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- **Kilmot Project**
  a transmitter to accompany the Kilve RX
- **The Propagator**
  2m portable antenna
- **Harry Leeming G3LLL**
  a lifetime in radio
- **50MHz for 50p!**
  car boot radio

UK Exclusive

Icom IC-E7 Reviewed

This photo is definitely not actual size - it's tiny!

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April 2006

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SoftRock HF Receiver

Amazing Performance SSB - CW
Over 1000 sold in USA!
Variable Selectivity 6kHz - 25Hz!

Case not supplied

Build it yourself in approx 4 hours. Choosed 20m or 40m model. Plug into your PC soundcard and load the **FREE software** that gives you performance similar to top of the range receivers inc. **variable selectivity, SSB, CW,AM, FM, Digital readout to 10Hz, DSP noise filters etc.** Frequency coverage is determined by your soundcard. i.e 48kHz, 96kHz etc. Kits are centered around 7.040 and 14.060MHz. Crystal may be changed to move band coverage. Includes all components and both boards. Some surface mount components. **Runs from PP-3 or 12Volts** This is a Kit

£29.95!
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SoftRock-40

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www.wsplc.com

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NEW

SOFTWARE DEFINED HF TRANSCEIVER

Performs like a £5,000 transceiver but costs 80% less!

SDR-1000

1W - 100W, 160M - 10M.

Nothing else comes close to its performance. Spectrum display, superb receiver front end, and filter shape factors that were previously just dreams. **Welcome to Software Defined Radio! It simplt has no equal. Call in to Hockley store for a demonstration.**

www.flex-radio.com

100W Version £995 B
QRP 1W Version £649 B

ICOM IC-E7

NEW

The IC-E7 is Icom's new stylish, compact and light-weight dual-band handheld transceiver. It covers 2m and 70cm transmit and a wideband receiver that covers 0.495 to 999MHz with the capability of receiving FM, TV audio and other communications. c/w BP-234 Li-Ion battery & charger.

SPECIAL OPENING OFFER PRICE! ~~£199.95~~ **£169.95 B**

YAESU FT-1802E

NEW

The FT-1802E is the new rugged 2m FM Mobile Transceiver from Yaesu, providing high power output and outstanding receiver performance on 2m. It provides up to 50W RF output with a selection of 4 power levels 5, 10, 25 and 50W and comes with a DTMF mic. Power supply is 13.8V DC.

£129 B

NEW

ICOM IC-7000

The IC-7000 uses new IF-DSP technology as used in the IC-750PROIII and IC-7800. Slightly smaller than the IC-706MkIIG, it packs even more features. It covers all the amateur bands all modes from 160m to 70cm. Variable power low to high is available on all bands. The general coverage receiver tunes from 30kHz to 200MHz and 400 to 450MHz. It uses Digital IF filters with a choice of 41 different filter widths.

+FREE NC-4 Noise Cancelling Headphones

£999 C

Icom HF Transceivers

ICOM IC-756 PRO III

Top of its range of HF transceivers. HF & 50MHz, features large colour LCD with spectrum scope, auto ATU and 32-bit floating point DSP unit.

£2099 C

IC-7800 £6400 C
Icom' Flagship HF 200W transceiver. 200W max. The ultimate receiver - the ultimate design! AC psu built in.

IC-7800-PACK £6995 C
The superb transceiver as above plus 17" flat screen, keyboard and SM-20 base microphone.

IC-7400 *Lower Price* £1279 C
HF/VHF 160m - 2m transceiver 5 - 100W. SSB CW FM AM. 12V DC. Nice big display. Lovely price.

IC-706 MkIIGDSP £769 C
It's unbeatable. 160m - 70cm (up to 100W HF) yet so small with detachable head. The ultimate mobile..

IC-718 £449 C
This is a budget class radio HF 160 - 10m at a price that belies its performance. Beautiful display.

IC-703 *FREE IC-703 Logbook* £539 C
Take an IC-706, reduce power to 10W max and get rid of VHF/UHF. 160 - 6m of pure QRP joy!!

Going HF Mobile?

Then check out the great 80m - 6m SIDEKICK magnetic mount whip from USA. No hassel and great performance. £249.95 C

Kenwood HF Transceivers

KENWOOD TS-2000

Top-of-the-range Kenwood transceiver. The Station in a box. 160m-70cm with every feature imaginable inc. DX Cluster. Kenwood fans dream rig. HF/VHF/UHF or up to 23cm with the optional module. Built-in auto ATU, DSP and its unique TNC.

New Lower Price **£1295 C**

TS-2000X *Lower Price* £1789 C
Take the TS-2000 and add a superb 23cm module. The best 23cm we know of plus all other bands!

TS-B2000 *Lower Price* £995 C
Designed for the 21st century. You get HF - 70cm with PC software for direct PC control. It works great.

TS-570DG *Lower Price* £799 E
The best budget radio at the price. Superb 100W from 160m to 10m. As used by Peter Waters, G3OJV

TS-480HX *Lower Price* £799 C
Take the TS-480SAT, remove the auto ATU and offer a beefy 200W output. That's a really potent package!

TS-480SAT *Lower Price* £699 C
HF 160m - 6m with remote front panel. Large enough for base use, small enough for mobile. Big display

Yaesu HF Transceivers

YAESU FT-1000 MKV

200W HF transceiver, EDSP, Collins filter, auto ATU, 220V AC PSU. Acknowledged as one of the finest DX rigs on the market. Superb tailored audio and the ability to select Class A bias for dramatic signal purity.

£2099 E

FT-1000 FIELD £1499 E
The HF choice for DXers. With this rigs reputation on DXpeditions what more persuasion do you need?

FTV-1000 *Lower Price* £599 B
6m 200W module for the FT-1000 range. Probably the ultimate for 6m DXing.

FT-897D *See Offer* £649 C
160m - 70cm self-contained portable. 100W and up to 20W from optional internal batts.

FT-857D *Limited Offer* £579 C
160m - 70cm mobile with up to 100W output. Lovely tuning control from remote head unit - and great price!

FT-847 £999 C
Complete station in a box! 160m - 70cm - up to 100W (50W 2m/70cm). Great for satellite work.

FT-840 £399 C
Is there any other radio that comes close to this price? One of our all-time best sellers. 100W 160m - 10m

FT-817ND £419 C
The ultimate QRP self-contained radio. Up to 5W output 160m - 70cm. New low price. UK warranty.

FT-817bhiDSP £529 C
FT-817ND with fitted bhi DSP module.

Warning - as a regular advertiser you can be sure all our stock is genuine UK warranted. Check serial numbers!!

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

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Icom VHF/UHF Mobile/Base

ICOM IC-E208 *LIMITED OFFER*

VHF/UHF FM Dual Band Mobile Transceiver
**Freq range 144-146MHz, 430-440MHz Tx*
**55/50W (3 pwr steps each band)*
**Wideband Rx 118-173, 230-549 & 810-999MHz*
£215 C

IC-910H *Lower Price* **£1087 C**
2m / 70cm 100W Base station all - modes with option for 23cm module (**UX-910 £359**)

IC-910HX *Lower Price* **£1235 C**
As above but with 23cm module ready fitted and a big saving as well.

IC-2725E **£269 B**
Icom's new dual band 2m / 70cm radio. Very easy to operate and install and a lovely detachable head.

Kenwood VHF/UHF Mobile/Base

KENWOOD TMD-700E

2m/70cm dual band mobile transceiver with APRS. Doesn't need extra high cost boards to function. Only extra if required is a compatible GPS receiver.
Lower Price **£418 C**

TM-G707E **£265 C**
Dual Band 2m & 70cm with detachable front

TM-V7E **£359 C**
Dual Band 2m & 70cm with 50/35W output

TM-271E **£187 C**
Single Band 2m FM 60W mobile transceiver

Yaesu VHF/UHF Mobile/Base

YAESU FT-7800E *SPECIAL OFFER*

**2m/70cms Dual Band Mobile *High power 50W 2m /40W 70cms *Wide receive inc. civil & military airband *CTCSS & DCS with direct keypad mic. *Detachable front panel *1000 memories plus five one-touch*
FREE YSK-7800 SEPERATION KIT
£229 B

FT-2800M **£149 B**
*2m FM Mobile transceiver *High power 65W *Capable of VHF wideband receiver

FT-8800E *LOW PRICE* **£267 C**
*2m/70cm Dualband FM Mobile transceiver *50W 2m, 35W 70cm *Wideband receiver

FT-8900R **£339 C**
*2m, 70cm, 6m & 10m Quadband FM Mobile transceiver *Independent dial for each band

Icom VHF/UHF Handhelds

IC-V82 *NEW* **£159 B**
2m FM Digital Handheld 7W

IC-U82 *NEW* **£159 B**
70cm FM Digital Handheld 5W

IC-E90 *Limited Offer* **£199 B**
6m / 2m / 70cm handheld transceiver

IC-T3H **£129 B**
2m FM handheld 5.5W c/w BC-01 & BC-146

IC-E7 *SPECIAL!* **£169 B**
New 2m / 70cm handy wide RX

Kenwood VHF/UHF Handhelds

KENWOOD 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! This is a great radio to have at all times when you are on your travels.
£199 B

TH-D7E **£299 B**
2m/70cm dualband FM handheld transceiver with data communications

TH-G71E **£179 B**
2m/70cm dualband FM handheld transceiver

TH-K2E **£139 B**
2m FM 5W portable transceiver c/w Ni-MH battery/charger

TH-K2ET **£145 B**
2m FM 5W portable transceiver c/w Ni-MH battery/charger

TH-K4E **£139 B**
70cm FM 5W portable transceiver c/w Ni-MH battery/charger

Yaesu VHF/UHF Handhelds

YAESU VX-7R *LIMITED SPECIAL OFFER*

Totally waterproof, wide frequency coverage 500kHz-900MHz AM/FM. 132x64 dot matrix display providing easy-to-read frequencies and information plus pictorial graphics.
£209 B

***NEW* VX-6E *Offer* £189 B**
2m /70cm Submersible 5W

FT-60E 2m/70cm 5W **£169 B**
VX-2E 2m/70cms min **£119 B**
VX-110 2mhandheld **£94 B**

Alinco VHF/UHF Handhelds

DJ-C6E *NEW* **£119 B**
2m/70cm FM 300mW handheld transceiver

DJ-V5E **£169 B**
2m/70cm FM 5W dualband handheld transceiver

DJ-193E **£99 B**
2m FM transceiver no keypad, Ni-Cds & charger

DJ-195E **£109 B**
2m FM transceiver with keypad Ni-Cds & charger

DJ-C7E **£129 B**
2m/70cm credit size FM handheld

W3FF NEW Mini Buddipole

Portable 40 - 2m Ant
Just 14" long packed!

£189 C
Order as W3-MBP

Comes in a case **just 14" long** yet extends to a **highly efficient 4.6m long rigid rotatable dipole.** Great for camping and back-packing. Handles 200W and band changing is just a coil tap away. Supplied with 25' of coax and balun. Centre has standard 1/2" plumbers pipe thread. Optional telescopic mast and tripod available.

SGC HF Linear Amplifiers

SG-500 **£1399.95 C**
"Power Cube" 1.6-30MHz 500W solid state

Yaesu HF Linear Amplifiers

VL-1000 QUADRA **£3795 D**
HF + 6m linear amp. 1kW comes with PSU

Watson Mobile Antennas

ANTENNAS

W-2LE	1/4 wave 2m 0.48m 200W	£9.95	B
W-285	5/8th 2m 1.33m long 200W	£14.95	A
W-77LS	2m/70cm 0.42m 50W	£14.95	B
W-770HB	2m/70cm 1.1m 200W	£24.95	B
W-7900	2m/70cm 2m/70cm 1.58m	£32.95	B
WSM-270	Dual band mini magnetic	£19.95	A

BASES

WM-08	8cm diam magnetic	£9.95	A
WM-14B	14cm diam magnetic	£12.95	A
W-3HM	Hatch mount	£14.95	A
W-ECH	Cable kit	£12.95	A

NOTE: All antennas have PL-259 ends. Mag mounts have cable attached. Hatch mount needs ECH cable.

WATSON Low Noise PSUs

WATSON W-25SM

Competitors models get bad press (see Radcom Dec. P66) But "Watson W-25SM stood out from the others."

£79.95 B

NEW STOCK & OFFERS

YAESU VX-120 & VX-170 *NEW*

< VX-120
A 2m 5W handheld with an 8-key pad, Ni-MH batt & charger
VX-170 >
A 2m 5W handheld with a 16-key pad, Ni-MH batt & charger

£99.95 B **£109.95 B**

YAESU FT-DX9000D *NEW*

Top-of-the-range 200W HF + 6m Deluxe Base Station. Auto ATU, 220V AC PSU, Class 'A' operation for AM & SSB, large TFT data management unit and dual analogue meters, Main/Sub receivers, 32-bit IF DSP. Return of the FT-DX series represents the very best in high power DX-ready base stations.
£7299 D

bhi DSP Equipment

bhi NES10-2 MkII

NES10-2 Combined speaker and programmable DSP unit. Offers dramatic noise reduction and reduces annoying hetrodynes. 8 filter settings, 12V DC.
£99.95 B

NES-5 **£79.95 B**
DSP Speaker Basic Plug & Go model

NEIM-1031 **£129.95 B**
Noise Eliminating In-Line Module with DSP

ANEM *NEW* **£119.95 B**
"NOISE AWAY" Amplified LS DSP module

NEHM *NEW* **£99.95 B**
"NOISE AWAY" Headphone DSP module

1042 **£19.95 A**
Switch box allowing up to 6 items to connect to one bhi speaker/module.

NEDSP-1061 **£89.95 B**
Small DSP PCB module for retrofitting into rigs

NEDSP-1062-PCB **£89.95 B**
Amplified DSP module to insert in speaker path

NEDSP-1062-KBD **£99.95 B**
As NEDSP-1062 but with small keyboard

NCH **£34.95 B**
ANR Noise Cancelling headphones

WATSON WM-S Hands Free

WATSON WM-S

Stay legal. Flexible boom microphone mounts under sun visor. PTT box mounts on gear changer. All powered from rig mic socket! **Includes detachable lead to match your radio.**

£39.95 B

To check compatibility, download PDF "WM-S Compatibility" in leaflets section of www.wsplc.com

FT-897D SPECIAL!

FT-897D	£649
FP-30U Internal PSU	£199.95
FC-30 External ATU	£249.95
Total	£1098.90

ALL FOR JUST £849.95!

FT-897D	£649
2x FNB-78 Int Battery	£198
CD-24 Charge Adaptor	£99.95
PA-26U Batt Charger	£69.95
Total	£1016.90

ALL FOR JUST £849.95!

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

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NEW STOCK & OFFERS

FUJIKON
NOISE CANCELLING HEADPHONES NEW

These Active Noise Cancelling Headphones, from Fujikon, blockout annoying ambient background noise. Powered by an AAA battery noise cancelling is controlled by an on/off switch. NC-4 has a folding design for easy storage.

FUJIKON NC-2 £18.95 A

FUJIKON NC-4 £19.95 A

POCKET MORSE READER

MFJ-461
Reads CW
Just hold near receiver speaker
£69.95 B

That's right - just hold this self-contained decoder near your speaker and see the text scroll across the screen. Absolutely amazing

MFJ-936B Loop Tuner

The most amazing antenna we have seen in years. For optimum results take a wire around 1/5th wave long, bend into square loop (14ft on 20m = 3.5ft square) and attach to MFJ-936B. Result: Ultra low indoor noise and VK, ZL & W all on SSB! That's what we achieved in one day's operation! 20m loop works on 15m as well. Now In Stock. Great for QRP and portable as well.

£219.95 B

Antenna Accessories

Dipole Bits

Kevlar	Strong 400lb strain line 200ft	£22.95	A
FW-PVC-50	50m clear PVC 2mm wire	£39.95	A
Flexweave	50m multi-strand 2mm wire	£29.95	A
HDCW	50m hard drawn 16g copper	£14.95	A
Insul-8	Black ribbed insulator	£0.99	A
WDC-50	SO-239 dipole centre insulator	£6.49	A
Egg-m	Medium ceramic egg insulator	£2.15	A
Egg-s	Small ceramic egg insulator	£1.75	A
WS-2580	25pcs 3" ladder line spacers	£9.95	A

Diamond 50 Ohm Baluns

BU-50	1:1 1.7MHz 40MHz 1.2kW	£26.95	A
BU-55	1:1 3.5MHz - 75MHz 500W	£34.95	A

Antenna Traps (pairs)

TR-200-14	200W bands 10m - 20m	£44.95	B
TR-200-10	200W 10MHz	£47.95	B
TR-200-7	200W 7MHz	£49.95	B
TR-200-3.6	200W 3.6MHz	£53.95	B
TR-1000-14	1kW bands 10m - 20m	£59.95	B
TR-1000-10	1kW 30m	£61.95	B
TR-1000-7	1kW 40m	£64.95	B
TR-1000-3.6	1kW 80m	£73.95	B

German Made High Quality Baluns

HB-1-200	1:1 3.5 - 30MHz 200W	£25.95	B
HB-4-200	4:1 3.5 - 30MHz 200W	£25.95	B
HB-6-200	6:1 3.5 - 30MHz 200W	£25.95	B
HB-1-1	1:1 3.5 - 30MHz 1kW	£34.95	B
HB-4-1	4:1 3.5 - 30MHz 1kW	£41.95	B
HB-6-1	6:1 3.5 - 30MHz 1kW	£41.95	B

Remote 4:11.5kW Balun

REM-BAL	For coax to ladder line match	£46.95	B

Patch Leads

WPL-70	V low loss 75cm PL-259	£6.95	A
WPL-50	Standard 50cm PL-259	£2.99	A
WPL-50BNC	BNC version of above	£2.99	A
HQ-66	66cm RG-213 PL-259	£4.99	A
HQ-10m	10m long PL-259	£14.99	A

SGC External Auto ATU's

SGC SG-231

1 - 60MHz. 3 - 100W pep (50W CW). Min wire length, 7m. 50 Ohm feed. Needs 12V at approx 900mA.

£349.95 C

SG-239 £189.95 C
Mini auto ATU 1.8 - 30MHz 1.5 - 200W PEP primarily for long wires - non waterproof. 12V DC

SG-231 £349.95 C
1.8 - 60MHz 100W PEP. A great random wire tuner that you can use outdoors. 12V DC

SG-237 £299.95 C
1.8 - 60MHz 100W PEP. Great for mounting outdoors and feeding long wire. Waterproof. 12V DC

SG-230 £339.95 C
1.8 - 30MHz 200W PEP. The original design that handles end fed or coax unbalanced. Waterproof. 12V

SG-235 £749.95 C
3.5 - 54MHz. A hunky 500W PEP tuner that handles long wires. Great outdoor design. Waterproof.

Icom External Auto ATU's

AH-3 £379.99 C
1.8 - 28MHz. A hunky 120W PEP tuner that handles whips or wire longer than 2.5m. Waterproof.

Alinco External Auto ATU's

EDX-2 £299.95 B
1.8 - 30MHz 150W long wire tuner designed for use with DX-70 transceiver. Waterproof.

MFJ External Auto ATU's

MFJ-993B

**Auto ATU with digital data display *1.8-30MHz *Long wire, coax & balanced line *300W SSB, 150W CW *Cross needle metering*

£219.95 C

MFJ-991B £189.95 C
1.8 - 30MHz auto ATU. Similar to MFJ-993 but no digital display. Works with any HF transceiver. 150W PEP

MFJ-994B £299.95 C
1.8 - 30MHz high power auto ATU. 600W PEP / 300W CW. Tunes wire, coax and balanced feed.

SGC External Auto ATU's

MAC-200 £259.95 C
1.8 - 60MHz 200W PEP. Wire, coax and balanced feeder. Features auto antenna switching.

SG-237PCB £279.95 C
1.8 - 60MHz 100W PEP. Same as SG-237 but without housing for building into your own housing.

SG-211 £189.95 C
1.8 - 60MHz works off internal dry cells. Zero drain wait state. 60W PEP. Ideal for portable (Min 1W).

Yaesu External Auto ATU's

FC-20 £249.95 C
1.8 - 60MHz 100W matched for FT-100/Ft-847. Desk top unit to match transceivers. Coax systems only.

FC-30 £249.95 C
1.8 - 60MHz 100W. Designed for use with FT-857/FT897. Coaxial input / output.

FC-40 £239.00 C
1.8 - 60MHz 100W. New waterproof ATU designed for use with FT-897 / FT-857 and mobile operation.

Icom External Auto ATU's

AT-180 £349.95 C
1.8 - 54 MHZ ATU designed for IC-706. Plugs directly into transceiver for seamless operation. Coax only.

Kenwood External Auto ATU's

AT-50 £319.95 C
1.8 - 30 MHZ 100W ATU specifically designed for use with TS-50 transceiver. Coaxial only.

Cushcraft HF Antennas

MA5V £239.95 C
Vertical 5-band 20m - 10m. No separate radials needed. 250W. Self-supporting. 4.48m tall.

A3-S £469.95 D
The classic 20, 15, 10m 3-el beam. 2kW 8dB gain. 8.45 el. Turn radius 4.72m. F/B ratio 25dB.

A3-WS £379.95 D
Dual Band 3 el. beam for 17m & 12m. 2kW. El length 7.66m. Turn radius 4.4m. Gain 8dB. F/B ratio 25dB.

A4-S £569.95 D
Tri-band 4 element Yagi. for 20m - 10m. DXers delight. 2kW . 8.9dB gain F/B 25dB. Turn radius 5.49m

R-8 £469.95 C
8-band vertical 40m - 6m. No separate radials needed. 1.5kW. Height 8.7m

R-6000 £329.95 C
6-band vertical 20m - 6m. No separate radials needed. 1.5kW. Height 5.8m. Great small garden ant.

MA5B
£369.95 C

5-band 2 El mini beam. 20m - 10m 2kW. Elements 5.2m Turn radius 2.7m. (Dipole on 17/12m) 5dB gain

Diamond HF Antennas

DIAMOND CP6

Covers five popular HF bands and the 6m band. Low angle radiation makes it ideal for DX work. Outperforms dipoles for long distance contacts and compares favourably with beams located 10m+ above ground.

**Bands: 3.5 -50MHz *Power: 200W *VSWR: Better than 1.5:1 *Socket: SO-239 *Height: 4.6m *Radials: 1.8m rigid adjustable*

£239.95 C

Radio Works HF Antennas

CW-160 £129.95 C
8-band 160m - 10m dipole with 22ft vertical radiating feeder. 1.5kW. Balun fed. 265ft long.

CWS-160 £119.95 C
Compact 8-band 160m - 10m dipole with 22ft vertical radiating feeder. 1.5kW. Balun fed. 133ft long.

CW-80 £99.95 C
7-band 80m - 10m dipole with 22ft vertical radiating feeder. 1.5kW. Balun fed. 133ft long.

CWS-80 £109.95 C
Compact 7-band 80m - 10m dipole with 22ft vertical radiating feeder. 1.5kW. Balun fed. 133ft long.

G5RV Plus £59.95 B
Rugged 2kW balun matched G5RV with 102ft element and 31ft ladder line. Requires ATU. Made in USA

Hustler Base Antennas

6-BTV £229.95 C
80 - 6m 6-band vertical. 7.3m tall 1kW. Can be used at ground level with earth stake. Ideal small gardens

5-BTV £199.95 C
80 - 10m 5-band vert. 7.64m tall 1kW. Can be used at ground level with earth stake. Ideal small gardens

4-BTV £169.95 C
40 - 10m 4-band vert. 6.52m tall 1kW. Can be used at ground level with earth stake. Ideal small gardens

Butternut Antennas

HF-2V £229.95 C
80 / 40m high performance vertical. 1kW PEP 9.75m tall. Self supporting for ground mount use.

HF-6V £299.95 C
6 band vertical 80-40-30-20-15-10m. 2kW. 7.9m tall. Use own radials or ground mount.

HF-9V £349.95 C
9-band 80 40 30 20 17 15 12 10 6m vertical 1kW 7.9m tall. Use radials or ground mount

Buddipole Products

LOWER PRICES!

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W3-BP £179.95 C
40m - 2m adjustable dipole. 250W and max length of 4.65m. Packs down to 65cm approx.

W3-MBP £189.95 C
Same as the W3-BP but packs even smaller.

W3-BS £119.95 C
40m - 2m vertical is half a Buddipole. Ideal for QRP and rucksack - as used by Peter Waters G3OJV.

Peter Waters says: *I think these products are great. Superbly engineered and very efficient.* Options include adaptor for dipole to decorators pole £6.95, Field tripod £89.95, 2.45m telescopic mast £49.95, mini tripod for Buddistick.

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MP1-SA Low Price **£99.95 B**
Screwdriver style adjustable HF QRP whip 40m - 70cm. 150W PEP. Max extended 185cm approx

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Get mobile on all bands from 80m to 6m in minutes. This compact screwdriver antenna comes with cables and control box. Designed to go on our 3-way magnetic mount (£39.95 extra) it is an amazing performer and only 1.37m maximum! Available in Black Only.

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

April 2006
On Sale 9 March
Vol. 82 No. 4 Issue 1188
(May Issue on sale 13 April)

Published by
PW Publishing Limited
Ar owsmith Court
Station App oach
BROADSTONE
Dorset BH18 8PW
Directors: Stephen Hunt & Roger Hall

Editorial Department
☎ 0870 224 7810
Fax: 0870 224 7850

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

Production Editor
Donna Vincent G7TZB/M3TZB
donna@pwpublishing.ltd.uk

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

Art Department
☎ 0870 224 7820
Fax: 0870 224 7850

Art Editor
Stephen Hunt
steve@pwpublishing.ltd.uk

Typesetting
Peter Eldrett
peter@pwpublishing.ltd.uk

Sales Department
Fax: 0870 224 7850

Advertisements
Roger Hall G4TNT
roger@pwpublishing.ltd.uk
☎ 0207 731 6222

Advertisement Administration
Joan Adams
joan@pwpublishing.ltd.uk
☎ 0870 224 7820

Book Orders
bookstore@pwpublishing.ltd.uk
☎ 0870 224 7830

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

Finance Department
☎ 0870 224 7840
Fax: 0870 224 7850

Finance Manager
Alan Burgess
alan@pwpublishing.ltd.uk

Finance Assistant
Margaret Hasted

PW Publishing Website
www.pwpublishing.ltd.uk

All our 0870 numbers are charged at the BT Standard National Rate

Cover subject

The diminutive Icom IC-E7 as reviewed by Chris Lorek G4HCL on page 18 this month.

Design: Steve Hunt
Photographs: Courtesy Icom UK Ltd.

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64 **Subscriptions** Want to make sure you don't miss a single issue of your favourite radio read, then why not subscribe to PW in one easy step.

65 **Topical Talk** Rob G3XFD asks for readers' help and ideas for an exciting new project to coincide with PW's 75th anniversary year in 2007.

Published on the second Thursday of each month by PW Publ shing Ltd., Arrowsm th Court, Station App oach, B oadstone, Dorset BH18 8PW. Tel: 0870 224 7810 Printed in England by Holb ooks P inte s Ltd., Portsmouth P03 5HX Distributed by Seymour, 86 Newman St eet, London , W1P 3 D, Tel: 0207-396 8000, Fax: 0207-306 8002, Web http://www.seymour co uk. Sole Agents for Aust alia and New Zealand - Go don and Gotch (Asia) Ltd.; South Africa - Cent a News Agency. Subscriptions INLAND £32, EUROPE £40, REST OF WOR D £49, payable to PRACTICAL WIRELESS, Subscription Department PW Pub ishing Ltd., Arrowsm th Court, Station App oach, Broadstone, Dorset BH18 8PW. Tel: 0870 224 7830 PRACTICAL WIRELESS is sold subject to the following conditions, namely that it shall not, w thout written consent of the publishers fi s having been given, be lent, re-sold, hi ed out or otherwise disposed of by way of t ade at mo e than the ecommended selling price shown on the cover, and that it shall not be lent, re-sold, hi ed out or othe wise disposed of in a mutilated condition or in any unauthorised cover by way of T ade, or affixed to or as part of any publication or advertising, lite ary or pictorial matter whatsoever. *Practical Wireless* is Publ shed monthly for $50 per year by PW Publishing Ltd., Ar owsm th Court, Station App oach, B oadstone, Dorset BH18 8PW, Royal Mail International, c/o Yellowstone International, 87 Burlews Court, Hackensack, NJ 07601. UK Second Class Postage paid at South Hackensack. Send USA add ess changes to Royal Ma l Inte national, c/oYellowstone Inte national, 2375 Pratt Bouleva d, Elk G ove Village, IL 60007-5937. The USPS (United States Postal Se vice) number for Practical Wi eless is: 007075.

rob mannion's keylines

Rob Mannion G3XFD

I don't think Ofcom's announcement of 'Licences for Life' came as a surprise to any Radio Amateur in the UK. Personally, I think we should accept the situation with good grace and be grateful a third party will not be adding an unnecessary payment step between us and the pastime we enjoy.

