superb quaility ferrite ring with incredible properties. Ideal for "R.F.I". Width 12mm/ OD35mm. 6 for £12.00 P&P £4.00
12 for £20.00 P&P £5.00
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COAX SWITCHES (P&P £6.00)

2 way CX-201 (0-1GHz) SO239.....£19.95
2 way CX-201 'N' (0-1GHz) 'N' £24.95
4 way CX-401 (0-500MHz) SO239.....£79.95
4 way CX-401 'N' (0-500MHz) 'N' £89.95

WATSON COAX SWITCHES

(POST £4.00)

CX-SW4N DC-1.5GHz (5xN).....£59.99
CX-SW4PL DC-800MHz (5 x SO-239).£56.95
CX-SW3N DC-1.5GHz (4 x N) £49.95
CX-SW3PL DC-800MHz (4 x SO-239).£41.95
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CX-SW2PL DC-1GHz (3 x SO-239) £26.95

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DC-1 Standard 6-pin/20A fits most HF .....£22.00 P&P £3
DC-2 Standard 2-pin/15A fits most VHF/UHF .... £10.00 P&P £3
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YAESU REPLACEMENT MICS

MH-IC8 8 pin Yaesu mic (8-pin round) .....£44.99 P&P £5
MH-4 4 pin fits older HF, etc. (4-pin round) .....£39.99 P&P £5
MH-31A8J 8 pin modular .....£39.99 P&P £5

COAX BARGAINS

True military spec real UK coax

RG-58 Military spec x 100m.
£49.99 or 2 for £90.00
Coax stripping tool (for RG-58).....£4.99
RG-213 Military spec x 100m (10mm dia).
£129.99/100m or 2 for £229.99

Q-TEK TRI-MAGMOUNT

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

YAESU G-450C

Heavy duty rotator for HF beams, etc. Supplied with circular display control box

WOW **£309.99** or £349.99 with 25m cable/plugs

G-650C extra heavy duty rotator. £355 or £399.99 with cable
G-1000DXC extra heavy duty rotator. £425 or £479.99 with cable
G-2800DXC The goliath of rotators £845.99
GS-065 thrust bearing £54.99
GC-038 lower mast clamps £32.99

AR300XL

Quality rotator for VHF/UHF. Superb for most VHF-UHF yagis, 3 core cable required. 3 core cable £1 per mtr.

OUR PRICE **£81.99**

AE-201 thrust bearing.....£29.99

DIAMOND YAGIS

No tuning required

2m/10 element No tuning required SO-239 feed..... £79.99
70cms/10 element No tuning required SO-239 feed..... £49.99
6m/2 element No tuning required SO-239 feed..... £84.99

Q-TEK COLLINEARS (VHF/UHF)

Del £12.50

X-30 GF 144/70, 3/6dB (1.1m)..... £44.99
X-50 GF 144/70, 4.5/7.2dB (1.7m)..... £59.99
X-300 GF 144/70,6.5/9dB (3m)..... £79.99
X-510H GF 144/70, 8.5/11dB (5.4m) £139.99
X-627 GF 50/144/70, 2.15/6.2/8.4dBi (2.4m)....£89.99

DUPLEXERS & TRIPLEXERS

MX-2000 50/144/430MHz Triplexer £69.99
TSA-6011 144/430/1200MHz Triplexer.....£64.99
MX-72 144/430MHz.....£34.99
MX-72 "N" 144/430.....£35.99
MX-62M (1.8-56MHz + 76-470MHz) £64.99

MOBILE ANTENNAS

Del £10.00

DB-7900 2m/70cm (5.5/7.2dB) 1.6m (PL-259).....£39.99
DB-770M 2m/70cm (3.5/5.5dB) 1m (PL-259).....£24.99
Diamond HV-7CX 7/14/21/28/50/144/430.....£129.99
Diamond CR-8900 10/6/2m/70cm (1.26m) £99.99
Diamond AZ-506 2m/70cm – only 0.67m long.....£39.99
PL-62M 6m/2m (1.4m) PL-259 .....£23.99
PL-627 6m/2m/70cm (1.7m) PL-259.....£44.99

RH-9000 BNC

40cm flexible whip for the ultimate in gain. **£29.99** P&P £5.00
Tx:- 2m + 70cm (Rx:- 25MHz-2.9GHz).

RH-9090 SMA

40cm flexible whip that is ideal as replacement. Tx:- 2m + 70cm.
Rx:- 25MHz-2.9GHz **£34.99** P&P £5.00

EP-300

Over the ear earpiece.
£9.95
P&P £4.00

DB-770H (BNC)

2m/70cm Tx + wide Rx. High gain up to 5.5dB.

£54.99
P&P £5.00

STATION A4 LOG BOOK OFFER

3 FOR £10.00
P&P £4.50

EARPIECE/BOOM MIC

Over ear earpiece + boom mic. Available in Kenwood version or Yaesu/Alinco/Icom.

£24.99 P&P £4.00

ALUMINIUM POLES

20 foot (collection only) 2".....£69.99
10 foot (collection only) 2".....£34.99
2.4m (2") Ally pole.....£32.99
2.4m x 2" poles (4 off).....£100.00
5 foot x 2" pole.....£17.99
6 foot 1.25" heavy duty pole.....£10.99

COPPER ANTENNA WIRE ETC

Hard drawn (50m roll).....£40.00 P&P £7.50
New: 50m roll, stranded antenna wire.....£19.99 P&P £7.50
Flexweave (H/duty 50 mtrs) .....£44.99 P&P £7.50
Flexweave H/duty (18 mtrs) .....£21.99 P&P £7.50
Flexweave (PVC coated 18 mtrs) .....£24.99 P&P £7.50
Flexweave (PVC coated 50 mtrs) .....£59.99 P&P £7.50
Special 200mtr roll PVC coated flexweave.....£180.00 P&P £10.00
Copper plated earth rod (4ft) .....£14.99 P&P £8.00
Copper plated earth rod (4ft) + earth wire.....£24.99 P&P £8.00
New RF grounding wire (10m pack) PVC coated.....£14.99 P&P £5

METALWORK & BITS (Del Phone)

2" mast-floor base plate.....£14.99
6" stand off brackets (no U-bolts)..... £8.99
9" stand off brackets (no U-bolts)..... £10.99
12" T & K brackets (pair) £18.99
18" T & K brackets (pair) £22.99
24" T & K brackets (pair) £26.99
U-bolts (1.5" or 2") each £1.50

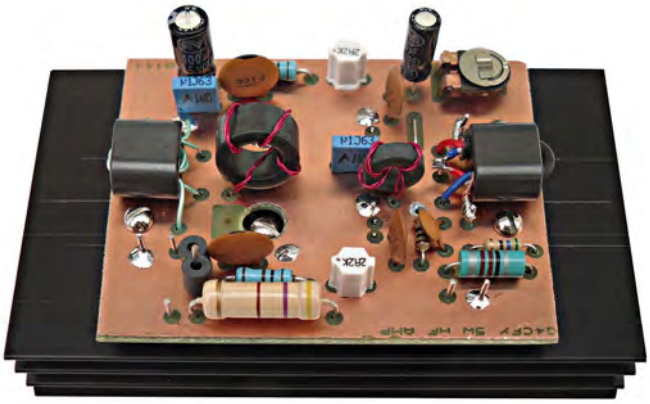
All bracket measurements are from wall to end of bracket

8mm screw bolt wall fixings £1.70
8-nut universal clamp (2" to 2").....£7.99
2" extra long U-bolt/clamp £6.99
2" crossover plate with U-bolts £14.99
15" long (2") sleeve joiner (1.5" also available) £18.99
3-way guy ring £5.99
4-way guy ring £6.99
Heavy duty guy kit (wire clamp, etc.) £49.99
Set of 3 heavy duty fixing spikes (~0.7m long).....£29.99
30m pack (4.4m) 480kg B/F nylon guy £15.00
Roll of self-amalgamating tape 25mm x 10mtr.....£8.99
Special offer:- Self-amalgamating 3 rolls..... £20.00

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

A 5W Wide-band Amplifier

In this session of *Doing it By Design*, Tony Nailer G4CFY continues his 5W wide-band h.f. amplifier design.



In *Doing it by Design* in the November issue *PW* I evaluated a number of different toroidal cores and dual aperture cores. I found that the optimum types were the dual aperture 'pig nosed' cores, which gave a really flat response from 1-40MHz.

In addition to the transformers described in the last article, I made up one using a short length of two-core cable with overall screen, formed into a U-shape and fitted to a dual aperture core. The screen was separated each side and used for the secondary winding.

The two inner leads were connected in series for the primary winding. So, the overall turns ratio was 2:1, giving an impedance ratio 4:1. It gave better high frequency performance than the version with one trifilar-wound turn, connected to give the same ratios.

Perhaps, at this point, I need to explain that two wires tightly twisted together are referred to as a bifilar wire, three wires as trifilar. If you ever need four wires it would be quadfilar.

Winding transformers, with regular toroids produce significant roll-off when wound with a four or more turns of bifilar wires. Conversely, when the turns are reduced the low frequency performance suffers. I concluded that such transformers would be suitable to provide relatively high inductance baluns for direct current (d.c.) feed to the base and collectors of the push-pull amplifier.

Initial Design

After my initial skeletal design shown in the November issue, the circuit of the proposed 5W broadband amplifier is reproduced here, in **Fig. 1**. Note that I haven't included the de-coupling capacitors required for the base bias point, as in the previous diagram. All the transformers are different from each other and not as listed in Fig. 11 of the first part article in the November issue.

In the first part, input transformer, T1, was a single turn of trifilar wire on a dual aperture core type 2843-000-302. One winding was separated, the other two were series connected. Also transformer, T2 was four turns of bifilar wire on a T37-43 core with the windings connected in series.

Again in part one, T3 was four turns of bifilar wire on a T50-43 core with the windings series connected. Transformer T4 was two turns bifilar wire on a dual aperture core type 2843-000-302. The windings are used conventionally with one as primary and the other as secondary.

Development Model

The amplifier based on the diagram, Fig. 1, was built directly onto a piece of printed circuit board (p.c.b.) with many of the joints in mid-air. Commonly referred to as 'dead bug style' this is ideal for prototyping radio frequency (r.f.) circuits as it provides the maximum amount of earth.

The transistors were bolted onto the p.c.b with the addition of mica washers and plastic insulators. I then fitted 4BA solder tags under the plastic insulating ferrules on each transistor to pick up the collector connection. No additional heat-sink was used, which (with hindsight) was a bit silly! A picture of the original model is shown in **Fig. 2.**

A multi-meter (on 100mA range) was connected in series with the collector supply feed and the bias adjusted to 50mA

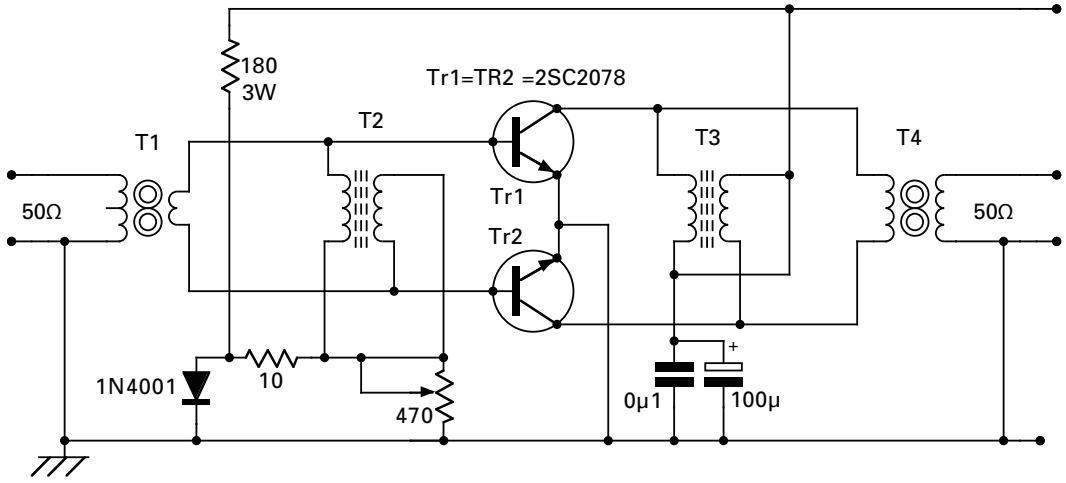


Fig. 1: The original (skeletal) 5W amplifier that Tony proposed in the November 2010 issue of *PW*.

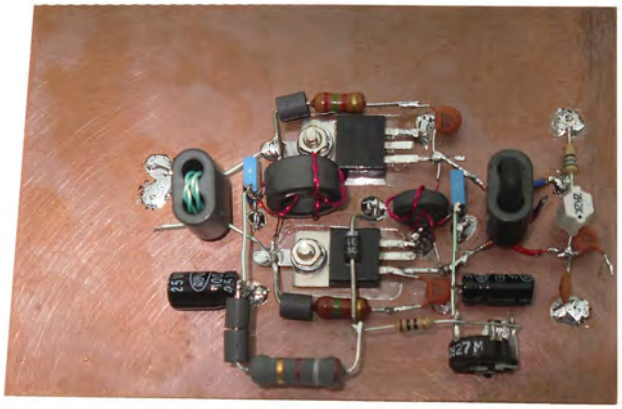


Fig. 2: The first breadboard attempt, not pretty perhaps, but it shows the idea is sound.

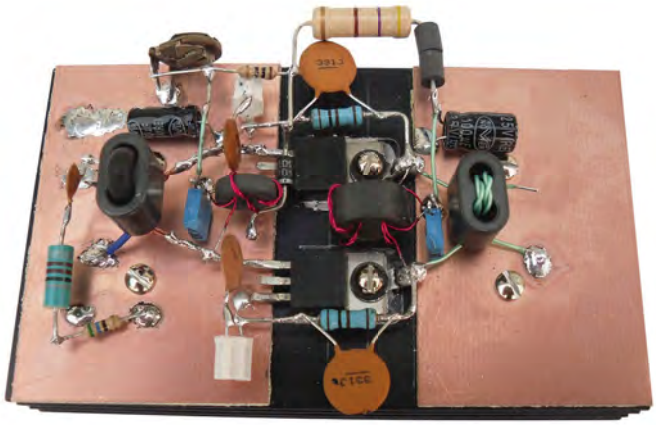


Fig. 3: After 'blowing-up' one transistor, Tony assembled the second version on a heat-sink.

total. The meter was then removed and the feed reconnected. Not having a suitable wide-band low power transmitter available I noticed (fortunately) that my Hewlett Packard HP8640 Signal generator was capable of producing 125mW across the required range.

To measure the signal I searched my box of Bird 43 Thruline elements until I found a suitable one and plugged it into the sampling socket of the meter. A good low s.w.r. dummy load was then connected to the power meter and cables were connected from amplifier to meter and to the signal generator.

Power Gain Tests

Next, I connected the amplifier to the 13.5V d.c supply and a signal on 28.4MHz applied and increased until 3W output was achieved. The required input was 2V r.m.s. and I assumed the input impedance to be 50Ω. The input power is: P = V*V/R, so P = 2*2/50 = 0.08W or 80mW. This represents a power gain of 37.5 at 28.4MHz. So far so good!

The test was then repeated on 14.2MHz and this time, only 1.2V r.m.s. input was required for 3W output. This represented a power gain of 104, which is not unexpected, but is far too high. The test was repeated at 7.1MHz and the input level was then just 1.06V r.m.s. giving a power gain of 133, again too high. However, when I ran a test at 3.55MHz – there was only a very low reading on the output power meter and the transistors became really hot!

Simple Feedback

To try and 'tame' the variation in gain, I used some simple feedback. I added a 150Ω 500mW resistor in series with a 10nF ceramic capacitor from the collector to base of each transistor. This was not something I'd worked out, but was 'cribbed' from another design. The feedback network worked really quite well and made the gains much more comparable; becoming 28x on 28MHz, 42x on 14MHz and 38x on 7MHz.

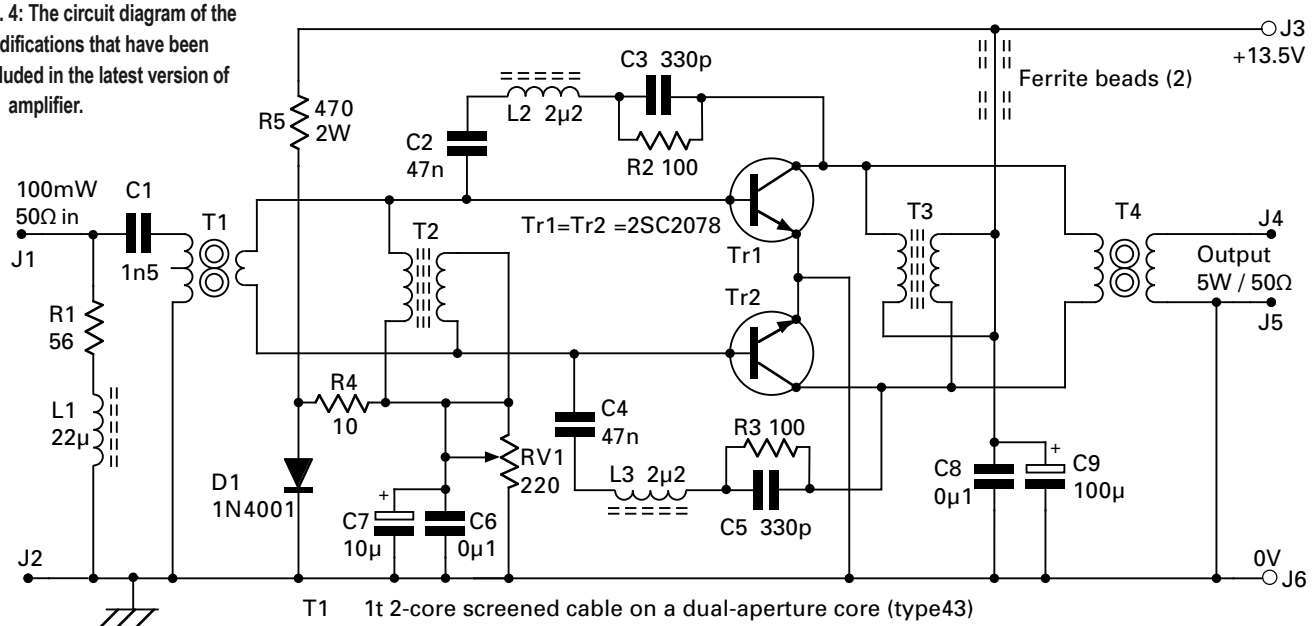
But there was still no useful power output on 3.55MHz or below but only interference to broadcast radio and the transistors getting very hot. Four further tests were undertaken using variations of turns on each of the four cores. During one of these tests one of the power transistors 'gave up the ghost', going low resistance.

Amplifier Rebuild

It was time for an amplifier rebuild! I carefully unsoldered the circuit from the p.c.b. but otherwise kept it intact. A used suitable heat-sink was found and measurements were made. Two pieces of p.c.b. were cut and drilled with matching holes in the heat-sink for screw fixings and two holes for the transistor fixings.

The two p.c.bs were fixed to the heatsink using 6BA screws and with 'crinkle' washers to ensure good electrical connections. The transistors were separated from the original amplifier and fixed to the heatsink by 6BA screws, nuts, washers – and also by using mica washers and plastic insulators.

Fig. 4: The circuit diagram of the modifications that have been included in the latest version of the amplifier.



T1 1t 2-core screened cable on a dual-aperture core (type43)
T2 4t bifiliar (29s.w.g.) enamelled wire on an FT37-43 core
T3 4t bifiliar (29s.w.g.) enamelled wire on an FT50-43 core
T4 2t bifiliar (25s.w.g.) enamelled wire on a dual-aperture core (type43)

I then put the rest of the circuit was put into place and remade the connections to the transistors and all earths to the p.c.b.s. Finally, I made a careful visual inspection to ensure the circuit was good again with everything connected that should be – and there were no unwanted shorts. A picture of the second model is shown in **Fig. 3**.

The cables were reconnected and the previous test was repeated. There was no real change in performance but the transistors stayed cool. But there was still no significant power output below 7MHz.

Solving The Problem

I set about solving the problem of no output at 3.5MHz and below. I connected a cable to my Spectrum Analyser and wound the probe ends around the coaxial cable between power meter and dummy load. Testing the unit on 28,14, and 7MHz revealed, as expected, a fundamental and a number of harmonics at reduced levels.

When tested the amplifier on 3.55MHz, there was also a large fundamental and a whole forest of other products. So there was output after all and it just wasn't showing on the Bird 43 power meter. Fortunately, inspection of the plug-in sensing element, showed the problem. It was rated at 5W in the range 25-60MHz. So maybe only the 28MHz reading had been accurate.

I disconnected the Bird Thruline and connected my old ex-Government 'Wattmeter Absorption No2 CT211. This unit had been rebuilt by me years ago, replacing the paper coupling capacitors with large disc ceramics. The sockets had been replaced with SO239s and a sniffer output, added using a BNC socket.

The huge cylindrical carbon load resistors had been adjusted so they were as close as possible to 50Ω. Finally I had calibrated it against a Bird Thruline with a variety of elements and made measurements using the p-p envelope on the oscilloscope to prove the power readings were correct. It has two ranges 0-1W and 0-25W and is within 5% accuracy to 200MHz.

New tests were undertaken on the amplifier and the sniffer output taken to the oscilloscope. The sinewave p-p level was the same on both 1.775 and 28.4MHz when the meter reading showed 3W from the amplifier.

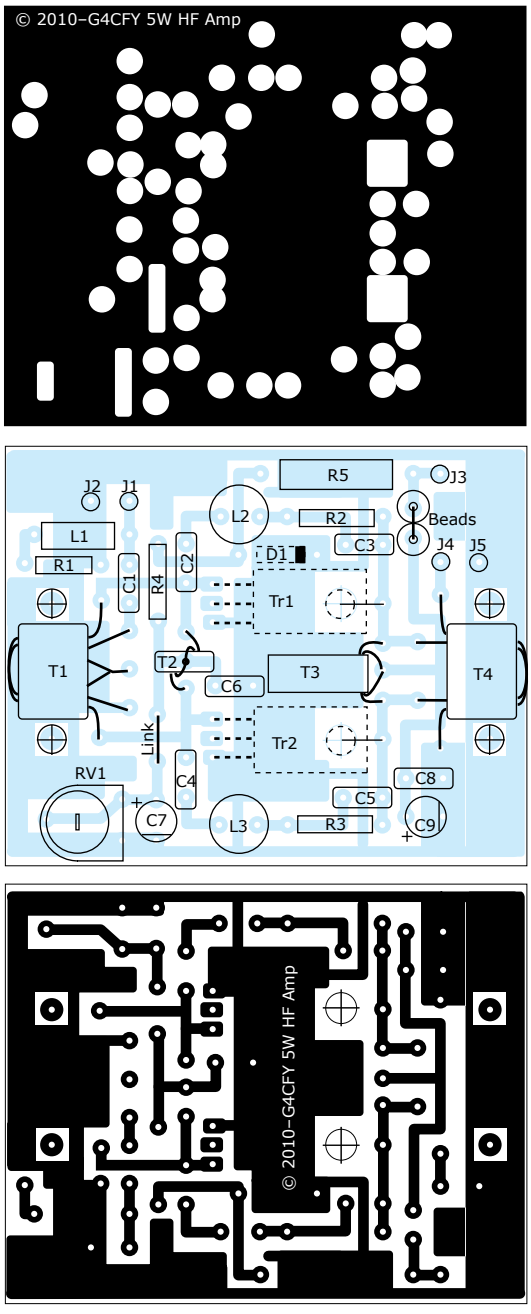


Fig. 5: The p.c.b. track and earth-plane patterns, with component locations on the overlay of the 5W wide-band h.f. amplifier. The two transistors and the diode are mounted from the track pattern side of the p.c.b.

Wide-Band Tests

Tests were undertaken on 1.775, 3.55, 7.1, 14.2 and 28.4MHz. The drive required on 1.775MHz was tiny compared with that on 28MHz. Gain on 1.775MHz was 150, while on 28.4MHz it was 31.

I devised an input network, which included a capacitor from the cable to the amplifier input with a reactance value of 50Ω at 1.8MHz. Then from the input end of the capacitor a 56Ω resistor in series with an inductor with a reactance value of 50Ω at 1.8MHz, to ground.

At the same time I changed the feedback collector-to-base network to a series arrangement of a 100Ω resistor a 2.2µH choke and a 47nF ceramic capacitor. This was intended to look mainly 100Ω resistive at 1.8MHz but 100Ω resistive and 390Ω reactive at 28MHz. This would now apply light feedback at the high frequencies and heavy feedback at low frequencies.

