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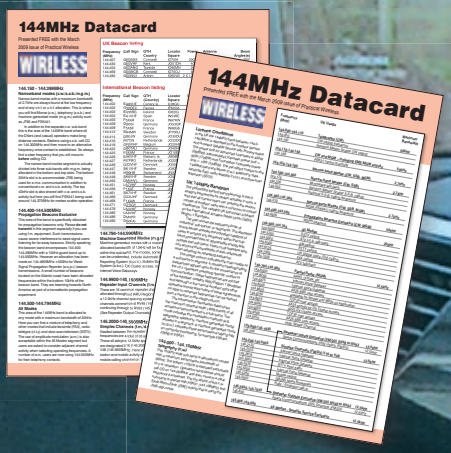
144MHz Datacard



Reviewed

The MKARS 80

3.5MHz s.s.b. kit transceiver

Reviewed

The Comet CHA-250BX

Broadband GP antenna

Reviewed

The AvMap GeoSat5 Blu-e and Kenwood TS-TMD-710E

An add-on unit that makes the Kenwood TS-TMD-710E even more attractive!

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NEW Icom IC-7700 HF Transceiver

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Hunt out any local FM signal instantly. Just press nudge button to move to next signal. Built-in speaker and rechargeable battery pack. Monitor your own signals.

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£59.95!

Waters & Stanton First with VX-8

YAESU

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

YAESU

FT-897D+

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

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**CW, SSB, AM, FMN, FMW, PACKET, DIGITAL*
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Get Ready For D-Star! (first repeater at Herne Bay)

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ICOM **IC-E2820**

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

IC-E2820 Mobile FM **£384 C**
IC-E2820 with D-Star **£539 C**

PW customers can claim an extra DC lead when ordering!

IC-E91
Fitted with D-Star
£379.95 C

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

FT-450 NEW

YAESU

160m - 6m 100W
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IF DSP
Voice Memories
23 x 8.4 x 22 cm

Also get voice recorder and announcer!

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

FT-450AT with Built-In ATU **£[Phone!]**

FT-2000

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FT-2000D 200W
£[Phone!]

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

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

W&S £259.95 D

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YAESU

Bluetooth

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

Deal: FTM-10E with Bluetooth Adaptor (BU-1), Headset (BH-1) & Charger (CAB-1) **Total List Price £382**
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160 - 6m

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

These Yaesu offers expire 31/10/08

FT-857D

YAESU

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

W&S £[Phone!]

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

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FT-DX9000Contest
FT-DX9000MP
[Phone!]

FT-817ND

YAESU

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**USB, LSB, CW, AM, FM, WFM, Digital (AFSK), Packet (1200/9600 FM)*

Deal: bhi DSP fitted **£449**

W&S £[Phone!]

IC-7800

ICOM

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

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On all orders over £100

This offer is exclusive to PW readers and applies to UK mainland only

TS-2000E

KENWOOD

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

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

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

W&S £1369 D

TS-2000X with 23cms **£1624 C**

TS-480SAT 100W HF+6m **£684 D**

IC-756PROIII

ICOM

HF + 6m 100W All-Mode

W&S £2068 D

Special Deals

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IC-7000

ICOM

HF/VHF/UHF All-Mode Transceiver

W&S £939 D

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

IC-7400 Deal 1

ICOM

HF - 70cms 100W transceiver plus SP-21 spkr and SM-20 mic **£1511 D**

IC-718 HF 100W transceiver **£449**

IC-706IIGDSP

ICOM

HF/VHF/UHF 100W Transceiver

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

W&S £739 D

IC-703DSP

ICOM

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

W&S £524.95 D

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For YAESU

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

Rig not included!

* *Direct frequency entry*
* *Mode change*
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* *20 Memories*
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bhi DSP Noise Cancelling

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Speaker and programmable DSP unit. Offers dramatic noise reduction.

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ANEM

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

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NEIM-1031

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This is a new range of cross-needle meters at a very competitive price!

This new range is available March 2009

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RX-203	1.8 - 200MHz 200W	**£49.95 B**
RX-403	125 - 525MHz 200W	**£49.95 B**
RX-503	1.8 - 525MHz 200W	**£69.95 B**

Icom VHF/UHF Mobile/Base

IC-E208

Dual Band FM Mobile *144-146MHz, 430-440MHz Tx *55/50W (3 pwr steps each band) *Wideband Rx 118-173, 230-549 & 810-999MHz **£254.95 D**

IC-910H **£1239 D**
2m/70cm 100W Base station all-modes Option for 23cm module (UX-910 £359)

IC-910HX **£1439 D**
As Above but with 23cm Module ready fitted and a big saving as well.

IC-2200H **£199.95 D**
2m 55W FM mobile with rugged construction and with digital option.

IC-2725E **£319.95 D**
2m/70cm radio. Easy to operate and install and a lovely detachable head.

Kenwood VHF/UHF Mobiles/Base

TM-271E

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

£144 D

TM-D710E *Low Price* **£384 C**
Dual band APRS 50W FM

Yaesu VHF/UHF Mobiles/Base

FT-7800E

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

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

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

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

Yaesu ADMS Software

Programming Software For Your Radio

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

ADMS-1 F for VX-110/150 / ADMS-1G for VX-7
ADMS-1H for VX-2E / ADMS-1J for FT-60E
ADMS-2H for FT-8900 / ADMS-2I for FT-8800
ADMS-2J for FT-2800 / ADMS-2K for FT-7800
ADMS-3 Programming Kit for VR-500
ALL **£41.95** with FREE PC Radio Data Lead.
ADMS-4A for FT-817 & **ADMS-4B** for FT-857 ***BOTH*** **£32.95** both these items require a seperate CT-62 lead at **£29.95**

IC-E92D NEW

ICOM

2m/70cm Handheld with Built-in DSTAR

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

Includes antenna, and charger.

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

W&S £369.95 C

Icom VHF/UHF Handhelds

IC-E91 D-Star Ready

Latest dual-band handheld transceiver. receiver that covers 0.495 to 999MHz. **£269.95 C**

IC-E91	with D-Star	**£379.95 C**
IC-V82	7W 2m Digital	**£172.95 C**
IC-U82	70cms Digital	**£172.95 C**
IC-E90	6m/2m/70cm	**£219.95 C**
IC-T3H	2m 5W	**£144.95 C**

Kenwood VHF/UHF Handhelds

TH-F7E

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

Up to 6W out with Li-ion battery and **"scanner" style coverage from 100kHz to 1300MHz** including SSB on receive! **£209.95 C**

TH-K2E	2m 5W	**£139.95 C**
TH-K2ET	2m 5W FM	**£149.95 C**
TH-K4E	79cm 5W FM	**£139.95 C**

Yaesu VHF/UHF Handhelds

VX-7R

Black or Silver Available. Totally waterproof, Wide frequency coverage 500kHz-900MHz AM/FM.

£ Phone!

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

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

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£389.95 D

WATSON

Official Distributer UK's Lowest Prices

Power-Mite-NF

NOISE OFFSET POWER SUPPLY — NEW

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

W&S £69.95 C

Power-Max-45NF POWER SUPPLY — NEW

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

W&S £119.95 D

W-3A	Output 3A, 13.8V DC, supply 230V AC	£24.95 C
W-5A	Output 5A, 13.8V DC, supply 230V AC	£29.95 C
W-10AM	Output 10A, 0-15V DC, supply 230V AC	£59.95 D
W-25AM	Output 25A, 0-15V DC, Dual meters	£89.95 C
W-30AM	Output 30A, 0-15V DC, Dual meters	£119.95 D
W-25SM	Output 22A, 13.8V DC, supply 230V/115V AC	£59.95 C

DM-15W 15W DUMMY LOAD

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

W&S £15.95 A

Power-Max-25-NF

NOISE OFFSET POWER SUPPLY — NEW

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

W&S £89.95 C

Bargain Price Antennas

Pre-tuned & Weather Sealed Fibre-glass encapsulation

W-30 2m/70cms 3/6dB length 1.15m 150W SO-239 **£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 **£85.95 C**

Mobile Whips Bargain Prices

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

Watson - the name you know!

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

WATSON

Multi-Ranger-9

The Complete Mobile Operating System -

Efficient, Easy to use and Installed in minutes!

- *80 40 20 15 10 6 2m*
- *200W Power Handling*
- *Approx 1.8m long*
- *50□ Input Impedance*
- *Quick Band Change*
- *Corrosion proof connectors*
- *PL-259 Base*
- *Adjustable top resonator*

We recommend the W-300S magnetic mount for simple and safe mounting **£39.95 C**

If you are looking for an efficient mobile antenna system at an unrepeatable price, this has to be your choice! Now in use all over the world, it is so simple to install and tune. And changing bands is a breeze! For mounting we offer our super strong magnetic triple mount that has an SO-239 socket to match the MultiRanger-9 and comes with 3.5m of cable terminated in a PL-259. Price £39 (carriage free with Antenna)

Multi-Ranger-9
£39.95 C

Also great for portable use - just add radials!

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The Air Traffic Flight Monitor That Catches Everything!

No more missed transmissions. No more hunting for frequencies. Even safe inside aircraft cabin. Hear things others miss!

Just switch on, adjust volume and squelch to listen to any VHF airband signal. Great for airshows or where frequencies are not known. Passive non radiating, so safe inside an aircraft cabin. Built-in speaker plus headphone socket. Runs from PP3 battery or external 12V supply. You even get a FREE 12V cigar lead.

Only £79.95 C
Now In Stock!

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

Practical Wireless March 2009

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Volume 85. Number 3. Issue 1223. On sale 12 February 2009

FREE INSIDE
144MHz Datacard

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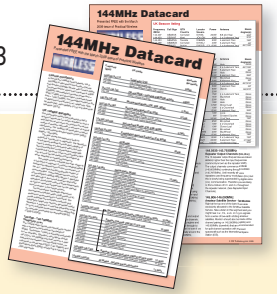

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We apologise for the non-appearance of *Carrying On The Practical Way* this month, it would seem that the posted copy from **George Dobbs G3RJV** went 'walkabout' over the Christmas period.

Front cover: Our thanks go to Richard Newton G0RSN for the photographs.

Design by Steve Hunt.

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Rob Mannion's

keylines

Rob's now on PSK31 thanks to his friends.

After a number of years listening to (or should it be 'viewing'?) the PSK31 digital mode on the high frequency (h.f.) bands, I've recently started transmitting with the mode – thanks to my kind friends **Tex Swann G1TEX**, who supplied the interface unit (the same one described by **Colin Redwood G6MXL** in his *What Next?* column) and **Phil Ciotti G3XBZ**, who kindly wired up the microphone plug unit on my behalf.

Phil, a professional wireman and prototyping engineer – managed the wiring up of the microphone plug/socket job on my rig without spectacles even though he's a G3! I had admitted defeat because it wasn't a job I can do neatly. Thanks Phil and everybody else (all are members of my club, the **Poole Radio Society**) for your help!

My very first QSO using my PSK31 set-up with my main rig on 3.5MHz at less than 25W was with an Estonian station – and it was also the very first time I'd heard or worked any Estonian station on 80 metres! We had quite a good chat despite some QSB.

One of the reasons why I've been so interested in PSK31 is its remarkable resilience to QRM and noise. Indeed, I think all PSK31 users should again congratulate (I say again because I know Peter's work has been acknowledged many times) **Peter Martinez G3PLX** for his remarkably effective, very narrow bandwidth Amateur Radio teletype-like mode.

Over the period I've been monitoring PSK31, using my Apple Mac laptop and the *Multimode* software (this provides many modes, including c.w., RTTY, SSTV, FAX, etc.) from **Black Cat Systems**, run by **Chris Smolinski N3JLY** (**http://www.blackcatsystems.com**/) – I've been very impressed with the number of older Amateurs using the mode. In fact, if I had a £1 coin for every time I've seen an operator's text appearing on my screen, saying "Old timer here – been licenced for 35 years or more and I'm using this mode for the first time – please forgive the typing", I would be very happy, despite the devaluation of Sterling!

Another reason why I've been so determined to become active on PSK31 is that its characteristic narrow band 'warble' can be heard at virtually anytime and even during the worst propagation conditions. This means, that in the same way as when I'm operating on c.w., there's literally someone to chat to '24/7' and I've seen some excellent chess games under way via PSK31 QSOs!

Battery Equipped

My first evening's operation using PSK31 was powered by my new 12V 100Ah deep cycle lead-acid accumulator, which didn't seem to notice the load placed on it during my three hours in the shack. However, I noticed the drop in received noise level!

Readers might be interested in the type of battery I've purchased. After searching the Internet I was shocked at the prices charged (please forgive my deliberate pun!) for deep cycle units. Indeed, one high street car accessory/hardware store had their cheapest 100Ah unit for around £140 .

However, by following various leads I ended up purchasing an Elecsol 100Ah carbon fibre battery from Tayna for less than £90. More details via **http://www.tayna.co.uk/catalog/1017/0/Elecsol-Batteries-Elecsol-Batteries-page1**

The reference to 'carbon fibre' doesn't – as I first thought – refer to the battery's casing (my prosthetic arm is made with a carbon fibre shell, so a casing could be made in the same way). Instead, it refers to the fact that the cell plates are reduced in weight by using carbon fibres. The technology also means that higher currents with a lighter final battery weight is possible.

Incidentally, although Tayna (based in Wales) offer good prices – there's a laborious question and answer system for information on their website. So, I recommend 'phoning them on **(01745) 823399** to escape the website!

My own research has made me realise just how little I know about modern deep cycle battery technology and a special article for *PW* is now under way. I'm sure many of our readers would be interested in learning more about these alternative power sources, so please contact me if you're interested in this topic.

Rob Mannion G3XFD/EI5IW

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Practical Wireless

readers' letters

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

Star Letter

North Sea Propagation

Dear Rob,
While I'm not given to writing letters normally, the Star Letter in the February 2009 *PW* readers' letters – from **David Buddery G3OEP** – induced me to put pen to paper (or should that be fingers to keyboard?). David's subject of working across the North Sea brought to mind when I first obtained my licence. We were on holiday in June 1984 at a small village called Scratby, just north of Caister on the Norfolk coast.

The bungalow we had rented was just five metres above the beach. In the evenings, after our young children had gone to bed, I would put up my HB9CV antenna on top of a 20ft mast – supported by a heel plate under the wheel of my car. I would then point the antenna inland to talk to amateurs in the UK – with no thought of DX as my radio was a Yaesu FT-230R 144MHz f.m. only mobile rig. However, on our second week, there was a 'high' over the North Sea, so nothing ventured nothing gained – I decided to point the antenna East over the sea.

I'm glad I did! What an evening! No sooner had I called "CQ" than I had a reply from an English Amateur living in Holland – then the sluice gates opened and I can't remember how many contacts I had, as I've since lost my log book from that time, but I'm glad that English Amateur took charge of the pileup. There weren't just contacts with Holland because I also worked into Germany and I finally closed down – reluctantly – at 0200 hours!.

Strangely a G3 living just up the coast at Hemsby, about a mile away, had been listening. He could hear me but did not hear any of the other stations, yet he had a 40ft tower and a big 144MHz Yagi. To this day I have not worked out what the propagation was, to last so long, five hours and covering such a large area.

Next topic! With regards to the young and old issue that's recently been aired in *PW*. We have found problems keeping young people interested in the club, and although three licenced youngsters live on the premises we meet in, they're not interested in mixing with us 'old fogeys'. They stay for a short while and then leave and it's probably our fault as it's difficult to pay them the attention they need and demand. However, to overcome this problem we're about to form a junior section of the club, with a permanent special call sign **GB5TAM**. They'll meet once a month on a Saturday morning with members of TARS helping, with myself and the other tutors running licence courses.

Finally can I ask, when anyone hears a youngster on air, please take the time to talk to them, I know that it can be difficult sometimes, but also it can be rewarding to listen to a fresh mind with different viewpoints and enthusiasm.
Bob Williams G1BCZ (Hon. Secretary Tamworth Amateur Radio Society)
Quince
Tamworth
Staffordshire

Editor's comment: *What a wonderful story Bob! As far as I'm concerned it sounds that you were fortunate enough to find a classic 'marine duct' (being just above the sea) and you took full advantage of it! I also applaud your initiative at the Tamworth Club. Please join me on the Topical Talk page for more discussion on marine ducting propagation.* ***Rob G3XFD.***

Old RAE Papers On The Web

Dear Rob,
In the November issue of *PW* you mentioned that the old RAE questions papers are currently on the Web and how they seem to compare to the current Advanced Licence questions of today. That being so, can you please allow me to present to *PW* readers some facts of the exam at that time, in order that those viewing them will be better informed to assess the requirements?

(a) No copy of the Licence was permitted in the exam; all the licence information had to be remembered. (b) No copy of the formulae was permitted in the exam; all the formulae had to be committed to memory.

(c) No Electronic Calculator was permitted in the exam; you had to use a Slide rule and Maths tables only.

(d) Students would require a full knowledge of how a circuit functioned. So, you could be asked to draw the a.g.c. circuit of a radio receiver and explain how it functioned.

(e) You were required to pass in both sections i.e. Licence **and** Technical sections of the exam.

A failure in the Licence section would mean a failure in the total exam, even if you had 100% in the Technical section. (In the current Advanced exam today, if you tick **any** 39 question boxes correctly then you could expect to pass).

So, if you fancy having a go at the old RAE papers, remember, no licence, no formulae sheet and no scientific calculator.

I would not like to even begin to make a comparison between the standards of the old RAE and the current Advanced, but I do believe that all the facts should be presented rather than to just express an opinion that the exam questions in the old RAE look easy now. Maybe the past 40 years has mellowed your memory Rob? Best regards to everyone at *PW*.
Carl Langley G3XGK
Lowestoft
Suffolk

Editor's comment: *You've given me some food for thought there Carl and I think it deserves a little more discussion! Please join me on the Topical Talk pages.* ***Rob G3XFD.***

Young & Old Welcomed by G4OWY!

Dear Rob,
For some reason, I missed the January issue of *PW*, so I missed your editorial concerning "young people only". So, I read **Kevin Luxford VK3DAP/ ZL2DAP's** comments with just a bit of mystified consternation in the February issue. My consternation stems from the fact that even now the shrill rhetoric concerning the 'Foundation Type Amateur Licence' apparently continues on unabated within a small core of hard-hearted people. They seem determined to deride, what is for many people not so clever as they are, probably the only way they will be able to claim an Amateur Radio Licence for themselves. And so enjoy what many of us take for granted – to communicate with others locally or worldwide, be it via the Internet or via traditional methods.

No matter where you go in the world, or what Amateur Radio-related magazine you read, the same 'Luddites' are blowing their horns loud and clear that an "easy-route" into Amateur Radio is akin to some sort of religious war. And anyone not imbued with their sense of righteousness is 'unclean' and not fit to join the hobby of Amateur Radio – full stop!

As Kevin VK3DAP/ZL2DAP rightly points out, there are many "mature" people out there just itching to get on the air and just as many youngsters too! And of course, the abandonment of the Morse test and a Foundation Licence or whatever you like to call it, has enabled lots of people to help their dream of becoming an Amateur Radio operator come true – and what exactly is wrong with that? Do those people who decry such things happening really believe our common hobby will have a future if it remains stuck in a proverbial rut? Of course not! Opinions that the Morse test should be retained and that all Foundation type Amateur Radio examinations be swept away are mistaken in my opinion. Besides, what right do these high-minded souls have to deny others entry to our hobby? None!

Instead, let us celebrate our accomplishments – there are so many, I won't name them all here. But I am sure the more enlightened amongst us will know what some of them are. So let's not forget that we are the only people (outside of the military, etc.) who are able to talk to an astronaut whilst he, or she, is spinning about in space above our heads. Yes, we Amateurs can do the uplink and the downlink too! That's just one example of the many things only we can all do if we wish to.

Amateur Radio has always had it fair share of detractors. However, as times slips by our hobby will survive their onslaught – as it has successfully done since its inception.
Ray Howes G4OWY
Weymouth
Dorset

Editor's comment: *Thank you for your first E-mailed letter Ray! The original* Keylines *editorial you missed featured (amongst other topics) the new RSGB GB4FUN exhibition trailer unit and the fact that some Amateurs consider the RSGB's efforts to attract young people – rather than aiming at older people – to be a mistake. However, I mentioned that I'm sure that GB4FUN will attract anyone who has the slightest interest in Amateur Radio communications – whatever their age! Additionally, from comments received during club visits I've made in the last few years when I've met new recruits (of all age groups) I know GB4FUN is a very effective way of promoting our hobby!* ***Rob G3XFD.***

Indian Call Centre Meets Retired Merchant Navy Officer!

Dear Rob,
I was interested to read in your *Keylines* Editorial the February *PW* about your broadband experiences and the fault at your local telephone exchange. As you know, before moving to my present address I was staying with my parents. Mum and Dad didn't use the Internet, so I

Community Radio From CB?

Dear Rob,
I am writing in response to a great letter last month (January *PW*) written by **Ian Abel G3ZHI** with regards to getting older people involved in our hobby. I think it's a very good idea to get help the aged to promote amateur radio in a bid to combat some people's loneliness. It could also be very good hobby for people facing retirement but who don't play Golf!

Another option however for the less technically minded, or those not wanting to take exams, is CB radio. The CB frequencies are not as busy as they were some years ago, and could be a cheaper alternative for some of the elderly community. This could be re-badged as 'Community Radio.' With brand new transceivers on the market for as little as £50 this could be a good option for some. I had always wanted to get involved in Amateur Radio since I began using a CB many years ago and no doubt this is the case for many of the Amateurs out there today. We all have to start somewhere!

Many courses are run and advertised for retired people for Computer Basic, etc. However, a good number of more mature persons are 'techno-phobic' and are put off by computers. Radio is definitely the answer – whether CB or Amateur.

It all comes down to promoting our hobby and perhaps the 'Community Radio' alternative. If GB4FUN and Help The Aged work with local councils and support groups alike, then it won't be long before the lonely are chatting for the UK. Best wishes.
Peter Owen M6PEO
Birch Hill
Bracknell
Berkshire

Battery Powered G0TAK

Dear Rob,
I received February 2009 *PW* okay, thanks for that and, of course, the first page I went to was the *Keylines* Editorial. (I'm struggling with my own editorial page for *QRV*, the RAFARS Journal at the moment!).

As you and many of your readers will know I enjoy a relatively 'quiet' r.f. environment out here in the fields of Cumbria – formerly Westmoreland. I was worried when I first reconnoitred the area because there is a quite large power distribution substation just over half a mile away from us – it's hidden in the trees but that is no bar to QRM!

During our second viewing trip I was accompanied by a DX-394 with a battery and the built in whip antenna. A quick trawl through the h.f. bands proved to my satisfaction that it would be safe to buy the house!

Mind you, I had lived in Blackpool for a good few years and, as you know, that place is equipped with one of the few Marconi spark gap transmitters still operating – although it's known as the tramway system!

Our little enclave – it doesn't warrant the name of 'Hamlet', having only eight houses on the site of an old farm – is delightfully quiet. We have overhead power supply but that gives us no problems except when the local farmer rams one of the pylons as he did last summer! Most of the inhabitants could, at the kindest, be said to be 'Waiting for God', so we're not plagued with DVD players and other equipment with dodgy power supplies as suffered by 'townies'. However, I do have a small TV with built in Freeview box and that does need a transmitting licence all its own – but that is not much used. I also have one PC, which I just cannot 'cure' of EMC problems.

I think the QRM generators, such as those I've mentioned, are some of the reasons that makes so many people take to the hills with a small battery powered radios, to enjoy QRM-free environment.

The main distraction to h.f. operating at home is in the summer when the animals are in the fields and the electric fences are ticking away. There has however, been a bit of a switch to arable farming in the area – so even that doesn't worry me too much except for summer grazing time!

I've always been keen on portable and mobile h.f. operating, with a fair sprinkling of QRP working, and for that you do need the quietest operating conditions you can obtain. It is perhaps not surprising then, that I have gravitated towards equipment which can be powered by a battery supply. The present 'stock', not likely to change in the near future, consists of an FT-817 and FT-897; both with batteries fitted. I also use an Elecraft K2 and an Index QRP Plus, which can both be run from either a lead-acid or a Gell-cell option. I do sometimes use these options in the home, especially when some farmer forgets how (or where) to drive his tractor!

Although I haven't noticed any significant decrease in noise levels from external sources when using batteries in my particular circumstances, I must say that the DC/QRP option does give me what appears to be a quieter environment within the receive section of even the best of my various sets; and significant relief from the ever present fan noise from those more modern rigs and power supplies which seemingly cannot do without them!

I would heartily endorse your suggested solution; get 'proper' power supplies wherever possible, and in any case try the battery option and see how you get on with it. I think you will be pleasantly surprised.

Roy Walker G0TAK
Old Hutton
Kendal
Cumbria

Editor's comment: *Thanks for the feedback Roy! Please join me on the* Topical Talk *pages for more on this point.* ***Rob G3XFD***.

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had broadband installed while I was staying there. All was well for the first six months and then followed a series of disconnections and connection failures.

My Internet Service Provider (ISP) was BT Openworld who have their customer service centre in India. In short I had great difficulty in understanding them and they had greater difficulty understanding me when describing the problems I was experiencing over the 'phone! Another really annoying factor was the times at which they would 'phone back asking me to try something at my end (04:50 in one such case!). My dad, as a retired former Chief Engineer Officer with Clan Line – that used British officers and Indian crew – can speak fairly good Hindi, be it a rough dialect as used by seamen! One such early morning call (06:20) was intercepted by dad, who bluntly told them what to do should they ever disturb his sleep again – in Hindi and with appropriate expletives! It cured the late night and early morning calls!

All along BT and BTopenworld were blaming my PC and other associated equipment. Sparing you the long details, I had to involve my local trading standards department who advised me not to use E-mails, but to write and keep copies and send all correspondence by recorded delivery. The fault was finally traced – like your own problems – to the local exchange where it was discovered that a 'Mexico' fuse had developed an intermittent fault. It took a further four months and more assistance from Trading Standards to receive any form of compensation; which turned out to be re-imbursement of one month's charges, this after experiencing three months of intermittent connection!
Best wishes.
Colin Topping (GM6HGW)
Glenrothes
Fife, Scotland

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

news & products

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

New Zealand Low Energy Bulbs Switched Off – Then On!

David Searle ZL3DWS shares the story of a CFL Saga from 'Down Under' – with his tongue firmly in his cheek!

David reports,"In June 2008 the New Zealand Labour government decreed that from late 2009 standard light bulbs could no longer be imported. However, the heat generated by the outcry will take years to be recovered through more carefully thought-out energy saving measures! I suggest that *PW* readers might like to visit the NZ media site **www.stuff.co.nz** and search on 'bulb ban' for more information.

"Spotting a chance to save a few NZ dollars I jumped into my diesel powered urban tractor (a.k.a. 4WD) – with clouds of sooty black exhaust belching and with a heavy foot I sped to the supermarket 5km away to purchase several of the low power compact fluorescent lights so my family could be more 'eco-friendly'.

"At home 100W bulbs were smugly replaced with a 20W CFL low energy type for NZ$10 each. Weeks later, nearby lightning strike-induced voltages on the incoming overhead mains line sent the CFLs silently to recycling heaven. Well not quite! As CFLs contain mercury that's very toxic to humans and all other life forms the local council will only take complete units for recycling – but if you break one you're very much on your own!

"However, the same lightning lit up my grey cells! If I sold the 4WD, said no to post box mailers (junk mail) so I didn't buy what I didn't need, bought a bicycle, and unplugged all household appliances when I wasn't operating – I'd really up the energy saving stakes.

"After a November election the new National Government in New Zealand dropped plans to phase out standard light bulbs. (Last one out of the office, please switch off the fluorescent strip lighting. You'll save much more energy than I can!). Now I'm wondering what the USA's new **President Obama** is going to do on the same front!"

See **http://sites.google.com/site/zl3dws/**
David W Searle ZL3DWS E-mail **ZL3DWS@nzart.org.nz**
193 Cashel Street
PO Box 20-256, Christchurch 8543
New Zealand

Morse To The Rescue!

Sylvia Jones, 79, from Swansea, in South Wales suffered brain damage five years ago. But thanks to her schoolgirl knowledge of Morse code, she has broken her silence using sounded dots and dashes thanks to her son son **Alan**. Alan, an ex-BBC World Service technician, then rigged up a system using an old margarine tub and shower curtain ring!

Alan had worked out how they could communicate again after sitting with her as she recovered from a life-saving operation. Mrs Jones's injury has left her unable to move, speak or feed herself but her understanding is unimpaired. Alan, 52, of the West Cross area of Swansea, said: "First one eye opened, then the other, then her right thumb moved." He said that after she was moved to a hospital ward he thought about how to communicate with her and remembered her schoolgirl knowledge of Morse code.

Alan said, "Of course, she hadn't used it since her schooldays, so obviously she was rusty, but she remembered it and it all grew from there." He then used his knowledge to make a system using a margarine tub, a shower curtain ring and an old plug! Using this, his mother is able to send out messages in code so they can communicate.

He has also devised an electronic version of snakes and ladders, so his mother can play the board game with him. "She can hear and understand what I am saying but she has to use Morse code to answer.

"The first thing she ever said after I had learned the alphabet was 'How is Fred?' "That was a reference to our pet tortoise who was in the attic hibernating. She was more concerned about the tortoise than herself." Mr Jones spends up to nine hours a day sitting with his mother at the residential home, where she now lives in nearby Gorseinon.

Alan's goal is to get her back home permanently and he is now working on a way to translate her coded messages on to a computer screen. "That will mean what she taps out will be able to be read by anyone present, allowing her to have conversations with other people".

Editorial note: *This news item appeared in various forms and outlets, including the BBC Wales website,* The Daily Telegraph *and a number of regional Welsh newspapers and radio stations. Our thanks go to the many readers who alerted* PW *to the story! I think that there can be no doubt that Morse is alive and kicking! Perhaps an electronic keyer might help Mrs Jones?* ***Rob Mannion G3XFD.***

A New Chile Service!

No – it's not a new method of keeping cool! Instead, it's a new initiative to get that elusive QSL card from South America as **David Calderwood CE2WZ/GW4VHO** explains.

"Hi *PW*! Can I ask you to draw the attention of your readers to a new QSL tracking service which some good hearted DXers here in Chile are offering to Radio Amateurs worldwide? I've prepared a short outline of the service below and further details are available on their website.

"Have you sent a QSL to Chile but had no reply? Perhaps you had a contact with XQ, CE, CA, CD, XR, 3G, CC, which hasn't been confirmed?

"A group of Chilean Radio Amateurs are offering to try to help to obtain missing card or cards by carrying out searches and making enquiries in Chile. This service is offered as a goodwill gesture by the group of Chilean Amateurs and it's completely free. To use the service you need to contact **José Luis Jiménez**. His E-mail address is **ce1kr.joseluis@gmail.com**. You can write to him in Spanish or English. Full details are available on the website **http://hunting-qsl.blogspot.com/**

73s." **David Calderwood CE2WZ/GW4VHO**.

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New April Date For Blackpool Norbreck Rally

The Norbreck, Blackpool, one day exhibition and Amateur Radio Rally, billed by the **Northern Amateur Radio Societies Association** as "The largest single day Amateur Radio Rally in the UK", has moved to a new date – **Sunday April 5th 2009**.

The rally, which has to change dates due to maintenance and refurbishment at the **Norbreck Castle Hotel & Exhibition Centre, Queens Promenade, North Shore, Blackpool FY2 9AA**, opens at 11am (disabled access from 1045am).

The organisers announce that there are to be over 100 traders and clubs attending and there'll be a Bring & Buy available. There's also free car parking at the Hotel and wheelchair access to every part of the event. Further details on the rally and hotel accommodation from **Dave Wilson M0OBW** on **(01270) 761608** or via E-mail **to dwilson@btinternet.com**

Retailers Use Repeaters For Better DAB – To Boost DAB Signals In-Store

There's no doubt that many *PW* readers will have noticed less-than-ideal television picture quality in some TV/Hi-Fi retailers' showrooms. However, if they find it difficult to get a good – noise and other impairment free TV picture for display purposes – what do they do for DAB Radio reception? The answer they can now install a repeater!

Following a successful, year-long trial of DAB repeaters installed in Currys Superstores and John Lewis branches, the UK Regulator Ofcom has agreed to put in place a permanent licensing regime for all retailers across the country.

Since the scheme was approved in 2008, DSGi has moved quickly to install repeaters in over 300 of its Currys stores, enabling DAB digital radio to be more clearly demonstrated to consumers.

Many electrical retailers suffer from poor analogue and DAB signal strength due to the steel framed infrastructure of the building or their basement location. Installing a DAB repeater on the roof of the store means a signal can be boosted in-store and DAB radios can more easily be demonstrated, thus increasing sales potential. Indeed, some stores have reported as much as 30% uplift in sales simply by ensuring all DAB radios enjoy clear, uninterrupted reception.

The Trading Manager of DSGi, **Amanda Cottrell** said: "We know from experience that demonstrating DAB radio in-store is the best way to show consumers the benefits of more station choice, ease of tuning and clean, digital quality sound. Consumers like to get hands-on with new technology and these DAB repeaters will help us to maximise sales in areas where demonstration was a problem."

The scheme is now open to all retailers via the Digital Radio Development Bureau (DRDB), which will manage the licensing of repeaters in conjunction with Ofcom.