At the same time, we shouldn't forget that Ofcom have a remit to keep administration costs to a minimum. We should also be careful that any deregulation steps (designed to make Ofcom's job easier/cheaper) should not also make the Amateur Radio hobby in the UK seem like a poor relation to the rest of the world. I think that our national representatives as well as individual Amateurs should keep an eye on Ofcom's future proposals..

Keep alert and be prepared to provide your opinion whenever Ofcom ask for it. You should be prepared to take part in any consultation processes as they rely on your feedback.

UK Exclusive

We are very pleased to bring you the first UK review of the Icom IC-E7, a dual band v.h.f./u.h.f. hand-held transceiver with wide band receiver coverage. Icom have managed to pack a lot into this compact hand-held including 1000 memory channels, CTCSS and DCS tones as well as 1.5W output on v.h.f. and 1W on u.h.f.

Sadly, this means that our review of the IC-7000 has had to be held-over for a future issue.

Help From Friends

This month's PW has mostly been written, subedited and prepared without me, because during the production process, I have been either in hospital or recovering at home. It has only been possible to produce the April issue thanks to a great deal of help from my friends and colleagues at PW Publishing Ltd.

As soon as I was taken in hospital, the back-up swung into operation to ensure *PW* was produced on time. Art Editor **Steve Hunt** was magnificent and, with the help of **Tex Swann G1TEX,** things were organised extremely well. Even **Donna Vincent G7TZB** (also off sick, following an operation) helped out from home. Publisher **Roger Hall G4TNT** (see Topical Talk), despite being based in London, also helped and **Peter Eldrett** (Advertising Dept/Copy) turned into a copy typist (thanks Peter!).

However, I have special thanks to **Elaine Richards G4LFM**, Editor of our new title *RadioUser* for her Trojan work - **she really put herself out for *Practical Wireless***. I'm sure readers will join me in thanking all my colleagues for their help. As Steve said to me - it's at times like this we naturally work together as a unified team to produce what everyone wants, their regular edition of *PW*. By the time you read this I'll be back at the office and Elaine will be planning holidays. She deserves them!

Something From Last Month

Unfortunately, I didn't have room to include a photograph I took of my granddaughter Georgia - building her long awaited crystal set over the Christmas holidays. I'm making up for this omission this month.

If you can detect a sense of satisfaction (while she's trying to keep the 80-year-old British Broadcasting Company approved headphones on her 9-year-old head) you're quite correct! Georgia and I are planning her next receiver - this time using the ubiquitous MK484 'sure fire' single chip radio.

Unfortunately for me, Georgia's school has heard (Freddy attends the same school too) about our exploits and it seems I shall soon be invited to help 40 youngsters build MK484 receivers. I have the necessary Criminal Record Bureau (CRB) check certificate, along with earpieces and other bits and pieces, but not 40 MK484s. All I need now is an extra helping of patience, kindness and enthusiasm - I'll certainly need it!

Rob G3XFD

practical wireless services

Just some of the services *Practical Wireless* offers to readers...

Subscriptions

Subscriptions are available at £33 per annum to UK addresses, £41 Europe Airmail and £50 RoW Airmail.

Components For *PW* Projects

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

Photocopies & Back Issues

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

Placing An Order

Orders for back numbers, binders and items from our Book Store should be sent to: **PW Publishing Ltd., Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW**, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling. Credit card orders (Access, Mastercard, Eurocard, AMEX or Visa) are also welcome by telephone to Broadstone **0870 224 7830**. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to Broadstone **0870 224 7850**.
The E-mail address is **bookstore@pwpublishing.ltd.uk**

Technical Help

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

amateur radio waves

General Standards

● **Dear Rob**

I came back to Amateur Radio three years ago, after taking a decade off, directly as a result of picking up a copy of *PW*. In the interval, much had stayed the same but some things had changed a lot.

Just as an instance, when I was last active, people tended to respect the band plans on v.h.f., you rarely heard f.m. other than on Simplex and repeater channels. Now it's everywhere! Recently, there was clearly a lift in progress when I switched on the rig. There were three f.m. contacts taking place there, one of which was a net involving several stations, some of which were inaudible to me. What I could hear sounded like a club net! I asked one of the other pairs to QSY as they were QRMing the beacons that I wished to listen for. They were a bit miffed about it but, to their credit, they did move. What I found striking was that the one I called said that he had been licenced 16 years and this was the first he had heard of beacons!

More recently, there was a net going on in the satellite sub-band, which included some M3s. Now the Foundation licence is not something I know a lot about, never having had to study for it (but I would have given my right arm for it 40 years ago!) but I believe that the M3s are not allowed in the satellite sub-band, am I right?

I tend to ignore the murmuring about M3s running too much power, though I suppose it may happen occasionally. What I think happens is that people forget that the difference between 10W and a hundred is just a smidgen over an S-point and a half; go up again to 400W and it is just another S-point. A decent antenna, properly tuned, and ten watts can be quite competitive! Make no mistake about it, many of these M3s are good operators and equipment wise they know what they are doing. In fact, they are a credit to Amateur Radio, which is just as well since they are its future!

Brian Carter G8ADD
Birmingham

Higher Power

● **Dear Rob**

Having received my March issue of *PW* I started, as usual, at the back!

I would like to offer a comment on 'Higher Power'. My feeling is that it is not so much to do with trust or honesty but, as I see it, to a general disregard for, and lack of acceptance of, 'The Rules' that affects all walks of life.

Another example of this is the aspect you highlight regarding the situation on '40'. There is, in many cases, a lack of understanding of 'what's going on' between launch the signal at one end of a QSO and its reception at the other. I frequently find that in a group of friends who meet on 40 metres I can hear one of our group in Watchet - though he can't hear me but can hear a station in Southampton - and I can't hear a Midlands stations, though Scotland comes in loud and clear. The situation can, and sometimes does, change rapidly during the duration of our 'net'. Many, including those of long enough standing to know better, immediately blame the station that has suddenly appeared on 'their frequency'.

It grieves me to read letters - as I sometimes do - saying 'I don't want to understand, I just want to talk'. That is what the telephone is for.

J.W. Barker G3WAL
Bournemouth

● **Hello Rob**

As an M3, I run 10W not forgetting the loss in the coaxial cable. I know we are at the bottom of the sunspot cycle but I still have a JA in the logbook, even with just 10W. I use a trapped dipole, 7 metres AGL, 10.5m long - if you can call that long! - and there are five 10m radials underground. I also have a vertical, the HVU-8, which is OK on 20 metres.

As you say, it's all about trust (you only lie to yourself) is there any point in this?

J.F. Banks M3VRB
Stevenage

● **Hi Rob**

Thank you for raising the issue of M3s using more than their permitted power in your Topical Talk column. I got my licence in May 2005. I have never exceeded my power allowance. Indeed, having upgraded to an Intermediate Licence in November 2005, I can see no reason for a Foundation licensee to break the rules unless they do so to the extent of 1.5kW amplifiers ... it is fair to say that the only real difference that I noticed was a slight improvement in quality of communication - there was certainly no discernible improvement in distance. A change of mode to PSK was the way that gave an immediate improvement to my DX. Clearly, antenna is everything, power is nothing when doing DX (though I know that is an over-simplification).

Talking to fellow newcomers, I find that they have also experienced the Power Police. Small wonder that this hobby has trouble keeping new young members. They must feel put down every time they meet these people on the air - it must be so much easier to retreat to the mobile 'phone.

I suspect that this problem revolves around Amateurs who got their full licence back in the days of the RAE and have never tried to work with a small amount of power. If you haven't done it then you don't know what can be done with it. Some of them may also resent the removal of the need to do Morse now. These are sweeping statements and I extend my apologies to those who have done the lot, QRP, Morse, et al. However, if this is a way of fighting a rearguard action, then it is misguided and detrimental to the hobby.

At the opposite end of the scale there are some M3s using very nice stations; the likes of Yaesu FT-1000s and IC-756 PROs. these, unfortunately, tend to invite the assumption that the privileges of the licence are being abused. Here, jealousy plays its part - it doesn't matter if the person is sticking to the rules, the station advertises high power and high ambition and hence the assumption of breaking the rules. It's a bit like owning a Porsche - everybody assumes you will be doing 120mph on the motorway. One of your own correspondents used the speed limit analogy last year, effectively accusing M3s of breaking the rules. I was offended at the time. If you can't keep such innuendo out of editorially approved articles then it will continue to be rife within the hobby.

Let us hear less about M3s using more power than they should, which requires a burden of proof, and instead celebrate some of the marvellous achievements that are done on 10W or less by all levels of licensee.

via E-mail
Martin Addison 2E0MCA

Enjoyed the Review

● **Dear Rob**

I was very interested to read in the March issue of *PW* your review of the MFJ-993B Intelli Tuner.

I bought a 993 in December 2004 and must put on record how well it suits me and my set up. I use an FT-840 coupled to the 993, thence via 15 feet of RG213 to a Radio Works 1-1 balun and finally to a small switch box that contains a coupling coil and two relays to convert the home-brew G5RV to a Marconi T. I will admit the relays in the 993 make a bit of noise but now mostly I only hear a single click when re-tuning.

I have asked the question but have not had an answer yet. What makes a 993 into a 993B and is there a good reason to update my system.

I do look forward to the arrival of *PW* each month. I have been retired for 18 years and do enjoy my radio even more these days as my sight is not as good as it used to be. This is another reason for enjoying the MFJ-993.

Ken Hutley G0VDP
Maldon, Essex

Editor's reply: I contacted MFJ about the differences, Ken, and this is what they had to say:

"The B model of the MFJ-993 has 20,000 virtual antenna memories. This gives you up to four antenna memory banks for each of two antenna connectors for a total of eight antennas, each with 2,500 memories for a total of 20,000 memories. It is also the world's first dual power level 300/150 watt automatic antenna tuner.

"You can choose the higher power 300 watts mode for 6 - 1600Ω matching range or change to the 150 watt mode go to the extra-wide 6-3200Ω matching range.

"You might want to check our website for more information and download the manual (**www.mfjenterprises.com**)"

Martin F. Jue K5FLU
MFJ Enterprises, Inc.

An Old Man's Hobby!

● **Dear Sir**

It is official. According to the recent MORI poll questionnaire commissioned by Ofcom and sent out randomly to Radio Amateurs (I didn't receive one) of each class of licence holder - it is still an old man's hobby, then! What a surprise.

Apparently, 78% are over 45 years of age. All those youngsters entering the hobby doesn't seem to have made much of an impact - so far as the age thing is concerned. Hmmm? What's worse, 94% of licence holders are male! No wonder we rarely hear the sweet sound of a female (young or otherwise) voice breaking through the QRM.

Funny thing is, though, with so many females with new M3 callsigns, where are they? It can't be just a case of being mic-shy, can it? No, there has to be another reason surely. What's more, where are the pre-teen M3s? In fact, I never hear any of them on my travels. Perhaps it's a school-time problem or whatever?

The MORI poll quoted above, says that 86% use the Internet. That must be the answer, that is where they all are - on the Internet, the pre-teens, etc., that is. Silly me.

Ray J. Howes G4OWY
Weymouth, Dorset

Letters Received Via E-mail

Letters Recieved by e-mail. 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

amateur radio rallies

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

March 11
Junction 28 QRP Rally
Contact: Russell Bradley G0OKD
Tel: (01773) 783394
E-mail: russel.bradley@ntlworld.com
The South Normanton Alfreton and District Amateur Radio Club (SNADARC) in Association with the G-QRP Club are holding their rally at the Village Hall Community Centre, Market Street, South Normanton, Nr Alfreton, Derbyshire.The event will be fully signed, just five minutes from the M1 Junction 28 and the A38. Open to the public from 1000. There will be Amateur Radio, electronics and related items, Bring & Buy and special interest group stalls, outdoor flea market (weather permitting), refreshments.

March 12
Bournemouth Radio Society Annual Sale
Contact: John Bales G0HAT
Tel: 07719 700 771
E-mail: johncbales@yahoo.co.uk
Website: www.brswebsite.freeserve.co.uk
Bournemouth Radio Society 18th Annual Sale will take place at the Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth BH10 7LH.

March 12:
Aberystwyth Rally
Contact: Ray GW7AGG
Tel: (01970) 611432
E-mail: ray@clocktower.go-plus.net
The Aberystwyth Rally consisting of hobbies fair with Amateur Radio, computers, model railways, model aircraft and doll's houses takes place from 1000 -1630 at Penweddig School, Aberystwyth. There will be h.f. and v.h.f. on the Air, Hobbies demonstrations, trade stands and Special Interest Groups and refreshments. Talk-In on S22.

March 12
Wythall RC Radio & Computer Rally
Contact: Chris G0EYO
Tel: (07710) 412819
E-mail: g0eyo@blueyonder.co.uk
Website: www.wrcrally.co.uk
Wythall Radio Club 21st Annual Radio & Computer Rally takes place at the Woodrush Sports Centre, Shawhurst Lane, Hollywood, Nr Wythall, Birmingham B4. Attractions will include: loads of radio and computer traders, massive Bring & Buy, refreshments, good on-site parking and all under cover in the Sports halls. The location is only two miles from J3 M42. and will be well signposted. Talk-in on S22. Doors open from 1000 until 1500 hours.

March 19
Bredhurst R&TS Rally
Contact: Mike
Tel: (07888) 726919
Website: www.qsl.net/brats/
The Bredhurst Receiving and Transmitting Society's Rally will be held at Derwent Way, Rainham, Gillingham, Kent. Doors open 1000, 0930 for disabled visitors. There will be trade stands, refreshments and special interest groups in attendance.

March 19
***Norbreck Amateur Radio, Electronics and Computing Exhibition**
Contact: Peter Denton G6CGF
Tel: 0151-630 5790
Norbreck Amateur Radio, Electronics and Computing Exhibition organised by the Northern Amateur Radio Socieities Assocation (NARSA) at the Norbreck Castle Exhibition Centre, Blackpool. Don't miss what is said to be the Largest single day exhibition in the country. Morse tests will be available at the show on demand.

March 19
Exeter Rally
Contact: Vic G4KEE
Tel: (07811) 920840
The Exeter Rally takes place from 1030 - 1530 at the America Hall, De La Rue Way, Pinhoe, Exeter EX4 8PW. Please note this rally is taking place instead of the Tiverton Rally that was originally scheduled for 19th but had to be cancelled due to the unavailability of the venue.

***PW Publishing Ltd. will be in attendance.**

Note to Rally Organisers: Please include the postcode of your rally venue.

If you're travelling a long distance to a rally, it could be worth 'phoning the contact number to check all is well, before setting off.

amateur radio news & products

A comprehensive look at what's new in our hobby this month

Space Colloquium

There will be a presentation on the SSETI ESEO satellite project at the AMSAT-UK International Space Colloquium that will be held from Friday 28 until Sunday 30th July at the University of Surrey, Guildford. **http://www.uk.amsat.org/**

Charter Special Event

Stafford & District Amateur Radio Society is taking part in celebrating 800 years of Stafford Borough. The 800th anniversary of King John signing the Charter that recognised the area as a borough is on 1 May 2006. An exciting programme of activities is now being put together and Stafford & Districts ARS is playing its part to make sure that the celebrations go with a bang.

They are holding a special event day on Sunday 30 April at Stafford Castle starting at 0930. Operation will be on h.f. and v.h.f. under the callsign **GB800SB**. Special QSL cards will be issued for this event.

DX Get-together

Members of the **British DX Club** are organising a get-together of radio enthusiasts on the evening of Thursday 16 March. This will be at Wetherspoons The Society Rooms pub in Park Green, Macclesfield (next to the registry office). The gathering is informal and open to all, whether a member of the BDXC or not. They would especially welcome members of the local radio clubs (Macclesfield, Stockport, East Cheshire, etc.) and Summits On The Air participants, as well as British DX Club members. Feel free to bring details of your latest constructional project, photos and QSL cards. Enthusiasts will be there from 1900 and will remain until at least 2100, after which they may adjourn to one of the excellent nearby Indian restaurants or other pubs.

On the night Tom Read M1EYP will be monitoring 145.500MHz. If you are going to go along, please try to let him know with an **E-mail to tommyread@hotmail.com** or **Tel: (01625) 612916.**

New Satellite Transponder

AMSAT-UK are participating in the SSETI ESEO satellite project that is planned for launch in late 2008 into a Geo-stationary transfer orbit similar to the initial orbit of AO40 and to those planned for Eagle and P3E.

The European Student Earth Orbiter (ESEO) is a satellite planned for launch in late 2008 into a Geo-stationary transfer orbit similar to the initial orbit of AO40 and to those planned for Eagle and P3E. The prime communications system for ESEO is being developed by the University of Wroclaw in Poland and will operate on 'commercial' S-Band space frequencies. It will provide all the usual telecommand and telemetry facilities and use standard ESA CCSDS packet communication techniques. The ESEO also has a need for a redundant communications system – one that can operate in the event of a primary system failure but can and also function satisfactorily if/when the spacecraft is not in its intended earth-pointing mode. This is where AMSAT-UK are planning to assist.

The current project calls for a unit that can receive telecommands from earth on u.h.f. (435MHz), transfer those to the OBC via a CAN bus. Additionally, it must transmit telemetry and mission data to the ground on S-BAND (2.4GHz). They are planning to use omni-directional antenna systems so the data rate will necessarily be quite low although output power will be approximately 9 watts. **http://www.sseti.org/**

Sandford Mill Open Day

The Sandford Mill Radio Museum, Chelmsford, will be open to the public on International Marconi Day - Saturday 22 April - between 1000 and1600, admittance and parking are free.

The museum is only open four or five times a year so this offers a rare chance to see the many fascinating exhibits that are displayed there. These include spark transmitters from the late 1890s right through to some very high power commercial transmitters from the 1960s. There is also a good selection of valves and early television broadcast cameras. Recent additions include a fully equipped ship's radio room and the collection of Marconi and other marine radio equipment donated by the late Donald Imber G0VIS.

The **Chelmsford Amateur Radio Society** will be operating all day from inside the preserved wooden hut that housed the original 2MT broadcast station. Visitors to the stations are most welcome.

For further information contact the secretary **Martyn Medcalf G1EFL. Tel: (01245) 469008 http://www.g0mwt.org.uk/**

Best Seller - it's official!

The official figures are now in from the newstrade and they show that *RadioUser*, the recently merged *Short Wave Magazine* and *Radio Active*, is outselling every other hobby radio magazine on the bookshelves by a considerable margin. If you've not seen this 84-page magazine jam packed with more columns, more features, more pages - covering everything for the radio listener and enthusiast all in one place, the March issue is on sale now - available from all good newsagents priced £3.25 or call the PW Bookstore on 0870 224 7830 to order a single copy, post free. Check out **www.radiouser.co.uk** for more information on the current issue and details of a special offer on back issues. For the latest news and chat with fellow readers, you can join the RU readers forum simply by visiting **http://uk.groups.yahoo.com/group/RadioUser_Readers** and joining in.

Send all your news and club info to
Donna Vincent G7TZB
at the PW editorial offices
or e-mail donna@pwpublishing.ltd.uk

60th Anniversary

The Yeovil Amateur Radio Club will holding a 60th Anniversary operations day on 4 June at Eggardon Hill, Dorset SY54828 BNG93958 6 miles south off the A356 Maiden Newton road. GX3CMH/P will be operating h.f., 6m, 4m, 2m and 70cm throughout the day commencing at 0900, refreshments and barbecue. Talk-in on S22. Details on www.yeovil-arc.com or contact **Derek M0WOB Tel: (01935) 414452.**

Cracked Case?

For anyone who has ever cracked the case of their radio, now there's an American company with a solution to your problem. Plastex Powder is mixed with water then used to fill the crack. It sets within minutes and then it can be sanded, sawn, drilled, tapped or even painted.

For more complicated repairs, such as broken off plastic tabs, the kit comes with a rubber moulding bar that can be softened in hot water, pressed against a similar part and the resulting mould can then be used to fabricate a completely new piece. The powder comes in clear, black and white and costs $11.95 from **www.Plastex.net**

Stations to Listen For

Claude Franck is operating as **F4BQO/TR8FC** from Libreville, Gabon until May. He'll mainly be on air from 1800UTC in the evenings on 14.19MHz u.s.b. and 24.900MHz c.w.

Throughout 2006, the Croatian Amateur Radio Association will celebrate the 150th anniversary of the birth of Nikola Tesla, who was born near Gospic in Croatia on 10 July 1856. The station 9A150NT will be active on all bands and all modes throughout 2006. The station will be active each month from a different Croatian county. The Croatian Amateur Radio Association will issue a special event Nikola Tesla Award to commemorate this anniversary. The operating schedule and other details can be found at:
www.inet.hr/9a6aa/9a150nt

The Australian Communications and Media Authority has given the Wireless Institute of Australia (**http:www.wia.org.au/**) the green light to use the AX prefix to celebrate the 2006 Commonwealth Games in Melbourne. Look out for special event stations AX3GAMES and AX3MCG. the AX prefix can be used by all Australian Radio Amateurs until 31 March 2006.

Sound Isolating Earphones

Shure E2 'in ear' sound isolating earphones combine Dynamic MicroDriver speaker technology with a sound isolating design to deliver rich, full-range sound while blocking outside noise. Because every ear is different, E2 Earphones come with three pairs (small, medium, large) of disposable Foam Sleeves and three pairs (small, medium, large) of Flex Sleeves to ensure the ideal personalised fit. They come with a compact carrying case and the cable spool inside provides a convenient, tangle-free way to store your earphones and cost £65 from **Nevada, Unit 1 Fitzherbert Spur, Farlington, Portsmouth PO6 1TT. Tel: 0239-220 5100 www.nevada.co.uk**

Re-launched Website

The Bromley & District Amateur Radio Society website has been re-launched with a new look and even more stories and info! Take a look at **www.bdars.org**

One of the main reasons for change was to make the site more accessible to vision impaired users, the new format is a lot more compatible with the vision impaired browser systems and should make the whole experience easier for these users. After all, Amateur Radio has had a good history of working with these users on air, why is this not the case on-line?

One major addition has been to the Foundation Exam area of the site. As well as having all of the normal information about the exam syllabus, they have now added an interactive online 'Practice Foundation Exam' - why not give it a try, even if you have been licenced for years it's good fun to see how well you score!
www.bdars.org/genesis/Foundation/quiz.html

Prizes for the Young

Each year SOTA Beams (**www.sotabeams.co.uk**) runs a Challenge to encourage younger Radio Amateurs to try out portable radio operating. This year the star prize was won by **Sam Thomas 2W0UPT**. Sam is 16 and activated 34 SOTA summits across England and Wales. He received a portable 2 metre beam and pole as his prize.

Worthy runner-up was 15-year-old **Nicola Brown 2E0DNB** with 15 summits activated. Nicola comes from an active radio family with both her dad **M0SGB** and sister **M3DNC** being keen SOTA activators too. Her efforts were rewarded with a waterproof logging system.

SOTA Beams will be running the Challenge again in 2006 and invites entries from younger Radio Amateurs. Details at **www.sotabeams.co.uk**

Bigger Screen for the IC-7000

With the introduction of the new IC-7000 DSP radio from Icom, Martin Lynch and Sons now have available a 5in TFT colour display to match the radio. The built-in screen on the IC-7000 is quite small, only 2.5in. and some owners wanted a larger display without using a conventional 12 or 14in screen size. The IC-5LD is 12V powered, has two inputs and has various brackets to mount in the shack or even in the car. The screen has twin video inputs so you can have the IC-7000 on one channel and a DVD or remote camera on the other.

The price for the IC-5LD is £129.95 and it is available from **Martin Lynch & Sons Ltd., Outline House, 73 Guildford Street, Chertsey, Surrey KT16 9AS. Tel: (01932) 567333 www.hamradio.co.uk**

EUCW/FISTS QRS Party 2006

FISTS CW Club invites all radio amateurs to take part in the annual EUCW/FISTS QRS Party over five days, Monday-Friday, following the 4th Sunday in April each year (that's 24 - 28th April this year).

This is not a contest, just enjoy plenty of slow Morse activity for a period of five days. The dates selected are intended to avoid weekend contest activity.

Dates/Times: Monday 24th April 0001UTC to Friday 28th April 2359UTC.

Mode: CW only.

Power: Any authorised power.

Call: CQ QRS. Stations may be worked once per day, per band.

Frequencies: Recommended areas of activity, +/- 10kHz of the FISTS calling frequencies, including WARC bands, but contacts can be made on any frequency. Non-QRP stations should avoid calling CQ on the popular QRP frequencies.

Keys/Speeds: Use any type of key or keyer. No keyboard sending or pre-programmed messages from computers or keyers, but pre-programmed CQ calls or CQ loops are permitted. Maximum speed 14 words per minute (70cpm). The speed of a QSO should be at the speed of the slower station.

Contacts: Normal friendly QSOs, no special requirements. QSOs with any station count. Work any station in any country, including stations not taking part in the QRS Party but try to persuade them to work QRS.

Logs/Feedback: This is not a contest, but logs and feedback will be welcomed in the following classes:

A - More than 10W input or 5W output power

B - QRP (10W input or 5W output, or less)

C - Short wave listeners.

Logs should show Date, Time, Callsign, Name, QTH and EUCW Club/Number (if appropriate) of the stations worked/heard and may include up to three votes for 'Most Readable Morse Heard' (one vote per station).

Awards: a) A certificate will be awarded to the three participants working/hearing the most stations in each class. b) Certificates of Merit will be awarded to the three operators receiving most votes for the 'Most Readable Morse Heard', provided the operators nominated have also submitted a log. If the operators receiving the most votes have not submitted a log the certificates of merit will be awarded to the qualifying operators with the next highest number of votes.

Send logs by surface mail or E-mail not later than 31 May to: **FISTS/EUCW QRS Party Organiser, Robert Walker M0BPT, 38 Wheatley Street, West Bromwich B70 9TJ. E-mail: m0bpt@blueyonder.co.uk**

FISTS calling frequencies: ±10kHz

2m: 144.058MHz
6m: 50.058MHz
10m: 28.058MHz
12m: 24.918MHz
15m: 21.058MHz
17m: 18.085MHz
20m: 14.058MHz
30m: 10.118MHz
40m: 7.028MHz
80m: 3.558MHz
160m: 1.808MHz
QRP CW Calling Frequencies
1843; 3560; 7030; 10116; 14060; 18096; 21060; 24906; 28060kHz.

amateur radio clubs

Keep up-to-date with your local club's activities and meet new friends by joining in!

SOUTH GLOUCESTERSHIRE
Thornbury and South Gloucestershire ARC
Contact: Tony G0WMB
E-mail: tonytsgarc@beeb.net
The Thornbury and South Gloucestershire Amateur Radio Club meets on a Wednesday evening at the United Reform Church Hall in Thornbury at 1930. **April 5**: AGM and 19th: Video Night.

COUNTY DOWN
Bangor and District ARS
Contact: Mike GI4XSF
Tel: 028 4277 2383
Website: http://www.bdars.com
Bangor and District Amateur Radio Society meet on the 1st Wednesday of every month in "The Stables", Groomsport at 2000. **April 5**: Annual Constructors Contest. Bring along something you've made and you could win a prize! New members and visitors are most welcome.

