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Global Monitoring

MFJ-890 Review

December 2002 £2.85
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NEW
CLASSIC DESK MICROPHONE
Retro-look with stand. £259 B

NEW
HST-817 TRAVELER HEADSET
& Boom Mic. - purpose-made for your FT-817. £89 B

BEST-SELLER
GM4 or GM5 GOLDLINE HAND-MICS. £129 B

NEW
HST-706 TRAVELER HEADSET
& Boom Mic - purpose made for your IC-706. £89 B

NEW
PRO-SET PLUS
Contest Quality Dual Headset + Boom Mic with Dual Mic Inserts £199 B
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Tokyo Hi Power HL-50B 50W Linear Amplifier

This model has been specifically designed for the FT-817. Enjoy up to 50 Watts output

NEW LOW PRICE
£265.95 C

FT-1000MP MKV FIELD £2299

NEW

YAESU FT-897

NEW

100W HF 50W 2m and 20W 70cm
Plus 20W on (optional) Internal Battery

Available November

UK's largest Selection of HF Transceivers

We will price match on any currently advertised in-stock items that are of UK origin. **Beware of non UK sourced items.** If the dealer cannot get supplies from the UK distributors, then there may be a reason! All our gear is UK sourced with full manufacturers warranties.

NEW PRODUCTS

Power Tank

FD-7021 **£24.95 B**

4 Ah supply with built-in 3/6/9V output plus 12V DC. Has built-in lantern and computer controlled battery state. Compact size: 180w x 85d x 210h mm, 3kg. Shoulder strap.

AC chargers included

Special Offer AR-147

2m
50W
Output
£ 149.95
Carriage £6.00

The AR-147 offers a top performance 2m FM transceiver plus VHF air-band receiver. You get CTCSS, (auto reading), and DTMF complete with keypad microphone. 12.5 and 25KHz steps plus 1750Hz tone makes it truly universal. Power levels of 10 Watts and 5 Watts are also selectable. Includes mobile mounting hardware and full warranty.

29 YEARS in THE BUSINESS
WINNER of KENWOOD 2002 AWARD
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PLAY SAFE, GO TO W&S

ICOM HF Transceivers

IC-756-PRO	160m - 6m 100W	LAST FEW	£1799.95 C

IC-756-PRO II
The flag ship of the ICOM range. Lovely big easy to read display

IC-756-PROII	160m - 6m 100W 12V	£2495.95 C
SP-20	Speaker with filters	£164.95 B
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SM-8	Base microphone	£129.95 B
SM-20	Base microphone	£144.95 B
PS-125	Icom tcvr PSU	£295.95 C
IC-7400	160m - 2m 100W 12V	£1449.95 C
IC-706	160m - 70cm Tcvr with DSP 12V	£849.95 C
IC-718	160m - 10m 100W 12V	£649.95 C

Yaesu HF Transceivers etc.

FT-1000mkV	160m - 10m 200W 230V	£2799.95 C
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MD-200ABX	Desk mic	£249.95 B
MD-100ABX	Desk mic	£110.00 B
FT-920AF	160m - 6m 100W 12V	£1199.95 C
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FT-817	160m - 70cm 5W Batt.	£595.95 B

FT-817
All bands & All modes gives you a totally portable HF DX or VHF/UHF station. *Ours includes* battery and charger.

FT-840	160m - 10m 100W 12V	£499.95 B

Kenwood HF Transceivers etc.

TS-870S	160m - 10m DSP 100W 12V	£1399.00 C
PS-33	AC power supply	£199.95 C
PS-53	AC power supply	£229.95 C
MC-60A	Desk mic	£117.95 B
MC-80	Desk mic	£72.95 B
MC-90	Desk mic	£187.95 B
TS-570DGE	160m - 10m 100W 12V	£849.00 C
YK-88CN-1	270Hz CW filter	£61.95 B
YK-88SN-1	1.8kHz SSB filter	£61.95 B
TS-50S	160m - 10m 100W 12V	£629.00 C
TS-2000	160m - 70cm <100W	£1695.00 C
TS-2000X	150m - 23cm <100W	£1999.00 C
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RC-2000	Remote head for TS-2000	£199.95 B
ARCP-2000	TS-2000 software	£44.95 B

NEW YAESU VX-7R

Waterproof 3-Band Radio
6m - 2m - 70cm
The new robust handy from Yaesu

£329.00

ICOM E-90 NEW

3-Band Radio

At last, the new Icom handy has arrived for 6m-2m-70cms plus general coverage and TV sound!

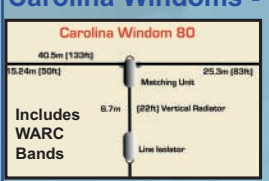
£299.00

Triple Mag Mounts *Upgraded* £39.95

Ideal for HF whips and large VHF whips. Amazing adhesion even at 70mph! SO-239 or 3/8" available

W-300T = 3/8" **W-300S** = SO-239

Carolina Windoms - DX from a wire!



Outperforms G5RVs and "Del-Boy" designs! The only antenna to give both high and low angle radiation even at 20ft above ground. Rated at 1kW, there's a model for you.

CW-160	160-10m 80.1m	£139.95 C
CWS-160	160-10m 40.5m	£134.95 C
CW-80	80m-10m 40.5m	£99.95 C
CWS-80	80m-10m 20.1m	£119.95 C
CW-40	40m-10m 10.3m	£94.95 C

Many more in our 2003 Radio Communications Guide 336 pages! £2.95 plus post

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PRICE MATCH

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CARRIAGE CHARGE CODES: A=£2.75, B=£6, C=£9 D=£12

YAESU

FT-1500M • 2m FM Mobile — £159 C

SPECIAL OFFER SAVE £70

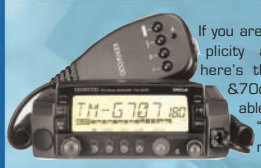
Small, compact yet built like a Battleship! Should last for years. Look at the Price!

KENWOOD

TM-D700E • 2m + 70cm FM — £449 C

Large detached screen and APRS, make this a firm favourite. 50W on 2m and 35W on 70cms. Features 200 memos, CTCSS, Band Scope, built-in TNC, DX cluster monitor, alphanumeric etc.

TM-G707E • 2m + 70cm FM — £289 C



If you are looking for simplicity and low cost, here's the answer. 2m &70cms with detachable front panel and "Easy operation mode." GREAT!

TM-V7E • 2m + 70cm FM — £359 C

A lovely cool blue display, easy with 50/35W output. 50W/35W p;us 280 memos and five storable operating profiles.

ICOM

IC-207H • 2m + 70cm FM — £279 C

A great budget class radio for VHF & UHF use.

IC-2800H • 2m + 70cm FM — £419 C

Large colour display with video input, and airband rx. 50W/35W and remote head unit.

IC-2100H • 2m FM Mobile — £229 C

Rugged design with switched receive filters 12.5/25kHz

IC-910 • 2m + 70cm All Mode — £1249 C

Icom's new dual band all-mode base station radio with 23cms option.

YAESU

FT-7100 • 2m/70cm Mobile — £299 C

SPECIAL OFFER £299

Just arrived is this new dual band radio that has extended rx. Power is 50/35W. Features dual in-band reception and detachable display (requires YSK-7100).

AMAZING VALUE

One of the Best Buys in Dual Band Mobile!

KENWOOD

TH-D7E • 2m + 70cm — £299 C

DATA COMMUNICATOR

One of the most successful handhelds over the past few years. It has a built-in TNC for Packet use. You can also use it for APRS operation in conjunction with an external GPS unit. Plus NMEA, 200 memos, and up to 5W output.

TH-F7E • 2m + 70cm — £249.95 C

NEW

WITH EXTRA WIDE RX COVERAGE

- 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.

THG-71E — £199 B

- 144 - 146MHz FM
- 430 - 440MHz FM
- 3 power levels
- 6W (13.8V) 5.5W (UHF) HI
- 0.5W LO • 50mW EL
- 200 multi-function memories
- Freq. deviation: ±5kHz
- CTCSS tone encoder/decoder
- Illuminated keypad,
- memory name function
- Auto power off • Auto batt. saver
- Time-out timer
- 5.5 - 16V DC (13.8V)

NEW DSP SPEAKER

NES10-2 (includes 12V AC adaptor)

Kills noise Brings up Signals.

£99.95 Carriage £6

Just plug it into your speaker or headphone socket and hear the noise drop away. Dip switches offer variable settings. Works with any receiver.

YAESU

YAESU VX5R • BLACK OR SILVER — £239 B

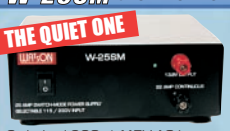
Tiny but incredibly rugged, the VX-5R provides transceiver capability on three amateur bands (50/144/430MHz) and almost continuous reception from 500kHz up to 999MHz.

YAESU VX1R • 2m/70cm — £149 B

Ultra-wide frequency coverage which includes VHF and UHF TV audio, AM broadcast, FM broadcast and AM airband.

W-25SM • 25AMP SWITCH-MODE POWER SUPPLY

THE QUIET ONE



£79.95 carr.£6

Switched 230 / 115V AC input and fixed 13.8V output at 22 Amps continuous and 25 Amps peak. Over voltage and over current protected and fan cooled. Measures 180mm (W), 75mm (H) and 190mm (D)

RIGblaster

IT'S NOT A TNC

PSK31, MFSK, MT63, SSTV, RTTY,AMTOR, CW, PACKET-APRS,HELLSCHREIBER, REMOTE BASE, METEOR SCATTER, CLUB GST'S, REPEATER CONTROLLER, VOICE KEYER.

RIGblaster Plus	£139.95B
RIGblaster M8	£109.95B
RIGblaster nomic RJ	£62.95 B

CHECK OUR WEBSITE FOR FULL DETAILS

RT-11 • REMOTE AUTOTUNER — £239 B

NEW

NEW FROM LDG

ASK FOR DETAILS.
ALSO AVAILABLE IN KIT FORM.

GZV-4000 • 40A 5-15V Switch Mode

DIAMOND ANTENNA

- Output voltage 5 - 15V DC
- Output current 40A continuous
- Built-in cooling fan
- Supply 230V AC 50Hz
- Size 210 x 110 x 300mm
- Weight 3.5kg

£159 C

W-CRI • PADDLE KEY — £44.95 B

- Metal parts brass
- Hardwood base
- Size 145 x 80 x 50mm
- Weight 375g

W-GMP • MORSE KEY — £29 A

- Metal parts brass
- Hardwood base
- Miniature size
- Size 100 x 50 x 45mm
- Weight 150g

Kent Morse Practice Oscillator

- Size 160 x 55 x 97mm
- Weight 260g

£19.50 A

'Amazing' MP-1 Variable Antenna 7MHz - 430MHz! 150 Watts

Use Portable, Mobile, Home or even balcony!

SLIDE TO CHANGE BANDS!!

It's sweeping America as the most versatile antenna for any location. Kit includes telescopi whip, variable coil, lower mast, base bracket (SO-239), clamp and optional wire radials (3m approx). Total height approx 2m. Will also screw directly into 3/8" mobile mounts. The whole antenna packs down to pocket size, yet puts together in a couple of minutes. And with the high Q coil, you get high efficiency. Take it with your FT-817 as hand luggage!!