Original Source: Radio Netherlands Worldwide's Media Network, *DRDB (thanks also to* ***Richard Brunton G4TUT*** *of the Southgate Club's website for the tip) Editor.*

Worcester Foundation Course

The **Worcester Radio Amateurs Association** (WRAA) are to run a Foundation Course over the weekend of February 28th to March 1st. Application forms can be downloaded from the website at **http://www.wraa.co.uk/**

The course will follow its normal format with Saturday for Theory and Sunday for the Practical work, with the exam in the afternoon. If you wish to take this course, we will need you completed candidate form and payment by **14th February**. Our course fee remains at £35 if you would like more information please email **info@nospamwraa.co.uk** (remove '**no spam**' before sending).

The WRAA meets at the **9th Worcester (Hallow) Scout HQ, Off Main Road, Hallow, Worcester WR2 6PP**.

Martin Carter G7HNL (Hon. Sec. WRAA)

The Worcester Radio Amateurs Association has a well deserved reputation for successful Foundation Courses.

The Merlyns Flyte

Dave Mason G3ZPR shares the story of an intrepid Radio Amateur yachtsman who is being 'tracked' on his way to Australia by members of the **Poole Radio Society**.

Dave reports: "Alan Mockford M0GKD, a keen yatchsman, joined the **Poole Radio Society** for the 2007/08 series of training courses, in order to gain the Full Amateur Licence. His motive was clear, he would be setting sail towards the end of the year (2008) bound for Australia where his daughter is living and would be using his high frequency (h.f.) equipment to talk to others out there in the oceans, the club back here, on the south coast of England, and E-mail via h.f.

Alan succeeded in passing all exams to a high standard and received the callsign IC-M0GKD and had installed and tested all equipment in his yatch *Merlyns Flyte*, His Icom IC-M801E is a marine radio, which also covers the Amateur Bands, plus a Pactor Modem to enable uploading position reports about every two days.
Merlyns Flyte is a Bavaria 38, 12.3m (38 ft long), 4m wide (13 ft) weighing over 10 tons and Alan has a backstay antenna suitable for the 7 and 14MHz bands.

He set sail from Poole on September 20th 2008 taking a route north of Alderney then via the Chenal du Four between Ushant and Brittany, across the Bay of Biscay down to La Corunna in NW Spain, arriving at the marina in the old docks on 24th September.

Leaving the marina again on saturday 27th September he set a course for Lisbon via Cape Finisterre and Bayona, arriving there on 6th October, leaving again on 13th bound for Madeira (Funchal) with a dolphin escort. (I believe it was here he was joined by another crew member). They set sail again on November 12th to Gomera, a quiet place where they spent the weekend, then out to cross the Atlantic, a haul of 2681 nautical miles. Alan's simple navigation told him to 'head south until the butter melts, then head west'. His experience proved correct and he had to keep the fridge going 24hrs a day but, clearly, his batteries suffered.

On December 3rd their position was approximately 1000 miles east of Antigua and later, a stopover in the Dutch half of St. Martins Island enabled new batteries to be fitted and a wind generator to be installed to assist keeping the 'fridge going! By the 12th they had just 92 miles to run, arriving at the marina in Cristobal/Colon around Christmas. Here the boat was measured and allocated a canal (Panama) transit slot for tuesday January 13th.

I was able to watch Alan's transit via the Panama Canal Webcam, through the Gatun Lock and, the next day, out of the Miraflores Lock into the expensive marina at Flamenco Bay. A course has now been set to cross the Pacific Ocean for Galapagos.

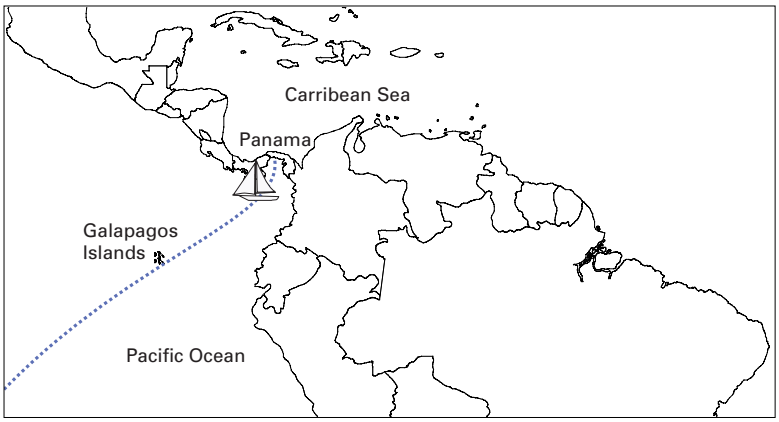
Throughout this journey, members of the Poole Radio Society have attempted to keep in touch with Alan on h.f. but, sadly, have not been successful. On December 3rd, Alan reported (via *Winlink*) that he was keeping a daily sked with an Amateur in Ontario Canada on the marine frequency of12.359MHz and other boats in the western Atlantic.

I then planned a special effort for our next attempt. I consulted **Gwyn Williams G4FKH** of Propagation fame who really confirmed my doubts about propagation conditions and suggested we brought in the biggest guns we could, lots of watts and good high gain directional antennas. We had none! A chance word with *PW* Editor **Rob G3XFD**, resulted in a suggestion to contact **Roger Cooke G3LDI** (of c.w. fame) as it was mooted he had just what was needed. ie 400 watts and a good antenna at over 100 ft, surely that would work.

That sked was arranged for Sunday January 18th at 1500 UTC on 14.316MHz. **Phil Ciotti G3XBZ**, myself and **Sten Malmquist G4ZPU**, together with **John G8JMB**, **Rob G3XFD** and **Alan G4UWS** monitoring. We set up a 144MHz link prior to the sked and opened a landline connection to Roger in Norwich. With Roger as MC we listened for any response, not a word from Alan. Sten, remote keying an SM/ prefix high-power transmitter succeeded in a QSO with Jim in Kentucky who joined in the fun by putting out a call from his QTH. We were sadly disappointed. Alan confirmed that he had kept the sked and heard nothing.

Despite these setbacks we will not give up as I have had successful contacts to the Caribbean (Martinique) and Panama (Aruba Island) on 7MHz. Our problem now will be the time difference as Alan continues to cross the Pacific. Looks like some late night/ early morning effort will be required! **Dave G3ZPR**.

Editor: *Dave will be providing further reports during Alan's voyage. If you want to join in – please contact me at the office.*



Top Ham Competition At Kempton Rally

The third **Radio Society of Great Britain** (RSGB) **Top Ham Competition** — will take place at the spring **Kempton Radio & Electronics Fair** on **Sunday April 19th April 2009** at **Kempton Park Race Course**. The competition is sponsored by the RSGB in association with **RadioFairs**.

The format remains the same; everyone at the rally will get the opportunity to enter the competition free of charge. The initial round will be relatively simple multiple choice questions on Amateur Radio and electronics. The first 95 entries handed in will all receive a commemorative prize and once marked, the the highest scoring 10% will be entered for a valuable prize draw. Those who achieve the six highest scores will be asked if they would like to compete in the second round. This will involve much harder questions in a TV style quiz, on a stage in the exhibition hall. The final winner will be presented with the RSGB Top Ham Trophy and a brand new Icom IC-7200 transceiver and the runner-up will receive an IC-92D v.h.f./ u.h.f. transceiver.

It's hoped that Top Ham will be televised via local TV repeaters and onto the Internet. For more details visit the Radio Fairs website **www.radiofairs.co.uk**

Further details from **Terry Giles G4CDY**, **RadioFairs**, **37 Smithamdowns Road**, **Purley**, **Surrey CR8 4NG**. Tel: (**0208**) **660 7555**.

Comet Amateur Radio Range Expanding!

Mike Deverux G3SED of Nevada contacted the Newsdesk to announce, "We're pleased to announce that Comet is expanding it's range of Amateur Radio products for 2009. First of the new range to be introduced are two antenna tuners, the CAT-300, a new antenna tuner from Comet Japan. This tuner is the first in a line of new products for 2009 and emphasises Comet's commitment to developing more Amateur radio products.

The Cat-300 Antenna Tuner covers h.f. and 50MHz, reading both s.w.r., average and peak power on an illuminated easy to read cross needle meter. With two antenna inputs and 300W power handling and Nevada state it's an ideal accessory for any shack. The first shipment has arrived and the retails for £169.95.

Specifications of the Comet CAT-300 300W antenna tuning unit:

Frequency coverage: 1.8 - 60MHz
Power: 300W (s.s.b.) 30W/300W Average/PEP
Antenna connections: Two coaxial cable inputs (Input SO239) and connections for long wire, etc. (see photograph),
Impedance: 10 – 600Ω
Meter: SWR/Power (Cross-needle illuminated display panel)
Size: 250x93x200mm
Weight: 2.7kg
Price (RRP): £189 p&p £10

Further information from:
Nevada,
Unit 1 Fitzherbert Spur,
Farlington, Portsmouth, Hampshire PO6 1TT
Tel: **(02392) 313095**
FAX: **(02392) 313091**
E-mail: **sales@nevada.co.uk**
website: **www.nevadaradio.co.uk/**

Merion ARS RNLI SOS Fundraising Week

The **Meirion Amateur Radio Society**, based in Barmouth in Mid-Wales, took part in The RNLI SOS Radio Week. The photograph shows a group of MARS members alongside the smaller inshore lifeboat with three lifeboat crew on board.

The event took place on January 24th and 25 and the Meirion Amateur Radio Society (MARS) took part in the RNLI SOS Radio Week, operating the callsign **GB6BLB** from the Lifeboat station and Meirioneth Yacht Club in Barmouth. The event was organised for UK and Irish Amateur Radio operators, to raise funds for the **Royal National Lifeboat Institution** (RNLI) through sponsorship, and was aimed to coincide with the RNLI's own fund-raising week.

The MARS members think that support for the RNLI is very important, and offered their support for the Barmouth Lifeboat Station through this event. The society members contacted local people and companies for sponsorship, and many were very generous with their offers.

The RNLI is a volunteer organisation with many people giving their time, skill and commitment saving lives at sea 24 hours a day 365 days a year.

The main all-weather lifeboat at Barmouth is the *Moira Barrie*, a self-righting *Mersey* Class boat, powered by two 285bhp engines, with a top speed of 17 knots. Since Barmouth lifeboat station was established, it has answered around 1100 calls and saved over 500 lives.

The weekend went very well indeed and MARS operated GB6BLB for 36 hours continuously – making many contacts with other Amateur Radio stations throughout the world. Two of the MARS operators – **Simon Poyser 2W0SAK** and **Louis Martin MW6LDM** – stayed awake for the whole of the 36 hours, while most others dropped by to help out whenever they could or grabbed some sleep on a couch when possible. The station comprised of Icom and Yaesu equipment for both h.f. and 144MHz with antennas supplied by **Snowdonia Radio Company**.

The h.f. bands propagation changed throughout the event – so it meant chasing the openings to get the best chance of that rare DX. Operators used all available modes during the weekend, 'phone, PSK31, c.w. (Morse) and the GB3DW repeater for local contacts.

During February MARS will be presenting a cheque to Barmouth lifeboat station from the sponsorship that was raised from the event. For more information see **http://meirionars.multiply.com/** or E-mail **tawelfan@talk21.com**

rallies

Radio rallies are held throughout the UK. They're hard work to organise so visit one soon and support your clubs and organisations.

Send all your rally info to

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

February

February 15th

The Northern Cross Rally

The Northern Cross Rally will be held at Ossett School, Storrs Hill Rd., Osset, W.Yorkshire WF5 0DG. Doors will open at 10.30am (10:15 for disabled), admission will be £3 and there will be talk-in.

www.northerncrossrally.org

February 15th

The Swansea ARS Rally

The Swansea Amateur Radio Society Rally will be held at Afan Lido (Aquadrome), Aberavon seafront, Port Talbot SA12 6QW, 1 mile from the M4 (J41). Doors will open at 10.30am, admission will be £1.50 (50p for concessions) and there will be free parking, catering, a Bring & Buy, special interest groups and trade stands.

Roger GW4HSH
Tel: 01792 404422.

February 22nd

The BRATS Radio Rally

The Bredhurst Receiving and Transmitting Society (BRATS) Radio Rally will be held at Rainham Girls' School, Derwent Way, Rainham, Kent (just off the A2 & M2/J4). Doors will open at 10.00am (09.30 for disabled) and entrance will be £2.50. There will be parking, talk-in on 2m, special interest groups, catering, lectures and trade stands.

E-mail: O.wheeler@btopenworld.com

February 22nd

The Radio-Active Rally

The Mid-Cheshire Amateur Radio Society (MIDCARS) Radio-Active Rally will be held at The Civic Hall, Nantwich, Cheshire CW5 5DG. Doors will open at 10.30am and admission will be £3 (under 16s free). There will be talk-in, a car park, trade stands, a Bring & Buy, catering and a licensed bar.

Simon Chettle G8ATB
Tel: 01270 841506
E-mail: info@radioactiveshow.co.uk
www.radioactiveshow.co.uk

March

March 1st

The Cambridge & DARC Rally

The Cambridge & District Amateur Radio Club Rally will take place in the Britten Arena, Wood Green Animal Shelter, King's Bush Farm, London Road, Godmanchester, Cambridgeshire PE29 2NH. This is on the A1198, 4 miles from Huntingdon via the A14.

David G8JKV
Tel: 01223 355254
E-mail: rally@cdarc.co.uk

March 8th

The Wythall RC Radio & Computer Rally

The Wythall Radio Club Radio & Computer Rally will be held at the Woodrush Sports Centre, Shawhurst Lane, Hollywood, near Birmingham on the A435, 2 miles from J3 on the M42. Doors will open at 10.00am and admission will be £1.50. There will be talk-in on S22 and V44, car parking, trade stands, a Bring & Buy and catering.

Chris G0EYO
Tel: 07710 412910.
E-mail: g0eyo@blueyonder.co.uk
www.wrcrally.co.uk

March 14th

The Lagan Valley ARS Rally

The Lagan Valley Amateur Radio Society Rally will be held in The Village Centre, 7 Ballynahinch Road, Hillsborough, Ulster BT26 6AR. Doors will open at 11.30am and there will be parking, trade stands and catering.

Jim GI0DV
Tel: 02892 662270
E-mail: jim.henry@ntlworld.com

March 29th

The Caradon Hill RG & Callington ARS Rally

The Caradon Hill Repeater Group & Callington Amateur Radio Society Rally will be held at the Callington Community College, Callington, Cornwall PL7 7DR. Doors will open at 10.30am (10.00am for disabled and 7.30am for traders). Admission will be £2.00.

Jamie 2E0JLH
Tel: 0779 554 60374
E-mail: caradonhillrepeatergroup@hotmail.co.uk

April

April 5th (Note – new date)

The NARSA Rally*

The Northwest Amateur Radio Societies Association Rally will be held at the Norbreck Castle Exhibition Centre, Queen's Promenade, North Shore, Blackpool FY2 9AA. There will be over 100 trade & club stands, a Bring & Buy, a construction competition, free parking and disabled access.

Peter G6CGF
Tel: 0151 630 5790.
E-mail: g6cgf.peter@ntlworld.com

April 5th

The Northern Mobile Rally

The Northern Mobile Rally will be held at the Richmond School, Darlington Road, Richmond, N. Yorkshire DL10 7BQ. Doors will open at 10.30am (10.00am for disabled) and there will be parking, trade stands and catering.

E-mail: rsars@hotmail.co.uk
www.rsars.co.nr

April 26th

The Yeovil QRP Convention

The Yeovil QRP Convention will be held at Digby Hall, Hound St, Sherborne, Dorset DT9 3AA. (Digby Hall adjoins the central shopping car park). The doors will open at 10.00am and there will be talk-in on S22 and V44, car parking, lectures, trade stands, a Bring & Buy, catering and facilities for the disabled.

Derek
Tel: 01935 414452.
E-mail: yarc-contact@tiscali.co.uk
www.yeovil-arc.com

May

May 3rd

The Dambusters Radio Rally

The Dambusters Radio Rally will take place at the Thorpe Camp Visitor Centre, Thorpe, Near Coningsby Lincolnshire LN4 4PE, on the B1192 at Tattershal. Doors will open at 10.30am (10.00am for disabled, 8.00am for traders). Admission will be £2 (accompanied children free) – this includes admission to the Visitor Centre. There will be free car parking and free camping space will be available on the site.

Tony G3ZPU
Tel: 01507 527835
E-mail: g3zpu@yahoo.co.uk
http://beam.to/tcrm

May 4th

The Dartmoor Radio Rally

The Dartmoor Radio Rally will be held at Tavistock College, Crowndale Rd, Tavistock, Devon PL19 8DD. Doors will open at 10.30am (10.15am for disabled) and there will be talk-in on S22 and V44, car parking, family attractions, trade stands, a Bring & Buy, catering and facilities for the disabled.

Peter M1AYI
Tel: 01822 860277

June

June 7th

The Red Rose QRP Festival

The Red Rose QRP Festival will take place at the Formby Hall, Alder Street, Atherton M46 9EY. Doors will open at 11.00am, admission will be £1.50 and there will be talk-in on S22 and V44, free car parking, special interest groups, trade stands and a Bring & Buy.

Les G4HZJ
Tel: 01942 870364.
E-mail: g4hzj@ntlworld.com

June 28th

The West of England Radio Rally

The West of England Radio Rally will be held at the Cheese & Grain, Frome, Somerset.

Shaun G8VPG
Tel: 01225 873098.
E-mail: rallymanager@westrally.org.uk
http://westrally.org.uk

Send us all your details if you would like your event to be mentioned here.

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NEW - Transworld Antennas

Built in the USA

ML&S are pleased to announce their appointment as sole European Distributor for the innovative Transworld Antennas fully automated remote antenna systems.

At last you can finally buy a fully automatic antenna that can be controlled via your modern Icom, Yaesu or Kenwood HF Transceiver.

The Transworld TW2010L "Backpacker" antenna system offers 5-Band coverage (10-20m inc WARC) and is the little brother of the famous TW2010 "Adventurer". It's especially suited for the amateur operator who loves backpacking, cycling, camping, or otherwise being on the go with his station.
Pricing includes Backpacker, quadra-stand & carrying bag. £379.95

The Transworld TW2010 "Adventurer" is the perfect antenna for high performance DX communications in a portable package.
Pricing includes Adventurer antenna, quadrapod, and transport bag. £499.95

The Transworld TW4040 "Adventurer" 40 meter Monoband Antenna is ideal for camping, emergencies, or permanent installations. The 4040 switching array box covers the entire 40 meter band (i.e., 7.0-7.3 MHz) without the necessity of either manual band changing or the need for a controller! Just attach a feedline and you are ready to talk. **Pricing includes Antenna, stand and travel bag. £319.95**

For more information on this exciting range of quality built products from Transworld Antennas see: www.transworldantennas.co.uk

Hustler Antennas

HUSTLER

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

Full range of Hustler accessories in stock

See web for full listing

Base Station Range, free standing, max 7.3m tall, 1kW
4-BTV 40/20/15/10m..... **£182.95**
5-BTV 80/40/20/15/10m..... **£224.95**
6-BTV 80/40/30/20/15/10m **£255.95**
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Mobile Range, 200W or 1kW, both stocked.
RM10 to RM-80 10M to 80m single-band whips,
£24.95 to **£56.95**

Kinetic SBS-1e

NEW MODEL

Real-time Virtual Radar

Another Gold Medal for the UK thanks to Kinetic Avionics.

SBS-1e 'Pocket Radar'

Based on the famous original SBS-1 launched in 2005, the **NEW SBS-1E Pocket Radar** is a portable low-cost Mode-S/ADS-B Receiving instrument designed for commercial, training and aviation enthusiasts. Supplied complete with antenna and Basestation Virtual Radar software. The SBS-1e Pocket Radar allows you to track ADS-B aircraft on a PC simulated radar screen and identifies and displays Mode-S equipped aircraft.

NOW IN STOCK! **only £439.95**

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ML&S are appointed distributors for the SBS-1e and associated products.

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Begali

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

The finest range of keys available today.

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


Begali Sculpture

Simplex. Excellent value available with Palladium or Gold Contacts.


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Simplex Mono. As above but single lever.

Magnetic Classic. As the name implies, employing magnets for the return rather than springs.


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Signature. Beautiful design. Uses precision bearings, magnetic system & two sets of paddles.

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


Begali Camel Back

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The best British range of keys money can buy!

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

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

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

MyDEL MLS-SM. Mobile Safety Microphone

NEW MODEL

We've been 2 years getting this right to work with the current crop of radio's.
Available for: All Icom using RJ-45 (IC-7000, IC-E2820 etc). All Yaesu using 6 pin RJ-11 & RJ-45 (FT-8900, FT-8800, NOT FT-7800, FT-817/857/897/450) All Kenwood RJ-45 8 pin, (TS-480S, TM-D710, TM-V71E, TM-D700 etc).

Only £39.95

Little Tarheel II

£349.95

Motorised Mobile Antenna

- Freq: 3.5 to 54 MHz continuous
- Power rating: 200 watts p.e.p
- Vswr: typically 1.5 or less
- Weight: 850g
- Mast size: 1.5" diameter
- Mast length: 16 inches
- Whip length: 32 inches
- Total length in 54 MHz position 48 inches
- Total length in 3.5 MHz position 54 inches
- Includes 20ft of plug & play control box, ferrite decoupling core and 3/8 stud

When properly installed on your vehicle this antenna will provide continuous coverage from 3.5 to 54 MHz with the supplied whip. The Little Tarheel II like all of Tarheel motorized antennas are built to the highest specification

WonderWand

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

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

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

WonderWand TCP
A tuneable counterpoise ideally suited to the WonderWand for increased performance.
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5 STAR

British Products

Mini VNA PC Controlled Antenna Analyser

The mRS miniVNA is a compact 100kHz to 180MHz antenna analyser interface that is operated via a PC powered by a single USB connection. You can see at a glance where the antenna is resonant, what the SWR and the return loss is. The best (minimal) SWR frequency is automatically found and displayed. An optional internal RS232 connection is also available. **MLS: £259.95**

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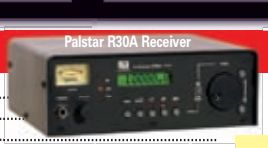
Palstar R30A Receiver

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R30 Matching Accessories:
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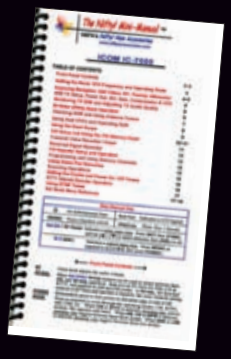
Please see web for latest prices

Nifty Equipment Manuals and Quick Reference Cards for Yaesu, Icom, Kenwood, Elecraft & Ten-Tec radios. See Web for details.



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YAESU

Yaesu FT-2000 HF Base Transceiver

ML&S: £1899.95

D Version ML&S: £2399.95

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

Available from stock and on permanent demo in our showroom

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

FT-2000 Accessories

DMU-2000 Data Management Unit. £CALL

- Spectrum Scope with Limited Bandwidth Sweep feature
- Audio Scope/Oscilloscope Display Page
- Swept-Frequency SWR Page
- Memory Channel List
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SP-2000 External Speaker with 2 inputs & filters..... **£139.95**
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3 versions available.160m Band Kit "A". 80/40 Band Kit "B". 30/20m Band Kit "C" ..... **NOW IN STOCK £359.95**

The Ultimate Accessory!

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

Yaesu FT-950 HF Base Transceiver

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

The FT-950 available NOW from ML&S at only £999.95

Got a Yaesu FT-2000 or FT-950?
Add a DMU-2000 Data Management Unit - Call for best price!

Yaesu FT-450 HF Base Transceiver

Call or see web for best price!

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

Nifty Handie Stand

Get double duty out of your HT, add an external microphone and use it as a Base Station. The HT Stand holds your radio upright and steady at a comfortable viewing angle. Stops a remotely connected antenna or external microphone from "dragging" your HT around on the desk. Only £28.95

Yaesu FT-897D

Latest batch straight from the factory! Call for Lowest Price or Special 'Bundle' Offers!!

High Power version of the FT-897. Use as a transportable, (20W) or as a base/mobile (100W)

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

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The worlds only all-band portable transceiver. Only £399.95
Why not add a CSC-83 Carry Case for only £19.95?

Bundle 1 FT-817ND 'Vanilla' - Basic FT-817 .....£399.95
£39.95 deposit, 36 x £13p/m

Bundle 2 FT-817ND + YF-122C 500Hz CW Filter.....£489.95

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

NEW Yaesu VX-8 - Due March 09

Latest 6/2/70 Handie with Bluetooth, APRS and optional GPS.
See web for more details, price TBA.

Yaesu FT-7800E. NOW ONLY £199.95
Bar make the tea it'll give you 2m/70cm @50W/40W.
Add a YSK-7800 Remote Kit for Only £19.95!

Yaesu FTM-10R. ML&S £239
A small compact dual band 2m/70cm transceiver with high power output of 50W on 2m and 40W on 70cm, (adjustable power levels of 50/40W, 20/20W, 5/5W). Receive range from 0.5–1.8MHz, 76–108MHz, 137–222MHz and 300–999MHz.

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

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

Yaesu FT-8800. ML&S £299.95
Similar to the FT-7800 but can receive on 2 & 70 simultaneously.

Yaesu FT-8900. ML&S £349.95
High-power FM on 10m, 6m, 2m & 70cm. When your local repeater is busy, slip onto 10m & work DX!

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

NEW Yaesu VX-3E. ML&S £144.95
Micro Handie 2/70 with scanner. Complete with Li-ion battery, charger & antenna.

Yaesu FT-60. ML&S £149.95
Latest twin band handie complete and ready to go.

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

Yaesu VX-7R. ML&S £219.95
The UKs best selling Triple Band Handie.

Perseus VLF-LF-HF Receiver

RRP: £749.95

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

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

New Product!

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

KENWOOD

AvMap Geosat 5 Blu APRS

AvMap Geosat 5 Blu APRS
The AvMap Geosat 5 Blu is an attractive, feature-rich personal navigator customized with Amateur Radio features. The Geosat 5 Blu is practical and easy to use with a builtin highly sensitive 20 channel Sirf 3 GPS engine for fast and highly accurate fix. The ultra bright, non-glaring, 5 inch, TFT TOUCHSCREEN is easy to view. The Geosat 5 Blu night mode and auto brightness features make viewing easy and hassle-free in any lighting condition.

intro price: £359.95

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

ML&S: £259.95

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

CG-3000 shown with optional remote switch.

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Input impendence: 45-55 ohms
Input power: 10 - 600W PEP
SWR: <2:1
Power supply voltage: DC 13.8V
Current consumption: <1.5A
Memory channels: 800
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The Comet CHA-250BX Broadband GP Antenna

The Comet CHA-250BX antenna, can be a useful antenna for those of us who have postage-stamp sized gardens as it doesn't need radials.

The CHA-250BX is described by the manufacturer as a ground-plane antenna. It's essentially a multi-band vertical covering 3.5-50MHz (80m-6m) working against ground. But it doesn't require any radials or earth connection. General advertising sources suggest it's the ideal antenna where there is restricted space. (More on this later).

The item was well packed for transit and arrived undamaged. The box contained all the pieces required for assembly, there were no deficiencies which always goes down well with me! There are five sections to be joined and at the base of section one is the black housing containing what is described as the 'Matching Section,' **Fig. 1**.

Instructions are in the form of a sheet folded (the wrong way) and describe, in quaint 'Jinglish', (Japanese English) the specification and assembly method. Great attention is also paid to safe practice. However, as I removed the various components I noticed a lack of de-burring (sharp edges) on the mounting bracket and swarf had not been removed from the clamping split, which is cut in the top end of the base section. Other than these items, the general engineering was of a good standard.

The lower section wall thickness is 2mm with the matching unit at its base terminating in an SO239 connector, the upper end accommodates the second section, which is locked into position with a substantial worm-drive (Jubilee) screw clip round the clamping split. The matching unit is mounted on a rectangular plate, which is pre-drilled to take two 'U' bolts for mast mounting, as can be seen in Fig. 1.

Section two has a wall thickness of 1.8 mm. The top end is inwardly reduced (swaged) to accommodate the third section.

Section three is likewise formed and has a wall thickness of 1.5 mm with what appears to be a *ptfe* insert at the lower end for strength. It's secured to the second section through pre-drilled holes with two hexagon headed bolts (M5x35) and wing-nuts.

Section four, wall thickness 1.5 mm, is secured to the third section with two hexagonal headed bolts (M4x30) and wing-nuts into pre-drilled holes.

Section five (also 1.5 mm) is adjustable within the fourth section. This is locked by two set-screws retained within two stainless steel collars at the

Dave Mason G3ZPR has been busy evaluating a vertical antenna and despite poor propagations conditions enjoyed himself very much!

Braving a below 0°C shack to get the propagation conditions to check out the antenna.

Fig. 1: This is the feed-point of the antenna, showing the matching section and the clamp fitting onto a mast.

top of the fourth section.

The instructions for fixing each section were well illustrated, clear and specific and the holes for securing bolts are accurately drilled which make for easy assembly. Mounting to a mast is effected by the previously mentioned 'U' bolts into the mounting plate. These will accommodate mast diameters between 30 and 72mm (1.18 to 2.8in).

Note: The manufacturers state clearly that the antenna should be mounted **at least 10.5m (35ft)** above ground for optimum performance.

Assembly Space

As I worked, I soon discovered that a substantial space is needed to assemble the antenna, as the total length, fully assembled, is 7.13m (23.8 ft). Starting at the base, I slid the second section 200 mm (8in) into the first and secured it with the worm-drive clip around the clamping split. The instructions advised me that it should be tight but not so excessive as to strip the clamp!

Next, I slid out section three from within section two until the fixing holes were aligned and inserted the M5 x 35 stainless bolts. These were then secured with the wing-nuts. Then I slid out section four from within section three, aligned the holes, inserted the bolts (M4 x 30 this time) and secured the section with the wing-nuts.

The instructions then advised that I should slide out section five completely from section four and then slide it back 100mm (4in) before securing the section with the two set-screws. The antenna was then fully assembled!

Mounting Method

As with any antenna, I think that serious consideration should be made as to the mounting method appropriate for the location to be used. It was at this point I was reminded of advertising suggestions relating to what might be referred to as 'limited space' or, as a friend commented, 'postage stamp' UK gardens.

As I see it, there are three ways of mounting a vertical antenna 10.5 m (35ft) above ground.

a) Fix on the apex of the house gable with brackets and stub mast fixed to the wall.

b) Attach it to a tilt-over, crank up, mast.

c) Attach it to a pneumatic mast.

Method (a) requires at least

two people and a head for heights to fix brackets and a stub mast, while working from a double/ triple extension ladder or, preferably, a scaffold tower. The antenna then has to be hoisted into position and held steady for fixing – remember it's fixed at its base so needs to be held very steady by an assistant while the 'U' bolts are secured around the stub mast. Don't forget to fit the feeder before dismantling the tower!

Disadvantages: Includes risks of working at height (although you could use professional antenna erectors) and possibly poor **E**lectro **M**agnetic **C**ompatibility (EMC) due to proximity of house wiring in roof spaces and to neighbours' TV antennas.

Advantages: Occupies no garden space.

Assembly hint: If your garden really is postage stamp sized, and you haven't got the room to assemble the antenna horizontally – it can the be assembled vertically starting with the top two sections (five and four) resting it against a wall corner, with the assembly continuing until the complete antenna is ready to hoist aloft.

Method (b) is much easier if you happen to have an existing tilt-over mast, but here enters the problem of garden length! The retracted mast tilted over will be something like 3.6m (12ft) long, add to that, the length of the antenna 7.3m (about 24ft) means the total length required from the mast base will be 10.9m (36ft) minimum. If you have that space, attach the feeder, tilt up, lock, and crank to full height – a one man job. Disadvantage – none, if you have one, use it. Advantages – permanent, with less chance of EMC problems.

Method (c) (pneumatic mast) is the only one which can be carried out in the smallest of spaces and the one chosen by me as the easiest, most effective and practical method. I'm lucky enough to have the use of such a mast but they are very expensive if purchased new, **Fig. 2**.

The antenna can be fixed to the mast at ground level if about 8.8 m (29ft) is available and then the whole assembly can be lifted to its fixing points by two people. Alternatively, it can be lifted on to the lowered mast using a cunning slide over stub (Described below). The advantages are – it requires only the space around the mast base. Less chance of EMC problems. This method has the added advantage of ease of lowering when not in use but, when fully erected, the mast **must** be guyed, or the base must be anchored down sufficiently well, **Fig. 3**.

Disadvantages of the pump-up mast method of mounting – none. But it's less permanent than the tilt-over option. Remember, a vertical is best sited well away from other antennas and house wiring – and keep it high!

The Inevitable VSWR

The manufacturers of the antenna specify a voltage standing wave ratio (v.s.w.r.) of less than 1.5:1 typical, and make a point of stating that *"...before transmitting, please check that the VSWR is less than 1.5 at the operating frequency*." Initially, I found it difficult to reconcile the actual values with those stated.

The addition of an LDG Z-100 antenna tuner unit (a.t.u.) to the system, (only for the purposes of double checking) made a considerable difference, bringing values closer to the those suggested. The stated values were however, achieved (without the a.t.u.) when I upgraded the feeder to H100 – a better quality and lower-loss cable. There's a moral in there somewhere. Don't skimp on feeder, it's really part of the antenna !