BERKSHIRE
Reading and District ARC
Contact: Pete Milton G8FRC
E-mail: g8frc@radarc.org
Website: www.radarc.org
Reading and District Amateur Radio Club meet on the 2nd Thursday each month in the summer and 2nd and 4th Thursday in the winter at Woodford Park Woodley Reading. Meetings commence at 2000. **April 13**: Software in the Shack by **Don Field G3XTT**. **April 27**: Evening visit to Martin Lynch & Son at Chertsey. Following their previous success, Reading and District Amateur Radio Club will be holding another Foundation Licence Course commencing April 21st. Contact **Harry Hogg G3NGX** on **(01491) 872919** or E-mail: **g3ngx@radarc.org**

EAST LOTHIAN
Cockenzie & Port Seaton ARC
Contact: Bob Glasgow GM4UYZ
E-mail: gm4uyz@cpsarc.com
Website: www.cpsarc.com
Cockenzie and Port Seton Amateur Radio Club meet on the 1st and 4th Friday of each month in the Thorntree Inn, Cockenzie. **March 24**: **Rob Mannion G3XFD** talks on *PW* 2006 and into the Future at the Port Seton Community Centre, Youth Activities Area.

Charge those Batteries

The Maha MH-C801D is an eight cell charger that will charge either AA or AA cells in just one hour. It will even refresh older or degraded batteries. There are eight independent charging channels for any mix of up to eight AA or AA Ni-Mh batteries, it can provide a full charge in just an hour and help keep your batteries in tip-top condition for longer. It has a large, clear l.c.d. screen that shows the charging status of each individual battery. The charger comes with a world-voltage mains adapter, full instructions and costs £69.95 including P&P. **Nevada, Unit 1, Fitzherbert Spur, Farlington, Portsmouth PO6 1TT. Tel: 0239-231 3090. www.nevadaradio.co.uk**

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Ofcom News

Ofcom has announced its conclusions in the reform of amateur radio licensing, which is intended to reduce the administrative burden on the UK's 63,000 Amateur Radio users.

So what will affect Radio Amateurs the most? Ofcom has decided to issue Amateur Radio licences that will remain valid for life as long as the licence details remain correct or until the licence is revoked by Ofcom or surrendered by the licensee. There will be no end date on the Amateur Radio licence. Such licences will be personal to the licensee and will not be transferable. It is Ofcom's intention that from 1 October 2006 (the intended implementation date), all Amateur Radio licences will be issued by Ofcom. Any licences that are due to expire before the implementation date must be renewed by contacting the RLC as usual. Licences issued, renewed or amended before the implementation date will be subject to existing licence terms and conditions but licences issued, renewed or amended on or after the implementation date will be subject to the revised licence terms and conditions. Although many Radio Amateurs will change over to electronic licences, Ofcom will continue to make paper licences available, subject to an administrative charge for those who don't have Internet access or those who don't wish to use this method of licence renewal.

Ofcom believes that the new approach to Amateur Radio licensing will reduce unnecessary bureaucracy and costs associated with this important hobby. Ofcom regards the Amateur Radio community as a key radio spectrum user group and wishes to see Amateur Radio prosper.

How it Came About

The 12 week consultation closed on 18 August 2005. Ofcom received 1,466 responses during the consultation period, many of which were in favour of Ofcom's key proposals although the majority were in favour of maintaining the existing licensing regime but with a proposed extended renewal period of five years. In addition to the consultation process, on 26 May 2005, MORI sent a questionnaire and accompanying material to 4,500 amateur radio licence holders. The survey sought licensees' views on Ofcom's proposals and also gathered other information such as membership of societies.

MORI received 1,572 completed questionnaires by the closing date of 20 June 2005, which showed that when licensees were asked specifically whether they supported or opposed Ofcom issuing licences that remain valid for the life of the licensee, 58% claimed to support this move.

What will Change

Apart from clauses establishing lifetime licensing there will be no substantial changes to the current legal framework for Amateur Radio licences. There will still be a legal requirement for Radio Amateurs to hold a valid WT Act Amateur Radio licence. The establishment or use of Amateur Radio equipment without a licence or outside the conditions of the licence is an offence under wireless telegraphy legislation.

Depending on the nature of the offence, a warning or official caution may be issued. For serious cases of misuse, Ofcom will prosecute, for which the maximum penalty on conviction is a £5,000 fine and/or six months imprisonment. The courts may also order forfeiture of any radio apparatus used in connection with an offence.

It will still be a requirement to hold a valid Radio Amateur Examination Pass Certificate in order to obtain and to retain a licence. For Radio Amateurs who wish to operate overseas, there will still be a licence document available for inspection by foreign administrations.

Ofcom will continue to hold the database of the names and addresses of all licenced Radio Amateurs. The licensee will retain responsibility for notifying Ofcom and ensuring that licence details are amended as and when necessary (upon a change of address for example). Ofcom will ensure that electronic licensees are sent e-notifications at regular intervals to serve as reminders that they are required to keep their licences up-to-date. Ofcom are considering sending postal reminders to those opting to apply and receive licences by post. These processes will help to ensure that the integrity of the Amateur Radio licence database is maintained.

It is important that you do remember to update your details as Ofcom will invoke a licence revocation procedure five years after the date when the licensee last amended the licence or last confirmed that the licence is still valid (depending on which of these events occurs last).

So don't ignore any reminders you get! Licensees who either amend their licence at least once every five years or who confirm that the licence is still valid at least once every five years should not receive a five year reminder/revocation notice from Ofcom.

Every Amateur will continue to hold their own unique callsign(s); Ofcom will continue to notify Amateur Radio licence holders of changes to their licence terms and conditions. It will still be possible for Radio Amateurs to apply for an individual variation to the licence for additional services if required (for the operation of voice repeaters for example); Ofcom will retain the power to revoke the licence should the Radio Amateur breach the terms and conditions of the licence.

Getting a Lifetime Licence

Ofcom will post lifetime Amateur Radio licences 6 weeks before the date when the licence is currently due to expire. Ofcom will only send these licences to licensees whose licence expires on or after the implementation date (1 October 2006). Any licences which expire before the implementation date must be renewed with the RLC as normal. This information posted to Radio Amateurs will include user account information that will enable the licensee to access the online, web-based, self-service licensing service. Future licence holders will have the option to accept electronic notifications or to make a postal application for the licence and receive postal notifications.

Taking a Radio Amateur Exam

In their consultation document, Ofcom asked, 'Do you agree that WT Act licence exemption for radio amateurs is not currently practical?' 1292 out of the 1466 responses agreed that WT Act licence exemption for Radio Amateurs was not currently practical. Those that felt exemption was currently impractical gave various reasons,

It was widely held that Amateur Radio required some form of regulation and that exemption would lead to an increase in callsign piracy, and to an increase in the levels of radio interference. Many respondents were concerned that exemption would lead to UK Amateurs being disenfranchised from the global Amateur Radio community. Further concerns regarding the loss of the examination requirement could lead to self constructed Amateur Radio equipment being brought within scope of the R&TTED which would make it difficult for Radio Amateurs to build their own equipment.

It was responses like this that helped Ofcom to decided that there will still be a legal requirement for Radio Amateurs to hold a valid WT Act Amateur Radio licence.

Ofcom has no plan to make Amateur Radio equipment WT Act licence exempt and believes that any marginal benefits that exemption may bring in the future can be achieved by the light licensing regime proposed. Ofcom has carefully considered its duties under the Wireless Telegraphy and Communications Acts and considers the continuation of licences to be justified, particularly taking account of its international obligations and in order to avoid harmful interference.

Trade Response

We spoke to some of the main Amateur Radio dealers to see what they thought of the changes.

Martin Lynch from ML&S was particularly pleased to see that Ofcom had retained the examination requirement for Radio Amateurs. He thinks it is good that Ofcom didn't deregulate.

Mike Devereaux G3SED of Nevada also welcomed the changes as long as it doesn't diminish the value of the Amateur licence. He says we must maintain the standards of the licence and so must maintain some form of examination. He also wants to see some kind of robust reminder system so Amateurs are reminded to maintain their details on the system.

Jeff Stanton, Director at Waters & Stanton PLC said: "My first thought is that a response of 1572 replies from the survey is a very low figure on which to base this change as 58% supporting votes is only just over 900 votes for the proposal. This is out of a total of around 63,000 licensed Amateur Radio users. The alternatives to be faced were probably either an increase in license fee to a 'profitable' annual amount or to waive it altogether and cut jobs in the Licensing Centre.

Now that the decision has been taken I believe my customers will be very happy not to have to pay this fee every year. However, I would urge those who are not already members of the Radio Society to put the saving towards membership so that the Society can fight any future loss of frequency allocation."

Conclusion

So, the changes should make little change to most Radio Amateurs. You will no longer need to remember to send off your licence fee every year, but you will need to update/conform your details at least every five years with Ofcom. Just make sure you reply to any and all Ofcom consultations in the future. **PW**

Technical

Tony Nailer G4CFY carries on from February 2006's column where he talked about decibels (dB). Now he looks at how to use dB when quoting noise figures.

FOR THE TERRIFIED!

Welcome to the eighth Technical for the Terrified (T4T). I'll continue on from the February 2006 issue of *PW*, where I considered dB, and now look at their application with regard to noise figure. This is another of these areas where operators happily quote a figure without ever having measured it or really thought about what it means.

In the last T4T, I considered, amongst other things, the loss, expressed in dB, of a downlead. What many don't appreciate is that this equates directly to system noise and is added to the input noise figure of the receiver (or transceiver). For example 14 metres of RG58 on 144MHz has a loss and noise figure of 3dB. If used with a rig with a 1.5dB noise figure the whole system will be 3 + 1.5 = 4.5dB.

Noise Figures and Decibels

Some years ago I came to the conclusion that the background, man-made and Galactic noise almost perfectly equates with the metre wavelength for each frequency. This is Nailer's First Law. On 144MHz (2m) the background, man-made and Galactic noise floor is about 2dB. On 28MHz (10m) it is 10dB. On 430MHz or 70cm it is 0.7dB. I'll let you work out the noise level that's to be found on 7MHz or 40m. That's it, you're right it's 40dB. How about that then?

Students of h.f. receiver technology noted several decades ago that pre-amplifiers (pre-amps) were unnecessary. The background noise was so high that amplifiers preceding receive mixers often did **not** improve the signal-to-noise ratio of a received signal. Worse than that, they actually made it worse.

At v.h.f. on the other hand, the introduction of the dual-gate MOSFET with noise figures of about 2dB did produce an improvement in signal-to-noise ratios on 144MHz. This is because prior to that, the bipolar transistors had noise figures as high as 7dB, or possibly worse if not correctly noise matched.

Above The Noise

Ideally, in order to hear any signal on 144MHz, that is above the noise at your antenna terminals you need a system noise floor lower than 2dB, including the downlead. If the receiver noise figure (NF) was 1.2dB than you would need a cable loss below 0.8dB or you would be losing weak signals in the noise. In practice a 144MHz station would probably have a 3dB cable loss and 2dB or more receiver noise figure, total 5dB. The answer to this is to employ a masthead pre-amplifier.

The calculation of noise figure (NF) involving a pre-amp is a bit more complicated and requires converting dB to gain factors (F) then back again into dB.

$$Ft = F1 + \left(\frac{F2 - 1}{G1}\right)$$

Where Ft is the total noise Factor, F1 is the noise Factor of the pre-amp, F2 is the noise Factor of the receiver and cable and G1 is the power gain factor of the pre-amp.

Using a pre-amp with a 1.5dB noise figure and 20dB gain in front of a downlead with a 3dB loss and receiver with a 2dB noise figure work out like this:

$$NF = 10\log(F1)$$
$$\text{Then } F1 = \text{antilog}\left(\frac{1.5}{10}\right)$$
$$\text{So } F1 = 1.412$$
$$\text{Likewise } F2 = \text{antilog}\left(\frac{5}{10}\right)$$
$$= 3.163$$
$$G1 = \text{antilog}\left(\frac{20}{10}\right)$$
$$= 100$$
$$Ft = 1.412 + \left(\frac{3.163 - 1}{100}\right)$$
$$= 1.412 + 0.022$$
$$= 1.434$$

The total noise figure NF will be 10log (1.434) = 1.565. With such high gain in the pre-amp the total system noise figure is now well below the background and man-made noise floor of the band.

As a further example let's repeat the calculation with a power gain of 13dB in the pre-amp.

$$G1 = \text{antilog}\left(\frac{13}{10}\right)$$
$$= 19.95$$
$$Ft = 1.412 + \left(\frac{3.163 - 1}{19.95}\right)$$
$$= 1.520$$
$$NF = 10\log(1.520)$$
$$= 1.818$$

This is still very respectable and with less gain the intermodulation in the receiver mixer will be greatly reduced.

To determine the optimum gain for a pre-amp where the noise figure of the pre-amp, cable and receiver is known, use the following formula:

$$G1 = \frac{(F2 - 1)}{(Ft - F1)}$$

In this case choose a final noise floor just below that background, such as 1.9dB on 2m.

$$Ft = \text{antilog}\left(\frac{1.9}{10}\right)$$
$$= 1.549$$
$$F1 = 1.412$$
$$F2 = 3.163$$
$$\text{Then } G1 = \frac{(3.163 - 1)}{1.549 - 1.412}$$
$$= \frac{2.163}{0.137}$$
$$= 15.788$$
$$G(dB) = 10\log(15.788)$$
$$= 11.98dB$$

On transmit, with this system, the feeder loss will lose half the signal, so 25W becomes 12.5W. Now, at a remote receiver the signal will only be half an S-point down compared with a full 25W. Hardly enough to worry about. So at v.h.f. there is a strong

argument to use a pre-amplifier rather than expensive feeder.

Combined Noise

Consider now the situation on 70MHz (4m) using the same 14m of RG58 cable. It now has a loss of 2.2dB. The combined background noise figure is 4dB. Now, converted p.m.r. rigs, due to the requirements for strong signal handling will be well filtered and have a noise figure probably in excess of 4dB. Indeed many people contact me for pre-amps to bring these units to life.

The calculation will now be done for a downlead of 2.2dB feeding a station pre-amp with 13dB gain and 1.5dB noise figure, followed by a rig with a 4dB noise figure.

$$Ft = F1 + \left(\frac{F2 - 1}{G1}\right)$$

$$\text{Where } F1 = \text{antilog}\frac{\left(2 \cdot 2 + 1 \cdot 5\right)}{10}$$

$$= 2 \cdot 344$$

$$F2 = \text{antilog}\left(\frac{4}{10}\right)$$

$$= 2 \cdot 512$$

$$G1 = \text{antilog}\left(\frac{13}{10}\right)$$

$$= 19 \cdot 95$$

$$Ft = 2 \cdot 344 + \left(\frac{2 \cdot 512 - 1}{19 \cdot 95}\right)$$

$$= 2 \cdot 42$$

$$NF(dB) = 10 \log 2 \cdot 42$$

$$= 3 \cdot 84dB$$

This exercise has demonstrated that, at 4m and below, provided the downlead cable losses are relatively low then a station pre-amp will work well in front of a noisy radio. At 2m and above it is difficult to achieve a worthwhile noise figure without the use of a masthead pre-amp.

Equipment tailor-made for amateur small signal use has less front-end filtering than commercial rigs, so will often have noise figures low enough to make a pre-amp unnecessary. The Spectrum 70MHz (4m) transverter with a 1.5dB nominal noise figure will work fine with any cable loss up to about 2.5dB.

In the situation where a station uses 35m of RG213 or UR67 on 4m, the cable loss will be 4.34dB. This is already above the typical 4m noise floor so there is no way that a station pre-amp can get the system right. We need to go to a masthead pre-amp again.

Pre-amp Gain

I will now determine what gain is required for a pre-amp with a 1.5dB noise figure feeding a cable with a 4.34dB loss feeding a receiver or transverter with a 1.5dB noise figure.

$$G1 = \frac{\left(F2 - 1\right)}{Ft - F1}$$

$$F2 = \text{antilog}\frac{\left(4 \cdot 34 + 1 \cdot 5\right)}{10} = 3 \cdot 837$$

If the required NF is 3 · 9dB

$$\text{then } Ft = \text{antilog}\frac{3 \cdot 9}{10}$$

$$= 2 \cdot 455$$

$$F1 = \text{antilog}\frac{1 \cdot 5}{10} = 1 \cdot 413$$

$$G1 = \frac{\left(3 \cdot 837 - 1\right)}{\left(2 \cdot 455 - 1 \cdot 413\right)} = 2 \cdot 723$$

$$G(dB) = 10 \log 2 \cdot 723 \quad = 4 \cdot 35$$

How about that then. The pre-amp needs hardly any gain at all to achieve the required result. Adding loads more gain will only increase the signal reading on the S-meter without giving a usable improvement in signal-to-noise ratio.

The lessons here are that pre-amps are not needed for sensitivity but to improve the system signal-to-noise ratio. A well designed station will use sufficient gain in the pre-amp to achieve a system noise figure slightly lower than that typical for any given band.

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

Topics explained within Technical For The Terrified, in previous issues of *PW*.

Part 1: Formulae, algebra and powers and roots of numbers. **February 2005**.
Part 2: Indices of numbers, and series parallel combinations of resistors. **April 2005.**
Part 3: Inductive and capacitive reactance and its application in filters. **June 2005.**
Part 4: Tuned circuits and values of L and C needed for resonance. **August 2005.**
Part 5: Stabilised supply rails using resistors and Zener diodes. **October 2005.**
Part 6: Transistor biassing for audio amplifier and amplifier gain. **December 2005**.
Part 7: The use of the decibel (dB) for cable losses, antenna gains and effective radiated power (e.r.p.) **February 2006**.

Photo copies or back issues of these topics are available through the *PW* Bookstore.

Icom IC-E7 Hand-held Transceiver

Chris Lorek G4HCL, investigates a dual-band hand-held transceiver that has wide band receive capabilites in a very small package!

Like most other electronic equipment, radios are becoming more compact than ever. Many years ago a v.h.f. hand-held was often referred to as a 'brick' and the first one I owned, a Standard C-146A back in 1974, was certainly a handful, although other 2m portables at the time were worn as an 'over the shoulder' pack.

Nowadays, we expect rather more and, of course, in rather a smaller size. Icom's new IC-E7 manages to pack in a tremendous amount of operating facilities into a tiny case. With a size of just 47 x 81 x 28mm and a footprint smaller than a credit card, it's a dual band v.h.f. (2m) u.h.f. (70cm) f.m. transceiver plus a wideband receiver covering from 495kHz right up to 999.990MHz with reception modes of a.m., f.m. and wideband f.m. So, as well as a dual band hand-held you also get a receiver capable of picking up not only v.h.f. and u.h.f. communications, short wave and medium wave broadcast stations, 4m and 6m amateur bands, v.h.f. Band II broadcast and analogue TV sound on u.h.f., but also with the capability of tuning into civil and military airband, v.h.f. marine band and plenty more.

On transmit it offers a 1.5W power output on 144MHz with 1W on 430MHz with a selectable low power level of 100mW on each band. The supplied compact 'rubber duck' antenna screws into an SMA socket on the top panel of the transceiver. This allows other portable antennas to be connected, for example a higher gain type or an even more compact 'stubby' antenna, as well as external antennas such as a mobile whip or a rooftop collinear from home.

First Impressions

As soon as I opened the box and held the radio in my hand I must say that I was very pleasantly surprised at its diminutive size – a progressive move by Icom. I was, personally, a little 'put off' by the metallised plating on the front panel and on the top of the tuning knob, although this is just a personal taste and I'm sure Icom have done their homework in finding out what both current and future fashions should present in hand-held accessories like this.

With the many functions available and the control buttons acting in a multi-function capacity, I did need to have a good read of the operating manual, even to be able to do something like changing the tuning steps on 144MHz to 12.5kHz so that I could tune to my local repeater. But Icom have very usefully included a 'cut-out and fold up' section in the user manual to act as a credit-card sized reference guide to carry around in your pocket or wallet. Very useful and top marks Icom! Besides the user manual and battery chargers, a wrist strap is supplied to help prevent you dropping the tiny set when you're using it.

Battery Power

Like the very best in up-to-date portable electronic devices, the IC-E7 uses a high capacity, yet very compact, Lithium Ion battery pack. Its 1800mAh capacity gives plenty of operating time; Icom quote a typical operating period of around 20 hours with 5% transmit, 5% receive and 90% standby, or 15 hours of continuous receive capability. A drop-in-style charger with a plug-in mains 'wall cube' supply are provided, using this fully recharges the set's battery pack in around three hours, again rather better than an overnight charge that would usually be required.

To help the battery pack last that bit longer, there's a selectable automatic 'battery save' facility. Here, when you're monitoring an inactive channel, the receiver will silently power on and off, initially with a 1:4 ratio (125ms on, 500ms off) if no signal's been received for five seconds, this ratio becomes 1:8 (125ms on and one sec off) if no signal's been received for another 60 seconds. There's also an 'auto power off' facility where the set can automatically switch itself off if you've not used any of the operating controls for a selected preset time either of 30, 60 , 90 or 120 minutes. The l.c.d. backlight can be set to either come on automatically for 5 seconds if you press any buttons on the set, or to be continuously on, or permanently off to preserve your batteries that bit more during daytime operation.

The display of the diminutive IC-E7, shown much larger than life.

Controls

Even just a quick glance shows there's certainly not a plethora of operation buttons and knobs festooned on the set! Instead there are just five multi-function operation buttons together with up/down buttons and a click-step rotary knob. The up/down buttons act as a digital volume control in 40 increments, the display giving an indication of the setting. A press of the small 'SQL' button opens the receiver squelch and, if you rotate the click-step rotary knob while you're pressing it, you can set the squelch to either one of nine pre-set levels, or to be permanently open, or to an 'Auto' level setting that uses a noise pulse-counting system to determine when a signal is present.

Memories and Channels

The front panel 'Band' button cycles through the various receive and transceive ranges of m.w., h.f., 50MHz, f.m. Band II, v.h.f. Air Band, 144MHz, 300MHz, 430MHz, 600MHz, 800MHz and TV channels and from any of these you can use the top-panel click-step rotary knob to tune into whatever frequency you want to listen to. Tuning steps include the usual 12.5 and 25kHz steps for v.h.f and u.h.f. amateur bands as well as 9kHz for medium wave, 5kHz and 10kHz for h.f., 6.25kHz for v.h.f./u.h.f. two-way communications and, usefully, 'true' 8.33kHz steps as well as 25kHz steps for v.h.f. airband.

To store your favourite frequencies into memory there are 1000 memory channels available, which can be grouped into 18 memory banks, of up to 100 channels per bank. For scanning these can be either individually scanned with memories skipped from the scan as needed, or scanned in individual banks. Memory banks can also be linked together for scanning, where you choose which banks you'd like included. You also assign each memory channel and memory bank with a short alpha-numeric name 'tag' of up to six characters; to help you remember what's stored in each.

As well as memory scanning, in 'VFO' mode, you can select either a full scan, a selected band scan, or a programmed scan, where there are no less than 25 frequency ranges (using 25 pairs of lower and upper band scan edge channels) to let you search for activity. In scan mode, when a signal is received, you can set the receiver to either hold the channel until the signal disappears, or resume after a period of between 2 and 20 seconds after the scan's halted. The scan can also resume after a period you've selected of between zero and five seconds after the received signal disappears.

If you're in anew area, or indeed if you want to find what's active in your area, a very useful 'auto write scan' can be put into action to find and store into memory any new active channels for you. There are 200 dedicated auto-write memory channels available for this, which you can then copy to other 'normal' memory banks for subsequent scanning and even alpha-tagging then if you wish.

Sub Tone and Digital Squelch

Like many other transceivers the IC-E7 is equipped with Continuous Tone Controlled Squelch System (CTCSS), or sub-tone for short, on both encode and encode/decode, as well as DCS (Digital Coded Squelch) again either encode-only or full encode/decode. Besides allowing you to monitor a given channel in 'quiet' mode where the squelch will only raise when the correct sub-tone or DCS code is received, the receiver can also, if you wish, be set to emit a series of bleeps when the correct pre-programmed sub-tone or DCS code is present on a received signal.

Most if not all UK repeaters now can be accessed purely by the use of the correct CTCSS tone for the geographical area you're in. To find out which tone is being used there's also a useful 'tone scan' built into the receiver. Here, when you're monitoring a given channel you can initiate a tone scan that will show you on the set's display which, if any, CTCSS tone is being used. But for those repeaters which aren't, or for when you're travelling around the country and don't want to fiddle about with tone frequency settings and the like, if you're operating mobile for example, there's also a 1750Hz toneburst built into the transceiver for manual repeater activation.

Product
Icom IC-E7 hand-held transceiver v.h.f./u.h.f.

Company
Icom (UK) Ltd

Contact
Sea Street
Herne Bay
Kent CT6 8LD
Tel: 01227 741741
www.icomuk.co.uk

Pros & Cons
A tremendous number of facilites packed into a very small unit. Excellent wide band receiver. Not sure about the metal plating on the front, though.

Price £199.95

Still slightly large than life.

Accessories

Besides the top panel SMA antenna connector, there's a single jack socket on the top panel which allows you to plug in an external earphone or speaker/mic. As most speaker/mics use a two-plug system, Icom have an optional OPC-782 adapter lead available for this and another option, a protective carry case that helps protect the transceiver from scratches and so on, has a special tension release loop that holds this adapter lead in place to prevent the small top-panel connector being damaged by cable stress and the like. The top panel connector can also be used with an optional cable to clone data from one IC-E7 to another and a further option of a PC cloning cable and interface plus software lets you transfer the set's data to and from your PC. Other optional

accessories include a filtered vehicle DC cigarette cable adapter to charge the transceiver's battery in your car, various speaker microphones, an earphone and an SMA to BNC antenna connector adapter.

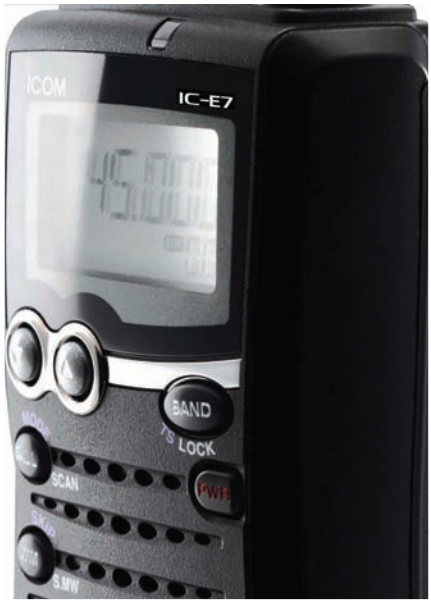
On the Air

I programmed up the various memory channels with all the 2m and 70cm Simplex and repeater channels, as well as plenty more with other frequencies using the set's wideband receive capability. A quick on-air test with a local station showed that I was in communication, so off I went. I used the set both in my local area in hand-held mode, on the road into a car whip antenna on business trips and for local commuting and at home connected to my rooftop dual-band collinear using an antenna adapter. The set was a lovely small size and easily fitted into my shirt or other pockets, but I did miss the facility of a belt clip, which can't be attached (maybe the optional case would have been useful here?). But the handy wrist strap kept me from dropping it.

On receive there was enough audio for indoor use although turning the volume up did cause some 'rattling' from the small internal speaker, which to be fair I'd have expected. So for in-car use and when I was outdoors I tended to plug in an earphone, which gave me very good audio. The set-top antenna was also naturally a compromise, but comparing this with another similarly tiny, dual-band, hand-held transceiver I regularly use gave virtually identical results. So, no surprises here. Using my car roof-mounted whip helped matters tremendously, of course. My transmitted audio on u.h.f. was described as very good, although on v.h.f. it did seem overdeviated and I had to be careful to back off from the mic to prevent audio clipping.

Operating from home with my external antenna gave varied results. It suffered dreadfully from paging breakthrough when I used it on v.h.f., I simply just couldn't monitor or scan 144MHz band channels without it constantly emitting 'brrr beeeep' noises. The receiver usefully has a switchable 10dB attenuator and using this helped a lot . Even with this enabled it still allowed me to communicate with higher-powered mobile and repeaters due to the transmitter's 1.5W/1W power output. But to be fair it's not really designed for this style of operation, it's a tiny hand-held, so I shouldn't be too critical!