£149.95 carr.£9

FT-817 Accessories

W4RT FT-817 Products

One Big Punch

Speech processor to boost your transmit audio. Fitted in rig by us. Price includes fitting by us. **£59.95 B**

One Board Filter

NEW

A Collins SSB 2.3kHz and CW 500Hz mechanical filter on one board. Much steeper curves and flatter response than the original 2.7kHz ceramic filter. Plus improved transmit audio! Price includes installation by us. **£259 B**

MP-1 Options

TRIPOD £19.95 A

Compact tripod for free standing MP1

MP-80M £22.95 A

80m Coil for MP-1 3.4MHz - 4MHz

FT-817 BRACKET

MP1 bracket mounts on side of FT-817

£19.95 A

WATERS & STANTON

PRICE MATCH

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Freephone Orders 08000 73 73 88

Get in Front with HUSTLER

CARRIAGE CHARGE CODES: A=£2.75, B=£6, C=£9, D: £12

5BTV

£209.95
Carr. £9.00

4BTV

£169.95
Carr. £9.00

HUSTLER®

BASE STATION ANTENNAS

Spec	5BTV	4-BTV
Bands	5	4
Coverage	80m-10m	40m-10m
Bandwidth 10-40m	Full	Full
Bandwidth 80m	100kHz	N/A
Resonance	1.15:1	1.15:1
Power	1kW CW	1kW CW
Traps	1" forms	1" forms
Tubing	1.25"	1.25"
Bracket size	1.75"	1.75"
Height	25ft 1" (7.64m)	21ft 5" (6.52m)
Weight	17lbs. (7.7kg)	15lbs (6.8kg)
Wind (112kph)	13kg	-

"I worked my first ZL while actually on the move using a Hustler whip" - Peter Waters G3OJV. Customers are also telling us how pleased they are with the base verticals. Check the prices!

HUSTLER Mobile Antennas

Model	Band	Bandwidth	Price
RM-10	10m	150-250kHz	£19.95 B
RM-11	11m	150-250kHz	£19.95 B
RM-12	12m	90-120kHz	£19.95 B
RM-15	15m	100-150kHz	£19.95 B
RM-17	17m	120-150kHz	£24.95 B
RM-20	20m	80-100kHz	£24.95 B
RM-30	30m	50-60kHz	£26.95 B
RM-40	40m	40-50kHz	£26.95 B
RM-80	80m	25-30kHz	£29.95 B

Model	Band	Bandwidth	Price
RM-10-S	10m	250-400kHz	£24.95 C
RM-15-S	15m	150-200kHz	£26.95 C
RM-20-S	20m	100-150kHz	£31.95 C
RM-40-S	40m	50-80kHz	£37.95 C
RM-80-S	80m	50-60kHz	£51.95 C

Lower mast sections

MO-1	54" (FOLD @ 22")	£33.95 C
MO-2	54" (FOLD @ 27")	£33.95 C
MO-3	54" (NON FOLD)	£26.95 C
MO-4	27" (NON FOLD)	£22.95 C

AMERITRON USA

AL811 XCE 160-10M 600W PEP

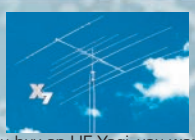
£799

AL811 HXCE 160-10M 800W	£989
AL800 XCE 160-10M1250W	£1995
AL1200 XCE 160-1-M 1500W	£2695

WE ONLY SELL EUROPEAN CE VERSIONS WITH FULL 10 METRE COVERAGE

CUSHCRAFT COMMUNICATIONS ANTENNAS

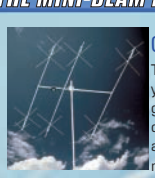
HF HORIZONTAL BEAMS + DIPOLES



When you buy an HF Yagi, you want quality and realistic performance. You also want to know you can get spares. We offer a wide choice with guaranteed spares availability. COUNT ON US!

MA5B	10-20m (5 band) 3 el 2.7m radius 1.2kW	£349.95 C
X-7	10-20m 7 el. 12.5 - 13dBi 2kW 6.09m radius	£669.95 D
X-740	40m add on kit for X-7	£299.95 C
A4-S	10-20m 4 el. 8.9dBi 2kW 5.49m radius	£599.95 D
A-744	Gives 40m or 30m operation from A-4S	£159.95 C
A3-S	10-20m 3 el. 8dBi 2kW 4.72m radius	£499.95 D
A-743	Gives 40m or 30m operation from A3-S	£159.95 C
A3-WS	12 & 17m 3 el. 8dBi 2kW 4.4m radius	£399.95 D
A-103	Gives 30m operation from A3-WS	£159.95 C
D-3	10-20m dipole element 7.86m 2kW	£249.95 C
D-3W	12, 17, 30m 17m dipole element10.37m 2kW	£249.95 C
D-4	10-40m dipole element 10.92m 2kW	£329.95 C
D-40	40m dipole element 12.88m 2kW	£299.95 C
Ten-3	10m 3 el 8dBi 3m radius 2kW	£189.95 C
ASL-2010	13.5-32MHz 8 el. log periodic6.4dBd 5.86m radius	£799.95 D

THE MINI-BEAM FOR SMALL GARDENS



Cushcraft MA5B

The best 3 element mini beam you will ever find. 2 element gain on 10, 15 & 20m, and dipole performance on 12m and 17m. Up to 25dB F/B ratio, it accepts 1.2kW yet has a boom length of only 2.2m and element length of just 5.2m Turning radius is 2.7m. Uses a single feeder, this really works the DX. Get one up before winter! £349.95 C

CUSHCRAFT VERTICALS

R8 (Illustrated), covers 8 bands from 6m - 40m, stands 8.7m high and requires no radials. You can feed it with 1.5kW and typical VSWR is around 1.2:1 £499.95 C

R8-GK Optional guy kit for R8 £49.00 B

R-6000 6 band 6m-20m that requires no radials and handles 1.5kW. Stands just 5.8m high and was chosen for the RSGB GB4FUN vehicle antenna. It works!! £349.95 C

NEW MA5V VERTICAL 20-10m **£229.95 C**

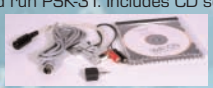
WATSON

WEP-300B • EARPIECES £2.95 A

Over-the-ear earpiece, popular for security and emergency use. Its low cost and firm mounting even in arduous conditions make this a popular item. Fitted with 3.5mm jack plug.

WSA-1 PSK-31 • ADAPTOR £39.95 B

All you need to connect up to your sound card and run PSK-31. Includes CD software.

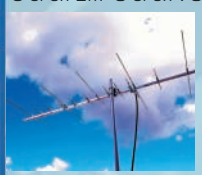


SPECIAL OFFER

WATSON **DBY-2759**

2m + 70cms dual band Yagi single feed.

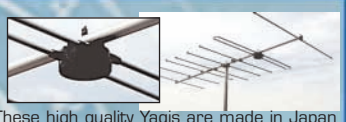
5 el on 2m 9 el on 70cm 2.15m long



~~£79~~
£49 C

A Top Quality Antenna At a Bargain Price

MASPRO VHF/UHF YAGIS



These high quality Yagis are made in Japan and superbly engineered. Features folded dipole, balun transformer, waterproof box and SO-239. You won't find anything better on the market.

Take a look at our prices!

144-WH5	2m 5 el. 6.6dBd 0.93m	£26.95 B
144-WH8	2m 8 el. 8.6dBd 1.79m	£37.95 B
144-WH10	2m 10 el 9.7dBd 2.3m	£41.95 B
435-WH8	70cms 8 el. 8.6dBd 0.8m	£29.95 B
435-WH12	70cms 12 el. 12.8dBd 1.51m	£35.95 B
435-WH15	70cms 15 el. 14.2dBd 2.19m	£41.95 B

To compare with dBi figures, add 2.4dB

WATSON

QS-112 • SPEAKER MIC £16.95 A

Combined speaker-mic. with PTT switch. Models for Yaesu, Kenwood, Icom, Alinco and Motorola.

SPM-102 • SPEAKER MIC £9.95 A

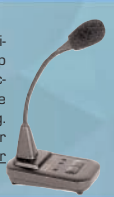
Incredible value!

Has 4-way 3.5mm plug for VX-1, VX-5, FT-50 and IC-Q7E Handies

Limited stocks.

WM-308 • BASE MIC £59.95 B

The perfect answer for a high quality base microphone. Built-in pre-amp powered from rig or 2 x AA, electronic PTT and FM/SSB response switch. Includes lead with 8-pin plug. The plug needs to be wired for your radio. We can do this but phone for quote.

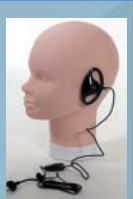


WCT-321 • LAPEL TALKER £19.95 A

The elegant way of personal communications.

Earpiece with combined lapel hanging mic and PTT. Models to suit most radios.

State: Kenwood, Yaesu or Icom when ordering



AVAIR VSWR • POWER METERS

Great value and great performance. There's one just right for you.

AV-200 1.8 - 200MHz 5/20/200/400W £49.95 B

AV-400 140 - 525MHz 5/20/200/400W £49.95 B

All fitted with SO-239, PEP/RMS readings, 3W for FSD approx.

Also available AV20 & AV40 compact meters

WATSON

ATX WALKABOUTS

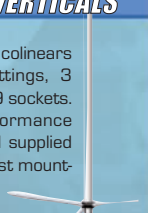
WALKABOUT PORTABLES

Multi & single telescopic whips. Covers 80m to 6m BNC. Ideal for FT-817 and similar QRP radios.

ATX Walkabout 80 - 6m	£69.95B
AT-80 Single band	£24.95B
AT-40 Single band	£24.95B
AT-20 Single band	£19.95A
AT-17 Single band	£19.95A
AT-15 Single band	£19.95A
AT-12 Single band	£19.95A
AT-10 Single band	£19.95A

BASE VHF/UHF VERTICALS

2m / 70cm fibre glass colinears with stainless steel fittings, 3 short radials and SO-239 sockets. These are high performance antennas, pre-tuned and supplied with all hardware for mast mounting.



Dual Band 2m/70cms

W-30	3/6dB 1.15m long	£39.95 C
W-50	4.5/7.2dB 1.8m long	£49.95 C
W-300	6.5/9dB 3.1m long	£59.95 C

Triple band 6m/2m/70cms

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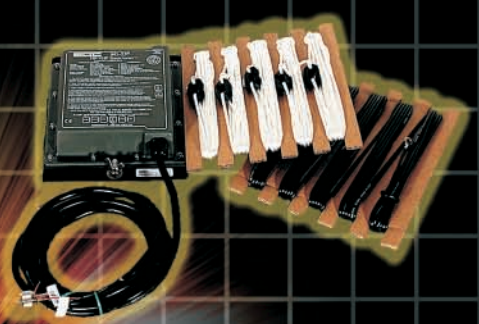

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Cover Subject

Now for something a little different! Faced with an interesting, useful, but unfortunately not particulary photogenic front cover subject of the MFJ-890, the *PW* team set about looking for ways to illustrate the point of Beacon Monitoring. The result is the image you see on the cover and for all of you who are new to beacon monitoring, or a little confused by it, all should become clear after you've read the review on page 30! If you are new to beacon monitoring and have a go - don't forget to let the editorial team know how you get on.