Fig. 2: Dave G3ZPR, suitably dressed, for the cold weather setting to – starts to raise the pump-up mast in his back garden.

Fig. 3: Each leg at the base of the pump-up mast must be securely held in place, in this case with a 700mm long ground-spike.

On The Air

It was then time to see how the antenna performed on the air because, of course, what's really important for an antenna is, it's ability to perform, bringing in the signals and sending them out to good use. However, my tests were restricted by the limitations inflicted by propagation conditions. Clearly, there's little point in trying to use a band when it is effectively closed.

Despite the propagation problems, I made every effort to seek out the smallest opportunity of a contact by going on air at some ridiculous hour which paid off. This proved to be between 0001 and 0300 hours on 7MHz, even if it was -1^{0}C in the outdoor shack! I had QSOs to Aruba Island and Martinique in the Caribbean – decidedly warmer than my location!

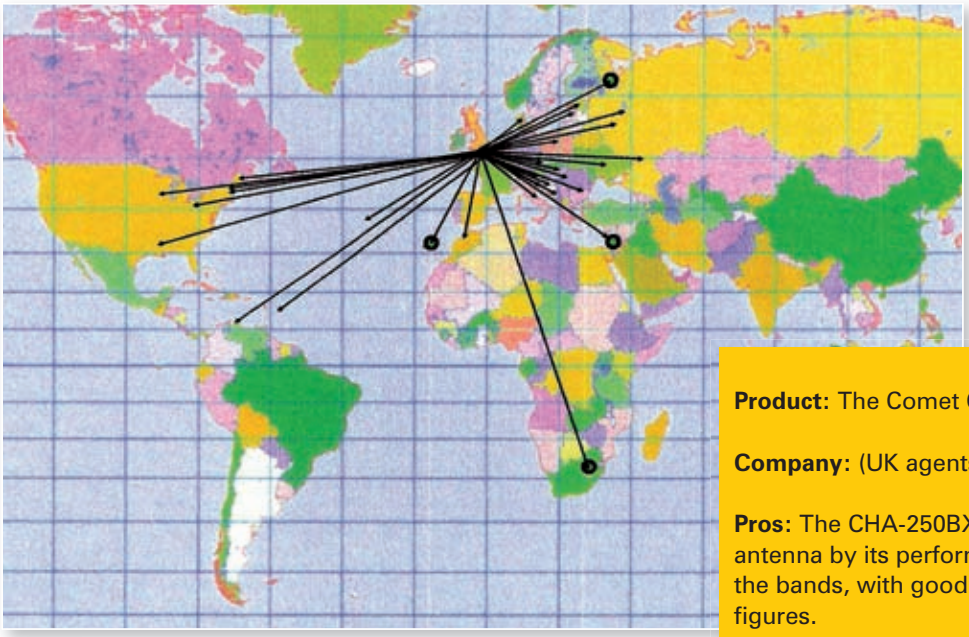

Fig. 4: This map shows the location of the stations worked, using the Comet CHA-250BX, when propagation conditions allowed. This meant in one case working after midnight in a freezing cold outdoor shack!

Product: The Comet CHA-250BX vertical antenna.

Company: (UK agents and distributors) Nevada.

Pros: The CHA-250BX has proved itself to be a good antenna by its performance, and its actual v.s.w.r. across the bands, with good quality feeder, meets the claimed figures.

Cons: Assembly really requires two people and plenty of space.

Price: The CHA-250BX antenna costs £299.95 plus £10 P&P.

Suppliers: My thanks for the loan of the review unit go to **Nevada Radio, Unit 1, Fitzherbert Spur, Farlington, Portsmouth, Hampshire PO6 1TT.**
Tel: +44 (0) 23 9231 3090
Fax: +44 (0) 23 9231 3091.
E-mail: **sales@nevada.co.uk**
Website: **http://www.nevadaradio.co.uk/**

Because of these problems I decided to carry out a beacon search (using the inrcedibly helpful **International Beacon Project's** 18 beacon, worldwide system, see **http://www.ncdxf.org/beacon/BeaconSchedule.html**) on the offending bands, 14 to 28MHz. And where I've heard any beacons, I've included them on the results map, **Fig. 4**. Please note that the lack of results can't be laid at the foot of the antenna and we all look forward to better times in the not too distant future. In general, when and where propagation has been good, so have the results!

Bands & Beacons Heard

14.100MHz – **4U1UN** (United Nations building) S2, **OH2B** (Finland) S1.

18.110MHz – **CS3B** (Madeira Island) S8.

21.150MHz – CS3B (Finland) S9.

24.930MHz – CS3B (Madeira Island) S 8, **ZS6DN** (South Africa) S1.

28.200MHz – Nothing heard.

Note: even though the 18, 21 and 24MHz beacons were of good strength, there were no contacts to be made on these bands. No contacts were made on 50MHz but an SWR of 1.5:1 was achieved.

A Good Antenna

The CHA-250BX has proved itself to be a good antenna by its performance, its actual v.s.w.r. across the bands, with good quality feeder, meets the claimed figures but variations can be expected if anything other than 'Low loss' feeder is used. Other reasons can reasonably be attributed to local conditions or the difference made by height.

I did some tests with the antenna lower than the height specified (easy when you can pump the mast to intermediate heights) and the difference was surprising. The matching unit at the base of the first section is certainly effective and there's no need of an a.t.u.

I agree with the suggestion that the antenna is suitable for small gardens but, of course, no location is identical to another and new owners will need to be resourceful during assembly. The device is comparatively light and mounting the antenna to its mast may appear easy enough – but a momentary loss of balance when it's being raised can occur leading to a variety of nasty results. So get help for the assembly and be safe.

Finally, I'm grateful to Nevada for the opportunity of reviewing the CHA-250BX, it has given me hours of fun doing what I like best of all – operating on the bands. The current difficulties with propagation conditions only spur me on to 'keep at it' and the rewards are making contacts despite those difficulties! ●

Mike Devereux G3SED replies: *"Hi Rob! The review looks fair and factual. My own experience with this antenna has found that it performed best for me on 20, 30 and 40 metres. When I tried this antenna against my 87ft Titanex Vertical (with 140 132ft radials) on 40 metres for example, I was truly amazed how close it came – only one S-point down. Clearly it's a winner on that band. I also had QSOs on 80 metres out to 200 miles during daylight, but my larger antenna outperformed the Comet by over 3 S-points as you might expect. However, it allowed me to make QSOs at distance on 80 metres with a virtual nil footprint when compared to a 132ft dipole or the Titanex vertical with all those radials.Thanks again for the review – a great job from Dave!*
Mike Devereux G3SED

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OPTIONAL 10-15-20mtr radial kit **£59.95**
OPTIONAL 40mtr radial kit **£19.95**
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Review

The MKARS 80 3.5MHz s.s.b. kit transceiver

Fig. 1: The various packets contain all the components and the manual can be downloaded from the Internet.

Members of the **Milton Keynes Amateur Radio Society** (MKARS) have designed a low cost single sideband (s.s.b.) transceiver construction project, which is now being offered for sale by a commercial organisation (see end panels). The MKARS 80, as it's known, is a modified BITX20 design and incorporates a digital readout and frequency stabilising circuit. The whole of the 3.5MHz (80m) band is covered.

All the transceiver components are mounted on a single high quality printed circuit board (p.c.b.). No surface mount components are used – making construction easier! The kit can be purchased with, or without, a metal case. All external connections are via a row of p.c.b. connections along one edge of the main board.

Some experience of handling and soldering small components is required to successfully complete the project. Overall size of the supplied case is 156x101x45mm, excluding the control knobs. Power output is in excess of 5W and the receiver section is a superhet design, incorporating a crystal filter.

What Do You Get?

Having decided to purchase the kit, what do you get in exchange for your money? To answer, let's take a detailed look.

The review project was supplied with an undrilled case, which is covered with a protective film to avoid scratches. Opening the case revealed six plastic re-sealable bags that contained all the components required to build the project, **Fig. 1**.

Each of the bags was clearly numbered and contained an easy-to-read list of all the items contained within. A further bag contained various lengths and gauges of enamelled copper wire for winding the inductors. The last item was a high quality p.c.b.

The p.c.b. is of double-sided construction with large areas of ground plane to aid r.f. stability. It's coated on both sides with solder resist so that only the tinned copper solder pads are exposed. On the component side, white silk-screen printed component markings has been applied to aid the placement of the resistors, capacitors, etc.

Where circuit tracks need to be joined, plated through holes (p.t.h.) were provided, making soldering necessary only on the one side. I think that a p.c.b. of such superior quality is a rare find in Amateur Radio kits – especially at the lower cost end of the market!

Keen constructor Phil Ciotti G3XBZ shares the enjoyable experience he had building and using the MKARS 80 kit transceiver for 3.5MHz.

What Don't You Get?

The most obvious item I haven't mentioned yet is the construction and user manual. To keep the total cost down a manual **is not supplied** with the kit. Instead, as with a lot of today's equipment the manual is available via the internet from the MKARS Website, and can be viewed, read and a hard copy printed for use. However, if the constructor isn't are able to access the Internet, the MKARS will supply a ready printed version at extra cost.

The printed-out manual consists of 26 pages of A4 sized paper in a landscape format. Contained within its pages are sections on component identification, construction, alignment details, fault finding, voltage chart and a circuit diagram. When printed, the manual is easy-to-read with well spaced lines of text.

The kit doesn't come with the control knobs. These are left for the constructor to find as there is quite a range available. However, when choosing the knobs be aware that they need to be suitable for use on 6mm shafts.

Checking The Kit

Having unpacked the various bags from the case, my next job was to check that all the components were present and were of the correct value. Although this may seem to be a long-winded process – it has two benefits. First, I was able to check the supplied items against what's required; the second meant I became familiar with the different component types. This is helpful as it makes identification much easier when construction begins.

The bags were numbered one to six and I checked them in that order. Each bag also had a printed list of the components it contained and I found a small magnifying glass helpful when dealing with the various diodes as the printing on these is small.

In the manual there is some very useful information on component identification, if the constructor needs help. With the supplied kit everything was satisfactory so I could move on to the next stage. Although I know this has been said many times before – but my advice has to be: **read the instructions through carefully before starting the soldering!**

Interesting Component Numbering

An interesting method of component numbering has been used in this project. All low component numbers are in the top left hand corner of the p.c.b., i.e. R1, C1, D1 etc. The numbers increase going horizontally across, then down and across until the high numbers are at the bottom right corner. Put simply, it's like reading a book and using this method it soon becomes easy to locate the next item to be fitted.

When bending the resistor legs to fit the spaces, I held them in one hand and gently bent them with the fingers of the other. My advice is that all values are checked thoroughly before soldering, it can save a lot of fault-finding later!

The p.c.b. overlay page of the manual is very useful, helping to find item numbers quickly, as it's an enlarged top view of the completed board. All instructions are the familiar 'read, solder the component, tick the box', style. I also use a coloured highlighter pen on the p.c.b. overlay drawing, to block in the outline of the component just fitted.

Note: The winding of the various transformers and inductors can be tricky, although with care and patience these can be wound by referring to the pictures and text in the manual. Helpfully, enough enamelled copper wire was supplied for several attempts, should the winding process go wrong although I had no problems whatsoever!

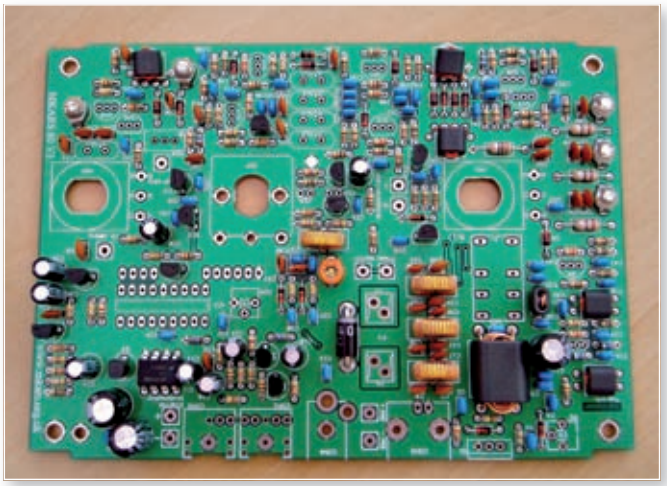

Fig. 2: Part way through the construction phase of the p.c.b.

First Tests

Having completed the p.c.b. assembly, **Fig. 2**, it was then time for me to carry out the initial testing phase of the project. However, before switching on any newly built equipment it's always advisable to check all soldered joints and to look for possible solder splashes between adjacent pins.

I used a multi-meter – switched to the ohms range – to ensure that the resistance at the direct current (d.c.) input connector fell into the required range. Next, I checked that connecting a loudspeaker and a 12V supply resulted in noise coming from the transceiver (it did!).

A check on the five and 8V supplies proved satisfactory, so I then connected a 3.5MHz antenna and signals on the band were heard immediately. After tuning around for a short while, I switched the receiver off, satisfied that it had worked first time! So, with the soldering iron hot again, it was time to continue the assembly process.

Fitting The Display

After I had installed the programmable integrated circuit (PIC) micro-controller in its socket, the display was the next job. **Note:** There's a height restriction of 12mm from the surface of the main p.c.b. to the top of the display itself. Any higher than this could result in damage to the display when the main p.c.b. is attached to the case. If necessary, the display can be removed, without any unsoldering, to gain access to the main p.c.b.

The Alignment

The alignment process is straight forward to accomplish although I think it's certainly a good idea to read and understand the instructions **before** attempting any of the adjustments required! I noted that the power amplifier (p.a.) bias current potentiometer R2 needed care in setting, as it is of the single turn type. Incidentally, only variable resistors and capacitors are adjusted in the setting-up process, so there are no cores to break!

Most Radio Amateurs should have the required test equipment to enable the alignment process to be completed. My own multi-meter, power meter, dummy load and a second receiver were all that I used to assemble the kit.

Next, feeling rather pleased at progress so far, I then tried the transmit sections by talking into the microphone and monitoring it on a nearby receiver. However, although the rig was going into the transmit mode, I couldn't hear any audio coming from the other receiver, when tuned to the same frequency.

Fig. 3: An 'Abra-file' sawblade make the job of cutting 'letter-box' hole for the display, much easier.

Fig. 4: All assembled and ready to go after Phil had fitted knobs of his choice.

Something was obviously wrong! Checking all the external connections, and finding no mistakes, the fault had to be on the main p.c.b..

Referring to the circuit diagram, voltage tables and layout, I then began to test the various sections of the transmitter. A short while later I discovered the problem – I had scored the home-brew equivalent of an own goal, as one of the windings in T3 was not making proper contact with the solder pads, and was in effect, an open circuit.

Re-soldering both joints (to burn off all the enamel insulation) cured the problem. On re-testing the rig, good, strong, clear audio was heard from the monitor receiver. Then, satisfied that the MKARS 80 was working well, I was able to start the final assembly stages.

Website Templates

Besides the manual, templates for the necessary holes that need to be drilled in the supplied box are also available from the MKARS website. Two templates are required, one for the front panel, and one for the side panel. These are then attached to the case and the centres of the holes are punched to give the drill a starting place.

I started by clamping the case firmly (don't forget to wear eye protection whilst drilling) and found that all drill sizes are given on the templates – very helpful! The cut-out for the display was then undertaken using with an Abra-saw, which fits into a standard hacksaw frame. This useful tool can be used in any direction, left, right, up or down and makes it easy to cut rectangular holes as in **Fig. 3**.

After I had prepared all the holes and de-burred them the control and connector panels needed their lettering applying. Again, templates are available if required although I used a self-adhesive labelling system for the review kit.

The final part of the assembly is installing the completed p.c.b. into the case using the hardware supplied. Adding the control knobs completed the project.

On The Air

With only three controls on the receive side the MKARS80 is easy to use. Despite being a relatively simple design, without any automatic gain control (a.g.c.) function, I had great fun listening to the 3.5MHz band.

The r.f. gain control also adjusts the audio volume from the external loudspeaker, so be prepared to turn back the gain on strong signals. This is even more important when wearing headphones. With the aid of the built-in frequency locking circuit the receiver stayed on tune, even when monitoring Morse Code QSOs (contacts). The digital display also shows battery volts and gives an indication of frequency locking activity.

To transmit, all I had to do was close the push-to-talk (p.t.t.) switch and speak into the microphone. A bright red light emitting diode (l.e.d.) is used, to indicate modulation, and this should extinguish on voice peaks. An electret microphone was used, and this provided more than enough gain to drive the rig to full output.

I used a power meter to monitor the r.f. output to ensure the transmitter was not overdriven. Several contacts were made to confirm the transceiver was operating correctly and no adverse comments were made on my transmitted audio. All on-air tests were conducted using a modified G5RV antenna mounted at 8m above ground.

Phil's Opinions?

One of the questions normally asked when purchasing a kit is. "What else do I have to buy to complete the project?" The answer with the MKARS 80 project is very little. Everything, apart from the knobs, is supplied!

All the components are of good quality, especially the p.c.b., which is a real delight to work on. The manual is well written, with lots of extra information to help with the construction.

Provided its limitations are accepted the transceiver can provide good contacts on the 80m band, and generate interesting conversations. I consider the MKARS 80 to be very good value for the outlay, providing many hours of enjoyment, building and operating. Well done MKARS! ●

Product: MKARS 80 3.5MHz s.s.b. transceiver kit (designed by **Steve Drury G6ALU**, a member of MKARS).

Company: Radio-Kits (Milton Keynes)

Pros: Good quality components and instructions, excellent p.c.b. Good value for money.

Cons: Care needed in handling small components.

Price: £45 plus £3 p&p (UK). Please enquire for foriegn postage rates and payment methods.

Supplier: My thanks go to **Steve Drury G6ALU**, for the loan of the transceiver kit, which can be supplied by **Radio-Kits** at **25 Crosslands, Stantonbury, Milton Keynes, Buckinghamshire MK14 6AY**. Tel: **(01908) 222672. E-mail g6alu@tiscali.co.uk** Website **http: www.radio-kits.co.uk** A builders support group is available at **http://uk.groups.yahoo.com/group/mkars80/** (which prospective builders are welcome to join).

The MKARS80 designer Steve Drury G6ALUI writes: *"Sorry your MKARS 80 kit didn't work first time Phil! I'll add a "take care point" in the next release of the manual so other builders are aware that extra care is required in soldering through the coating of the enamelled copper wire used. Incidentally, a c.w. adapter will be available shortly, this allows the MKARS 80 to transmit and receive in the c.w. mode."*

Regards, Steve G6ALU

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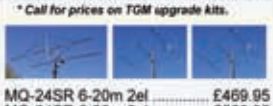

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Tony Nailer's

doing it by design

Using a single local oscillator, Tony Nailer G4CFY turns the *PW* Poundbury IF Unit into a 3.5/14MHz receiver

I must first apologise to my devoted followers that there was no *Technical for the Terrified* in the February 2009 issue of *PW*. Things were very busy at home just before the Christmas break and with my other non-radio interests, I was pushed for time!

One extra item thrown into my 'mix' was developing the printed circuit board (p.c.b.) for the computer interface that **Tex Swann G1TEX**, the Technical Editor of *PW* had been developing in conjunction with the **Poole Radio Society** as a club project. The p.c.b. layout and hardware design for the project were to be my part and it was agreed that **Colin Redwood G6MXL** would write an article in his *What Next?* about its construction.

To make the project accessible to the absolute newcomer to the hobby, Colin described the construction in such detail that it ran to five published pages in the issue putting pressure on other articles. When *PW* enquired if I would be willing to miss out my *Technical for the Terrified* column in the February issue, as it was to our mutual advantage, I willingly agreed to do so!

Threshold Voltages

During December I received a long letter from **John Dickinson** about threshold voltages for the BS170 field effect transistor (f.e.t.), and also about how the Editor of *PW*, **Rob Mannion G3XFD**, kept going on about the transmitting Amateur side of the radio hobby, seemingly to completely overlook those who are only interested in the receiving side of wireless.

Looking through *PW*'s annual index in the December 2008 issue of the magazine, I found there were 15 articles on antennas, 12 reviews – of which just four were transceivers. There were 14 practical articles of which five were for receivers; there were six *Doing it by Design* of which three were transceivers and three for test equipment; there were 12 *Carrying on the Practical Way,* which were of general interest mixed including receiving, transmitting, filters, and v.f.o.s. I think that all-in-all it's quite a good balance.

As a designer and writer for *PW* and supplier of kits, I can tell you that there is more interest in peripherals and test equipment than in transceivers or transmitters. Presumably with a steadily shrinking hobby there are more second-hand transceivers available than interested purchasers. When an enthusiast can buy an older 100W all-h.f. band transceiver for a nominal £100+, what's the attraction of a 5W kit for a mono-band transceiver at £50 in kit form?

The answer to that question is, that when anyone with available funds or credit can buy a transceiver and put it into operation, and start making contacts, there is almost no achievement in creating a station. Apart from plucking up courage to reply to a CQ call for the first time, or actually making the call in the first place there's no other achievement at all.

Conversely, there's an enormous amount of satisfaction and sense of achievement, when using a receiver or transceiver, either built from parts separately sourced, or from a kit. The achievement is that it has been put together using your own skills in construction and alignment.

The Poundbury Project

In the March 2006 issue of *PW*, I

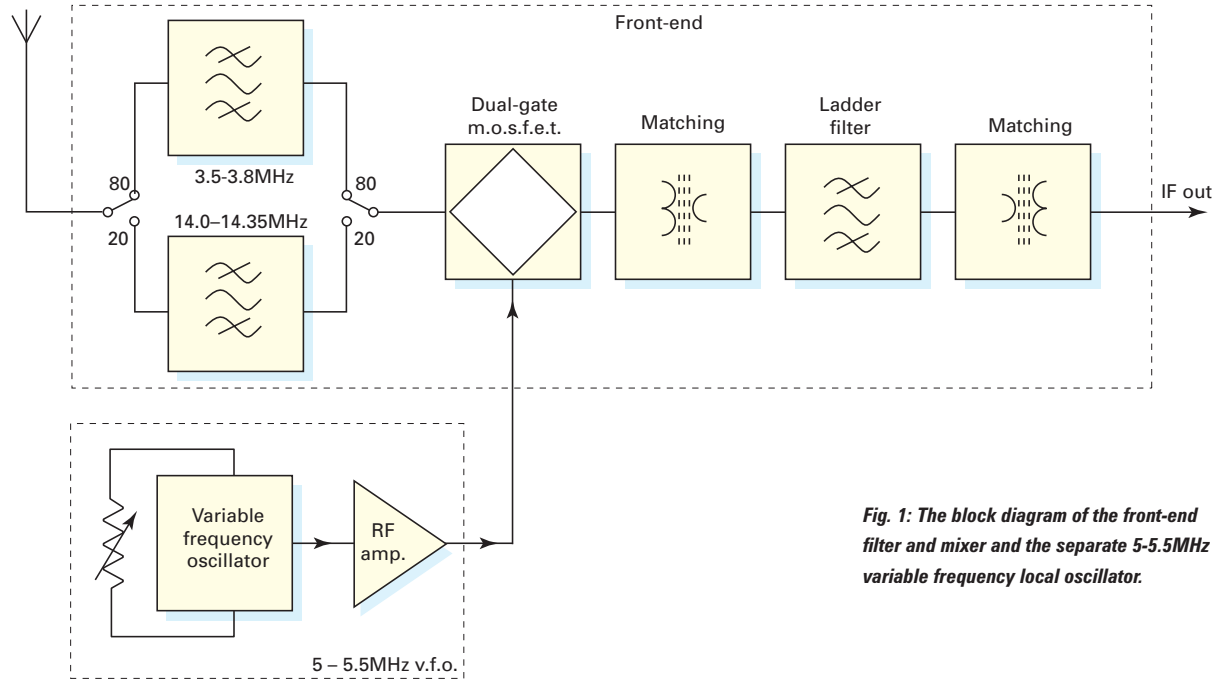

Fig. 1: The block diagram of the front-end filter and mixer and the separate 5-5.5MHz variable frequency local oscillator.

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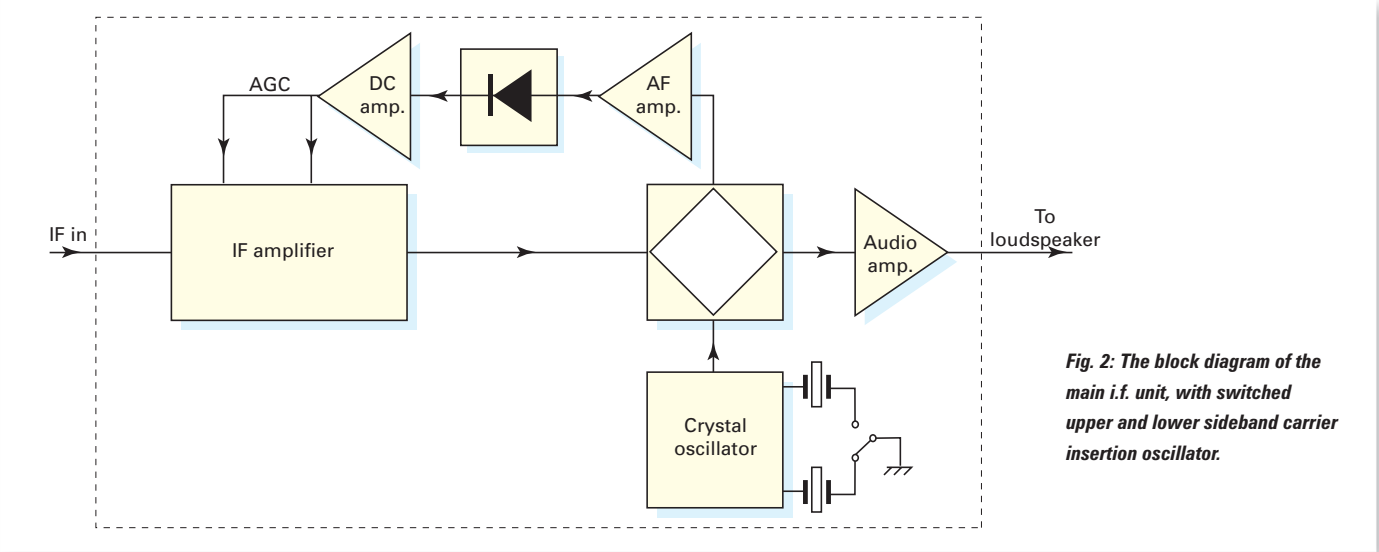

Fig. 2: The block diagram of the main i.f. unit, with switched upper and lower sideband carrier insertion oscillator.

started the Poundbury transceiver project by describing the Portland variable frequency oscillator (v.f.o.) and buffer. Then in May 2006 in *Doing It By Design* (*DiBD*), I described a mixer-oscillator board to translate the Portland v.f.o into a very high frequency (v.h.f.) local oscillator.

In the June, August, and October 2006 issues of *PW*, I detailed the development of the Poundbury s.s.b. transceive i.f. unit. This included an s.s.b. filter, microphone amplifier and processor, double balanced mixer, receive intermediate frequency (i.f.) amplifier, s.s.b. product detector, automatic gain control (a.g.c.) system, audio amplifier, and carrier oscillator.

In June 2007 *PW* I gave details of the Poundbury 70MHz (4m) front-end receive and transmit preamplifiers. These, together with a two-stage transmit amplifier, from my transverters, then created a complete 25W 70MHz s.s.b. transceiver to build yourself.

The development work I did, showed that converting down to match a diode ring mixer on receive and transmit, created great problems with signal levels, and that it was better to carry out mixing at higher impedances. There was also a problem that many constructors had their own crystal filters, which had different footprint, or load impedance to the one specified in the Poundbury project.

So, it seemed that the filter, diode ring mixer, and matching transformer on the Poundbury main board was no longer required. Also that in many applications carrier crystals would be required for u.s.b. and l.s.b. generation and demodulation. Consequently in 2008 I laid out a new board for the Poundbury i.f. Unit, without the crystal filter or matching transformer, or diode ring. It now included the provision for two d.c. switched carrier crystals. This board was called the Poundbury-2 s.s.b. i.f. unit.

As a necessary step towards a dual-band 3.5/14MHz s.s.b. transceiver and to satisfy those readers who are termed as 'short wave listeners', I have spun off the receive side of the Poundbury-2 unit. I've worked out what is required to complete a dual-band receiver using a 9MHz i.f. The block diagrams of the project are shown in **Fig.**s **1** and **2**.

Poundbury RX Main Board

The Poundbury Receiver Main Board includes an i.f. amplifier using a field effect transistor (f.e.t.), and two cascaded dual gate mosfets, a full-wave demodulator, a.f. amplifier, carrier oscillator with two d.c. switched carrier crystals, and an automatic gain control system (a.g.c.) with S-meter output. The circuit is shown in **Fig. 3**.

The signal processing section of the i.f. amplifier uses discrete stages with tuned outputs. It is extremely stable and low noise with a very wide dynamic range. More than can be achieved using any of the alternative integrated circuit (i.c.) systems such as the MC1349 or MC1350, or the now obsolete SL600 series i.c. The use of inter-stage i.f. transformers limits the signal and noise into a narrow band at the demodulator. The signal derived from the product detector also contains very little noise.

The audio amplifier has been chosen from numerous types I've tried over a period of 30 years, it uses a fair number of components **but** has a low quiescent current and again very low noise.

The a.g.c. unit first stage is IC1:B, biased at ground with its negative input, which causes it to amplify only positive going signals. The output from this stage feeds a diode D5 which charges capacitor C33. Resistor R30 in conjunction with C33 determines the time constant of the a.g.c., in this case 100mS. This is quite fast and could be slowed if found necessary by increasing C33 to 220nF or even 470nF.

The next i.c. in the circuit IC1:C is a voltage amplifier which amplifies the

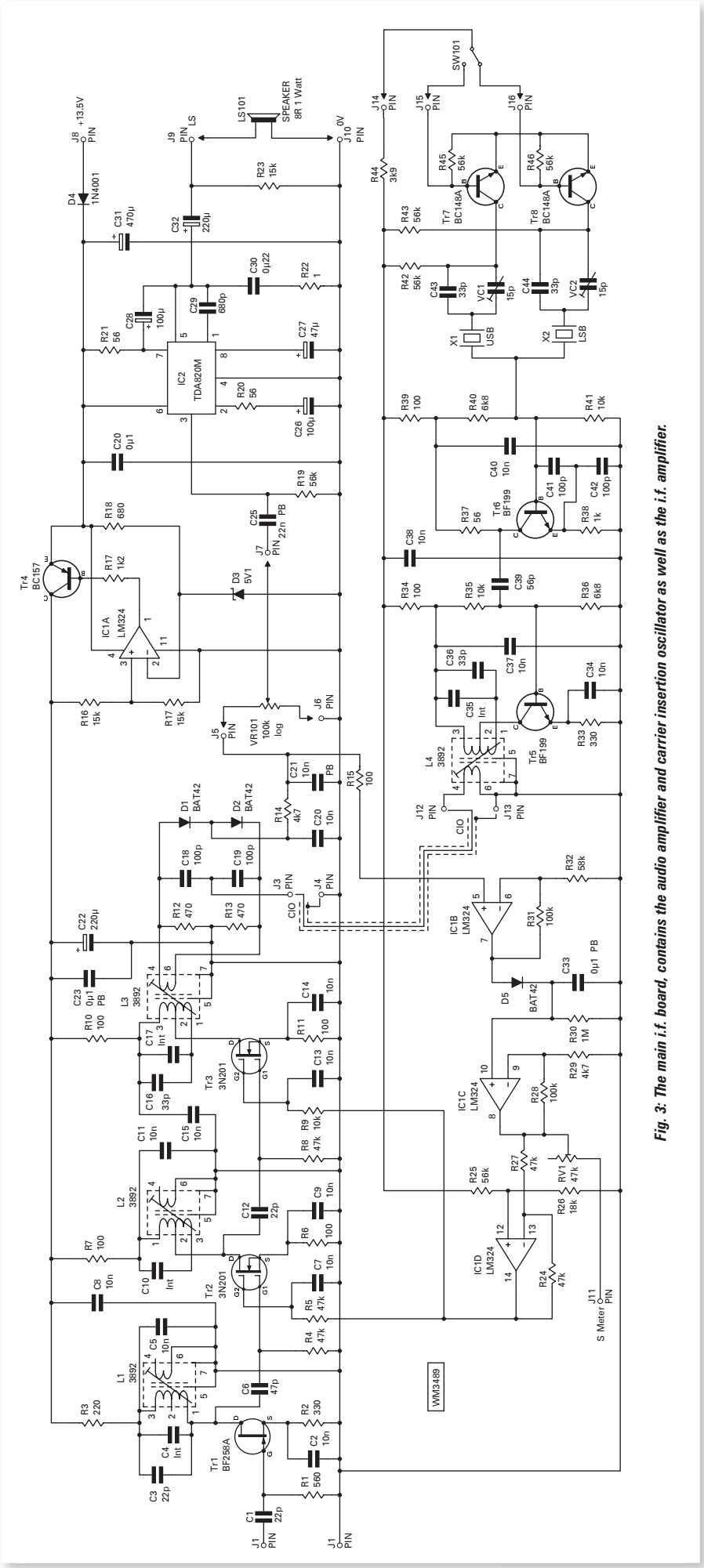

Fig. 3: The main i.f. board, contains the audio amplifier and carrier insertion oscillator as well as the i.f. amplifier.

voltage across R30 by 21 times. So an input voltage of 100mV becomes an output of 2.1V. The third i.c. IC1:D acts as a level shifter and inverter so that with no signal, the voltage at its output sits at around 4V, which is the biassing voltage for the G2 terminals of m.o.s.f.e.t.s Tr2 and 3.