The single rotary control is used for several tasks.



Few buttons adorn the diminutive IC-E7.

I travel away on business frequently and the receiver's wideband and 'auto store' facilities were very useful here, giving me a lot of 'alternative' listening to enjoy! I particularly liked the auto-store function; it was intelligent enough to know when an active frequency had already been stored into memory and hence it wasn't duplicated, unlike some dedicated scanners that simply fill up the available 'auto-store' channels with the same frequency each time! Even the medium wave receive capability was useful, as I like listening to Capital Gold on 1557kHz. For medium wave as well as for short wave monitoring, substituting the small set-top antenna with an external length of insulated wire to act as a 'long wire' antenna was usually called for to get the best results. Yet this small 'travel friendly' set was even useful with the auto-power-off facility to listen to at night, either for broadcast stations whether they be Band II f.m. or medium/short wave, or indeed as a scanner, simply to lull me off to sleep.

Conclusions

A lovely small yet very powerful radio, which is not only a fully-featured dual-band 144/430MHz transceiver but a wideband multi-mode receiver with over 1000 memory channels. I really enjoyed using the set and I'm sure it'll find a home in the pockets of many radio amateurs and listeners. **PW**

Specifications

GENERAL

Frequency coverage:
Transmit/Receive:
144-146/430-440MHz

Receive Only:
0.495-999.990MHz

Frequency Steps:
5/6.25/8.33/9/10/12.5/15/20/25/30/50/100/200kHz

Modes:
TX: f.m.
RX: a.m./f.m./w.f.m.

Voltage:
3.7V d.c. (Lithium-Ion battery pack, 1800mAh)

Current drain:
RX: 150mA (max power), 80mA approx. (standby)
TX High; less than 1.5A
TX Low; 0.4A approx. (144MHz), 0.5A approx. (430MHz)

Audio Output:
More than 50mW at 10% distortion with an 8Ω load

Antenna Connector:
SMA. 50Ω

Dimensions (W x H x D):
47 x 81 x 28mm

Weight:
160g with battery and antenna

TRANSMITTER
RF Power output:
High: 1.5W (v.h.f.)/1W (u.h.f.)
Low: 0.1W / 0.1W

Spurious Emissions:
Less than -60dB (high power)
Less than -50dB (low power)

Max frequency deviation:
±5.0kHz

Spurious and Image rejection:
More than 40dB

RECEIVER
Sensitivity:
a.m. (10dB S/N)
0.495-5MHz: 2.2 µV
5-30MHz: 1.4µV
118-137MHz: 1.4µV

f.m. (12 dB SINAD)
30-90MHz: 0.45µV
90-144MHz: 0.2 µV
144-148MHz: 0.18µV
148-180MHz: 0.2µV
350-470MHz: 0.18µV
600-940MHz: 1.4µV
940-999.990MHz: 2.5µV

w.f.m. (12dB SINAD)
76-108MHz: 1.8µV
600-800MHz: 2.5µV

Selectivity:
a.m./f.m. 12kHz (-6dB), 30kHz (-60dB)
w.f.m. 150kHz (-10dB), 700kHz (-20dB)

Receiver system:
Double superheterodyne

Intermediate frequency:
1st 46.35MHz (a.m./f.m.)
14.85MHz (w.f.m.)
2nd 450kHz

The Propagator

Rob Hannan G4RQJ enjoys taking his v.h.f. transceiver out onto the hillside to improve the DX contacts. He needed to design an antenna that could double as a walking stick whilst remaining light-weight and visually acceptable too. Hence the Propagator was born.

Fig. 1: A light-weight Quad, not something I'd recommend building.

Fig. 2: A general view of the Propagator (an early version). The gnome impression is unintentional.

For a good few years, one of the main pursuits at G4RQJ has been pedestrian portable two-metre operation from hilltops. At first, the antenna was the usual 'rubber duck' but I always yearned for some sort of beam. The requirements were, light-weight, visual acceptability and the ability to double as a walking staff. I settled on a folding four-element Quad, which was not a good choice on any front, requiring a large photographic tripod for support, having the visual refinement of a box kite and useless as a walking pole, **Fig. 1**.

I persisted with this for some time in the face of comments such as "did He give you any stone tablets?" and "if you strike a rock will a serpent appear?" but two things really forced a rethink. The first was the advent of SOTA [1*] and the chance of getting out into the hills on most weekends with the possibility of someone being there to answer plaintive CQ calls. The second was when XYL Audrey emerged from our shed with a telescopic clothes prop and said "This any good?" I should point out at this juncture that not all telescopic clothes props are identical, so this article is essentially an outline of ideas and methods that will probably need adapting to suit individual cases.

The prop was obviously very suitable as a walking staff with little modification, (make it look less like you're a fool with a cloths prop, **Fig. 2**) and would double as a two metre high mast. It was also hollow and would, therefore, allow the boom for a four-element 2 metre beam to be stored inside it. The hunt was on for a suitable boom. Garden cane seemed to have possibilities, having the necessary strength and being hollow to accept the elements in transit but a suitable length could not be found that would fit inside the prop.

The breakthrough came when I realised that the local DIY supermarkets sell plastic garden canes in a variety of sizes. More importantly, these 'canes' have a metal interior and are hollow. Care should be taken to select the right type as some lack one or all of the these features. The cane required has four lines of blips along its length but does not have simulated cane 'knuckle' rings and is sold under the names of Growstick or Plantstake. Make certain before proceeding that the cane will slip inside your prop if you are building the two-metre beam version.

Fig. 3: The prop upper end detail.

The handle section, which doubles up as the top mast section, and the beam mounting clamp are made first. It is formed from an 800mm section of 25mm plastic conduit, which should be a loose fit over the bottom section of the prop. At one end the grip is fitted. (**Fig. 3**). Cut five rings of

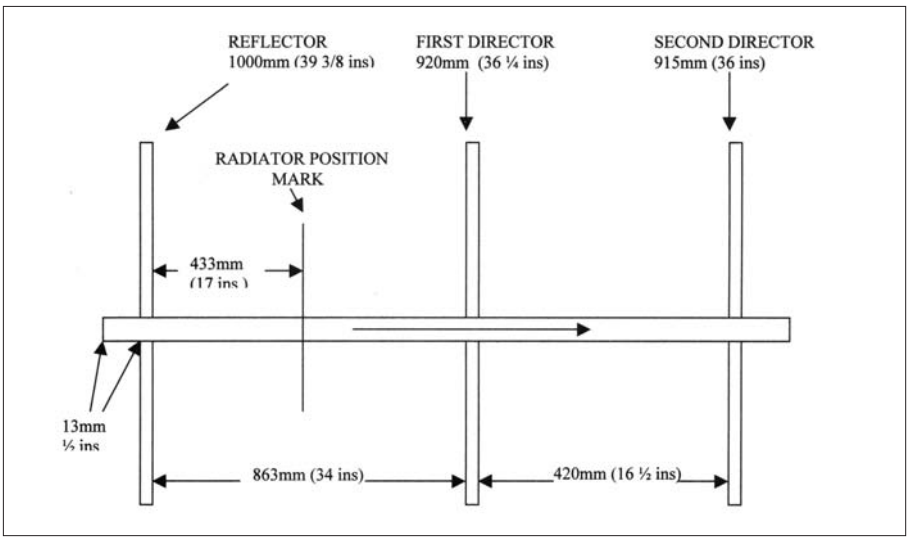
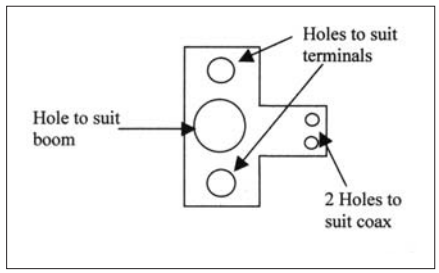


Fig. A: Two metre beam.

Fig. B: The element mounting plate is made from sheet plastic, paxolin, or other suitable insulating material. Exact dimentions are not given as these will vary between individual installations.



adhesive heat shrink sleeving of a size that will shrink to a tight fit on the conduit. Starting about 25mm from the end of the conduit shrink the first piece into position, taking care not to melt or deform the conduit! Grip the conduit as you would for walking with the first ring above your index finger. Position the second ring so that it sits between your first and second fingers and when things are comfortable shrink the ring into position. Take your hand out of the way first! Repeat this operation for the remaining three rings and when things feel comfortable, place a 150mm section of the same sleeving over the whole and shrink into position. This will produce a comfortable non-slip grip that fits your hand.

Transfer your attentions to the opposite end of the handle section and drill a hole right through it 20mm from the end. (**Fig. 4**) This hole should be of a diameter to allow the boom to be pushed through, (approximately 13mm) and can be omitted if you don't want to use a beam with your Propagator. At 90° to the boom holes, drill a 5mm hole through one side only. This is where the self-tapping wing screw that holds the boom in place will fit.

A word at this point about the self-tapping screws, one of which are shown in **Fig. 5**. Various other screws were tried before settling on this method. A pan headed, gimlet pointed slotted screw has a large washer or solder tag soldered into the slot, using flux and a large iron. The resultant 'wing screw' is a useful item, easy to handle in the cold and not too easy to lose in grass. Two are required but it is a good idea to knock out a few extras of different lengths and diameters to keep in the travelling bits box.

Now to the prop itself. The first job is to make the bottom end more substantial and waterproof. It is quite surprising how much water can get into the prop from a casual prod to test the firmness of ground! A plain 15mm stop end plumbing fitting can be inserted into the lower end of the prop having first removed and discarded the original plastic ferrule. Insert it, cup end out and secure it in place with two small self-tapping screws. The cup area can now be filled with hot glue or similar to render the end waterproof

Now, the prop-locking collar must be removed from the lower prop section without damaging either item. Take a Mole wrench and set it so that it does not quite grip the lower prop section but the sides of its jaws will strike the inner end of the locking collar. Hold the lower section, place the wrench over it and strike the collar with the side of the jaws. A couple of good blows should see the collar fall free.

The next task is to make the collar into a tight fit on the lower pole but removable by hand. To achieve this, cut away the plastic ribs inside the collar with a craft knife testing the fit frequently. Don't worry if you go too far as you can always secure the collar with a 'wing screw'; it will just not look as neat. Now, take the lower half of the prop and slide the handle section over the upper end of it, grip uppermost. Replace the locking collar and abut the handle section against it. Place a 30mm piece of adhesive heat shrink sleeving over the lower prop section at the base of the handle section and shrink into position (**Fig. 6**). Cut a long piece of the same sleeving and shrink it into place to cover the 30mm piece and the prop section to its base. Allow a small overlap at the lower end. The sleeving will close over the metal of the prop preventing it cutting into the rubber foot, which can be fitted next. The rubber feet are available from many outlets dealing in walking sticks, crutches, etc. They come in many sizes, just pick one that is a tight fit. Remove the clothesline fitting from the upper section (you will look much more professional). Take the handle section and drill a 5mm hole through one side only, 20mm below the handgrip. Insert the top end of the prop upper section into the handle from the grip end until it is just visible through the 5mm hole in the handle just drilled. Mark through it and drill a hole to accept a self-tapping wing screw. This screw defines the position of the handle section when used as part of the mast. I used to use a wedge between the two sections until a particularly windy day on Whit Fell when the beam started to spin like a windmill in the gale and tried to drag the rig up the pole by its feeder!

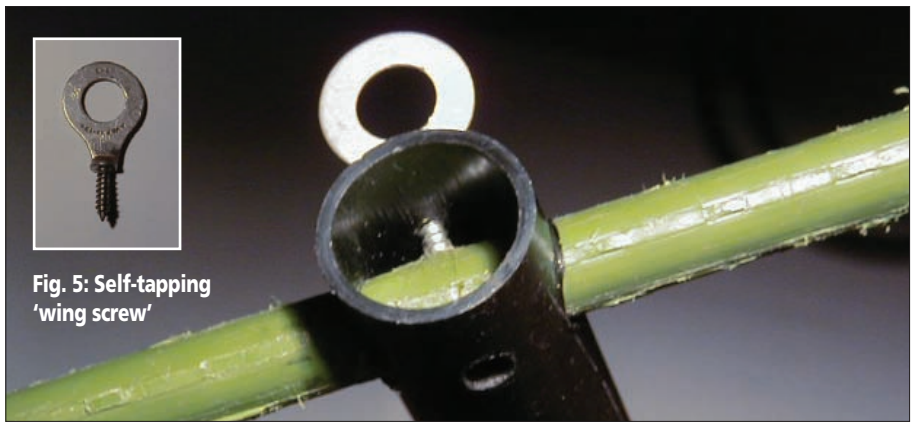


Fig. 4: The boom mount with wing screw.

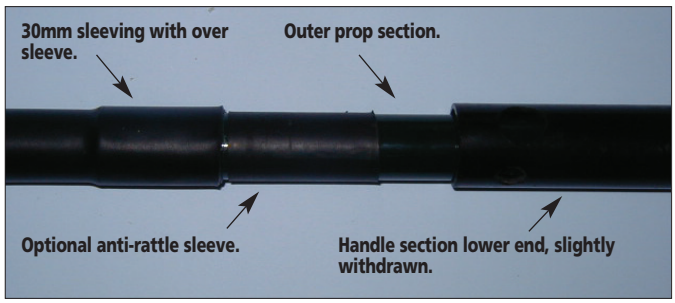


Fig. 6: The handle lower end location detail.

Almost Complete

Your basic Propagator is now almost complete. Fashion a suitable cap for the upper end of the prop. I have just completed a new top cap for mine incorporating a compass, see **Fig. 7**. Purists may wish to carve a horses head handle, just remember it must be easily removable in the field. Finally, place a 15mm ring of adhesive shrink sleeving at the lower end of the prop upper section. This will prevent rattling when walking and also stop you over extending the prop in the field. A similar ring can be placed at the top end of the section to stop it falling into the lower half during disassembly. Remember to leave enough space above the ring for your chosen top cap and to have the locking collar on the section before you shrink the piece into position!

Assuming you are going to build the 2m/70cm beam return to the 'Growstick' cane and cut a 1310mm length, which will be the boom. Leave the moulded plug in place at one end. It will stop the stored elements falling right through. The elements will be formed from 2mm stainless steel welding rod (wire coat hanger will do the job but will not be as strong or look as good) and with the exception of the driven element pass through the boom. Cut the elements to the dimensions of **Fig. A**. These are not 'magic' sizes; they are copied from an old commercial 2-metre beam, which was to hand. Purists will point out that the driven element should be folded for matching purposes but this is difficult to arrange and in fact the beam presents a reasonable VSWR and operates well as shown. Take the reflector and locate its centre. Measure and mark a point half of the boom diameter away from the centre point and wrap a

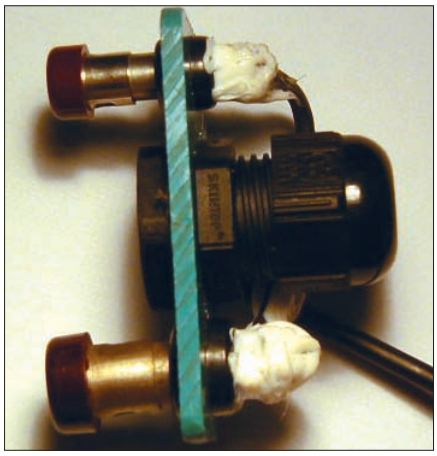


Fig. 8: The driven element mounting plate.

Fig. 7: The compass cap.

Summits on the Air, or SOTA, is the award programme for both those interested in operation from hilltops and those interested in working or listening to them.

Certificates are available for gaining 100, 250, 500, 1000 points. At 1,000 points Activators achieve 'Mountain Goat' status and Chasers/SWLs are 'Shack Sloths'. Achieving 'Mountain Goat' and 'Shack Sloth' status requires considerable dedication and effort and so, trophies can be claimed to mark this significant milestone. For those with boundless energy and enthusiasm there are additional certificates for 2,500, 5,000, and 10,000 points.

The SOTA Uniques is a count of the number of different summits in an activator's, chaser's or SWL's record. It is purely the number of distinct summits, regardless of SOTA points scores for individual hills. The SOTA Online Database has been modified, with a Unique Activated summits and Unique Chased summits tables added to the 'View Results' tab.

Certificates are available for the usual thresholds of 100, 250, 500 and 1000. There being 7793 summits in world associations at present (December 2005), then the recently introduced thresholds of 2500 and 5000 theoretically apply at least! It is felt that this new award will extend the challenge particularly for leading SOTA activators and chasers, where point scores are large and well beyond Mountain Goat/Shack Sloth, but often with less than 200 unique summits. It also addresses something that activator and chasers have been doing since the launch of the programme - counting their unique summits worked and activated. The same awards are available in the SWL section.

www.sota.org.uk

small piece of epoxy putty or similar around the element. Repeat this for the two directors and set aside to dry. The purpose of these putty pieces is to prevent the elements falling through the boom when the antenna is used vertically. In the field pick the elements up with the putty pieces between finger and thumb, the heavy end will obligingly point downwards and this is the end to push through the boom. I have used endless marker sleeves, etc., but they all fall off! When the putty has dried, it should be sanded to give the smallest profile possible to prevent the elements jamming when stored in the boom. Before drilling the boom for the elements try some tests holes in the off cut from the boom and select a drill which gives a snug fit on them. Drill the holes in the boom at the indicated positions to accept the elements, taking care to get them in the same plane. A little error here will look awful when the elements are fitted. A pillar drill helps if you can get to one. It is possible to drill the boom to accept a set of elements for 70cm, which are small and easily carried and can be used instead of but not as well as the 2m set. Mine are drilled at right angles to the 2m set to avoid confusion in poor weather and light on summits. The driven element mount only requires rotating through 90°, measure from this point to place the 70cm elements. I use four elements for this too. Use the standard spacing and sizes from any Handbook.

This leaves the driven element. First cut two 650mm lengths of welding rod, which will be the radiating element. The mounting plate (**Fig. 8**) is the product of a good deal of experiment. Initial versions used a drilled out plastic block secured to the boom with a pinch bolt and elements held by small bolts. This proved difficult to manage with cold fingers and the small bolts were easily lost. The answer proved to be a cable gland, which it was found to be a good fit on the boom and could be secured by its ferrule. The gland, which fitted my boom, is a Cable Gland Round Top IP 68 Type 3 PG11 from Radio Spares Part Number 206 6103 but they are available from many other electrical factors.

The element holding terminals may present a problem. The best types are those shown in the photograph but these are hard to come by. Eagle-eyed readers may have noticed that the two shown are different sizes. The larger of the two is connected to the inner of the coaxial cable and is easy to identify in the field and place uppermost when working with vertical polarisation. It is by far the best type and the real reason I do not use two of them is that I cannot find another. The smaller one below is an adequate substitute. If you have a poorly stocked junk box do not despair, as once again an adequate substitute is available from good compoent suppliers. I have used these with no problems but for extreme weather conditions the junk box type inspire more confidence. If you do not intend to use the antenna in poor weather you could well get away with the more familiar, and cheaper, screw type terminals provided that there is a hole to accept the element. Unfortunately, these are difficult to handle with cold hands.

The element mounting plate is shown in **Fig. B**. It is made from sheet plastic, Paxolin or other suitable insulating material and is secured to the cable gland by the gland nut. As the element holding assembly can be used on a number of bands it was given a piece of cable all of its own. RG174/AU is small and works well; the two cable holes should be drilled to allow the cable to be threaded through to act as an anchor. The inner and outer should be connected to the rear of the two terminals and waterproofed in the usual manner taking care to leave room to unscrew the ferrule for installation purposes.

Assemble the beam with its boom in place through the handle section and locate the point at which the assembly feels balanced when held by the grip end of the handle section. This will be about 260mm from the reflector, between the driven element and the first director and will be the normal operating position for the beam. Mark the position with the marker pen. A decision is required now. Do you require to operate with the choice of both horizontal and vertical polarisation? If so you will need to drill two holes in the boom and this produces a weak point where the boom may eventually fail. Having said this I have never had a failure in the field and with replacements at about £1 each it is not a disaster. If you only require one polarisation then only the appropriate hole of the following two need be drilled. Rotate the beam until the elements are in the vertical position and mark through the small hole in the handle section onto the boom. Rotate the beam into the horizontal position, push it about 20mm through the handle and repeat the marking exercise. In practice, it is best to have the beam just a few degrees off the horizontal which does not affect the performance but stops high winds shaking the elements out of the boom. Drill holes in the boom, one side only, to accept a wing screw at the marked positions and your beam is complete.

Next month we'll look at methods of guying the Propagator as well as h.f. attachments.

K is also for Kilmot!

A follow-up transmitter for the PW Kilve, also by Tim Walford G3PCJ, published in the January 2006 issue of PW.

The Morse letter 'K' at the end of a transmission can also imply the imperative to transmit - so, with that in mind, let's look at the transmitters of the K-family! We have the *PW* Kilmot, producing double sideband (d.s.b.) 'phone signals and the *PW* Kilton, which is for c.w. (Kilton is near Kilve in Somerset but you won't find Kilmot on the map!).

Both transmitters have a nominal 1.5W output when run on the ubiquitous 13.8V supply and both are built on a 50x80mm double sided p.c.b. In principle they can both work on any single band from 3.5 - 14MHz. Given the greater interest in phone operation, most of this article is about the Kilmot as shown in the photograph opposite. As with the Kilve before, kits are available – see at the end of the article for more details.

Why Double Sideband?

The Kilmot uses double sideband because it's much simpler and easier to produce than single sideband. Although it's not difficult to remove the unwanted sideband with a filter, there can be extra complexity when a variable output frequency is desired (see Note 1).

I considered that a transmitter generating s.s.b. would be far too complex as a companion to the simple Kilve receiver. So, the next best thing is to leave both sidebands present and just remove the 'anti-social' carrier from the transmitted signal. Not single sideband but double sideband (d.s.b.), or d.s.b. suppressed carrier (d.s.b.s.c.) to give it a fuller definition!

Luckily the ubiquitous SA602/612 integrated circuit can be used to create a d.s.b.s.c. signal very easily and over a very wide frequency range! The use of double sideband is entirely compatible with other stations using single sideband mode. Some of the stations may not even be aware that you are using d.s.b.

Anyone using a radio in either upper sideband (u.s.b.) or lower sideband (l.s.b.)

Note 1:
The usual method employed when creating a variable frequency single sideband (s.s.b.) signal, is to generate the initial s.s.b. signal at one fixed frequency (where simpler filtering can be used). Then this signal is mixed with the output from a variable frequency oscilllator (v.f.o.) to create an s.s.b. signal in the band of interest. *Editor*

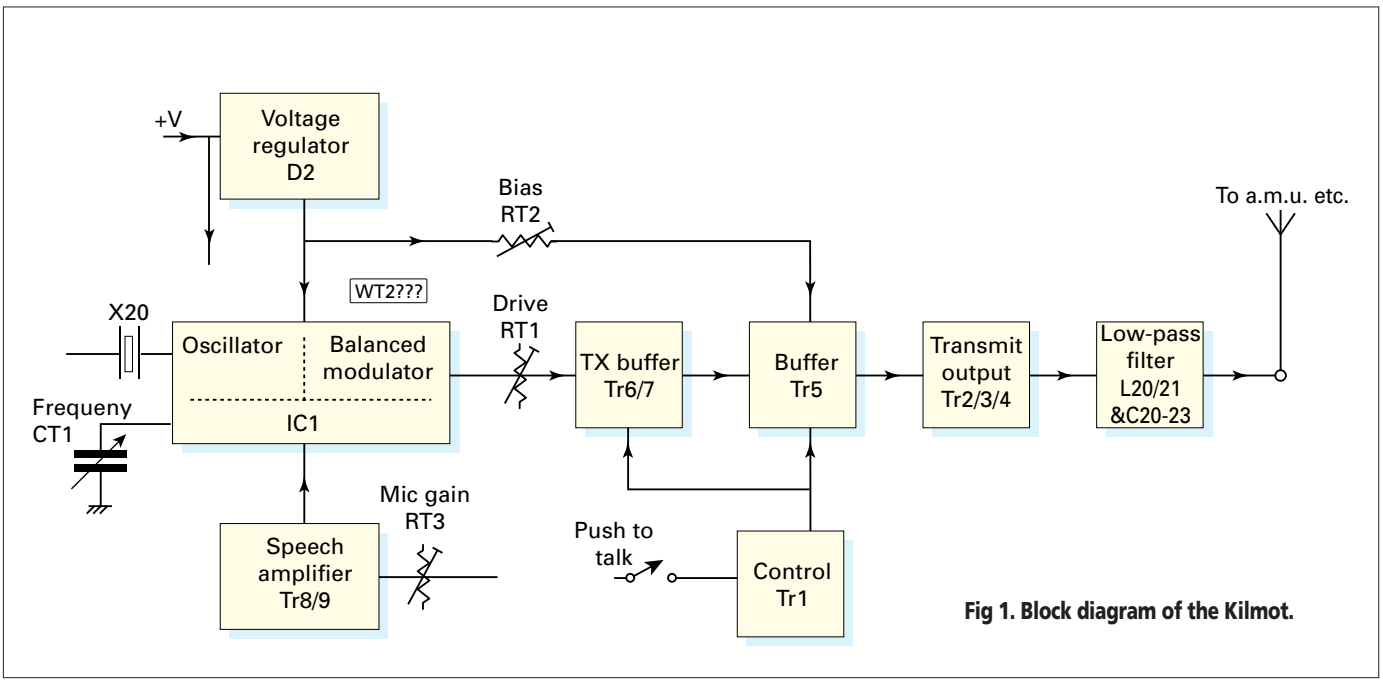


Fig 1. Block diagram of the Kilmot.

will hear the sideband they have selected. And, of course, your direct conversion Kilve receiver will hear their single sideband signal anyway! (The d.s.b. approach is not really recommended for appreciably higher-powered transmitters.)

Avoiding FM!

The next serious problem to be overcome is to avoid the risk of frequency modulation, i.e. the transmitter's frequency being 'pulled' by unwanted r.f. output stage currents getting into the resonant circuits of the transmitter's local oscillator – such feedback also leads to chirp in c.w. transmitters.

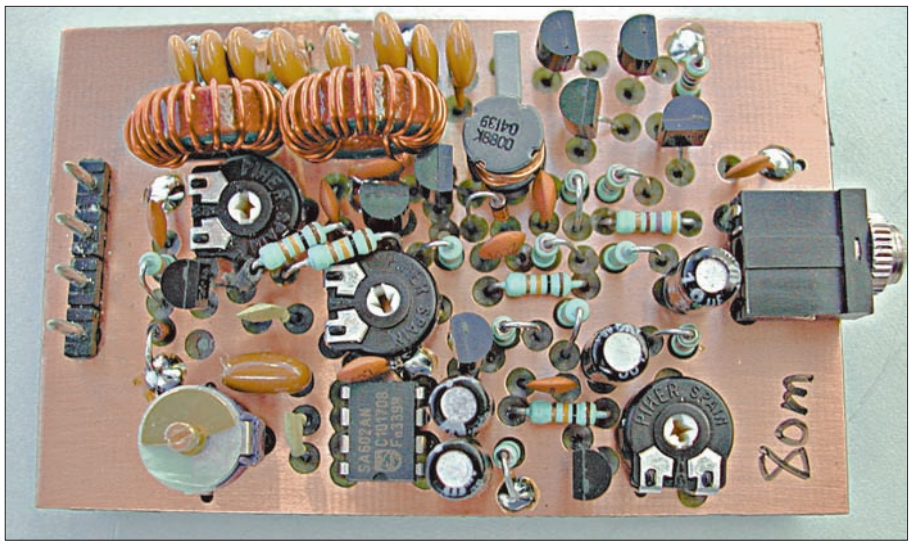
One approach for avoiding f.m. in a simpler rig is to mix two r.f. frequencies, one of which is from a v.f.o. the other from a crystal oscillator. This is an excellent method, but again it's a more complex solution. Such an approach doesn't match the simplicity of the Kilve too well!