Further Tests

In the further tests, the result was a power gain of 62.5 at 1.775MHz rising to 174 at 7.1MHz and falling back to 41.6 at 28.4MHz. I changed the 2.2µH choke at the input to 22µH and now tried the circuit at 5W output across the range. The results are shown in **Table 1**.

I reasoned that if I could series resonate the 2.2µH choke in the feedback network at around 7.1MHz I could focus the feedback at that frequency and reduce the gain closer to that at other frequencies. I wired 220pF ceramics across the 100Ω resistors and re-ran the tests.

With the parallel network, the highest gain turned out to be 51.9 at 3.55MHz and the lowest at 28.4MHz, being 27.2 times. So, I increased the value of the resonating capacitors to 270pF and re-ran the test. It was better still so I tried 470pF but that had gone to far, and I then tried 390pF and then 330pF! This value gave the best results, which are shown in **Table 2**:

This performance was really good as the second harmonics are in excess of 25dB below the carrier and the third harmonics though not nearly as good are easily attenuated with low-pass filters.

The gain of the new design is flat to within 1.6dB from 1.775MHz to 28.4. The addition of a resistive T-attenuator consisting of two 10Ω resistors in series and a 120Ω shunt from their junction to ground, at the input will make the amplifier meet the original requirement of 250mW input for 5W output.

Table 1

F(MHz)	V in	2F(dB)	3F(dB)	Gain
1.775	2.00	-39	-24	62.5
3.55	1.25	-39	-20	160
7.1	1.20	-41	-19	174
14.2	2.30	-37	-13	47.3
28.4	2.45	-36	-21	41.6

Table 2

F(MHz)	V in	mW in	2F(dB)	3F(dB)	Gain	G(dB)
1.775	2.3	106	-40	-30	47.2	16.7
3.55	2.0	80	-25	-18	62.5	18.0
7.1	2.0	80	-40	-16	62.5	18.0
14.2	2.15	92	-37	-12	54.1	17.3
28.4	2.34	110	-37	-20	45.7	16.6

Table 3

F(MHz)	V in	mW	2F(dB)	3FdB)	Gain	G(dB)
1.775	2.23	99	-38	-28	50.3	17
3.55	1.65	54	-34	-17	91.8	19.6
7.1	1.95	76	-40	-17	65.7	18.2
10.0	1.35	36	-41	-19	137.2	21.4
14.2	1.63	53	-34	-12	94.1	19.7
18.1	1.38	38	-39	-15	131.3	21.2
21.225	1.43	41	-47	-17	81.6	20.9
24.9	1.75	61	-44	-21	122.3	19.1
28.4	2.13	91	-40	-22	55.1	17.4
29.7	2.25	101	-39	-22	49.4	16.9

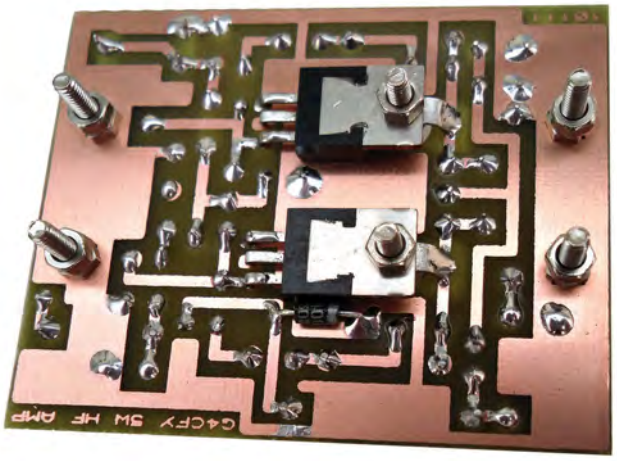


Fig. 6: Here's how to mount the transistors, and the diode on the underside of the board.

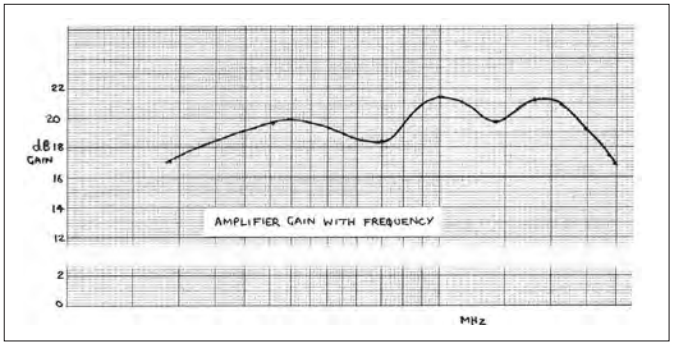


Fig. 7: A graph of the amplifier gain (in dB), using 10 test frequencies within the complete Amateur h.f. band.

Base Bias Supply

The base bias supply adjustment was a bit 'sharp' and the position of the trimpot at the correct setting was only a quarter rotation. The feed resistor from the positive supply rail to the bias diode was 180Ω 3W, which makes the diode current about 70mA. I reasoned this was too much and maybe I was unnecessarily 'stretching' the diode.

I then changed the feed resistor for a 470Ω 2W type, which now passes some 27mA through the diode. Also, I changed the bias trimpot from 470Ω to 220Ω. The unit was switched back on and the bias reset at 50mA. Adjustment was much easier and the trimpot was about mid position.

Completed Development

The circuit diagram of the developed amplifier was drawn up on the computer and is shown in **Fig. 4**. I then created a netlist and transferred it to a p.c.b drawing program, which produced the component placement, top side ground-plane, and the track underside as shown in **Fig. 5**.

Before assembly, the p.c.b. was used as a template for marking out the heat-sink mounting hole positions. During assembly however, I noted that one of the holes for R4 was not cleared on the top side. Also the electrolytic capacitors were laid out with 5mm spacing, when 3.3mm would have been better. One of the beads in the 2 bead choke is in contact with capacitor C3 – so I may just shift C3 slightly.

The transistors were fitted to the board again using 4BA solder tags to pick up the collector connection and link it to the pads and track on the board, as is shown in the underside view **Fig. 6**. Some heat-sink compound was added to the transistors and mica insulators before assembly to the heat-sink. Full nuts, half nuts and washers were used to secure the board to the heat-sink at the same height as the body of the transistors.

Final Test

The newly completed board tested much the same as previously, but there was a gain of 94 at 14.2MHz compared with 50 at 1.775MHz and 29.7MHz. Further extensive tests were made sweeping continuously from 1.775-29.7MHz. The results for all the h.f. Amateur bands are shown in **Table 3**. A graph of these results more clearly shows the full variation of gain with frequency and is included as **Fig. 7**.

Ten Frequencies

My tests of the prototype at just six frequencies across the whole h.f. range gave the impression that the gain was flat to within 1.6dB. This is clearly not the case as revealed when ten frequencies are tested. The variation is 4.5dB, which requires further thought on how to smooth it out.

The gain achieved is still greater than the 13dB originally required so there is some scope for increased feedback. There does not seem to be any standard solutions included in other published amplifier circuits. In a complete transmitter, some of the output can be rectified and fed back to a dual gate m.o.s.f.e.t. in the early part of chain to keep the output at a constant level regardless of the gain.

I'm pleased with the result so far – and particularly that the finished p.c.b version works just the same as the second development model! I'll experiment further with the feedback to see if I can achieve a flatter response and then make whatever changes to the p.c.b as required. This will be included in the next article in this series, which may also include development and tests of a higher power second stage. In the meantime, I wish all *DiBD* readers a very happy Christmas!

PW

If you wish to correspond regarding this or other articles in this series please contact me on tony@pwpublishing.ltd.uk

KITS & MODULES

TRANSVERTERS for 2 or 4 or 6 metres from a 10 metre rig, or 4 or 6 metre from a 2 metre rig. Includes new overtone local oscillator, and integral interface unit. 20dB receive gain, 25W transmit power. Low level drive dual IF versions **TRC2-10dL, TRC4-10dL & TRC6-10dL**, high level drive single IF versions **TRC2-10sL**, **TRC4-10sL**, **TRC6-10sL, TRC4-2sL, TRC6-2sL**, Complete kit **£179.00**. **Built £266.00.**

TRANSVERTERS for ICOM rigs, supplied with cables. Automatic with no cable switching. IC756Pro & II & III, 775, 781, 7600, 7700, & 7800 use type **TRC4-10L/IC1.** IC735, 761, & 765 use type **TRC4-10L/IC3. Built to order £280.00.**

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MASTHEAD PREAMPS 400W rated, for 2 or 4 or 6metres. RF switched. DC fed via a separate wire. 20dB gain 1dB NF. Heavy duty waterproof masthead box with SO239 connector. **RP2SH, RP4SH, RP6SH. PCB & hardware kit £42.50, Ready Built £65.00**. **Masthead fitting kit £6.00**.

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TA6SB 5W in 50W out, **TA4SB** 7W in 50W out, **Complete kit £70.00, ready built £89.00**.

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PSK31 INTERFACE KIT. Module as described in PW Feb 2009. Suitable for a variety of digital modes. PCB and components **£21.00**. Box kit complete with cables but excluding microphone plug **£35.50**.

COMPONENTS

(see web-site for details)

CAPACITORS, ceramic, poly block, electrolytic, mica, trimcaps.
RESISTORS, ¼ W carbon film, 10Ω to 1MΩ, and trimpots.
DIODES, small signal, zener, rectifier, Shottky, & varicap.
TRANSISTORS, small signal AF and RF bipolar and FET, medium and high power VHF.
QUARTZ CRYSTALS, HC18U, HC25U, & HC49U, new & used.
INTEGRATED CIRCUITS, linear & logic.
VALVES, tested good, B7G, B8A, Octal, and older.

DUAL GATE MOSFETS

TYPE	Package	F MHz	Gfs mmhos	Idss mA	Nf dB	Price £
3SK45	TO72	200	14	17	2.2	2.00
3N201	TO72	300	12.8	15	2.0	2.25
40673	TO72	400	12	15	3.5	2.50
BF964S	SOT103	1000	18.5	10	1.0	1.50

P&P £1.00 any quantity

SPECTRUM 10mm COILS, pin compatible with TOKO types. Coil values 1.2, 2.6, 5.3, 11, 23, 45, and 90uH. Some types have the primary tapped at ¼ turns and a low impedance secondary winding. Others have centre tapped primary and relatively high impedance secondary winding. Full details of turns ratios, etc. can be found on the components page of the website. **1-9 qty 75p each plus £1 P&P**.

LCR BRIDGE with 5 resistance ranges 100, 1K, 10K, 100K & 1M. 3 capacitance ranges, 100pF, 1nF, 10nF and 3 inductance ranges, 1mH, 10mH & 100mH, plus external reference. Scale calibrated 0.01 to 10 times reference value. Optional drilled and labelled plastic or painted diecast box. **PCB & parts with pot and switch £26.00. With plastic box £39.00, with diecast box £44.00.**

OFF-AIR FREQUENCY STANDARD, crystal calibrator unit phase locked to Radio 4 using a two-loop system. Includes a monitor receiver to ensure Radio 4 is being heard loud and clear. Fixed outputs 10MHz at 2V p-p, and 1KHz at 1V p-p as oscilloscope CAL signal. Switched outputs 1MHz, 100KHz, 10KHz, and 1KHz at 6V p-p, into 500 Ohms. Single board design as featured in July & Sept 2008 PW. Background heterodyne whistle at 2KHz confirms lock condition. 12/13.5V DC operation at 65mA. **PCB kit with ferrite rod £50.00, PCB kit + drilled box and hardware complete £86.00. Ready built £131.50.**

TWO TONE OSCILLATOR as featured in *PW* March 2005. A vital piece of test equipment used together with an oscilloscope for setting up AM, DSB, & SSB transmitters. **PCB & hardware kit £28.00. Ready Built £52.50**.

CLASSIC
20/80m SSB RECEIVER

Classic superhet receiver for 20 and 80m using a 9MHz IF and a 5.0-5.5MHz VFO. Uses a 6 crystal ladder filter with near symmetrical passband, 2dB insertion loss, 1.8:1 shape factor, and 70dB stopband. Minimum discernable signal 0.2uV. Fixed tuned bandpass preselector on 20m, tunable preselector on 80m. Logarithmic AGC and Signal meter response. Maximum signal handling 1mV. 500mW audio output. Supply requirement 13.5V at up to 250mA. **VFO with its drilled box, preselector and main board PCB's and component kits including crystals £92. Complete kit including box and hardware £147.00. Ready built £240.00.**

UPWEY 160m AM/LSB RECEIVER

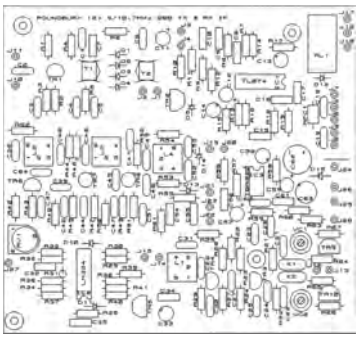
Single conversion superhet receiver for Top Band using a 4 pole ceramic IF filter LTW455HT. Stopband –40dB at + - 9KHz, -60dB at + - 100KHz. Ultra stable Colpitts VFO, and resonator-stabilised high-side BFO. Minimum discernable signal 0.1uV. Tuneable preselector and S meter. 500mW audio output. Supply requirement 13.5V at up to 250mA. **PCB & parts kit including Main board, VFO with its box and tuning capacitor, preselector with polyvaricon, and BFO £92.50. PCB and parts kit plus drilled and labelled case and all hardware including meter, speaker, and slow motion drive £175.50. Ready built £241.50.**

SYNTHESIZER CONVERSION CB to 10FM, suitable for the old style UK CB rigs with LC7136/7 or TC9119P synthesiser IC's. Puts the rig onto 29.31-29.70 MHz. Each board is aligned prior to despatch. State rig type when ordering. PCB size 64 x 40 x 17mm.
Type **SC29**. **PCB Built & aligned £26.50**.

PORTLAND VFO, a rock stable FET VFO. Meets the requirement for the Intermediate Licence VFO project. Modified to allow alignment to top and bottom of required band. Several versions available: 5.0 - 5.5Mhz for 20 & 80 metres; 7.0-7.2MHz for a direct conversion for the extended 40metre band; or 7.900 - 8.400MHz for use as part of a mixer-oscillator system as local oscillator for 4m RX or TX. Supplied with Buffer 2A to deliver 1.6V p-p into 50Ω with 2nd harmonic 40dB down. **PCB and component kit with potentiometer £18.00. Drilled Box and PCB kit with potentiometer and feedthroughs £27.00. Ready built £50.00**. State required frequency when ordering.

NEW PRODUCT

DUAL PEAK/NOTCH FILTER with Audio Amplifier. It connects directly to the loudspeaker or headphone socket of the receiver and produces up to ½W of audio to a front facing loudspeaker. The unit can be used to notch out two unwanted heterodynes, or just one while enhancing the wanted audio frequency. Similarly it can be used sharpen otherwise dull speech or to dampen shrill audio. **PCB kit and all the potentiometers £35.75. PCB kit and all the hardware with drilled and labelled box £73.00. Ready Built £112.00.**



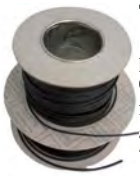
POUNDBURY (ver2) 9MHz SSB TX GENERATOR & RX IF. Speech processor and diode ring modulator with carrier suppression greater than 50dB. IN/OUT termination impedance 560Ω to match external SSB filter. Receive section FET and MOSFET IF amplifiers and a singly balanced diode product detector, discrete audio derived AGC, 0.5W IC audio amplifier. Includes USB and LSB carrier crystals, which are DC switched. PCB size 125 x 115 x 17mm. **PCB and components £66.00**.

G2DYM / G4CFY AERIALS

Guy — 7 1 rap — -piece — 7 1 rap — Guy

TRAP DIPOLE for 80/40/20/15//&10m. 106 feet long. Supplied with 70 feet of low impedance twin feeder. Low TVI and low noise. 2S points quieter than a G5RV with same feeder length. PVC covered wires with lugs. Regular duty 150W rated £157.00.
600W rated. £164.50, inc. carriage.

1:1 BALUN 160-10m, 1kW rated. Loss under 1dB from 1.8 to 40MHz. Ideal for use with the G4CFY trapped dipole, or any other aerial fed with low impedance twin feeder. £43.00 inc P&P. Version with Marconi-T switching. £53.00 including P&P.



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Enjoying 1.3GHz Home-brew Part 1

John Cooke GM8OTI describes his adventurers getting started in microwaves – from first ideas to first QSO.

When I first received my licence in 1978, my intention was always to move up to the higher frequencies. It's taken me over 30 years, but I've finally reached the microwave part of the spectrum!

After a gap of many years, I started getting back into Amateur Radio in 2008. I worked through a few home-brew projects for the high frequency (h.f.) and very high frequency (v.h.f.) bands first, then in late 2009 decided the time had finally arrived to start moving up to the microwave bands.

Where To Start?

After my decision the first question was – where to start? Back in the early 1980s I had bought some waveguide, mixer diodes and a Gunn diode for a 10GHz project but I'd never got around to putting it together. Today we have the world wide web as a reference, and reading around many websites I realised that it's still possible to start at 10GHz, but not cheaply if a narrow-band system is required – which for me means single sideband (s.s.b.).

I had bought a Yaesu FT-817 when I came back into the hobby, intending to use it to drive microwave transverters. Since my long term goal is to move up the microwave bands, it seemed that 1.3GHz was the best band to start with.

The Transverter

Obviously, I would need a transverter, so I think it's worth looking at the basics. A transverter is a relatively simple device and for reception, it consists of a local oscillator and a mixer. The wanted frequency is mixed, with the local oscillator frequency, down to the band that your existing transceiver (in my case the FT-817) can receive, which becomes the intermediate frequency (i.f.) for the transverter.

Signals at the unwanted image frequency – which the mixer also shifts into the i.f. passband – are removed if a band-pass filter or filtered pre-amplifier is used at the microwave frequency before the mixer. A pre-amplifier can also improve the system sensitivity.

Note: A useful diagram showing the essentials of a transverter was given in the *What Next?* column in the August 2010 issue of *PW*.

When a transverter is used for transmission, the signal produced by the transceiver in the same band is mixed with the local oscillator frequency and 'mixed up' to the wanted frequency – in my case the 1.3GHz band. On the transmit side at least, a band-pass filter is required to remove unwanted mixer products, and usually an amplifier will be required, again with suitable band-pass filtering.

The transverter simply shifts the received signal down in frequency to the band being used in the i.f. transceiver, or takes the output from the transceiver and shifts it up to the microwave frequency. This means that, providing the transverter amplifiers are linear, any mode of transmission that the i.f. transceiver can handle can be used: Morse (c.w.), s.s.b., frequency modulation (f.m.) or even digital modes.

There are lots of transverter designs out there on the web and in handbooks. For someone like myself starting from scratch – and aiming to do things simply and cheaply – not all of these designs are ideal. It's easy enough to buy a ready-built transverter or a kit, but these approaches are not for me either, because they are a relatively expensive way of getting started. In fact, much of the fun I get from the hobby is in getting equipment I have built from scratch on the air.

One possible approach was a 'no tune' transverter, built using printed circuit filters. However, I had no experience at all of these and decided I could try that approach later. I decided to go with tuneable filters, and looked for suitable designs to base my ideas on.

My experience at v.h.f. had taught

Fig. 1: The local oscillator crystal oven.

me how critical layout can be, and at microwave frequencies (above 1GHz) this is even more the case. Most designs I came across use surface mount device (s.m.d.) components, which remove many of the problems of lead inductance at these frequencies. Additionally, s.m.d. components are also significantly cheaper than many older discrete components and allow a more compact circuit board – useful for my /P operations. So, I realised I would also have to start working with these – another new experience!

Local Oscillator

The key component for the transverter is the local oscillator. When I started, little did I realise just how true that statement is!

The narrow-band and simplex f.m. section of the 1.3GHz band is 1296-1298MHz. I decided to use a 432MHz i.f., reasoning that I could use the front and rear antenna connectors on the FT-817 for two different bands, so that I would have access to 144MHz as well as 1.3GHz at the press of a switch. The required local oscillator frequency is 1296 - 432 = 864MHz, which mixes with 432-434MHz to produce the required 1296-1298MHz.

I had read that 96MHz is commonly used as the base frequency for microwave local oscillators (in this case, 864 = 9 × 96) so I needed to generate 96MHz. I found a 24MHz crystal on an old computer interface card (96 = 4 × 24) so work could start!

Since the crystal frequency is being multiplied up 36 times (864 = 36 × 24), **any error** in the frequency **will also be multiplied by 36 times**. One standard way of keeping the frequency stable is to hold the crystal temperature very stable using a heater and a thermostat, which together make an 'oven controlled crystal oscillator' (o.c.x.o.).

My 'oven' is a copper bar with a slot cut for the crystal, which is heated by a power transistor with the temperature detected using a thermistor. A simple feedback loop using an op-amp controls the temperature. I built and tested this oven, and found it extremely stable and very sensitive. Indeed, if it's operated in the open, blowing on the circuit will cause the heater to operate! The oven, complete with the oscillator circuit, is surrounded by insulation and mounted in a tinplate box (**Fig. 1**).

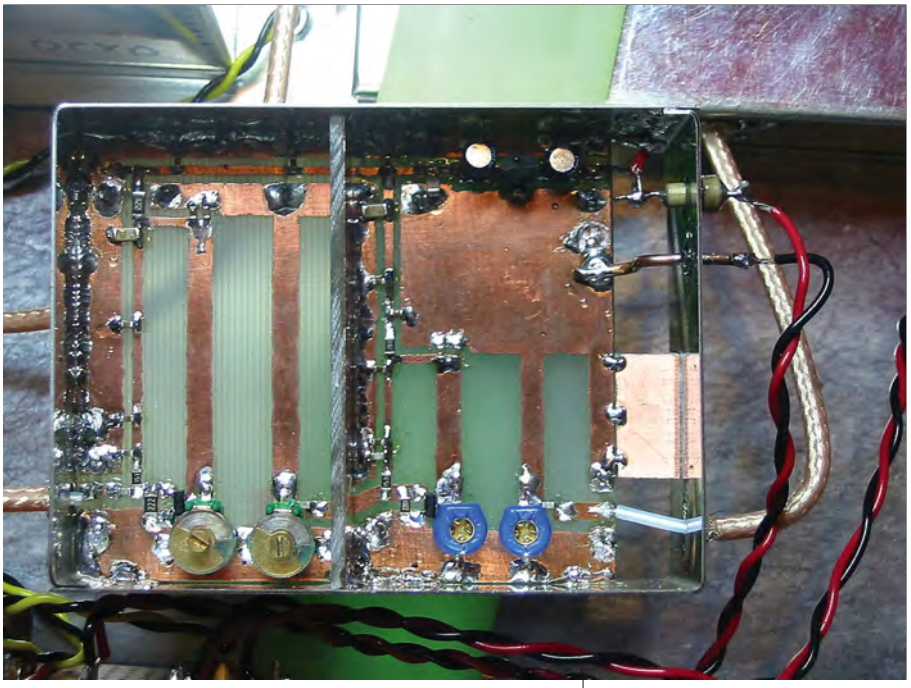

Fig. 2: The prototype local oscillator multiplier triplers, which didn't work well!

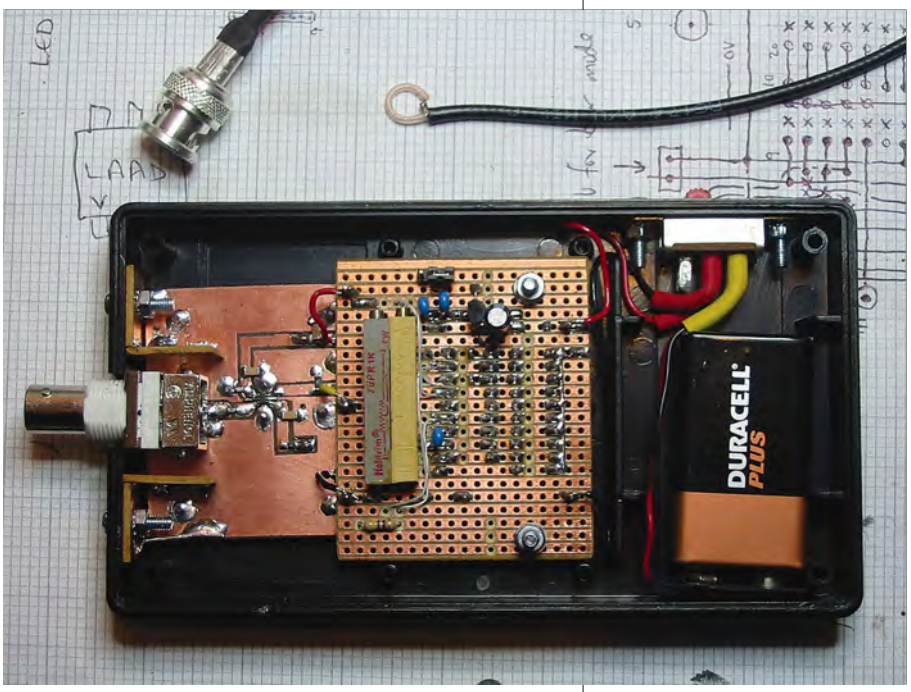

Fig. 3: Simple test equipment – a microwave r.f. 'sniffer'.