When a really strong signal is received the voltage at this point will drop to close to zero volts, which reduces the gain of the i.f. stages by as much as 60dB.

Carrier Oscillator

The carrier insertion oscillator (c.i.o.) is a standard Colpitts type with two carrier frequency crystals, switched on their earthy sides using a pair of BC148A transistors. Output from the oscillator is taken from the collector circuit of the stage, where the distortion is lower than that at the emitter. The following stage Tr5 is a standard common emitter amplifier with a low impedance output from the secondary of its collector coil.

Coupling from the carrier oscillator to the product detector is by means of miniature coaxial cable. This is a deliberate requirement as the voltage required by the full wave bridge is at least 1.6V peak-to-peak (p-p). This signal must not be allowed to radiate to any part of the i.f. amplifier, where it will mix with the incoming signal and also generate a.g.c volts, desensitising the receive i.f.

Portland VFO Modified

The local oscillator is a development of the very successful Portland v.f.o., used with the Poundbury 70MHz project, but modified to cover 5-5.5MHz. This frequency range is a classic in that the difference between the v.f.o and the 9MHz i.f. gives 3.5 – 4.0MHz, and the sum gives 14.0 – 14.5MHz. One v.f.o range, two bands, clever isn't it!

The major problem in its design was obtaining the suitable value inductor around 20μH. Fortunately there are still stocks of the TOKO coil TKANS 32696A with a maximum inductance about 23μH.

At 5.0MHz the capacitance to resonate this is;-

C = 1/(39.5*F1*F1*L), where F1 is 5.0MHz and L is 20μH,

C = 1/(39.5*5*10^6*5*10^6*20*10^{-6})

C = 1/(39.5*5*5*20)μF

C = 50.5pF.

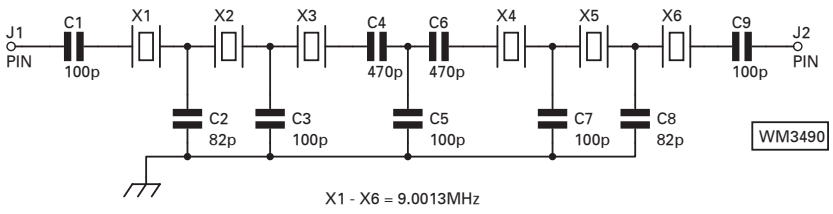

Fig. 4: Using six crystals to form the 9MHz ladder filter gives a narrow-band filter for the receiver.

At 5.5MHz the capacitance to resonate this is;

C = 1/(39.5*F2*F2*L), where F2 is 5.5MHz,

$C = 1/(39.5*5.5*10^6*5.5*10^6*20*10^{-6})$

$C = 1/(39.5*5.5*5.5*20)\mu F$

C = 41.8pF.

Total Change

The total change in capacitance is then just under 9pF, which can be easily achieve by a pair of anti-phase varicap diodes. I intend to try base to emitter to ground capacitors of 100pF each and a coupling capacitor to the tuned circuit of 47pF. The active part of the circuit then contributes about 24pF. The varicaps and other loading then require 17.8 to 26.5pF.

Apart from these requirements the rest of the design follows that detailed in the article of March 2006, except that the supply regulation now uses a 3-terminal regulator in place of the zener and resistor.

Front-End Filters

The front-end filters for the project are still in the development stage, and have not even been bread-boarded yet. However, initial calculations prove that the band from 3.5 to 3.8MHz is too wide to use band-pass coupled tuned circuits. Instead it will be necessary to use cascaded high-pass and low-pass filter sections, with nominal 50Ω input and output impedances.

Classic designs for cascaded filters are available and I've anticipated I'll use two 'T' high-pass sections (with three series capacitors and two shunting inductors), followed by two 'Pi' low-pass sections (with two series inductors and three shunt capacitors). It may be worth designing elliptic high and low-pass sections for these as the inductors are relatively cheap and the performance improvement in stop-band rejection is dramatic and often worth the extra complexity.

The other band from 14 to 14.35MHz is proportionally narrower, which represents a bandwidth of 1/40, or a *Q* of 40. Two or three capacitively 'top-coupled' parallel tuned circuits in this case will provide quite a sharp filter with the required bandwidth.

Switching the inputs and outputs of the bandpass filters can be carried out using diode switching. With signals of very low level, most probably under a few millivolts p-p, and switching currents of say 10mA, losses will be low, and intermodulation generation insignificant. This method requires only a single pole switch to change bands.

Front-End Mixer

I could have tried being really clever with the front-end mixer, using a diode ring, or push-pull f.e.t.s., but very long experience has shown that the humble dual-gate m.o.s.f.e.t. is really a very successful mixer.

I've found that, when the dual-gate m.o.s.f.e.t. has zero bias on gate 2, it's barely functioning. Then a reasonable local oscillator swing provides good mixing action, with up to 10dB conversion gain.

In this application it will be necessary to feed it with an input impedance of maybe 1kΩ, using a wide-band step-up transformer from 50Ω. The nearest convenient multiple is from a 1:4 turns ratio transformer, providing an impedance transformation from 50Ω to 800Ω. That will do nicely.

First IF Filter

The output of the front-end mixer should be matched to the first i.f. filter, for which I settled on a crystal ladder filter. I've experimented with a six-crystal ladder filter and achieved great success, the component values and circuit is shown in **Fig. 4**. This has a pass-band of 2.6kHz, a 'skirt' bandwidth of 7.6kHz, and a stop-band attenuation of 79dB. The termination impedance was less than 4pF and about 150Ω.

To match into this from the m.o.s.f.e.t. mixer, I could use either TOKO coil with appropriate secondary turns, or otherwise a toroidal transformer, again with a 4:1 turns ratio. This could be paralleled with 2.7kΩ to give something slightly less than 168Ω loading.

On the output side of the crystal filter, another wide-band toroidal transformer, or auto-transformer could be employed with a 1:2 turns ratio. This would transform the 150Ω to 600Ω so that the main board input could be set to 680Ω, to provide 170Ω load for the filter. My experience is that filters often produce flatter pass-band shapes into higher than design loading.

Final words

It is now clear, the direction the development will take and that most of the pieces of the project are using proven techniques. The band filters and matching toroids being the only areas requiring experimentation and evaluation.

In the next article in this series it's intended to provide the printed circuit boards for the three sections of the project as planned. The alternative would be to include the filter and matching sections and m.o.s.f.e.t. mixer on the main board, with 50Ω r.f. and v.f.o. inputs, which could then be used with v.f.o.s and front-end filters for other h.f. bands. ●

Correspondence

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

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club news

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Bath Buildathon II

Looking at the feedback from those taking part, the success of the second Bath Buildathon at least equalled that of the first. The solder smoke was rising all day long as ten Brendon transceiver kits were worked on all at the same time. Two of the builders were Full licence holders looking to improve their radio construction skills but the rest were all at the Foundation stage and were building their Intermediate projects; they all passed their exams the following week.

First to complete his kit was **Wayne M0WAY**, who travelled all the way from Wolverhampton, but the prize for 'furthest travelled' went to **Andy Cox M0HLT**, who returned to his native Bath from near Penzance where he now lives. Andy came to introduce his son, **Eden**, to the joys of homebrew.

Although Eden is only 7 years old and not yet licensed he was wielding the soldering iron and tuning in signals on a newly completed receiver like a professional. Eden even exchanged a greetings message under the supervision of **Steve Hartley G0FUW**, who organised the event. Eden hopes to start a Foundation class very soon.

Steve says that organising a Buildathon is hard work but with a small team of helpers any club or training organisation can do it, especially using a readily available kit. Steve was ably assisted by **Mike Coombs, G3VTO**, and **Lewis Thomas, G4YTN**.

The Bath event was filmed by a couple of local Amateurs who happen to work in the broadcast industry and it is hoped to have a DVD available to help others run their own Buildathon events very soon. **Brian Reay G8OSN**, chair of the RSGB Amateur Radio Development Committee, has even suggested that there may be a national Buildathon competition. Watch this space! 73, **Steve G0FUW**

BEDFORDSHIRE

Shefford &DARS
David Lloyd. Tel: (01234) 742757
www.sadars.org.uk
The Shefford and District Amateur Radio Society meets every Thursday at the Community Hall, Ampthill Road, Shefford, SG17 5BD (next to the Chip shop). See web site for our full programme.

BERKSHIRE

Reading & DARC
Pete Milton. Tel: (01189) 695697
www.radarc.org
The Reading & District Amateur Radio Club meets on the second and fourth Thursday of the month at Woodley Pavilion, Woodford Park, Haddon Drive, Woodley, Berkshire RG5 4LY. Feb 26th Harwell Labs - the History to 1954. Nick Hance MBE.

CAMBRIDGESHIRE

Huntingdonshire ARS
Gerald G8AKL Tel: 01487 740794
E-mail: hunts.hams@yahoo.co.uk
www.hunts-hams.co.uk
Huntingdonshire ARS meets at the Medway Centre, Medway Road, Huntingdon PE29 1SF. Meetings are from 7.30pm until 10pm on the 2nd & 4th Thursday of the month.

CHESHIRE

Chester & DRS
Barbara Green Tel: 07957 870770
E-mail: barbara@rutland.go-plus.net
www.chesterdars.org.uk
The Chester & District Radio Society meets on Tuesday evenings at the Burley Memorial Hall, Common Lane, Waverton, Chester CH3 7QN.

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

Macclesfield & DRS
Adie Dodd. Tel: 0795 7765511
www.gx4mws.com
The Macclesfield & District Radio Society meets every Monday at the Pack Horse Bowling Club, Westminster Road, Macclesfield SK10 3AT at 8pm.

Stockport RS
David Simcock. Tel: 0161 456 7832
E-mail: secretary@gx4mws.com
www.stockportradiosociety.co.uk
The Stockport Radio Society meets on the first and third Tuesdays at the Bramhall Air Scouts HQ, Leewood Hall, Benja Fold off Ack Lane East, Bramhall, Stockport SK7 2BX.

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

CORNWALL

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

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

COUNTY DOWN

Bangor and District ARS
Mike. Tel: 028 4277 2383
http://www.bdars.com
The Bangor and District Amateur Radio Society meets on the first Thursday of every month in 'The Boathouse', Harbour Car Park, Groomsport BT19 6JP at 8pm. At 8pm on March 5th we are holding an operating evening. This will be an ideal opportunity for members to get used to our new equipment.

COUNTY DURHAM

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

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

DERBYSHIRE

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

DEVON

Exemouth ARS
Mike G1GZG, Tel: 01395 274172
E-mail: micael.newport1@btinternet.com
The club meets on the 1st and 3rd Wednesdays of each month at 'The Scout Hut', Marpool Hill, Exmouth Devon EX8 1TD.

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

Torbay ARS
Dave Helliwell.
E-mail: g6fsp@tars.org.uk
www.tars.org.uk
The Torbay Amateur Radio Society meets Fridays at 7.30pm in the Teignbridge District Scout Headquarters, Wolborough Street, Newton Abbot, Devon TQ12 1JR.

DORSET

Blackmore Vale ARS (BVARS)
Nick Perrin Tel: (01747) 838936
E-Mail: bnperrin@theiet.org
www.radioclubs.net/bvars/
BVARS meets in The Youth Club, Coppice Street, Shaftesbury Dorset SP7-8PF each Tuesday evening at 7.30pm. The Club callsign is G4RBV. The main meeting is the second Tuesday of the month and details of events and full details of the Club can be found on the website. Mar 29th it's an 80m Fox Hunt at Bryanston School Dorset. Open to all to attend but first come first served for use of the club's DF receivers.

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

Poole Radio Society G4PRS
'Tex' G1TEX Tel: 07966 460 552
www.g4prs.org.uk
Meetings are every Friday at 19:30 for 20:00 at the The Old Chapel Hall, Cabot Lane, Creekmoor, Poole BH17 7BX, the second friday meeting of each month is the formal evening, all others are basically shack and Natter nights. The Intermediate class is presently fully booked and well underway!

Dumfries & Galloway (Scotland)

The Wigtownshire Amateur Radio Club
Ellis Gaston Tel: 01776 820413
Web: www.gm4riv.co.uk
The club meets every Thursday from 19:00 Hrs at the The Aird Unit, Stranraer Academy, Stranraer, DG9 8BQ, South West Scotland. Mar 5th Shack PSK Natter Night, 12th Shack PSK Natter Night, 19th Shining a light on Darkest Borneo by Tam Wylie GM4FDM a DXPedtion and on the 26th, it's a Shack PSK Natter Night.

EAST SUSSEX

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

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

ESSEX

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

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

Chelmsford ARS
Martyn Medcalf. Tel: (01245) 469008
E-mail: info2007@g0mwt.org.uk
www.g0mwt.org.uk
The Chelmsford Amateur Radio Society meets on the first Tuesday of each month in the Marconi Sports & Social Centre, Beehive Lane, Great Baddow, Chelmsford CM2 9RX at 7.30pm. - All welcome. Saturday 25th April CARS will be operating from Sandford Mill for International Marconi Day.

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

South Essex Amateur Radio Society
Contact: Dave (G4UVJ) 01268 697978
E-mail: southessex.ars@btinternet.com
www.southessex.ars.btinternet.co.uk
Local Network: 145.225MHz
Meet second wednesdays of each month at South Benfleet Primary School, High Rd, South Benfleet, Essex SS7 5HA. (Entrance: 51°33'10 .45N 0°33'39.65E), (Opp. Smiths Wood Yard). All welcome.

FIFE (Scotland)
Glenrothes&DARS GM4GRC
D Francis MM0DYX Tel: 01383 823878
Meet Wednesdays at the Football Pavillion, Station Rd. Thornton Fife. Club Chairman Ken GM3YBQ runs course at all licence levels.

GLOUCESTERSHIRE
Cheltenham ARC G5BK (CARA)
Alan Errock, G3HC. Tel: 01452 813
E-mail: alan@errock.co.uk
www.caranet.co.uk
The club meetings are held on the first Friday of each month, starting at 8p.m. at Prestbury Library, The Burgage, Cheltenham, Gloucestershire, GL52 3DN.

Gloucester Amateur Radio and Electronics Society
Tel: Anne 2E1GKY/M3GKY 01452 548478 (After 10am)
E-mail: hamreed@blueyonder.co.uk
www.g4aym.org.uk
Meet at Churchdown School, Winston Road, Glos. GL3 2RB, every monday evening at 7-30pm until 10pm except for Bank Holidays when we operate from a local escarpment. March 9th VHF/UHF Operating. April 6th is "Warships to Waterbuses" by Malcolm G6UGW.

GWYNEDD (Mid-Wales)
Merion ARS
Tel: John 07868 738016
Email : tawelfan@talk21.com
http://meirionars.multiply.com/
Meirion amateur radio society meet on the first Thursday of each month at The Royal Ship Hotel in Dolgellau Gwynedd LL40 1AR at 19.30. Visitors and new members are very welcome. Regular talks are organized and all the details for meetings and special events can be seen on the club website.

HAMPSHIRE
Andover Radio Amateur Club.
Martin M0MWS. Tel: 01980 612070
E-mail:- martinsmith@kukltd.co.uk
www.arac.co.uk
The Andover Radio Amateur Club meets on the first and third Tuesdays in the month at the Club venue in The Village Hall at Wildhern, SP11 0JE. Map Ref SU350510 at 19:30 hours.

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

Farnborough & District Radio Society (FDRS)
Derek G3OFA E-mail: mail@fdrs.org.uk
www.fdrs.org.uk
Meets every 2nd and 4th Wednesday in the month at 7:30 for 8:00 pm in the Farnborough Community Centre, Meudon Avenue, Farnborough, Hampshire, GU14 7LE Visitors and new members are always most welcome. Feb 11th New licensee's thoughts on amateur radio - Jon 2E0JPJ, Feb 25th Computing by Surf-IT - Garry, Mar 11th An introduction to astronomy - Julian M3XPJ, Mar 25th Visit to Martin Lynch & Sons (Chertsey) and on Apr 8th it's Model radio controlled aeroplanes by Colin G8BCO.

Horndean & District ARC
Stuart Swain. Tel: (02392) 472846
E-mail: g0fyx@msn.com www.hdarc.co.uk
The Horndean & District Amateur Radio Club meets on the first and fourth Tuesdays each month in the Lovedean Village Hall, 160 Lovedean Lane, Lovedean, Hants PO8 9SF at 7.30pm. Visitors are always very welcome. Their Bring-and-buy sale which was to take place on that earlier this year will now take place on Tuesday May 26th.

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

Lymington Community Association Radio Club
Keith G8MZF Tel:(01590) 672337 (work) (02380) 849395 (evenings)
Email: lymcomass@aol.com
The club meets at Lymington Community Centre, New Street/Cannon Street, Lymington SO41 9BQ, on friday nights. Talk-in on the night on or near 145.550 club call M0LCC. All are welcome. Start time hopefully 7.30pm bar open from 7.00pm. Plenty of free parking nearby.

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

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

Jersey
Jersey Amateur Radio Society - GJ3DVC
Rob Luscombe (secretary) 2J0RZD Tel: 07797 923916
E-mail: gj3dvc@gj3dvc.org.je
http://www.radioclubs.net/gj3dvc/
The Jersey Amateur Radio Society meets every Friday at 7.30pm at The German Signal Station, Rue Baal, La Moye, St. Brelade, Jersey, JE3 8HQ, also on a Wednesday evening from time to time to maintain, alter and improve the shack, antennas etc. and also for club training. Coffee and car parking available, visitors are always welcome, shack rental available. See our website for further information.

New Intermediate Course at Jersey Amateur Radio Society

Well done to **Steve Whitfield** for passing the Foundation exam back in September and he is now the proud holder of the callsign **MJ6SIT**. Steve is keen on the use of data modes which he has already used to good effect with contacts far and near and is also well versed in electronics with a background in electronic engineering. Subsequently club President **Mike GJ0PDJ** has started teaching a new intermediate course on a Wednesday evening up to Christmas 2008 with success by **Mike** now **2J0SZI** and **Steve** now **2J0SIT** (see above), **Chris MJ3CMB** will be taking his exam early in 2009. **Rob Luscombe**

Further information via **mj0jer@gj3dvc.org.je** website **http://www.pjnr.com/jars/**

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

Hilderstone Radio & Electronics Club
Mike Howland E-mail: g4mix@waitrose.com
www.g0hrs.org.uk
Meetings now at The Science Block, Chatham House School, Chatham Street, Ramsgate, CT11 7PP on 2nd and 4th Friday of the month at 7-30pm.

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

LANCASHIRE
Oldham RC
Christopher Cunliffe. Tel: 07749347142
E-mail: secretaryoarc@btinternet.com
www.oarc.org.uk
The Oldham Radio Club meets on Thursdays at Royton Air Training Corps, Hillside Avenue, Royton, Oldham OL2 6RF at 7:30pm.

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

Thornton Cleveleys ARS (G4ATH, & G6GMW)
John Tel: 01253/399377,
E-mail: m3waz@hotmail.co.uk
www.tcars.org.uk
Meet monday evenings at the Frank Townend Center, Kensington road, Cleveleys, Lancashire FY5 1ER. March 9th "Vintage PCs" by John M0JFE, 16th "Tech Talk" by Ted G3WBB, 23rd "Computer Fault Finding" by John G8RDP. April 6th Natter Night.

LINCOLNSHIRE
Spalding & DARS
Graham Boor. Tel: 07947764481
E-mail: secretary@sdars.org.uk
www.sdars.org.uk
The Spalding & District Amateur Radio Society meets at the Castle Sports Swimming Complex, Spalding PE11 1QF on Fridays at 7.30pm.

Stenigot "Chainhome" Amateur Radio Club
Steve Burke M5ZZZ Tel: 01507 600202
E-mail m5zzz@btinternet.com
www.stenigotchainhomearc.co.uk
Meetings are held on the third Friday of the month commencing 19.30 at Gayton le Marsh Village Hall, Gayton le Marsh, Lincolnshire. LN130NW. Feb. 20th A talk by John G0ATW and Lee G4TNX ."Amateur Television Basics". Mar. 20th Auction and Table Top sale Go home with more than you bargained for: Doors open 18.30 Lots must be booked in by 19.30. Tables Free (Limited number) Auction starts 20.00.

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

Southgate ARC
David Sharp. Tel: 01992 422622
E-mail: david.sharp1@tesco.net
The Southgate Amateur Radio Club meets on the second Wednesday of the month at Hazelwood Lawn Tennis and Squash Club, Ridge Avenue, Winchmore Hill, London N21 2AJ at 7.30 for 8 pm.

Wimbledon and District ARS
Jim Bell M0CON
Tel: 020 8874 7456
E-Mail: jamesm0con@o2.co.uk
http://www.gx3wim.org.uk
The Wimbledon & District Amateur Radio Society welcomes new comers to our meetings whether they are licensed or not. We hold our meetings the second and last Friday of each month at Martin Way Methodist Church, Buckleigh Avenue, Merton Park, London SW19 9JZ. The church is on the corner of Martin Way and Buckleigh Avenue.

THE LOTHIANS (Scotland)
Cockenzie & Port Seton ARC
Bob Glasgow. Tel: (01875) 811723
E-mail: gm4uyz@cpsarc.com
www.cpsarc.com/news.php
The Cockenzie & Port Seton Amateur Radio Club meets in the Thorntree Inn (Lounge Bar), High Street, Cockenzie, East Lothian EH32 0HP from 7pm till late. Organised talks are held in the Port Seton Community Centre, South Seton Park, Port Seton, East Lothian EH32 0EE. Timings 18:30 to 21:30hrs. Feb 20th Radio Check Night by John MM0JXI. Mar 6th Normal club evening, 20th Talk by Malcolm Gibson "Databases and their Uses" in Port Seton Community Centre Resource Room 2, at 19:30 to 21:30

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

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

NORFOLK
King's Lynn ARC Ray Dowsett, MBE.
Tel: (01553) 671307
E-mail: ray-g3rsv@supanet.com

www.klarc.org.uk
King's Lynn Amateur Radio Club meets every Thursday at the Scout HQ, Chequers Lane, West Winch, King's Lynn, PE33 0NY off the A10 at West Winch at 7.30pm.

Norfolk ARC
Mark Taylor. Tel: (01362) 691099
E-mail: narc@g0lgj.co.uk
www.norfolkamateurradio.org
The Norfolk Amateur Radio Club meets every Wednesday at the Eaton CNS School, Eaton Road, Norwich, NR4 6PP, where it meets weekly,from 7-10pm, usually in 6th form centre at front of school, every Wednesday from 7-10pm. Mar 4th Gary G6NYH from Norcall regarding PMR, Mar 11th an informal / Construction / Workshop 4 (RSGB CC), Mar 18th a visit from Elaine Richards G4LFM Radcom Editor and Mar 25th it's an Informal / Construction / Workshop 5 / Bright Sparks

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

NORTHAMPTONSHIRE

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

SHROPSHIRE

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

Telford & District ARS
Mike Street. Tel: (01952) 299677
E-mail: mjstreetg3jkx@blueyonder.co.uk
www.tdars.org
The Telford & District Amateur Radio Society meets on Wednesdays at the Little Wenlock Village Hall, Malthouse Bank, Little Wenlock. Telford TF6 5BG at 8pm. February 4th Open House/On the air/Committee. (Away venue) , 11th Video evening with MØTAW, 18th Under £5 construction competition, 25th Society project.

NOTINGHAMSHIRE

Worksop Amateur Radio Society (W.A.R.S.)
'Daz' Spence. Tel: (01623) 747314
Email- g3rcw@qsl.net
www.qsl.net/g3rcw/
Meets every Tuesday at 7:00 pm. Our cubhouse is located at 59 - 61west street, Worksop, Nottinghamshire. S80 1JP. Exams and courses run frequently for all licence levels. Construction nights due to start in the autumn, and we also put on various special events amongst which is the famous Sherwood Forest. Licensed bar & hot food available on club meet nights. Membership fee for the year is £10.

SOMERSET

North Bristol ARC
Dick Elford. Tel:(01454) 218362
E-mail: g0xay@aol.com
www.nbarc.org.uk
North Bristol ARC meet Fridays at 7.30pm at SHE7, Braemar Crescent, Northville, Filton Bristol BS7 0TD. We carry out training for all the Radio Amateurs examoination, and our next training course is to be for Intermediate exams.

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

Lymington Community Association Radio Club

This is a relatively new club that meets at Lymington Community Centre, New Street/Cannon Street, Lymington SO41 9BQ. New they may be but they're already well underway with their training sessions. The picture shows some of the intermediate class members getting to grips with soldering on a recent Friday night training session – there weren't too many burnt fingers! I think the instructors suffered the most! And most people agreed that PL259 plugs are awful things to fit! **Keith G8MZF**

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

SOUTH GLOUCESTERSHIRE

Thornbury and South Gloucestershire ARC
Tony. Tel: (01454) 417048
E-mail: tonytsgarc@sky.com
The Thornbury and South Gloucestershire Amateur Radio Club meets in the United Reformed Church Hall, on the corner of Chapel Street and Rock Street, Thornbury BS35 2BA at 7.30 - 9.30pm.

SOUTH WALES

Barry ARS
Glyn Jones. Tel: (01446) 774522
E-mail: glyndxis@talktalk.net
www.bars.btik.com
The Barry Amateur Radio Society meets on Tuesdays from 7.30 to 10.30pm in the Sully Sports & Social Club, South Road, Sully CF64 9TG.

SOUTH YORKSHIRE

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

Sheffield ARC
Trevor Wood. Tel: 0114 2216947
E-mail: trevorwood6@yahoo.co.uk
www.sheffieldarc.org.uk
The Sheffield Amateur Radio Club meets at the SYPTE Social Club, Greenhill Main Road, Sheffield S8 7RH every Monday at 7.15pm. All three types of classes are held for the Foundation, Intermediate and Advance levels of licensing.

STAFFORDSHIRE

Tamworth Amateur Radio Society
Colin Marks. Tel: (01827) 700893
E-mail: colin.marks2@ntlworld.com
The Tamworth Amateur Radio Society meets every Thursday at 7.30pm at St Francis Church, Masefield Road, Leyfields, Tamworth B77 8JB.

SUFFOLK

Bury St Edmund's ARS
George Woods G3LPT Tel:01359 259518
Darren Coe G7SDC Tel:01284 701732
storno@yahoo.co.uk
www.radioclubs.net/bsears/
The Club meets on the 3rd Wednesday of the month (Except Aug and Dec) at the Culford school IP28 6TX at 7.30PM. Visitors are welcome. Please see our web site for further details.

SURREY

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

TYNE & WEAR

Angel of the North RARC
Nancy Bone. Tel: 0191 477 0036
E-mail: nancybe2001@yahoo.co.uk
www.anarc.net
The Angel of the North Radio Amateur Radio Club meets every Monday 7 to 9pm at Whitehall Road Methodist Church Hall at the corner of Whitehall Road and Coatsworth Road, Bensham, Gateshead NE8 4LH. The entrance to radio club room is through door at the side of building next to the car park. The car park entrance is on Whitehall Road. February is anniversary month so come along and operate and on Feb 21st there's an anniversary party for all members and their partners 7-00 pm onwards at the Borough Arms at 82 Bensham Rd., Gateshead, NE8 1PS.

Tynemouth ARC
Tony Regnart G8YFA.
Tel: 0191 280 1981
E-mail: mail@g0nwm.com
www.g0nwm.co.uk
The Tynemouth Amateur Radio Club meets each Friday from 7 to 9pm at St. Hilda's Church, Stanton Rd, North Shields, Tyne & Wear NE29 9QB. It's known locally as 'the church near the fire station'. Mar 6th Vertical Antenna Design, 13th Operating Night & Mors, 20th Horizontal Antenna Design, on the 27th it's an Operating Night & Morse

WEST MIDLANDS

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

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

Stourbridge and District ARS
John. Tel: (01562 700513)
www.g6oi.org.uk
The Stourbridge and District Amateur Radio Society meets on Monday evenings, except for Bank Holidays at The Radio Shack, Old Swinford Hospital School, Heath Lane, Stourbridge, West Midlands DY8 1QX at 8pm. We have Open Shack Nights - Tea/Coffee always available, along with an opportunity to get on the air or just a natter with whoever attends

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

Wythall Radio Club
Chris Pettitt. Tel: (07710) 412 819
E-mail: g0eyo@wythallradioclub.co.uk
www.wythallradioclub.co.uk
The Wythall Radio Club is based at Wythall House, Silver Street, Wythall, near Birmingham B47 6LZ. They meet every Tuesday at 8pm and meetings are informal and friendly. Their 2009 annual rally is planned for March 8th – see rallies pages in this issue.

WEST SUSSEX

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

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

WEST YORKSHIRE

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

WILTSHIRE

Trowbridge & District AR
Ian Carter. Tel: (01225) 864698
E-mail: ian.l.carter@btinternet.com
http://uk.geocities.com/tdarc@btinternet.com
The Trowbridge & District Amateur Radio Club meets at Southwick Village Hall, Southwick (nearest postcode is BA14 9QN). Mar 18th is a natter night and on April 1st there's a talk on VP8-YL's First All Ladies Dxpedition to the Falklands (2009) – by Nicky Marriott M5YLO.

WORCESTERSHIRE

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

Club Secretaries

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

Roger Stafford's

antenna workshop

Roger Stafford G4ROJ takes a look at the history and practicalities of kite antennas for the h.f. bands

Flying High With Amateur Radio – Kite Antennas

It's often said of many things, 'there ain't nothing new in this'. That's certainly true of kites, which have been around for centuries. The same goes for kite antennas, they have been used since the birth of radio.

Marconi used kite and balloon antennas in his early experiments. It's an interesting story why he used a kite antenna to receive the first trans-Atlantic radio signal, it's typically one of secrecy and intrigue. Originally, for his long range attempt, he had set up a receiving station at Cape Cod but had problems, mainly because the antennas kept blowing down in the gales.

Marconi was selling radio equipment to various outlets, particularly shipping lines, but he needed a big 'boost' to really get things going. It was certainly newsworthy when a ship, fitted with his equipment, sent out a distress call and lives were saved. However, he knew really long range transmissions would give him the edge! The critics and skeptics of the time said it couldn't be done because the curvature of the earth would interfere.

Marconi became more determined than ever and aware that others were watching closely, for their own research. Looking for another receiving site in secret, he found Signal Hill, at St. John's Bay Newfoundland. He realised that if he put up a fixed antenna farm, his rivals would catch onto his intentions. In order to fool opponents, he said that he was continuing his research using portable antennas on ships. In fact he landed all the equipment at St Johns and put up a balloon antenna, which promptly broke away and was lost. So, a kite was used and the rest, is as they say, history!

The reason I use kite antennas is no where near as dramatic as Marconi. After passing the RAE and Morse test, I was a technical 'rep' travelling around the UK. I used my travels, to operate h.f. mobile and portable, mainly on 3.5MHz, a little on 7MHz and on other bands when the mood took me.

In travelling and being away some nights, instead of propping up the hotel bars as most reps did, I went out operating /P. On one occasion, I saw what could be done with a 'Gibson Girl' RAF box kite and a piece of wire attached to a QRP transmitter. I was then smitten!

Various Combinations

For many years, I tried various kite/antenna combinations but with a job change, I had to call a halt to the fun, but quickly picked it up again after retiring several years ago. Nowadays I get out as much as possible when conditions and flying space are favourable. I've learned to pick the appropriate kite for the wind conditions, now having over 30 different kites. Additionally, the type of kite depends on what configuration of antenna I want to lift.

The flying height restriction in this country is 60m, with very limited flying within 5km of an airport. I belong to a kite flying club, which carries public liability insurance and have flown antennas a lot higher when the club has a field day. In spite of the the extra height it doesn't seem to make all that difference to a signal. Generally, 60m is enough!

The pictures that I've used in this article are just a few of the antennas I've tried. In some of them I've coloured in the various wires and flying lines to show the configurations up better as wire antennas are often difficult to see. All the pictures, with the exception of one, have been taken from the ground, but to get some 'birds eye level views' of the kites and antennas.

I've looked at suitable cameras and mounts and of course I already have the kites. All of my kites fall into the single-line category, particularly the ones used as 'lifters'. Briefly I use 'sparred' kites for light winds of 5–10knots (kt), for moderate winds (10–20kt) I use 'sled' type kites which have a few spines, mainly relying on the wind to form their shape. Finally, I use soft, 'inflatable' kites for strong winds above 20kt. I have also played about with lighter than air balloons but kites are what I use most.

For the antenna elements I've used many different electrical conductors, but generally have settled on electric fencing as used for containing cattle. This stuff has the advantage that it can also be part of the flying line system for the kite. This gives me some interesting antenna configurations as can be seen in the pictures. Static build-up can be a problem, so I use a spark jumper set up with high value bleed resistors across the base of the points.

Simplest Configuration

The simplest configuration, is a single kite lifting a 'vertical' wire which, is antenna and flying line combined. Like most of my antennas, this is made from cattle electric fencing. It's a particularly high grade fencing material in that the interwoven wire is tinned copper rather than the normal stainless steel. (This also seems to work well anyway!)