The alternative method is to use an appreciably higher *Q* in the resonant circuit of the transmitter's local oscillator (l.o.) to reduce the influence of the unwelcome current from the output stage. This means using an oscillator with either an actual crystal or a ceramic resonator as if it were a crystal.

Crystals have a very high *Q* that normally prevents them being pulled over more than a few kHz. Ceramic resonators, on the other hand, though not as stable as crystals, have a typical *Q* that allows them to be 'pulled' over 50kHz range at at 3.5MHz - just by altering the 'loading' capacity with a trimmer capacitor.

Hence both the Kilmot and the Kilton are fundamentally 'crystal' controlled rigs where the receiver has to be tuned independently of the transmitter. Ceramic resonators are included for 3.5MHz (nominally 3.69MHz for 'phone and 3.58MHz for c.w.) that allow about 50kHz downwards tuning with the on-board trimmer.

For the higher bands, crystals are a necessity since the temperature stability of ceramic resonators is not good enough. You can use your own 'special' crystals, such as the QRP c.w. ones of 7.030/14.060MHz, or the 7.159/14.318MHz crystals (normally used for non-radio purposes). The latter crystal may be sourced from many computer boards, but it's at least in the phone section of the band!



A completed 3.5MHz double sideband Kilmot transmitter.

Both transmitter circuits have their own oscillator stage that will work with either a crystal or ceramic resonator. But in either case, the transmitter can be driven from an external oscillator if you wish. This would enable you to explore more complex frequency generation schemes using the mini mixer kit, etc.

Kilmot Diagrams

The diagram, **Fig. 1** shows the block diagram of the Kilmot, with the full circuit in **Fig 2**. The oscillator stage is part of the SA602 mixer chip IC1 The oscillator section drives the other part of the chip that comprises a doubly balanced mixer.

The other set of inputs to the doubly balance mixer are driven by the speech amplifier. The output from the mixer is then an amplitude modulated signal comprising both upper and lower sidebands with a suppressed (or at least a very much reduced) carrier.

There are then three stages of r.f. amplification using discrete m.o.s.f.e.t. devices, before the final stage comprising three more BS170s TR2/3/4; which are connected directly in parallel. Working three devices in parallel caters for the increased standing dissipation caused by a significant bias current required for linear operation.

Unlike a c.w. transmitter, all the various stages of the Kilmot transmitter have to be linear. This is because the amplitude of each sideband is dependent on the amplitude of the audio speech signal from the microphone.

To ensure that no stage 'limits' with excessive signals, making it non-linear in operation, there are gain controls for both the audio and the r.f. aspects. The transmitter output stage drives the ubiquitous half-wave low pass filter, whose purpose is to remove unwanted r.f. harmonics.

This filter stage is of the 'half-wave' or Pi form and is made up of two simple inductors wound with 0.56mm (24s.w.g.) wire on two powdered iron toroids. Completing the filter are eight capacitors that can be connected singly, in series or parallel pairs depending on the chosen band, see **Table 1**.

The transmitter circuit has provision for driving a transmit/receive (T/R) relay, controlled from the microphone's p.t.t. switch. Unfortunately, due to the lack of room on the p.c.b., you will have to devise your own means of mounting this relay – perhaps secured by a length of insulated wire as a strap over the body of the upturned relay.

Note: The relay should have a diode (cathode to +supply side) across the actuating coil to protect the driving transistor. The p.t.t. switch also turns on the transmitter r.f. stages.

Band	Filter Nominal Capacity	Connection Form	C20A C21A C22A C23A	C20B C21B C22B C23B	Filter Nominal Inductance	L20 L21 Turns on T50-2
80m	800pF	Parallel	470pF	330pF	2µH	20
40m	400pF	Single	470pF	Not Fitted	1µH	14
30m	300pF	Single	330pF	Not Fitted	0.75µH	12
20m	200pF	Series	470pF	330pF	0.5µH	10

Table 1. Component values for transmitter low pass filters.

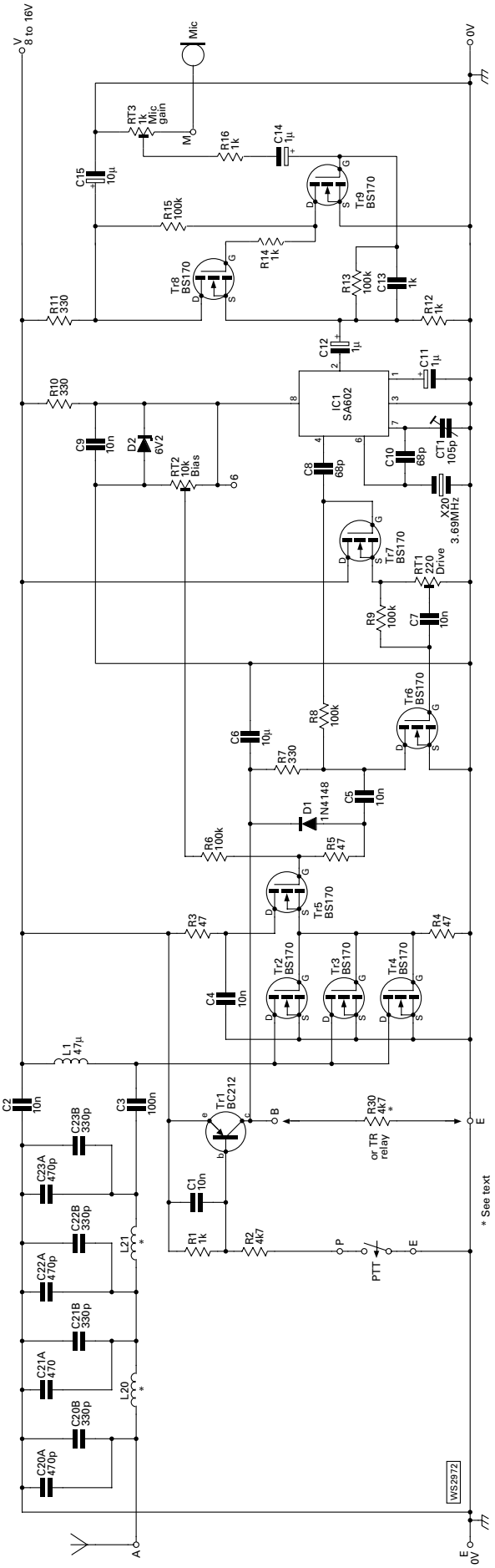


Fig 2. The full circuit of double sideband Kilmot transmitter. The Kilton circuit isn't shown in this article, although it is discussed.

Building the Kilmot

Both forms of the transmitter use double sided p.c.b. material with a ground plane that provides shielding and low impedance 0V connections. Connections to the 0V rail are made by soldering designated suitably shaped components on the top as well as underneath the p.c.b..

The Kilmot p.c.b. is rather full and the two presets should not be mounted close to the p.c.b., so that there is room to insert resistor leads under the edge of the body of each preset. Construction starts with the supply and control aspects, which can be easily tested with a multi-meter.

The speech amplifier, comprising a pair of BS170 m.o.s.f.e.t.s like the Kilve's audio amplifier, comes next and can also be checked with your meter. After assembly, you should be able to hear the SA602 oscillator/mixer stage on another receiver that covers the chosen band. Similarly, you should be able to hear the stronger signal from the r.f. amplifier stages TR5/6/7 when these have been fitted.

The output transistors and low pass filters are the final parts to be added prior to setting it up. At this stage you do not need to worry about T/R switching or where to mount the relay, as the tests can be done with your dummy load connected directly to the transmitter output.

Adjusting the Kilmot

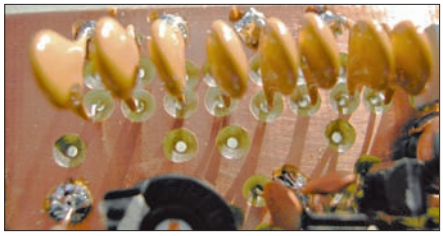
Firstly turn all presets fully anti-clockwise. Next, adjust the standing current in the output transistors by measuring the d.c. supply current. Go to transmit by pressing the p.t.t. switch and note the supply current with zero bias output from RT2; then gingerly advance RT2 till the total supply current increases by about 100mA.

For the r.f. tests, you'll need to feed the r.f. output to your dummy load and have some means of assessing the changes of output level, ideally an r.f. voltage or power meter. The preferred audio input is a low level audio signal generator, as that will have a constant output – whistling into your microphone with a steady level is possible but not that easy!

Adjust the r.f. drive preset, RT1, and the microphone gain preset RT3, to about mid position; then see if you can obtain any r.f. output when you go to transmit. Then reduce RT1 until the output power is about half the probable maximum for your supply voltage. (Typically 1.5W max on 13.8V) This will ensure that the output stage is not limiting while you adjust the earlier stages.

Then, try increasing RT3 to check that the r.f. output level does still increase, this step is to check that none of the later stages are limiting. Reduce RT3 a little further so that you have some adjustment range to cater for a low output microphone.

Advance RT1 to just below the point



Low pass filter capacitor detail shows a 3.5MHz Kilmot low pass filter, with the eight capacitors fitted (the unused holes under the capacitors are for the 14MHz series connection combination) the four unused holes below are for the two inductors.

Kits and Bits

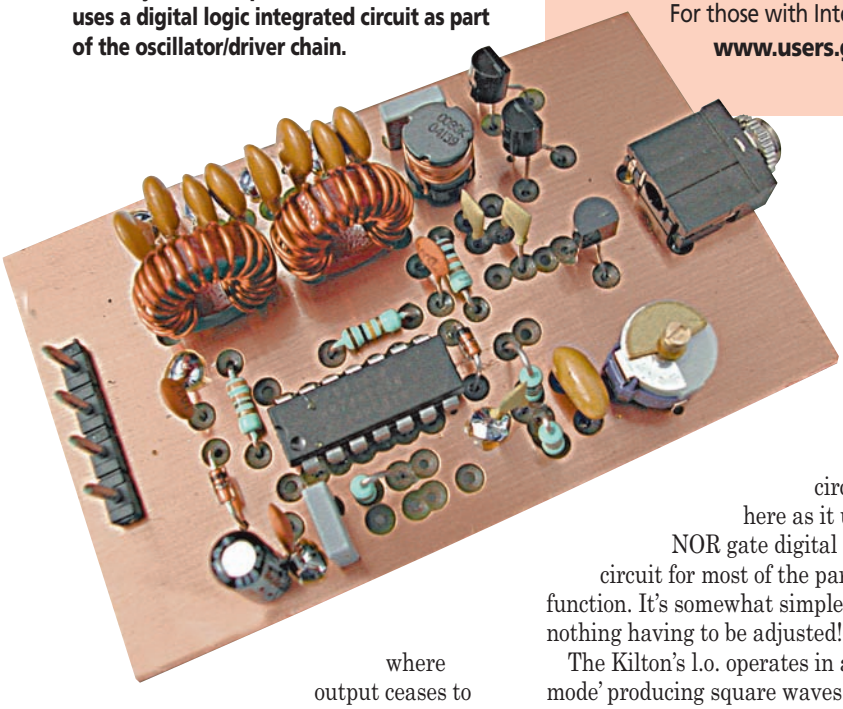
Kits for the Kilve family are available from Walford Electronics. The kits include all parts, to build them 'open' style as in the accompanying photographs.

Prices are:-

Kilve direct conversion receiver any band 3.5 - 14MHz	£19
Kilmot d.s.b. phone 1.5W transmitter inc 3.5MHz ceramic resonator	£24
Kilton c.w. 1.5W transmitter inc 3.5MHz ceramic resonator	£19
Optional Transmit crystals 14.060 (c.w.) or 14.318MHz (d.s.b.) 7.030MHz (c.w.) or 7.159MHz (d.s.b.)	£2
Optional T/R relay Free if receiver is ordered with either TX	£2

P&P is £2 per order. Please send your orders with a cheque direct to Walford Electronics, Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ.
For those with Internet access, further information is available at
www.users.globalnet.co.uk/~walfor

The very much simpler Kilton transmitter uses a digital logic integrated circuit as part of the oscillator/driver chain.



where output ceases to increase as the output stage begins to limit - the transmitter should then be producing its anticipated output for the supply voltage.

Next, connect your microphone and readjust RT3 to give the same peak output for normal speech. In practice there is often a range where RT1 can be low and RT3 high or vice-versa, without any stage limiting.

The Kilton

The Kilton c.w. transmitter (see above) also uses a ceramic resonator for 3.5MHz or a crystal for the higher bands. I've not shown any circuit diagrams here as it uses a quad NOR gate digital integrated circuit for most of the parts and function. It's somewhat simpler with nothing having to be adjusted!

The Kilton's l.o. operates in a 'digital mode' producing square waves, rather than a simple sine wave. But you can still use the same choices of crystals or ceramic resonators. The output stage of this c.w. only transmitter has two BS170 transistors because their dissipation is lower (being either on or off). The drive from the output stage is passed to the same design of r.f. low pass filter.

The Kilton also has the ability to drive a T/R relay with semi-break in operation. But again, there's not enough room on the p.c.b. for the relay to be fitted. So, you'll have to make provision to fit it yourself! The relay driver circuit can also be used for simple full break-in operation.

Muted Receiver

One set of T/R relay contacts is normally used to switch the antenna between receiver and TX - the other set can be used to mute the receiver during transmission, by connecting the other set of contacts in series with the phones. Because both K transmitters have only a limited tuning range (especially for the higher bands), the receiver is normally adjusted to near the transmitter's frequency.

For the d.s.b. ' phone version Kilmot, the receiver frequency should normally be exactly the same as that of the transmitter; but for c.w. the receiver frequency needs to be slightly offset to one side or the other of the transmitted signal to obtain a beat note with the received signal.

Achieving transceiver v.f.o. operation over a wide range of frequencies requires a mini mixer kit, with additional frequency offset circuits for c.w. But for basic 3.5MHz 'phone operation, there are some intriguing possibilities, such as joining the Kilmot and Kilve together as a transceiver!

But be warned creating a Kilve/Kilmot transceiver does require quite a few alterations! The last K family article will sketch out some of these options for you to contemplate and experiment with!

(PS. Did anybody spot the minor mistake about Fig. 3 in the January 2006 Kilve article?)

PW

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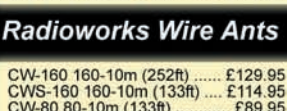

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One-Big Punch

One BIG Punch (OBP) is a custom add-on accessory for the Yaesu MH-31 microphone commonly used with many Yaesu amateur radios

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Speech Compressor for the Yaesu MH-31 mic and FT817 FT857, FT897. Improve the TALK POWER.

MAX PUNCH £165.95

You can also enjoy the "MAX PUNCH" option that features the HC-4 with the OBP and the HC-5 (w/o OBP). The TONE switch is used to select which element is operational.

HAND MIKE £57.95

W4RT Electronics Microphone with One BIG Punch Speech Compressor included.

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One-Board-Filter

The One-Board Filter (OBF) affords you the opportunity to have both the Collins CW and SSB mechanical filters available in your FT-817 together!

OBF £229.95

Replace two filters in the space of one. OBF includes the two optional filters and fitting.

Collins Mechanical Filters
for the Yaesu FT-817, 857 & 897.

500 Hz CW - £94.95 ***2.3kHz SSB - £94.95***

This is the option that many, many FT-817 owners have requested. The OBF utilizes Collins Mechanical Filters that are the same as used in the optional Yaesu filters for the FT-817. The bandwidth of the 7-pole CW filter is 500 Hz and the 10-pole SSB filter is 2.3 kHz. The One-Board Filter is NOT available for installation by FT-817 owners. This is not a "do-it-yourself" option. The One-Board Filter must be installed by RADIOWORLD, or a competent engineer . If in doubt please call for details.

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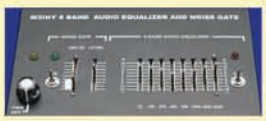

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Antenna Workshop

A Low Cost Multi-band

Len Paget GM0ONX explores the W3DZZ and says that it's a trapped multi-band antenna that shouldn't be discounted.

And they said Amateur Radio was an indoor, sedentary hobby!

Whether it's due to space limitations or planning constraints by either by the local council or the XYL (or OM), few of us are able to erect an array of h.f. antennas for each of the bands we wish to operate and have to rely on a compromise multi-band antenna.

Designs of antenna seem to come into and fall out of fashion. Today's ubiquitous solution to the problem of multi-band operation seems to be one or other of the variants of a G5RV antenna. These antennas are available commercially and offer a 'quick fix' to the problem of working a number of h.f. bands with only one antenna.

However, this solution does require an antenna matching unit to get the best out of it with a modern rig. The typical modern rig has a transistorised p.a. stage and works best into a 50Ω load.

This 'unchangeable' impedance load is required by most modern rigs and when I tried a simple, but correct, G5RV at at my station, the combination gave a very mediocre performance. When I was first licenced in the early 1980s, the popular solution to this problem was to build a W3DZZ trap dipole.

The W3DZZ trap dipole, unlike the G5RV, does not require the use of an antenna matching unit on 3.5 and 7MHz. With its traps therefore, effectively with different electrical lengths at different frequencies, it has a typical in-band impedance of about 75Ω. The feed point impedances in other pre-WARC bands were also well within the limits 'tuneable' by the Pi network of the valve p.a. used by most rigs of the day.

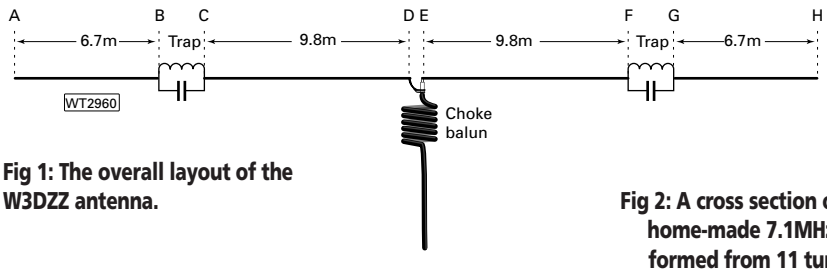

Fig 1: The overall layout of the W3DZZ antenna.

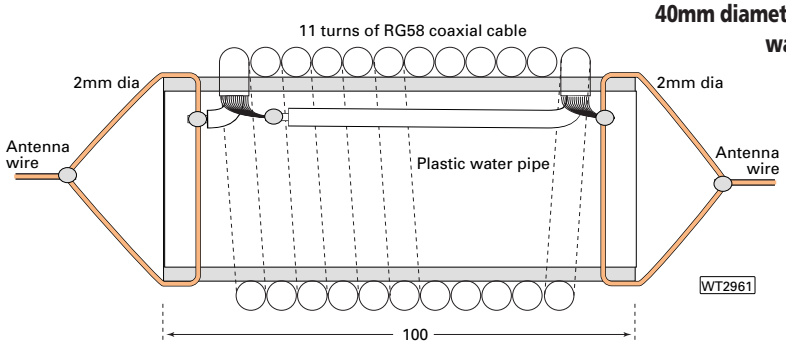

Fig 2: A cross section of the home-made 7.1MHz trap formed from 11 turns of coaxial cable wound on a 40mm diameter plastic water pipe.

Shorter Than Conventional

The W3DZZ antenna is shorter than a conventional 3.5MHz dipole making it ideal for restricted sites. The antenna is constructed using two 7.1MHz traps and 33m of wire. The antenna operates as an half-wave dipole on both 3.5 and 7MHz, as well as a full wavelength dipole on 14MHz. It also acts as a one and an half wavelength antenna on 21MHz and two full wavelengths on 28MHz, giving some gain over a simple dipole on these three higher frequencies.

The layout of the antenna is shown in **Fig. 1**, the version I constructed with **David Livingston MM3DHL** was constructed using one point five mm^2 pvc covered wire. You could use hard drawn copper or 'flexweave' cable instead as they both resist stretching. Both of these solutions can be expensive and difficult to obtain locally.

Back then, in the eighties, commercial traps for the W3DZZ were once readily

Trap Dipole

available from virtually any and every Amateur Radio emporium. But, unfortunately, they're no longer readily available and, no doubt, this has contributed to the decline in popularity of the antenna.

All, however, is not lost as it is very easy to construct your own traps. The 7.1MHz traps in this version of the W3DZZ are constructed from 11 turns of RG58 cable wound over a 100mm length of 40mm diameter pvc water pipe as shown in **Fig. 2** and the photograph of **Fig. 3**.

It's imperative that the ends of the coaxial cable are properly sealed as the braid of coaxial cable does a better than fair impression of a wick. Any water finding its way into the coaxial cable will ruin the trap. Any sealant must be of the non acetic acid type (i.e. doesn't smell like vinegar) as acetic acid types will corrode the copper connections through time. Unlike many commercial traps, these coaxial traps will happily run at up to 1kW power. So, with such a capability, the traps will loaf along at the UK's legal limit of 400W.

A topic that's generally overlooked by most builders of dipole antennas, is that dipoles are designed to be fed using a balanced feeder and, strictly speaking, should not be directly fed with unbalanced feeder such as coaxial cable. A simple balun can, effectively, overcome this problem and can be constructed from six turns of coaxial cable wound with a 50mm internal diameter as shown in **Fig. 4**.

The centre piece of the antenna is constructed from a scrap piece of Perspex or other good quality plastic board and is shown in Fig. 4. Perspex is rather brittle and a nylon chopping board would make a suitable substitute. If 'borrowing' one from the kitchen - check with the boss first!

Reduce The Strain

The wire elements are woven through the holes in the centre-piece to help reduce the strain on the terminals. The connections to the traps are made using the centres from 30A terminal block to allow trimming of the element lengths. After trimming the antenna these terminal blocks can be replaced with good quality soldered joints trimmed.

If possible, the antenna should be fed with 75Ω coaxial cable such as RG11 as the impedance of an half-wave dipole antenna is around 75Ω, but in practice an acceptable performance is still achieved with 50Ω coaxial cable. The coaxial cable and the balun are secured to the centre-piece using cable ties and then covered with waterproof tape such as 'Denso' tape, **Fig. 5**.

The dipole can be erected either as a conventional straight dipole or as an inverted V without any major loss in performance. The actual form will depend on the space and support structures available at the antenna location.

As with any antenna, it will need a degree of tuning to get the best out of it. Tuning this antenna is very simple, but must be carried out in the correct order. Start on the 7MHz band and trim the sections of wire between points C and D and between points E and F (Fig. 1) .

Trim no more than 50mm of wire from both sides of the antenna each time, before checking the matching. Try to get the the (voltage) standing wave ratio, (v.)s.w.r. as near 1:1 as possible on the desired section on the 7MHz band.

On no account attempt to trim any wire on any other part of the antenna until you are completely satisfied with results of the 40m band. An s.w.r. of 1.5:1 or less should be possible over the whole of the 40m band.

Once you are satisfied with the s.w.r. on the 7MHz band move to 3.5MHz and trim the sections between A and B, and G and H, again only 50mm at a time until you get the lowest s.w.r. on the 3.5MHz band. Unfortunately, it's unlikely that you'll be able to cover the whole 3.5MHz with an s.w.r. of 2:1 or less - but do the best you can!

Most Interest

A tip is to choose the area of the band that is of most interest to you. Then centre the lowest s.w.r. reading on that frequency. With careful tuning, you should be able to cover a 150kHz, or more, section of the band dependant on wire size used and the antenna's height above the ground.

The antenna, can be also, be used on 14, 21 and 28MHz using the internal tuner of most modern rigs and will usually give a easier match with this W3DZZ antenna than with a G5RV antenna. Although not officially on an harmonic of any other band, the version built by David Livingston MM3DHL and myself also gave reasonable performance on both 18 and 24MHz. Though this may only be a testament to the flexibility of the antenna matching unit of his Kenwood TS-570 rig.

The antenna, as described, should cost less that £10 to construct, excluding feeder cable. It may be constructed within a few hours. Many thanks go to David MM3DHL for testing the dipole and assisting with the photography for the article.

PW

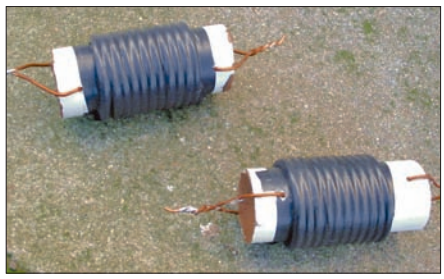

Fig. 3: And here are two I made earlier!

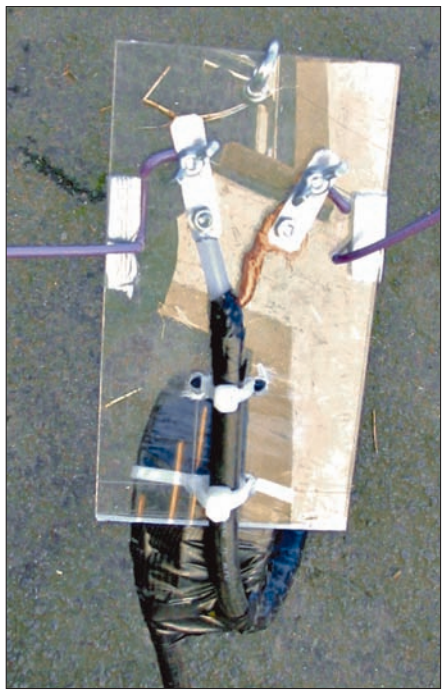

Fig. 4: The centre-point of the antenna was made from a scrap piece of Perspex, but a piece of chopping board would do the job as well. Note the choke wound balun slightly hidden by the centre-piece.

Fig. 5: Waterproofing the centre-piece with sticky Denso Tape keeps the weather out of the joints.

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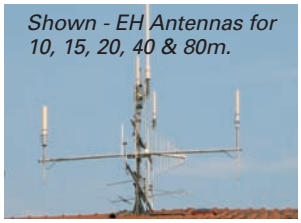

Shown - EH Antennas for 10, 15, 20, 40 & 80m.

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Cobra 40	7-7.2MHz	2kW	93cm long	(500W RTTY/AM)	**£105.00**
Venus 80	3.5-3.8MHz	2kW	248cm long	(500W RTTY/AM)	**£179.00**
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Churchill's Radio?

We received an interesting letter from a PW reader that sent us looking for the magnifying glass and deerstalker. Despite our best efforts, the detective work came to nothing. What do you think?

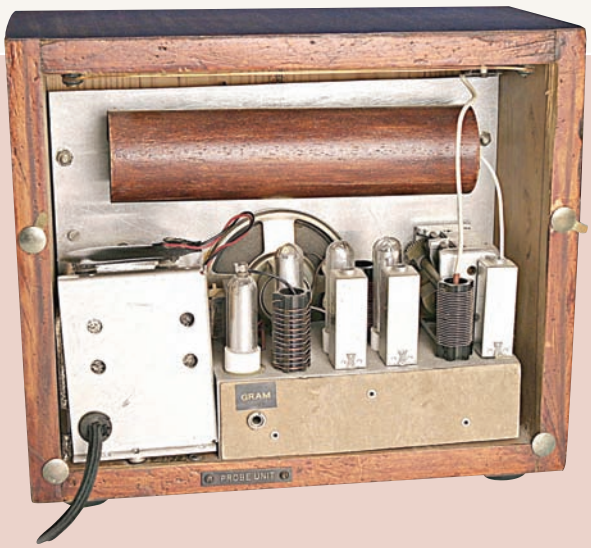

Fig. 1: Looking in the rear of this antique wireless set shows the technology at its finest.

Dear Sir,

I've been told your company takes an interest in old radios and radio related architecture. I'm writing in the hope you may be able to throw some light on the radio depicted in the enclosed photographs.

Years ago, the St. Paul's Cathedral (London) choir boys would regularly be seen snaking their way over to the cathedral from their old school in Carter Lane. If I remember correctly, it was in the early 1970s that the new school was built behind the Cathedral and the old one became a Youth Hostel. Opposite the old school stands Faraday Building.