The prototype included a multiplier to give an output at 96MHz, I was able to verify that the frequency was accurate by using the FT-817 tuned to 432MHz exactly (432 = 18 × 24). Clearly, I was detecting a bit of an unwanted harmonic at 432MHz that was leaking out, but it at a very low level.

The next step was to multiply the 96MHz up to 864MHz, which I decided to do by using two triplers (864 = 96 × 3 × 3). The tuned circuits (at 288 and

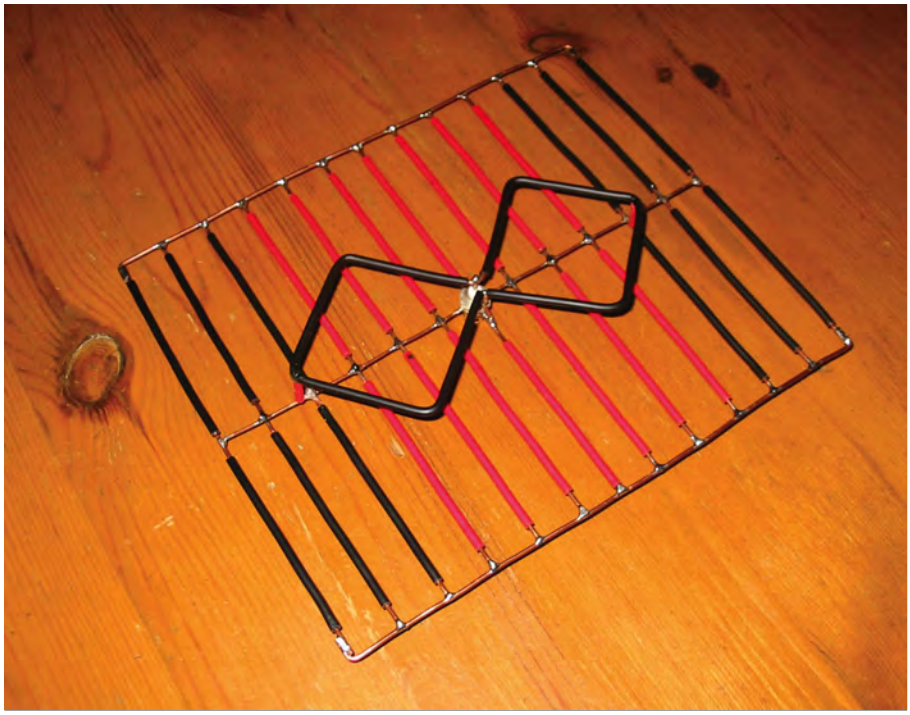

Fig. 4: Bi-quad loop antenna.

864MHz) were printed line inductors tuned by small trimmer capacitors (**Fig. 2**). Setting these up is where I began to realise that my lack of test equipment for these high frequencies started to show!

Simple Test equipment

I obviously needed some simple test equipment and a very simple device which (if constructed suitably) works as well at microwaves as at h.f. – is a radio frequency (r.f.) probe. This is the familiar diode rectifier circuit, which produces a voltage proportional to the amplitude of the r.f. signal; the voltage can be detected with either a voltmeter or an oscilloscope. The only drawback is that an r.f. probe on its own is not very sensitive.

I needed a way to detect weak microwave signals easily, and found a neat design for a microwave 'r.f. sniffer' in the *International Microwave Handbook (2nd edition)*. This uses a detector chip (the LTC5508) which will work at frequencies up to at least 7GHz, producing an output voltage which varies with the logarithm of the input r.f. level.

The sniffer (**Fig. 3**) works very well – it detects leakage from my home microwave oven (at about 2.4GHz) but not at dangerous levels – it's very sensitive! It enabled me to peak up the multiplier chain, by sniffing the r.f. from the printed inductors using a little single turn loop at the end of some coaxial cable.

With the multipliers apparently working and producing what I assumed was the correct local oscillator signal, it was time to look at the rest of the transverter.

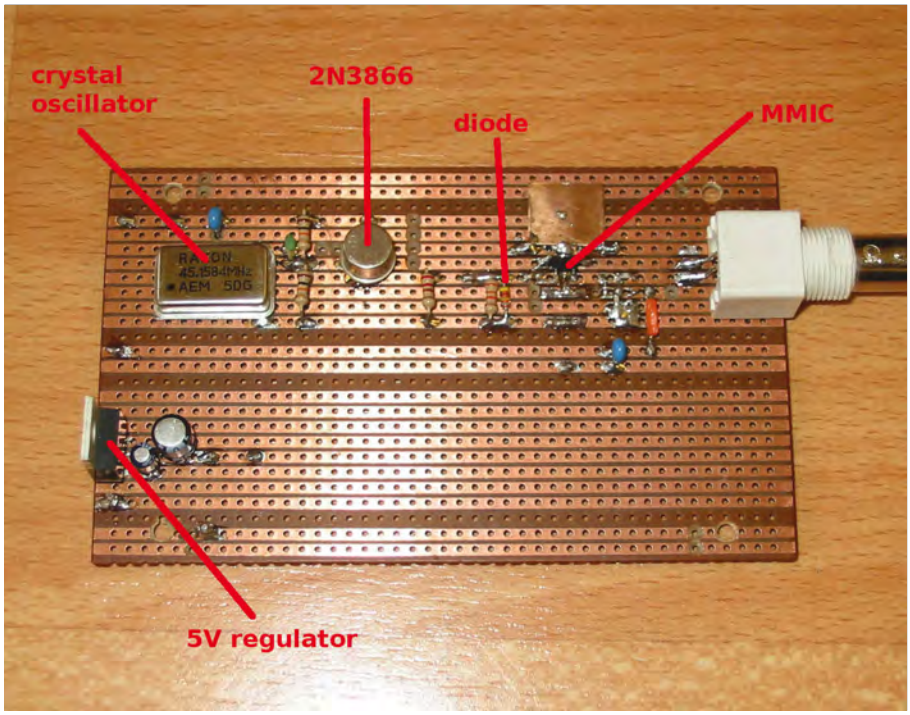

Fig. 5: Signal source – a frequency "comb" generator.

Mixer & Receive Pre-Amplifier

Another design in the *International Microwave Handbook*, which looked to be close to what I wanted, was a transverter built by **Sam Jewell G4DDK**. It was designed for a 144MHz i.f. and has an integrated local oscillator multiplier chain. I decided to use the basic design for the transverter, making small changes which include relay switching of the i.f. transceiver and matching the mixer to an i.f. at 432MHz, together with using my external local oscillator.

As I prefer to build projects in stages, I drew out a circuit layout that enabled me to build the board in three parts, which fitted together; the mixer, the receive pre-amplifier, and the transmit amplifier and filter. The double balanced mixer is a Mini-Circuits ADE-5, and the band-pass at 1296MHz is set using a Toko 3-stage helical filter, the 5HT-123080C. The amplifiers are all Monolithic Microwave Integrated Circuits (MMICs) from various manufacturers.

I'm lucky to live quite close to a 1.3GHz beacon, **GB3EDN** (Edinburgh), which provides an excellent test signal source. Even using the local beacon, I thought I ought to have some sort of antenna; I found a simple bi-quad loop design by **Herbert Dingfelder DL5NEG** in the *International Microwave Handbook,* which was easy to build (**Fig. 4**).

In the absence of a local signal, a source can be built fairly easily – yet another piece of simple test equipment! An integrated crystal oscillator (I found one of a suitable frequency on an old computer sound card) generates a square wave output which can be used to drive a diode harmonic generator, producing a 'comb' of frequencies at multiples of the oscillator frequency into the microwave region (**Fig. 5**).

With the mixer alone I couldn't detect GB3EDN, but once the receive pre-amplifier was added, I found that I could easily hear the beacon from a site just over 1km away. For me, this was a great success – the receive side of the

transverter appeared to be working!

I was greatly encouraged by this and started work on the transmit part of the transverter board, which includes a two stage Toko helical band-pass filter (5HW-367MN113F) at 1.3GHz. This was followed by a little amplifier after the transverter intended to bring the output up to a reasonable level (about 500mW). The component side of the completed transverter board is shown in **Fig. 6**. **Note:** The Toko filters are mounted on the other side of the board.

Teething Problems!

I then ran into some teething problems as things seemed to start going wrong. Unfortunately, it turned out that what I thought was working – in fact wasn't. The output amplifier didn't seem to work at all. There was a signal coming from the output when the transverter was switched to transmit – but it didn't go away when I removed the i.f. drive!

It was clear that the output amplifier on the transverter board was oscillating. I cured this by changing one of the amplifier MMICs to a lower gain device – but still found the circuit didn't have a measurable output on transmit.

Additionally, I found that I couldn't detect the harmonic from the comb generator that I expected to find in the 1.3GHz band. Something was definitely not working properly!

Jon GM4JTJ To The Rescue!

Fortunately, **Jon Joyce GM4JTJ** got in touch with me, having seen my home website pages after reading my letter to our Editor in the May 2010 issue of *PW*. Jon might have guessed what problems I would come across – and suggested I look at a design for a microwave wavemeter that he has used in the past.

In fact, Jon GM4JTJ's suggestion was very helpful indeed – as it one of the crucial bits of test equipment I knew I would need at some stage – but had tried to do without so far! I had wavemeters for lower frequencies from building v.h.f. equipment – after all, they are one way of making sure we comply with our licence conditions relating to 'unwanted emissions'.

Of course, I had realised earlier that I would have to build one for microwave frequencies eventually – and clearly that stage had now been reached! So, there was a little diversion from the main project to build what Jon described as a "sludgepump" wavemeter (you can see why in **Fig. 7)**. This is a design described as a "wide range cavity wavemeter" in the *International Microwave Handbook* and it really made things rather clearer. Used with my microwave r.f. sniffer, rather than just a sensitive meter on the diode detector of the wavemeter, I found it easy to detect harmonics produced in the oscillator multiplier chain.

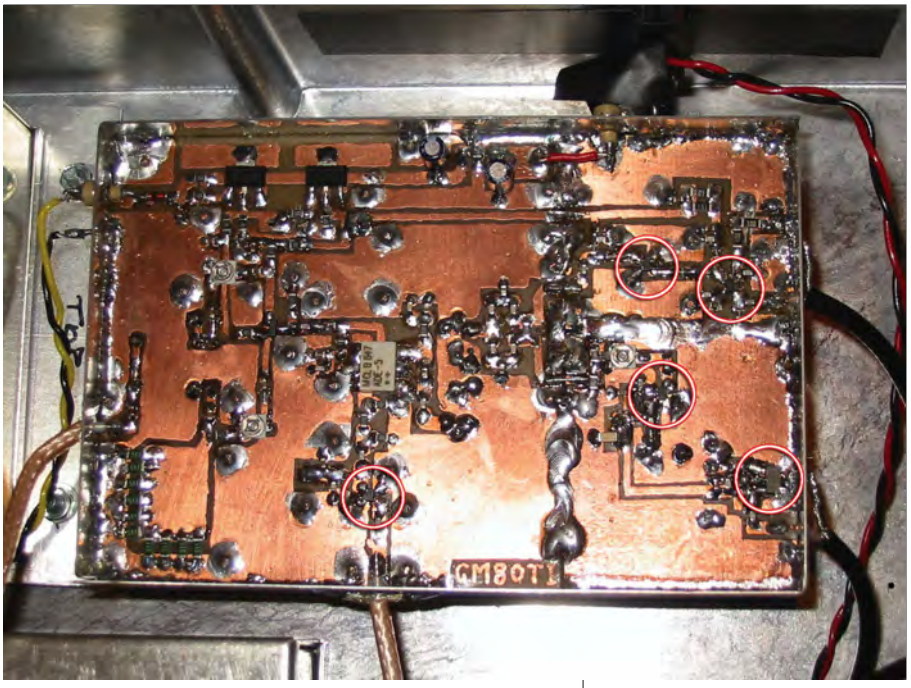

Fig. 6: Component side of the transverter main board; the MMIC amplifiers are circled in red.

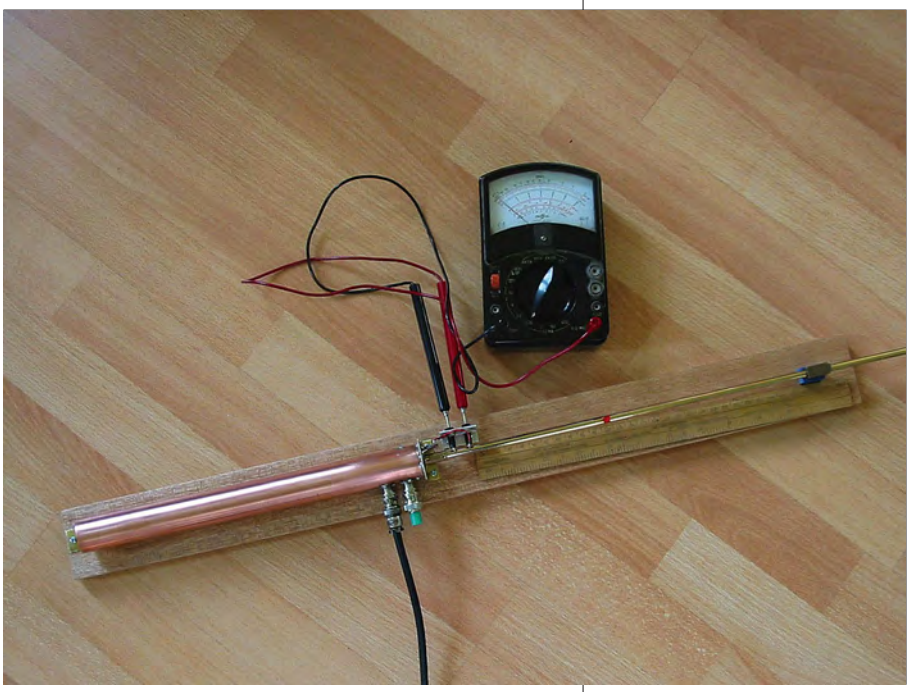

Fig. 7: More simple test equipment – a microwave wavemeter. The 'pump handle' (right centre) moves a resonant rod in and out of a pipe cavity, and the length of the resonator (which is a quarter wavelength) is measured on a scale.

I found that the local oscillator multiplier chain was picking up the wrong harmonics, and was also not producing a strong enough local oscillator signal at the right frequency. In addition, the o.c.x.o. output at 96MHz was also not strong enough. As a result of this I decided on a complete redesign of the multiplier chain – because the local oscillator is clearly a critical part of a transverter! I hope you've enjoyed sharing Part 1 of my 'microwave adventures' as much as I have – and I look forward to continuing them in Part 2.

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Simple Receivers

Simple receivers will really benefit from George Dobbs G3RJV's practical amplifier project!

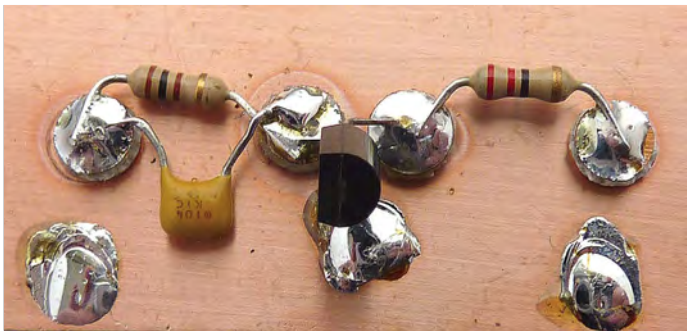
It's so simple to be happy, but so difficult to be simple. Gururaj Ananda Yogi (1932 – 1988)

Simple receivers have frequently been the subject of *Carrying on The Practical Way* (*CoTPW*). In recent editions I've described several versions of the Sudden direct conversion receiver. Most direct conversion (DC) receivers derive all, or most, of their gain from the audio amplification stages. So, I thought it worth looking at a simple radio frequency (r.f.) amplifier to go in front of a simple DC or regenerative receiver.

Those *CoTPW* readers who have enjoyed the excellent work of the late **Doug DeMaw W1FB**, may recall he was a great advocate of the field effect transistor (f.e.t.) grounded-gate r.f. amplifier. They are liberally spread throughout his receiver designs. As the name suggests, in a grounded-gate amplifier the gate of an f.e.t. is connected to ground. An alternative term used for this configuration is 'common gate' amplifier.

A Typical Circuit

A typical grounded-gate amplifier circuit is shown in **Fig. 1**. Grounded-gate amplifiers offer a limited amount of amplification, in the order of 10dB, but they are easy to build and usually very stable in operation. However, two precautions that usually ensure stability are to keep the gate lead of the f.e.t. as short as possible and the addition the small value series resistor (R1) to prevent parasitic oscillations.



George built his pre-ampliier 'Manhattan' style, on a small section of p.c.b. material.

Like all r.f. amplifiers it's also helpful to keep the input circuit away from the output circuit. In this article I use shielded inductors in cans or toroidal cores – yet another useful aid to amplifier stability. The grounded-gate amplifier is ideal for isolation on the front end of a regenerative receiver or an r.f. amplifier in front of an NE602 mixer circuit.

The values given for the circuit in figure are for a 7MHz (40 metre) band r.f. amplifier. The amplifier has a tuned input and tuned output provided by T1 and 2. These are wound on T50-6 cores. The main winding is 30 turns of 0.35mm (30s.w.g.) enamelled copper wire spread over three quarters of the circumference.

A 60pF trimmer in parallel with a fixed 100pF capacitor resonates the main winding on 7MHz. Incidentally, an idea trimmer capacitor for this circuit is the brown Murata 5mm ceramic type.

The input tuned winding on T1 requires a tapping in the coil to match the f.e.t. input. The inductor is tapped five turns up from the grounded end. Small link windings – consisting of five turns wound over the centre of T1 and 2 – provide the r.f. input and output points.

The 9V to power the amplifier is fed through the tuned winding of T2. Commonly available MPF102 and J310 devices both work well in this circuit.

There are certain circuits that are useful 'building blocks' capable of use in a variety of applications. An ideal building block circuit is one that is simple but versatile. The grounded-gate amplifier is one such circuit. So, in preparing this article I decided to explore a couple of versions that might prove useful to readers. With that in mind, I built the f.e.t. portion, minus the input and output tuning, onto a separate board.

As in some of my more recent projects, I used Manhattan-type construction with insulated pads glued

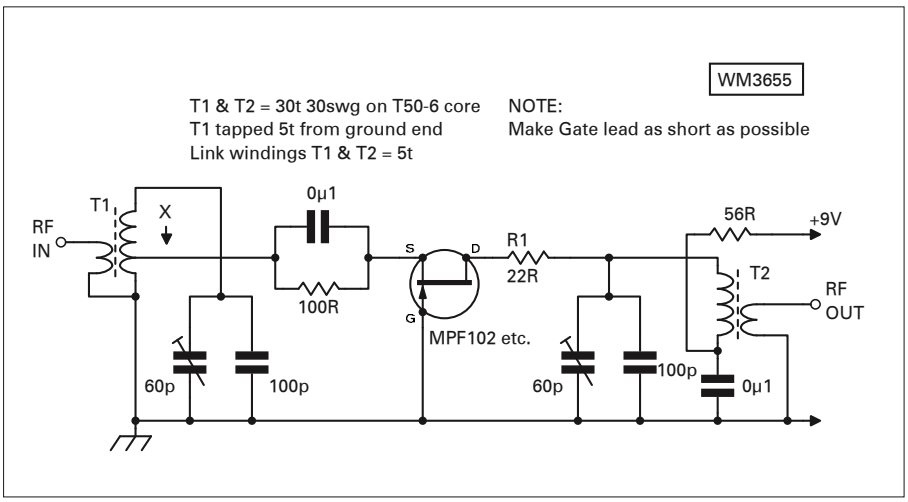


Fig. 1: The spartan, but effective grounded-gate f.e.t. band-pass amplifier, that George suggests can improve a simple radio receiver.

to a ground-plane of printed circuit board (p.c.b.) material. Recently however, I had an E-mail from a *PW* reader with a tale of woe about this method of construction. His problem was mounting the little pads that provide the connection points for the circuit elements. Using a rapid-setting glue (Cyanoacrylate Adhesive) to fix the pads to the board was more difficult than he expected.

I admitted that the technique could be tricky and when I first used the Manhattan technique, I manipulated the pads with a pair of fine pointed tweezers. In practice, I gripped the edge of the pad with the tweezers, turn the pad over to expose the underside and apply a single drop of the adhesive.

Then I used the tweezers to place the pad on the ground-plane. Pressing down on the pad with the points of the tweezers for about 20 seconds and the pad would be firmly in place. That method works well – but I have a nice pair of stainless steel pointed tweezers and sometimes the position of the pad shifted slightly when removing the tweezers.

More recently, I've been using a simpler (and I think better) method of sticking the pads on the board. It requires nothing more than a wooden cocktail stick (or a match stick) and a small piece of 'Blutac' stationery putty. I cut the pointed end off one side of the cocktail stick and then take a tiny ball of Blutack (about 5mm diameter) and push it on the blunt end of the cocktail stick. This technique makes a little tool for picking up a pad by pressing the Blutack onto the top side of the pad.

I then Turn the stick so that the bottom of the pad faces upwards and apply some of the adhesive. **Note:** It really only needs a very small amount of glue to secure the pad. Touching the pointed nozzle end of the glue tube on the bottom of the pad and barely wetting the pad is all that is required.

The pad can be accurately placed using the stick and then secured by pressing down on the stick for about 20 seconds. I have found this method a quick and easy way to place the pad in the desired place and secure it to the ground-plane.

Amplifier Testing

For my amplifier tests I built the tuned input and output circuits, again Manhattan-style, on small pieces of printed circuit board material; about 3.5mm by 3mm. Both T1 and 2 require three pads on the ground-plane; two pads for the tuned winding and one pad for the r.f. input or r.f. output.

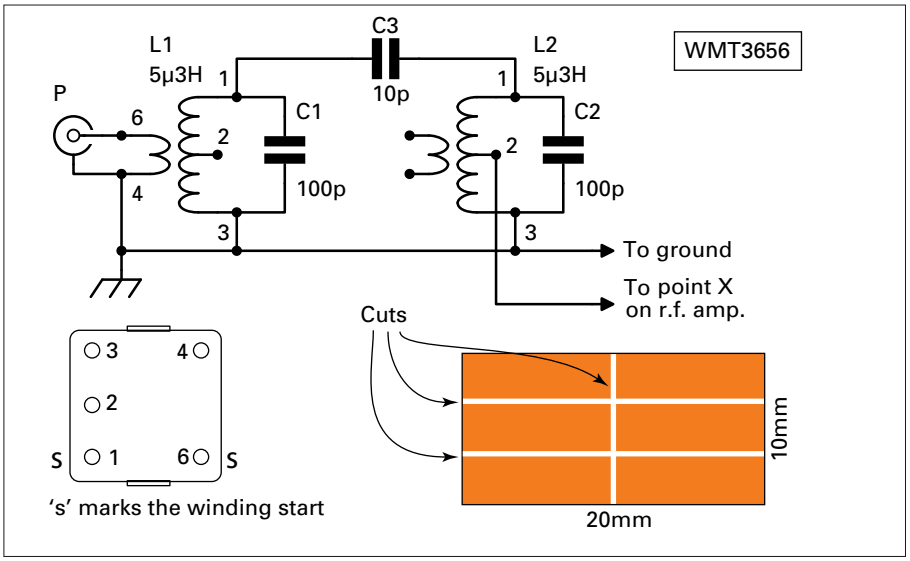


Fig. 2: A band-pass filter using Spectrum Communications 10K coils with adjustable cores in a screened cans. The pinout diagram is from a 'pin-view' perspective along with a suitable mounting pad made from p.c.b. material.

Transformer T1 requires a pad for the top of the winding and another for the tapped point of the winding, the bottom of the winding going to ground. However, T2 requires a pad for each end of the tuned winding as the bottom of the winding is insulated from ground. In my prototype the small boards for T1 and 2 were mounted piggy-back style over the spare ground-plane at either side of the board with the f.e.t. and its associated components.

The prototype (Fig. 1) was tested using my old Yaesu FT-7 transceiver tuned to the 7MHz band. When I retired I had several 'sentimental value' pieces of amateur radio equipment on shelves in my super-sized Vicarage shack. Sadly, I parted with most of them including a whole variety of home-built items.

A small blob of stationery putty and a shortened cocktail stick used as a tool to place the p.c.b. material pads.