On the subject of wires, I finally found the answer after tangling up many lines and wires. The answer is model aircraft control wire, the stuff they used to whizz model planes round on two wires using a control handle. Basically it's strong, light and the type I use is hard-drawn steel with a brass coating. I use the 19kg breaking strain 0.33mm three-strand type. Care is needed in handling the wire, it must be wound on a drum and care taken not to kink the wire, which weakens it.

I have found that 5λ/8 wire, tuned against ground is as effective as long wires of a few hundred metres where I believe the signal just goes straight upwards, with little low angle signal. For this option, I often use a Cody 50 Pro kite, about 2 x 1.5m, a winged box kite, which is very steady in moderate winds.

I often go around giving talks and demonstrations where I can. And on a few occasions I've had the disappointing situation where there has been no wind and I couldn't get an antenna up, as kites need wind! So, I've been looking seriously at using

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Arrowsmith Court,
Station Approach,
Broadstone,
Dorset BH18 8PW
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Fig. 1: Looking vaguely 'frog-like' the four balloons give a good initial lift to this kite/balloon combination.

Fig. 2: A twin-keel kite and its Mylar lifting balloon.

Fig. 3: A lightweight Allsopp Helikite and the reel containing the flying line/antenna element.

Fig. 4: The black 'mark' on the balloon is a small flycam-2 camera for taking a series of aerial photographs and storing them on a memory card.

lighter than air aerostats to lift antennas in the 'no wind' conditions.

Initially, like many people, I thought it was just a case of blowing up a balloon with Hydrogen or Helium and off you go. How wrong I was! Early efforts to generate Hydrogen to blow up weather balloons on-site revealed several drawbacks.

Hazardous Game

Firstly it's a time consuming process inflating a large balloon. Secondly, generating Hydrogen is somewhat of a hazardous game, **it can easily blow up in your face** as I found out to my cost! Hydrogen is a highly flammable gas, **not the thing to be playing with at a public demonstration**.

Then, after inflating the balloon and attaching the wire, the thing will often refuse go straight up in the air! It will inevitably weave all over the sky, often ending up back on the ground, or end up wrapped around someone's TV antenna. The problem is that, with relatively small balloons up to a metre in diameter, they're drastically affected by the lightest swirl of wind. Remember, it's rare indeed that there's no wind at all at heights of more than a few metres above ground.

So, having learnt valuable lessons, I did a bit of research to see what others had done. In the early 1940s, a kite enthusiast, **Domina Jalbert** encountered the same problems as I had and put together a 'kytoon'. (There's an interesting short article and pictures in *Popular Mechanics* August 1950.) This aerostat was a blimp shaped balloon approximately 2.5m long, fitted with kite wings. The idea was to get lift from the lighter-than-air gas and instead of a light wind blowing the balloon back down, the wings would produce lift to counteract that effect.

The kytoon was very effective and a number of these were used by many Radio Amateurs and the services as a communication antenna. Unfortunately, they are fairly large and expensive to buy and operate. This set me on the track of trying to make my own version of a kytoon as I was enthusiastic about producing a fairly large aerostat and ended up marrying a delta kite to a weather balloon.

The combination worked after a fashion, even lifting a very lightweight dipole but still had the problem of on-site inflation and deflation. This was workable using Hydrogen, but when I worked out the cost using Helium gas, it was right out of my reach and I had to rethink my needs.

The first thing to consider was the cost of the Helium – it's too expensive to just use it for a few hours and then discard it. This meant that the aerostat had to be small enough to be carried in a car and kept in a fully inflated form for the next outing.

One of the characteristics of Helium is that it is a very 'searching' gas and will escape from the tiniest of pores. Latex balloons don't hold Helium for more than a few days, although you can extend their 'float' time by using a sealant inside the balloon. A better option is a 'Mylar', or foil balloon, their float time is much longer than latex, although ultimately the Helium will still leak out.

The second point is that small balloons, (up to one metre in diameter) have limited lift, approximately 50g (2oz) for foil balloons and 225g (8oz) for latex. This was a limitation with foil balloons, as larger ones aren't readily available. Latex and chloroprene (a man-made rubber) balloons can be larger in diameter but they only have short 'float' times of a few days.

The ballon size also limits the size and type of kite that can be used and also the type of flying line and/or wire. An inflated one metre balloon is the biggest (sensible) size to carry inflated in a car (I

can actually get two easily in the back of mine). So, weight is a critical factor.

So, now I can usually get an antenna into the air in most conditions. Winds over 25-30kt defeat me, as can rain can on a windless day as the weight of the rain pushes aerostats down. But anyway, who wants to play with balloons in the rain!!

The foil aerostats take about £6 worth of Helium to inflate and about 50p to £1 of top-up every few weeks. I only use latex balloons on special occasions, as they take about four or five times more gas. All things considered, it's easier to use the foils and settle for end-fed antennas, which although they're noisy on receive, they provide good results.

My Experiments

The pictures shown in this article are some of my experiments where my interest still centres around 3.5MHz and the pictures are of suitable antennas. I've enhanced some of the antenna pictures to show the parts with more clarity. My colour code is as follows:

Black dotted = element wire
White = flying line
Black solid = coaxial cable.
Orange = 300Ω ribbon.
Green = 75Ω twin.
Black and white = 600Ω open wire.

The kytoon shown in **Fig. 1**, is a small delta kite fitted with three 900mm 'foils' and a 600mm round foil. It worked well with a 26 gauge wire and light-weight 50kg high-tensile line. There's quite a lot of lift from this and I managed to fly a fine wire loop for 7MHz fed with bell wire. It was a bit unsteady, as it really needed wind assistance to keep it flying. I did better with the chloroprene (man-made rubber) balloons which have better lift. To aid stability, I often add tails to the kite.

A specially made lightweight sled delta is shown in **Fig. 2**, this has a 900mm foil balloon. It worked fine for 3.5MHz 5λ/8 end-fed wire, but it struggled to lift a lightweight dipole. Shown in **Fig. 3**, is an **Allsopp Helikite**, lightweight model. For those who want a ready-made solution, this little aerostat works satisfactorily to pull up a lightweight end-fed wire. (The reel underneath holds the control wire antenna.)

As an aside, I also have dabbled in kite antenna photography. I found a tiny camera called a 'flycam 2'. Used by model aircraft enthusiasts for taking pictures from model planes and helicopters. So I purchased one to try out (costing about £40) and this is shown attached to a ballon in the picture of **Fig. 4**. I simply 'Velcro' the camera to the kite or balloon, set it going and walk about with the aerostat or kite.

The camera weighs only 30-40g and with a 2Gb memory card will take about 700 pictures, (one every few seconds), or about 15 minutes of video with sound. The resolution is quite low (1.3Mpixel), but I have had some interesting shots taken from kites and aerostats **Fig. 5**, which was from an aerostat holding up an end-fed 5/8 wave antenna for 7MHz. Eeven from the balloon, the antenna is effectively invisible. The picture was taken at Milton Keynes Amateur Radio Club, on one of those infuriating days with no wind.

I've found foil balloons are adequate for simple end-fed antennas, but if I want more lift for more complex arrays, I have to use latex/chloroprene balloons. An advantage is that I can vary the amount of lift by the amount of gas used. And here I could have put in a picture of an aerostat in action holding up a 5λ/8 wave end-fed antenna for 3.5MHz, but there would only have been a blob for the car in one bottom corner and a much smaller blob for the antenna in the opposite top corner.

Fig. 5: Aerial camera view from 'above'. Even from here the antenna supported under the kytoon is invisible.

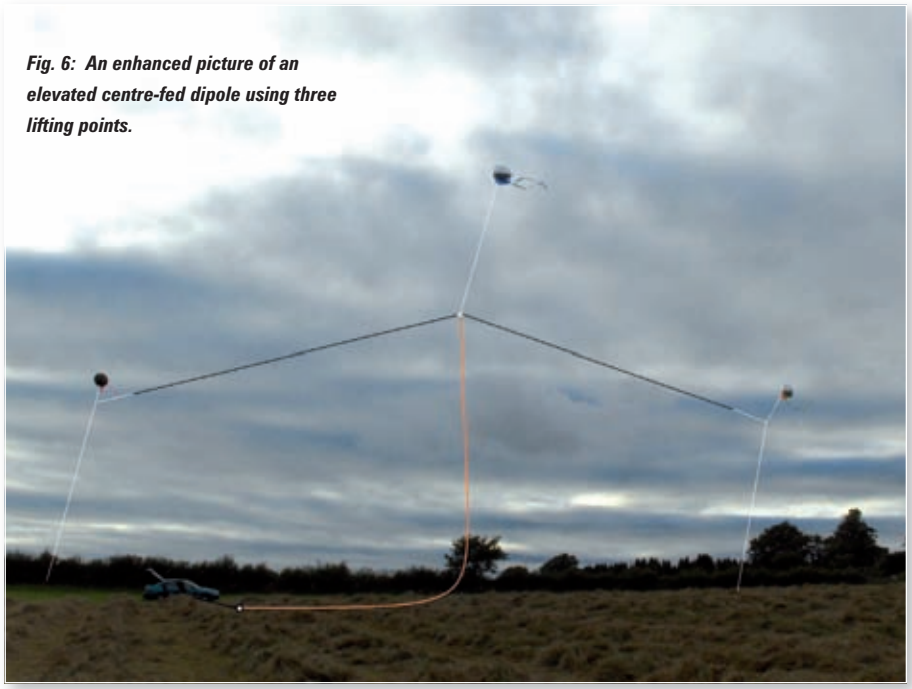


Fig. 6: An enhanced picture of an elevated centre-fed dipole using three lifting points.

Simple To Fly

A simple antenna to fly, is the the good old half-wave centre-fed dipole. It's very easy to make with electric fencing wire and any feeder you care to use. It can be flown on a single kite, with the elements at roughly a 45° angle and fed in the middle from lightweight twin

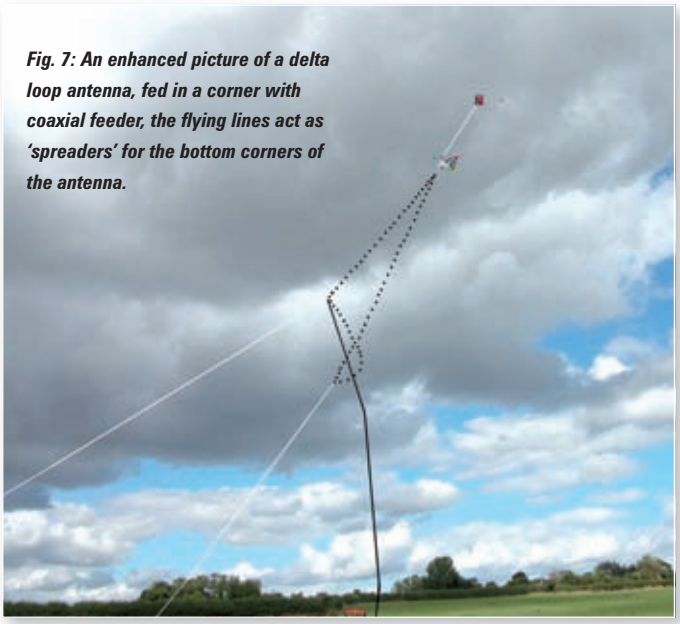


Fig. 7: An enhanced picture of a delta loop antenna, fed in a corner with coaxial feeder, the flying lines act as 'spreaders' for the bottom corners of the antenna.

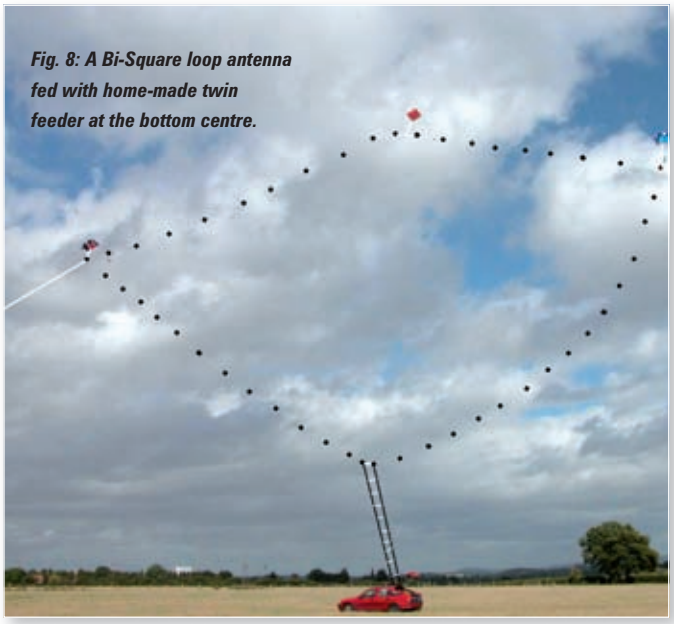


Fig. 8: A Bi-Square loop antenna fed with home-made twin feeder at the bottom centre.

feeder. Another, more elevated version is shown in **Fig. 6**. It's fed with flat-twin feeder on one lifter and has a lifter kytoon at each end.

An interesting fact emerged from my experiences with these types of antennas because, when it's under serious tension, the sloper is slightly directional as could be expected. However, on one occasion the feeder got caught up and effectively made the upper section of the antenna a 'vertical', thus changing it to an omni-directional low angle radiator.

I'm going to try an antenna where the two lower legs are used as the tethers and act as radials, with a third upper section as the radiator and coaxial cable fed. This is typical of how I develop antennas. I try something and suddenly realise I can modify it!

The antenna shown in **Fig. 7**, is one of a series of delta loops that I'm currently working with. I'm trying different feed options, moving the feed point around the loop (shown here fed in the bottom corner) the kite is a Floform 4, one of my bigger paraform kites, and was suited to the quite strong wind that day.

You can clearly the angle of the antenna; it is at about 65° to the horizontal. I can get the antenna perpendicular by using a separate flying line. Angled antennas however, are easier to erect. What difference it makes, I don't know, as they seem to work extremely effectively anyway!

The loop antenna, **Fig. 8**, is the Bi-square antenna, small for the higher bands but on 3.5MHz like this one, a bit of a beast! It's worth it though, with 3-4dB of gain when flown at 50+m. This loop is held up by a pair of 1.2x2m sleds,

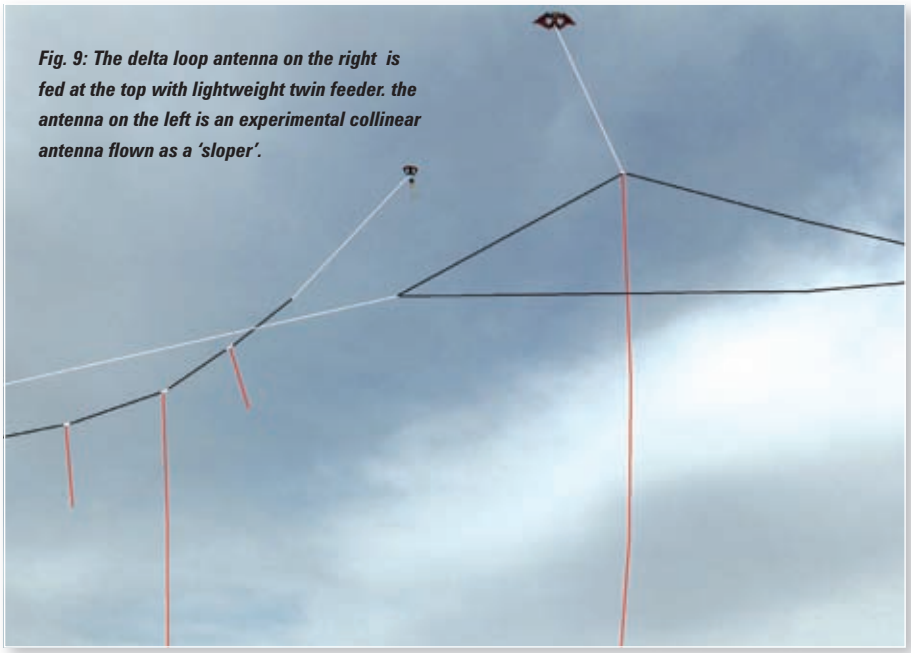


Fig. 9: The delta loop antenna on the right is fed at the top with lightweight twin feeder. the antenna on the left is an experimental collinear antenna flown as a 'sloper'.

and a Green's Parascoop in the middle. The Parascoop is a useful kite because it will fly at a high attack angle and gets near to giving perpendicular antennas. The wind was about 10-15kt.

I did try joining the top of the loop and running it on 1.8MHz. Unfortunately there were too few contacts to make positive conclusions, other than "it's working extremely well old boy!"

I belong to the **Worcester Radio Amateurs Association**, (WRAA) and spend a lot of time with them doing demos for other clubs, putting antennas up for special events such as **Jamboree on the Air** (JOTA), run by the local Scout groups, **Vintage Military Amateur Radio Society** (VMARS) field days, rallies, kite festivals, in fact anything where I can fly some big antennas. I have had a go putting up kites on contest days, but of course I need to be careful of the height rules in some of these. (WRAA is keen for me to lift a 144MHz 'halo' antenna as high as I am allowed for the VHF Field Day.)

Finally, it only remains for me to express thanks for the opportunity of showing what can be done with kite antennas and to put out an invitation to any Radio clubs or similar organizations to contact me via **www.WRAA.co.uk** if you would like me to come along and give a talk on 'Portable h.f. working particularly with kite antennas' and hopefully a practical demonstration; but providing the wind is your problem! Look forward to seeing you.

73 Roger G4ROJ

KITS, MODULES & AERIALS

PSK31 INTERFACE KIT

As featured in February 2009 issue *Practical Wireless*.
PCB on its own £5.00. PCB and components £21.00. Complete kit with box and hardware cables and jack plugs £35.50.

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**.

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**

STATION PREAMPS for 2 or 4 or 6metres. RF & DC switched. Adjustable 0-20dB gain. 100W power handling. **RP2S, RP4S, RP6S, PCB & Hardware kit £35.00, Ready Built £57.00**.

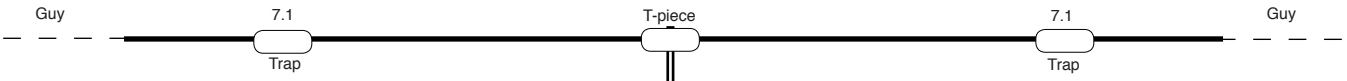
MASTHEAD PREAMPS, for 2 or 4 or 6meters. 20dB gain 1dB NF. 100W through handling. RF switched & DC fed via the coax. Heavy duty waterproof masthead box, and a DC to RF station box with SO239 connectors. **RP2SM, RP4SM, RP6SM, PCB & hardware kit £41.00, Ready Built £65.00**. **Masthead fitting kit £6.00**.

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

SPEECH PROCESSOR increases the average sideband power of SSB transmitters without driving the PA into clipping. Includes filtering to enhance the higher voice tones to increase intelligibility, and it sounds nice too. Panel control for clip and output level. Supplied with plugs & sockets to suit most popular rigs. Type **SP1000, PCB & Hardware kit £39.50, Ready built £57.00**.

3N201 MOSFET equiv. 40673 £2.25 each, P&P £1.00 any quantity.

G2DYM / G4CFY AERIALS



Special offer! Full size trap dipole for 80/40/20/15 & 10m. Original G2DYM normal duty top wires now modified to new length, 106 feet. Supplied with new traps and with 70 feet of 75Ω twin feeder. Complete and ready to erect, £140.00, carriage £20, while stocks last.

1:1 Balun, 160-10m, 1kW rated £40.00, plus £3.00 carriage.

Trapped inverted L aerial. 80/40/20/15 & 10m for a small garden. Coax driven from far end of garden and tuned against ground. A good all round aerial with 6dB more gain than a 24 foot trapped HF vertical. That's 4 times power on TX and one S point extra on RX. £64.00, plus £10.00 carriage.

Wire dipoles, with insulators and centre piece. Call for price.

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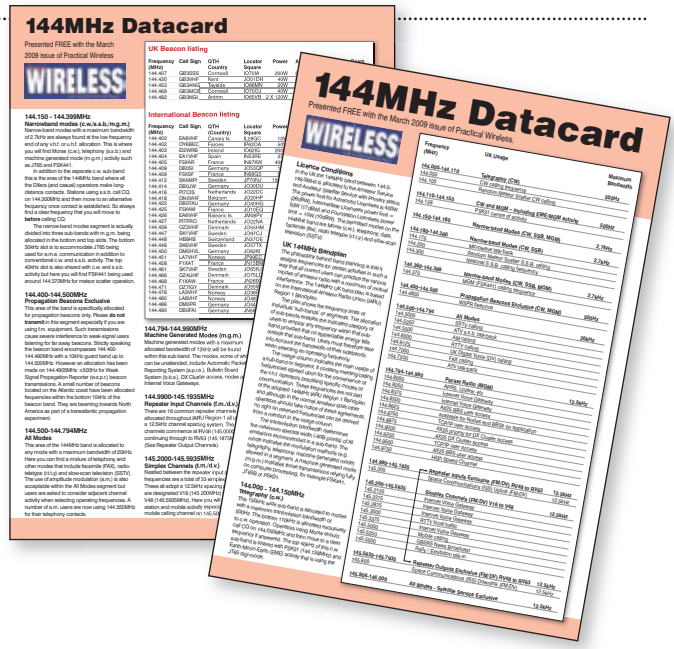
144MHz Datacard

David Butler G3ASR, explains how to get the best from the 144MHz band and our datacard for the band.



Getting Started

One of the great attractions of 144MHz operation is that with 2MHz of bandwidth to play with there are so many different ways of using this amateur service allocation. Do you only want to chat with stations in your immediate locality or do you want to make DX contacts with stations much further afield. Do you want to operate from home, in the car or go out hill-topping. What communication methods are you interested in using. Will it be via Morse code, telephony or data. Are you going to use f.m. or s.s.b or a computer generated mode. How about internet gateways, repeaters or satellites?

How many times have you heard a station saying that they can't hear any activity on the 144MHz band? Probably quite often but when you ask that station what antenna they are using the answer is possibly a small vertical, maybe a Slim-Jim, fed with 20m of rather thin coaxial cable. They might as well be using a piece of wet string! The fact of the matter is that to make the most of operating on the 144MHz you need a good antenna and a short length of high quality low-loss cable.

As you no doubt appreciate there are many types of antennas to choose from but a few fundamental questions should be asked first. Do you want local communications or go DXing. Do you want omni-directional coverage or use a beam antenna. Let's start with the basics. Convention dictates that f.m. based local communication traffic (voice and digital) uses vertical polarisation. The DX transmission modes of c.w. and s.s.b. or a machine generated mode (m.g.m.) such as FSK441 use horizontal polarisation. I'm not saying that you can't use f.m. with a horizontal antenna, it's just that the vast majority of operators follow this simple convention.

If you want local communications (possibly for an f.m. natter-net) then you will probably need omni-directional coverage. A simple vertical dipole or vertical co-linear antenna is very popular for this type of general transmission. Locate it as high as you can, ideally above roof level. But don't lose all your transmit power or received signals within the feeder. Spend as much as you can afford on low-loss coaxial cable, ideally nothing less than 10mm diameter.

If you want to work long distances (DX) on c.w. or s.s.b. then you must have some form of horizontally polarised beam antenna. A Yagi of 6-elements or more is ideal. However as with any type of directional antenna you must also use a rotator. You might be able to locate a small Yagi and rotator onto a suitable chimney stack but be aware that this often puts your antenna at the same height as neighbouring television aerials. The reality is that if you want to go DXing on the 144MHz band you'll need a substantial mast or tower, a good rotator and an excellent Yagi. Of course there is one other way and that is to operate portable from a local hill top. With a small pole and a directional beam you can work hundreds of kilometres even when running relatively low power. And it's great fun.

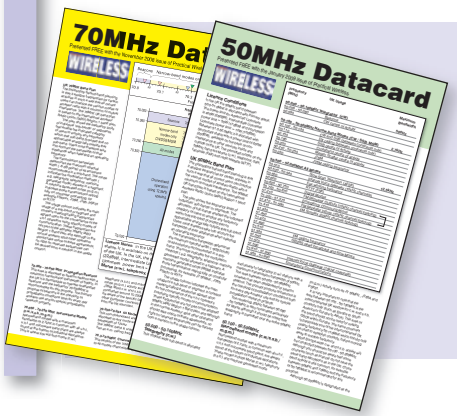
Propagation Modes

If you operate exclusively with f.m. equipment the only propagation that you will normally experience is a tropospheric mode. You may occasionally hear fixed stations or repeaters from slightly further afield. However if you use a weak-signal mode such as c.w. or s.s.b. then you will experience the excitement of catching numerous propagation modes. These modes include tropospheric ducting, Aurora, meteor scatter (m.s.) and Sporadic-E (Sp-E) and will enable contacts to be made up to 2000 kilometres away and sometimes even further. ●

Keeping up to date

If you want up-to-date information regarding the 144MHz band, then take a look at these web sites.

Spectrum Information: **http://www.rsgb.org/spectrumforum/**
Analogue and Digital Repeaters: **http://www.etcc.rsgb.org/**
Data Communications: **http://www.dcc.rsgb.org/**
Amateur Satellites: **http://www.uk.amsat.org/**
RSGB VHF Manager: **vhf.manager@rsgb.org.uk**



The 144MHz Datacard with this issue is the third one of the series. Keep it in a safe place and then add to them over the coming months. Soon you'll have an in-depth operational knowledge of the v.h.f. and u.h.f. bands.

If you missed the 70 and 50MHz Datacards, you can still get them for just £1.75 each by calling 0845 803 1979 or send a cheque or postal order to the Editorial address, made payable to PW Publishing Ltd.

A GPS unit that can show you where everyone else is via APRS.

The AvMap GeoSat5 Blu-e and Kenwood TS-TMD-710E

Richard Newton G0RSN tries an add-on unit that makes the Kenwood TS-TMD-710E even more attractive!

The editor of *PW* has done it again and he's made me an offer I just couldn't refuse! Over the past years I've had great fun reviewing all sorts of equipment for *PW* but I have to say that one thing in particular has captured my imagination and continues to be of interest to me – the Automatic Packet (or position) Reporting System (APRS). This is where a station's position is sent using packet radio and is then translated by receiving software and displayed as a position on a map.

I reviewed the first fully functional APRS rig on the market, The Kenwood TS-TMD-700E and, more recently, that rig's successor the TMD-710E. Both these radios have APRS firmware and a built-in terminal node controller (TNC) so all they need is the addition of a Global Positioning Satellite (GPS) unit and once equipped the operator has the ability to report their position, send and receive messages and even show direction and speed!

I've also written articles about APRS itself and on the use of software packages like *UI-View*. As a mainly a mobile operator I wanted to be able to see stations around me, so some years ago I started to experiment with my 'TMD-700E and a Garmin III plus GPS receiver

with a small grey scale screen. This was the best I could afford at the time and was probably one of the best solutions available.

The TMD-700E TNC

The TNC in the Kenwood TMD-700E could output received station and location information in a number of formats, one was the NMEA format, the Garmin could accept this format and would display the information it received on its rather simple map as a waypoint. This had certain draw backs, the Garmin could not keep

much in memory and if anything a little out of the ordinary was received I would get a message "invalid Waypoint received" and would have to re-set the unit completely.

The Garmin III plus would also give every waypoint received from the rig the same generic icon, so although you saw the callsign it was never clear what type of station it was, whether mobile, home, digi, weather station, etc. Because of the limitations I gave this up and just kept the GPS hidden underneath the car seat and set it to just output location information to the rig.

So, imagine my reaction when *PW* asked me to look at the new combination of the 'TMD-710E and a satellite navigation system called AvMap, the mobile APRS solution that gives you a full colour APRS map in your car! Yes, of course, I jumped at the chance but there one problem – I had just changed my car and I was still trying to work out how to get a radio into it! This was just the motivation I needed!

I don't really intend to go into great detail about the Kenwood TMD-710E, I reviewed this rig for *PW* on not that long ago back in January 2008 but just to give you a taster here's a reminder.

The Kenwood TMD-710E is a full dual-band rig for 144 and 430MHz, with an impressive extended receive capability. It has built in APRS and Echolink functions. The built-in APRS function comes with either a semi or fully automated APRS facility using an impressive firmware pre-installed on the rig. If you prefer, the rig offers the ability to use the built-in TNC for APRS or any other packet function with the external connection of a personal computer.

Italian Company

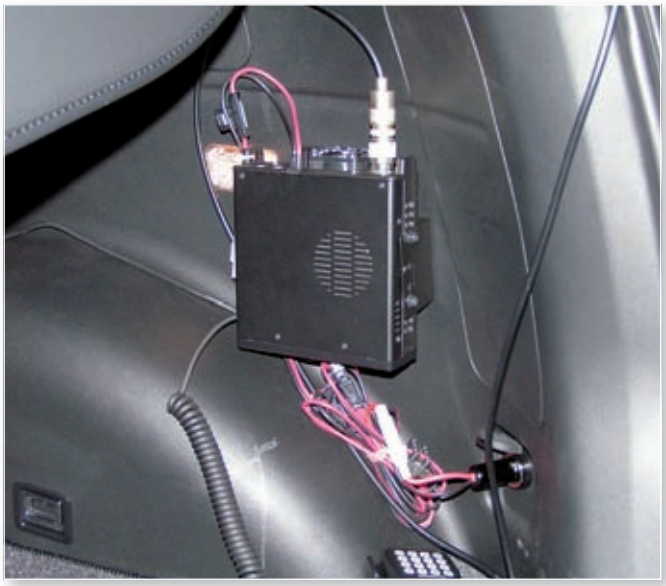
So, what of the other bit of kit, the AvMap? Well, in fact AvMap are an Italian company who make all sorts of satellite navigation systems and the AvMap GeoSat5 Blu-e is the one I loaned for the review. This has an impressive 127mm (5in) full colour display, has full satellite navigation functions and is Bluetooth® equipped for 'hands free' operation.

What's in the box? The AvMap GeoSat5 Blu-e it is supplied with pre-installed Tele Atlas map of Europe on an SD card and a versatile suction-mount that allows it to be attached to the windscreen. It also comes with a power lead terminated in the normal cigar lighter plug, USB cable and an audio/video adaptor. The unit is supplied with a comprehensive user manual that offers good explanations and examples along with the all important pictures!

The rig and AvMap were also accompanied by a brief but informative set of instructions on how to get the two units talking to each other – with details of the menu settings for both units. The instructions were simple to follow and the review unit worked first time.

The AvMap GeoSat5 Blu-e is larger than the normal Tom-Tom or Garmin GPS units, measuring 139.7x100x36mm and weighing 390g. However, as you can see from the pictures of it in action, it doesn't look out of place on the dashboard.

The screen resolution is 320x240 pixels, which I found to be pleasing to the eye and the APRS icons were easy to see and identify. The display brightness can be set manually or to automatically change brightness, depending on conditions.



In the boot of Richard's car there's a convenient power socket so, the TMD-710E's body was mounted nearby.

The control head for the TMD-710E was mounted on one of the small 'spare' shelves to be found on the dashboard.

The AvMap GeoSat5 Blu-e has a Sirf III GPS receiver with 20 channels built-in with an internal antenna but there's also a connection for an external antenna, which appeared to be a 2.5mm jack socket. However, I didn't need to use this because the unit acquired sufficient satellites with the internal antenna, even when indoors near to a window. In the car there was never any problem at all.

The unit offers other external connections; these include a USB port for software updates, a 3.5mm jack for speakers or head phones. It also has an Audio Video input, again 3.5mm jack but the unit is supplied with an adaptor that takes the 3.5 mm jack to two in line phono sockets so that the unit can accept audio and video (AV) signals and act as an external display for a DVD player, camera or anything that has a PAL or NTSC output.

The unit also has a Traffic Message Channel (TMC) input. This can be used with an optional extra TMC receiver to display traffic messages through the RDS radio channel. This socket, a 2.5 mm jack socket, is the one that the TMD-710E uses to communicate with the AvMap.

Beginning the navigation from Minehead back home, via a friend's place.

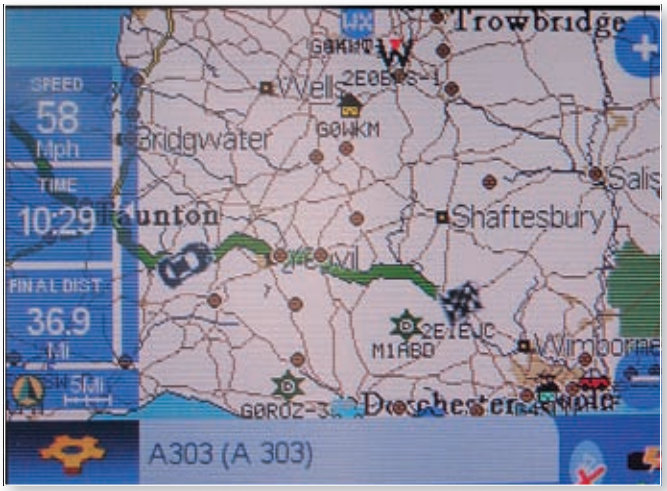
Calling up the APRS folder within the in-built address-book allows you to choose locations via the touch-screen.

Tapping on Terry 2E1EJC's entry in the address-book selects his location as the end-point.

A simple tap on 'Go' to start the calculation of the best route there.

A few seconds later and it's almost finished.

Then up pops the whole route to Terry's place all plotted out from the present location. And off we go!



Over half-way there and route details and nearby APRS stations can be seen along with travelling information.