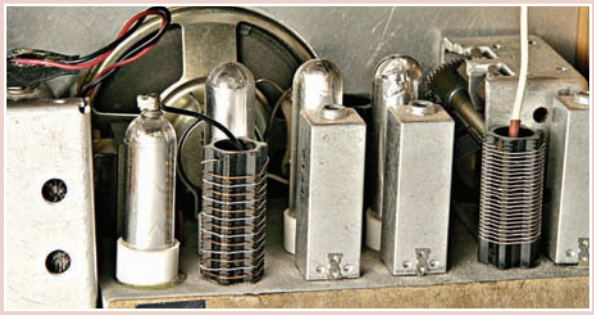

Fig. 2: A closer view of this wonderful old set showing the various coils, tubes and valves.

During the war, Faraday was the head-quarters of Allied Command Communications. The building, just 100 yards south of the Cathedral, is often to be seen on television. Its green roof is quite noticeable. The North East block has walls 15 feet thick with massive iron doors between its double outer skin.

It is said the enormous magnetic field produced by Faraday Building was the reason so many bombs detonated east, behind the cathedral, where the new school was subsequently built. Below, and stretching far beyond Faraday, are the 'deep level' communications tunnels. 'Road' signs hang from the ceilings and raised paths on either side protect the cable-laden walls from damage by cable laying tractors. In places, the tunnels lead into massive rooms, full of buzzing equipment.

I remember an old acquaintance telling me that during the war he was often posted down there to keep an eye out for any invading force. He said he couldn't have done much as he was sent down with an unloaded rifle. Apparently the 'powers-that-be' didn't want Frank 'letting one off' and damaging a cable!

Some nights Winston Churchill slept in Faraday, it being handy for meetings at the old choir school opposite. It was during the school's change of use to a Youth Hostel that this radio came to light. The frequency (judging by some of the coils) seems quite high. The dial, however, shows standard l.w., m.w. and s.w. frequencies. The set includes (in its roof) a couple of turns of wire forming a frame aerial. Burned into the wood is an oval inscription with the words 'Australian Cheddar Cheese'. Evidently a re-used box.

My (elderly) Area Engineer at that time in Faraday believed that Churchill used the set to monitor allied pilot transmissions over the city, the radio being built for around 50Mc/s but camouflaged as a domestic set. The cabinet is veneered and has a wickerwork speaker grill. The valves do not pull out but appear to be wired in. Wired in valves are often found on aircraft and government service equipment, perhaps a clue to its manufacture. I would like to know if these sets are serviceable and who supplies the spare parts. Thanking you.

Peter Adams
Colchester

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Did you see Issues One & Two?

Here's a taster of what's in Issue Three!

- **Lightning on the Edge of Space**: Chris Davis, who is a space scientist working at the Rutherford Appleton Laboratory in Oxfordshire, discusses the evidence showing that lightning enhances the Sporadic-E layer.
- **DRMscan**: Using this program to search for DRM stations, even those DRM test transmissions that are not listed in the schedules.
- **Looking Back**: A trip back through significant happenings in radio history from the pages of *Short Wave Magazine* and *Radio Active*.
- **Military Matters**: Kevin Paterson details many of the major frequency changes that have affected the military comms monitor. Make sure you have the most up-to-date information.
- **Signal Analysis**: We take a closer look at some of the more complex techniques that can be used to help make sense of any data signal you may come across.
- **Scanning Scene**: Up-to-date frequencies and scanning news for the real enthusiast.
- **Reviewed**: **Watson Digital Hunter** to track down who's using what frequency.
  etón E10 portable short wave receiver.
- **Airband Basics**: Godfrey Manning looks at the different types of Air Traffic Control you may hear.
- **Scanning in Action**: Introducing ShopWatch to those just starting out in scanning.
- **LM&S Broadcast Bands**: Another bumper month as Chris Brand delves into the Long, Medium & Short Wave bands looking for the most interesting broadcast signals.
- **Off the Record**: A round up of some of the sounds that radio users who listen out for free radio broadcasts on the AM bands may have been hearing.
- **New Products**: All the latest and most interesting radios and accessories to interest the scanning, airband and broadcast listener.
- **Comms from Europe**: Some interesting websites to look at and news of some interesting European PMR 446 radios.
- **The History of Marine Radio in Ireland**: From the first coast stations to the dramatic developments of the last few years.
- **Maritime Matters**: WIth Robert Connolly.
- **Info in Orbit**: How to set up your own digital satellite TV receiver.
- **News**: If it affects radio listeners from clubs to airshows and frequencies to new books, you'll read about it in *RadioUser*.
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Particularly Wireless

Harry Leeming G3LLL, who has a well-deserved reputation as a radio guru, offers advice on radio problems, that are based on real solutions. For as he says, "it's really been very practical wireless"!

You don't have to be a genius to repair Amateur Radio equipment. I am slightly dyslexic, I tend to think differently and am not good at spelling or multiple-choice questions; hence I failed my eleven-plus and had only three years of secondary modern education. My school report stated that I had 'an enquiring mind': in reality it meant that I tended to embarrass teachers by asking them questions that they could not answer!

There was one time when my maths teacher had spent a whole period demonstrating how, by the use of log tables, one could multiply by adding. My hand went up, "But please sir why does it give the correct answer?" Poor teacher, he had obviously never even thought of the question, let alone the answer! Years later, looking at a slide rule, gave me the answer.

When I was 11 we had moved out of the town into the village of Guide, just on the outskirts of Blackburn. For Christmas I was given a 'telephone kit', which consisted of a length of wire and two ex-government magnetic earpieces that also acted as microphones. Just using the short length of wire was too tame and so off I went into the fields with my friend **Walter**. We connected up to barbed wire fences and upped the ranges to a mile or so.

Our houses were about 200m apart and so my next move was to wire the earpieces to the gramophone pick-up sockets of our domestic radios and then to run a wire between our houses. This was quite a success and ended up with our families entertaining each other with impromptu concerts.

Dad obtained a new domestic radio with a short wave band and then I found 'Hams' on what was then on the 40 and 20m bands and started listening absolutely enthralled! This was it! I wanted to become a Radio Ham and all thoughts of a future career were aimed at enabling me to meet this goal.

In September 1952, on my 15th birthday, I started work as a trainee radio and TV engineer. The next summer my parents took me on holiday to Southport along with my younger brother. On the first day, I visited a market stall and came away with a vast pile of back numbers of *Practical Wireless* and *Practical Television*, both of which were then under the editorship of **F. J. Camm**.

Buried in Magazines

I spent almost the whole holiday buried in the magazines, much to the annoyance of mum and dad, who thought that they had paid for me to get some fresh air. When I returned to work, the chief engineer had been struggling with a difficult fault on a projection TV for days, without getting anywhere. I had seen the fault described in one of the magazines. So he wasn't at all pleased, when this 15-year-old proceeded to tell him exactly which capacitor in the set was causing the trouble!

With the help and encouragement of dad who actually re-learnt the Morse he had tried to learn as a flight mechanic in the RAF, just so that he could teach me. With everyone's help, over the next few years I was licensed as G3LLL. I also gained both my 'Murphy' and City and Guilds radio and TV servicing certificates.

At 21, Her Majesty called me up for National Service. In spite of my certificates, army intelligence tests indicated that I was not bright enough to be trained as a radio mechanic. I've never been one to be unduly awed by authority and so I protested. To keep me quiet, I was sent to an army base workshops to be assessed.

I must have been right, because, within one week I'd been passed out as a fully qualified REME telecommunications mechanic grade 3. Had I been 'more intelligent' I would have needed nine months on minimum pay just to get to grade 3! Being qualified gave me an increase of pay and I was then posted to Manorbier, South Wales and eventually achieved a grade 1 telecommunications mechanic qualification. (I am tempted to ask who failed the intelligence test!)

Manorbier is a beautiful spot. I worked on the radio controls systems of target practice aircraft and I even constructed a piece of test equipment for them, but it was a long way from my home. I plucked up courage and started writing to **Brenda Holding** whom I knew slightly and who attended the same Mission Hall as myself. We got to know each other very well via correspondence.

Immediately after being released from

Holdings of Blackburn; Harry began in their technical de

National Service, Brenda's father employed me to develop the electronics side of Holdings of Blackburn Ltd - his photographic and audio business - and two years later Brenda and I were married.

I had started off at Holdings carrying out tape recorder and 16mm sound film projector repairs, but soon we expanded into leading makes of 'Hi-Fi'. I became even more interested in the subject, particularly with regard to Hi-Fi equipment's sensitivity to Radio Frequency Interference (r.f.i.). At this point, I realised that I had not just a loving wife and mother to our two wonderful daughters, I also had an editor and typist, with built in spelling and grammar checker!

Handed Out

With Brenda's help, I started writing for various Hi-Fi magazines on the subject of r.f.i. and was flattered to learn that, in some parts of the country, these articles were photo-copied and handed out by the official interference investigation officers.

At around this time, colleagues on the photographic side of the business, were having problems with cameras that possibly had faulty shutters, but had no way of testing them; could I do anything? I knew next to nothing about cameras, but Blackburn's head librarian **Brian Derbyshire** was extremely helpful and came up with a bundle of photo-copies of information. With the assistance of engineer **Derek Fielding**, I designed, produced and patented a camera shutter speed tester.

The new tester was reviewed in several UK and USA photographic magazines very favourably. Unfortunately, we had little idea how to market it, but by using an export agent (who, of course, took a large slice of the profit!) we sold a few hundred worldwide.

Eventually we started to sell a little Amateur Radio equipment as part of the business. At that time Trio, had two good amateur band receivers, that unfortunately

partment after he finished National Service.

Harry G3LLL in his workshop.

omitted the 160m (1.8MHz) band. I obtained coils and crystals and sold a very successful modified version, to which I'd added 1.8MHz.

In 1972, we obtained an agency for Yaesu and luckily a second-hand FT-101 became available, which I grabbed to use for experiments. As a result of these experiments several units, which I designed and made especially for use with the FT-101 appeared. The projects were: an r.f. speech processor, a double balanced mixer and an f.m. unit and later, a kit to add the new 10, 18 and 24MHz bands. We also brought out a kit to add 1.8MHz to the Yaesu FT-401 and FT-560 rigs.

By this time I'd learned a little more about selling and we did some exporting of the projects. It gave me quite a thrill to go on 21MHz and have someone come back to me from across the Atlantic, who was using a unit I had made. My experience of modifying and repairing the FT-101 came to the attention of the editor of the now discontinued magazine, *Ham Radio Today* and, in 1983, I was asked to a series of articles about it and later about my experiences in the shop.

As time moved on, photography and Hi-Fi became unprofitable, our daughters left for university, (**Angela**, to study electronics, **Dawn**, psychology) and so Brenda and myself decided to set-up on our own as Holdings Amateur Electronics in Johnson Street, Blackburn. We got considerable help and encouragement from **Ken Perfect** and **Fred Rendal** of Amateur Electronics, Birmingham.

Modified Version

By that time the FT-290 had appeared and my modified version, fitted with 'listen on input' and an automatic tone burst, went very well and gave us a flying start. The work in Blackburn carried on for 15 years and eventually we retired to Heysham near Morecambe in 1999.

In the business we always tried to oblige, but, of course, the customer isn't always right and I have had plenty of examples of this. I will always remember the guy who came in to ask how he could get a Radio Ham closed down, as he was interfering with his TV. I tried to explain about filters and ferrite rings, but he was not interested. I then advised him to get a form from the post office so that the DTI could sort out where the fault was. At this point he said, "Well actually, I don't have a TV licence, will that make any difference?" No rewards for the best comment on that one!

In repair work, simplicity is the essence. Just last week I was reading the mail on a news group, when a Ham in the states complained that the tuning knob on his FT-757 had become very stiff. Someone else came back with elaborate instructions detailing how the unit and the photo interrupter could be stripped down and told him that it would take about 4 hours. I went on with a 5-minute 'quick fix' and was thanked by several people who had been having just the same difficulty.

To repair equipment you don't necessarily have to be clever, only know the 'tricks of the trade'. I now only do the odd repair, strictly for personal callers; there is no point in retiring and then not having time to enjoy life.

I have enjoyed sharing my experiences of repairing the older, mainly pre-1990 Yaesu equipment, with readers of *Radio Active* and hope that I will now be of help to *Practical Wireless* readers. You, the reader, will decide whether or not this column is a success, as it is only when I get feedback and requests for advice on dealing with problems with the older Yaesu equipment, that my memory will be jogged into action. If you do not have E-mail, please send a stamped, self-addressed envelope, if you want a reply and I will get back to you as soon as possible. Do remember though that being retired, we may suddenly disappear on a bargain holiday!

And so it is over to you, if you do not ask, you may never get the advice you want! **PW**

Carrying On The Practical Way

George Dobbs G3RJV, harks back to the heady days of writing to the Eagle comic about his valved portable receiver. But first a quotation!

"This is a marvel of the universe:
To fling a thought across a stretch of sky -
Some weighty message, or a yearning cry."
Josephine Preston Peabody, 1874 - 1922 (on wireless)

A simple regenerative receiver project.

I have been writing for radio magazines, and indeed some non-radio ones too, for many years. These days I get little excitement from seeing my own words in print. That was certainly not the case on the first occasion when something I had written was printed for others to see. Early in the 1950s I wrote a letter to the *Eagle* comic for their reader's letters section.

Some readers will recall the *Eagle,* which was edited by **Marcus Morris,** a Lancashire vicar with contributors including **Chad Varah**, the founder of Samaritans. The lead character was Dan Dare, pilot of the future, and it ran from 1950 to 1969 with a revival from 1982 to 1994.

I wrote the *Eagle* letter about my bicycle short wave receiver. It was very novel in those days to have a radio that could be listened to on the move. The radio was a home-made two-valved regenerative receiver built into an old drawer from a bureau - desk. It hung by its brass handle from the crossbar of my Raleigh bicycle.

In the saddle bag I had high tension and low tension batteries and the tank whip aerial was clamped on the handle bars. I proudly cycled around north Lincolnshire trying to decipher the indistinct signals in my S. G. Brown headphones.

My little regenerative receiver in the December 2005 edition of this column produced more mail and comments than any other project I have described for a long time. Like most writers, I like to please my readers so, I have been looking at other regenerative receiver ideas. One of the things I wanted to try was a simple valved receiver, as I've not built one for a long time. I also tried a few other solid state designs, that may appear in this column later.

Would-Be Builders

One problem for would-be builders of valved receivers is the power supplies. In many cases, it proves to be more expensive to build a suitable power supply than to build the receiver itself. Luckily my friend **Johnny SM7UCZ**, called to visit me and brought several electronic goodies as gifts. In amongst these were a couple of 1T4 battery valves; ideal candidates for a battery regenerative receiver.

The 1T4 (or DF91) is a pentode valve, with a B7G base, once commonly used in the r.f. and i.f. stages of battery-powered receivers. It is still available at a reasonable price from a variety of companies that sell valves. The heater runs from 1.4 volts and it works well with a high tension voltage in the 40 to 60 volt range, both supplies easily attainable at little cost.

My power supply came entirely from a visit to a local 'Pound Shop'. The heater supply is provided by a single 1.5 volt cell (D cell size) two of which cost £1. The high tension supply is made using cheap PP3 9V batteries. These came in packs of three for £1. Five PP3s are joined in series using the alternate snap connectors to produce 45 volts. So the power supply cost me £3 with two spare batteries remaining. With the power supply problem solved, I looked at alternative circuits.

The circuit of my completed receiver is shown in **Fig. 1**. A trimmer capacitor, C1, couples the antenna to the tuned circuit formed by L2 and C2. C3 is a band-spread control - of which more later. Components R1 and C4 configure the circuit for leaky grid detection. A regenerative receiver uses positive feedback to greatly increase sensitivity. It can also become the local oscillation for the reception of c.w. and s.s.b. signals.

The simplest method of providing the positive feedback is to use a winding in the valve output (anode) coupled to the tuned winding on the input (grid). In the heyday of regenerative receivers the coupling winding was often called the 'tickler coil'. It's L1 in this case and is wound on the same former as L2.

Feedback Signal

The feedback signal from L1 must create positive feedback, adding to the signal present at the valve grid (g1). To enable this, the windings L2 and L1 need to be out of phase. In the circuit, Fig. 1, there are dots marked on the windings to show how they are connected in relation to each other. The feedback repeatedly passes through the valve, greatly increasing the signal level at the tuned frequency.

The amount of feedback depends upon the coupling between L1 and L2; too little and the regenerative effect is limited, too much feedback and the circuit will break into uncontrollable oscillation. So a method of controlling the feedback is required. Commonly a variable capacitor is placed between the tickler coil and ground to increase or reduce the level of feedback. In this circuit I have used a fixed value capacitor, C5, and control the feedback by varying the gain of the valve.

To vary V1's gain, a potentiometer is used to adjust the voltage on the control grid (g2) of the valve. Avoid old potentiometers with dirty or worn tracks. The feedback control is critical to the operation of the receiver.

A moulded 2.2mH choke (L3) provides an r.f. load in the anode circuit and a pair of high impedance headphones completes the circuit between the choke and the high tension supply. High impedance headphones are not easy to obtain and readers lacking such headphones can use an audio transformer in place of the headphones and use a pair of low-impedance (stereo) headphones.

A suitable transformer would be the LT700, which matches 2kΩ (centre tapped) to 8Ω. These are available from **Bowood Electronics** (1). Another possibility is to

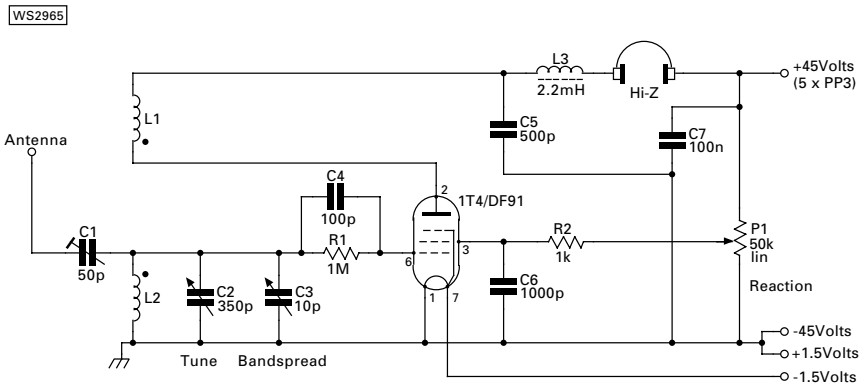

Fig. 1: Circuit diagram for the valved super regenerative reciever.

replace the headphones with a fixed resistor of 2.2kΩ and pick off the audio signal between the resistor and L3 via a capacitor (100nF or greater) to feed an external audio amplifier.

Large Diameter

I wanted to use a large diameter coil former for L1 and L2 following the old regenerative receiver practice to increase the *Q* of the coils. Looking for a former of about 50mm (2in) diameter, I finally settled for using the bottom half of a 250ml plastic bottle, which had previously held Tonic Water. (The contents joined some gin one evening for my wife's nightcap).

With extreme care and a sharp knife, cut off the top and neck portion of the bottle. The resultant former tends to flex a lot when the windings are applied so I slipped it onto an aerosol can for support whilst winding the coils. The windings are shown in **Fig. 2**. I pierced pairs of small holes in the walls of the bottle to secure the end s of the windings. Use 10 turns of 0.56mm (24 s.w.g.) wire for L2 and and four turns of the same wire for L1.

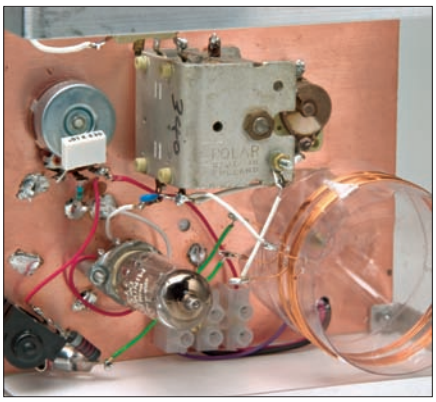

Fig. 2: A large diameter coil former allows high *Q* coils to be wound.

Both windings are close wound (each turn alongside the next) with a gap of about 3mm between the two windings. I spent quite some time experimenting with the ratio of turns on the windings. I wanted to receive the 3.5MHz (80m) band and the winding of L2 achieves that and also allows for the reception of adjacent broadcast bands. I suspect I am slightly over coupling the feedback with 4 turns but readers can try other combinations of windings. The ideal is to achieve controllable feedback over the whole tuning range of L2 and C2 combinations.

Band tuning is very sharp and ideally C2 needs a reduction drive to tune stations smoothly. For easier tuning, I added a band-spread capacitor, which is a lower value capacitor to enable a slower tuning rate when C2 has located the area of interest. The main variable capacitor, C2 was culled from an old broadcast receiver and I happened to have a 10pF variable capacitor; which I found was ideal for the band-spread. In the past I have pulled vanes off a larger value variable capacitor to obtain a smaller value variable for band-spread tuning!

Like any regenerative receiver, this one needs a little skill to operate, especially the feedback control that's often called the 'reaction control'. All the controls interact!

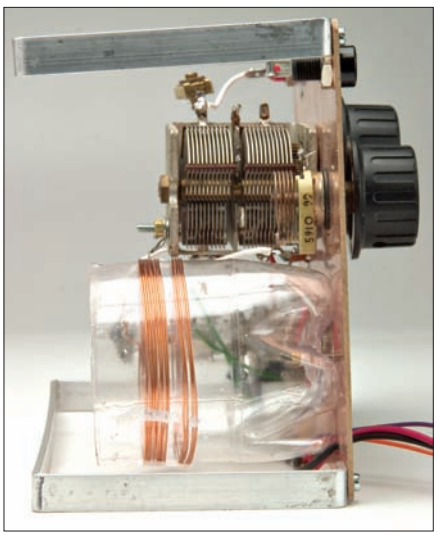

Fig. 3: Both coils can be seen clearly in this view.

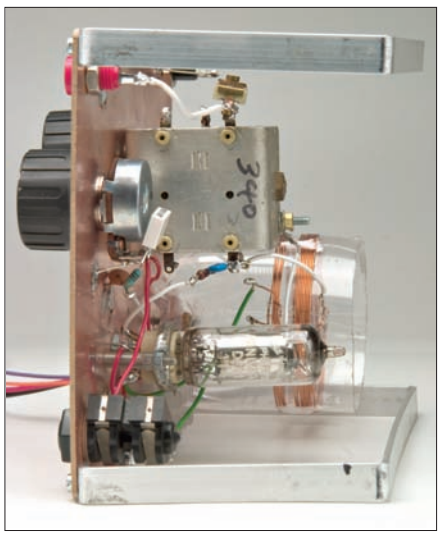

Fig. 4: A clean and simple layout is essential.

Constantly Adjust

Altering the tuning changes the feedback and so the user has to constantly adjust the tuning in relation to the reaction control. Unless you've used regenerative receivers in the past, some practice is required to get the full potential from the receiver. For a.m. signals; increase the regeneration control until the detector is just oscillating. This is indicated by a distinct 'rushing' sound.

Then use the main tuning control to locate some signals. Reduce the reaction control to just below the oscillation point and use the band-spread control to tune in the required signal. Since the tuning and reaction controls interact, it sometimes helps to use both hands; one for each control. The closer the reaction control is set to the point of oscillation, the better the sensitivity of the receiver.

For c.w. (Morse) and s.s.b. (single side-band) signals the reaction control is adjusted to be slightly over the point of oscillation. The bandspread control can be used to adjust the pitch of a c.w. signal or resolve the speech of s.s.b. signals. If the signal input from the antenna is too high, this may damp the regeneration action. The input trimmer can be set according to the effectiveness of the antenna and the strength of the signal.

So, lots to play with here! Plus an excursion back into the earlier days of radio. A simple regenerative receiver is capable of surprising results but they do require a little skill **PW**

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

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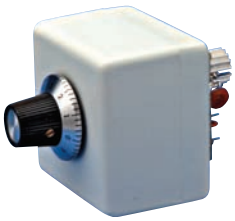

PORTLAND VFO as featured in March 2006 PW. 7-7.2MHz as local oscillator for a direct conversion receiver or transceiver. Otherwise as 7.1-7.6MHz to use in conjunction with a mixer-vfo system as local oscillator for a 4 metre receiver/transmitter with a 9MHz or 10.7MHz IF. The version shown in the article included a PCB for Buffer No 2 with output level to drive diode ring mixers. Also available with Buffer 1 directly compatible with the mixer-vfo in the May issue PW. **VFO PCB with Buffer 1 or Buffer 2 PCB and parts kit with potentiometer £14.50. PCB and parts kit with drilled box £23.50.**

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

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144MHz Contesting

If you think that contest operating means draughty hilltops and late night sessions, think again. Roger Lapthorn G3XBM has a much gentler way of enjoying a contest.

Roger Lapthorn G3XBM with his 'lazy' contest set-up.

Halo on the pole fixed with pvc tape!

... the lazy way!

Many of us remember 20-30 years ago when the 144MHz band hummed with s.s.b. activity on almost every evening and weekend. There was a certain thrill about putting out a long CQ call and then listening hard to hear a weak station replying just above the noise level. The beam was peaked to winkle the signal further out of the noise before the contact was made and entered into the log with some sense of achievement.

Many people used about 2.5W PEP from an FT-290 into a small add-on linear taking this up to 30W PEP. The ubiquitous 9-ele Tonna antenna was a popular choice. With such a station, contacts out to several hundred kilometres were possible in flat band conditions. In lifts this could be extended considerably. The same still holds today with the FT-817 and a small add-on linear, but very few seem to enjoy the chase in the way we did back in the 1970s and 80s.

However, this lack of s.s.b. activity all changes in contests when lots of stations still make for the hills and enjoy the excitement of working new squares and trying to pull in some super exotic DX from

deep in Europe. The September 2005 RSGB Trophy was no exception and this is the story of my lazy approach to enjoying the fun.

My last, half-hearted, 144MHz s.s.b. activity was back in June 2005 for the *PW* QRP contest, which I entered with just a vertical co-linear antenna. A few contacts were made but I really needed a horizontal beam. With an old friend coming to stay with us during the RSGB Trophy weekend, I'd no serious plans for Amateur operating in the contest. But Saturday saw our visitor happy to read his books bought on a shopping spree in Cambridge. The sun was out and I remembered that somewhere in the back of the shed was a, somewhat worse for wear, 144MHz halo. The screws were all rusted and the coaxial cable had seen better days. Now, if I could clean it up, put some new coaxial to it and tape it to the pole on my rear wall I would at least have an omni-directional horizontal antenna, albeit with no gain.

Out came the screwdrivers, pincers and emery paper and inside 15 minutes the rusted screws and nuts had gone and been replaced by shining new ones. In the back of the garage was about 5m of new RG58 50Ω coaxial. Ten minutes later, the coaxial was attached to the halo and it was up on the pole, held in place with pvc tape!

At the shack end - my bedroom table by the way - a small piece of thin coaxial with a BNC plug on one end was found so the free end was stripped back and twisted connections made to the RG58 that came into the bedroom from the halo. A quick listen about 30 minutes before the contest started and there were plenty of stations around tuning up and checking their linear amplifiers. No such problems at the G3XBM end – just the FT-817 at 5W PEP! The match was fine despite the coaxial 'splicing' arrangements, so there was time for a cup of tea before the 1500 start.

FT-817 on the bedroom table.

The first QSOs in the log were with the local club (G2XV/P) and one further away in IO91 square (G3SAD/P). Then a PI9 in Holland was heard, but a quick call resulted in no success. Out came the trusty Morse key and a 519 report resulted. The QSO was lost in QSB but at least this Heath-Robinson station was getting across the channel from Cambridgeshire. In the next hour or so, a string of other UK stations went into the log, although having a visitor meant that I had to go and make some tea and be sociable some of the time!

After tea a G calling 'CQ contest' on s.s.b in IO80 square was heard. He responded to a call on the key - good DX for 5W and a halo I thought. A QSO with an ON4 on s.s.b. then followed. Then to my amazement GM2T right up in the middle of Scotland appeared calling weakly on s.s.b., but audible. A call on the key and he actually heard me! A solid QSO (RST519) went into the log and I retired for the evening having been called by my wife to be sociable yet again!