Design: **Bob Kemp**
Photograph: **Tex Swann G1TEX/M3NGS**

December features

18 Tex's Tips
Tex Swann G1TEX passes on an idea to help you tune your transceiver easier, and one for helping you maintain a tidy shack. Don't forget to send in any of your own handy hints and tips you'd like to share with fellow readers!

22 Radio Basics
A multimeter plays a very important part in the Radio Amateur's shack, so to help you decide which one to buy, **Rob Mannion G3XFD** dedicates his column to advice on meters and measuring.

24 *Practical Wireless* Club Spotlight Magazine Results
Everyone's A Winner! Did your club enter the 2002 *PW* and Kenwood Club Spotlight Magazine Competition? If so, find out you fared in this year's contest and as usual the standard of entries was very high.

26 Power That Valved Portable
Phil Cadman G4JCP shows you how to power-up that old portable valved radio, which you thought would long remain silent due to the difficulties in finding suitable batteries. Follow his advice and constructional details and you'll soon have your prized portable up and running.

30 MFJ-890 Beacon Monitor Review
Beacon monitoring has now been made easier thanks to the MFJ-890 DX Beacon Monitor, as **Rob G3XFD** recently discovered when he had this interesting little unit to review.

34 Carrying On The Practical Way
It's the season to be merry and so in true festive spirit **George Dobbs G3RJV** presents some simple ideas for short-wave receivers, which the whole family can enjoy over the holidays. So, after the eating and drinking... why not sit back and listen to the radio (after you've built it!)?

38 Elecraft K2 HF Transceiver Review
Neill Taylor G4HLX has been busy building and testing the high specification Elecraft K2 h.f., c.w. and s.s.b. transceiver. Find out how he got on using this 3.5 - 28MHz transceiver on air, as well as his thoughts on building it from the supplied kit.

42 Antenna Workshop
Did you enter Amateur Radio via an interest in CB? If so it's likely that you'll have an Firestik antenna lurking in the corner of your shack**. Peter Dodd G3LDO** shares is idea for operating bicycle mobile on the h.f. bands, using that modified Firestik CB antenna.

44 Valve & Vintage
Copies of vintage *PW*'s laid out on the work bench must mean it's **Phil Cadman G4JCP**'s turn in Valve & Vintage 'shop'. This time Phil reports on feeback from readers and looks at a valve used in car radio.

58 Index 2002
We've all done it - remembered seeing an article published but can't quite put our finger on when it actually appeared! So, to help you, check out our 2002 Index of Antenna, Constructional, Features, Looking At.., Reviews and Theory articles.

Please note the scheduled article on Silent Key Sales has been held-over due to the huge amount of correspondence we've received on the subject and the decision to dedicate more space to this topic. Look out for the article coming very soon.

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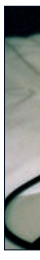

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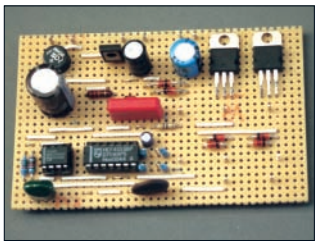

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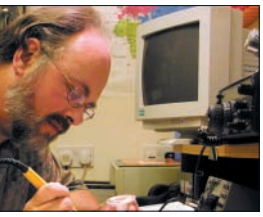

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December regulars

9 Rob Mannion's Keylines
Topical chat and comments from our Editor **Rob G3XFD**. This month Rob looks back on the Leicester Amateur Radio Show & Convention and provides an update on the Czech Beacon jammer as reported last month.

10 Amateur Radio Waves
You have your say! There's a varied and bumper selection of letters again this month as the postbag keeps on filling with readers making 'waves' by writing in with their comments, ideas and opinons. Keep those letters coming!

11 Amateur Radio Rallies
A round-up of radio rallies taking place in the coming months.

14 Amateur Radio News & Clubs
Keep up-to-date with new products and who's doing what in the world of Amateur Radio with our News pages. This month there's news on the 5000th Foundation Licence being issued as well as the chance to find out what your local club is doing in our club column.

48 VHF DXer
David Butler G4ASR keeps you up-to-date with the DX contacts on the v.h.f. and u.h.f. bands.

50 HF Highlights
This month **Carl Mason GW0VSW** has news of the first 5MHz report to be submitted to his column.

52 Keyboard Comms
Unsolicited E-mails can cause real problems so, this month **Roger Cooke G3LDI** looks at what can be done to stop them.

54 In Vision
Graham Hankins G8EMX, *PW*'s resident Amateur Television expert has news of a video to help you get started in ATV, as well as looking forward to 2003!

57 Tune In
The International Broadcasting Convention forms the basis of **Tom Walters** column this month.

62 Bargain Basement
The bargains just keep on coming! Looking for a specific piece of kit? - Check out our readers' ads, you never know what you may find!

64 Book Store
The biggest and best selection of radio related books anywhere!

69 Topical Talk
'Scratchers', 'Whistlers' and deliberate jamming are the topics under discussion this month.

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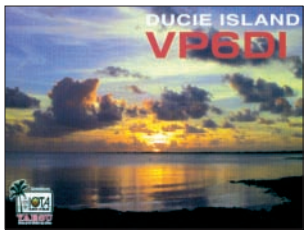

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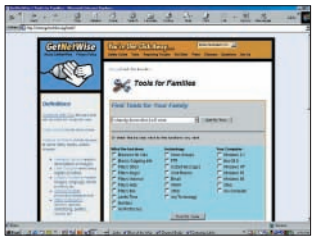

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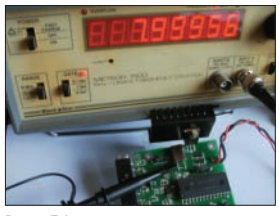

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rob mannion's keylines

Welcome to 'Keylines'! Each month Rob introduces topics of interest and comments on current news.

As I write this edition of Keylines in mid-October the Editorial team are in many ways only just recovering from the hard (but enjoyable) work involved with the Leicester Show during September. And what a show it was!

For the first time since the event moved to Castle Donington the record for the number of readers waiting to have a chat (I'm sorry so many of you had to wait a long time...but at least you had a chance to try the 'drinks and nibbles!) was almost broken. The existing record was set at the old Granby Halls...at 32 readers patiently waiting for a chat!

I had tremendous pleasure in meeting many old, and making new friends. It's a great privilege to sit here in the Editor's chair...serving (and Editors are servants of their readers) you in the best way possible. So, keep us on our toes won't you? We need your feedback - and we'll do our best to respond in whichever way is best/necessary.

Funnily enough... there's a similarity between the old venue and the new site! The newer warehouse style edifice at Castle Donington seems to also suffer from poor ventilation as did Granby Halls . Along with being dark inside - even with modern lighting, it gets very stuffy. I also had the misfortune to suffer from cigar smoke fall-out from someone nearby during the two days of the show!

Let's hope in future that the ever-present, friendly and helpful LARS Committee Members in their well-known burgundy coloured blazers can help. Maybe they'll find some was of improving the flow of fresh air through the building and/or controlling/easing the problems caused by tobacco smoke in the building. It's a great show and only needs one or two problems solved - such as I've mentioned - to make it even more enjoyable.

Baldock Co-operation

In the news report on page 13 of the November issue (headlined Beacon Jammer In Czech Republic) I made a very brief mention of the help from 'professional monitors'. And of course, this was a reference to the Radiocommunications Agency's Baldock Monitoring station in Hertfordshire.

I'm very grateful indeed for the help - quickly and ably provided - by the RA staff. Of course they do not react directly to requests from the General Public (such as mine) and my contact with them was through **Alan Betts**, the Head of the Amateur Radio Section in London. Thank you Alan! Incidentally, Alan Betts will be writing a guest editorial appearance in Keylines during 2003. I've no doubt it will make interesting reading!

Incidentally, at the time of writing (18 October) the 14.1MHz IBP frequency jammer, located near Prague (Praha) has only been heard on occasions. It was evident throughout the day on Monday 14th (I had a day off) but despite propagation favouring European coverage on '20' for the rest of the week...it's not been heard since. Hopefully some action has been taken. Many people have done their best to assist. Let's hope we've succeeded (See Topical Talk Page 69).

RADIOCOMMUNICATIONS AGENCY

Longleat Rally

The sad news that the Marquis of Bath and his Estate Manager consider - after 40 years or so - it is 'No longer appropriate' to host the traditional Amateur Radio Rally on the Longleat Estate came as a real shock to myself and very many others. **As a result there will no rally at the Longleat venue in 2003.**

My puny attempts to draw attention to this (seemingly so) slight towards the Amateur Radio fraternity have drawn a blank so far. But I will not give up!

Hopefully a new venue will be found soon and *PW* will support - in any way we can - a replacement event at a new venue. No doubt our families, while we're busy enjoying the radio side of things will support 'other attractions' at a new venue...just as enthusiastically as they did those at Longleat over the last 40 years.

Price Increase

With this issue of *PW* the cover price has increased by 10 pence. This price increase is forced on us by printer's paper costs, together with the well known punitive costs we suffer in the UK for transport costs, directly due to punitive fuel taxation.

Despite the increase I know readers will appreciate that we try to minimise increases by providing the best value for money magazine we can. However, I've no doubt that many more readers will take advantage of the special subscription offers we're making (see Flag Flap around the cover this month). Don't forget...you can stave off price increases for the period of your subscription and save money too!

Rob G3XFD

practical wireless services

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

Subscriptions

Subscriptions are available at £30 per annum to UK addresses, £38 in Europe and £42 (Airsaver), £49 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Practical Wireless* and *Short Wave Magazine* are available at £60 (UK) £73 (Europe) and £81 (rest of world), £85 (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. The printed circuit boards for *PW* projects are available from the *PW* PCB Service, **Kanga Products, Sandford Works, Cobden Street, Long Eaton, Nottingham NG10 1BL. Tel: 0115 - 967 0918. Fax: 0870 - 056 8608.**

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. Back issues for *PW* are £2.50 each and photocopies are £2.50 per article.

Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate.

A complete review listing for *PW/SWM* is also available from the Editorial Offices for £1 inc P&P.

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Technical Help

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

amateur radio waves

Make your own 'waves' by writing into *PW* with your comments, ideas, opinions and general 'feedback'.

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

Construction Camp?

● **Dear Sir**

It was nice to meet the Editorial team at the Leicester Show, take part in the 70th anniversary of *PW* and to have the chance of following up our discussion on home construction. However, whilst I enjoy reading these articles, I know my abilities fall short of actually building something successfully and I was wondering if other readers feel the same way? If so could a *PW* inspired 'construction club' be an answer in providing a hands-on approach to home construction where I can learn how to translate a circuit diagram in to a working project?

To this end I suggest a Saturday School or Morse Camp approach, at a central location where novice builders could construct, for example, a receiver under a tutor who could explain and demonstrate the process. It could perhaps encourage some people like myself, who make a bit of a hash of building, to learn the techniques of home construction.

It's only a suggestion but perhaps under the auspices of *PW* it would enable constructors to develop a skill which cannot be conveyed only by reading the magazine.