The AvMap GeoSat5 Blu-e is easy-to-use as a SatNav, you can search for a location by address or postcode and everything is done by touch screen menus. These menus are sensibly laid out and well labelled. The unit also has easy short cut keys down the right hand side. These display the main menu, set the unit to navigate to home, access the contacts menu, bring up the route functions and turn the power on and off, the **On**/**Off** button also controls the brightness of the display.

I thought I would test the AvMap out as a SatNav when travelling to a friend's wedding in the back-of-beyond near Bath. The AvMap found the location, a mill in the middle of nowhere, by correctly pin-pointing the postcode. It successfully navigated us to the location and in fact, it was so good we arrived an hour early! The verbal commands could clearly be heard through the efficient internal speaker.

I have to say that being familiar with the 'TMD-710E and interfacing it with GPS receivers may have helped but I was really impressed on how easy it was to get these two bits of kit talking to each other. I just followed the instructions and within minutes the two were 'chatting' to each other with no problem at all. The 'TMD-710E was receiving location information from the AvMap and likewise the AvMap was receiving details of received stations from the 710e and displaying them on the map. Fantastic! All I had to do now was figure out how to get it in the car!

Antenna Problems!

The first problem was finding a suitable antenna! I have always used a boot or hatch-mounted antenna, however I now have a glass hatch! So the quick fix was a magnetic mount, and so that was it, a 5λ/8 whip on a large magnetic mount on the roof of my car.

However, the review nearly came to an abrupt and messy end when I forgot the antenna and happily drove into the local Tesco's underground car park! Luckily the horrendous 'grinding' noise was much less fatal than it sounded and a quick exit was enough to save the day!

I boot-mounted the 'TMD-710E as there was a convenient 12V d.c. 15A socket in the boot. The remote head lead stretched to the front console where I mounted the head on a fold-down cover for one of those almost useless little nooks and crannies you get in modern cars. The lead from the GPS unit goes to the head of the TMD-710E, so this made connection to the AvMap a cinch!

The only additional thing that I had to get was a microphone extension lead, so that I could use the microphone and actually speak to people as well as watching stations appear on the map. (My thanks to **David Wilkins G5HY** from Kenwood who sent it by courier just after Christmas).

I had the whole thing done in a jiffy, within an hour I was sitting in the car watching station after station appear on the AvMap screen. The really impressive thing is that it displays the APRS icons, cars, weather stations and houses, even the Kenwood sign; they were all there, in full colour for all to see on the map.

Obviously you cannot interact with the icons on the AvMap like you can on *Ui-View* or similar software package. The information stored on each station is very brief – basically the callsign, the icon and the location is about it information-wise. That said, using the map in conjunction with the Kenwood TMD-710E and the firmware is great! I had the visual interest of seeing the station on the map and using the rig I could send and receive messages.

The AvMap GeoSat5 Blu-e doesn't just display the stations on the map, it also saves them in a contacts folder, which I could access by using the '**Where to Go**' short cut key. I could then choose between Address, Home, Point of Interest or Contact. If I then pressed the contact on screen button, I could then see a folder called APRS. Pressing on this identified all the stations that the AvMap has received from the Kenwood TMD-710E – listed in alphabetical order. I could then choose to delete them, view them on the map or even edit the contact information, thus making this a kind of mobile APRS log book of sorts. The operators can also choose the 'navigate to' option and away they go!

I took a series of pictures to illustrate this choosing to navigate to **Terry Bain 2E1EJC's QTH** in Blandford Forum. I did this as I left Minehead having visited my Mum.

It's not really something that you have a contact with, this set up is more for the operator than anyone else but I did put on my beacon comment that I was reviewing the rig and the AvMap and invited messages.

Dave Houlden G1OCN who runs an APRS Weather station near Weymouth sent me a good few messages – alas it was during my turn to drive so I was unable to reply to him. However, it was great to know that I was getting out and appearing on the network though.

One thing to bear in mind is that the rig will send the location of a station to the AvMap, that station will then appear and will remain on there until it is heard again. If it's not heard again it will be there until you delete the contact from the AvMap's database. I only mention this to explain why you may notice a mobile station on the same road as you and wonder why you do not pass them. It's possible that this station was received days before and then didn't 'beacon' again.

On a *Ui-View* map normally your station will drop off if the system does not hear an update from you after one hour. This means dormant stations will not appear. Not so with the AvMap – it isn't 'intelligent' – it just plots what it hears and there it will stay until it hears the same callsign again with a different position, in which case the station will disappear from the old position and be re-plotted at the new position.*

Products: The Kenwood TS-TMD-710E and the AvMap GeoSat 5 Blu-e.

Companies: Kenwood UK & Martin Lynch & Sons

Pros: The Kenwood TS-TMD-710E and the AvMap are impressive, but putting them together was pure genius! The AvMap GeoSat 5 Blu-e can also be used with the Kenwood TMD-700E and the TH-D7 hand held. This combination is a real hit in my book!

Cons: AvMap – it isn't 'intelligent' – it just plots what it hears and there it will stay until it hears the same callsign again with a different position, in which case the station will disappear from the old position and be re-plotted at the new position.

Price: The AvMap GeoSat 5 Blu-e is available from **Martin Lynch & Sons** and costs £359.95 plus £10 carriage and the Kenwood TS-TMD-710E is available from Amateur Radio dealers.

My thanks for the loan of the review units go to **Kenwood UK (Communications) Kenwood House, Dwight Road, Watford, Hertfordshire WD18 9EB. Tel: (01923) 816444. Fax: (01923) 212477** and to **Martin Lynch & Sons, Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS.**
Tel: (**01932**) **567333**.
E-mail **sales@hamradio.co.uk**
website **www.hamradio.co.uk**

As you can hopefully see from the photos I took the map display can be zoomed in and out, the detail is excellent and it was great fun seeing the stations appear. I can only imagine how useful this would be on a Raynet exercise, to be able to see where the mobiles were on a map in the car with the minimum or effort. Setting all this up is just so simple!

David Wilkins G5HY *of* **Kenwood UK** *comments: Thanks for courtesy copy of Richard's review. I'll pass on to AvMap Richard's comment about old icons remaining on screen until deleted. Perhaps they can build a software timer in to delete them after a fixed time or similar? But of course I can't speak for them in this!* ***David****.*

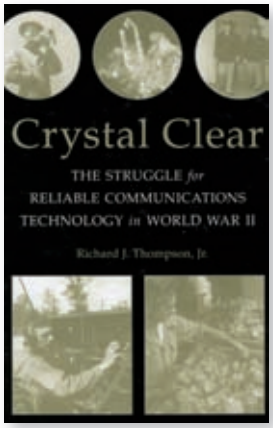
On The Road

I used the set-up all over Christmas and the New Year when travelling around near home in Dorset and on my journey from Dorset to Somerset. I really enjoyed using the rig and the AvMap together and it was so easy to take out of the car I could use it even on the shortest of journeys without it being a bind. I would also love to try this out while camping or caravanning.

As two separate bits of kit both the Kenwood TS-TMD-710E and the AvMap are impressive, but putting them together was pure genius! According to AvMap, The AvMap GeoSat 5 Blu-e can also be used with the Kenwood TMD-700E and the TH-D7 hand held. This combination is a real hit in my book, thanks to Kenwood for the loan of the '710E and thanks to **Martin Lynch** for the loan of the AvMap GeoSat 5 Blu-e. ●

Book Review

Crystal Clear
The Struggle For Reliable Communcations Technology in World War II



Author: Richard J. Thompson, Jr.
Publisher: Wiley Interscience
ISBN: 0-470-04606-6
Price: £36.95

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Our Technical Editor Tex Swann G1TEX takes a look at a book that details how reliable communications helped the Allies to success in the 1939-45 World War.

It's easy now to forget that at the start of the Second World War, radio communications weren't quite as simple as they can be today. Radios had to be 'driven' by technically competent operators, and even then were rarely on exactly the right frequency, with their basic LC tuned circuits. To gain reliability of communications, the greater frequency accuracy of quartz crystal oscillators would be needed. But they were technically difficult and time consuming to make

This 230-page hard-backed book from the IEEE Press (Wiley Interscience), isn't a light read, but is a formal potted history of how the war of 1939-1945 drove the American quartz-crystal 'industry' units from a leisurely, amateurish pace of making a few thousand units per year pre-war, to making more than 28 million accurate and high quality units per year by the end of the war. And stopping the axis powers gaining the same ability at the same time.

Arranged into 11 chapters it covers the procurement of the raw quartz crystals from Brazil, to solving the problems of reliability and aging of the individual units. Coupled with the sheer number of individual crystal manufacturers, all guided and controlled by a small number of people in the US Signal Corps who oversaw all stages of the operations, this was juggling with hundreds of balls!

There's a reference section, which sets out the American radios sets, the number and type of the crystal unit in each set, along with three pages of the main crystal manufacturers. There are also almost 50 pages of references for further reading.

Although mainly historical, I did find out how to grow my own quartz crystals, and I'll make a start as soon as I can find a suitable superheated water bath that I can keep at several hundred times normal temperatures and pressure for a some weeks!

All in all a fascinating book, in which I found the interplay of all the characters and companies becoming more and more enthralling. Some of the better innovations having come from small firms, lead by amateurs. **G1TEX**

Colin Redwood's

what next?

Having described the data interface last month Colin G6MXL moves on to describe slow-scan TV.

There was bit of a mix-up with the circuit diagram of the data-interface and its description in the February What Next? *Column in* PW. *In the circuit diagram The capacitor C2 (0.1µF) above R3, should be C3 and the 1µF capacitor marked C3, should be labelled C4 to make sense with the description. My apologies to all concerned for this error.* ***Editor.***

Having looked at receiving PSK31 in the January issue of *PW*, and described a data interface unit to enable transmitting and receiving PSK31 in the February issue, this month I'm following up with an introduction to Slow Scan Television (SSTV) using the same data interface unit. Apart from using a different program on the computer, the connections for SSTV are identical to those used for PSK31.

Slow Scan Television (SSTV)

Amateur SSTV has been with us for many years and it's a very popular mode, enabling static colour pictures to be sent over the air. In the early days long persistence phosphor cathode ray tubes (c.r.t) were used to display the black and white picture as it built up at the receiving station.

Whilst producing remarkably good results, there was no way of storing the pictures, except by audio recordings, and/or by photographing the screen using a slow shutter speed. The quality of the output can be seen in **Fig. 1**, which shows a photograph taken from a 5FP7 radar cathode ray tube from a tape recording.

Later, several firms including Robot and Wrasse produced hardware-based SSTV equipment. At the time the units were quite expensive, and were not always adaptable to the many advances in SSTV that were taking place. In the 1990s with the advent of more powerful home computers and with a simple interface connected to the serial port of the computer, good results could be achieved with software such as **DL4SAW**'s *GSHPC* and other software running under DOS.

These days, SSTV has moved on further and most Amateurs make use of the sound card, within their computers, to send and receive SSTV. Although what I'm describing this month uses computers at both ends of the contact, some Amateurs would still describe this as 'Analogue' SSTV. But another variant, known as 'digital' SSTV is already with us and I'll be looking at this latest step forward in SSTV in a future *What Next?*

Popular Bands

The most popular bands for SSTV are '20m', using u.s.b. on 14.225 to 14.235MHz, '80m', using l.s.b. from 3.730 to 3.740 MHz, and '2m' using mainly f.m. at 144.500MHz. Most Amateurs and short-wave listeners (s.w.l.s) will have the capability of listening on one of these bands. When the band is open, 14MHz is probably the most active, with 3.5MHz a close second. Between them they provide the greatest variety of pictures and operating techniques.

Demonstrating SSTV is an excellent way of attracting visitors to an exhibition station. A picture gradually appearing on a monitor attracts the eye and potential visitors are often intrigued to see the final result. Though if you really want to impress your friends, you could try receiving SSTV pictures from the International Space Station on 145.800MHz (f.m.) using SSTV mode Robot 36 instead of the usual Martin Mode 1, **Fig. 2.**

Required Software

Like PSK31 where we used *DigiPan* software, we need some software for SSTV. There are many available for SSTV. The program *MMSSTV* has been around for many years now and does the job in my view. Unlike its predecessors which were DOS programs, *MMSSTV* is very much a 'mouse-driven' graphical application running under *Windows*.

There's also a logbook built into *MMSSTV* and being 'freeware' there's no need to register. Most of the topics I'm discussing with specific reference to *MMSSTV* will also apply in general to other SSTV software.

Downloading *MMSSTV*

You can can be download *MMSSTV* from **http://mmhamsoft.amateur-radio.ca** it's quite straightforward, **Fig. 3**, just click on 'Download'. If you are using a dial-up internet connection, the download will take a few minutes as it is about 2.5Mbytes in size. It is well worth the effort. Having downloaded the *MMSSTV* software, the next step is to install the software on your computer.

Installing *MMSSTV*

If you have previously installed *MMSSTV* and want to install the latest

Fig. 1: A photo taken from a 5FP7 radar cathode ray tube from a tape recording.

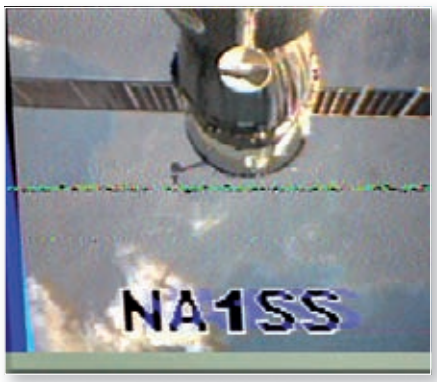

Fig. 2: A SSTV Picture received from the International Space Station in October 2008 on 145.850MHz using SSTV Standard Robot 36 settings.

Colin Redwood G6MXL
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Fig. 3: Downloading MMSSTV.

Fig. 4: Entering your callsign into the settings.

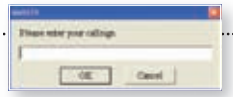
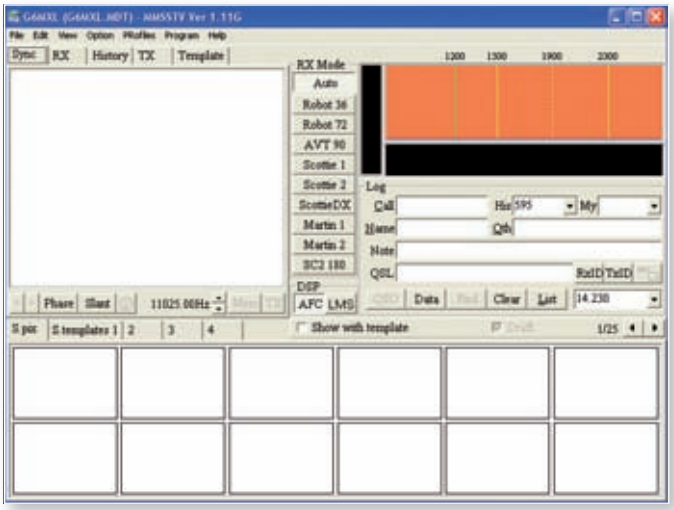


Fig. 5: The main MMSSTV screen.



version, you'll need to remove the existing version of the software first. Note that the MMSTV111G.exe file does not have a valid digital signature to verify its publisher. Provided that you understand and accept the risks, press 'Run' and the installation will continue in the same way as any other application software.

As the install progresses, you can choose where to store the program. For instance, within my 'Program Files' folder I have created an 'Amateur Radio' folder, and within this folder I have separate folders for each Amateur Radio application. I therefore created a 'MMSSTV' folder in my Amateur Radio program folder, and followed the usual installation prompts.

Running *MMSSTV*

Starting *MMSSTV* is just like starting any other *Windows* application. So, the first time you run it, you'll be asked for your callsign, **Fig. 4**. Thereafter the screen that greets you is a typical application graphical screen with the usual sorts of menus and buttons and menus, **Fig. 5**.

Configuration

Having downloaded and installed the MMSSTV software, there are several things that need to be configured. I've mentioned some of the most important ones below, but I suggest that readers look at the *MMSSTV* manual and experiment to get the best results.

Many of the considerations apply to SSTV regarding audio levels as with PSK31. In addition I would suggest that when receiving pictures, readers turn the volume up a little higher than they might otherwise do, in order to improve the signal to noise ratio, which will give a cleaner signal with less patterning.

Different Standards

There are a number of different SSTV standards, however Martin Colour 1 (often termed Martin Mode 1 after **Martin Emmerson G3OQD**) has stood the test of time, and is still the one most commonly encountered on the air. You can set *MMSSTV* either to detect the SSTV mode automatically (from the first second or two of the transmission), or always to use a particular SSTV mode. Note that by 'right-clicking' on the mode, a larger range of SSTV modes are made available.

My preference, as with other programs was to set the default to Martin Mode 1, and change it only if I had a particular reason for doing so (such as receiving pictures from the International Space Station using Robot 36). I often found myself receiving pictures part way through, and it was useful to at least see part of picture (for example to get a callsign) than no picture at all. There are a lot more images being sent by various other SSTV modes than a few years ago, so readers will probably want to experiment here, though *MMSSTV* is good at guessing the mode so, I suggest that readers try setting it to automatic mode detect.

Picture Folder

When running *MMSSTV* you also get to choose which folder to permanently save your pictures into. My personal preference is to have mine saved to an SSTV folder within 'My Pictures'. It's also possible to choose what type of file is saved (.jpg or .bmp). If you are short of disc space, then .jpg would be a good choice. The process for doing this is described in the very comprehensive help facility.

AutoStart Function

The Autostart function is very useful if you know you're already on a frequency where you've exchanged some pictures. One useful technique I have found is to leave the receiver tuned to 14.230MHz, with auto-start and auto-save selected and see what is received, perhaps whilst doing other things in the shack. But generally, when working SSTV, I prefer manual contol.

There are many other configuration settings that readers may like to explore. The help facilities provide plenty of guidance and ideas for readers.

Receive Clock Adjustment

If, when receiving the first few images, the verticals appear to be at an angle, **Fig. 6**, you'll need to adjust the receive clock oscillator frequency. The facilities to do this are really excellent. The easiest way to do this is to use the **Sync** button at the top left of the picture. Start to receive a picture from a station that you believe to be well calibrated, such as one participating

Fig. 6: Receiving First Picture – note the slanted verticals.

Fig. 7: Here's one of Colin's pictures with the CQ Template superimposed ready to transmit.

in a well-established SSTV net. Then make small adjustments and try again until the verticals are no longer slanting. I found I need to change my settings from the default 11025.00Hz to 11026.20Hz.

Tuning In

I'm sure, you're all aware that careful tuning is needed to get the right pitch of the voice with a normal phone single side band signal. Careful tuning also needs to be applied for SSTV signals when using upper or lower sideband operation. The audio frequency of the received tones. will affect the picture you get. In particular it is important to get what is known as the 'line synchronisation' pulse at the correct audio pitch.

The line synchronisation pulse (sync pulse) is a very important part of the wave form of any television signal. This marks the start of each horizontal line that makes up the picture. The SSTV sync pulses are transmitted at a lower audio frequency than the rest of image information. If you listen to the audio of an SSTV signal, the line sync pulses are the ticking sounds heard every second or so.

Looking for the sync pulse and making sure it is correctly placed, by careful tuning when using s.s.b. will give the best results in terms of picture colour and shade. The signal is correctly tuned when the sync pulses fall at an audio frequency (pitch) of 1,200 Hz. To help with this, *MMSSTV* includes a tuning indicator in the orange area at the top right of the screen. This will give a clear indication to help when tuning in. The three vertical lines are at 1,200 Hz (Sync Pulse), 1,500 Hz (Black) and 2,300 Hz (White).

Receiver Bandwidth

I found it helpful to try different settings of the various filters on my receiver to get the best results.

Pictures To Send

These days many Amateurs will have access to either a digital camera or scanner. You can load images from a computer storage drive easily. A real bonus is the standard templates provided for overlaying a CQ call on top of an image, **Fig, 7**. There are other templates for reports, and 73 type messages, facilities, that combine to make *MMSSTV* really easy for a newcomer to the mode.

Fig. 8: A typical SSTV picture that was received in December 2008.

Transmitter Power

Unlike s.s.b. 'phone signals, an SSTV transmission consists of long periods of sustained tones at full modulation. So you'd be better reducing transmitter power, to keep the output stages and power supplies within their recommended limits.

I hope that readers will now feel confident to try SSTV. It really is a great fun. without the possible problems of language to contend with. And unlike many 'phone QSOs, which can often be rather predictable rubber stamp-type contacts, with SSTV there's always an air of anticipation to see what the picture will be.

I should perhaps warn readers that SSTV can be very addictive. I look forward to receiving reports of your success with SSTV and you may be surprised at how much SSTV activity you find on the bands. My local area often has an SSTV net on 144.525 MHz f.m. on Monday evenings for just one example. ●

Colin's waiting to hear from You!

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

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

ALINCO DJ-175

Alinco's new 2 meter handheld sets the standard for features, convenience and easy operation.

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Learning Morse With Ford!

It's certainly true that the subject of the Morse* code evokes strong feelings! Some feel that without compulsory Morse testing there's no effort required to become a Radio Amateur and others believe that working hard to learn to receive and send the Morse code (at the once compulsory 12w.p.m.) was a necessity to obtain a Licence.

On the other side, anti-Morse proponents declare that the original reason for learning the Morse code no longer exists. Amateurs aren't required to communicate with stricken mariners tapping out their urgent pleas for assistance nowadays.

I belong to neither school of thought – but I do think there's little sense **insisting** on Morse proficiency for a licence and this is reflected in regulatory changes worldwide. So, Morse now becomes an optional skill, for us to master if we believe it will enhance our enjoyment of Amateur Radio – and let's not forget that primarily it **is a hobby** and is meant to be **fun** (something that comes through time and time again in this very magazine!).

So, does the option of learning of Morse lead to any advantages at all? Yes, I happen to think that this skill is an enjoyable part amongst the many facets of our hobby, such as the building and operating of very simple QRP (low power) equipment and is a satisfaction in itself! For sheer simplicity there's nothing to beat a c.w. (continuous wave) transmitter.

Incidentally, the term c.w. can cause confusion to the beginner, as the result of Morse sending is not a continuous wave but a keyed continuous wave. It's also possible to send Morse using a keyed audio frequency oscillator to modulate an existing a.m. (or f.m.) carrier where it's called modulated continuous wave (m.c.w.).
*The capital letter M is used because the code is named after its inventor – **Samuel Morse**.

Certain Rigours

Learning the code does impose certain rigours. However, undoubtedly, there's a satisfaction in learning and becoming proficient in a new skill or language, and Morse is arguably both and better for not being compulsory! Few of us enjoy being told we **must** do something!

So, assuming you've read this far, you may well want to get involved with this fascinating skill. There have been countless methods espoused in the past to help learn the code, and many different courses, on tape and computer programs. The methods I'll run through here probably combine many promoted previously, and summarise what has worked for me.

We should be clear about one thing to start with. Learning Morse, as with learning anything, does require an effort. But, using my suggestions you may find that effort to be pleasurable!

Learn The Code!

The first thing to do is to learn the code by heart. I suppose that's where most of the effort comes in but I have a few tips. First, don't attempt to learn by rote combinations of dots and dashes in alphabetical order. You'll be aiming to be able to recognise **patterns of sounds**, without consciously translating into dots and dashes and looking up the correct letters in your mind or a crib list.

The foundation of all this is sound patterns. For example the letter A is **not** dot-dash but di-dah, as a rhythmic sound. By the way, in good Morse a dah is meant to be three times as long as a dit, although in practice the ear is much more tolerant as long as a dah is definitely and consistently longer than a dit (as the representation of the sounds suggest).

Next, risk the pitying glances of others, and get used to making the sounds like di-dah, and not just by reading them. Try a few, B is dah-di-di-dit and C is dah-di-dah-dit. That last example has a certain rhythm and t**he rhythm is part of the secret of learning Morse code**. The next thing to consider (although I've used the first three letters of the alphabet to provides examples) is that the actual order of the alphabet is completely irrelevant. In fact, I've found that it's much better to consider the sounds in groups.

The Morse symbols were chosen by Samuel Morse to reflect the frequency of letters in ordinary text and E and T are the most common letters, so they (E = dit and T = dah) have the simplest sounds. Here's a list of these very simple sounds (dits first).

E = dit
I = di-dit
S = di-di-dit
H = di-di-di-dit

Your instinct may be to count the dits, but very quickly you'll recognise the sound and rhythm of them. There are two more 'all-dit' sounds. The figure 5 is di-di-di-di-dit and the erase signal is di-di-di-di-di-dit (more than five dits, to a maximum of eight).

You'll probably realise that **physically** counting sounds is too slow. However, you'll quickly learn the rhythm – which is what's needed. (More on how you quickly learn it in a moment).

Now for some simple dah sounds. They are T = dah, M = dah-dah and O = dah-dah-dah

Alan Ford VK2DRR – formerly G3UIV – passes on some tips to help learn the Morse code!

There's another and that is the figure 0 (zero), being dah-dah-dah-dah-dah (Interestingly, there isn't a signal for four dahs in general use!).

I think it's a very good idea to learn these simple sounds first. Indeed, learning by rote, repeating the same sound over and over, and then in groups with the letters mixed up, is the best way. When you've got all those off pat, it's time to move on.

Next, we can consider some easy opposites: A = di-dah and N = dah-dit. After mastering these, and revising the earlier ones, move to the (slightly harder) opposites

D = dah-di-dit
U = di-di-dah
G = dah-da-dit
W = di-dah-dah
K = dah-di-dah
R = di-dah-dit

And next, the most complex, still remembering as opposites

B = dah-di-di-dit
V = di-di-di-dah
F = di-di-dah-dit
L = di-dah-di-dit
P = di-dah-dah-dit
X = dah-di-di-dah
Q = dah-dah-di-dah
Y = dah-di-dah-dah

Nearly done!

Still revising the previous letters as well, we have

J = di-dah-dah-dah
C = dah-di-dah-dit

And last of all

Z = dah-dah-di-dit

The Figures

The figures are a bit harder and as there's no more likely frequency of one figure above another in ordinary text, so there's no choice of simple or less sounds to be made – they are all about the same. This is where you may be tempted to count, and indeed may find yourself doing so at first. But, again, the secret is **in recognising the rhythm**.

1 = di-dah-dah-dah-dah
2 = di-di-dah-dah-dah
3 = di-di-di-dah-dah
4 = dit-dit-dit-di-dah
5 (we've already learned as di-di-di-di-dit)
6 = dah-di-di-di-dit
7 = dah-dah-di-di-dit
8 = dah-dah-dah-di-dit
9 = dah-dah-dah-dah-dit
0 (we've already learned this as dah-dah-dah-dah-dah).

So, how do you actually learn to recognise the sounds. As I've said, there is some effort to be made in the initial learning. You simply have to learn by rote, sounding out dits and dahs aloud. Reinforce your learning by continually translating when in a bus or train (not the car!) for example. Sound out the words of advertisements, at least in your head – but preferably aloud (under your breath!). Remember to put a space between each distinct letter and a larger space between words and do so for short periods several times a day, every day. For example, when you're reading a newspaper or book.

The most important thing (after making sure you learn sounds and not symbols) is to practise every day. Preferably several times a day. You can augment this portable and easy manual sounding method (i.e. voice!) with a Morse practice oscillator and you can then hear sounds in headphones or from loudspeaker as you key them.

Receiving Practice

How about receiving? Here, the regular Amateur slow Morse transmissions come to the rescue. Needless to say, you start at the slowest speed, practise frequently, then progress to the next speed up. Hopefully, the letters (or figures) themselves are all of similar length at whatever speed you receive – it's just that the slower stuff has longer gaps between characters.

You'll quickly find yourself recognising the rhythm of common words. 'The' together with 'and' come to mind. However, especially with the longer words, they often turn out to be slightly different ('then' and 'their' for example) and this can be confusing. So you need to learn two tricks here.

First, try not to guess (or at least write down) words and letters ahead of the sending. Only write down characters as received. Second, if you miss a letter, don't get flustered and so miss many more. Just leave a gap and pick up again on the next sound. You can usually fill in the gaps later – the time to make an intelligent guess!

An aid to avoiding guessing words is to practise receiving (and sending) random groups, the most common being 5-letter groups, as developed in wartime for encrypted transmission. The problem in practising receiving 5-letter (or figure) groups is checking what you've done.

Good Morse practice sessions always have a voice read-through afterwards, so that you can check out the accuracy of your efforts. If there are no conveniently available slow Morse transmissions, it's a good idea to learn together with a friend.

The checking process is essential after you have each sent out code on practice oscillators. This will minimise bad habits like consistently mis-identifying symbols. If you do find a character that you frequently get wrong, simply learn that character by rote, always remembering that you learn **the rhythm** and **not** the dits and dahs.

When it comes to slow Morse transmission and later to actual QSOs (contacts) there are some further pitfalls. First, you can be easily thrown by sound patterns you just don't recognise, because they're not in the alphabet (often made up from conventional signals merged together). Some common examples are

Comma (or exclamation mark) = dah-dah-di-di-dah-dah
Stroke (slash) = dah-di-di-dah-dit
Question mark = di-di-dah-dah-di-dit
Full stop = di-dah-di-dah-di-dah
Message end = di-dah-di-dah-dit

Then there are the abbreviations often used by Amateurs and others. Some of the most common are 'es' (dit-(pause)-di-di-dit) meaning 'and'. Great use is also made of the Q code (example: 'low power' is QRP), which of course you are already hearing in your head as dah-dah-di-dah-(pause)-di-dah-dit-(pause)-di-dah-dah-dit.

Two other common sounds are laughter (hi!), which is di-di-di-dit-(pause)-di-dit and best wishes (73) dah-dah-di-di-dit-(pause)-di-di-di-dah-dah.

Summarising, learn the sounds (never dots and dashes) in groups, then practice often preferably with at least one other person. It soon becomes habit and your speed will soon improve and then you'll have a new string to your bow, and hopefully enjoy contacts with others of like mind. Good luck!

David Butler's

vhf dxer

This month David Butler G4ASR takes at look at your v.h.f. and u.h.f. reports and how to make an aircraft scatter contact.

Welcome to the world above 30MHz! No DX activity was reported on the 50MHz band during December apart from one Sporadic-E (Sp-E) opening during the morning of December 6th. In this hour long event that commenced at 1000UTC, stations in southern England reported hearing s.s.b. signals from EA7AH (Spain), IZ7EUH (Italy) and 9H1TM (Malta). However, a few UK operators did mention making daily meteor scatter (m.s.) contacts – the activity level still seemed depressingly low.

It looks like many operators have moved up to the 70MHz band where a reasonable amount of activity can be found! Although there were no Sp-E openings reported during December a number of operators did mention making m.s. QSOs with stations in the Balearic Islands (EA6), Czech Republic (OK), Denmark (OZ), Italy (I), Luxembourg (LX), Sardinia (IS0), Slovenia (S5) and Spain (EA).

Recently, I mentioned that Radio Amateurs in Spain now have been granted temporary access to the 70MHz band and that two stations EA1YV (IN52) and EA3GLJ (JN01) are now active. The good news is that they've now been joined by the stations of EA1DDU (IN73), EH3CT (JN01), EA5EF (IM99), EA6SX (Mallorca JM19) and EA6VQ (JM19). The Balearic Islands are a separate DXCC country and the station of EA6SX was the first to claim initial contacts into the UK.

On December 9th at 0205UTC, EA6SX contacted the station of G0CHE (West Sussex IO90), on December 10th the station of GW8ASD (Clwyd IO83) and on December 13th, the station of GM4ISM (Lanarkshire IO85). The first Spain to Northern Ireland 70MHz contact was also completed on December 13th, when the station of EA1YV (IN52) contacted GI4KSO (Co. Down IO64) via JT6M during the Geminids meteor shower.

The JT6M-mode meteor scatter operation is very popular on the 70MHz band when it's devoid of Sp-E openings. Some of the stations known to have been worked via this digital mode from the UK during December, included LX1FX (JN29), LX2LA (JN39), IK1EGC (JN35), IW4BET (JN54), IS0AWZ (JM49), OK1DFC (JN79), OK1KT (JO70), OZ1BNN (JO55), OZ3ZW (JO54) and S51DI (JN76).

Vrata Vaverka OK1KT mentions that he lives in a block of apartments and that his antennas are mounted on the roof of the 13th floor about 45m above ground. Although the space is limited he does have a rotatable mast onto which is attached a 5-element 50MHz Yagi, a 3-element 70MHz Yagi and a 15-element 144MHz Yagi.

On January 1st 2009, Danish Radio Amateurs obtained an additional 25kHz of bandwidth that's been added to their existing 70MHz allocation. As they still share the spectrum with commercial users their band plan is a little complicated so take a look at the diagram, **Fig. 1**, as this will give you a clearer picture.

The 144MHz Band

A reasonable amount of DX activity was reported on the 144MHz band during December and this was primarily caused by the Geminids meteor shower and two periods of enhanced tropospheric propagation. The Geminids meteor shower, one of the most spectacular visual showers, reached its annual maximum on December 13th. Most contacts on the 144MHz band were made using FSK441, although there was a small number of s.s.b. QSOs being made right at the peak of the shower.

There's always a significant amount of activity during this period as the **Bavarian Contest Club** (BCC) organises a meteor scatter contest every year during the Geminids shower. Last year it was held between December 11-15th and UK operators mentioned making m.s. contacts with stations such as DK1MAX (Germany JN58), EA3AXV (Spain JN01), F1DVP (France JN12), IQ3AZ/P (Italy JN66), LA/PA5DD (Norway JP51), OE5KE (Austria JN78), OH6KTL (Finland KP02), OK2POI (Czech Republic JN99), OM3BC (Slovakia JN78), SM4/OZ2M (Sweden JO69), SP7VC/4 (Poland KO13), S51AT (Slovenia JN75) and 9A2TK (Croatia JN76).