Despite the 'downsizing' the FT-7 transceiver came along with me to the tiny shack and workshop in our retirement house. It was the trusty transceiver I'd used when my sons were young and our holidays were taken in our aging Volkswagen Camper van. The FT-7 together with a set of Hustler mobile whips, bought at a radio flea market, gave me many happy evenings from campsites in mainland Europe.

The FT-7 also had that distinct advantage that, unlike modern commercial transceivers, I knew what happened inside and if it went wrong I could probably do something about it!

My FT-7 also liked the grounded-gate amplifier – and it added an appropriate amount of gain to the receiver.

However, it occurred to me that if the amplifier was to be used in front of a simple receiver on 7MHz it could make the receiver more susceptible to overloading and cross modulation. Although two tuned circuits are included in Fig. 1, these only offer quite basic filtering. In practice, the amplifier would benefit from a better band-pass input filter.

The diagram, **Fig. 2**, shows a band-pass filter using **Spectrum Communications** 10K coils with adjustable cores in a screened can. I described a range of such filters in the May 2010 edition of this column. The diagram shows a filter suitable for 7MHz. Two tuned circuits (L1/C1 and L2/C2) are loosely top coupled by a low value capacitor (C3).

The inductor L1 and 2 are Spectrum 5u3L coils, which are additionally useful in this application because the tapping point (pin 2) on the main winding is close to the end of the winding at Pin 3 offering a good match into the f.e.t. circuit.

I have included the manufacturer's coil connection drawing in Fig. 2 as it is essential to use the correct pins to obtain better matching option. The coil connection drawing is viewing the pins from under the coil base. When wired, the connections should follow the pin numbering in the circuit diagram. The

output from the filter, at pin 2, goes to the point marked 'X' in Fig. 1. Note that the manufacturer's drawing does not use a 'pin 5' – the link winding is between pins 4 and 6.

Filter Built Using Pads

The band-pass filter was also build using pads. Some years ago I had some pads that suited the footprint of Toko coils but these have long gone. For my band-pass filter prototype here, I used some custom integrated circuit (i.c.) carrier pads from 'qrpme' in the USA, designed for 8-pin dual in line i.c.s.

By joining the inner two pads on each side of the i.c. carrier, I could make a Spectrum 10K coil fit. The three pin side of the coil base fits the outer pins plus the joined inner lands and the two pin side fits the opposite two outer pins. Most readers will not have access to these i.c. carriers – but it's easy to make a suitable coil carrier.

An inset drawing in Fig. 2 shows how to make pads for a coil carrier. Each carrier is made on a piece of blank p.c.b. material measuring 10mm by 20mm. At the half-way point on the longer side of the board score through the copper surface using a junior hacksaw to make two large copper pads.

The job is easy to do – you can grip the board in a vice and gently sawing through the copper until the insulated material is reached. It's also possible to do this using the 90° slot in a woodworker's mitre board – although this requires careful manipulation. Then, for this method, the board is turned 90° and two more hacksaw scores are made to divide each of the halves into three equal rectangles.

To mount the coil, tin the six pads with fresh solder and generously tin the pins of the coil base. Seat the coil pins on the pads and apply the hot tip of the soldering iron to each pad in turn to make a secure connection for the pins. Pins 3 and 4 on L1 and pin 3 on L2 are connected to ground. It's also advisable to ground the screening cans on the coils by using one of the tags at the bottom of the can.

Adding the band-pass filter will make quite a difference to receivers with poor front end tuning. The simplified version of the Sudden receiver I described in the April 2009 will be greatly improved – especially when listening to the 7MHz band in the evenings. The diagram, **Fig. 3**, shows the very basic input tuning on that receiver.

Another suggestion is to use the simple input filtering of that receiver as

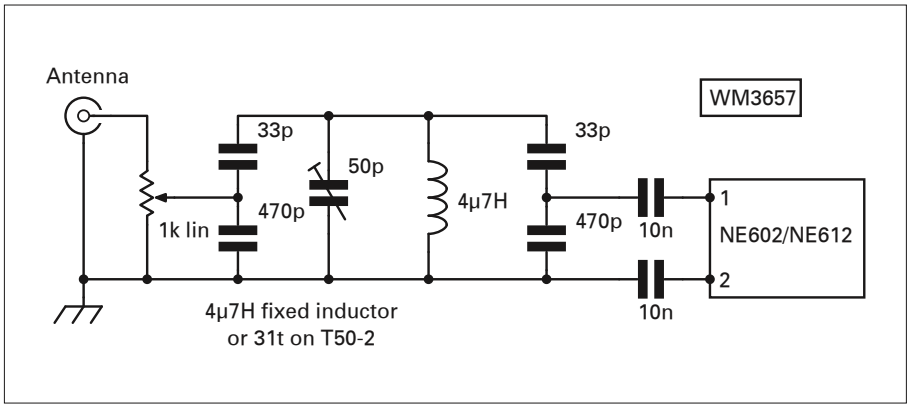


Fig. 3: The diagram shows the very basic input tuning on that receiver Sudden receiver I described in the April 2009 issue of *PW*.

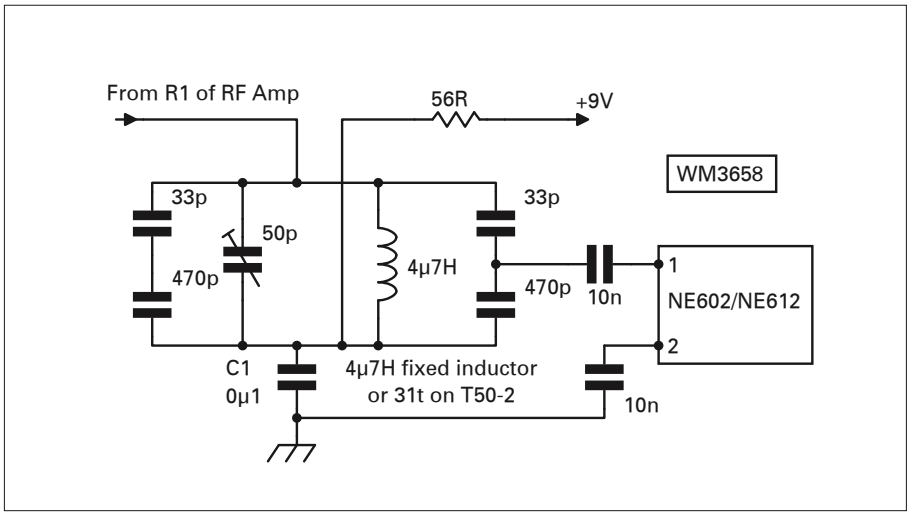


Fig. 4: Adding the grounded-gate amplifier, the tuned circuit is lifted from direct connection to ground by adding C1.

the tuned circuit at the end of the grounded-gate amplifier. A method for doing this is shown in **Fig. 4**. The tuned circuit is lifted from direct connection to ground by adding C1. There's no longer a d.c. ground connection but C1 provides an r.f. (radio frequency) ground connection. This enables the 9V supply to be connected through the 56Ω resistor.

Small bits of p.c.b. material make suitable 'Manahatten' style mounting pads for 10k type coils.

Worth The Effort!

The modifications to the April 2009 receiver require a little work and re-routing of the grounded portions of the input circuit – but the effort is worthwhile. Similar modifications could be applied to other simple receivers and I'm sure that enterprising *PW* readers could work out the details for themselves.

The grounded-gate r.f. amplifier is a very simple circuit that readers might like to try in a variety of applications. See you next time and I wish everyone a really happy Christmas!

PW

Rallies

Send your rally info to:

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

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.

January 2011

January 16th

The Dover Rally

The Dover Amateur Radio Club Rally will be held at the Whitfield Village Hall, Dover CT16 3LY. The doors will be open from 9.00am to 1.00pm and admission will be £1.00. There will be talk-in via GB3KS, trade stands and catering.
www.doverradiorally.com

January 16th

The Red Rose Winter Rally

The West Manchester Radio Club will be holding its Red Rose Winter Rally at a brand new venue – The George H Carnall Leisure Centre, Kingsway Park M41 7FJ. This is just off Junction 9 of the M60, opposite the Trafford Centre. The doors will open at 11.00am and there will be a free car park, trade stands, a low cost Bring & Buy, special interest groups, a café area with a licensed bar and facilities for the disabled.
Steve
Tel: 07502 295141
www.wmrc.org.uk

February

February 6th

The Canvey Rally

The 26th Canvey Radio & Electronics Rally will be held at The Paddocks, Long Road, Canvey Island, Essex SS8 0JA, which is at the southern end of the A130. The doors will open at 10.30am, admission will be £2.00 and there will a free car park, trade stands, catering and facilities for the disabled.
Dave G4UVJ
Tel: 01268 697978 (evenings)
www.southessex-ars.co.uk

February 13th

The Harwell Rally

The Harwell Radio and Electronics Rally will take place at the Didcot Leisure Centre, Mereland Road, Didcot OX11 8AY – 3 miles from the A34 between Oxford and Newbury. The doors will open at 10.30am (10.15am for the disabled) and admission will be £2.50 (children under 12 free). There will be talk-in (GX3PIA) on 145.550MHz, free car parking, trade stands, special interest groups, a flea market, catering with a licensed bar and facilities for the disabled.
Ann G8NVI
Tel: 01235 816379
E-mail: rally@g3pia.org.uk
www.g3pia.org.uk

February 13th

Northern Cross Rally

The Wakefield & District Radio Society Rally will take place in the sports hall (at the original venue) of Thornes Park Athletic Staduim, Hornby Road, Wakefield WF2 8TY. Talk-in will be provided on their local, wide-coverage repeater GB3YW (145.7857MHz, 82.5Hz, Narrow Deviation) courtesy of the Five Towns Repeater Group. More details to follow.
Ken Quinn 2E0SSQ
Tel: 07900 563117 (before 20.00 please)
E-mail: kquinn27@o2.co.uk

March

March 6th

The Exeter Rally

The Exeter Radio and Electronics Rally will be held at the America Hall, De la Rue Way, Pinhoe, Exeter EX4 8PW. The doors will open at 10.30am (10.15am for the disabled) and admission will be £2.00. There will be talk-in, trade stands, a Bring & Buy and catering. All profits from the event will be shared between the local 2m and 70cm repeaters, GB3SW, GB3EW and GB3EX.
Pete G3ZVI
Tel: 07714 198374
E-mail: g3zvi@yahoo.co.uk

March 13th

The Wythall Rally

The Wythall Radio Club's 26th Annual Radio Rally will be held at the Woodrush Sports Centre, Shawhurst Lane, Hollywood, Nr Wythall, Birmingham B47 5JW, which is only two miles from J3 on the M42. The rally will be open from 10.00am to 3.00pm and admission will be £2.00. There will be talk-in on S22, on-site parking, trade stands, a Bring & Buy and refreshments.
Chris G0EYO
Tel: 07710 412 819
E-mail: g0eyo@blueyonder.co.uk
www.wrcrally.co.uk

March 19th

The Lagan Valley Rally

The Lagan Valley Amateur Radio Society Rally will be held at The Village Centre, 7 Ballynahinch Road, Hillsborough. The doors will open at 11.30am and there will be car parking, trade stands and catering.
Jim GI0DVU
Tel: 02892 662270
E-mail: jim.henry@ntlworld.com

March 20th

The Yeovil QRP Convention

The 27th Yeovil QRP Convention will be held at Digby Hall, Hound Street, Sherbourne, Dorset DT9 3AA (adjoining the central shopping car park). The doors will be open from 9.30am to 4.00pm and there will be talk-in on S22, car parking, trade stands, a Bring & Buy, catering and facilities for the disabled.
Derek M0WOB
Tel: 01935 414452

April

April 3rd

The South Gloucestershire Rally

The Avon Scouts Amateur Radio Club together with the Thornbury and South Gloucestershire Amateur Radio Club will be holding their third rally for the West Country at the Avon Scouts Activity Centre, Fernhill, Almondsbury BS32 4LX. This is conveniently located close to the crossover of the M4 and M5 motorways. The rally will start at 10.00am, admission will be £2.00, there will be talk-in on S22, ample parking, refreshments and facilities for the disabled. There will also be space for 20 car boots on a hard standing nearby; tables and boots are available at £5 each and prior booking is essential.
Stan Goodwin G0RYM
Tel: 01454 413177
Mobile: 07833 517370
E-mail: gentryone@googlemail.com
www.avonscouts.org.uk/woodhousepark

April 10th

The Blackpool Rally*

The Northern Amateur Radio Societies Association (NARSA) Exhibition will be held at the Norbreck Castle Exhibition Centre, Blackpool. The doors will open at 11.00am (10.45 for the disabled) and there will be car parking, talk-in, special interest groups, a Bring & Buy, catering with a licensed bar, Morse tests and facilities for the disabled.
Dave M0OBW
Tel: 01270 761 608
E-mail: dwilson@btinternet.com
www.g1gyc.demon.co.uk/narsa

April 17th

The Lough Erne Rally

The Lough Erne Amateur Radio Club 30th Annual Rally will be held in the Share Holiday Village, Lisnaskea, Co. Fermanagh BT92 0EQ N. Ireland – access from Erne/ Shannon Waterway. The doors will open at 12 noon and there will be car parking, trade stands, a Bring & Buy, catering with a licensed bar and facilities for the disabled.
Iain
Tel: 028 66326693
E-mail: gibbjgbb@aol.com
www.lougherneradioclub.co.uk

June

June 19th

The Newbury Rally

The Newbury Radio Rally and Boot Sale will take place in the Newbury Showground, which is next to J13 of the M4. It will open at 9.00am and admission will be £2.00. Sellers will have access from 8.00am and pitches will cost £10. There will be talk-in on S22, free car parking, trade stands, catering, a flea market, special interest groups and facilities for the disabled.
E-mail: rallynadars.org.uk
www.nadars.org.uk

June 26th

The West of England Radio Rally*

The West of England Radio Rally will be held at the Cheese & Grain, Bridge Street, Frome, Somerset BA11 1BE. There will be car parking, trade stands, catering and facilities for the disabled.
Shaun G8VPG
Tel: 01225 873 098
E-mail: rallymanager@westrally.org.uk
www.westrally.org.uk

August

August 14th

The Flight Refuelling Hamfest*

The Flight Refuelling Amateur Radio Society Hamfest will be held in the Cobham Sports and Social Club Ground, Merley, Nr. Wimborne, Dorset BH21 3AA.
Mike Sykes M0MJS
Tel: 01202 883479
E-mail: Hamfest@frars.org.uk
www.frars.org.uk

August 15th

The Friskney & East Lincolnshire Rally

The Friskney & East Lincolnshire Communications Club Rally will be held in the Frisknet Village Hall, Church Road, Friskney, Lincolnshire. This is 6.5 miles south of Skegness. The doors will be open from 10.00am to 2.30pm and admission will be £1.50. There will be talk-in on S22, catering, car parking and facilities for the disabled.
Bren 2E0BDS
Tel: 01754 820204
E-mail: felcc@btinternet.com
www.felcc.webs.com

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MyDEL MP-5189 New batch arriving December!

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See web for more details. NOW IN STOCK! £219.95.

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MiniVNA original still available (without Bluetooth)

Mike Richards G3WNC's Data Modes
PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW
E-Mail: mike@pwpublishing.ltd.uk

Looking at QPSK – a more complex PSK mode

In his Data Modes column, Mike Richards G4WNC takes a look at QPSK-31, a more complex variant of PSK-31.

At the time that PSK-31 was developed there were a number of suggestions that the mode would be further improved – if some form of error correction could be built-in. However, the designer Peter Martinez G3PLX was sceptical of the value of this but never-the-less went on to develop an excellent error correction system.

In order to correct errors over a communications link the transmitted signal needs to be configured in some way so that the receiver can detect if an error has occurred. In the simple **Amateur Microprocessor Teleprinting Over Radio** *(*AMTOR) system this was achieved by using an alphabet where each character comprised a specific combination of 1s and 0s. If any character was received that didn't align with this pattern it was assumed to be an error and a repeat requested.

However, because it's a broadcast mode PSK-31 is different in that the transmit and receive stations aren't locked together as in AMTOR. In the case of AMTOR, the normal way to build-in error detection and correction is by adding extra information to the transmitted signal. Using AMTOR as an example, each character is repeated but delayed by three characters. The snag of course is that this then halves the effective speed of the link as everything you type is sent twice!

Doubling up on the data sent, is one of the reasons why AMTOR uses 100Baud on air to achieve a decoded rate of 50Baud. The same problem will occur with PSK-31. If we were to add extra information, the overall link speed will slow down. So, the first problem therefore is – how to increase the capacity of the PSK-31 link to cater for error correction?

Modifying The Modulation

The solution chosen to increase capacity, was to modify the modulation system itself. You will recall from my earlier introduction to PSK-31 that phase-shift modulation is employed and in PSK-31 the phase of the signal is reversed to signify a data bit. This reversal would be similar to reversing your antenna leads.

In an engineering sense, phase shifts are measured in degrees from a reference point in the cycle. Complete reversal, as used in PSK-31, is actually a 180° phase shift. In a practical PSK-31 system, as used by Amateurs today, the phase-shift is created in software and not by actually reversing any wires. Because of this, it's quite possible to change the phase by amounts other than the 180° used in PSK-31.

If we were to change the phase in 90° steps our signal could have four possible states (0°, 90°, 180° and -90°) instead of the original two (0° and 180°), hence we'll have doubled the capacity! This type of modulation system is known as Quaternary Phase Shift Keying (QPSK) and was selected for the error correcting version of PSK-31.

The use of multiple phase-shifts is commonplace in modern communication systems and some of the more advanced systems have eight phase shifts available. Unfortunately though, there's a downside from doubling the capacity and that's a 3dB degradation in signal-to-noise ratio. With a QPSK signal, the demodulator output is no longer just 0 or 1 but a combination of two binary digits as shown in **Table 1**.

To make use of the system, the transmit data stream is examined two-bits at a time to determine which phase-shift should be sent to communicate the next two bits. The decoder simply has to examine the incoming carrier and check for phase changes at the pre-set bit rate of 31 bits per second. The detected phase change is then converted back into the original two bits. Okay, so that's QPSK described simply – but now we need to look at how the QPSK31 error correction system operates.

Convolutional Coding

A convolutional decoder (as used in QPSK-31) is a combination of logic gates that generates 2-bits of output for each bit that enters, hence the need for twice the capacity in the link. However, the combination of output bits is not just a function of each bit as it arrives, but is influenced by the previous four bits.

The dependence effectively spreads the information over five bits but in a very specific way that the decoder can use to reconstruct the message, should part of it get garbled in transit.

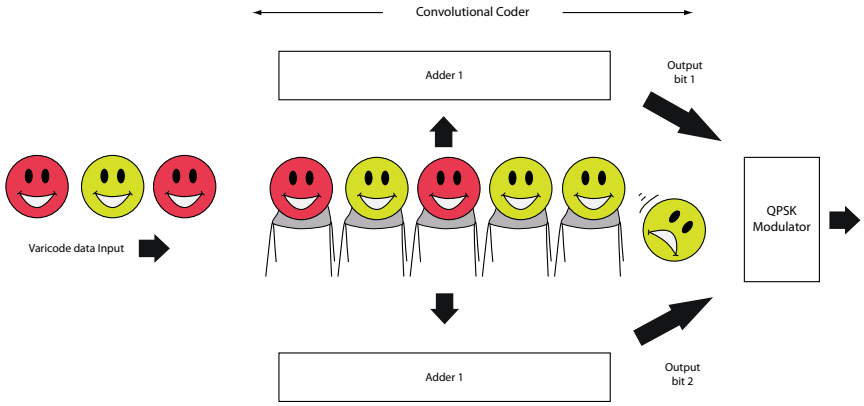


Fig. 1: The simplified diagram of a PSK-31 convolutional Encoder.

Table 1 QPSK Phase-shift to digital output

Phase Shift	Demodulator Output
In Phase 0°	00
Advanced 90°	01
180°(reversal)	10
Retarded 90°	11

Table 2, QPSK Output for a single space character

Sequence	Convolution Output	QPSK Shift
Start	00000	180
1st bit	00001	+90
2nd bit	00010	-90
3rd bit	00100	-90
4th bit	01000	0
5th bit	10000	+90
6th bit	00000	180

Spreading the coding over five bits also adds a small delay to the data. The precise logic of the encoder takes a bit of work to get your head around so I'm not going to labour it here but you will find some good tutorials on the Web if you want to delve a bit deeper (see **Web links**).

To help, here's a highly simplified analogy that may help you understand what happens inside the encoder (see **Fig. 1**). Imagine an arrangement where the encoder comprises a set of five chairs each of which can hold one data bit. When a new data bit arrives it pushes all the data along one place to the next chair and the end bit falls off.

The combination of bits sat on the chairs is then added in a special way and the two output bits generated and passed to the QPSK modulator. The sequence is continued as each new data bit arrives. In **Table 2** I've shown what happens when a space (Varicode '1') surrounded by '0's is passed through a QPSK-31 encoder, you should be able to spot the lone 1 working its way across the 5-bit pattern. In **Table 3**, I've shown an adapted copy of the QPSK-31 convolutional code table that Peter Martinez G3PLX published some time ago.

Table 3, Convolutional Code Table

Code	QPSK (deg)	Code	QPSK (deg)	Code	QPSK (deg)	Code	QPSK (deg)
00000	180	01000	0	10000	+90	11000	-90
00001	+90	01001	-90	10001	180	11001	0
00010	-90	01010	+90	10010	0	11010	180
00011	0	01011	180	10011	-90	11011	+90
00100	-90	01100	+90	10100	0	11100	180
00101	0	01101	180	10101	-90	11101	+90
00110	180	01110	0	10110	+90	11110	-90

Viterbi Decoding

Having generated our complex convolutional coded signal we then need to be able to decode it and take advantage of the error correction properties. There a number of ways to decode this form of signal but the best method is to use the Viterbi algorithm. This complex mathematical algorithm was devised by **Andy Viterbi** back in 1967 and remains the most effective way to decode convolutional coded serial data such as QPSK-31.

Incidentally, following development of his famous algorithm Andy Viterbi went on to found the QUALCOMM research and development company that did much of the pioneering work for cellular phones.

Software decoders based on the Viterbi algorithm actually use a collection of encoders (32 for QPSK-31) all working in parallel. They each examine the last received bits and do their best to predict the value of the next phase shift. The encoders are then judged on their success and the worst 16 killed off whilst the 'survivors' spawn 'two children' and the process continues.

It's a sort of Darwinian decoding where only the most successful encoders survive, so the predictions become ever more accurate! It is the refined set of encoders that's used to decide whether or not an error has occurred and to correct it. The accuracy of the error detection and correction process can be improved when more received bits are used to feed the Viterbi decoder.

In the case of QPSK-31 a value of four times the time spread of 5-bits is employed, i.e. 20-bits. When combined with the 5-bit delay in the transmit encoding process, that gives a 25-bit overall delay in each direction which equates to 800ms at 31.25Baud. That's a round-trip delay of 1.6s which is not a problem, although you might notice a slight delay on changeover.

Receiving QPSK-31

If you're on the air with PSK-31 you will probably find that your existing software includes the QPSK mode, so it's just a question of selecting that mode. Although the error correction system used for QPSK is very effective – you don't generally find many people using it. Frequencies for QPSK are the same as PSK-31 and they will look pretty similar on the waterfall display.

If you tune into a PSK-31 signal but it seems your system's unable to decode it, the chances are that it is QPSK. One other point to note about QPSK is that it is sideband sensitive, i.e. the receiving station has to use the same s.s.b. mode (u.s.b. or l.s.b.) as the transmitter.

You may also encounter different speed version of QPSK with 63 and 125Baud, which are the only two in general use. I shall be using QPSK-31 on 7, 10 and 14MHz over the next few weeks – so why not look out for me and give me a call?

Well that's about it again for this month, but next time we'll move on and start looking at some of the Amateur Radio multi-tone data systems. **PW**

Web Links

Convolutional Coding and Viterbi Decoding Web Links

There's an excellent tutorial by Chip Flemming at: **http://home.netcom.com/~chip.f/viterbi/tutorial.html**

There's another useful tutorial in PDF format from the Complex to Real website at: **www.complextoreal.com/chapters/convo.pdf**

And of course, at the ubiquitous Wikipedia: **http://en.wikipedia.org/wiki/Convolutional_code**

There's a very interesting working model that can be found at: **www.ece.drexel.edu/commweb/cov/cov_encoding.html**

Tim Kirby G4VXE's World of VHF incorporating VHF DXer
Willowside, Bow Bank, Longworth, Oxfordshire OX13 5ER
E-mail: tim@g4vxe.com
Twitter id: G4VXE

D-STAR – the Debate Continues

Tim Kirby G4VXE welcomes readers to the world of Amateur Radio above 30MHz and starts by discussing digital radio technology.