Alan Morrison
Wolverhampton
West Midlands

Editor's comments: It was nice to meet you too Alan! In fact I asked Alan to write in on this subject because - during the show in particular - a number of readers approached me on the same subject. Indeed, at one point there were around a dozen or so of us all chatting on the same subject at one point! Alan's idea is a good one, and if enough interest is shown perhaps we could arrange a 'Practical Teach-In' on basic construction. I feel the most appropriate venue would be at one of the QRP rallies...perhaps Rochdale or South Normanton as they're both central (We're a long way from anywhere down here on the south coast!). Reader's comments and suggestions will be very welcome, enabling us to evaluate the level of interest.

Frank Rayer Admiration

● **Dear Sir**

I enjoyed the article about 'Mr Project' **F. G. (Frank) Rayer G3OGR** in the October issue of *PW*. He is, along with Isambard Kingdom Brunel, one of my heros.

I have an Atlantic short wave 2, which has worked for nearly 20 years when I rebuilt it. It was given to me by a workmate sometime before that. It was at the time a Three Band Receiver built to a design by **A.S. Carpenter** *PW* May 67. This worked reasonably well but was a little temperamental.

Luckily I found some octal plug-in formers at a local rally. So, I was able to wind some suitable coils put it together and had to fiddle the second valve base wiring as I had several EF91s but no 6BA6s. (The EF91 was just as good as I later tried the second stage with the right valve).

I took the little set to our local radio club, The Torbay Amateur Radio Society. We had some fun resolving s.s.b. and Morse on the 7MHz band. The audio was boosted by my old Linear audio amplifier with a 2 EL34s at the business end. The manufacturer's name of the amplifier being suited to a demonstration at a club for Amateurs!

In those days *PW* printed circuit boards that one could read and I wish you would print larger circuits nowadays too. Never mind, I suppose I shall have to lump it! Jazzy writing and pretty pictures are the modern way I suppose and the poor old circuit has to squeeze in where it can.

Another little circuit I can recommend is the four transistor receiver featured in for *PW* February 1961 (This was the first *PW* I bought). I recently built the receiver using genuine Germanium transistors...including an old red spot all of 40 years old! It works a treat with a 1.5V battery and a pair of low impedance headphones that came from a rally. (They are very comfortable having once been worn in aircraft).

I also liked the article on mobile operating. I have been push bike mobile recently with my Yaesu FT-817 and a magmount on the bike carrier. As I write this letter I think the sunshine is encouraging me to get some bits together and have a wander on Dartmoor which very conveniently is only a couple of miles from the home QTH.

Peter Lewis G4VFG
Ivybridge
Devon

Editor's comment: Thank you Peter! I too admire I. K. Brunel - the man behind that great engineering triumph the Great Western Railway. No doubt G3OGR's family will be proud for the comparison. The tribute to Frank Rayer was a long time coming, but - thanks to William's willing co-operation was worth waiting for and very many readers have expressed their thanks. I hope you find the 'follow up' letter from William Rayer of interest, and also the Bicycle Mobile ideas from Peter Dodd G3LDO in Antenna Workshop!

Letters From The Editor

● **Dear Sir**

Thank you for the September - 70th anniversary issue of *PW* and the October issue with my article 'Mr Project - The F. G. Rayer G3OGR Story' featuring my late father. Following our telephone conversation, and as promised, I've now compiled the recollections of the attempts by F. J. (Fred) Camm, the founding Editor of *PW*, to stop my father writing for other magazines. The situation was as follows:

Several years after my father died, my brother and I were tidying the attic (this would have been around 1984). There were boxes containing all my father's business letters relating to radio and other publications. It was while going through these that I found a series of four or five letters between my father and F. J. Camm dating from the 1950s.

Mr Camm wrote to say that my father had been writing for other magazines not in the 'Practical' series, and that he wanted his writers to write exclusively for his magazines, otherwise he would not publish any of their articles! At this time my father was writing articles for *Radio Constructor* along with *PW* and *Practical Television* so he was quite worried. My father replied to Mr Camm, saying that writing was his job, and that he wrote for many other journals, not just in relation to radio. Mr Camm was undeterred. In his next letter he asked my father to confirm whether he would or would not write radio articles exclusively for the 'Practical'

series. My father's reply was that writing for these journals was unlikely to be a full time job, and he needed to work on other articles and books.

In the end the correspondence petered out. My father couldn't really give a 'Yes' or 'No' answer to Mr Camm's demand. If he agreed he would have no longer be able to write for mechanics and photography magazines and other journals. If he disagreed the acceptance of *PW/PT* articles would cease. On reflection perhaps Mr Camm realised he was asking too much, because (rather grudgingly) he said he'd publish more articles by my father, and in return my father said he would devote most of his articles to *PW*. (He may have offered *PW* 'first refusal', but I'm not certain about this as we didn't keep these letters.

Following this incident my father often used pen names when writing for other magazines, right through the 1960s and 1970s. Two I can remember are Ronald Worcester and George Longdon. In the 1970s I remember asking Dad why he used pen names...but in his reply he never mentioned the exchange of letters between him and Mr Camm!

I hope the Editorial team - and readers of course - find this revelation of interest! I'm sorry now we didn't keep Dad's letter, but there were countless boxes full of papers going back for many years. You're welcome to publish this extra recollection, and I'm delighted that so many readers enjoyed the tribute to G3OGR. Thank you for publishing it on my behalf.

William Rayer
Guernsey
Channel Islands

Editor's comments: Thank you too William...without your help the article would not have been possible. The tribute was long overdue. However, may I assure readers and authors that the present *PW* Editor would not act in the same way as Mr. Camm! (What a revelation eh?).

The Ultimate Sacrifice

● **Dear Sir**
I refer to the letter from **G7FZB** in the October edition of *PW* under the title 'Arguing and Bickering'. Dr Ridgeway appears to have a very large chip on his shoulder with regard to the understanding of why Morse code was ever used. What does particularly annoy me in his tirade is the insensitivity of his remarks with regard to - in his own words - "the mode that failed to save all the passengers on the *Titanic*".

I wonder if G7FZB realises that **without the use of Morse code**, the 705 people **who did survive** the loss of the ship in 1912 may not have lived to tell the tale, but have frozen to death in the North Atlantic. Does he further realise that one of the Radio Operators, **Jack Phillips** was to lose his life in that terrible tragedy many years ago? With his off-hand comment G7FZB is dismissing the bravery shown by the two Radio Operators who transmitted the continually changing circumstances on the ship until the very last moment.

Additionally, G7FZB may also be interested to know that on a more recent occasion Morse code was to be used in British waters, when in 1952 a car ferry, the MV *Princess Victoria* transmitted SOS when the ship was overwhelmed by the sea at the start of her journey from Stranraer to Larne. Her radio operator, **David Broadfoot** a native of Stranraer in Scotland, was, in a period of six hours to transmit over 50 messages in Morse code. When the ship turned over on her starboard bow, he became trapped in the radio room with no passage to safety and he, like Phillips of the *Titanic*, paid the ultimate price for doing his job. He was posthumously awarded the George Cross which was accepted by his wife from our present Queen.

So G7FZB you may not have any interest in learning Morse code but spare a thought for those who do and the great sacrifice that some have made, before 'having a swipe' at this mode of communication.

Jack McKinney GI3TZB
County Down
Northern Ireland

Rapture In Radio!

● **Dear Sir**
It was probably the best *PW* for ages! All that radio nostalgia in the September 2002 issue held me in virtual rapture for far too long!

As an 'old-timer' though I can never get enough of nostalgia - especially the radio kind. Not only does it serve to whisk me back temporarily to a time when most things radio were...how can I express it...'less stressful' perhaps?, I think it may also serve to put the eventual future of our wonderful hobby into proper perspective?

Oh yes, belated birthday greetings on your 70th Anniversary!

Ray J. Howes G4OWY
Weymouth
Dorset

Thanks Radiocommunications Agency

● **Dear Sir**
May I through the pages of your magazine offer my grateful thanks to the often much criticised Radiocommunications Agency (RA)?

Over the past 12 months, there has been much (often quite heated) debate locally via the GB3BC 144MHz repeater

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.

November 10
The 12th Great Northern Hamfest
Contact: Ernie Bailey G4LUE
Post: 8 Hild Avenue, Cudworth, Barnsley, S. Yorkshire S72 8RN
Tel: (01226) 716339, mobile (017787) 546515 (1800-2000)
The 12th Great Northern Hamfest will take place at the Metrodome Leisure Complex, Queens Road, Barnsley, South Yorkshire. Doors open at 1000. The Leisure Complex is in the town centre and less than two miles from junction 37 on the M1 motorway, five minutes walk from the train and bus station (follow the brown Metrodome signs from all directions). The venue is on one level with excellent disabled facilities. Features include all the usual trade stands, component and specialist interest groups and a large Bring & Buy. This year, tables will be allocated to Radio Amateurs to sell their own equipment at a nominal charge. Talk-in will be via GB3NA on 145.675MHz and admission is £2.50.

November 17
MARS 14th Radio & Computer Rally
Contact: Norman G8BHE/Peter G6DRN
Tel: 0121-422 9787/(07730) 132726/ 0121-443 1189
E-mail: nlgutteridge@aol.com
The Midland Amateur Radio Society are holding their 14th Radio and Computer Rally at King Edwards Grammar Camp Hill School, Vicarage Road, Kings Heath, Birmingham, junction A4040/B4122. There will be trade stands, local clubs, special interest groups, large free car park, refreshments and a Bring & Buy stall. Doors open 1000 and admission is just £1.

December 1
The BARAC Rally
Contact: Mark G0GFG/Brian G7OCK
Tel: (01388) 745353/(01388) 762678
The Bishop Auckland Radio Amateurs Club Rally will take place at Spennymoor Leisure Centre. Please note that this is a venue suited for both trader and disabled as it boasts good parking and access to a large ground floor hall. There will be the usual radio, computer, electronics, as well as a Bring & Buy, catering and bar facilities. Morse tests will be available on demand. As you can imagine, there is a lot to do for all the family within the confines of the Leisure Centre. Doors open 1100 (1030 for disabled visitors) and admission is £1, under 14s free of charge if with an adult. Talk-in on S22.

December 8
Red Rose Radio Rally
Contact: Stephen Daniels
Post: Astley House, Johnson Street, Tyldesley, Manchester M29 8AB
Tel: (01942) 888900
The Red Rose Radio Rally will be held at Lowton Civic Hall, Lowton, near Leigh. Doors open 1100, (1045 for disabled visitors). There will be car parking for approx. 200 cars and it's easy to find from junction 23 of the M6 motorway. There will be catering, disabled access, computer stalls, licensed bar, car parking and also a visit by Santa Claus!

December 8
Worcester Radio Rally
Contact: John G8MGK
Tel: (01527) 545823/(07762) 203355
Website: www.qsl.net/gb2tcr
The Worcester Radio Rally is being held at the Worcester Rugby Club, M5 Junction 6, Worcester. Doors open 1000, admission £2, car park free. There will be trade stands, Special Interest Groups, a licensed bar, catering and free raffle.

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 waves

over the identification clause in the BR68 Licensing Conditions booklet. Some Amateurs interpreted this to mean that callsigns should be given on repeaters before and after every single 'over'...and thus led many others (especially new licensees) to believe the same.