In a meteor scatter context all these contacts were at a relatively short distance of around 1000-1400km. However, there was activity much further to the east that enabled contacts to be made with stations up to 2000km away. Amongst these were HA8AR (Hungary KN06), HA8CE

Frequency (MHz)	Mode	Usage
69.9875	Beacons	Beacons and CW
70.0500	CW and SSB	
70.0625		
NOT AVAILABLE FOR THE AMATEUR RADIO SERVICE		
70.0875	CW and SSB	
70.1125		
NOT AVAILABLE FOR THE AMATEUR RADIO SERVICE		
70.1875	CW and SSB	70.200MHz SSB/CW calling
70.2500	All Modes (12.5kHz)	
70.2875		
NOT AVAILABLE FOR THE AMATEUR RADIO SERVICE		
70.3125	FM (12.5kHz channels)	70.325MHz Packet Radio
70.3875		
NOT AVAILABLE FOR THE AMATEUR RADIO SERVICE		
70.4125	FM (12.5 kHz channels)	70.450MHz FM calling
70.5125		

Fig. 1: Danish Radio Amateurs obtained an additional 25kHz of bandwidth that's been added to their existing 70MHz allocation on January 1st. Their shared bandplan is a little complicated and is shown here.

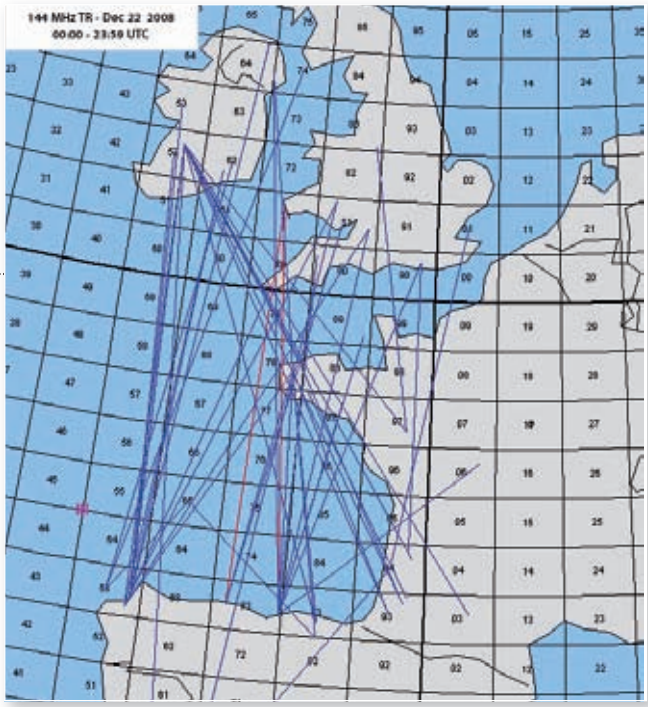

Fig. 2: Some of the many 144MHz tropo paths that were open in the days leading up to Christmas Eve 2008.

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(KN06), LY2R (Lithuania KO15), LY2WR/P (KO02), LZ2FO/2 (Bulgaria KN14), RZ1AWT (Russia KP40), US2YW (Ukraine KN38), UT5ST (KN28), YU2DX (Serbia KN04), YU7AA (JN95) and YU7KB (JN94). One of the longest distance QSOs made from the UK was probably that between the stations of G4PBP (IO82) and RZ1AWT (KP40) over a path of 2125km.

The station of IQ3AZ/P was specifically active for the m.s. contest and the original plan of this group was to install two 16-element Yagis on the same mast with two independent rotators. The idea was to introduce a spatial offset between the two antennas thus creating a wider lobe or even a dual-lobe radiation pattern, well suited for an m.s. contest. If a contact was established then the two antennas would then be re-aligned to obtain a combined vertical stack with associated higher gain.

However Murphy visited the group during the antenna installation causing the tower to collapse! Once all the bits of the antenna hardware had been bent back into shape it was decided to adopt Plan B, which consisted of a single Yagi and rotator arrangement. Sometimes you can be too ambitious! With this arrangement and a GS35 linear amplifier the group were pleasantly surprised to make a total of 134 unscheduled QSOs on the 144MHz band. The UK contacts included the stations of G3WZT, G4AEP, G4DCV, G4DEZ, G4DHF, G4PBP, G4PCS, G4ZFJ, G6HIE, G6HKS, G8VHI, GD0TEP and GU8FBO.

Tropospheric Propagation

Two periods of excellent tropospheric propagation were reported on the 144MHz band, one between December 21st and 24th to southern France and Spain and the other around December 30th and 31st to Denmark and Sweden. Take a look at the diagram, **Fig. 2**, and you'll see many of the tropo paths that were open in the days leading up to Christmas Eve.

Operators in southern England, Wales and Ireland reported making contacts into southern France with stations such as F2CT (IN93), F6GPT (IN94), F5BUU (JN03), F5VHX (JN04), F6ARQ (JN05) and F4DSD (JN23). Propagation into Spain seemed to be even better with contacts around 900-1250km being made with the s.s.b. stations of EA1BLA/P (IN53), EA1DDU (IN73), EA1EBJ (IN73), EA1ETQ (IN73), EA1FDI (IN53), EA1GCN (IN73), EA1MX (IN73), EA1YV (IN52), EA2DR (IN83), EA2TO/1 (IN83), EB1BXW/P (IN53), EB1EHO (IN73), EB1IVY/P (IN63) and EB2FJN (IN83).

The conditions were so good that David Bowen 2W0ZJA (Brecon IO81) reported hearing the f.m. repeater EA1E (IN72) on 145.725MHz during the evening of December 22nd. David was using a Yaesu FT-857D transceiver with a Watson W-2000 tri-band collinear antenna and contacted the stations of EA1ASC, EA1CTA, EA1DOB and EA1GGZ.

Propagation was also excellent on the 430MHz band! Some of the s.s.b. contacts made here included G7RAU (IO90) to EA1MX (IN73) at 837km, GI6ATZ (IO74) to EA1EBJ (IN73) at 1214km and GI4SNA (IO64) to EA1DDU (IN73) at 1224km.

A high pressure weather system remained fixed over the country for much of the Christmas period enabling some good inter-UK contacts to be made. The 144MHz station of **Alan Flett GM0HTT** (Orkney IO89) was heard putting out a very consistent signal on a number of days – one of his longest distance contacts being made with the station of **G7RAU** (Isle of Wight IO90) at 940km. Alan also reported hearing the OY6BEC beacon (Faroe Islands IP62) off the back of his beam but as it's only 380km from his QTH that's not entirely surprising!

During the evening of December 30th the tropospheric propagation moved towards Scandinavia with 144MHz contacts being made into Denmark (OZ), Norway (LA) and Sweden (SM) by stations located throughout much of England and Scotland. Contacts on s.s.b. were reported with LA4YGA (JO48), OZ1BEF (JO46), OZ1BNN (JO55), OZ3MC (JO46), OZ3TT (JO66), OZ5TG (JO45, SM1A (JO97), SM6TZX (JO67), SM7FWZ (JO77) and SM7GVF (JO77).

Conditions were also up on the 430MHz band but here there were more beacons reported than Amateur stations. Prominent amongst the beacons heard were LA5UHF (JO38) 432.441MHz, OZ7IGY (JO55) 432.471MHz and SK7MHL (JO65) 432.489MHz. Only a few contacts were actually reported, GM4WJA (IO87) to OZ1BEF (JO46) and G8VHI (IO92) to SM7FMX (JO65), although there were probably many more than these two. The stacked antenna array at the QTH of **Reg Woolley G8VHI** can be seen in the photograph, **Fig. 3** (on the following page).

Aircraft Scatter

Next, I'm going to take a look at a technique called aircraft scatter. This is the process of scattering radio waves off the body of a high altitude aircraft in order to make distant contacts on the v.h.f., u.h.f. and microwaves bands.

It may sound a bit complicated but if you are an active v.h.f. or u.h.f. operator you might already have experienced aircraft scatter without even realising it. Sometimes you

Fig. 3: The stacked antenna array at the QTH of Reg Woolley G8VHI.

may hear a station less than 800km away for less than a minute before it completely disappears never to return.

Or you might be listening to a signal over 300km away that suddenly starts to fade very quickly but also possesses a large amount of signal strength enhancement. After less than a minute the station reverts back to the low tropospheric signal level again. There is a good chance that both of these effects are caused by aircraft scatter.

If you understand the nature of aircraft scatter you can then use it to make QSOs with distant stations independent of prevailing weather conditions. Although primarily used for communication on the 430MHz band and upwards, it will also work successfully on the 50, 70 and 144MHz bands.

The altitude and position of the aircraft determines the maximum distance possible and its speed determines the maximum Doppler shift on the scattered signal. In practical terms it's possible to make s.s.b. contacts of 500-600km or even further on the 430MHz band with 100W and a single Yagi. The Doppler shift on this band will be a few hundred Hz and on the 1.3GHz band it will be three times larger, maybe 600Hz or more.

On the lower bands the Doppler shift will be scaled down with frequency in a similar way. The time available when an aircraft is in the right position is always very short – usually less than one minute. Therefore you need to work very quickly using a calling sequence of around 10 seconds. Exchange only the most vital pieces information for the QSO; callsigns, report and a confirmation that all details have been received.

There are now available receivers such as the Kinetic Avionic Products SBS-1 or the AirNav Radar Box that decodes (Mode-S /ADS-B) transponder signals from aircraft. The transponder operating on 1.090GHz broadcasts information about the aircraft such as latitude, longitude, altitude, ground speed, etc. Using such a receiver and associated software you can now display and track aircraft from the comfort of your shack.

Per Green SM0DFP mentions that he has been using an SBS-1, since being inspired by a talk given at a recent Nordic v.h.f. convention. Within seconds of starting the device the first aircraft were detected and displayed on the 'radar screen'. The simple vertical antenna was at the time located indoors. Once the antenna was placed outside on the roof of the shack the range increased to around 250km.

Later on, Per SM0DFP installed a ground-plane antenna made from a section of LDF4-50 Heliax cable with an associated low-noise amplifier and the range increased to a staggering 400-500km. As the aircraft might be at the mid-point of the path this theoretically would give an indication for possible scatter contacts up 1000km away.

Using the SBS-1 together with *Spectran*, a real-time spectral analysis program (see **www.spectran.com/Software_en.shtml**) Per was able to correlate aircraft location and enhancements in signal strength on a distant beacon transmitter. In fact, Per reports that he regularly listens to the 10GHz SK6YH beacon some 400km away and can detect a 10 to 30dB signal enhancement when a suitable large aircraft passes through the beam.

Deadline Time

That's it again for this month. If you do hear or work any DX stations on the v.h.f., u.h.f. or microwave bands then please send me your reports – or any other news – to reach me before the last Saturday of the month.

73 David G4ASR.

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The Affiliated Societies Contest (AFS) run by the **Radio Society Of Great Britain** (RSGB) is over once again. I wonder how many of you decided to take the plunge and have a go in this single band, afternoon contest? It's always a very well supported contest, though it can be daunting, but nevertheless, always enjoyable. I write this column so far in advance however, that I won't know if I worked you or not! Also by the time you read this, the RSGB CC contests will have started again.

I do hope you are taking part, even if your speed is not up to 30 w.p.m. yet and if not you should try the 'QRS Corral' at around 15 wpm. The corral for slower sending is to be found towards the top end of the narrow-band mode area of each band, avoiding the PSK section in each case. Any good operator will always slow down to **your speed**, so persevere and gain some valuable experience and of course a lot of fun. When you're established on the air, try to stick to a particular part of your favourite band.

Once on air, call 'CQ' on a regular basis as the best way of establishing friendships, you'll probably find regular skeds gradually evolving. You can build lifetime, very rewarding friendships in this way – I speak from personal experience here. It's amazing what you can learn, without realising it, just by using the h.f. bands, building up a pool of knowledge regarding antennas, propagation and so on.

More Practice

Being active on the h.f. bands need not mean transmitting of course. You can get plenty of practice, propagation allowing of course, by listening to the W1AW broadcasts. Take a look here: **http://www.arrl.org/w1aw.html#w1awsked**

The schedule is the same all year round and consists of text from the pages of *QST* magazine, c.w. frequencies including code practices, qualifying runs and c.w. bulletins. During the broadcasts, the speed varies between five and 35 w.p.m. Times are given in USA time zones so you will have to convert. Eastern standard time (EST) is UTC+5 so take a listen around 1400z (the 'z' meaning UTC) on 14.0475MHz, which would probably be the best band at present.

Even More Practice

If you are getting into contesting, then I have a computer program for you. It's been around for some time and is a dead ringer for *N1MM Logger* and it's called *Morserunner*, by **Alex Shovkoplyas VE3NEA**. It's the nearest thing you can get on a computer to being in a real contest. After you have installed it, there are several parameters to set up to simulate a contest.

I'd recommend that you start with single callers at a speed you can manage and gradually increase both the speed and the number of callers. You can have as many as nine stations calling at once. You can even have QRM, QRN, QSB, flutter and 'lids' added to make life difficult. It's a lot of fun, but I warn you that it can be addictive!

The Rolls Royce of Paddles

If you like paddle keys, and if you're after the ultimate in paddles, one to try is manufactured to personal order by **Kevin Gunstone M0AGA**, or master engineer **Alan Reed G4HCD**, using the latest computer controlled technology. The paddle is called the Chevron, **Fig. 1,** and is available in either highly polished lacquer coated chrome. Or if you are feeling really flush, they can supply a 9ct gold-plated version. You can have your call sign in place of the Chevron name. It weighs over 2kg and will **not** move.

Fig. 1: Surely, this is the Rolls-Royce of paddle-keys.

To ensure ultra smooth operation, each lever has been tested and the combination of a friction free resistance in the tensioning and large bearings above and below the lever allows for extremely close tolerances to be set for QRQ and QRS operators alike. As a single lever paddle user I wanted someone more suited to try one out so, I asked **Malcolm Prestwood G3PDH** to try it and here are a few of his comments: "All vertical and horizontal pivot systems have a high tolerance which creates a precise and free movement. Regardless of your preferred contact gaps they can be set accurately and precisely. I noted however, that with even with a relatively small gap there was a mechanical click as the paddle was moved. This seems to be characteristic of keys with magnets as opposed to those with mechanical springs.

"It would seem to be the result of overcoming the magnetic effect which causes the contacts to close more quickly than the mechanical spring variant with its more linear tension. The audible mechanical click is being caused on contact closure rather than upon release.

"However, for me the true joy of this key is the ability to set it such that no movement can be felt whatsoever on the contacts, which is how I like my paddle. This can be difficult to achieve reliably on a conventional key with springs but is simplicity itself with the Chevron key."

Even I could send fairly well with the key, but it would be nicer if there was a single lever paddle available.

73 and May the Morse be with you! **Roger, G3LDI**

Phil Cadman's

valve & vintage

Phil Cadman G4JCP launches his 2009 series of columns with a request on behalf of the Black Country Living Museum.

Hello and a hearty welcome to my first column of 2009! I trust you all had a good Christmas, and that the new year has begun well for everyone? While the economic outlook for 2009 isn't good, I certainly hope things won't be as bad as some experts are predicting!

Now, before moving on to my main topics, I'd like to make a request on behalf of the **Black Country Living Museum**, which is an urban heritage park situated in the shadow of Dudley Castle. At the museum, historic buildings from all around the Black Country have been moved and authentically rebuilt.

Currently at the planning stage is the recreation of a row of several shops. Set in the mid-1930s, it's envisaged that one of the shops will be a typical radio emporium from around 1937. Unfortunately, there's been a woeful neglect of our radio and electronics heritage here in the UK, and so I think the recreation of even a modest radio shop is well worth our support!*

In order to be as accurate as possible, the Museum is seeking photographs – particularly of the inside – of radio shops taken around 1935–1939. Contemporary manufacturers' and retailers' catalogues and other associated literature will also be welcome. In addition, stories and anecdotes about working in a small radio shop in the 1930s would be of great interest. But please note that the Museum is **not** seeking any exhibits at this stage. As the Museum has no staff with specific radio experience, can anyone who has something they feel may be of use please contact me first. To get some idea of what the Museum offers, please take a look at **http://www.bclm.co.uk/**

Editorial note**: You have our full support Phil and I encourage readers to visit the museum where it's even possible to ride on a preserved Bournemouth trolleybus – and see a glass bulb mercury arc traction rectifier working! It's a fascinating place and I'm sure their planned radio shop will be a great success. **Rob Mannion G3XFD.

Stef's Compactron

With the mention of Compactrons in my last column (Dec. 2008 issue of *PW*) it prompted an E-mail from regular *PW* author **Stef Niewiadomski**, who tells me he's just finished a medium wave/s.w. tuned radio frequency (t.r.f.) receiver using a **6AF11** compactron. The set can receive a.m., s.s.b. and c.w. transmissions, and is capable of driving a loudspeaker at very good volume.

Stef's already used it on medium wave and on 3.5MHz, and more bands are on the way. The photograph, **Fig. 1**, shows a photograph of the receiver. Thanks for the information and the photograph, Stef. Much appreciated!

The 6AF11 is actually three valves in one envelope: a high-μ triode, a medium-μ triode and a high-μ pentode. The pentode is, I believe, intended for use as a video output valve in monochrome television receivers, but it also makes a good audio output valve. Stef's design uses one of the triodes as a regenerative detector, while the other provides audio voltage amplification. Compactrons are still readily available and they're ideal candidates for experimentation, as Stef's receiver ably demonstrates.

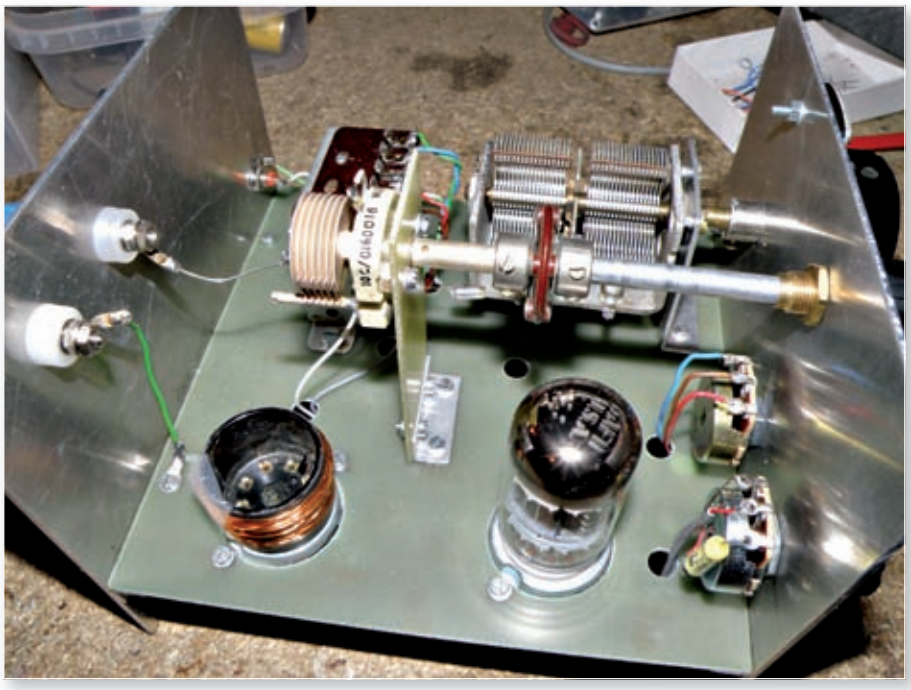


Fig. 1: Stef Niewiadomski's tuned radio frequency (t.r.f.) receiver using a 6AF11 compactron.

Hearing Aids

Last time, I mentioned miniature battery valves and their extremely important use in hearing aids. After the end of the War, the availability of rugged miniature battery valves prompted the then Ministry of Health to ask the Medical Research Council to review hearing aid design and to investigate whether the new health service could afford to make aids available to everyone.

It was eventually decided that the NHS should issue what became known as the **Medresco** – a name derived from Medical Research Council – hearing aid. The development work was done by the **Post Office** (now British Telecom) at their famous Post Office Research Station at Dollis Hill in London.

At the time, commercial hearing aids were beyond the means of most people, so the Medresco aids were the first hearing aids freely available to everybody who needed them. The first Medresco aid – designated **OL10**

– was issued in 1948 and such was its success, by 1951 over 400,000 patients in England and Wales had a Medresco OL10 or one of its successors.

The photograph, **Fig. 2.**, shows a Medresco aid with its associated battery pack. The aid itself could be attached to the outside of clothing (such as clipped to a pocket), while the battery pack would be worn out of sight. The first aids had crystal earpieces, while later ones used magnetic earpieces.

Back in March 1957, *Practical Wireless* featured an article showing how to convert a surplus hearing aid into a radio and one was shown on that month's cover. However, I would never recommend that anyone possessing such a hearing aid does such a thing today – unless it's physically very damaged, I'd say leave well alone!

The photograph, **Fig. 3**, shows both the component side (A) and the microphone side (B) of the circuit board within an **OL35A** aid. What strikes me is the relatively large size of the passive components and the microphone insert. Even if the valves remained the same size, imagine how much smaller this hearing aid could be if made with modern passive components and an electret microphone!

By the way, I'd like to thank *RadioUser* columnist **Godfrey Manning G4GLM**, for the photographs in Fig. 3. Thanks are also due to a friend of Godfrey's – **David Milne** – who has very kindly provided both myself and Godfrey with Medresco aids (the Editor doesn't have to shout at me down the 'phone now!).

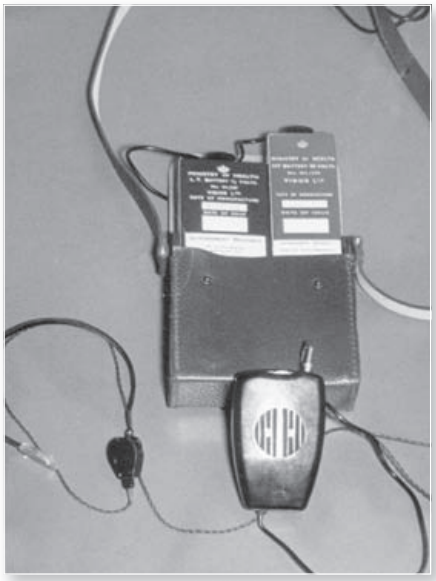


Fig. 2: A Medresco aid with its associated battery pack.

Amazing Low Power

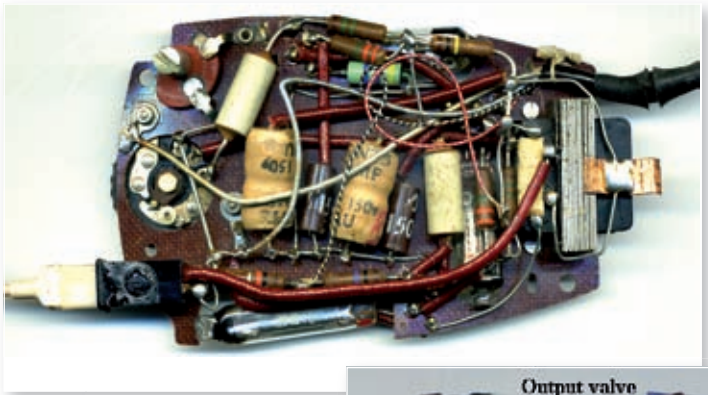
I'm amazed at how little power the valves used in the Medresco aids require. The circuit of the aids shows two voltage amplifying pentodes and an output pentode in a quite conventional arrangement, although the resistor values are higher than usual. For example, the control grid leaks are 10MΩ, the screen feeds are around 3MΩ, and the anode loads are 1MΩ or more.

But what makes these resistor values amazing is the OL35A's h.t. supply of just 18V! (Early aids like the OL10 used a 30V h.t.). Indeed, the automatic bias for the output valve reduces this by over two volts, so the valves are effectively operating on a supply of just 16V.

Godfrey has measured the total current of an OL35A and found it to be 200 - 300μA depending on volume. The filament current is just 20mA, obtained from a 1.5V dry cell.

The output valve is a **CV2331**/**DL64**, while the two voltage amplifiers are **CV2260**/**DF64**s. Note that the rated filament voltage of the CV2260/DF64 is just 0.625V. The filaments are therefore wired in series, which makes the one filament positive with respect to its control grid (so the control grid appears to have a negative potential with respect to the filament), thus giving the valve negative bias for free.

The DF64 and DL64 are only two of a range of miniature battery valves suitable for very low current operation. Most are still available and are ideal for use in miniature receivers and transmitters. Indeed, one day I may get around to making a transceiver with these class of valves. In the meantime, would anybody else like to have a go? It should be possible to put a single valve transmitter in normal size matchbox, while one of those large boxes of kitchen matches ought to be big enough for a complete 'clandestine' transceiver.



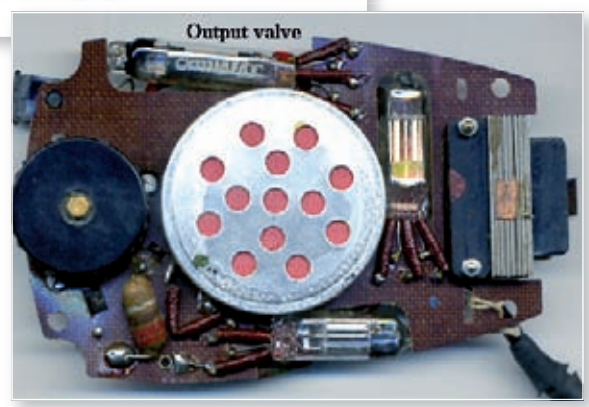


Fig. 3: The component side of the Medresco hearing aid.

'New' Replicas

Towards the end of last year I was contacted by my friend **David Reynolds G3ZPF**, who is Webmaster for the **Radio Amateur Old Timers' Association** (RAOTA). He said he'd received an E-mail from **Louis Vermond VE3AWA**, asking if anyone in RAOTA was interested in building replicas of pre-1940s receivers and transmitters.

Louis included photographs of some of the excellent 1920s and 1930s-style equipment he's constructed, all using parts and techniques from that time. David passed the E-mail on to me in case anyone reading the *V&V* column was similarly interested in building early Amateur Radio gear. Louis can be contacted by E-mail at **ve3awa@sympatico.ca**

One of Louis's photographs showed his version of the **QSL40**, a single valve, 3.5/7MHz transmitter originally

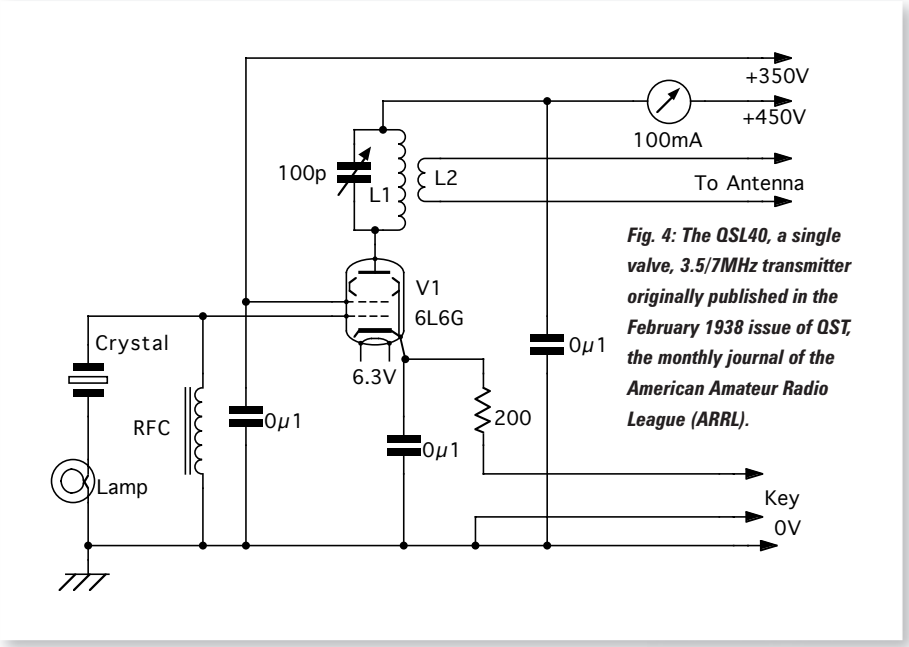


Fig. 4: The QSL40, a single valve, 3.5/7MHz transmitter originally published in the February 1938 issue of QST, the monthly journal of the American Amateur Radio League (ARRL).

published in the February 1938 issue of *QST*. This is a good example of the simplest kind of transmitter you can build capable of producing a reasonable output power.

The diagram, **Fig. 4.**, shows the circuit much as it appeared in *QST*. I hasten to add that a transmitter like this should not be used today; it needs the very minimum of a key-click filtering and some parasitic suppression as it's a rich souce of harmonics. However, building the transmitter as is, and only running it into a dummy load, is perfectly acceptable providing due care and attention is paid to the voltages involved.

So, for anybody who wants to live dangerously, the brief details are: r.f.c. = 2.5mH. Lamp = American type 40 (6.3V 150mA). Crystal = 3.5MHz or 7MHz, physically large type (10X or similar). L1 (3.5MHz) = 21 turns 16 s.w.g. enamelled, spaced one turn on 3 inch former. L1 (7MHz) = 15 turns as above. L2 (both bands) = 6 turns 16 s.w.g. enamelled, close-wound over h.t. end of L1.

While searching the Internet for any further information about the transmitter, I came across a rather interesting story. It seems that some years ago, **W0VLZ** of Rochester Minnesota in the USA, acquired a rather battered version of a QSL40. Its previous owner told W0VLZ that the transmitter had come from a closed radio museum in Houston Texas, and had a label bearing the words '**The Hero of Hallettsville**' (Hallettsville is a town some 100 miles west of Houston, Texas).

Wanting to know more, W0VLZ subsequently discovered that early on Saturday morning June 29 1940, four inches of rain fell at Hallettsville. That night a downpour of another ten inches fell, and further upstream of the Lavaca river – which flows through the town – 16 inches of rain fell (that's an awful lot of water). By early Sunday morning the river was flooding, and soon the town was under several feet of water and completely cut off. In addition, there were no outside communications, so a plea went out for help.

Houston Amateurs responded by gathering emergency radio equipment, including the little QSL40 transmitter. Contemporary sources indicate that the transmitter was first used outside the town and then, when the water receded sufficiently, in Hallettsville City Hall. Once there, radio communication was maintained for 24 hours until other lines of communication had been established. Pictures, and the full story can be found on the Internet. Simply search for 'The Hero of Hallettsville'.

So, the little transmitter had indeed been something of a 'hero'. And the story serves as a reminder that even simple equipment can make a contribution in emergency situations. We're becoming increasingly dependant on complex technology for communications, so it's nice – even prudent – to have something simple in reserve in case the worst happens. While in towns and urban areas some means of communication will probably be available whatever happens, in remote spots the same may not be true, even in a rather small and crowded country like the UK.

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Broadcast Station Departure

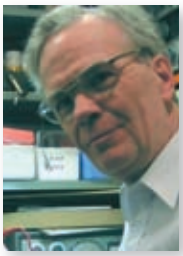
And finally.... in readiness for the departure of broadcast stations from the 7.100 to 7.200MHz segment of the 7MHz Amateur band, the International Amateur Radio Union Region 1 General Conference (held last November in Cavtat, Croatia) recommended a new 7MHz Bandplan. Sadly, I'm a little disappointed that the Bandplan makes no mention of amplitude modulation (a.m.). Even though the 7MHz band is only 200kHz wide, surely 10kHz or so could have been designated as an a.m. 'window', where priority could have been given to a.m. operation?

Before the total domination of s.s.b. for high frequency (h.f.) voice communication, many short wave listeners (s.w.l.s) had their first experience of Amateur Radio by hearing Amateurs operating a.m. transmitters on 7 and 14MHz. Both bands being tuneable on those broadcast receivers which included a short wave band.

How nice it would be if – just occasionally – Amateur a.m. transmissions could once again be heard on domestic radios. Some amateurs - Americans in particular - delight in putting old s.w. broadcast transmitters back on the air (run at legal power, of course!). So when h.f. band conditions finally improve, imagine the nostalgic thrill of hearing American, European and local Amateurs all running a.m. on 7MHz. I mean, weren't the AR88 and similar receivers made for such listening? And how about the Sunday morning RSGB news on a.m. once again?

Oh dear. I've probably upset the s.s.b. crowd now, so I'd better beat a hasty retreat back to my 'a.m.' bunker (cunningly disguised as a gigantic Marconi CR100 receiver). Providing I escape, please send your comments and letters to me, either via E-mail to: **phil@g4jcp.freeserve.co.uk**, or by mail to: **21, Scotts Green Close, Scotts Green, Dudley, West Midlands DY1 2DX**.

73, Phil G4JCP



Harry Leeming's

in the shop

Possible cures for radio frequency interference on hi-fi equipment and earth loops and how to produce a good looking meter scale.