Welcome to where we enjoy discussing Amateur Radio activities above 30MHz – the world of v.h.f., where I'm starting off this month by discussing digital radio technology. The *PW* Editor* has received letters from Ian Bevan G0YAP and Angus Young M0IKB highlighting the difficult decisions that some repeater groups are having to face. Angus lives in the Scarborough area to where Ian is a regular visitor. Both wrote to highlight the issues that occur when the local repeater converts from analogue to digital and what happens to the stations 'left behind'.

Angus writes, "We have now lost anyone to talk to on 2 metres in the Scarborough area, people have removed mobile sets from their cars because they can't access the new [D-STAR] repeater. What a complete shame and for those who say, 'No, it's just a coincidence that this has happened', it's not, talking to another guy in another town that switched to a D-STAR repeater they also lost local chat on any other of the channels."

Ian says, "The way I see it is, why have a system that restricts usage to a small number of users running just one type of radio? Regarding D-Star....I await to be enlightened."

Both Ian and Angus highlight their concerns that D-STAR radios are only produced by a single manufacturer, Icom. Elsewhere, others have highlighted their concern that D-STAR uses a proprietary CODEC for encoding speech. Personally speaking, I have great sympathy with Ian and Angus to the extent that they find themselves without the useful analogue repeater that they were once able to use.

However, it must be a difficult decision for a repeater group to take. Closing their analogue repeater and replacing it with a digital one – particularly if there are no other analogue repeaters which satisfactorily overlap the coverage area. Ultimately, of course, that's down to the repeater group. So it's probably a good reminder that if you care or feel strongly about the repeaters in your area and the direction they take, get involved with the local group, contribute to them and influence the outcome.

Some repeater groups have managed to offer both digital and analogue repeaters on the same frequency, such as GB3WE at Weston Super Mare. This keeps existing analogue users happy, whilst giving those that wish to do so, the opportunity to experiment with the D-STAR system. Other groups have perhaps converted a 145MHz system to D-STAR whilst retaining a 433MHz analogue repeater.

My own experience is that I find the D-STAR system interesting to learn about and to use. It will evolve and eventually we may find a different standard for digital voice operations on v.h.f. or u.h.f. No doubt the CODEC issue will be resolved in time, and if digital voice operations at v.h.f. becomes sufficiently popular then I'm sure other manufacturers will join in.

Interestingly, using an Icom rig or repeater is no longer the only way onto D-STAR. Adapters such as the Satoshi board allow rigs such as the Yaesu FT-7800 or FT-8900 to be used on D-STAR (take a look at **www.dj0abr.de/english/technik/dstar/dv_yaesu.htm**) and there are other innovative repeater solutions being created that aren't Icom products – but perhaps they can be said to have been developed because of Icom's work with D-Star.

Until it becomes sufficiently clear whether D-STAR is **the** standard for Digital Voice at v.h.f., I suspect that we will have to try and make digital and analogue modes co-exist as best as possible.

***Editorial note:** I've been unable to contact the repeater groups involved so we can provide balanced comment. To enable us to do so, I would be pleased if WoVHF readers in the areas mentioned could contact those involved with the repeaters so I can make contact with them. **G3XFD**.*

The Five Metre Band

I knew that mention of the old 5m band in the column recently would result in some interesting correspondence and so it proved! It was good to hear from **John Marshall, G3RKH** who had some interesting facts; 5m was the only allocation above 30MHz in the pre-war period. The Americans also had a band at 112MHz. In the UK 5m was closed to Amateurs at 0000 on 1st April 1949. John recalls several Amateurs who had ceased operation altogether when the 5 metre band was lost.

John went on to remind me that the 144MHz band was opened to UK Radio Amateurs on 1st September 1948, so it overlapped with 5m for a period of seven months. Initially, the band was 145 to 146MHz only. A handful of Amateurs were permitted to use the 50MHz band (outside TV hours) which resulted in G6DH contacting W1HDQ in November 1947. There had been reports of G stations on 5 metres being heard in the USA before the Second World War – but two-way contact hadn't been achieved. (See G6DH's article in the *RSGB Bulletin* for December 1947, pp. 106-108).

Wonderful history John – thank you. Does anyone have the recording of the last night of 5m operation? It would be really good to find someone who has a copy. I'd love to hear it and I know that many others would too.

Propagation Websites

It's always good to find websites which give some clues about what's happening in v.h.f. propagation terms. During the Sporadic E season, I find the DX Sherlock site **www.vhfdx.info** of huge value. It takes data from DX Clusters and other sources and plots the paths on a map. It doesn't just work for Es, though and you may find it a

The antenna systems at the location of DK3EE located in Verle in Germany.

useful site when checking up on Aurora or Tropo.

One site I hadn't come across – until **Matty Cunningham MD0MAN** gave me a tip-off – is William Hepburn's Tropospheric Ducting Forecast site **www.dxinfocentre.com/tropo_nwe.html** This site looks very interesting indeed and provides maps which chart the likelihood of tropospheric ducting appearing in a particular area over a period of about six days.

The 50MHz band

It was good to hear once again from **Ronald Pincho ZB3B** (Gibraltar). On October 5th, Ronald found a nice opening. He comments, "I heard several UK beacons which were quite strong, I managed to work Paul G4SCY via the GB3SX repeater up on Stoke-on-Trent, on just 20W of f.m. I struggled a bit with the fading so decided to move down to 50.110 s.s.b, gave out a couple of 'CQ' calls and then moved up to 50.140MHz and then managed to work a nice pile-up of mainly UK stations. The opening lasted for more than one hour, but by around 17:30 GMT conditions had disappeared.

"By the way, my 50MHz set-up consists of a Yaesu FT-450AT, running 50W, the antenna is a ZX6 4-element mono-bander for 50MHz, at 25m a.g.l., around 200m south from the Gibraltar Cable car station!"

Mark Marment, CT1FJC also caught the Es opening on October 5th and worked 57 stations; 32 G, 10 ON, and two PA (Dutch) stations, five F (French), four DL (German), one GJ (Jersey, Channel Isles) stations, and one Italian station! All were on s.s.b. and almost all were 59+. On October 11th Mark found a nice opening into the Caribbean and worked **KP4EIT** on s.s.b., peaking 5-7. Mark comments that **KP4EIT** is generally the first station to be heard from that area.

In the evenings, Mark has heard beacons from Africa many times during the month including, ZS, TR, ZD8 via TEP. Around 2200z some nights the band has opened up into PY, but with very weak signals and so far Mark has found it difficult to break the EA8, and Caribbean wall.

In an E-mail to Mark, I commented that if experience in previous solar cycles is anything to go by, these openings will improve. Hopefully – just hopefully – the evening opening into South America will extend by the long path into Japan.

Matty Cunningham MD0MAN wrote with regard to the item on poor QTHs sometimes coming up with surprising results on v.h.f. Earlier in the year on May 31st, Matty worked **WP4JCF** in Puerto Rico. (Well done Matty!).

The 144MHz Band

Mark Haynes M0DXR writes, "I have just experienced a wonderful tropo opening on 144MHz which has allowed me to work many new squares. Being my first serious year on the band, there are plenty of close squares available for my all time totals. On October 11th, I managed SSB QSOs in to IO89 (Orkney), IO87, JN78, JO50, JO51 & JO41.

"I even managed to work **LA3EQ** up in JO28, which was a lovely surprise. But the best one of them all has to be the GM portable station on a gas drilling platform in JO07 in the North Sea, which was actually a simplex f.m. QSO! Propagation was also very good to OZ, with many QSOs in this direction too. I could see that the RSGB 432MHz UK Activity Contest was going well on the cluster on October 12th, but I'm not currently QRV on the band.

"I had a good RSGB UK Activity Contest on 144MHz in September. About one hour before the contest I was struggling frantically to get the new antenna up – a 15-element Cue Dee. It's not easy trying to position it correctly up a ladder, but somehow the gods were on my side and I managed to secure the beast! Performance was excellent, a good few S-units up from my previous 11-element Yagi. The result was 114 QSOs with the best DX into northern Scotland."

Mark went on to say how much he appreciates his wife **Gemma 2E0WPX** 's patience when propagation appears from nowhere! Even though she is licenced, she thinks I'm crazy, but such is the fascination of radio!! (Their daughter, 8-month old **Rebecca** wasn't available for comment when I contacted them!).

Graham Boor G8NWC was another who enjoyed the excellent tropo on October 10th. Using his usual 50W and 7-element Yagi erected at 6m, from his

An interesting arrangement of h.f. and 50MHz beams at WP4JCF, seen on his entry at QRZ.com website.

QTH in South Lincolnshire. Graham made many contacts made to Germany, Poland , Denmark, Holland and Lithuania (LY), which proved to be the best DX at 1600km (1000 miles). Well done, Graham – I'm particularly envious of the LY station you worked!

I made just a handful of contacts from **G4VXE** during the excellent tropo opening. On October 11th, **Thomas Fahnenschmidt DK3EE** (JO41) was a superb signal, something echoed by **Tony Jay G8JAY** who worked DK3EE using an indoor antenna! The club station DF0WD from Spenge, North Rhine-Westphalia, Germany was also a good signal from JO42. On October 12th, I took a break from looking on 432MHz during the activity contest and found **Laurent F6HPP/P** (JN19) who was a very strong signal. (If you take part in 144MHz contests F6HPP will be a familiar callsign to you, but it was nice to have a more relaxed contact with Laurent on this occasion.

Stewart Wilkinson G0LGS wrote with some interesting details about the **Cheltenham Amateur Radio Association's (CARA)** 'Railways on the Air' station, GB0GWR, which was operated from Cheltenham Racecourse station on the preserved Gloucestershire and Warwickshire Railway. Stewart says that one of the surprises on 144MHz f.m. on September 26th, was working **Andy MW0FMF/P** on the North Wales Summit of 'Cyrn-y-Brain' (GW/NW-043 for SOTA) with Andy using just 500mW with a simple J-Pole antenna to make the 144km contact!

Incidentally, I can confirm that the 144MHz f.m. station at GB0GWR was working very well, with a collinear antenna on a 20m tower. This is because I worked the station when I was operating G4WXE/ near Burford, well back from the Cotswold escarpment!

The 432MHz band

For the 432MHz band Matty Cunningham MD0MAN writes with news about the **GB3IM** repeater on the Isle of Man. Some antenna repairs are needed, but in the meantime other systems have been pressed into service and are working well. The GB3IM repeater uses the *AllStar* linking software see *https://allstarlink.org/* so any licensed hams can create a login on this page and connect to any of the other *AllStar* links straight from your web browser! If you have *Echolink* you can also connect to **GB3IM** using the node number 464453. Indeed, shortly after Matty sent his E-mail, I was able to connect to **GB3IM** and have a quick QSO!

Simon Collings, G4SGI has some news about the **Gloucestershire Repeater Group's** repeater, **GB3UK** which is located on Cleeve Hill on the Cotswolds. The antenna is now a tri-band collinear for 144/432/1296MHz and has been elevated another 15m up the mast. It will be interesting to see how the coverage area changes. Located at over 1000ft a.s.l, it's widely heard, so even if you are some distance away – have a listen and see if you can hear it!

At G4VXE I enjoyed the early October tropo opening on 432MHz, though time to spend on the air was limited. On October 10th, I worked **DL5EBS** (JO31) and on October 11th I worked **OP7V** (JO10). During the RSGB's 432MHz Activity Contest on October 13th I worked **DF0MU** (JO32) for my best DX, but was also very pleased to work **Richard Baker GD8EXI** (IO74). Like last month, the best signal from Richard was when I was beaming south-east. I'm starting to wonder about the possibility of a reflection from the Didcot power station's 200m (650ft) concrete main chimney stack!

The 1296MHz band

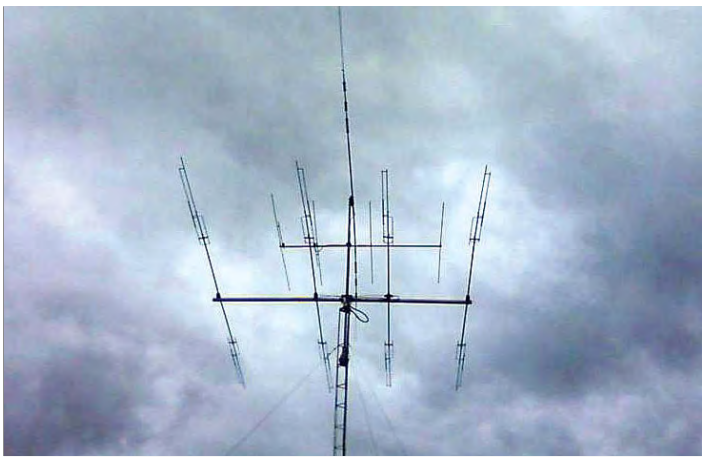
On to the 1296MHz band now and it's good to hear from **Mike Hall M0MGH** again and that he's had a bit more success on 23cm. He writes, "I've now moved my 23cm antenna to point around 100° which takes in Lincoln/ Norfolk/mainland Europe. I've also turned it horizontally. I managed to hear some PA (The Netherlands) stations the other day when we had that high pressure weather system over us in mid October."

Unfortunately, time constraints meant that Mike didn't get a chance to make any QSOs, but he was encouraged to have at least heard some DX! Fingers crossed for next time! Mike's also looking for ideas on the most economical way of producing around 50 to 100W on 1296MHz.

Seasons greetings

If all goes according to plan, you should get this just before Christmas, so may I take this opportunity to wish all readers and their loved ones the happiest of holiday seasons and all the best for 2011. Let's hope the New Year will be a happy, healthy and exciting one for us all and on v.h.f. too, of course!

PW



Another slightly clearer view of WP4JCF's antennas – again from the QRZ.com website.

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Local Clubs & Societies

Colin Redwood G6MXL takes a look into the busy world of Amateur Radio clubs.

Welcome to *What Next?* (*WN?*) where this month I'm looking at local Amateur Radio Clubs and Societies. In particular I'll be considering various ways they can attract and retain members. It's all about activity and publicity and successful clubs do both well!

I'll start by looking at ways of attracting new recruits to Amateur Radio. In my opinion there's no single way that's guaranteed to succeed and digressing for a moment – if you think of any of the big world-wide brands, they certainly don't rely on just one technique of 'brand awareness'. Indeed, I think the same applies to Amateur Radio clubs and societies. The good news is that your target audience is about 99.9% of the population above the age of around eight!

Prominent Posters

Well designed posters – displayed in prominent locations such as libraries and shopping areas – are a cost-effective way of making people aware of Amateur Radio and your club or society. Someone seeing a poster in one of these locations is likely to be one of the 99.9% of the population who are not currently a licensed Amateur! On the other hand, if your local Amateur Radio dealer allows your club to display a poster at his premises, this will need to be targeted at the 0.1% of the population who already have a licence.

Open Days

In my experience open days where the public are invited along to your club premises aren't very successful in attracting new members – simply because it's difficult to persuade them to come along. Why (for example) would you suddenly go to an open meeting of the local pottery club?

Personally, I think it's far more effective to go out to events such as fetes and exhibitions, etc. With this approach the public can't miss you! However, **it's vital** on these occasions to really engage with the visitors. By 'engage' this I mean 'selling' Amateur Radio to the visiting potential 'customer'. Don't let people just wander past! Instead, imagine you are a double glazing salesman on commission!

Ask people if they have heard about the hobby. Tell them about the things that Radio Amateurs can do (**Fig. 1**). Explain that there's no need to learn Morse Code – but don't forget to mention that c.w. is an extremely effective mode. Even if the visitors aren't really interested, they will at least go away with a bit more understanding of our hobby.

Fig. 1: Paul Warman G0ODP, of Poole Radio Society, explains Amateur Radio to a couple of visitors from St. John's Ambulance Brigade at a fete in the local park.

They may also pass on contact details of the club to friends, family and acquaintances, so it's important to have brochures available. So, make a point of giving a copy of your club's brochure (see later) to any members of the press and youth organisations attending.

It's important to remember on these occasions that the purpose is to attract visitors to the hobby, not to work lots of stations. With the right encouragement, young visitors seem to enjoy sending their names in 'secret' Morse code using the crib sheet from the Foundation Licence practical. Success can be rewarded with a certificate to take home and show family and friends.

Club Brochure

Some clubs have brochures (**Fig. 2**) that can be given to members of the public who show interest. These should be designed for complete newcomers to Amateur Radio. There's no need to explain amateur radio and amateur radio clubs to existing license holders and in any case if they pick up the brochure they will see contact details and can look on the club's website to see the programme for the next few months.

The Website

There's no doubt in my mind that a well designed website can be a great asset to any club or society. It's worth bearing in mind that it will only be people who have at least a minimal interest in the hobby that are likely to see it. People simply don't search for 'Amateur Radio' or any other hobby on Google – if they don't have at least a slight interest in or awareness of the hobby!

There are four key features of a website that I consider important. Firstly, there must be something on the front page about training courses. In my view, many club websites bury this

Fig. 2: The Poole Radio Society brochure. The fold-out leaflet can be downloaded from the club's website at http://www.g4prs.org.uk/

vital information too far from their home page.

Secondly, there must be up-to-date information about where and when the club meets. This needs to include dates, times and places including the address and ideally a map. This is vital information to anyone who wishes to join your club.

Thirdly, there must be some contact information. How does someone contact the club? Ideally this should include an E-mail address and telephone number and person's name.

Finally, the website must be readily located by Google and other popular search engines. To test this, try entering Amateur Radio and your town (e.g. Amateur Radio Chippenham) into Google. If you do not see your local Amateur Radio club or society on the first page displayed, then I think you need look for ways to improve this aspect of your club's website. The Chippenham & District Amateur Radio club have certainly got this right! (**see www.g3vre.org.uk/**)

If there are other Amateur Radio organisations nearby, it makes sense to agree to add links between each other's websites. This will be useful when someone stumbles on a club's site and is looking for another, which (perhaps) meets on another day of the week or is nearer to their home.

Training Courses

An ever increasing number of Amateur Radio clubs are running training courses and attracting candidates isn't always easy. Effective publicity – in as many different ways as possible – seems to be the only successful route and the club's website is certainly one very good place to start.

Circulating the course details to the course tutors Yahoo newsgroup can also be productive, as can including it in the *Practical Wireless* news, and the **Radio Society of Great Britain** (RSGB) news. The local press is another place to try. The Hamtest website at **www.hamtests.co.uk/** is also useful. It may be worthwhile to let other local clubs know about your courses. Potential candidates may find certain venues, dates etc. more convenient. In my experience naming a start date seems to have a useful effect of concentrating minds of potential candidates.

Finally on this point – publicising the completion of successful courses on the club website and in the Amateur Radio and local press will reinforce the message that the club actually runs training courses.

Club Meetings

Regular meetings are a vital part of any club's programme. Just standing around nattering informally at every meeting – isn't sufficient to attract and in particular retain members long-term. A station on the air and some construction activity will help. At the very least I think there should be a themed discussion at least once a month.

Providing refreshments is likely to prove popular. If nothing else, it gives the opportunity to start a conversation with visitors.

Fig. 3: Some Amateur Radio kit designers (in this case Tim Walfod G3PCJ) visit clubs to discuss their products.

Finding speakers to give the talks is not always an easy task. Most clubs however, will have at least one or two members who are more than capable of giving at least one talk. To encourage other members to do the same, why not arrange a meeting of ten-minute talks? Some club members will be willing to talk on a subject for ten minutes, even if they are unwilling to talk for longer.

Sometimes, it's difficult to think up topics for club meetings. Generally speaking, almost any topic to do with Amateur Radio will prove interesting to members. Talks about different antennas, different modes, power supplies are more likely to meet with interest than a really specialist topic (**Fig. 3**). Nevertheless there is a case for a good balance of subjects, and I don't think they all need to be directly related to the hobby. I remember a talk on fibre optics which was very interesting as light is, of course, another important part of the electromagnetic spectrum.

Quizzes can be another idea for a meeting. Whether the subjects are entirely Amateur Radio, general knowledge or a mixture of the both is up to the club or perhaps the quiz organiser.

Club Activities

There are numerous activities that clubs can take part in. As an example, how about a barbeque during the summer months? Many clubs enjoy portable contests and field days. Some combine these with a barbecue.

Visits to places of interest to Radio Amateurs can also be popular. Examples of these include rallies, Bletchley Park (Of *Enigma* Second World War decoding fame) and military museums incorporating a display of radio equipment.

Construction Contest

Many clubs and societies run construction contests and I think it's important that these contests allow as many members as possible to enter. This may mean having several categories; one suitable say for well-established constructors and another for those new to construction.

At my local club (Poole), one of the members sets a construction challenge each year. Support for the challenge varies quite a lot depending on the topic of the challenge that year. The more general in nature the subject is, the better the support. Recently, we found that a vertical antenna for an h.f. band such as 14MHz (20m) proved to be a popular subject, resulting in entries from a third of the members.

Fig. 4: It is really important that your club name is visible at any events you attend so, a board such as this, with the club's name and logo is ideal.

Operating Challenge

Talking to members of my own club, I was surprised how few were actually active on the air. Indeed, some members hadn't transmitted for many months! To encourage activity on the air, I came up with the idea of on-the-air challenge. Quite simply the aim is to make contact with as many different countries using as many different bands and modes as you can in one year. Members get one point for each DXCC country worked, each band used and each mode used.

There are four challenge categories: the first is for those with an Advanced Licence, the second is for those with an Intermediate licence or who are prepared to operate within the constraints of an Intermdiate Licence, the third is for those with a Foundation Licence or who want to operate within the constraints of Foundation Licence conditions (QRP and Bands). The latter allows QRP operators the opportunity to participate on a reasonably level playing field. The final category is for those without an Amateur Radio Licence (listeners).

The challenge has stirred quite a lot of interest amongst members and is giving a point of discussion between members at nearly every meeting. No doubt other clubs could come up with something similar.

Some clubs successfully run their own club contest or on-air activity periods. This can be an excellent way of getting members on the air and raising awareness amongst local Amateurs. Even a simple two hour 144MHz f.m. activity period or contest on a cold and wet Sunday afternoon in winter can be surprisingly popular, raising the profile of the club amongst local Amateurs. Club awards for working so many club members can be quite effective for raising the profile of a club in the amateur radio press and amongst local Amateurs.

Club nets can also be popular with members. They allow members who are unable to attend the club meetings to still participate in the club. It also allows non-members the chance to meet members on the air. It is important to choose a suitable band and mode that will allow the largest number of members to participate.

Stalls at Rallies

Besides being a good way of raising funds for the club, a stand at a local Amateur Radio rally can bring the club some useful publicity and may attract potential members. For this to be effective, it is important that the club name is readily seen, otherwise most of the effort will be wasted (**Fig. 4**). Could you imagine your favourite brand of baked beans not including its name on the tin?

You can also run your own rally – but organising a rally isn't something to be undertaken lightly! It needs a lot of dedication over a number of months to publicise the event. It may be better to start off with a table sale one club evening, perhaps inviting some nearby clubs to attend.

The Buildathon

The Buildathon idea seems to have caught on over recent years. At these events, experienced constructors help other amateurs new to home construction to build a project such as a simple receiver or transmitter. I suspect that most clubs could run one – if they put their minds to it. The important thing is to agree the project (**Tim Walford G3PCJ**'s range of kits seem particularly popular for these events), and then put all the effort into publicity and arrangements.

Food for Thought?

Hopefully *WN?* readers will have found some food for thought amongst the ideas I've presented here. In short it's all about the combination of activity and publicity – both are needed! If you have other techniques that work for your club, please let me know and I'll be happy to include them in this column.

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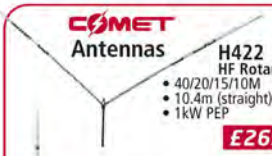

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Great News for ZD9HGW

Carl Mason GW0VSW presents your h.f. bands news. All reports to Carl by the 15th of the preceding month please!

Welcome to *HF Highlights* (*HFH*) and there's certainly a lot to get through this month! I'll begin with the good news for the DX operation run by Colin Topping GM6HGW from the island of Tristan Da Cunha – where he was operating as ZD9HGW. Colin has just heard that the American Amateur Radio Relay League (ARRL) has approved his operation and the call is now valid for DXCC credit.

This had taken some time to resolve and involved many E-mails, two letters plus a copy of Colin's ZD9 licence to get it sorted! It would seem prudent that if you do ever operate from a more 'unusual' location and require DX credit – then some sort of proof that you were there is advisable to satisfy the ARRL if any questions arise.

The proof should include any licence, or failing that at least some photographs or other proof that you operated from the location. You can then send copies to the ARRL DX desk to get the appropriate credit! The DXCC List (**www.arrl.org/dxcc)** is based upon the principle suggested by **Clinton B. DeSoto W1CBD**, in his landmark 1935 *QST* article, *How to Count Countries Worked, A New DX Scoring System*. DeSoto's article discussed the problems DXers had in determining how to count the DX they had worked. He presented a solution that has worked successfully for many generations of Radio Amateurs ever since!