Next morning, our visitor made tracks back up to Yorkshire after breakfast. Being Sunday, the lawns needed cutting so the next hour was occupied with that - at least the sun was shining. After a quick wash it was back to the FT-817 to see what was about.

In the next 10 minutes, a QSO with GJ4ZUK/P was in the log on s.s.b. followed by GI6ATZ way up in Northern Ireland. I called him on the key but he replied saying his Morse was not too hot, so try s.s.b. as the QSB was coming up. Sure enough I got a 52 report in the log.

At that point I decided that other jobs needed doing in the garden, so I finished my contest activity having spent at most some three hours out of the 24 actually listening and operating. A total of 16 QSOs were in the log in three short, but exciting, sessions with QSOs in six countries and the best DX some 550km up into Scotland.

So, next time you feel like having a go in a v.h.f. contest don't necessarily assume you need 400W and a huge rotatable beam – others may have these and this will allow **you** to work some decent distances without that much effort, especially if conditions are a bit 'up'. Even 5W of s.s.b. and c.w. to a halo will allow you to work plenty of DX and plenty of new squares. So, next time why not give it a go?

PW

Look forward to this year's 144MHz QRP Contest.

It is on **Sunday 11 June 2006**, the date has been agreed with the RSGB VHF Contests Committee to co-ordinate with the second 144MHz Backpackers' session as usual.

The small 'shack' used by GX4ARF/P in last year's contest! Not as comfortable as Roger Lapthorn G3XBM would like!

One station active in IO91GI in Berkshire last year - at least they had a little comfort!

History and

1930s

19th March 1938
Short-wave Radio in Swiss Mountains
Short-wave radio was recently tested on the Swiss mountains for use by Ski-ing Rescue Brigades and the Swiss Army. Portable receiving and transmitting 'stations' were 'worn' by the skiers during the tests and radio direction finding apparatus was brought into use to locate the 'casualties'. An aeroplane, which received instructions while in the air by radio, went to the rescue. during recent tests.

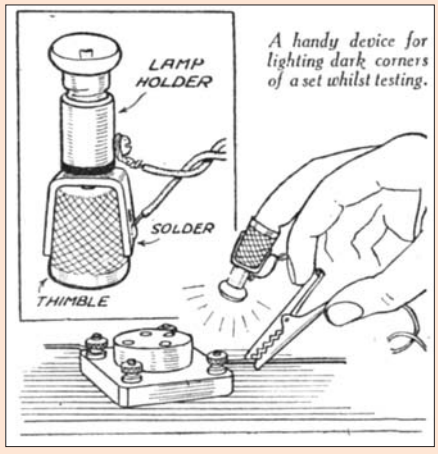
A temporary transmitting station in the Swiss Mountains sending out a call for assistance during recent tests.

6th April 1938
Talking Lamp Posts
It is stated that a suggestions had been put forward and tried out to facilitate traffic movements during a 'black out' arising from an air-raid. The suggestion is that loudspeakers and talking film equipment be fitted to lamps at cross-roads, the film being automatically set in motion with the changing of the traffic lights, and the loudspeaker then announcing clearly the name of the cross street or intersection.

5th May 1938
Certain local councils, we understand, are banning outdoor aerials on the grounds that the average aerial pole is generally of a flimsy nature and renders the landscape unsightly. To combat this band, builders are now stated to be incorporating the aerials and associated leads inside the walls of houses, and communal aerial systems are being so designed for use in flats.

5th September 1936
A Hand Light for Dark Corners
The accompanying illustrations show a device which I use for lighting up dark corners of sets when testing or adjusting. It consists of a bulb holder, a thimble and a length of flex. The feet of the bulb-holder are bent to the shape of the thimble, and then soldered together with one of the leads of the flex. The other lead is taken to the screw on the upper part of the holder.

A bulb is then placed in the holder and the flex taken to battery which can conveniently be placed in a pocket. The thimble is then placed on any convenient finger and wherever the hand goes to make any adjustment, the light goes as well.
Raymond Deane (Harrow)



22nd August 1936
5-Metre Tests on Snowdon

Short-wave amateur transmitters carrying their apparatus to the summit of Mount Snowdon for tests carried out recently.

A number of North Wales amateur transmitters, Messrs G.A. Massey (G6YQ), F.J.E. Starkey (G6KY), J.H. Wood (G5YP) and A.K. Cardwell (2AKD) are climbing to the summit of Snowdon on Sunday, August 23rd to conduct a series of 56Mcs test transmissions. Two transmitters with inputs up to 10 watts, equipped for 'phone and modulated C.W. will be used, operating under the callsign G6YQ/P, between the hours of 9am (0900BST) and 6pm (1800BST).

2nd September 1939
The Ekco 'Pick-me-up' portable - an 8-stage superhet. It measures $11\frac{3}{4}$in by $11\frac{1}{2}$in by $7\frac{5}{8}$in.

A handy device for lighting dark corners of a set whilst testing.

Heritage

1940s

October 1940
A production line at maximum output. Many months of preparation are essential before the first operative starts the chassis on its journey down the line.

December 1940
A transmitting set found in a rubber dinghy from a German bomber which crashed into the sea. It has a kite aerial, and one of the 'umbrella' type. It was used to send out SOS.

June 1960

Club News from 1960

February
Torbay Amateur Radio Society
At the last meeting of the society Mr Launder B.Sc (G3FHI) continued his interesting series of lectures with one on 'Wave Propagation - illustrated by diagrams. For the December meeting G2BMZ carries on the series with a talk on Aerial Arrays.

March
Grafton Radio Society
A large practical workroom offers excellent facilities for construction groups, with expert advice always on hand. The main speciality of this club is the training and coaching of short-wave enthusiasts seriously interested in obtaining an amateur transmitting licence. Members receive practical coaching on the air, using the Club's transmitters (G3AFT) under qualified operators.

April
Kingston and District Amateur Radio Society
The meeting held at the Society's new headquarters on January 18th was a great success. A Junk Sale was held followed by a Brains Trust, whose answers to the questions were very instructive to all present.

May
Coventry Amateur Radio Society
A Receiving and Transmitting contest for 'Cars' members was held on February 19th. Competition is keen for the G2LU trophy, awarded to the member who can read the fastest CW.

A 50MHz Receiver for 50p

Fresh from a car-boot sale, Ed Chicken MBE G3BIK describes what he has done with the cheap radio systems he found there.

Fig. 1: Made in China, these were originally marketed as children's toys.

Unbelievable as it may seem, I recently paid a mere £2 Sterling for two pairs of 50MHz 'walkie-talkie' transceivers complete with 9V PP3 batteries at a local car-boot sale. More surprising still, is that they were in full working order. There were two models, which I will refer to as models A and B.

Made in China, the military-styled radios that I found were originally marketed as childrens' toys. The sets comprising of a single channel receiver and low-power a.m. transmitter working on 49.86MHz. They even incorporate a tone-modulator and Morse-key.

My interest was caught by the receiver, with the possibility of it being modified to cover the 50-52MHz Amateur Radio band. This is a magical band, which despite being v.h.f., does at times open up to world-wide coverage as though it were 21MHz.

This article now gives basic information by which to easily modify these radios for use on the 50MHz Amateur Band, but also gives full circuit and constructional details for a simple to make low-cost super-regenerative receiver to cover that band, based on the receive circuits of these transceivers.

Receiver Section

Modification to the receiver section of either model consists simply of unscrewing the ferrite tuning slug by two turns, then soldering a Varactor tuning diode between the transistor's collector and the negative/ground rail, as shown in **Fig. 1**.

In fact, that would make Model A both receive and transmit on 50-52MHz since it uses the same transistorised variable frequency oscillator for both functions. The single-modification frequency selection, wasn't available with Model B, because its transmitter uses a separate crystal controlled oscillator.

The receiver circuits were found to be of the well known single transistor single tuned circuit super-regenerative design. Basically, the transistor is configured as a self-excited 50MHz LC oscillator, with an RC network in the base-bias circuit, the time-constant of which puts it just above the audio-frequency range.

The outcome of the RC circuit is that it causes the r.f. oscillations to be switched on/off (called self-quenching) at about 20kHz, hence the transistor behaves as an r.f. amplifier operating at peak gain (i.e. immediately before the onset of r.f. oscillation) some twenty thousand times per second.

Supersonic Switching

Because of the supersonic switching, the circuit thereby behaves as a very sensitive r.f. amplifier and detector, which can resolve both amplitude and frequency modulated signals. The one and only resonant LC circuit tunes the incoming radio signals, factory-set to 49.86MHz.

Audio signals recovered by the detector are low-pass RC filtered to divorce them from both the r.f. signal frequencies and the self-quench low frequency. The filtered audio is then passed to a two-transistor audio-amplifier, which drives a small loudspeaker.

On transmit, the loudspeaker is used as a microphone in association with the audio-amplifier, which then serves as the transmitter modulator. The amplifier also acts as a keyed tone-generator for the transmission of Morse code.

The antenna system on the original radios, is a rather poor affair. It consists of a short 'rubber-duck' antenna made from what resembles curtain-wire and is made to be resonant at 49.86MHz by an in-series ferrite-cored coil.

So as a feasibility study, one of the receivers was very simply and quickly retuned to be within the 50-52MHz Amateur band by two anti-clockwise turns of the ferrite slug in the LC tuned circuit, and similarly for the antenna's series coil. Then, a Varicap diode arrangement was connected between oscillator's collector and 0V as a convenient method by which to tune over the whole band.

Worked Fine

The resultant modification worked fine! But there's not a lot of internal space for the tuning potentiometer so mine is fixed on the outer case with hot glue! The circuit diagram shows my final home-built receiver circuit for reception on the Amateur 50-52MHz band.

The circuit is similar to that of the original toy military-transceiver, but with the addition of the Varicap tuner, an antenna-coupling link, and the use of a

more readily available type of transistor.

As a receiving antenna, I improvised a 50MHz dipole using nothing more than a length of TV coaxial cable. Alternatively, a random-length wire antenna could be used, but with a low value variable capacitor in series at the end nearest the receiver by which to tune the antenna wire for maximum received signal.

In practice, the 20pF f.m. sections of a miniature a.m./f.m. tuning capacitor (such as the Maplins type AB11M) worked fine with my own long-wire antenna.

Finally, I have since bought a pair of children's 27MHz CB transceivers, but that's another story! **PW**

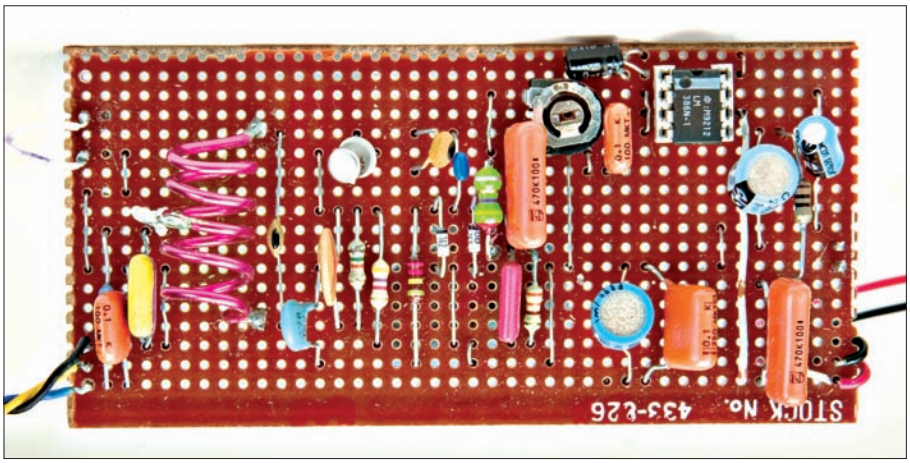
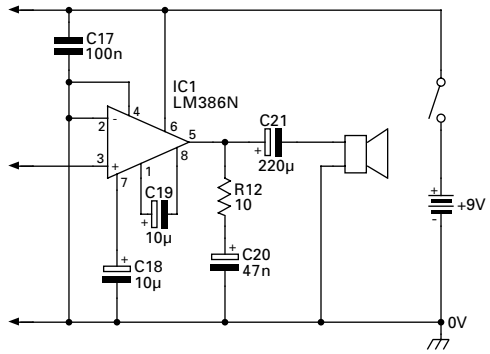
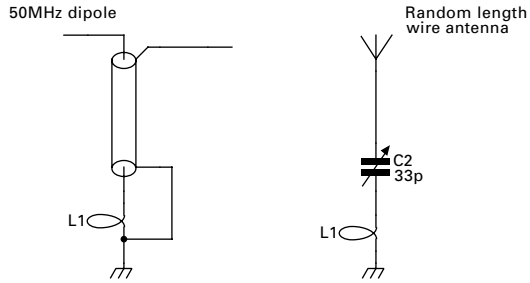


Fig. 2: The simple receiver coupled to the i.c. based audio amplifier, built on a Vero board.

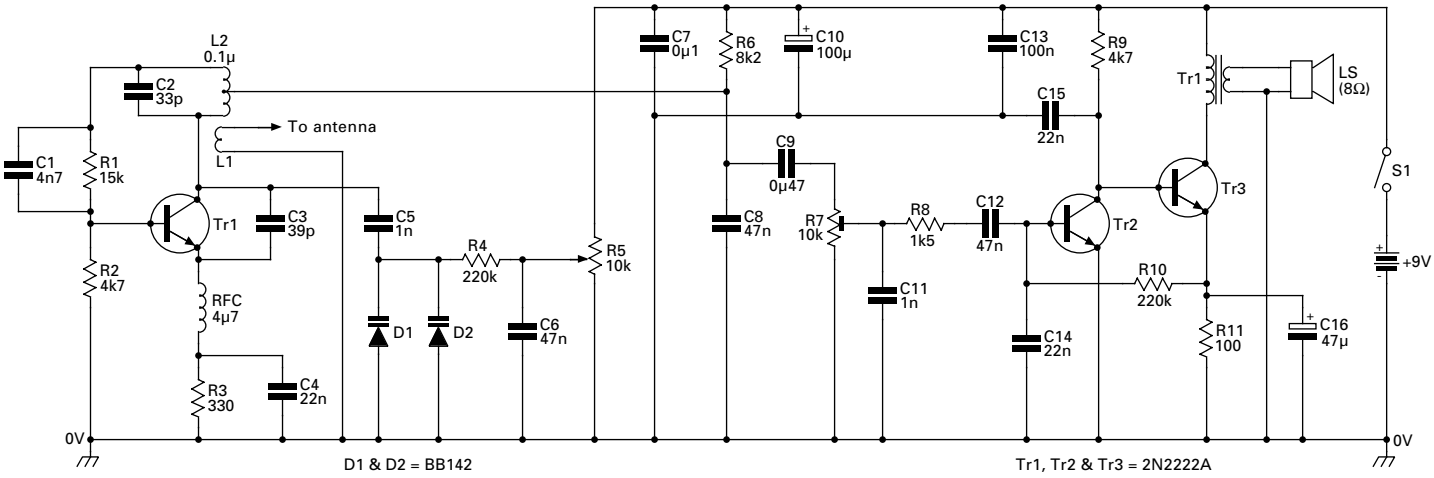
Inside the original radio. The Morse 'key' is low right on the p.c.b.



An alternative audio amplifier.



Two simple ideas for more effective antennas.



The regenerative receiver couples to a simple audio amplifier in the original circuit. It's easily re-tuned to 50MHz.

VHF DXer

REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

THIS TIME AROUND DAVID BUTLER G4ASR TAKES A LOOK AT THE 70MHZ BAND

It was very good to receive reports of excellent propagation openings that occurred on the 70MHz band during January. Stations mentioned making contacts via Aurora (Au), Meteor Scatter (m.s.), Sporadic-E (Sp-E) and tropospheric enhancement (tropo). The Radio Society of Great Britain (RSGB) v.h.f. Contest Committee had also organised a series of 70MHz activity contest periods that commenced in January. These created a large amount of activity throughout all of the UK regions.

Auroral backscatter openings were reported on January 2 around 2055UTC, on January 23 at 1300UTC and on January 26 again around 2055UTC. Most openings were rather brief and fairly weak but they did enable a few c.w. and s.s.b. contacts to be made with stations in central and northern parts of the UK.

The Quadrantids meteor shower that occurred between December 28 - January 7 (with shower maximum on January 3) created an opportunity for DX contacts to be made with stations in Croatia (9A), Denmark (OZ) and Slovenia (S5). Contacts using JT6M a machine generated modulation (m.g.m.) system were made with stations such as OZ1DJJ, S59MA and 9A1Z. **Ken Osborne G4IGO** (IO80) reports that on January 20 he made a JT6M contact with CT1HZE for a first valid 70MHz QSO with Portugal. At 0955UTC on January 29 the station of **Paul Higginson GW8IZR** (IO73) also contacted CT1HZE via meteor scatter to claim a first GW-CT 70MHz QSO.

Currently, the only authorised frequencies in Portugal are two 12.5kHz wide channels centred on 70.6125 and 70.6250MHz. Portuguese stations using c.w., m.g.m. or s.s.b. therefore transmit in a band lying between 70.607-70.630MHz, which is outside of the UK allocation. Stations in the UK need to operate in split mode, transmitting typically around 70.1MHz and receiving around 70.6MHz. The only problem is that you may receive interference from UK fire services that use similar frequencies.

Only one Sporadic-E opening was reported during the month but it was particularly good as it was to a new DXCC country that hadn't been worked by many UK stations. Between 1615-1830UTC on Sunday January 29 the band was open to Portugal (CT) and a number of stations in England and Wales picked up new locator squares and a new country.

Daran Josey 2W0CDJ reports having an excellent day on January 29. In the morning he participated in the two hour RSGB activity contest and was very pleased to work 18 stations via tropo propagation. Later that day at 1725UTC he contacted the station of CT1HZE (IM57) via Sp-E with 57 signals both ways. Daran then went on to make an s.s.b. contact with the station of CT1FFU (IM59) receiving a 55 report.

Joe Kraft CT1HZE mentions that he is now looking for schedules in c.w., s.s.b or JT6M, especially with stations in EI, GD, GI, GJ, GM and GU. He is running a 6-element Yagi with good power and can work UK stations using 50-100W and a 3-element beam via sporadic meteors. So if you fancy making a first ever QSO with CT send an E-mail to Joe at **funk-telegramm@t-online.de**

TROPO CONTACTS

Ross Wilkinson G6GVI mentions that he had a good year on 70MHz in 2005 making a total of 887 QSOs with 207 stations, the majority of these being on f.m. On January 15 he was active in the first two hour activity contest as G6GVI/P from Winter Hill, Lancashire. He reports making 20 contacts in the first hour but only seven in the second hour.

Using 25W to a 2-element Yagi, Ross managed to get down to the south coast of England and up into Scotland. Surprisingly only four stations were on f.m. and none on a.m., all the rest were on s.s.b. with two newcomers using transverters in which the solder had hardly cooled!

Ron GW4EVX also had a very enjoyable Sunday morning contest session and reports that it was encouraging to hear such a good level of activity on the 70MHz band. He made 16 contacts in the first hour and another 16 in the second, the last one timed at 1156UTC. Seven stations were worked on f.m. by using a 5λ8 vertical antenna.

Tropospheric propagation was very good on January 31 when an area of high pressure was situated over the UK and Scandinavia. Stations in central and southern England reported making s.s.b. contacts with Danish stations such as OZ1BNN, OZ2LD, OZ2SYV and OZ3ZW. In Scotland the station of GM4AFF reported making crossband contacts from 70MHz to the 144MHz band with PE1MZS (JO21) and PA5DD (JO22).

BAND PLAN FOR 70MHz

The 70MHz band is a special allocation granted by the UK administration in the 1950s. The initial allocation was only 200kHz wide but this was later increased then subsequently decreased to the present 500kHz bandwidth between 70.0-70.5MHz. In the UK the band is allocated with Secondary status and is available on the basis of non-interference to other services outside of the UK. The power limit is 160W (22dBW) and permitted modes are Morse, telephony, data, facsimile (FAX) and radio teletype (RTTY.).

70.000 - 70.050MHz

This area of the band is allocated to beacon stations. In the UK it is permissible to operate unattended beacons and the frequency 70.030MHz is recommended for this purpose. The primary purpose of beacons is the checking of propagation conditions both for every day amateur use and for special propagation research projects.

70.050 - 70.250MHz

Narrowband modes (in common with all v.h.f., u.h.f. and microwave band plans) are always found at the bottom of individual allocations. This is where you will find Morse (c.w.), telephony (s.s.b.) and machine generated modulation (m.g.m.) activity. Listen on and around 70.200MHz, the combined c.w. and s.s.b calling frequency for national activity. When the band is open DX activity may be found around 70.200MHz or 70.100MHz.

70.250 - 70.294MHz

This area of the band is allocated to All Modes with a maximum bandwidth of 12kHz. The 70MHz band is unique insofar that it still has an a.m. calling frequency on 70.260MHz.

70.294 - 70.500MHz

This section of the band is allocated to All Modes channelised operation where both telephony and digital modes exist. These are narrowband f.m. (n.b.f.m.) channels with 12.5kHz spacing and in this sub-band area you'll find f.m. telephony, packet radio, FAX, RTTY and Internet gateways.

Incidentally, although the majority of

Colin Redwood G6MXL operating his portable 70MHz station.

channels in this sub-band are 'allocated' to digital modes, Internet gateways or emergency communication groups that does **not** mean you cannot use them for f.m. telephony. It's simply a case of listening on these channels to ascertain **locally** whether they are in use or not. If you hear no other traffic then you may conduct your contact on any channel you wish to use.

INTERNATIONAL ACCESS

During recent IARU conferences the submitted papers urging other Region 1 v.h.f. managers to approach their authorities to seek access to the 70MHz band. Prompted by this, a number of administrations within IARU Region 1 have now granted Radio Amateurs access to the band.

In 1998 Slovenia (S5) signed up to the CEPT agreement obtaining access at 40 and 70MHz. Their Four Metre allocation of 70.000 to 70.450MHz is based on the UK band plan with a maximum power output of 100W. Incidentally, the allocation between 40.660-40.700MHz is for propagation beacons only.

Slovenia is located at an ideal distance from the UK for a number of propagation modes including aurora, meteor scatter and Sporadic-E. Many Slovenian stations are now active on the 70MHz band and some of them operate on f.m. as well as c.w. and s.s.b. and therefore can be worked on converted private mobile radio (p.m.r.) sets.

The station of OX3LX reports that in August 2003 he sent an application to the authorities in Greenland (OX) requesting access to the 70MHz band. On 19 September 2003 he was informed in writing that Amateurs in Greenland could now use 70.000-70.500MHz with an output power of 1kW!

In December 2003 the Official Gazette of the Republic of Croatia (9A) announced that effective from December 26 an allocation between 70.000-70.450MHz has been granted to Croatian Radio Amateurs. The modes of c.w. (A1A), s.s.b. (J3E), r.t.t.y. (F1B) and packet/data (F2D) have been allowed with a power limit of 10W output.

Since 2003 South Africa (ZS) has had an allocation between 70.000 to 70.300MHz with a maximum power of 400W output. Their band plan has DX sections for c.w. and s.s.b. modes between 70.030-70.150MHz and 70.200-70.300MHz.

In 2004 the station of OY9JD was granted a permit by the Faroe Islands (OY) National Telecom Agency to use three frequencies 70.025, 70.050 and 70.100MHz on c.w. with a power output of 25W. He prefers to operate on 70.100MHz and is looking forward to working some stations soon via aurora or Sporadic-E propagation.

From February 2004 Radio Amateurs in Denmark (OZ) are now allowed to use segments in the 70MHz band without a special permit. A few stations with permits had been active on the band since July 2003. The allocated band segments are 70.0125-70.0625, 70.0875-70.1125, 70.3125-70.3875 and 70.4125-70.4875MHz with a power output of 25W. As the c.w./s.s.b. calling frequency 70.200MHz is not available in Denmark the frequency 70.100MHz has been nominated instead. Beacons are allowed in the band 70.0125-70.0500MHz and OZ7IGY has been operating on 70.021MHz since November 2003.

In January 2006 the Portuguese authorities issued a number of special 70MHz permits. The good news is that three DXCC countries CT (Portugal), CT3 (Madeira) and CU (Azores) are included. As I've already mentioned contacts have already been made with UK stations transmitting in the narrowband sub-section 70.050-70.250MHz and receiving CT stations around 70.625MHz.

KEEP UP TO DATE

At the beginning of 2006 there were 20 DXCC countries (CT, CT3, CU, EI, G, GD, GI, GJ, GM, GU, GW, OX, OY, OZ, ZB, ZC, ZS, S5, 5B, 9A) with authorisation to use the 70MHz band and by the end of the year there could well be a few more. To keep up-to-date with recent developments take a look at **www.70mhz.org** This website created by Stewart GM4AFF and Allan GM4ZUK and maintained by Ross G6GVI has up to date details of international allocations, band plans, beacons, contests, equipment and station reports.

Similarly you can register at **http://groups.yahoo.com/group/fourmetres/** to participate in a 70MHz E-mail reflector. There is a similar group for Northern Ireland operators at **http://groups.yahoo.com/group/northern-ireland-4metres/**

DEADLINES

That's it for this month. Keep a look out for the first signs of Sp-E on the 70MHz band. It should appear in four to five weeks time.

Thank you for your reports. Please keep sending them in to the address given at the top of the column by the last weekend of the month.

73, David G4ASR

DAVID BUTLER G4ASR
YEW TREE COTTAGE
LOWER MAESCOED
HEREFORDSHIRE HR2 0HP
TEL: (01873) 860679
E-MAIL: g4asr@btinternet.com

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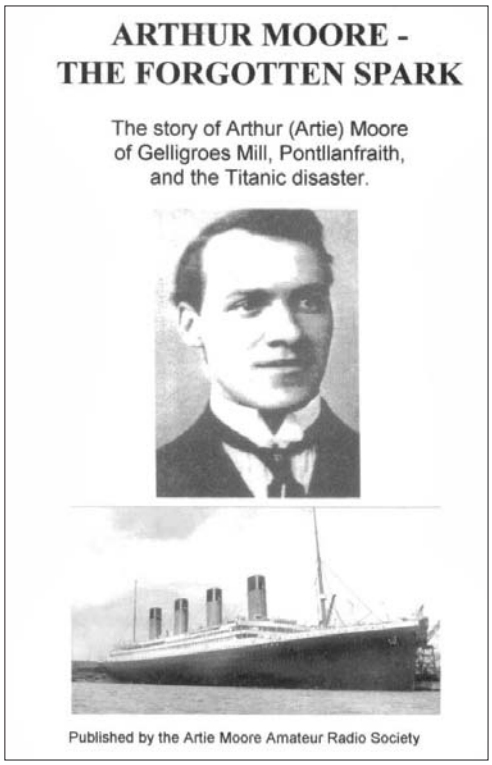
HF Highlights

AS USUAL, INFORMATION, REPORTS AND PHOTOGRAPHS TO ME PLEASE BY THE 15TH OF EACH MONTH.



This interesting publication is available from GW0LBI.

An interesting publication called *Arthur Moore – The Forgotten Spark* landed on my desk this month and it was written by former HF Highlights columnist **Leighton Smart GW0LBI**. Artie was born in 1887 and by the age of ten had developed an interest in engineering. In his teens he entered a competition in *The Model Engineer* magazine and won a book entitled *Modern Views of Magnetism and Electricity*. This must have fired Artie's imagination because his attention was diverted from engineering to the new science of wireless. Later, he was to become well-known for receiving the very faint distress signals from the ill fated RMS *Titanic* at his home in Gelligroes Mill, near Blackwood in Gwent. Artie later joined Marconi as a draughtsman and at the outbreak of the First World War became a technician supervising the installation of wireless equipment in warships.

Now I don't want to spoil the whole story, as I am sure many of you will be interested to read it for yourselves. If so, drop a line to **Leighton at 33 Nant Gwyn, Trelewis, Mid-Glamorgan CF46 6DB** enclosing **£2.50,** which includes postage for your own copy.