The result was of course that the local repeater became nothing more than a 'callsign box' with callsigns often being given by some stations up to three to four times every single minute. This endless repetition of callsigns was more than just off-putting to newcomers and 'old hands' alike; it was also taking up too much conversation time and making repeater use extremely tiresome to say the least.

However, after I contacted the RA by letter and E-mail, they very sensibly acknowledged that the clause was not clear enough, was confusing, and was also certainly open to interpretation in a number of ways. They promised they would be clarifying the issue regarding the use of callsigns as soon as they could.

The RA were as true as their word and I am happy to report that in the new edition of the BR68 Licencing Conditions booklet the identification clause has been completely updated and clarified and the matter of the frequency of callusing use both on and off repeaters is now clear for all to see.

Full marks to the RA and to Mrs Denise Carter of the RA's Amateur Radio section in particular for their sensible and speedy response on this matter. Their prompt action shows that they are after all serving the interests of the Amateur Radio hobby.

Leighton Smart GW0LBI
Mid-Glamorgan
Wales

Morse Mode Defence

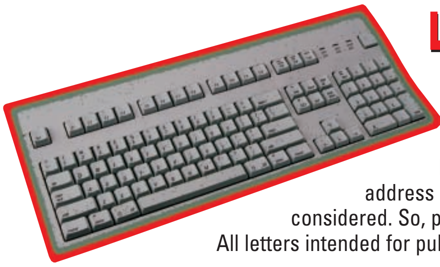
● **Dear Sir**
Although I can appreciate **G7FYB**'s argument (October *PW*) about reaching DX stations by means of the use of Amateur satellites and yet not the h.f. bands for achieving the same DX objective, it's unworthy of the good Doctor to blame the Morse Code for the tragic loss of life in the RMS *Titanic*.

After all, no matter what the speed of communication, whether it be c.w. or not, the saving of life is dependent upon the ability of rescuers to get quickly to the scene. A ship not equipped with wireless may have been just 'over the horizon' entirely ignorant of the SOS.

In a more 'up-to-date' sense G7FYB could blame the 999 service if an ambulance was unable for one of a number of reasons, to get to an accident scene quickly. The recently superseded electro-magnetic auto-exchange relay is slower than the electronic system in which case a Morse SOS may well have proved the speediest!

Alan Pidgeon G6CBP
Worcester

Keep your letters coming to fill *PW*'s postbag



Letters Received Via 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**

RadioSport NEWS

A New "Picketts Lock"

London Show finds new home


Nestling in the Hertfordshire countryside, Wodson Park Leisure Centre.

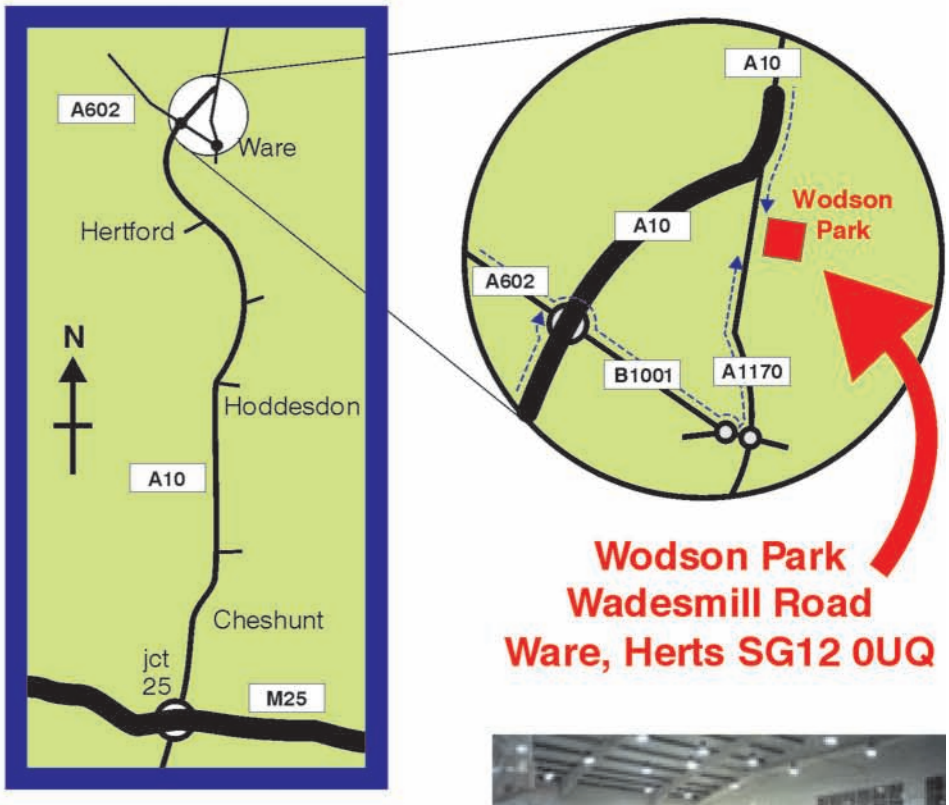
With the closure of Lee Valley Leisure Centre, the traditional home of the **London Communication & Computer Show**, the organisers were presented with the challenge of finding a new venue that would suit all parties. After a long and exhaustive search, they came across a place which not only met all the criteria but is conveniently located off junction 25 of the M25, the motorway junction that many visitors to London Shows have been using for years.

Their efforts have already been rewarded, with exhibitor bookings practically filling the venue several months before the event.

London COMMUNICATION & COMPUTER SHOW

Saturday 23 November & Sunday 24 November

(Opens 10.00am each day)



Wodson Park
Wadesmill Road
Ware, Herts SG12 0UQ

THE NEW VENUE

Wodson Park is a leisure centre that is similar in many ways to 'Picketts Lock', except that it is located a few miles outside the M25. Getting there is every bit as easy, indeed the journey time from the M25 is practically the same as it is to Picketts Lock. Talk-in stations will be operational on 2m & 70cm, and when you arrive you will find plenty of free parking. Full travel details can be seen on www.radiosport.co.uk

Wodson Park is quite new, so it has all the facilities you would expect - brightly-lit halls, a good sized catering outlet, two bars, a passenger lift and facilities for the disabled.

REASONS TO GO

Apart from meeting friends new and old, there will be major retailers, computer systems, software and upgrades, on-demand Morse Tests and Assessments, and Special Interest Groups. Southgate ARC's Bring & Buy completes the list.

All-in-all it should be well worth visiting.


One of Wodson Park's halls.

Presented by RadioSport Ltd, 126 Mount Pleasant Lane, Bricket Wood, Herts AL2 3XD.
Tel: 01923 893929 Fax: 01923 678770 Web: www.radiosport.co.uk

amateur radio **news**

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

Scottish News

Certificates Awarded

Wigtownshire Amateur Radio Club have just completed the first of their new UK Amateur Radio Foundation Courses, believed to be the largest class participating in the scheme in Scotland so far.

Ian Macdonald MM5WIG who is the volunteer at the Wigtownshire Amateur Radio Club, and Senior Instructor in Dumfries & Galloway for the Radio Society of Great Britain, along with a very enthusiastic team from the Wigtownshire club ran an intensive two day course at the Stranraer Academy. The course was run using Microsoft Powerpoint presentation material which was kindly supplied by fellow Amateurs from the Bangor & District Amateur Radio Society in Northern Ireland.

The Wigtownshire Club are now preparing their own improved Scottish version of the material.

Eleven students atttended the course from all over Scotland and all passed their examination and Morse assessment with flying colours. The youngest student, **Daniel Sturgeon** who's 12 years of age, is now just bursting to use his father's rig!

Further Foundation Courses are being planned for 2003 at Stranraer and members of the club feel the participation has given them a new lease of life. The club meet every Thursday at the Aird Unit of Stranraer Academy and new members are always warmly welcomed.

Wigtownshire ARC
Ian Macdonald MM5WIG
Tel: (01988) 403364

New Trident Antennas

Bust That DX!

Trident - the newest UK Antenna Manufacturer have just released their DX Buster series of 50MHz Yagi antennas. Read on to find out more....

Trident antennas are the brainchild of **Mike Devereux G3SED** and **John Barker G0OPB**. Mike has over 40 years experience as a DXer and DXpeditioner, whilst John has years of design and manufacturing experience.

The new range of antennas have been designed with the serious 50MHz Dxer in mind and are computer optimised for both performance and survival in the worst of the UK's weather. Using a riveted construction the antennas are said to be extremely lightweight but strong. The Yagis are pre-assembled so that they can be put together quickly without the need for on-site measurements.

Two Trident 7-element long boom 50MHz Yagis spaced 6.7m (22ft) apart - 23m (75ft) high at the Mike G3SED's QTH.

The top of the range 7-element 10m (30ft) long boom Yagi boasts gain of 13.3dBi with an impressive radiation pattern. It's said to be ideal for stacking applications (weighing only 11kg) but can withstand winds of over 118 mph.

Full details on the Trident range are available direct from the distributors Nevada or on the Trident Website at **www.tridentantennas.co.uk**
Nevada, Tel: 023-9231 3090, FAX: 023-9231 3091
Website: www.nevada.co.uk

Big day at Baldock

5000th Foundation Licence Awarded!

Andrew Finch M3FMA was recently awarded the 5000th Foundation Licence and Rob Mannion G3XFD attended the presentation at the Radiocommunication Agency's Baldock Monitoring station.

Andrew Finch M3FMA's enthusiasm is a great deal larger than his 11 year old diminutive frame! Rob soon found this out when chatting to him. Young Andrew is member of the Chelmsford Scout Amateur Radio fellowship (CSARF).

Those present at Andrews presentation included **Alan Betts,** Head of the Amateur Radio Section at the RA, **Bob Whelan G3PJT**, President of the RSGB, **Paul Bigwood G3WYW** Yaesu UK ltd., members of CSARF, and Andrew's parents and Grandfather. Prior to the presentation, Alan Betts, Andrew and his entourage were treated to the 'Grand Tour' of the Baldock Monitoring station. The tour included a demonstration of direction finding techniques and a look at one of the mobile laboratories.

Alan Betts presented Andrew with a special certificate on behalf of the RA, along with some special souvenirs including an RA Monitor Mouse Mat!

Next, demonstrating their full support for the Foundation Licence, Paul Bigwood G3WYW from Yaesu UK ltd, presented a Yaesu FT-817 and a selection of useful 'goodies' to Andrew. This presentation was then followed by the RSGB's presentation of even more goodies - including a log book - by Bob Whelan.

The event rounded off with Andrew M3FMA posing for the press before everyone enjoyed a buffet lunch. Throughout this period Andrew clutched his FT-817 and resisted all attempts by the Editor of *Practical Wireless* to steal his new rig!

Celebrating Andrews success and wearing RSGB hats (from left to right), Alan Betts, Bob Whelan G3PJT, members of CSARF, Andrew M3FMA and Paul Bigwood G3WYW.

Illegal Equipment in use

Radiocommunications Agency Conviction

The following notice was received at the Newsdesk direct from the Radiocommunications Agency.

"**Steven Richardson**, 47 of Dane Ghyll in Barrow in Furness has been convicted of having illegal radio equipment available for use. He was fined £500 after pleading guilty to a charge under Section 1A of the Wireless Telegraphy Act (as amended by the Broadcasting Act 1990) at Preston Crown Court on 16 September.