*We offer our apologies to **Harry G3LLL** and readers, as this part of the* In The Shop *series should have appeared before the column that appeared in the February issue of* PW *so, the Shutter Tester part is out of sequence. **Editor***

Both home Hi-Fi and Amateur Radio increased their popularity in the 1970s, but unfortunately they were rarely if ever compatible! If you complained to your Hi-Fi supplier that you were experiencing 'interference' from a local 'ham', his response was likely to be, "Sorry nothing to do with me mate, see the ham."

Likewise if you told your Amateur Radio supplier that your rig was breaking through on your neighbours' Hi-Fi system, he'd likely have said to you, "Many of these systems are wide open to r.f. interference – nothing much we can do about it". For most retailers this was an easy opt-out but, as at that time we sold both Hi-Fi and Amateur Radio equipment, we had no choice but to get rather more involved with the problem.

Typically, a high fidelity system will have a collection of fairly long leads running to various input and output devices. Leads act as antennas, and will pickup signals from radio transmitters – particularly if they happen to be resonant lengths. If for example you connect the speakers up with two 5m wires, you have a dipole suitable for the 14MHz band, with the audio amplifier at the centre. This is **ideal** for amateur band reception.

Strange Voices

A neighbour of mine at the time was once wakened up in the early hours of the morning by 'strange voices', that occurred during one of my very rare excursions on the air at the time. His equipment was not even switched on, but his amplifier and speaker leads somehow operated as a giant crystal set. Some phono inputs were extremely sensitive to r.f., and we even had complaints of the unwanted reception of Radio Moscow!

To minimise the pickup of external hum and noise, the low-level interconnecting leads were of course screened, but if the input sockets are isolated from the chassis, any signals sat on the outside of the lead will run down to chassis via the amplifier's printed circuit, and inject r.f. into all the sensitive circuits. In cases of r.f. breakthrough the use of screened speaker leads is suggested by some people, but once again the r.f. can still enter the equipment on the outside of the lead. This however, was not the only problem.

"The Hi-Fi equipment you've installed has just made a terrific bang, it sounded like a cannon going off. Is it going to explode?" This question was typical of many complaints we had from our Hi-Fi customers. The cause of the 'explosion' was usually interference from the thermostat on the refrigerator or the central heating system, which was coupled through the ring main electrical wiring to the Hi-Fi system. The problem was much worse with some makes of 'upmarket equipment'.

To some enthusiasts the specification was everything, and

Fig. 1: An externally added r.f. filtering capacitor may be the only way of filtering some equipment.

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claims such as "Response flat within ±1dB 1Hz to 1MHz" were not uncommon. Whilst these figures were possibly true, it was a good example of the advertising department demanding technology for technology's sake.

We noted that the fridge crash problem, and r.f. breakthrough was worse with those systems that had an excessively wide response, and presumed that this was the common cause. One of the most respected Hi-Fi manufacturers, **Peter Walker** of Quad Electronics, didn't try to produce equipment with such ridiculously wide response. In fact he commented, "The wider you open the window, the more the muck flies in."

Being on both sides of the fence we did quite an amount of experimenting, and consulted and swapped ideas with the more sensible Hi-Fi makers. The manufacturer J.E. Sugden for instance, was very interested in reducing the problems as much as possible in their Hi-Fi amplifiers, and sent us a prototype of a new amplifier to have a play with. **Jim Sugden** realised that when the input sockets and connectors were isolated from the chassis to avoid an earth loop, they must be filtered by a low inductance capacitors. These are best fitted internally, but as a modification to cure an r.f.i. problem, they can be tacked on externally as shown in **Fig. 1**.

Limited Frequency Response

We advocated additionally that capacitors should be fitted between base and emitter of the transistors of the input stages, to limit their frequency response and short out radio frequencies before they got a hold. Sugden's production model

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Fig. 2: The original Yaesu FT-101ZD had neither a.m. or f.m. but adding them could cause problems with earth loop feedback.

amplifier incorporated both forms of protection, was very resilient against radio breakthrough, and as a bonus the dreaded mains-borne 'explosions' also disappeared.

Of course many Hi-Fi amplifier input circuits now incorporate integrated circuits (i.c.s), but where adequate r.f.i. protection has not already been incorporated, the cure is the same. **Note** that the capacitor to limit the frequency response has to be directly wired between the live and earthy input points of the device, not between chassis and the live input.

When dealing with transistors this mod is very easy to do, as it only entails soldering a disc ceramic capacitor of about 1nF on the underside of the circuit board directly between the transistor's base and emitter. But with an i.c., establishing which pin is the earthy side of the input, is not so easy.

Eventually, partly due to articles that myself and others wrote in magazines such as *Hi-Fi News*, the message got through, and more makers started incorporating anti-r.f.i. components, and deliberately limited the frequency range of their Hi-Fi equipment. Apart from curing many Amateur Radio r.f.i. troubles, this often resulted in improved amplifier reliability, as it protected the input circuits from spikes. As proof of this, I'm still using my Sugden A21 amplifier that's well over 30 years old. The removal of the 'cannon crashes' also did much to lighten the load on the listener's nervous system. Nowadays though we cannot, of course, go round adding extra parts inside other peoples Hi-Fi equipment, and so next month we will have a look at some external r.f.i. cures.

Earth Loops

The microphone input of an Amateur Radio transceiver is sensitive, and so can also suffer from hum and noise pickup caused by earth loops. For this reason the microphone input circuit is usually designed to be 'earthed' to the chassis at one point only, to avoid forming an earth loop. Even if it's designed correctly in the first place, there may be a problem if, at a later date, it's decided to add an extra unit, such as a tone-burst or an f.m. module.

Fig. 3: Derek Fielding who created the professional looking camera shutter tester scale of Fig. 4.

If the extra unit is connected to the microphone input, and is also earthed by the internal power supply, then the microphone input circuit will have two connections to chassis. Hence the dreaded loop is formed, though whether this will or will not cause hum, is almost impossible to tell, leaving us somewhat with a 'suck it and see' situation.

Loops & The FT101ZD

The original FT101ZD, **Fig. 2**, didn't have a.m. or f.m. capabilities, but in the final version, usually referred to as the FT101ZD MKIII, one of these modes could be fitted with an optional extra p.c.b., or alternatively the rig could be ordered factory fitted with either a.m. or f.m. To avoid causing an earth loop when the f.m. unit was fitted, Yaesu at first removed an earth connection from the internal wiring at the **AF**/**RF** gain control.

On later production models, Yaesu cut a slot though the copper on the under side of the f.m. board to isolate the microphone input side from the rest of the board, and reconnected the earth connection behind the **RF**/**AF** gain control. This did not cause any problems when the rig was sold with a factory fitted f.m. board, but has caused chaos ever since when poor Mr 'Average Ham' obtains, and tries to fit, an f.m. board.

If you fit an f.m. board without the

slot cut across the underside of the unit, into an FT101ZD that has the earth connection wired to the RF/AF gain control, you will get hum on your transmissions, and sometimes on receive as well so, it's necessary in this case to remove the correct lead. (There are three lead screens wired to the earthy end of the AF gain control, try disconnecting them one at once until you find which cures the problem).

Conversely, fit a board with the cut on the underside of the p.c.b. to a rig that does not have the earth lead connected, and on f.m. you will find an un-modulated carrier, about 100kHz off your receive frequency. (In that case, find the screen that's not attached and solder it to the point on the control where the other two go).

The f.m. board loop shouldn't be a frequent problem, as f.m. boards are not available now, (and I'm sorry but I don't have any either). So, this problem will really only occur when a rig that's wrongly wired or, you get hold of a second hand board. In either case, if you don't know the history, it can be very confusing!

Looking Professional.

In the last few issues I've described how, in the early 1970s, we developed a camera shutter speed tester. We had thoughts of making it look professional, as the original prototype, was simply thrown together in a metal box, and was not in the kind of state that could be sold as a professional instrument, (even so as a 'first', the prototype ended up in the Science Museum in London). We had no experience of producing items for sale, but being in the retail trade we were in touch with many knowledgeable and helpful people.

One of our Hi-Fi reps put us in touch with a printed circuit manufacturer, and a supplier of replacement stylii, let us have hundreds of stylus cases, which when sprayed black, were just right for mounting a small p.c.b. with the BPX25 photo transistor and its associated parts in. For the first 50 units we simply sprayed metal boxes with hammer-finish paint. One of our customers, who was an engraver, produced a professional looking panel that was simply glued on.

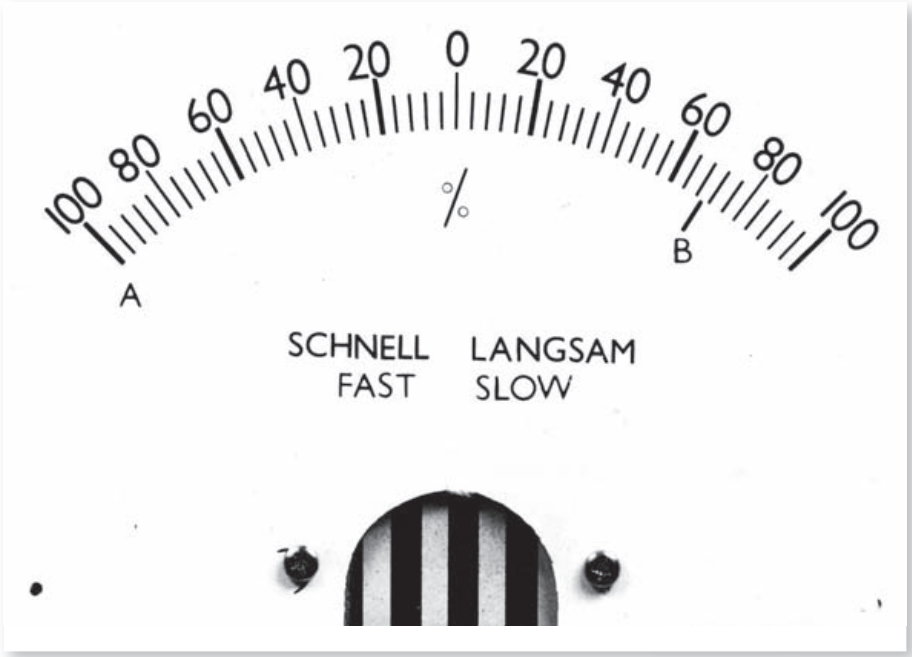


Fig. 4: The professional looking scale was created photographically from some artwork created by Derek Fielding.

Later, a local supplier of science teaching equipment for schools, Unilab, agreed to let us have some of their plastic boxes. We had these engraved, and Quad Hi-Fi let us have a supply of cardboard boxes to pack them in. The only thing that we were stuck for was a good-looking meter scale and engineer **Derek Fielding**, **Fig. 3**, solved this problem.

Derek removed the scale from a 100μa meter, and photographed it. Then using an enlarger, printed it out very much larger, so that it was easier to work on. He then applied stick-on figures and letters, and took another photograph of it. From this new negative he was then able to produce hundreds of scales exactly the same size as the original that looked as if they'd been professionally printed (**Fig. 4**)!

Of course, it would be very much easier to do this today, as one could just scan the original meter scale using a program such as *Photoshop Elements*, or *Paint Shop Pro*, and then add new figures. But you have to admire Derek's ingenuity of over 30 years ago. (Derek is now semi-retired but still very creative, his excellent church web site, **http://www.the-redeemer.org.uk/** is well worth a look.)

We sold the tester all over the world, but with the advent of fully automatic cameras, manufacture of the tester was eventually discontinued, and I now have no parts or commercial interest in it. I do know however that many readers of *PW* still take a pride in the performance of their mechanical shuttered cameras, and so in the following months I will publish the full circuit diagram, an explanation of how it works and brief details so that knowledgeable readers can construct their own unit.

Crazy World

Just to illustrate to crazy world of the supply chain, while I was stocking up for a production run to make the testers, I wanted about 600 BC109C transistors. Believe it or not, it cost less to order 1001 pieces, and throw 401 away, than it did to order 600!

See you next month. ●

Harry likes to hear about problems with older equipment, particularly pre-1990 Yaesu rigs. Please email him, (add some radio related term in the subject heading, to differentiate against spam), or write and enclose a stamped addressed envelope. Remember that electricity is dangerous, if you are not familiar with safety precautions you must never work on your equipment whilst it is plugged into the mains. (Switching off at the wall socket does not necessarily make equipment safe)

Carl Mason's

hf highlights

Carl Mason GW0VSW starts this month with a query, before turning to beacons and your logs.

A letter from **Tony Tuite GW0NSR** in Morfa, near Conwy, Gwynedd in Wales starts us off this month as he recollects how he became a licensed Amateur. Tony Writes "In late 1948 or early '49 I was a young schoolboy messing about with the family radiogram, a Decca 88 when I suddenly came across a couple of chaps chatting about the Port Talbot Steel Works and some problems they had at the time. Their callsigns were **GW4CZ** and **GW5VX**. My mother told me that they were Radio Amateurs and that if I sent a letter to them via Port Talbot Post Office I might receive a card from them. How do mothers know this kind of thing?

"Anyway, I decided to write to GW5VX and sure enough, a week later, I had a card from him with a very friendly note thanking me for my interest. I was never to hear the two operators again but their conversation started me off in the hobby and I have not looked back since! I began by building a one valve t.r.f. receiver which worked well, then things moved quickly forward as in 1951 I joined the RAF as a signaller and after my training was posted to Gibraltar where I was to become ZB2A.

"Since those days I have operated under various calls in some odd places around the World and have always enjoyed the hobby. Thanks to those two amateurs from South Wales (and a mother who knew what to do) I've had well over 50 years of pleasure from amateur radio."

Thanks Tony! If any of you know more about the two operators, GW4CZ and GW5VX, heard on that old Decca radiogram I am sure that Tony would love to hear from you.

Beacons

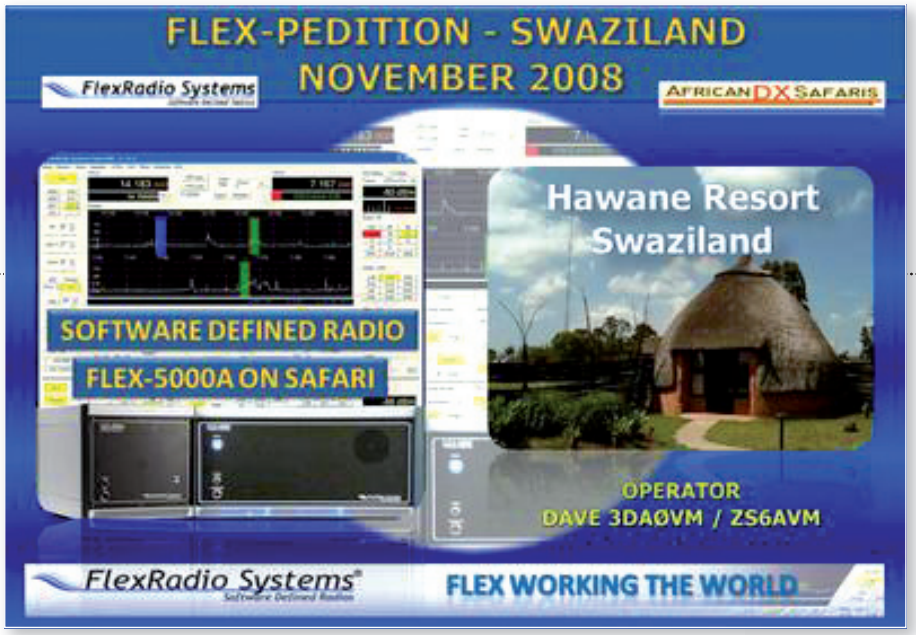
While scanning 10MHz recently on what appeared to be a dead band I heard a c.w. signal which turned out to be a beacon on 10.133MHz. The callsign was **SK6RUD** and it asked for a report to be sent in via the Internet. A look on the Internet showed that the beacon was located on the West Coast of Sweden, about 70km East of Gothenburg about 205m above sea level, and in a small village called Oxaback, set in the middle of a forest. The signal was coming from what turned out to be a 'Michigan Mighty Mite' homebrew transmitter running just 500mW to a full size ground plane antenna and I was copying it at 569.

Members of the Club Station **Radio Rud** have set up three beacons to evaluate propagation on 500kHz, 3.5425 and 10.133MHz. The list of reports makes very interesting reading and a map is available showing where they originated. There is also a link for construction details of the transmitter supplied by **Kyle Kindjerski VE6WTF**. It is a good example of what can be done with power levels below a watt or so (QRPp) so, when you get the chance have a listen out for the beacons and if you hear one add your report to the online log. You can even print off your own s.w.l. card to keep for your trouble once your report is added. The club/beacon information can be found at www.radiorud.se/index.asp and you can hear what the beacon sounds like at **http://uk.youtube.com/watch?v=wyUyT74Slv8**

The DX News

This months DX news begins with South Eastern Asia and **Mike Horecky OM2DX** who is now working for the Embassy of the Slovak Republic in Hanoi, Vietnam where he is expected to stay for the next three years. He will operate as **XV9DX** and **3W1M** on all h.f. bands using c.w., s.s.b. and some digital modes. The QSL will be via Stefan Horecky OM3JW, Mlynska 2, 900 31 Stupava, Slovak Republic.

In the land-locked Republic of Uganda **Peter Spaeth DL8SBQ** will operate as **5X4X** until June while he is working for the DED (German Development Service) as a technical adviser for infrastructure in the local administration in North West town of Arua. He uses a Yaesu FT-950 running 100W to a Spiderbeam for 14/18/21/24 and 28MHz bands pointing to Europe and a Zepp antenna for 7MHz. His call has been pirated so be aware that Peter cannot operate after 2000UTC as the power is cut off at



Carl Mason GW0VSW
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SA10 6SP
Tel: 01792 501176
E-Mail: gw0vsw@btinternet.com

that time. The QSL route is via **Heiner Spaeth DF5GQ**, **Alpenstrasse 37**, **78194 Hattingen**, **Germany**.

Tongatapu Island OC-049 is the largest island in Tonga and is the administration centre for the Kingdom. **Bert Rojas CX3AN** will be active there and operating as **A35HA** until the 21st February and will operate holiday style on 7-28MHz using c.w. and s.s.b. with an emphasis on 10 and 18MHz. Power will be 100W into dipole antennas and the QSL card is good via his home call.

Honiara lies on the Northern coast of the Solomon Islands OC-047 and and is the capital of the island and Guadalcanal Province. It's here that **Bernhard Stefan DL2GAC** will be operating until the 28th April as **H44MS,** using s.s.b. and concentrating only on the 3.5 and 7MHz bands. The name 'Honiara' is actually a mis-pronunciation as the early English colonialists found it hard to pronounce the original name of the area in the northern Guadalcanal language! So 'Nagoniara' which means 'In front of the wind' became Honiara!

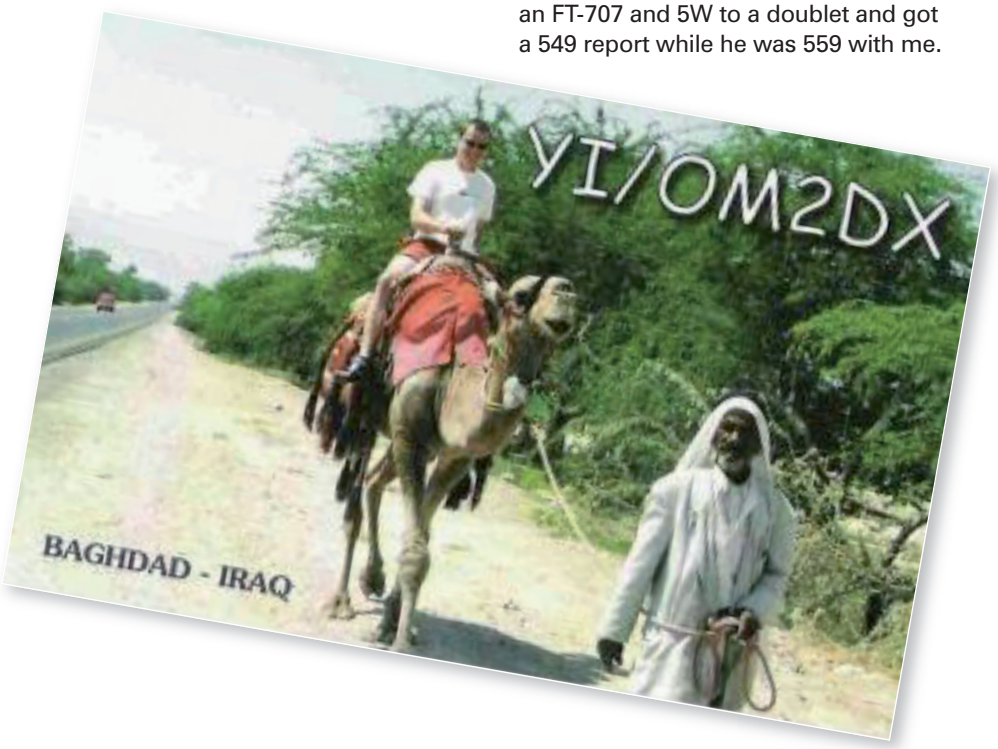
Your Reports

On to your reports now and first the 3.5MHz band where **Eric Masters G0KRT** in Worcester Park, Surrey used his Yaesu FT-817 and 5W QRP to a modified W3EDP antenna and tuned with an LDG SG-211 auto tuner, worked ON7CC (Belgian) 0820, OZ1BXN (Denmark) 1604, IK1RAC (Italy) 1716, DF0VK (Germany) 1723, SM5IMO (Sweden) 1831, OM5VSK (Slovakia) 1838, HA7UG (Hungary) 1920 and OK1XGL (Czech Republic) at 1937UTC.

Now welcome to a new reporter, **Dave Cousins G4WBB**, who lives near Barnsley, South Yorkshire. Dave managed LA5QFA/M (Norway) 1624, S58DX (Slovenia) 1653, DO1OVW (Germany) 1711, F9OH (France) 1735 and OK1ULN (Czech republic) 1741, PA1K (Netherlands) 1814, HB9EGR (Switzerland) 1819, SM/OZ4PAT (Sweden) 1837, ON4CFI (Belgium) 1847 at UTC on what he described as "a very poor band" using a Yaesu FT-2000, Tokyo Hy-Power Amplifier at 300W and a Cushcraft X-7 Tri-band beam.

I seem to have spent a lot more time in the shack this past month or so trying to access how well or how badly my indoor loop is performing. It was frustrating to hear some GQRP members filling their log books over December while I was unable to raise anyone. In desperation I connected a Watson 3.5MHz mobile whip to a 'mag mount' base and placed it onto a small baking tray which sat on the floor at the top of my landing. I ran a short length of RG-58 to my LDG auto tuner and from there back to the QRP Plus. What a difference this made as over the Christmas period, running 5W c.w. I was able to work stations on the band using the whip on transmit and occasionally the loop on receive.

Although the loop was good for reception and reasonably quiet the signal strengths were about 3 S-points down compared to the whip. Noise levels were high on this but manageable and something I have had to get used to as my house is surrounded by power lines. It was a compromise, but it worked, I was able to add a good number of calls to my log. One of the first was a two way GQRP chat with **Roy Smyth GI4CBG** in Belfast at 1438 who was using 5W to a doublet antenna and 569/579 reports were exchanged. Slightly later I worked **Eric Bowell G0OTE** in Bourne, Lincolnshire at 1653 who was running an FT-707 and 5W to a doublet and got a 549 report while he was 559 with me.



I was then amazed to be called by **Chris Jensen OZ1BXN** in Copenhagen (1150Km) at 1726 who had been listening to the QSO and wanted to give me a call. My report was 449 while Chris (running a Kenwood TS-440 at 10W) was 559 on the vertical and barely readable on the loop. A little later **Ben Nielsen OZ8BN** in Moen (1125KM) called at 1933 and gave me a 459 report on his dipole while his 50W got a 579! Finally, just before closing down I managed another two-way QRP contact with **Paul Wadley GU4YBW** in Guernsey at 1959UTC who was enjoying something of a mini pile up as I closed down. I mention these to show that even a very simple set up can allow you to operate and make a few QSOs. It may not be DX but it sure was fun!

The 7&10 MHz Bands

On the 7MHz band Eric G0KRT used QRP once again to log c.w. calls HA7UG (Hungary) 1455, DF7IS (Germany) 1504, OK1MKX (Czech Republic) 1510, LZ2RS (Bulgaria) 1518, EZ4ZZ (Turkmenistan) 2102, EA8CN (Canary Islands) AF-004 at 2110, IZ2CJ (Italy) 2121 and UW8SMZ (Ukraine) at 2222UTC.

Also active on the bands, Dave G4WBB used s.s.b. once again to work RW3MQ (European Russia) 1521, UR5MAF (Ukraine) 1524, IZ4KBS (Italy) 1533, EA1CEH (Spain) 1544, LA9UJ (Norway) 1548 and DF1QA (Germany) at 1550UTC.

On 10MHz the 'man-made' noise levels on my loop were high for most of the day making operating very tiring. There were brief openings and some DX but I was unable to work it. Using the QRP Plus with its 5W again but this time my indoor 'Crown' wire loop I struggled to get DL1DTX (Germany) 0932, HA3HP (Hungary), HB10DX (Switzerland) a special callsign celebrating 10 years of Swiss DX Foundation (SDXF) at 1020, EA1FGN (Spain) 1118, RW1AM (European Russia) 1546 and 3Z0HNY (Poland) 1552UTC in my log.

The 14MHz Band

The 14MHz band was once again the favourite of **Martyn Medcalf M3VAM** in Chelmsford, Essex, who fired up his Icom IC-746, SGC-237 auto tuner and half-size G5RV antenna to catch s.s.b. calls 3V8BB (Tunisia), UY5ZZ/A (Ukraine), J48NL (Greece) QSL via HA6NL, HA8TP (Hungary), RK3QS (European Russia), EA7HLU (Spain), YU1DW (Serbia), EW80M (Belarus) QSL via RD4WA between 1015 and 1730UTC using 10W.


Radio Rud
SK6RUD

CONFIRMING SWL REPORT OF RADIO BEACON

Callsign	Date	Time UTC	Freq MHz	Mode	RST
GW0VSW	19/11/2008	1320	10.133	CW	569

TX : Michigan Mighty Mite, 0.5 W
Keyer: Basic Stamp II
Antenna: GP antenna at 215 mtr asl, 10 mtr above ground
Grid Loc: JO67KI

Back in Worcester Park, Eric managed IT9QAU (Italy) 1224, UT5UTA (Ukraine) 1254 and OH7QR (Finland) at 1306 while Dave G4WBB managed 5B4AIX (Cyprus) AS-004 at 0757, BG1AJZ (China) 0845, VK3HE (Australia) in Melbourne, Victoria at 1331, W4NGR (USA) in Newport, Virginia at 1408, 5X1NH (Uganda) 1610 QSL via G3RWF, 3DA0VM (Swaziland) 1637 QSL via ZS6AVM, TR8CA (Gabon) 1639, PY3PDR (Brazil) 2104, HF0APAS (Antarctica) 2130 at the Polish 'Henryk Arctowski Station' on King George Island AN-010 QSL via SP9YI, LU8HMP (Argentina) 2141 and CX4BW (Uruguay) at 2146UTC.

The 21MHz Band

The 21MHz band has been quiet for a good while but I was fortunate to be at the right place at the right time working 7X4AN (Algeria) at 1402 followed by V51AS (Namibia) at 1406 during a short opening one afternoon. Both stations could be heard calling CQ for sometime but had no takers so, it does pay to listen around and put out the odd call. You maybe surprised who calls you back!

Signing Off

Only three reporters sent in their logs this month and all agree that the bands were in pretty poor shape while 3.5 and 7MHz appeared to only open during mid afternoon and early evening. Strong signals were copied one minute but quickly faded away the next making most QSOs very difficult. Maybe next month will be better!

That's about it for this column and my thanks go to our determined reporters for their logs. Don't forget you can send in a log no matter how big or small or even an listener report if you have been monitoring the bands. Just include the call, mode, antenna and receiver being used, the time and, of course, the band.

Finally, my thanks to **Mauro Pregliasco I1JQJ/KB2TJM** editor of the 425 DX Newsletter for all the DX information. Until next time I wish you all good DX. **73, Carl GW0VSW**

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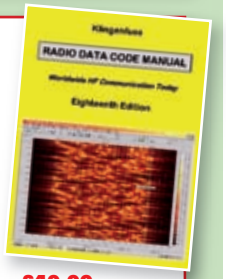

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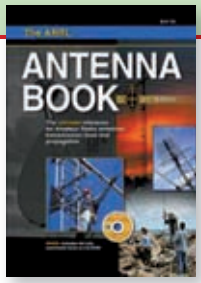

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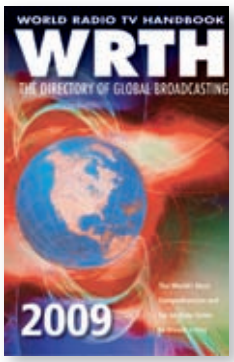

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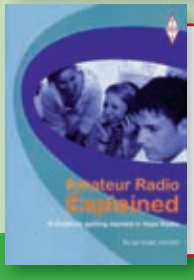

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Rob Mannion G3XFD writes: Peter Friedrichs has written a truly superb book but has chosen a title that really hides its 'light' under the proverbial bushel! Armed with the book an interested constructor can literally build a radio from scratch anywhere! Perhaps a better title could have been *Desert Island Radio for the Shipwrecked* because everything from simple earphones, detectors and mechanical amplifier to home made valves (tubes) and transistors. If you enjoy Rough Science on BBC2 you'll love this book! **Very highly recommended**.

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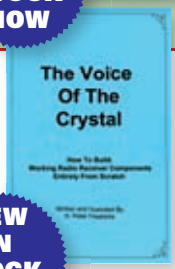

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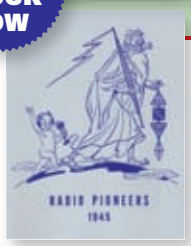

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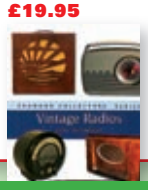

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Rob Mannion's

topical talk

Rob G3XFD comments on readers' letters – with topics including v.h.f. marine ducting, the old RAE and electric fences!

I think there's a fascinating selection of readers' letters in this issue this time. However, it's always heartening when we get letters featuring the technical and operating aspects of the hobby – although letters on all topics are welcomed!

Bob Williams G1BCZ from the **Tamworth Amateur radio Society** wrote a letter that brought back many memories for me involving v.h.f. and u.h.f. marine ducting propagation. The marine ducting phenomenon cause many problems for broadcasters such as the old **Independent Broadcasting Authority** (IBA). In particular, I can remember the difficulties co-channel interference (CCI) – caused by u.h.f. TV transmitters along, or near the coasts of our main Island.

Indeed, I remember when I was working (with some leisure time!) on Fair Isle in Shetland with **Don Hayter G3JHM.** Don and I were undertaking receiving antenna height diversity tests between **Keelylang Hill** (Orkney) and the **Fair Isle** transmitter-relay station, and the same marine ducting that was causing problems for our broadcast work, then enabled me to work stations in Kent (right down the North Sea coast of Scotland and England) on low power 144MHz f.m. – using only a simple dipole!

My experiences in the Royal Navy often proved that marine ducting can be very exclusive, sometimes allowing v.h.f. communication between vessels many hundreds of miles apart, while nearby cliff-top Coast Guard stations (above the duct) often couldn't hear anything! It's such a fascinating subject that I'm hoping to return to it again soon. Perhaps some of us could enjoy a day out at sea level on v.h.f./u.h.f. in similar fashion to that Bob G1BCZ enjoyed?

The Old RAE Papers

Occasionally, something we publish or refer to (sometimes just in passing!) in *PW*, really arouses a great deal of interest. This certainly applies to the old City & Guilds Radio Amateurs Examination Papers that have been (very kindly) made available on the Internet by **David Pratt G4DMP**. Indeed, a number of readers have written in to me on this very subject. However, very few of my correspondents agree with my comments (*Topical Talk* November 2008) that, "I was surprised to see that they didn't seem as fearsome as I remember them."

Actually, most of my correspondents – including my contemporary **Carl Langley G3XGK** (who was probably on the air for the first time about the same time as G3XFD) points out in his letter this month that I had most likely forgotten we could only use 'Guessing Sticks' (Slide Rules) and maths tables in the exam. Indeed, Carl suggests that perhaps the last 40 years has mellowed my memory!

In my personal reply to him I had to admit that he'd given me much food for thought – especially on the 'All Fail' if you failed on Part 1, despite doing a good job on Part 2 (exactly as I did at my first attempt!). However, having seen some copies of modern 'multiple choice' questions style examinations, I'm still pleased I had the opportunity to use my circuits and block diagram drawing abilities to demonstrate to the examiner I at least understood what was going on, despite (perhaps) not getting everything else correct in the question involved.

Finally on this point, I know of many G3s of my era who had never touched a soldering iron and hadn't any practical experience of building or servicing (with all the knowledge it brings) transmitters or receivers. Nowadays though, even with the simple level of 'hands on' experience in the training courses, I think that the M3s I've met (who've progressed on to the Full Licence) have benefitted greatly from their practical training courses.

Electric Fences

My friend and fellow Editor **Roy Walker G0TAK**, has an amusing approach to our hobby (letters this month) and thoroughly enjoys himself. However, I've also had experience of electric fences (both r.f. wise and via physical contact!) and appreciate the difficulties he has during the grass grazing season. Suggestions (practical please!) on how Roy can overcome electric fence QRN are welcome (on a postcard please!) readers!

Rob Mannion G3XFD/EI5IW

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