The CQ DX Marathon 2010

As you may know each year *CQ* magazine sponsors a challenge to work as many countries and zones as possible in a calendar year. The brief is "simply work as many countries and CQ Zones as you can in each calendar year regardless of the band or mode. Each country and zone counts only once, so you can concentrate on working 'new ones' rather than working the same ones on multiple bands or modes."

This year's DX Marathon ends on December 31st 2010 – so you have plenty of time to increase your score and get an entry in!

Winners are listed on the DX Marathon website **www.dxmarathon.com** where you can also find helpful hints to avoid some common errors in submissions together with the o HYPERLINK "http://dxmarathon.com/countrieslist/countrieslist.htm" fficial *CQ* magazine Countries and Zone List. There's also a list of known pirate stations that will not count and a score sheet 'version 2010.2' that incorporates the four new PJ countries. For this year only both the deleted and new PJs will be allowed to count.

Last year logs were received from 320 stations in 48 countries and 23 CQ zones with participation up 70% and this year's entry is expected to be even better. The DX Marathon is the perfect answer for the DXer who needs that extra incentive to get on the air.

New DX Group

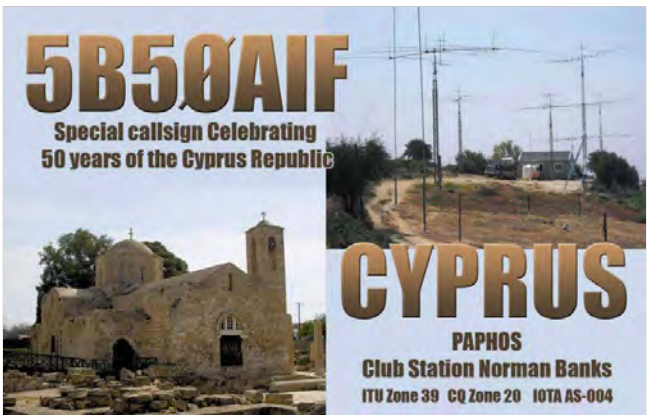
A new group called the Pacific DXers (**http://pacific-dxers.com**) was formed in September and is for anyone interested in DXing in the Pacific. They've already got a well stocked 'DXpedition Kit' which is available for members to use and **Eddie DeYoung VK4AN** says: "It will be made available on a booking basis for DXpeditions in the South Pacific area from 2011 onwards and already we have negotiated a big reduction in the price for accommodation at a Amateur Radio-friendly resort in Fiji for members staying over at least a week."

Other resorts are expected to follow shortly. Take a look at the website as it may give you some ideas for a more exotic holiday next year!

The DX News

There's just space for some DX news now and operating from Luanda in Angola is **Craig Haldane MM0SSG** who has been active as **D2SG** and will be in the country until March 2011. He will be QRV on 3.5-28MHz using c.w., s.s.b. and PSK31 with up to 100W.

The ON5AX QSL sent to Geoff M1EDF after a 7MHz c.w. QSO.



The 5B50AIF QSL after he was worked by Peter MI5JYK on 18MHz s.s.b.

Operation will depend on local conditions with a small vertical antenna for most bands together with a 14MHz dipole. Craig is fairly new to c.w. operating and asks if you work him to be patient! He'll also welcome reports from short wave listners (s.w.l.s). You can QSL direct only to his home call.

Also look out for **HG30FHA** the special call celebrating the 30th anniversary of the first Hungarian Cosmonaut **Bertalan Farkas** who was launched into space on May 26th 1980. The call will be active on all h.f. bands until the end of December and is being operated by members of the MOM Radio Club in Budapest (QSL via HA5KFV).

The TM0RDR QSL sent after he was worked by Bill 2E0BWX.

The QSL sent by the GB1MT/P h.f. station.

The IH9YMC QSL sent after he was worked by Peter MI5JYK on 18MHz s.s.b.

Your Reports

The first log this month is from another special event station run by **John Wakefield G0XIG** as **GB1MT** took to the air from Marley Telegraph, the 19th Signal Station of 22 on the Plymouth line located in South Brent, Devon. John made 1059 contacts, even though the bands were in poor shape, much like the weather which was wet and windy for the most part! Stations to make John's s.s.b. log on 3.5MHz included EI2CA (Ireland) EU-015 at 1732, F/OK2RJF (France) 1754, OY1R (Faroe Islands) EU-018 at 1743, HB2YXV (Switzerland) 1834, PA7AM (Netherlands) 1839, and OK2DEY (Czech Republic) 1842. Then came OZ1LCG (Denmark) 1845, MU0GSY (Guernsey) EU-114 at 2015, OM4AGS (Slovak Republic) 2114, TF2LL (Iceland) EU-021 at 2134 and DO1MGN (Germany) at 2224UTC. All were worked using the Yaesu FT-1000MP MkV at 3-400W with an ACOM 1000 amplifier and G5RV antenna set, in a north-south direction mounted at 15m (45ft).

Eric Masters G0KRT in Worcester Park, Surrey also tried the band finding conditions "rather mediocre". However, running 5W QRP and using c.w. Eric worked SQ1PSA (Poland) at 1841 while 7MHz proved slightly better as PA1MAX (Netherlands) 0945 and SM5CBC (Sweden) at 1549 both made his QRP log.

Next, Eric's 100W s.s.b. found an interesting contact with **Phil MM6PGL/P** at 1614UTC who was on a yacht moored off the Isle of Bute, using a 53ft vertical and a 'ground' to the sea via a copper cable. Using 10W from a wind powered generator charging his batteries, Phil's signal was 5/9+ with Eric who was operating a Kenwood TS-570.

Also active on 7MHz was **Bill Ward 2E0BWX** in Edwinstowe in the heart of Sherwood Forest. Bill uses an Icom IC-7400 and SRC X65 end-fed wire for the band and using s.s.b. logged TM0RDR (France) at 0825. This was a special call to celebrate the race of sailing ship across the Atlantic called "la Route du Rhum" (the route of rum), which takes place every four years between Saint Malo in France and Point a Pitre an Islands of the French Antilles. The QSL route via F4FJH and Hugh Gibson F/G6AIG/P south of Paris at 1245UTC.

The 14MHz Band

On the 14MHz band the log from **Colin Godwin 2E0BSW** in Malvern, Worcestershire shows contacts with PD0HQF (Netherlands) 1455, E75MC (Bosnia & Herzegovina) 1527, and SX7W/P (Greece) at 1849.This was a special call for the 2010 IARU R1 Field Day Contest (QSL via SV7CU). Then came OH7KBF (Finland) 1859, DOZ5EV (Denmark) 2225 and IZ8FWN (Italy) 2240.

Using PSK31 for the first time, Colin worked F4EZD (France) 1457, UX4LX (Ukraine) 2245 and W2GSB/LH (USA) NA-026 at 2255.~The latter was the Great South Bay Amateur Radio Club with a special call for the annual radio weekend at Fire Island Lighthouse ILLW #US019. The QSL Direct route is to POB 1356, West Babylon, NY 11704.

Colin was running an Icom IC-703 with 10W PSK31 to an inverted half-sized G5RV.

Also on the band was **Martyn Medcalf M3VAM** in Chelmsford, Essex who managed voice contacts with RZ1ZZ (European Russia) 0933. Next came YO8TOH (Romania) 1121, 9A/DL7CB (Croatia) on Ugljan Isl EU-170 which is part of the Dalmatia North group at 1213. Martyn was using a Yaesu FT-897 into a Comet CHA-250BX antenna.

In Biggleswade, Bedfordshire **Owen Williams G0PHY** used a Yaesu FT-747 and 100W to a dipole to find **Steve Tellinius-Lowe 9M6DXX/P** (East Malaysia) operating from Sebatik Island OC-295 at 1755UTC (QSL via M0URX).

Note: Steve 9M6DXX has visited 83 DXCC entities and operated from 37 of them. He's the author of the book *World Licensing and Operating Directory*, a guide to getting on the air from over 200 countries and territories around the world, published by the RSGB. So, if you are looking for a competitive station to rent or would simply like to complement your holiday with some Amateur Radio operating from an unusual location then Steve's book could be the reference source for you.

Back to-Biggleswade – where Owen continues his report, "I thought I had worked the station at the United Nations

The QSL from W2GSB after he was worked by Colin 2E0BSW on14MHz s.s.b.

The VK3IO QSL sent after he was worked by Geoff M1EDF on 10MHz c.w.

The PH9GFB QSL sent after he was worked by Peter MI5JYK on 18MHz s.s.b.

HQ in New York City 4U1UN as he was very strong and came back to my call immediately. However, it was too good to be true as the operator turned out to be a pirate. The roof at the UN HQ is undergoing repairs and the station has been off the air for sometime. Interestingly, if he was a pirate he also had the cheek to 'Twitter'' (a Social Networking site) that 4U1UN would be active that weekend".

In Edwinstowe Bill 2E0BWX changed mode to s.s.b. and with 50W and had QSOs with IK2IGS (Italy) 0950, LA2T (Norway) 1012, R6FS (European Russia) 1405 and SP9YFF (Poland) .

Meanwhile, with 25W and PSK31 found HA7RM (Hungary) 0829, YU1PJ (Serbia) 0930, SP3SLO (Poland) 1012, RU9SL (Asiatic Russia) 1257 and S54G (Slovenia) at 1555UTC using his Diamond CP-6 vertical.

The log from GB1MT included UA9CED (Asiatic Russia) 0827, 4K6FO (Azerbaijan) 0912, EA8TL (Canary Islands) AF-004 at 0948, 8P6GU (Barbados) NA-021 at 0958, NP3B (Puerto Rico) NA-099 at 1331, VE2ARQ (Canada) 1354. He also worked 9K2OK (Kuwait) 1355, TA4/DG1RYC (Turkey) 1530, 4Z5PG (Israel) 1534. Next came UA2FFD (Kaliningrad) 1600, KG4WV (Guantanamo Bay) NA-015 at 1607UT. This time he was using the Comet H422 antenna in a 'V' configuration at 7m which behaved itself this month!

The 18, 21 & 24MHz Bands

On to 18MHz now and to the log from **Peter Lowrie MI5JYK** in Newtownabbey, Northern Ireland. Peter has built another two radial wire GP for the band on a fishing 'roach pole', which was 'bungeed' to a wooden fence with the feedline about 4 metres above ground. He was very pleased with the s.s.b. results running under 5W QRP from a Yaesu FT-817. Contacts included OH2BV (Finland) 1002, RA9WLW (Asiatic Russia) 1125, DL6SBF (Germany) 1235, CT3FT (Madeira Island) AF-014 at 1251, OX3KQ (Greenland) NA-018 at 1321, TK5XN (Corsica) EU-014 at 1347, LZ4OC (Bulgaria) 1415. Then came OM6AT (Slovakia) 1435, HB9TUS (Switzerland) 1437, and PH9GFB (Netherlands) 1450 – a call for the Scout's Jamboree. Then hecworked ON3WAB/P (Belgium) at the Nature Reserve Knokke-Heist WFF-ONFF116 at 1507. Next on the list was 5B50AIF (Cyprus) AS-004 at 1524 with a special call celebrating 50 years of the Republic of Cyprus (QSL direct to EB7DX). Logged next was ER3ZZ (Moldova) 1531, EA7IQQ (Spain) 1545, IH9YMC (Italy) on Pantelleria Island AF-018 at 1759, and finally EA8MT (Canary Islands) 1814UTC – which is excellent going considering band conditions and Peter's very low power.

Also on the band was Bill 2E0BWX who used 25W and PSK31 with his vertical antenna to contact 9A5ZM (Croatia) at 0824, while Owen G0PHY managed one contact on 21MHz with PJ4W (Bonaire) breaking the huge pile up on the first day at 1645UTC.

The 18MHz band had a good deal of contacts for John as GB1MT was in demand again as a large number of stations worked him here including YO5OHO (Romania) 1054, UT7LA (Ukraine) 1057, and ES3RD (Estonia) 1324. Then came HS0ZIN (Thailand) 1334. Much further south was KP4BJD (Puerto Rico) who entered the log at 1430, VE1YX (Canada) 1435, and 5Z4FM (Kenya) 1520. Finally, John worked EB8CMT (Canary Islands) 1550 and 9H1FL (Malta) EU-023 at 1559UTC – once again with the Comet H422 antenna.

The 24MHz band was favoured by **Tom Kelly EI2AJ** who found the band in reasonable shape one morning. Tom worked (using c.w.) US8IX (Ukraine) 1138, RM5O (European Russia) 1142, SM5CCE (Sweden) 1150 and ER20D (Moldova) at 1157UTC . All entered his QRP log after he used his Yaesu FT-817 and inverted 'V' dipole antenna.

Signing Off

That's it for this month and indeed the year! There's just space to include a small plea for help from **Kadek YB9BU** (ex YC9BU) who has lost all his logs and QSL cards in a fire that destroyed his home in April 2007. He would like to apply for DXCC, WAZ and WAS awards and asks that if you have ever worked either YC9BU or YB9BU after 2003 – could you please send a replacement QSL card so he can rebuild his collection.

My thanks to all those who have contributed to the column this year and to all our reporters for their logs and activity reports. Thanks also to **Maurio Pregliasco I1JQJ/KB2TJM** editor of the ***425 DX Newsletter*** for all the DX information. Until next month I wish you all good DX and a very Happy Christmas. 73, Carl GW0VSW.

PW

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Threshold or Fringe Howl Phenomenon

Phil Cadman G4JCP dons his brown dustcoat – and a sprig of holly – as he's on duty in the shop this month!

Yuletide greetings, one and all. Welcome to my final festive foray into the *Valve & Vintage* (*V&V*) 'shop' for 2010. Last time I was on duty, I covered – in some detail – the operation of the regenerative detector. Unfortunately, Figs. 3 and 4 (page 57 of the September '10 PW) were incorrectly numbered: the descriptive text under each figure was correct, but the numbers '3' and '4' were swapped. Hopefully, the explanations of the figures in the main text should have made the mistake obvious. Nevertheless, my apologies.

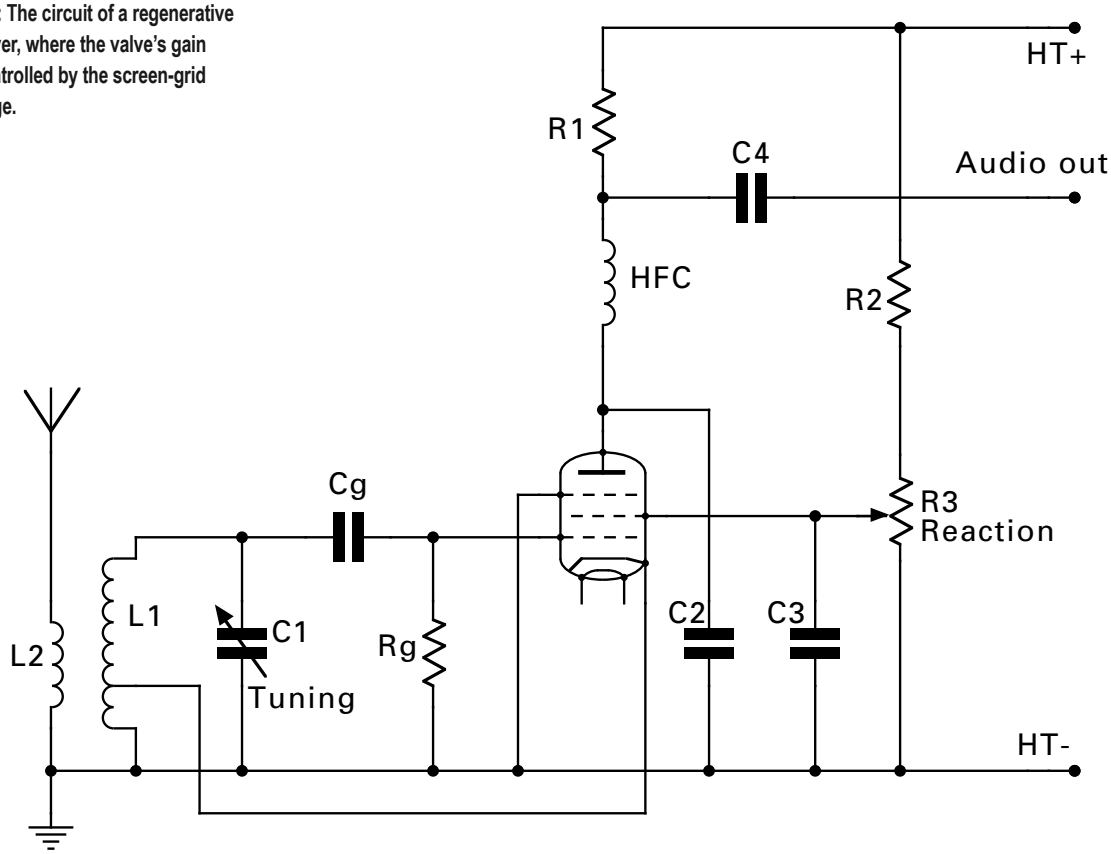
The example I chose, employed a triode valve and regeneration was provided by a separate winding inductively coupled to the grid circuit. Historically, the audio frequency (a.f.) anode load was often an interstage transformer, or possibly an a.f. choke. One reason for this love of iron was the high cost of high tension (h.t.) batteries – you didn't waste precious volts in resistive anode loads. Furthermore, inductive coupling maximised the gain obtainable from each stage.

Threshold Howl

Unfortunately, the inductively coupled circuits can be prone to a phenomenon known as 'threshold' or 'fringe' howl. This is an audio oscillation which occurs just as the detector reaches maximum sensitivity. Authoritative texts state that the effect may occur when the a.f. load impedance in the triode's anode circuit is inductive. It can be cured by replacing the transformer with a resistor, or by shunting the primary with a sufficiently low value resistor.

Unless you wish to recreate a vintage circuit with some accuracy, it's clearly simpler – and much cheaper – to use a resistor load rather than a transformer or choke. But remember to raise the supply voltage to maintain the triode's anode at the correct potential. Another way to beat threshold howl is to use a pentode rather than a triode valve. In

Fig. 1: The circuit of a regenerative receiver, where the valve's gain is controlled by the screen-grid voltage.



fact, the pentode is favoured by many enthusiasts but it's usually found in a different kind of regenerative circuit, such as that shown here in **Fig. 1**.

Our observant readers will notice the similarity of this circuit to a Hartley oscillator. Indeed, when oscillating, its operation is similar, although the value of Rg is much higher than it would be in an oscillator. In this circuit, the amount of inductive feedback is fixed, determined by the position of the cathode tap on the grid coil L1.

Usually, the tapping is around 10% of the total number of turns, and it should be adjusted so that oscillation occurs with between 20 and 50V on the screen grid. Interestingly, some texts say 20 to 40V, others say 30 to 50V, so take your pick!

Unlike the circuit I featured last time, where the feedback was adjusted by varying the amount of radio frequency (r.f.) current fed through the feedback winding, in Fig. 1 it's the gain of the pentode valve that's altered. In normal circumstances the gain of a valve is proportional to its cathode current and here the cathode current is varied by increasing or decreasing the screen grid voltage. This allows the gain of the valve to be adjusted over quite a wide range.

It can be a little difficult to visualise the feedback mechanism, but if you were to 'stand' on the cathode, looking around you'd see most of L1 was between the cathode and the control grid. However, part of L1 appears between the cathode and the screen grid and anode. Note, as far as r.f. signals are concerned, both the screen grid and anode are at earth potential; C2 and C3 providing the necessary paths. So, relative to the cathode, L1 couples energy from the anode/screen circuit to the grid circuit. (Sorry, I know it's confusing).

Component-wise, L1 and C1 are tuned to the required frequency and the time constant of RgCg should be long compared to the period of the carrier frequency. Values of 1MΩ for Rg and 100pF for Cg again work well. Capacitor C2 is of the order of 100pF and its purpose is to provide a low impedance path to earth (h.t.-) for r.f. currents, while presenting a relatively high impedance at audio frequencies.

The capacitor C3, typically 1µF, de-couples the screen to earth at both audio and r.f frequencies. Coupling capacitor C4 is typically between 10 and 100nF. With an h.t. supply of 200 to 250V, try 47kΩ for R1, 100kΩ to 150kΩ for R2, and R3 can be a 47kΩ potentiometer.

Automatic Again Control Effect

One point I omitted to mention last time was the automatic gain control (a.g.c.) effect these regenerative detectors exhibit. When a signal is received the average cathode current reduces due to the negative voltage developed at the control grid. Just like reducing the screen voltage of the pentode detector above, this reduction of cathode current reduces the gain of the valve. So the detector has a limited – but still worthwhile – a.g.c. characteristic.

The a.g.c. action becomes extremely useful when receiving c.w. signals. As the detector is brought into oscillation and oscillations build up, a proportional negative voltage will build up on the control grid. As before, this negative voltage will lower the cathode current and hence the gain of the valve. Oscillations will then cease to build up, quickly attaining a stable level. Thus the detector – if correctly adjusted –-will hold itself at the point of gentle oscillations, which is the ideal spot for receiving weak c.w. signals.

Before leaving the regenerative detector (hooray! do I hear you say), may I thank **Charles Miller**. He kindly informed me that the resistor values in the triode circuit from October 1946 (featured last time) were **not** misprints. Apparently, for many years the upper case omega (Ω) was used to denote one million ohms – while the lower case omega (ω) was used for units of ohms.

Suppressor Grid Modulation

Back in my June 2010 column I mentioned suppressor grid amplitude modulation (a.m.). This is the technique when the modulating waveform is applied to the suppressor grid of a pentode power valve). Suppressor grid modulation can only be used with true pentodes, and even then the valve has to have suitable characteristics if it's to produce good quality modulation.

Shortly after publication, I received an Email from **Terry Pickett G1VIE** who drew my attention to the **CV4055**, which from its characteristics seemed to be a potential candidate. However, having found both pictures and a description of the CV4055 on the Internet, things didn't look so good. Instead of a suppressor grid, the valve is really a tetrode with four vertical rods positioned between the screen grid and anode. Each rod is located on a line between a corner of the rectangular cathode and the anode structure. This – at least to me – is a very unusual arrangement of electrodes and I wonder if there are any more examples.

Norman Minter Search

Also in my June column, I asked for information about a gentleman by the name of **Norman Preston Vincer Minter**. He used to contribute construction articles to *The Wireless World* in the 1920s. I asked because, using the pseudonym of 'Free Grid', he was the author of all those 'Unbiased' columns in *Wireless World*. I was reminded of this fact when I recently read through the April 1971 – the magazine's 60th anniversary – issue of *WW*.

I suppose at Christmastide people are wont to look back over the year about to close, and also over longer periods of time. And this column is no exception! In fact, those of you with a modicum of mathematical mental ability will have realised that April 2011 will be the centenary of *Wireless World*. Alas, *WW* is no longer the magazine we once knew and loved, having evolved into *Electronics World*, and it now caters for an entirely different audience to that of its illustrious forebear.

Actually, *WW* didn't begin life as *Wireless World*. It initially came into being as *The Marconigraph*, a journal published by the Marconi Company. The first issue appeared in April 1911 and was mainly intended for Marconi engineers, marine operators and others interested in the Marconi Company. Exactly two years later, after it was decided to broaden the scope of the magazine and put it on sale on bookstalls, the name was changed to *The Wireless World*.

In those early days *WW* was published monthly, but it was soon to appear every week. A situation that continued until the outbreak of the Second World War when it returned to a monthly publishing schedule. Even our beloved *PW* suffered the same fate and both magazines continued as monthly publications thereafter. It was jokingly said that 'professional' engineers never admitted to reading *Wireless World*. But even a cursory glance at the contents and the adverts clearly showed that both the publishers and the advertisers knew full well they did!

Despite the publishing restrictions imposed by war, I believe this period signalled the beginning of the *WW* magazine that radio and electronics engineers took to their hearts. While

the content never catered for the raw beginner, most of the articles were written in such as way as to be understood by anybody with a good grounding in electronics. In particular, the educational articles by the legendary 'Cathode Ray' – a pseudonym of **M. G. Scroggie** of *Foundations of Wireless* fame – clearly explained both simple and complex subjects. No doubt to the benefit of countless grateful electronics students (and probably a fair few professionals too).

Not being tied to one branch of electronics, over the years *WW* provided some notable yet diverse, 'classic' articles. Such as **D.T.N. Williamson's** famous amplifier, still regarded as an important step on the road to high fidelity audio reproduction. Later on, **Peter Walker** (of **Quad** fame) and **John Linsley hood** provided 'sensible' Hi-Fi enthusiasts with both good solid audio designs and theoretical articles.

But I suppose the article which will forever remain the most famous – and certainly the most prophetic is the one entitled 'Extra Terrestrial Relays' by (the then unknown) **Arthur C. Clarke**. The article appeared in the *WW* issue of October 1945, and in it Clarke introduced the concept of geostationary satellites and correctly anticipated their potential for both reliable long distance communication and for broadcasting. (*The region of space where the satellite 'sit' is now known as the Clarke Belt. **Editor***).