In February 2000 information relating to illegal 27MHz CB single side-band radio transmissions was found posted on the Internet, revealing a forthcoming meeting of a club identifying itself as 26AT000. On Sunday 16 July 2000 a mobile monitoring station was established in the area of the meeting and unauthorised transmissions on 27.555MHz were heard. The station identified itself as 26AT000.

Using portable Direction Finding equipment, the transmissions were traced and proved to an aerial on the side of premises where the meeting was taking place. Radiocommunications Agency officers, accompanied by Barrow Police, entered the premises where they located a modified Kenwood Amateur Radio transceiver transmitting on the above frequency and labelled as 26AT000 Special Event Station.

Steven Richardson, a licensed Radio Amateur, was identified as the owner of the equipment".

Editorial Note: Mr Richardson is listed at G7OXB in the RSGBs 2003 *Yearbook*.

Third Generation Amateur

Newton's New Recruit

The Foundation Licence certainly seems to be attracting plenty of new blood to the hobby! Here's news of yet another M3 success!

The name Newton is well known among the pages of *PW* with **Richard Newton G0RSN** being one of our regular reviewers. So, the editorial 'team' were delighted to hear that **Thomas** Newton (Richards' son) was following in his father's footsteps. Nine year old Thomas attended a Foundation course run by the **Dorset Police Amateur Radio Society** at St John County HQ Dorchester in late September 2002. Accompanied by his Auntie, **Carolyn** (wife of **William G7GMZ**) and supported by Grandad **Terry G7VJJ**, Mum, **Diane**, brother **Oliver** (age 7, who wants to sit the exam next year!) and of course Dad G0RSN, Thomas represented the third generation of Radio Amateur in the Newton family. And Richard is sure that his Dad J**ohn G8EAM** (now a silent key), would have been very proud of him too.

Both Thomas and Carolyn passed the exam and are now on the air. Listen out for Carolyn operating as **M3CSK** and Thomas, who is having great fun talking to family and making new friends on 145MHz using a HamMaster 2010 (one of Richard's old rigs) with the callsign **M3TJN**.

Well done Thomas and Carolyn! It's good to hear the hobby of radio is still being encouraged through the younger generations in a bid to keep Amateur Radio thriving.

Feedback

Letters in Waiting

A mounting pile of letters await to be published in the January issue of PW. Rob Mannion G3XFD the Editor of Practical Wireless explains why.

Rob reports: "We've had a very great deal of feedback - both in letters, E-mails and telephone calls from readers expressing different points of view regarding the Star Letter from **Brian Matthews M3DMV** in the November issue of *PW*. Unfortunately most of the letters and E-mails arrived too late to be included in this issue of the magazine. As a result, and in an attempt to provide the fairest coverage of the topic, I've taken the decision to 'hold over' those we have on the subject until the January 2003 issue of *PW*.

If you were involved in the incident, or have an opinion we urge you to take this opportunity to 'have your say'. We try to publish a balance of opinions...but can only do so if you let us know what you think, or provide your version of any events or incidents. So, let's be hearing from **you** - your opinion is important! **Rob G3XFD**

amateur radio clubs

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

CAMBRIDGESHIRE

Cambridge & DARC
Contact: Ron Huntsman G3KBR
Tel: (01223) 501712
Website: www.cdarc.org.uk

Meetings of the Cambridge & District Amateur Radio Club are held (almost) every Friday from 1930 to 2130hours at the Coleridge Community College, Radegund Road, Cambridge. The club offers Amateur Radio, electronics construction, contest operating, computing, packet radio, TCP/IP over radio and Linux to name a few subjects. Morse Code classes are also available from 1930 if requested. Talks start promptly at 2000hours. Why not go along to one of these meetings? **Nov 22:** High Power Klystrons in u.h.f. Transmitters by Roy M1GRT; **29th**: Video evening; **Dec 6:** Equipment surgery, bring your faulty equipment along; **7th:** Visit to the Vintage Wireless Museum Dulwich, London and **13th:** Christmas Party.

ESSEX

Chelmsford ARS
Contact: David Bradley M0BQC
Tel: (01245) 602838
E-mail: cars@g0mwt.org.uk
Website: http://www.g0mwt.org.uk/

Chelmsford Amateur Radio Society meet on the 1st Tuesday of each month at 1915 hours in the Marconi Social Club, Beehive Lane, Great Baddow, Chelmsford. Forthcoming meetings include: **Jan 7**: Constructors evening, **Feb 4**: VHF/UHF Propagation by **Les Barclay G3HTF** and **March 4:** Talk by *Practical Wireless* Editor **Rob Mannion G3XFD.** The club also run Foundation Courses and the next one starts on **9 January**

HAMPSHIRE

The Three Counties ARC
Contact Damian M0BKV
Tel: (01428) 724456

The Three Counties Amateur Radio Club meet at the Bramshott Parish Club & Institute, 4 Headley Road, Liphook, Hants. GU30 7NP. Meetings are held on the 2nd & 4th Thursdays of the month at 2000hours. Forthcoming meetings include: **Nov 14:** WX Satellite Data Receiving Demonstration by **Frank Bell G7CND** and **28th**: Antenna workshop computer modelling of antennas with **Graham G4WNT**.

MANCHESTER

Wigan-Douglas Valley ARS
Contact: Dave G4GWG
Tel: (01942) 211397

The Wigan-Douglas Valley Amateur Radio Society meets every Thursday at 2030hours at TS *Sceptre*, the Sea Cadet HQ, in Brookhouse Terrace, off Warrington Lane, Wigan. Contact G4GWG for more details.

NORTHERN IRELAND

Bangor & Distrct ARS
Contact: Mike GI4XSF
Tel: 028-4277 2383
Email: mike@gi4xsf.com
Website: http://welcome.to/bdars

Bangor and District Amateur Radio Society meet on the 1st Wednesday of every month in The Stables, Groomsport at 2000hours. At 2000hours on **Wednesday 4 December 2002** the club are hosting a talk on 'Digital Modes in Amateur Radio', by **Harry GI4JTF**. Harry will demonstrate some of the new digital modes, such as PSK31 and will also show how some of the 'older' digital modes like RTTY are very easily used with a modern computer. Visitors and new members are (as always) most welcome. The club's next Foundation licence course is running on the weekend of **15 & 16th February 2003**. Sign-up now to secure a place!

Keep those details coming in!

SALES 01908 281705

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E&OE

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SHORT WAVE RECEIVING ANTENNA

MD37 SKY WIRE (Receives 0-40Mhz).....£39.95
Complete with 25 mts of enamelled wire, insulator and choke Balun Matches any long wire to 50 Ohms. All mode no A.T.U. required. 2 "S" points greater than other Baluns.
MWA-H.F. (Receives 0-30Mhz).....£29.95
Adjustable to any length up to 60 metres. Comes complete with 50 mts of enamelled wire, guy rope, dog bones & connecting box.

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18" T & K Bracket *(complete with U Bolts)*.....£17.95
24" T & K Bracket *(complete with U Bolts)*.....£19.95
36" T & K Bracket *(complete with U Bolts)*.....£29.95
Chimney lashing kit.....£24.95
Double chimney lashing kit.....£12.95
3-Way Pole Spider for Guy Rope/ wire.....£3.95
4-Way Pole Spider for Guy Rope/ wire.....£4.95
11/2" Mast Sleeve/Joiner.....£8.95
2" Mast Sleeve/Joiner.....£9.95
Solid copper earth rod 4'.....£9.95
Pole to pole clamp 2"-1.5".....£4.95
Di-pole centre (for wire).....£4.95
Di-pole centre (for aluminium rod).....£4.95
Dog bone insulator.....£1.00
Dog bone insulator heavy duty.....£2.00

POLES H/DUTY (SWAGED)

Heavy Duty Ali (1.2mm wall)
1 1/4" single ali pole.....£7.00
1 1/4" set of four.....£24.95
1 1/2" single ali pole.....£10.00
1 1/2" set of four.....£34.95
2" single ali pole.....£15.00
2" set of four.....£49.95

REINFORCED HARDENED FIBRE GLASS MASTS (GRP)

1 1/2" Diameter 2 metres long.....£16.00
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GUY ROPE 30 METRES

MGR-3 3mm (maximum load 15 kgs).....£6.95
MGR-4 4mm (maximum load 50 kgs).....£14.95
MGR-6 6mm (maximum load 140 kgs).....£29.95

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RG58 best quality standard per mt.....35p
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Mini 8 best quality military spec best quality per mt.....70p
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H200 best quality military coax cable per mt.....£1.10
PHONE FOR 100 METRE DISCOUNT PRICE.

CONNECTORS & ADAPTERS

PL259/9.....£0.75 each
PL259/6.....£0.75 each
PL259/7 for mini 8.....£1.00 each
BNC (Screw Type).....£1.00 each
BNC (Solder Type).....£1.00 each
BNC for 9mm (RG213).....£2.50
N TYPE for RG58.....£2.50 each
N TYPE for RG213.....£2.50 each
SO239 to BNC.....£1.50 each
PL259 to BNC.....£2.00 each
N TYPE to SO239.....£3.00 each
BNC to N-type.....£2.50
SMA to BNC.....£3.95
SMA to SO239.....£3.95
SMA to PL259.....£3.95
SMA to BNC (male).....£3.95
SO239 chasis socket round.....£1.00
N-type chasis socket round.....£2.50
SO239 double female.....£1.00
N-type double female.....£2.50
SO239 double female.....£1.00

YAGI COUPLERS

YC-6m For 2 x 50MHz Yagi.....£29.95
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G.A.P.12 1/2 wave alumimum (length 18' approx).....£19.95
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MB-4X 4:1 Balun 1000 watts power.....£29.95
MB-6X 6:1 Balun 1000 watts power.....£29.95
MB-Y2 Yagi Balun 1.5 to 50MHz 1kW.....£24.95

RIBBON LADDER USA IMPORTED

300Ω 20 metre pack.....£15.00
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(Other lengths available please phone for details)

TRI/DUPLEXER & ANTENNA SWITCHES

MD-24 (2 Way Internal Duplexer) (1.3-35 Mhz 500w) (50-225 Mhz 300w) (350-540 Mhz 300w) insert loss 0.2dBd SO239 fittings.....£22.95
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AR-31050 Very light duty TV/UHF.....£24.95
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RC5-1 Heavy duty HF.....£349.95
RG5-3 Heavy Duty HF inc Pre Set Control Box.....£449.95
AR26 Alignment Bearing for the AR300XL.....£18.95
RC26 Alignment Bearing for RC5-1/3.....£49.95

ROTATOR CABLE

3 Core.....0.45p per metre
7 Core.....1.00 per metre
(Please phone for 100 metre discount price)

MOUNTS

Turbo mag mount 7" 4mtrs coax/PL259 3/8 or SO239.....£14.95
Tri-mag mount 3 x 5" 4mtrs coax/PL259 3/8 or SO239.....£39.95
Hatch Back Mount (stainless steel) 4 mts coax/PL259 3/8 or SO239 fully adjustable with turn knob.....£29.95
Gutter Mount (same as above).....£29.95
Rail Mount (aluminium) 4mtrs coax/PL259 sutiable for up to 1inch roof bars or poles 3/8 fitting.....£12.95
SO259 fitting.....£14.95
Gutter Mount (cast aluminium) 4mtrs coax/PL259 3/8 fitting.....£9.95
SO259 fitting.....£12.95
Hatch Back Mount 3/8 4mtrs coax/PL259.....£12.95
Roof stud Mount 4mts coax/PL259 3/8 or SO239 fitting.....£12.95

BEST QUALITY ANTENNA WIRE

The Following Supplied in 50 metre lengths
Enamelled 16 gauge copper wire.....£9.95
Hard Drawn 16 gauge copper wire.....£12.95
Multi Stranded Equipment wire.....£9.95
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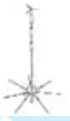

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TEX'S TIPS & TOPICS

Hello and welcome to the occasional column that, although it's called Tex's Tips and Topics, its really about your ideas, tips and tricks. So, here are a few suggestions from readers seeking to win book vouchers for every tip published!