DX NEWS

On to this month's DX news and to Japan where the call **8J3UKB** will be used to celebrate the opening of Kobe Airport whose International airfield indicator is the three letter code UKB. Operations will run on h.f. until the end of the month so, you should have enough time to listen out for them when conditions improve. You can QSL via the JARL Bureau. Kobe Airport, has one 2500m runway and was constructed on the 272 hectare wide area of reclaimed land about three kilometres south of Port Island. It expects to cope with more than 3.4 million passengers this year.

If you need to work Egypt on 'Top Band' Hans Personn SM0CFO is now active using an Icom IC-736 'barefoot' with 100W to a dipole as **SU9HP**. Listen out for him on 1.8MHz between 1945-2300UTC and you have until early April to work him, as he is due to return to Sweden then. QSL to **Bergengatan 4, 8tr, 16435 Kista, Sweden.**

One that may be of interest closer to home is from the Island of Jersey EU-013 where operators Jim Spears Jnr N1NK, Craig Hill K3PLV, Peter Treml K8PT and Tom Martin W8JWN will be active signing MJ/homecall from the 15-18th March. The bands and modes of activity were not available as I put the column together but all QSLs go via their home callsigns.

QSL UPDATE

On to some QSL information now and if you have worked S79RRC/A, S79RRC/F, S79EC or S79NAN your card should now go to **Eugene Shelkanovtcev, 302028 Orel, PO Box 70, Russia** as Albert Bailey K8SIX and Russell Wilson VE6VK have run out of cards.

SPECIAL EVENT NEWS

There are two special event calls to look out for from Sweden over the coming months. The first

CARL GW0VSW ROUNDS UP ALL THE LATEST NEWS FROM THE HF BANDS

is **8S30JC**, which will be aired throughout 2006 on all h.f. bands to celebrate the 30th anniversary of the Western Blekinge County Radio Amateurs who normally use the callsign **SK7JC**. If you work them you can QSL via the bureau or direct to **Vaestra Blekinge, Saendareamatoerer, Aadalsvaegen 28, SE-375 33 Moerrum, Sweden.**

The second special event call to look out for is **SA2006EM** and will be aired by SK6AG and SK6AW on the 6 April, 6 May and 6 June during the countdown to the 19th European Athletics Championships that will be held in Goteborg on 6-13th August. You will find information on the championships at **www.goteborg2006.com**

Also from 1 July through to the 13th August they will operate as **7S6EM** and **8S6EM**. A diploma is being offered and comes in two versions. One is for working the stations and the other for s.w.l.s. You get 20 points for working SA2006EM and 10 points each for working 7S6EM and 8S6EM. Other points can be gained by working SM6/SA6/SK6/SL6/7S6 and 8S6 stations for 5 points each and all other SM/SA/SK/SL/7S and 8S count for 2 points each. You need to work or hear at least two different callsigns to qualify for the diploma on the days mentioned earlier.

The application fee is 5 Euros and QSL cards are not required. Just send a return envelope marked **EM2006** to help with the sorting of incoming mail with a copy of your logbook and the fee to **Rickard Dahlstedt, Ekebergsgatan 4D, 417 02 Gothenburg, Sweden**. For direct QSLs they will need a self addressed envelope and either 1 Euro or $2 though cards will not be printed until the end of the event. Further information will be found at **http://sm6.se/em**

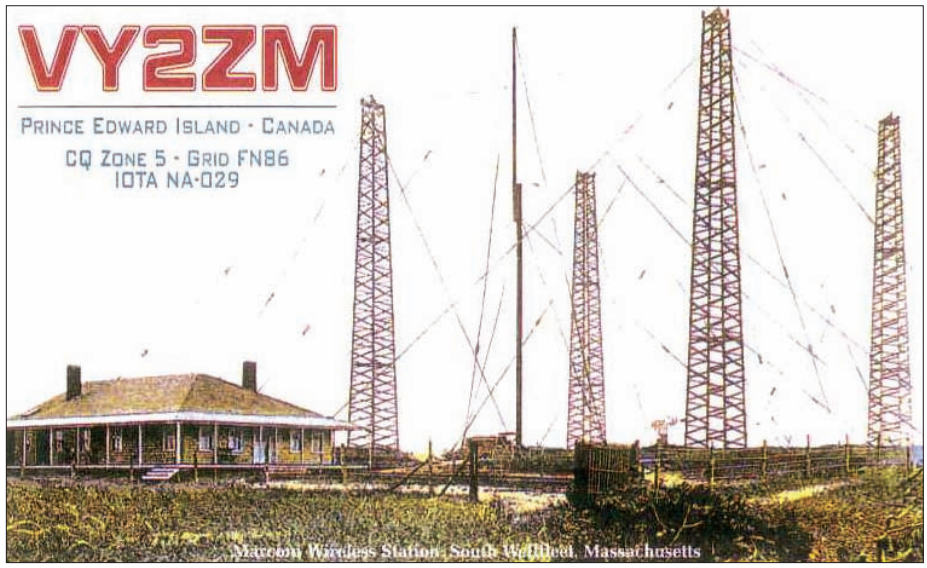
YOUR REPORTS

On to your reports and first off this month is **Ted Trowell G2HKU** on the Isle of Sheppy, Kent who tried 1.8MHz around 2200UTC working OK2PEX (Czech Republic), UA2FCB (Kaliningrad) and W1MK (USA) Rob in Boxford, Massachusetts using his Ten-Tec Omni V and full size G5RV. Ted say's "I was surprised to work the W1 on this band because my antenna is only 20ft high and the bottom 10ft of 300Ω feeder is tucked away inside a conifer tree. Neither the G5RV or the conifer seem to mind this arrangement, which has worked well for me over several years of operating".
In Worcester Park, Surrey is **Eric Masters G0KRT** fired up his Kenwood TS-570 and running 100W into an 84ft end-fed wire antenna with a loading coil attached and tuned by an SGC230 auto tuner. Eric was pleased to hear and work Jeff VY2ZM (Canada) on Prince Edward Island NA-029at 2208UTC and receive

a 599 report. Not bad for his 'first' transatlantic QSO on that band.

The QSL card has already arrived and it's a reproduction of an old postcard showing the wireless station built in 1903 in South Wellfleet by Guglielmo Marconi and site of the first transatlantic wireless message. Rather appropriate in this case. Today, all that remains of the station is some rubble and a few signs giving information on the 'earlier' achievement.

Moving on to 3.5MHz now where Ted logged S50A (Slovenia), T99C (Bosnia & Herzegovina) and HB9RE (Switzerland) around 2100UTC while Eric G0KRT switched to a Yaesu FT-817 for some 5W c.w. QSOs with OK1FK (Czech Republic) 0641, DL3XK (Germany) 0729, ON6WJ (Belgium) 0741 and IZ1GAR (Italy) at 2213UTC.



Eric Masters G0KRT worked VY2ZM and received this splendid QSL card for his trouble.

THE 7&10MHz BANDS

On 7MHz **Martin Addison M3JUQ** in East Finchley, North London used his Yaesu FT-840 and ran 10W s.s.b. into a folded half-size G5RV making a long list of countries including DL4FF (Germany) 0823, F5PRR/P (France) 0826, I3THJ/P (Italy) operating from the Castello Superiore di Barge at 0855, EI9HC (Ireland) 0943, ON4UMO (Belgium) 1126, EA4ADM (Spain) 1745, 9A650C (Croatia) 1808, LA0HK (Norway) 1834, S56ZDA (Slovenia) 2030, T77EB (San Marino) 2046 and YO7LID (Romania) at 2102UTC.

On the key once again **Ted G2HKU** found EA6BH (Balearic Islands) EU-004 at 1700 followed later by T99C (Republic of Bosnia & Herzegovina), K1AR (USA) John in Windam, New Hampshire and EA8/DL9KVR (Canary Islands) AF-004 around 2100UTC.

The 10MHz band is often neglected but does carry a good deal of good DX when it is open and often without the huge pile-ups you hear on other bands! Welcome to new reporter **Mark Waldron M0BLT** who lives in Kingswinford, near Dudley and spends a good deal of his time here even when the band appears to be closed! Running just 5W from a Yaesu FT-857 and using half-size G5RV Mark worked CT4CH (Portugal) 1157, F9KP (France) 1256, DL8KFO (Germany), HB9BMD (Switzerland) 1523, ZB2FK (Gibraltar) 1447, OM3RRC (Slovak Republic) 1513 and LA2MAO (Norway) 1523UTC.

THE 14MHz BAND

On to 14MHz and Cumbria where **Roy Walker 2E0RAF** sent in a huge log of QRP contacts using a Yaesu FT-897 transceiver and 5W into an 80m wire loop just above ground. Pounding the key OK2MSS/Q (Czech Republic) 0910, IS0PEV (Sardinia) 0923, (RA9JG (Asiatic Russia) 0945, HB9DNB (Switzerland) 0946, DF4ZU/M (Germany) 1008, LA7BJA (Norway) 1021, OE6BMG (Austria) 1139, YU150NT (Serbia & Montenegro) 1321, OH0GZ (Aland Island) EU-002 at 1330, UT7CQA (Ukraine) 1440, K1RM (USA) Vincent in Plainville, Connecticut at 1459 and EW8AO (Belarus) at 1500UTC all made his logbook.

In Biggleswade, Bedfordshire **Owen Williams G0PHY** made just one contact, 6W/HA7TM (Senegal) at 1114UTC using his Yaesu FT-757 and 100W s.s.b. to a dipole antenna. This was not a 'new one' for Owen but he was pleased to "crack the pile-up" quite quickly as band conditions began to lift.

Another s.s.b. operator is **Martyn Medcalf M3VAM** in Chelmsford, Essex who uses an Icom IC-746 and long wire antenna with SGC-237 auto tuner for his h.f. activities. Despite getting ready for a well earned holiday Martyn, found time to work EA3AHH (Spain) 0911, IO1HOC (Italy) 0913, YO/F6AJA (Romania) 1021, OE50AJN (Austria) 1246 and SP0TPX (Poland) at 1337UTC.

In Nuneaton **Chris Colclough G1VDP** had voice contacts with JY3ZH (Jordan) 0707, ZA/SP5EAQ (Albania) 0709, EW6GF (Belarus) 0844, C31ZM (Andorra) 1025, K0ARY/VP9 (Bermuda) NA-005 at 1347 and FY5GF (French Guiana) at 1848UTC using his Cushcraft MA5B mini beam and Yaesu FT-1000 Mark V Field.

THE 18MHz BAND

Moving to 18MHz now and Chris found conditions 'fair' logging on s.s.b. Z35W (Macedonia) 1009, 5Z1A (Kenya) 1432 and 6Y3R (Jamaica) NA-097 later at 1645UTC and Owen G0PHY added CO8LY (Cuba) NA-015 to his log at 1541UTC while in London Martin lists LY2PX (Lithuania) 1200, K8CW (USA) Alan in Mansfield, Ohio at 1513 and IW9GXQ (Italy) at 1520UTC.

THE 21&24MHz BANDS

The higher bands also showed some improved activity and Chris lists QSOs with Z2/UA4WHX (Zimbabwe) 0922, A61C/ND (United Arab Emirates) 1036, VU2DSI (India) 1239, VP8LGT (Falkland Islands) SA-002 at 1248 and A41MX (Oman) at 1308UTC.

Welcome to another new reporter, **Stephen Welton G7BXU** who lives in Reading and runs a Kenwood TS-570 with a home-made G5RV antenna at 25ft. Voice contacts on 24MHz included SV9COL (Crete) EU-015 at 0935, 5B4AHY (Cyprus) AS-004 at 1027 and KB4CIT (USA) Ted in Rockingham, North Carolina at 1456UTC followed later by EA8BWL (Canary Islands).

THE 28MHz BAND

There was only one report this month for 28MHz and that was from Chris G1VDP who said "Propagation was very poor" even though he managed to find FR1AN (Reunion Island) AF-016 at 0908, LZ1HB (Bulgaria) 1008, UT4IYZ (Ukraine) 1011, EK6YL (Armenia) 1024, 6W1EA (Senegal) 1034 and ZS6BRZ (South Africa) 1038UTC before the band closed.

SIGNING OFF

Well that is it for another month and thank you to all our reporters for sending in their logbooks this time around. They show that most of the h.f. bands were open at sometime or other during the day so maybe things are looking more promising now for the coming months. My thanks also to **Tedd Mirgliotta KB8NW** editor of the *OPDX Bulletin* and **Mauro Pregliasco I1JQJ/KB2TJM** editor of the *425 DX Newsletter* for the DX information. Until next time have a good DX filled month.

73, Carl GW0VSW

CARL MASON GW0VSW
12 LLWYN-Y-BRYN
CRYMLYN PARC
SKEWEN, WEST GLAMORGAN SA10 6DZ
Tel: (01792) 817321
E-MAIL: carl@gw0vsw.freeserve.co.uk

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In Vision

Use the 'Analogue In' port of a digital camcorder as an easy way to capture a computer generated test card for later replay and transmission.

There have been E-mails circulating around the British Amateur TV Club (BATC) committee during January were dominated by finalising the next edition of the club's magazine *CQ-TV*, the continuing (at the time) search for a suitable place to hold a General Meeting this year and - would you believe – an intense discussion on font sizes - yes font sizes for E-mails! Let's say no more about that! But we can say more about a General Meeting.

A General Meeting needs much planning, the first two decisions are to find a venue and appoint an organiser. It also needs a weekend clear of other radio-related attractions. Unfortunately, *CQ-TV* had to be sent to press with no mention of any meeting so it was perhaps with sighs of relief all round when **Ian Waters G6KKD** offered a village hall in Quy near Cambridge. There is a hotel and pub nearby, so this is a clearly a viable offer!

If this is accepted and firmed up, the BATC just needs an organiser and date; to help decide this, treasurer **Brian Summers G8GQS** has circulated a spreadsheet with all published rallies indicated and space for BATC committee to indicate their availability or not. The idea is to settle on a weekend free of any other 'competition' and when maximum manpower is available. In February's In Vision, I put forward four potential propositions for the general meeting. Well, I have had 'phone and E-mail messages of support for these so, thanks to those who responded. So, whenever the BGM does happen, it might be more lively than usual.

PRACTICAL TOPICS

Turning to more practical topics and Ian G3KKD has been making a new Alford Slot antenna for the Cambridge repeater GB3PV. This type of antenna is commonly used on ATV repeaters as it delivers a horizontally polarised signal with a circular radiation pattern. Unfortunately, the Cambridge antenna was producing a signal much lower than normal so a new Slot was made to the original design. Even so, the VSWR proved rather high so, Ian set about some improvements.

Ian's first step was to purchase some genuine 50Ω semi-rigid line. Tests then showed the antenna as inductive so, two small copper plates, separated by just 4mm, formed a capacitor across the slot's feed-point. Finally, a variable matching section of more 50Ω line, some copper tube and water pipe achieved a VSWR of near 1:1 at the repeater's transmit frequency. In case anyone is wondering what had happened to the old antenna, it was found that the feeder had become detached from the slot - hence the need for strong mechanical joints, as well as good soldering!

Still on things practical, are any of you building theG8SUY 24cm transmitter kit? I must admit that progress on the G8EMX version is at the moment slow, no fault of the kit, just other projects constantly intervening! And those surface-mount components really **are** small aren't they!

TWO CONTRIBUTIONS

The BATC Repeater Liaison and licence co-ordinator **Graham Shirville G3VZV** puts two contributions into the club's February magazine. He says in 2007 or 2008 a new Columbus module will be added to the *International Space Station* (*ISS*); Columbus will be carrying ATV thanks to the funding of two dual-band antennas, 1260-1270MHz uplinks and 2400-2450MHz downlinks.

Graham explains: "The addition of these new frequencies will enable us to establish wideband and video operations for the first time. This will provide ATV facilities for school contacts and continuous transponder operation".

The antennas will be fitted underneath the Columbus module so that they face the Earth (a distinct advantage) and will be of a unique design. Because space on the space station is obviously very limited, the antennas will be 'patches' only a few millimetres thick and fitted to the Meteor Debris Panels protecting the hull. The project is also using the Autononomous Transfer Vehicle for transporting equipment to the ISS, unfortunately also called ATV - to avoid confusion, Amateur television will be referred to as the Amateur Video System, or AVS!

Coming back to Earth, Graham reports on the current state of the ATV repeater network. As at January there were 29 on the 23cm band, 12 repeaters used 13cm (2.4GHz) and ten served at 3cm (10GHz). In his repeater news Graham Shirville includes the repeater maps from the Repeater Management Committee's website, and what continues to be obvious is the continued absence of any ATV repeater near or in Birmingham.

Now this is an old topic, a 24cm repeater was considered many years ago, but with potential problems from CAA radar the project never progressed. From January 1 2006 the Office of Communications (OFCOM) took over the administration of Amateur Radio licences so, maybe, it is time to try for a 2.4GHz repeater, which might be easier to gain approval.

GRAHAM G8EMX UPDATES US ON THE RECENT BATC COMMITTEE MEETING

LEICESTER REPEATER GROUP

I received the newsletter of the Leicester Repeater Group (LRG) by E-mail on deadline morning for In Vision. The group runs two microwave beacons - **GB3LES, 'LEX** and four repeaters - **GB3UM** on 50MHz, **'LE** on 70cm, **'CF** on 144MHz and ATV repeater **GB3GV** on 24cm.

It's unfortunate that, other than listing the keeper, the newsletter makes no mention of 'GV, so allow me to do so here; location - Markfield, co-sited with voice repeaters, output 1316MHz, input 1249MHz, CTCSS tone 77, Alford Slot omni-directional antenna, testcards cycled when not accessed, last known transmitter Worthing 1W drive feeding 'black brick' p.a. Access by standard f.m. ATV transmission. In his 'Chairman's Chatter' **Geoff Dover G4AFJ** states: "At the start of this year we had only two out of our four repeaters operational. Now we have four working well".

So, let's hope for some ATV activity then!

See you next time,
Graham G8EMX

GRAHAM HANKINS G8EMX
17 COTTESBROOK ROAD
ACOCKS GREEN
BIRMINGHAM B27 6LE
E-MAIL: g8emx@tiscali.co.uk

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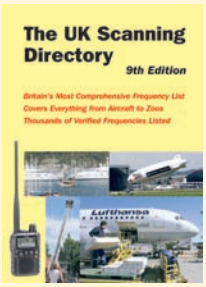
RADIO BOOK STORE

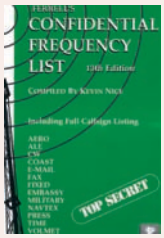
UK Scanning Directory - 9th Edition



This book will not disappoint!

The UK Scanning Directory is Britain's largest and best selling VHF/UHF frequency directory and the undisputed leader in the field. No other book dares to list so many frequencies and in such great detail. Only 19.75

Ferrell's Confidential Frequency List

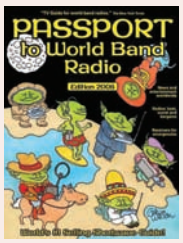


The 13th Edition of 'The Definitive HF Utility Guide' has been updated and includes MIL-STD-PSK modes, high speed HF E-mail services, extensive callsign listing, international call allocations, utility abbreviations and much more. **£21.50**

Klingenfuss 2005/6 Guide to Utility Radio Stations + FREE 2006 Supplement

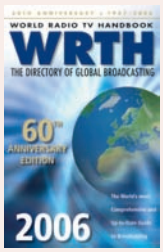
One of the most comprehensive, reliable and up-to-date manuals containing over 11,200 frequencies, 1900 stations, meteo radiofax, radiotelex and NAVTEX schedules, abbreviations, frequency allocations and radio regulations. **£30.00**

Passport to World Band Radio 2006



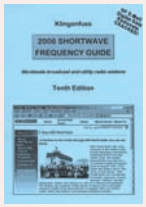
This book includes what's on world band radio, what to buy, how to get started and is written to make interesting reading. It contains a mix of articles, from an idiot's guide, to a five-minute start and ten easy catches to best times to listen. It also has a channel by channel guide to what's on the air. Everything the short wave broadcast listener needs to know. **£17.50**

World Radio TV Handbook 2006



A handy reference book that contains the names, addresses, programmes and frequency details of radio stations all round the world. Radio stations are listed under the country and all countries are split up into continents making it much easier to turn to the station you need. Also included are articles on HF broadcasting conditions, radio reviews and a section on how to use the book. **£22.50**

Klingenfuss Shortwave Frequency Guide 2006



Tenth Edition, 500 pages. There are over 9,000 entries covering broadcast stations world-wide and 10,000 entries covering utility stations world-wide. **£23.00**

Radio Listeners Guide

This handy annual publication contains radio product reviews and general information for listeners. Frequencies and locations of radio stations all over the UK and Ireland are given for BBC and commercial radio stations, as well as DAB services. All-in-all a very handy reference guide. **£5.45**

	Pages	Price	Code

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J.G. Lee (Babani)	116	£3.95	BP293
ANTENNA FILE (RSGB)	285	£18.99	ANTFIL
ANTENNA TOOLKIT (inc. CDROM). Joseph J. Carr	214	£25.00	ANTOOL
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AN INTRODUCTION TO AMATEUR RADIO. I.D. Poole (Babani)	150	£4.99	BP257
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Shack Essentials

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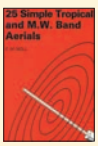
AMATEUR RADIO (VALUE) LOGBOOK (RSGB)	80	£4.95	TXLOG

25 Simple Tropical & MW Band Aerials



This concise book describes how to build 25 simple and inexpensive antennas for operation on the medium wave broadcast band (550 - 1600kHz) and on the 60, 75, 90 and 120 metre tropical bands. There are also designs for the 49m band. **£1.75**

An Introduction to Radio Wave Propagation

This book provides a broad, yet clear picture of radio wave propagation in a consise way without the use of too much technical language or mathematics. Included are explanations of the phenomena that is propagation dealing with everything from the Sun, through the ionosphere to noise. **£3.95**

ARRL Handbook

Radio amateurs and professionals rely on The ARRL Handbook for current antenna theory and a wealth of practical, how-to construction projects. This 20th edition is extensively revised and includes contributions from leading antenna experts. Many designs are the result of the latest advances in computer modelling. **£32.00**

Antenna Toolkit

This book acts as a miniature antenna manual with very good technical explanations without ever over-doing the maths for the not-so-keen mathematicians! The drawings and illustrations are very clear and the section on instrumentation is very helpful. **£25.00**

RSGB Yearbook 2006

UK & Ireland callbook. Everything you need is covered within its pages: contact names, addresses, phone numbers, websites and E-mail addresses. Supplied with a DVD entitled 'RSGB Today' that has a running time of 22 minutes. **£16.95**

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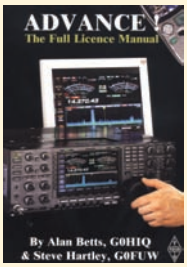

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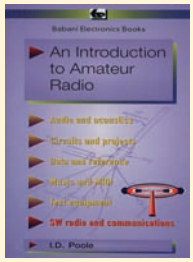

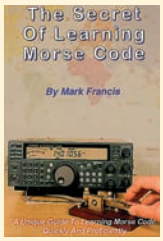

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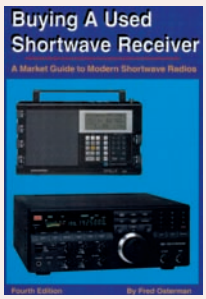

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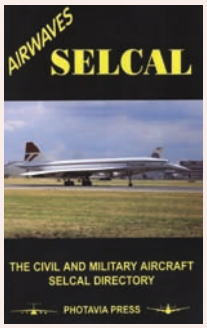

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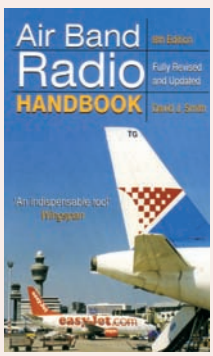

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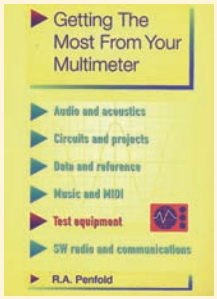

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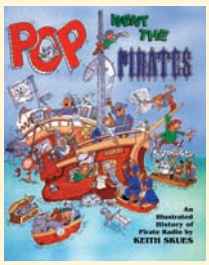

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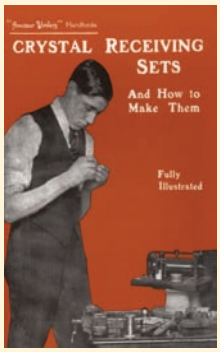

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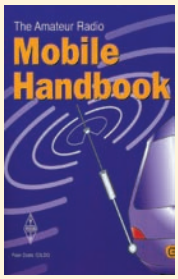

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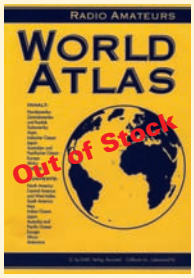

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ICOM IC-745 With Auto ATU Icom IC100 And Desk Mic Also Yaesu FT-290R with car mount and Amp. Both VGC Silent key sale sensible offers buyer to inspect and collect.Tel: Peter M3CKD 01386 881744 (eve) 07867 839784 Mobile (Worcestershire) or E-mail: m3ckd@aol.com

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WANTED

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MAKERS INSTRUCTIONS FOR FOLLOWING PLEASE Partridge Electronics Ltd, Joystick Antenna, Joymatch dual purpose aerial band switch artificial earth, Joymatch tuner model LO-Z500. Also, details of any use by military, HMG. Tel: John G6HRQ 10 Lynford Road, Mundford, Norfolk IP26 5HN.

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rob mannion's topical talk

This month Rob G3XFD explains how his plans for a special series in *PW* been brought forward by a colleague. This month, readers are getting a taste of what's to come in 2007 - *PW*'s 75th anniversary year.

As I've already explained in this issue's Keylines, for the entire production schedule of this *PW* I've been either in hospital or recovering at home and a number of decisions had to be taken in my absence. As I could not write Radio Basics, another article had to take its place.

Knowing that I've helped and supported the 'Looking Back' pages in our new sister title *RadioUser*, Roger Hall G4TNT decided to introduce a similar feature in this month's *PW*. I had already planned a series on the same theme to run throughout the 2007 publishing year and this gives me the ideal opportunity to appeal to readers for their feedback.

The series, reproducing selected articles/adverts/news items and even projects from the archives, will appear in the January 2007 issue and will run for the rest of the year.

Your Input is Important!

For this special series, 'History and Heritage', your input is important because I would like this unique series to reflect our readers' wishes. Of course, I have my own special ideas - the Second World War is particular interesting to me, especially as old and well-preserved issues from that period are very rare. Because of this, I feel that the spring of 2007 would be a good time to mark this very difficult period when *PW* played its part in flying the flag and winning the 'propaganda war', It was freely available in neutral countries and it was often easier to get *PW* in Portugal, Spain or the Republic of Ireland (then the Irish Free State) than it was at home!

Indeed, as many readers who've heard my old club visit talk entitled '*PW* Past, Present and Future' will know, several readers from Ireland who served in the British Forces during the War, often collected their *PW*s on returning home on leave. The only trouble they ever had was getting the magazine back into England on returning from leave, because, even though it was printed there it was viewed with suspicion as it was a specialist radio magazine!

I've no doubt at all, many stories will be published in our letters pages during 2007, along with by some splendid ideas for this series. I'm also planning to offer some special prizes for 'Star Letters' published on the topic as further encouragement. As usual with this type of series, I end by urging you to get writing, E-mailing and chatting to me at club visits, shows and so on.

I look forward to hearing from you. **PW**

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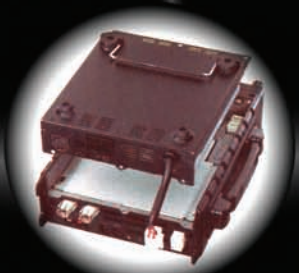

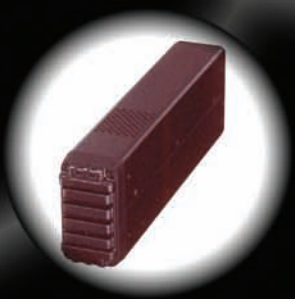

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