Wireless World sometimes provided a platform for the more heretical amongst us. In the late 1970s and into the 1980s, there were articles – and innumerable letters in response – by **Louis Essen** and **Herbert Dingle** which cast doubt on Einstein's Theory of Relativity. Then there were the thought provoking articles on electromagnetic theory by the inimitable **Ivor Catt**. I'm pleased to say that much of their work is now available on the Internet, because whether you agree with these gentlemen or not, they do 'make you think'.

In addition to the serious side of *WW*, there was nearly always some humour within its pages. I've already mentioned Free Grid, but there were others, notably 'Diallist' - a contemporary of Free Grid – and his 'Random Radiations'. When I was a regular subscriber, light relief was provided by 'Real and Imaginary' by 'Vector'. And it was he who penned the 'Salute to Free Grid' in the 60th anniversary issue in April 1971.

I think Vector had a strong poetic nature as he produced some hilarious poems and prose over the years. And of course, the April issues were hardly ever devoid of some spoof article or other. By the way, does anybody know who Diallist and Vector were?

Fig. 2: The front cover of the 60th anniversary issue of *Wireless World* that was published for April 1971.

Sad to say, the rise and fall of *WW* seemed – to me at least – to mirror the rise and fall of the British radio and electronics industry itself. I learned an awful lot from *Wireless World* and I wish I had every issue that was ever printed. Not living in a huge mansion, that would be out of the question – even if I could track down every copy! Still, maybe one day they will become available on CD or similar. I hope so.

The KW76 Receiver

Finally, a couple of points before I go QRT for this session. First, a question about the KW76 receiver, which was manufactured by KW Electronics around 1960. This unusual looking valved receiver was made specifically for mobile installations – but it seems to have had a very short production life.

Looking at KW advertisements throughout 1960, the set was only advertised for a few months and then disappeared. Can any *Valve & Vintage* reader offer an explanation? Indeed, are there any KW76 receivers still in existence, possibly even working?

I often look through old magazines and marvel at the professional appearance of many of the construction projects. Even the more mundane items were usually very well built, just consider the seemingly innumerable early solid state and valved receivers and transmitters produced for *PW*. And what about the multitude of things constructed by the readers of *PW* - and readers of other radio magazines – over the years. Where have they all gone?*

***Note:** I wrote the December* Keylines *before seeing Phil G4JCP's plaintive query. If you are a constructor with samples of old* PW *projects. Phil and I would be delighted to hear from you. **Editor**.*

While many items may have been stripped for parts or even thrown away, a sizeable number must remain. Can I respectfully ask every 'old timer' to see what is lurking in their loft or shed. Home construction seems to become ever more a case of populating a printed circuit board or just assembling a few modules and putting them in a plastic box. (And I won't even mention surface mount technology!) It may well prove prudent to take good care of older home constructed equipment, as one day it could become as valued as a 1920s crystal set.

And with that, do have a merry Christmas and a happy New Year and please send your comments and letters to me, either via E-mail to: **phil@g4jcp.freeserve.co.uk**, or by mail to: **21 Scott's Green Close, Scott's Green, Dudley, West Midlands DY1 2DX**. Happy Christmas!

PW

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. Now is the time to start a Spectrum Defence Fund – not just to fight the PLT issue but other threats as and when they come up. The RSGB intends to challenge Ofcom's interpretation of the various Acts and Directives in respect of the PLA/PLT threat. We aren't looking to remove Comtrend and other such devices from the market place – that's an expectation too far, neither are we likely to see rapid results. What we are looking for, among other things, is to challenge Ofcom on their duty to ensure that in the future, non-compliant items such as Comtrend, are not put on the market.

A Judicial Review would likely cost in the region of £75,000 but could be a lot more as we'd be taking on organisation with almost unlimited funds to defend their corner who could, if they so desired, play a very long game that in turn we'd have to match. If every amateur in the UK pledged £10 to the Spectrum Defence Fund we'd probably have enough to fight the case 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!

Help us protect the future of Amateur Radio

Please donate online at

www.rsgb.org/defencefund

You can also donate by post by sending a cheque payable to 'The Spectrum Defence Fund' and sending it to; Spectrum Defence, RSGB, 3 Abbey Court, Fraser Road, Priory Business Park, Bedford, MK443WH. The 'Spectrum Defence Fund' is a secure and independently audited fund, the proceeds of which will only be used in defence of the radio spectrum.

Spectrum Defence Fund

Advertising space kindly donated to the Spectrum Defence Fund by PW Publishing

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E-mail: G3LLL@talktalk.net

How Accurate Are Those Power Meters?

Harry Leeming G3LLL looks back to his time running a well known Amateur Radio shop and interesting times with his customers!

Welcome to *In The Shop* (*ITS*) where I look back to my time running Holdings in Blackburn, Lancashire, where we had an interesting time selling and repairing Amateur Radio, TV and hi-fi equipment, specialising in Yaesu gear. But it's back to modern times first when '*Joe*' sent me an E-mail asking if I could recommend an accurate high frequency (h.f.) power meter.

It's now about 12 years since I closed the shop – so I'm not familiar with the latest offerings. I did however, try to look up some specifications. Even the manufacturers' web sites don't seem to make claims for accuracy in many cases. Either they are 'hiding their light under a bushel' or they don't want to admit that making an accurate power meter is difficult.

I discovered links on one well known supplier's web site to their user manuals and these claim 5% accuracy on most of the h.f. range power meters. An E-mail to them asking "5% of what?" received a reply claiming that they checked their meters against a professional meter – which itself claimed an accuracy of ±5%! Another maker of s.w.r./power meters claimed 10% in the only specification I could find.

In practice, radio frequency (r.f.) power is difficult to measure accurately. Probably the most famous r.f. power meter of all, against which others are judged, is the Bird Thruline (pictured). But even this instrument (which costs hundreds of pounds,) only claims 5% accuracy! So, what does all this mean? If a power meter claims to measure the power of a steady carrier, to an accuracy of ±10%, and the meter reads 50W when checking your rig, will the actual power be correct within the range 45 to 55W? Well no, this is not how most test meter makers rate their accuracy!

Nowadays, you'll find the percentage accuracy of nearly all kinds of test meter relates to full scale deflection (FSD). If you set your meter on the 200W range and it has an accuracy 10%, its guaranteed accuracy is ±10% of 200W, or ±20W. If it reads 50W on this range, the actual power output then could be could be anything between 30 and 70W, and the meter would still be within specification. To be fair, most power meters I've tried are better than this But you should certainly not take readings below half scale as 'spot on' and don't ask for 'an accurate power meter' unless you want to spend a lot of money!

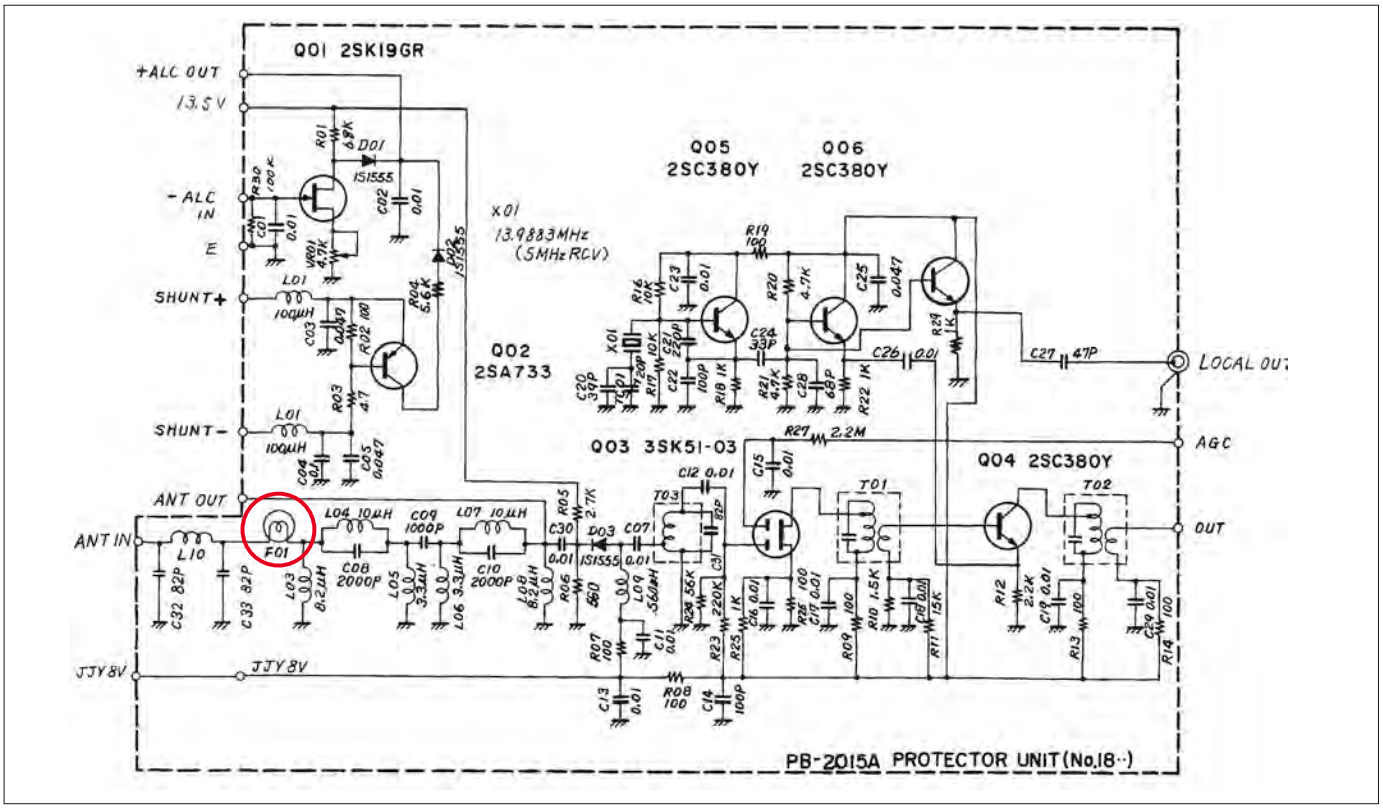

Fig. 1: On the FT-107 rig the antenna signal fuse is shown (ringed in red) as being on the p.a. stage protection board.

Demonstration Station Dangers

Chris Hoare G4AJA kindly sent me the following , "I purchased a brand new FT-757GX2 in 1987, this being my first h.f. rig with a transistorised p.a. Being used to a KW-2000E with 6146B p.a. valves I was a bit worried about blowing up the FT-757.

"As it happens the Post Office had just purchased a second-hand ex-Home Office RIS transit van. This was a wonderful bit of kit with a 24ft pump-up mast, one-way glass windows, a big separate 12V equipment battery and a long bench for mounting equipment. We called it 'Bertha'. One of my bosses was involved with a local Scout troop and persuaded me to set up a JOTA station for them based in Bertha.

"We were tuning up the antenna (a G5RV fed with 300Ω feeder) using the FT-757 on low power running from the vehicle's equipment battery. When we had got a reasonable v.s.w.r. I was increasing the power output using the drive control when there was a bang and everything went dead. ("Well I'm blessed I remarked!").

"This was because I had forgotten that the vehicle supply was fused at 5A, and it couldn't provide the 20A needed by the FT-757 on full power. It wasn't a problem as we had a car battery to hand and so we connected the rig up to this.

Probably the most well-known s.w.r. and power meter, the Bird Thru-line uses separate sensors for differing power levels and frequencies.

But I was then rather concerned to find that the FT-757 remained dead when the power switch was turned on.

"The reason for this was that, whilst tuning up, the MOX switch had been pressed and consequently was still pressed. The FT-757 will not power up with the MOX switch pressed. This isn't a bad idea – but it took me a while to figure it out and I thought that I had 'done in' the p.a. - Hi! We never got very good audio reports using the FT-757 from a 12V battery and I came to the conclusion that it really needed 13.6V to work properly".

Thanks for that Chris! You learned a lesson that I also learnt when trying to do a demo at the local technical college. Instead of using my own equipment I decided to take along, what was at that time, the new 'all singing all dancing' FT-757, and I just could not get my a.t.u. to tune correctly. Eventually, I noticed that while I was listening and doing the initial peaking on 3.5MHz, the memory was sending the rig over to 7MHz when I transmitted. Yes we all do silly things and I learned something from the experience! So, remember this: **Never** use equipment that you are not 200% familiar with in public. Always try out the demonstration station first.

Fuse Lamps

'**Thomas**' had arrived at the shop with his FT-707, and explained that it had been working well until it was hooked up with a mobile station on 3.5MHz. Finding that 'Bert' the other operator was only a few miles away, he invited him round for a meeting. As Bert came nearer the QTH, the S-Meter on the FT-707 went hard over, and then, whilst he didn't think anything of it at the time, dropped back to S9 as Bert parked. However, the next time Thomas tried his FT-707, the receiver was extremely deaf and would only just about pick up the strongest 41m band broadcast stations.

When confronted with a 'deaf' Yaesu

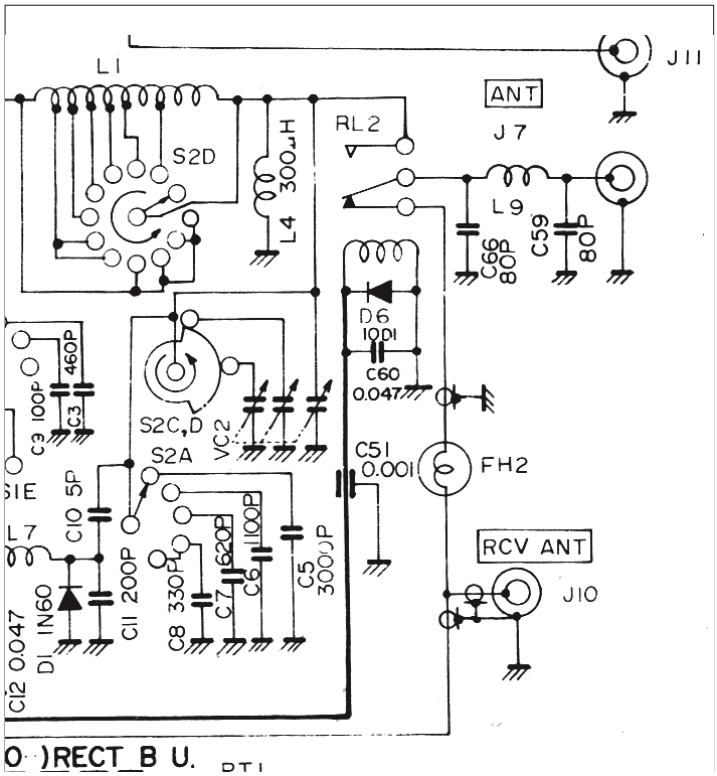

Fig. 2: On the FT-101ZD, the fuse (FH2) is fitted after the antenna changeover relay, and in line with the receiver signal input.

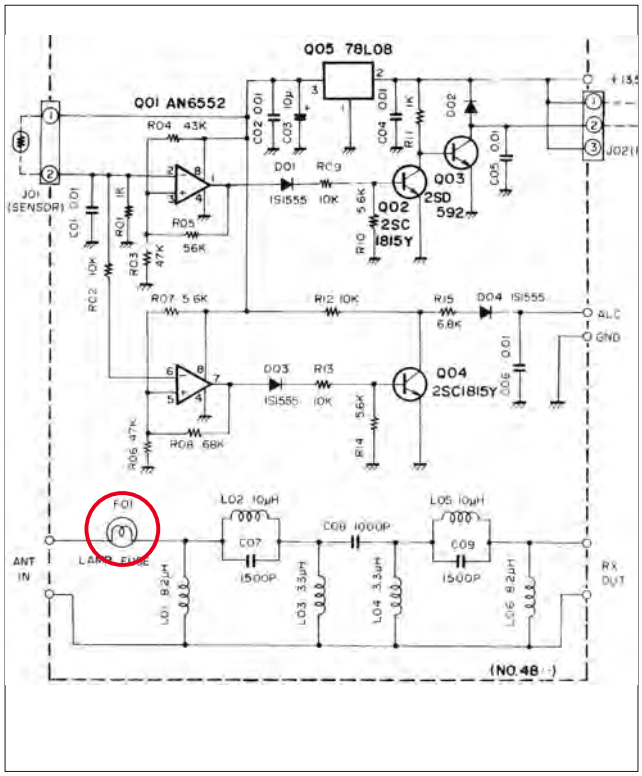

Fig. 3: On the FT-707 circuit diagram the antenna fuse (F01, ringed in red) appears on the fan motor control area of the circuit diagram.

h.f. rig, the lamp fuse is the first thing I suspect. These are used extensively in Yaesu h.f. equipment to protect the front end from being overloaded and damaged, and were a 'nice little earner' when we had the shop!

On most rigs (apart from the FT-102), the lamp fuse comes somewhere after the antenna change-over relay, and before the feed point for the crystal calibrator. If the lamp blows, you'll find that when you switch on the calibrator, this will still read 'S9+' as per normal, but signals from the antenna will be severely weakened. This was the cause of the trouble Thomas experienced – all I had to do was to dismantle his rig and fit a new lamp.

The fuse is in series with the input to the receiver and is clearly shown on the circuit diagrams. Visits from mobile stations weren't a common cause of a failure, the more likely happening is that the operator has two rigs and has left an unused one connected to an antenna, or even a long badly shielded patch lead, whilst transmitting. (Last month I mentioned the easy-to-get at the lamp fuse in the back of the early FT-101s).

Finding the FT-101 fuse must have been too simple and so Yaesu have made a much better job of hiding the antenna fuse lamp on most of their other h.f. rigs! In the case of the FT-707 it is on the 'Fan motor control unit panel' (well where else would you expect it to be?). On the FT-101ZD and the FT-902 the fuse is mounted on the edge of the underside of the p.a. compartment, whilst on the FT-107 it's mounted on the p.a. protection unit's circuit panel. (Shown as F01 in the lower left-hand side of **Fig. 1**).

In the absence of a full service manual, the only real way of finding the fuse is to start at the receiver input – and then trace the wiring backwards towards the antenna change-over relay. At this point it's worth mentioning that (while it's much less likely) bad contacts on this relay can also cause the same symptoms.

Suitable replacements

A 6 to 8V 100mA lamp will provide good protection, but some seem to attenuate the signal more than others. The best way to try a lamp is to temporally fit it and then try shorting it out whilst receiving a steady signal. Shorting out a lamp should not cause more than a half an S- point increase of signal, if it does the attenuation is too much, try a different type of lamp.

The G3LLL Service Is Free!!

By a strange coincidence, having planned out the previous item, I had an E-mail from the owner of an FT-767, who had experienced just the same trouble while trying to monitor the transmissions of his other rig. Fortunately, I was able to point him in the right direction, and to my pleasant surprise a couple of days later I had another E-mail, thanking me for saving him considerable expense in carriage and service charges and wanting to know how much he owed me.

There's certainly no charge – it's all part of the *PW* service – provided communication is via E-mail, or a stamped address envelope is included. On the other hand if something in *PW* saves you money, why not invest in its future by taking out a subscription?

Low Power Output FT-757

If a rig will not transmit, finding the fault doesn't usually present too many problems. However, when the output is just low – tracing the cause of the trouble can be difficult. You'll have to check: Is the power amplifier short of drive? Or is the fault in the amplifier itself?

To try and make life a little easier, at the shop I had a system which was crude but effective. When I had finished repairing a rig, before reassembling it I took a few readings. I then disconnected the high tension (h.t.) from the output stage, pressed the push-to-talk (p.t.t.), and whistled into the microphone (with the gain at maximum) and also I transmitted on c.w. at full drive. This enabled me to take rough signal level readings with a diode probe at various test points through the intermediate frequencies (i.f.). and radio frequency (r.f.) stages, and to then check the transmit drive into the power amplifier. I then jotted these down on the circuit diagram and they certainly proved to be invaluable!

For example, an FT-757 arrived on my bench with the complaint of "low output power". On some bands the transceiver would give up to 30W output – but on other bands only a few Watts. My 'whistle test' showed that the r.f. input to the power amplifier was only about 25 millivolts (mV) maximum, whereas it should have been a few hundred millivolts. So, what could it be? Shorted turns on an r.f. choke perhaps? I found an odd choke (it wasn't the correct value) but I temporally fitted it in place of L52.To my relief the rig then gave full output – so I obtained and fitted the correct component.

A Good Customer

You can be too smart and well dressed – as one of our Hi-Fi customers (who also owned an internationally known company) found out. At first he was a little difficult to deal with, as perhaps he was only too conscious that people who knew him would see him as a 'money box'. Despite this it wasn't in Blackburn that he was nearly 'taken for a ride'.

One day he came in, and told me that he had just heard a pair of absolutely marvellous loudspeakers in a London showroom. He'd negotiated a very special price and wanted to get them for us to fit to his equipment. I managed to hold back his enthusiasm for a few days, while I enquired from the speaker's importer. I discovered that the pair of speakers did indeed have a recommended retail price tag of around £2000, but this was a few hundred pounds less than the 'very special discounted price' our well healed customer had been quoted!

I couldn't get him on the phone, so I wrote him a letter that started. "Dear Mr **** I would respectfully suggest that the next time you visit a London emporium that you wear your gardening clothes, as the special price you were quoted did not include a discount, but was in fact considerably higher than the recommended retail price", and then I proceeded to advise him as to what cost that we could obtain the speakers for. Perhaps I was pushing my luck – but the letter broke the ice! He was most amused, gave us the business and was very friendly from then on.

Sometime later he came to me and said that he would tell me a story that would give me a laugh at his expense. He had been on holiday in the Caribbean, and got talking to an American. As he was a major exporter, and as the technology and products he had developed in Blackburn were in use all over the World, he expected that his company's name would be recognised, but no, the Yank had never heard of it! However, as soon as he mentioned Blackburn – the American said, "Oh yes I know that, it's where Holdings Ham Radio are based!"

Being known is one thing – it's a pity that I didn't have his gift of converting technology into cash!

Jeff's Problem

'**Jeff**' E-mailed me with a problem. He had a linear with a pair 572B valves that worked okay but one has a loose glass envelope. Someone had previously tried sticking it with epoxy adhesive but without much success. Any suggestions readers?

Do have a good peaceful and happy Christmas. And don't worry about the introduction of higher VAT in the New Year – we had to survive years ago when it was 25%! 73s Harry.

PW

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

Welcome to the world of Morse!

Roger Cooke G3LDI invites you to enjoy Amateur Radio on the key.

Welcome to the *Morse Mode*! The Norfolk Amateur Radio Club recently lost Peter Lock M0RYB due to the fact he's emigrated. Peter regularly took part in all the RSGB contests, all modes and lots of other contests besides and is now resident in Rushworth, Victoria, Australia as VK3BYR. Peter's gear should arrive shortly so he will be looking for c.w. contacts in the UK!

Peter says that there are two local clubs, one in Shepperton, 30 miles away, and the other in Bendigo, 40 miles drive from Rushworth – quite local in VK terms! Peter will find that **www.fistsdownunder.org/** shows Morse is alive and well in VK!

Mouse-Paddle Or Paddle-Mouse?

Martyn Jones GW6ITJ has written a program to change a mouse into a paddle, a novel innovation. Full details and the file download are available from here: **http://sites.google.com/site/gw6itj/morse-code/pc-cw-keyer**

Basically use your mouse buttons as the paddles or 'adapt' an old mouse to connect to your paddle and away you go. There are some screen shots to see on the site. Pitch, speed and a 'fine tune' on the mark are adjustable. Have a look and see what you think – criticism is more than welcome to improve it. Contact Martyn via **martynjones1@hotmail.com**

Learning With A Straight Key

As I have said before, learning to send on a straight key (SK) is part of the method I use, although it has to be said, that not many people stick with a straight key these days. However, the technique is always very useful to have, especially when **Straight Key Nights** (SKNs) come along.

If you can send good Morse on a straight key, it's an art form you should be proud of. To this end, **Robert Walker M0BPT** has written to me saying that he is more than willing to help. Robert says he would be happy to be put on a list of volunteers willing to visit students learning the code in his area, to perhaps mentor them in sending on a SK (character formation-spacing, etc.) to help the cause. Robert lives in West Bromwich and you can E-mail him at: **m0bpt@yahoo.co.uk**

Fig. 1: Neil Carr G0JHC, who has been awarded the prestigious Royal Order of Transatlantic Brass Pounders trophy for 2010.

The ROTAB Trophy

Neil Carr G0JHC has been awarded the prestigious **Royal Order of Transatlantic Brass Pounders** trophy for 2010, **Fig. 1**. This award recognises consistent and outstanding DX work. It was first awarded in 1924 and the original members of the order were those that took part in the trans-Atlantic tests. Why is this appropriate for this column? Well, Neil has a lovely statement on **www.qrz.com** that is applicable to this mode.