This month we have a simple 10 minute project from **Tony Martin G4XBY**, that makes tuning some transceivers quicker and easier and, from **Derek Southey G0EYV** an idea that's 'plumb centred' on making the shack tidier! I'll describe that idea later but first, let's start with Tony.

Tony wrote "I suffer from Arthritis and I sometimes find it painful to twiddle with the tuning knob, particularly if I want to quickly move frequency across the bands. My Alinco DX-70 Transceiver is a delight to use, however, like many other transceivers, it doesn't have a 'handle' built into the tuning knob. So, I set out to rectify this without causing any major damage to the radio".

To install Tony's modification you'll need: One rubber tyre from a discarded toy car. It should have a slightly smaller internal diameter than the tuning knob (Tony's grandson lost out). One 24mm long 3mm diameter bolt with a large flat head. One 5mm wide Tie Wrap (150-200mm long). An 18mm length of Chrome plated tubing.

The chromed tubing was cut from the suitable section of an old telescopic antenna, however any piece of stiff tubing would have done providing that its internal diameter allows it to fit the bolt. The only tool needed to complete the job is a pair of snipe nosed pliers

Between The Knees

Then holding the radio firmly between the knees, force the rubber tyre over the tuning knob until it sits uniformly around it. The handle's next. Take the piece of tubing and slip it over the bolt so that only the last few millimetres of thread protrude. (The bolt head retains the tubing in place).

Then take the tie wrap, place it around the tuning knob and loosely tension it leaving sufficient gap adjacent to the tie wraps fixing block to push the threads of the bolt between the tie wrap and the tyre.

Fig. 1: The simple - yet effective quick-tune handle for rigs that don't have one as standard (See text for more detail).

Next, with a pair of snipe nosed pliers, grip the loose end of the tie wrap and with a pulling-twisting motion tension the tie wrap. This action locks the bolt in place causing the threads to bite into the rubber tyre giving added strength with little or no lateral movement of the bolt (see **Fig. 1**).

That's it done! The piece of tubing should spin on the bolt as you turn the knob making tuning quick and easy. You can whizz up and down the bands easily now! Thanks Tony!

Electrical Trunking

Now to Derek's idea! I'm sure many of you have laid coaxial and power cables, not to mention rotator and other leads in plastic 'stick-on' surface electrical trunking to keep the shack tidy. Derek G0EYV certainly has, but as he said in his letter "I've always experienced difficulty snapping on the lid (and the cables tangle!). Whilst shopping for fittings in the plumbing section of a d.i.y. store I came across a similar product, but much easier to use".

Derek went on the describe the items he had found. Like the surface mount trunking, it also consists of a plastic channel 50mm wide and 15mm deep, and some two and a half metres long. Each piece is supplied with five clips with recessed holes suitable for countersunk screws. These clips are designed to mount two 15mm copper pipes running side by side in the clips, the whole run is then covered with the plastic channel (see **Fig. 2**).

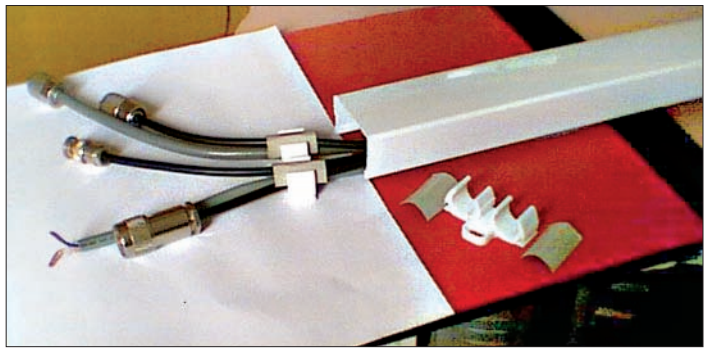

Fig. 2: A suitable replacement for surface mount electrical trunking may be found in a plumbing centre (See text for more detail).

If you now forget the copper pipes and think instead of coaxial and other cables it's so simple. Screw each clip to the wall, in line either vertically or horizontally along the line that you wish your cables to run. Then just lay the coaxial or other cables in the clips in line (using stiff card as a retainer if needed). All that's left to do to finish the job, is cut cover to length and 'snap it on'.

The channel material is easy to cut with a fine toothed saw (but care is required if using a modelling knife). So, cut-outs can be made for cables to exit at suitable points and it's easily 'mitred' if you require 90° corners in the runs

Note. The plastic covering is obtainable from most major plumbing outlets (pun intended) such as Wickes Home Improvement Centres, B & Q etc. It seems that Wickes Centres are the cheaper, selling the trunking with five clips. However, B&Q sell the five clips separately, and in their packs they supply screws and plugs! There's also a larger size available for use with 22mm pipes or for those with an antenna farm!

My thanks go to Tony and Derek for those ideas, they're both very useful. Book vouchers on the way to both of them, just right for Christmas stocking time. **So, if you want a book voucher for an idea - you've got to write in first! - What are you waiting for?**

Tex

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★★★★ *WRTH* gave it 4 star rating.

Optional DSP unit. £85.00

OUR PRICE **£589.00**

SP-21 extention speaker.....£74.99

JRC NRD-545 DSP

The ultimate short wave receiver with DSP - for the real perfectionist.

OUR PRICE **£1299.00** Del £10.00

NVA-319 Extention speaker £189.00
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hf made easy

YAESU FT-100'D' NEW VERSION

Superb mobile/base TVCR for HF/VHF/UHF, all mode. Now includes: TXCO/CW filter (narrow), larger speaker + loads more!

LIMITED STOCK @ **£799.99**

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100kHz-440MHz (with gaps). All mode transportable. Includes nicads/charger. O/P:- up to 5W. £799.00

SPECIAL PRICE **£579.00**

KENWOOD TS-570DGE

In our opinion, the best HF Tx below £1500.

OUR PRICE **£819.00**

PS-53 matching power supply.....£229.00
MC-60A Desk mic.....£119.95
SP-23 matching speaker £68.95

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TRUE IF DSP TRANSCEIVER When only the best will do!

STILL OUR No1 SELLER!

SALE PRICE **£1279.00**

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LATEST UK MODEL

ICOM IC-706II G

Now on its 3rd generation, this classic all-band transceiver is still our No. 1 best seller. HF + 6m + 2m + 70cm. *2 year warranty.*

OUR PRICE **£829.00**

AT-180 Auto A.T.U.....£339.00

NEW IC-7400

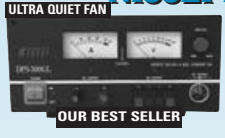
HF+6m+2m, All mode, 32bit DSP for outstanding signal enhancing. ~~£1549.00~~

OUR PRICE **£1399.00**

SP-21 matching speaker £74.99

power supplies

NISSEI PS-300



Features: ★ Over voltage protection ★ Short circuit current limited ★ Twin illuminated meters ★ Variable voltage (3-15V) latches 13.8V ★ Additional "push clip" DC power sockets at rear ★ Multiple front outlets ★ Detatchable IDC lead (supplied) for mains connection.

Superb 30 amp/12V

A SNIP AT **£119.95** Del £10

NEW NISSEI PS-1225

25A @ 13.8V yet lighter than an IC-706 but about the same size.

Features: ● Ultra quiet fan ● Over voltage/current protection ● Weighs ~ 1.8kgs ● Size: 57 x 177 x 190mm ● Additional sockets at front & rear.

~~£79.95.~~ **£59.95** Delivery £10.00

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- Volts adjust (9-15vdc)
- Light in weight: 2.1kg
- Automatic shutdown on load fault
- Ultra quiet cooling fan
- Over volts protection
- Compact size 190W x 120H x 225D mm. ~~£89.95~~

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vhf-uhf handies

KENWOOD TH-F7E

Transceiver & scanner 2m/70cm Tx (5W). Rx:- 0.1-1300MHz, all mode (incl SSB). Incls:- Lithium ion battery & charger.

+ FREE REMOTE MIC

OUR PRICE **£249.00**

VC-H1 Kenwood camera £199.95
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ALINCO DJ-596

2m + 70cm Handie.
Includes: (NIMH) Battery/Charger.
High + Narrow switchable.
High Power (4.5W) OP as standard.
Alpha Numeric Channeling.

SALE PRICE **£149.95**

Optional case.....£15.00
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Cigar lighter lead £19.99

ALINCO DR-605

SUPERB DUAL BAND MOBILE AT A REALISTIC PRICE

2m/70cm. 50/35W. True dualbaner at a sensible price. (Optional extended Rx).

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DR-135 2m FM mobile .....our price £179.00

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REGULAR-GAINER RH-770

BNC 21cm flexible whip that is ideal as replacement.

Rx:- 25MHz-2GHz.
Tx:- 2m/70cm OUR PRICE **£16.95** P&P £1.50

SUPER-GAINER RH-9000

BNC 40cm flexible whip for the ultimate in gain. (Rx:- 25MHz-2GHz).

Tx:- 2m/70cm OUR PRICE **£21.95** P&P £1.50

QS-300

A fully adjustable desk top stand for use with all hand-helds. Fitted coxial lead with BNC + SO239 connections.

OUR PRICE **£10.00** P&P £3.00

AR788 *NEW MODEL*

Quality rotator for VHF/UHF. Superb for most VHF-UHF yagis, 3 core cable required. £49.99. 3 core cable 50p per mtr.

OUR PRICE **£39.99**

AR-201 .....Thrust bearing for above only £13.99

MM-1 MICRO MAG ANTENNA

Micro magnetic base with (19") whip. Rx:- 0.5MHz-2GHz. Ideal for all scanners supplied with minature coax lead & BNC (all fitted). Tx:- 2m/70cm.

OUR PRICE **£24.95** P&P £5.00

SGC-230

200W instant auto ATU. Tune any length of wire with this superb ATU. (Minimum length applies.)

£349.95

SGC-237 HF+6m Tuner £379.00
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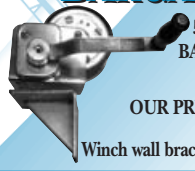
SGC-231 HF + 6m.....£379.00
Smart lock.....£62.95
Earth Stake.....£13.99

BARGAIN WINCH



500kg brake winch.
BARGAIN PRICE ~~£129.95~~.