Take a look at Neil's qrz.com entry and his amazing achievements. It makes interesting reading, especially the 10 band DXCC. Neil certainly has been a busy boy on the DX bands and mostly on c.w, too. It will provide you with incentive and a target to aim for.

Straight Key Weekend January 2011

The **First Class Operators Club** (FOC) Straight Key Weekend was well supported last year by both members and non members alike and the FOC Committee has agreed it can be part of the c.w. calendar again. The idea is not to have a contest – but to be active using any mechanical keys such as the semi automatic bug, the side swiper or the pump type straight key across all bands 25kHz up.

Whilst many operators use the electronic keyer, there are still a sizeable number who are proficient on the older style keys and FOC recognises the value of preserving these old, yet valuable skills.

The weekend of **January 1st and 2nd 2011** has been suggested as fairly free again with no major contests on the bands. So, you and your club operators are invited to join FOC on all bands with your straight key, bug key or any other mechanical keying device. (We'll leave it up to you what to use!).

The timing will follow the FOC BWQP event timing and start at 0000z and finish at 2359z over the Saturday and Sunday weekend. There are no prescribed operating bands or times - just be active as band conditions permit. It would be helpful if c.w. operators could put this information on club reflectors.

Please send your comments on contacts and working conditions to G3VTT by E-mail at: **g3vtt@aol.com** or post to them (QTHR) before the end of January. A log is not needed – but comments about the types of keys heard and the best 'fist' would make interesting reading. The FOC Public Website is at **www.g4foc.org**

73 and May the Morse be with you for 2011! Roger G3LDI **PW**

Classified Ads

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Some of the products offered for sale in advertisements in this magazine may have been obtained from abroad or from unauthorised sources. ***Practical Wireless*** advises readers contemplating mail order to enquire whether the products are suitable for use in the UK and have full after-sales back-up available. The publishers of ***Practical Wireless*** wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.

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E-mail: vincentvoy@hotmail.co.uk

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The prepaid rate for classified advertisements is 42 pence per word (minimum 12 words), box number 70p extra. Semi-display setting £13.90 per single column centimetre (minimum 3cm). Please add 17.5% VAT to the total. All cheques, postal orders, etc., to be made payable to PW Publishing Ltd. Advertisements, together with remittance, should be sent to the Classified Advertisement Dept., Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: 0845 803 1979, Fax: 01202 659950.

Please insert this advertisement in the ..... **issue of *Practical Wireless*** (if you do not specify an issue we will insert it in the next available issue of *PW*) for ..... insertion/s. I enclose Cheque/P.O. for £.....(42p per word, 12 minimum, please add 17.5% VAT to total).

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Advertisements from traders or for equipment that it is illegal to possess, use or which cannot be licensed in the UK, will not be accepted.

No responsibility will be taken for errors and no correspondence will be entered into on any decision taken by the Editor on any of these conditions.

You should state clearly in your advert whether equipment is professionally built, home-brewed or modified.

The Publishers of *Practical Wireless* also wish to point out that it is the responsibility of the buyer to ascertain the suitability of goods offered for purchase.

As of the February issue of *Practical Wireless*, Bargain Basement adverts will cost £5 per advert (subscribers still free) and will also be published in *RadioUser*, our sister magazine, unless requested otherwise.

FOR SALE

ONE 2.2KW 240V A.C. output four stroke petrol-engined portable generator (fits in rear of estate car). Never used, £180. Also, small, very portable, 750W 240V two-stroke petrol-engined generator. Never used, £70. Buyers must collect. Both generators were purchased for use with GB75PW but were not required. Tel: Rob Mannion G3XFD 01202 659910 (Broadstone, Dorset).

CLASSIC EDDYSTONE RX 730/1A serial No. BH0181 with manual and round Eddystone speaker, £140. Also, several high resistance headphones 2000Ω Marconi SG Brown types. Buyer collects. Tel: Nigel 01844 353823 (Oxon).

ICOM IC-7000 HF, VHF, UHF transceiver, in original box with manuals, mic, remote kit and LDG AT7000 automatic ATU all in mint condition. LDG is not in original box. £780 plus P&P. Tel: Colyn 0762 4413036.

KENWOOD TS-570DGE boxed, mint, £450. Yaesu FT-817ND, 6 months old, boxed, £320. Icom IC-R100 receiver, boxed, £100. Mydel MP-250 PSU, £45. MFJ-1040C pre-selector, 1.8-54MHz, boxed, £60. Tel: John G4XYY 01937 844197 (West Yorks).

ROTATOR advertised by main dealers as AR-300XL or AR788 for VHF/UHF and small HF beams. Bought new July. Used only three weeks. Cost £80, sell £60 including P&P. Tel: John G3EGC 01204 301502 (Bolton). E-mail: jvhoban@02.co.uk

YAESU FT-950 £1000. Nissiei 30A PSU, £100. Both items new, boxed and unused. MFJ-949E deluxe PSU, £100. New condition, boxed morse key, £25. Data interface, as new, £45. All plus carriage. Tel: Ian 01745 570538 (North Wales).

WANTED

DRAKE MN-4, MS-4 KW-77 circuit + handbook. Original or good copy. Drake R-4C, T-4XC, spares, AM filter. Tel: Tibbert 01248 722041 after 6:00pm (Anglesey).

KENWOOD TS-850 preferably one owner from new. Tel: Ian 01745 570538 (North Wales).

OLD HALF INCH FERRITE RODS must be half inch, 12.7mm, in diameter and be six inches long or more. Will pay very good money for the rods. Tel: Peter Tankard 0114 2316321 between 9am and 9pm (Sheffield).

VIBROPLEX single lever paddle. Tel: G3MCK QTHR 01572 756444 before 10:00pm (Oakham).

EXCHANGE

HEATHER LITE – Explorer 1.5kW HF linear amp. Would consider Ameriton AS-500 Solid State or similar. Tel: Conrad 07932 473601 (Croydon). E-mail: c.james1@sky.com

SWAP WANTED! I have a clean/fully working, unmodified aligned R1155A with untarnished dial and perspex window and smart boxed PSU. In return I require an HRO in similar condition. I will come to you and make you a reasonable deal! For a good HRO and coils I will even throw in a Radiovision hand bander 5. Tel: Brian 01843 594732 or 07944 418259 (Kent).

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Name .....

Address .....

..... Post code .....

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Signature ..... Security number

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B.B. Jan '11

TRADERS TABLE

The equipment for sale on this page is secondhand or ex-demonstration

Disclaimer

Advertisements from traders for equipment that is illegal to possess, use or which cannot be licensed in the U.K, will not be accepted. While the publishers will give whatever assistance they can to readers or buyers having complaints, under no circumstance will the magazine accept liability for non-receipt of goods ordered, late delivery or faults in manufacture.

NEVADA

023-9231 3090

TRANSCEIVERS

ALINCO DJ596 D/BAND H/HELD £89
ALINCO DJC7 HANDHELD TX £99
ALINCO DJV17 VHF/FM H/HELD £99
ICOM E91 VHF/UHF FM HANDHELD £169
YAESU FT1000MP MK V TX £1299
YAESU VX3E DUAL BAND HANDHELD £110

HANDHELD SCANNERS

ALINCO DJX2 AM/FM/WFM RADIO £79
ALINCO DJX30 HANDHELD SCANNER £119
BEARCAT 72XLT H/HELD £80
GRE PSR200 SCANNER £59
ICOM R5 HANDHELD SCANNER £145
REALISTIC PRO2006 SCANNER £129

RECEIVERS

ETON MINI 300 PORTABLE £13
YAESU VR5000 RX WITH DSP £435

CB RADIO

KERNOW BETA 5100 MOBILE CB £39

ACCESSORIES

ALINCO EJ47U DIGITAL BOARD £46
AOR VI8200 VOICE INVERTER £40
GLOBAL AT2000 ..... £59
JIM M75 SCANNER PREAMPLIFIER £54
KENWOOD AT230 ..... £99
KENWOOD MC85 MICROPHONE £79
PALSTAR AA30 ..... £69
TOYO SA450 ANTENNA SWITCH £17
UNIROSS CHARGER & BATTERIES £12
YAESU FC30 ATU £165
YAESU MH35A2B SPEAKER MIC £19
INTELLIGENT DIGITAL MULTIMETER £25
CLAMP ON DIGITAL MULTIMETER £10
ROBIN ANALOGUE MULTIMETER £15

B-GRADE ITEMS

ALINCO DJV17 H/HELD TRANSCEIVER £99
BEARCAT 72XLT HANDHELD SCANNER £89
BEARCAT 92XLT HANDHELD SCANNER £99
BEARCAT 800XLT £259
ICOM R5 HANDHELD SCANNER £179
ETON E5 PORTABLE SHORTWAVE RADIO £69
ETON G3 PORTABLE SHORTWAVE RADIO £69
ETON S350 RED PORTABLE RADIO £59
ETON G8 PORTABLE SHORTWAVE RADIO £39
ETON E100 PORTABLE SHORTWAVE RADIO £35
MAYCOM FR100 HANDHELD SCANNER £55
MAHA MH-C9000 CHARGER £39
PALSTAR AA30 RX ATU £89
ROBERTS R861 RECEIVER £140
TEAM ROADCOMM MOBILE CB RADIO £89
YAESU VX8 HANDHELD TRIBAND TX £279

SHORTWAVE SHOP LTD

01202 490099

TRANCEIVERS

YAESU FT-900 ..... £595
YAESU VX-3E £95
YAESU FT-108M/E £95
RCI – 2950 10MTRS MULTIMODE £125
ALINCO DJ-V5 ..... £200
ALINCO DJ-195 ..... £100
ALINCO DJ-S11 ..... £75
ALINCO DR-430 70CMS £85
ICOM PMR 446X2WATER RESIST/W.CHARG £200
MIDLAND CB 77-250K £50
MIDLAND CB 77-805UK £55
MAXON ALERT 7E CB £65
STANDARD HX260E MARINE H/H NEW £99

RECEIVERS

RCA AR-88 WITH MATCHING SPKR ..... £POA
JRC NRD 345 ..... £395
JRC NRD 525 ..... £725
JRC NRD 535 ..... £795
AOR 8200 MK3 DEMO MODEL £349
YAESU FRG-9600 ..... £225
YUPITERU MVT 7300 ..... £99
UNIDEN UBC-800XLT EX DEMO/SOFTWARE £265
BEARCAT UBC-278 BASE EX DEMO £139
REALISTIC PRO 2005 ..... £80
REALISTIC PRO 50 ..... £25
AMI DIGI SAT RX ASR WS201 ..... £129
ALINCO DJX3 ..... £70
WORLD RECEIVER WR2100 ..... £80
GOODMANS GCD200 DAB ..... SPECIAL PRICE £50
BPL WORLD SPACE £25

ACCESSORIES

HI-MOUND HK-708 STRAIGHT KEY £35
AIR MINISTRY 1940 STRAIGHT KEY £45
MILITARY STRAIGHT KEY CIRCA 1940 ..... £35
BHI NEIM 1031 ..... £55
BHI NOISE AWAY ANEM £55
ICOM AH7000 DISCONE £85
CB SIGNAL MASTER LARGE S METER £28
CREATE CLP 5130 LOG PERIODIC NEW £250
ICOM HS-51 SPECIAL BULK PRICE £29
YAESU MD1 B8 DESK MIC £50
YAESU XF-110CN FILTER £55
YAESU XF-110S FILTER £55
YAESU YSK-900 SEPARATION KIT £65
AKD WA3 ABS WAVE METER £25
AEA PK-88 PACKET CONTROLLER £35
WATSON HUNTER FREQ COUNTER £50
CG SB-2000 DATA CONTROLLER £75
DAIWA CN620A 1KW POWER/SWR £65
DAIWA PS-304 30A PSU £65
ZETAGI HP1000 SWR METER £65
MFJ 1278B DATA CONTROLLER £65
WELZ SP-220 SWR/PWR METER £65
PM-2000 2KW PWR METER £70
VARIOUS CB PSU'S ..... FROM £10
LOWE FX-1COMPLETE £75
TRAILER MOUNTED SCAM 40 PUMP UP MAST £925

WATERS & STANTON

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Ameritron	AL-82X	10-160m 1.5kW Linear Valve Amplifier with 2x 3-500 Tubes	£1,599
Microset	PT-110	12V Stabilized 10A PSU with Over V / A protection	£69
Nevada	PSDL	50ohms Dummy load Dc-3000MHz max 15W	£30
Heil	AD-1-Y4	Cable for pro set and yaesu 4 pin round	£10
Midland	SWR-25	3.5-150MHz SWR / Power Meter 100W	£29
Roberts	R-862	HF/VHF receiver AM/WFM 0.15-0.281 / 0.522-1.62 / 4.6-21.95 / 87.5-108 MHz 3 VDC (2*R6 / AA)	£49
Alinco	DJ-X3E	100kHz-1300MHz AM, FM, WFM Hand Held Receiver 700Ch + 8.33kHz step	£95
Optoelectronics	Model-2810	10Hz-3GHz Frequency Counter	£145
Academy	CB-34	3-way SWR Bridge and Field Strenght Meter 25W (3.5MHz) 15W (7MHz)	£15
Microset	PM-110	10Amp 13.5V PSU with inbuilt Speaker and Transceiver Frame	£110
Microset	RU-45	70cm 3-15W in,45W out Linear + GaAsFET Preamp 12V	£149
Microset	PT-105A	12V 5A (max) Protected Stabilized PSU	£29
Microset	PT-107	12V Stabilized 7A PSU	£39
Kenwood	BC-10	Desk Charger for PB-5, 6, 7 & 8 Ni-Cd's with PB-6	£29
Roberts	R-861	Portable 150kHz-30MHz SSB , FM stereo RDS	£139
Microset	VUR-30	2m & 70cm 1-6W in, 20/30W out Max FM + GaAsFET Pre-amp 12V	£179
Moonraker	FA-5000	80ch 4w UK/CEPT CB Mobile Transceiver	£49
Moorse Prac	Home Made	Morse practice oscillator	£10
Timewave	DSP-59	Multi-mode Audio Noise Filter with Gain Control 12V DC	£89
MFJ	MFJ-940A	28-30MHz 10m Mobile ATU + meter 150W	£39
AirNav Systems	Radarbox	Real-time Aircraft Virtual Radar using ADS-B + Internet Networking via USB	£249
Hi Mound	HK-706	Standard Straight Morse Key + Cover	£39
AOR	LA-350	High Perforrmance active loop aerial,	£99
Win-Radio	WIN-108	108-136MHz Airband Hand Held Receiver 20Ch	£79
Yaesu	CD-24	12V DC Charge Adapter for FT-897D Ni-MH	£69
Yaesu	PA-26U	AC Adapter for FT-897 CD-24 Charger	£39
Win-Radio	WR-G305i	9kHz-1800MHz All Mode PCI Internal Computer Controlled Communications Receiver	£399
Midland	Alan-78Plus	Multi 40ch 4w CEPT CB Mobile Transceiver	£59
General Electric	Search-40	40ch 3w AM CB Hand Held Transceiver	£29
Uniden	UBC-60XLT	66-512MHz (with gaps) FM Hand Held Receiver 80Ch. 4 x AA cells	£59
Alinco	DJ-175T	2m FM H/Held Transceiver + DTMF keypad & CTCSS	£55
MFJ	MFJ-784B	Tunable DSP Audio Filter with Noise Reduction 12V	£189
Yaesu	FT-60E	2m/70cm FM Mil. Spec. 5W Hand Held Transceiver + Full CTCSS & DTMF keypad	£119
Shure	526T	Dynamic Desk Microphone + Mic-lock VOX & Amplifier 1x PP3	£59
LDG	AT-1000	1.8-54MHz Automatic ATU 6-800 ohm 1000W max (100W 6m) + X-Needle Meter 12V at 1A	£279
Icom	IC-7800	HF+ 6m All Mode Deluxe Base Transceiver + Dual RX's, RTTY/PSK31, ATU & Gen. Cov. RX mains	£5,499
Microset	RU-45	70cm 3-15W in,45W out Linear + GaAsFET Preamp 12V	£149
MFJ	MFJ-933	5.3-30MHz 150W Compact Loop Antenna Tuner	£129
Adonis	AM-708E	Base Microphone + Amp, Compressor & 2 inputs	£99
Alinco	DJ-V17E	2m FM Palm Transceiver 5W, DTMF keypad & CTCSS	£99
Realistic	PRO-2004	25-520,760-1300MHz AM, FM, WFM Base Scanner 300Ch.	£79
Uniden	UBC-800XLT	25-1300MHz (+gaps) AM,FM,WFM Mobile Scanner,6000ch,"close call) Gps Input,Pc Control 12v+psu	£179
Watson	WM-2000	Desk mic + Amp, Compressor & Graphic Equalizer	£79
Yaesu	VX-2E	2m/70cm FM Ultra Compact Hand Held Transceiver + Full CTCSS & Wide RX	£79
General Electric	Search-40	40ch 3w AM CB Hand Held Transceiver	£29
Icom	PS-55	12V 20A Matching PSU	£99
Alinco	DJ-V17E	2m FM Palm Transceiver 5W, DTMF keypad & CTCSS	£99
Yaesu	FT-1802E	2m FM Mil. Spec. Mobile Transceiver + CTCSS & DTMF mic 50W	£75
Kenwood	SP-430	Matching Extension Speaker 1W 8ohm 300Hz-5kHz	£49
Yaesu	FC-20	1.8-30,50-54MHz Auto ATU 100W 50ohm	£129
Watson	W-25AM	12V Variable 25A PSU with meters	£69
Alinco	DR-M06SX	6m FM Mobile Transceiver 10W	£69
Yaesu	FT-90R	2m,70cm FM Mobile Transceiver 50W,35W (Remote Head)	£179
MFJ	MFJ-969	160-6m 300W Roller Inductor ATU + Dummy Load & meter	£139
Kenwood	TS-570D G	HF All Mode Base Transceiver with Gen. Cov. + ATU & DSP filter 100W 12V	£599

RADIOWORLD

01922 414796

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FL-101 9MHz Filter CW narrow 250Hz	£60.00
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Midland 48 Plus Multi	£69.00
Dee Comm Dummy Load	£69.00
Diamond SX-400 VHF-UHF SWR Meter	£70.00
Pure Evoke 2XT Portable DAB Digital & FM Radio.	£70.00
FNB-78 Internal Ni-MH Battery Pack 4500mAh for FT897	£70.00
UBC-72XLT Scanner with 'Close Call'	£74.95
President Harry II CB	£75.00
Yaesu MD-1 Desktop Microphone	£75.00
HS-800/PRO High Sierra Standard Control Box for 180	£75.00
Kenwood VB-2200GX 2M Amplifier	£79.00
Mizuho UZ-77 Active Loop	£79.00
Intek M-795 CB	£79.00
FDC-450A 70cm Handheld	£79.00
FDC-150A 2m Handheld	£79.00
Quansheng 70cm Handheld	£79.00
300W Max Dummy Load	£79.00
CD-24 Ni-MH Battery Charger Adaptor for FT897	£80.00
EZ-TUNE-7000IBOX High Sierra Control box for	£85.00
Yaesu VX-1R Dual Band Handy	£85.00
MFJ-451X Morse Interface (no keyboard)	£85.00
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Morse Key	£89.00
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Yaesu SC-1 Station Console	£89.00
ADI AR-146 2m FM Transceiver	£89.00
PM-2000 SWR & PEP Meter	£99.00
Yaesu FC-707 Antenna Tuner	£99.00
GRE PSR-214 FM Base Scanner	£99.00
Yupiteru MVT-3300EU Scanner	£99.00
Uniden UBC-180XLT scanning receiver	£99.00
Alinco DJ-V17E	£105.00
USC-230 Uniden-Bearcat ScanCat 230	£106.34
Yaesu MD-100 Desktop Microphone	£109.00
The TINY-2 MK-II - With Open Squelch Board	£109.00
IC-3210 Dual Band FM Mobile	£109.00
PT-1012 Microset 12A 13.5 PSU	£110.60
Icom PS-15 20A power Supply	£119.00
PALSTAR PM2000AM Mobile Watt Meter	£120.00
AR-MINI - pocket sized receiver	£120.00
Alinco DJ-X30 Scanning Receiver 100KHz - 1.3GHz	£125.00
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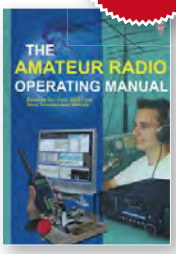

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	Pages	Price
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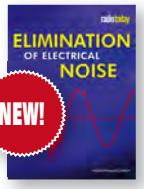

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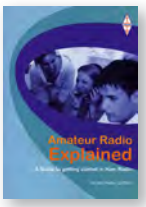

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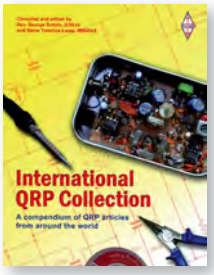

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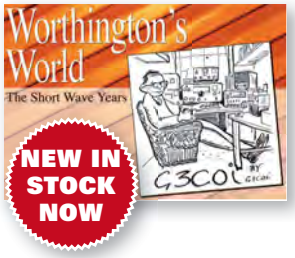

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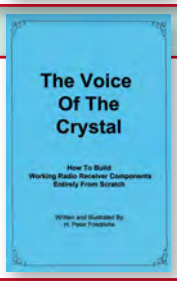

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Rob Mannion G3XFD/EI5IW's

Topical Talk

This month the Editor discusses the support clubs can offer to newcomers, and has news of a DAB radio seminar.

Denny Teasedale M3HSJ's letter (*Letters* this month) saying how much he appreciates **Tom Read M1EYP's** School Radio initiative, reminded me of my own early days in the radio hobby. In particular, Tom M1EYP's request for donations of Amateur Radio equipment that can then be loaned out to the students made me think of the kindness that came my way from the old **Radio Society of Great Britain** (RSGB) **Group** in Southampton.

Despite being very keen, I was a cash-strapped schoolboy who desperately wanted to join other club members on 1.8MHz 'Top Band' where the club gathered on their net every Sunday morning. One club member, my much-missed friend, mentor (and much valued critic at times!) **Jack Watts G2DSW** loaned me a greatly modified American Command receiver. It was wonderful to join in on 1.8MHz as a listener!

The opportunity to give the loan set back to Jack G2DSW came about due to the incredible generousity of a bus-conductor! The late **Bill Pickings** was a keen short wave listener who also happened to be the regular conductor of the Hants & Dorset bus that I often used to take me home. Bill, a very clever but usually diffident man who overheard me talking about Top Band to a school friend. He introduced himself and said that he had a Marconi B28 (CR100) that I could have – if I liked to collect it.

Fortunately, Bill lived quite close to me and I rode to his home on my bike – not knowing what a B28 was! However, those readers who've been fortunate enough to own a B28 will appreciate my shock on first seeing that rather large, heavily steel-cased receiver! Again I was fortunate that my sturdy Rudge bike was able to support the receiver while I carefully made my way home pushing the bike. The B28 then gave me sterling service for many years – indeed it was used when I became G3XFD, but eventually the main switching system failed and the set was retired, being passed on to a friend so he could keep his own B28 working.

The loaning and gifting of equipment between friends in clubs has been a feature of the hobby from the beginning. Indeed, it occurs in my own club (Poole) although not formalised in any way, it operates well and my 144MHz Sandpiper HB9CV antenna has been 'going the rounds' in the club for a long while!

Occasionally, I'm asked to help the families of Silent Key operators and listeners and occasionally a good transceiver or receiver has entered the Amateur Radio 'internal loan' system. I'm sure it's self-sustaining because over the years many of us have passed equipment on to our friends, to be used to help others in the same way we were helped.

I'll be donating some equipment to Tom M1EYP and I'm sure that many other Radio Amateurs will also be pleased to help. I also have no doubt that Tom's youngsters will eventually pass on equipment of their own to help other newcomers. Long live the true spirit of Amateur Radio!

The Future Of Digital Radio In The UK?

Just as we were going to press with this issue of *PW*, I received an invitation to attend a seminar in London entitled *The future of UK digital radio* – to be held on Tuesday December 7th. Unfortunately, I'm unable to attend because we will be entirely absorbed in preparing the February issue of the magazine.

Unfortunately also – bookshelf buyers of *PW* won't see the magazine until after the seminar has taken place, although most subscribers will have received their magazines. However, I've spoken to **Richard Brunton G4TYT** who runs the **Southgate ARC**'s informative website **www.southgatearc.org/** and – hopefully – many readers will have learned much about the plans to bring DAB radio to Band II. If you are as concerned as I am – please see the seminar website **www.westminsterforumprojects.co.uk/forums/event.php?eid=133**

Finally, on behalf of everyone at PW Publishing, I wish you all a very happy Christmas!

Rob Mannion G3XFD/EI5IW

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