OUR PRICE **£59.95** del £8.50

Winch wall bracket.....£19.99

shack accs

YAESU G-650C

Extra heavy duty rotator for large HF beams, etc. Supplied with circular display control box and 25mtr of rotator cable.
GC-038 Lower mast clamps £25.00
GC-065 2" Thrust bearing £48.00.

OUR PRICE **£359.00**

G-450C £315.00
G-1000DXC.....£499.95
GC-038 Lower mast clamps.....£25.00
GC-065 Thrust bearing (2").....£48.00
G-5500 (azimuth/elevation) rotator £549.99

D-308B BLACK DELUXE DESK MIC

(with up/down). Many amateurs using this mic (over 4000) have expressed extreme pleasure with it's performance. Includes 8-pin round "Yaesu" mic lead.

£49.95 P&P £6.00

OPTIONAL LEADS (P&P £1.50)

A-08	8 pin "Alinco" round	£9.95
K-08	8 pin "Kenwood" round	£9.95
I-08	8 pin "Icom" round	£9.95
AM-08	Modular phone "Alinco"	£9.95
IM-08	Modular phone "Icom"	£9.95
KM-08	Kenwood modular lead	£9.95

Spare foram wind guard (M.C.) .....£2.00 each

MFJ PRODUCTS

MFJ-259B

HF digital SWR analyser + 1.8-170MHz counter/resistance meter.

ONLY **£249.95** P&P £6

MFJ-269	160-70cm analyser	£315.95
MFJ-949	300W ATU + dummy load	£149.95
MFJ-969	HF + 6m ATU	£179.95
MFJ-962D	1.5kW versa tuna	£249.95
MFJ-784B	DSP filter	£229.95
MFJ-461	Morse reader	£84.95

UK VERSIONS

Radio Basics

Rob Mannion G3XFD had a marvellous time at the Leicester Show in September and met many Radio Basics readers. In the next few months he's aiming to pass on some of the advice requested.

● Just the job for the beginner, and more experienced radio enthusiast - the Maplin YJ08 30,000Ω/V analogue multi-meter.

It was good to meet so many of *PW*'s Radio Basics (RB) readers at the Leicester Show. Everyone on *PW* realises of course that it is a useful series, but I'm constantly amazed at the wide cross section of age and experience groups there are as RB readers.

I think the youngest RB reader I've met -at the show- was around 12 years old. She showed me some of her soldering work...and to tell the you the truth it made me ashamed of mine!

The topics of conversation ranged widely, but it seems that many RB readers - especially the less experienced - need advice on test equipment. This backs up the feedback received at the office following the publication of the Capacitance/Resistance bridge published earlier this year.

However, getting down to the heart of the matter it seems that many of you are puzzled...should you buy a traditional analogue (needle and pointer scale) meter or digital type with liquid crystal display (l.c.d.)? **Well my reply is wholeheartedly - for everyone to start off with a traditional type of meter.**

New Meter

Recently I bought myself a new meter, and it couldn't have been easier! I drove my new battery buggy (the one many of you saw at the Leicester Show) along the sea front from my home in Bournemouth to the new Maplin shop - only a short distance from the resort's pier. What a pleasant way of shopping eh?

The meter I bought replaced a much older Maplin type which had failed after 10 years or so of being dropped, and a great deal of hard work. But even though there were cheaper l.c.d. digital types available....I opted for the traditional type. Why?

The answer to the question is simple...I regard the needle-and-pointer display to be the best introduction to measuring voltage, current and resistance. Perhaps I'm old-fashioned, but I think it's easier to relate the measure by interpreting the relative position on a scale, rather than stark figures.

The only other way I can compare it is with a clock reading. With a dial-and-hands clock you 'read' the time- and you can make judgements instantly (20 minutes to go, etc.) whereas it's not quite so easy - believe it or not -with a digital type meter.

However, when really precise reading - especially for digital logic type of work - the digital display type comes into it own. **So start off with a moving coil type and then get a digital meter too...the best of both worlds.**

● Close-up view of the meter's display (see text).

Sensitivity & Ranges

The sensitivity of the meter, equipped with a delightfully clear three colour mirrored scale is 30,000 Ω per volt. (Ω / V) on d.c. and 10,000 Ω / a.c. (the far lower figure on a.c. is not unusual). This is one of the occasions where the kilo (k) is not often used, and the information is written out in full. Stated simply, the higher the stated ohms-per-volt, the more 'sensitive' it is because less current is taken to 'drive' the meter. The result being that less current is taken from the circuit being measured, and there's consequently less of a voltage drop which equates to more accurate results!

Ranges available on the meter are (a.c./d.c. and all from 0, maximum - full scale selection (f.s.d.) deflection only quoted: 10, 30, 100, 300 and 1000V. Battery test ranges with separate scale ranges (unusual feature but convenient) 1.5, 3 and 9., Current ranges are 100µA, 3mA, 30mA, 300mA and - separate socket for safety) 10A.

Resistance ranges are Ω x 1, x 10, x 1000 and 10,000. These will provide all the resistance measurements you'll need for hobby radio. A built in transistor tester is provided, and the meter is diode and fuse protected. There's an (adequate but not brilliant!) instruction leaflet supplied, along with test leads and there's fold-out stand. Not bad for around £15! Check out your local Maplin shop...just in case it's on offer at a lower price.

In future, the Maplin YJ08 will be used for all the voltage checks, etc., in this column. In other words it will be the RB 'standard' meter and I'll be explaining how to use it as we go along. And at the price...I think it's a bargain and much lighter than my (admittedly much more robust) AVO 8 meter!

Cheerio until next time!

PW

Did your club enter the 2002 *PW* and Kenwood Club Spotlight Magazine Competition? If they did...read on to see how they got on this year, as Rob Mannion G3XFD presents the results.

Everyone's A Winner!

Club Spotlight Magazine Results 2002

The standard of the entries for this year's *PW* & Kenwood Spotlight Club Magazine Competition were up - remarkably so in the opinion of the adjudicating panel. However, the numbers of magazines entered for the 'Local' club category was down this year...with only eight entries compared to ten last year.

For the second year running there were again only two entries in the 'National' category. Indeed, it was fortunate that the Scottish-based Cockenzie & Port Seton Amateur Radio Club has now opted for the 'National' category (they consider - and the adjudicators agree with their decision) that they are in fact a National Club as they have members from a far wider area than would be considered usual for a Local Category entry.

Additionally...the judges realise that it's a generous move by C&PSARC members to let other 'high fliers' win the trophy! On behalf of the judging panel I thank them for this kind act...which reflects well on the hobby and C&PSARC in our opinion.

National Winners

The National category winner this year is the **Benelux QRP Club**, whose entry *Nieuwsbrief* won with 38 points, compared to **Cockenzie and Port Seton's** commendable 34 points. No strangers to the competition, the Benelux QRP club - based in Holland and covering the 'Low Countries' (the traditionally term for Belgium Holland and the Grand Duchy of Luxembourg) impresses the adjudicating panel every year...despite the magazine being in Dutch! (Only one of the panel speaks or reads any Dutch). Despite this likely handicap all the judges were very impressed. All marks (within brackets, in bold) are out of a possible 10 per judge. A maximum score of 40 is possible.

Dave Wilkins G5HY commented: "Very good contents, very professional, clear diagrams, good layout". (**9**)

Jim Bacon G3YLA said: "Yet again a fantastic effort, very inspirational...enough to get me learning Dutch properly". (**10**)

David Barlow G3PLE (who originated the idea for the competition) said "Once again the Benelux QRP Club enter their superb, specialist production. Excellent material and ideas". (**9**)

My own comments are: Superb reading, breathes enthusiasm at you. Despite being in Dutch I can sit down and enjoy the reading and get ideas. Any words I don't know...I can find with the help of a English/Dutch dictionary. Absolutely superb 'real radio' club magazine". (**10**).

Robert van der Zaal PA9RZ, Editor of the Benelux QRP Club's *Nieuwsbrief* was unable to attend the Leicester Show, and **Edwin Voss PA3GVQ**, **Fig. 1**, kindly accepted **The Bert Newman G2FIX Trophy (Bert's Bell Trophy)** from **Hilda Rusbridge**, the late G2FIX's sister who makes strenuous efforts to attend the LARS each year. Thank you Hilda and family, and also to Edwin PA3GVQ.

Jim Bacon G3YLA, commenting on Cockenzie & Port Seton's entry said: "A good newsletter with good quality printing and measured a use of colour. I particularly liked the events and contest listings (**8**).

Dave Wilkins G5HY commented: "Very informative, and a good read. Good pictures and an excellent contest calendar! Well done C&PSARC"! (**9**).

Incidentally, each entrant receives a photocopy of their individual adjudication sheets. Only a representative number of comments can be published in *PW*...due to lack of space! Finally, let's hope we get a few more entries in 2003 for the National section. There's some superb magazines waiting in the wings...so let's see them please!

A Close Run Event!

Due to the high standard of entries - and the friendly rivalry between two clubs in particular...the competition was truly a 'close run' event. The winners, **Sutton & Cheam Radio Society (S&CRS) scored 38.5 points** (out of a possible 40) only beating their friendly rivals **- the Warrington Amateur Radio Club by half a point!**

When I telephoned the Sutton & Cheam (And no...I can confirm the late Tony Hancock **was not a member!**) to pass on the good news I was told that they were delighted...because Warrington and Sutton were always chasing each other in various contests! I was also delighted to realise just how friendly the competitive spirit was....in the best tradition of Amateur Radio. There was none of the "I must kill the other player", which is so prevalent in rugby and other games using different shapes of leather balls!

Commenting on S&CRS entry Dave G5HY said: "I rate this entry as excellent...the club information is absolutely first class". (**9.5**).

Jim G3YLA said: "An extremely good and informative newsletter with bags of club details and a noticeable attention to club members' needs.

● Fig. 2: Winner of the Spotlight Local section in 2002 was the very active Sutton & Cheam Radio Society...beating Warrington Amateur Radio Club by half a point! The S&CRS Editor was unavailable, and Robin Sykes G3NFV, accompanied by fellow S&CRS member Alan Cross G4WGE, kindly stepped in. Readers may well imagine - from the worried look on Robin's face - that he's thinking "We'll have to try even harder to keep the trophy next year"!

Does exactly what it says on the tin"! (**9**).

David G3PLE commented: "This tome is the ideal club/society newsletter"! (**10**).

My own comments were: "Superb! 'Fizzing' with features, interest and everything shows what can be done with a simple A4 sheet format. Very well done Sutton & Cheam". (**10**).

The S&CRS Editor wasn't able to attend the Leicester Show, however, **Fig. 2**, two members who were visiting the event were 'hijacked' to receive the Spotlight trophy. Unfortunately, Dave Wilkins G5HY was too busy to leave the Kenwood stand and so I had the proud duty of presenting the cup to **Robin Sykes G3NFV** and **Alan Cross G4WGE** on Dave's behalf.

As I've already mentioned...this year's competition in the Local category was very close with the Warrington Amateur Radio Club (WARC) missing out by only the half-point. Commenting on the WARC's entry I said: "A superb little magazine (A5 size) well edited, full of features, a nice read, well balanced serious content and light reading features. Designed for readers...not to win competitions. Does the job very well indeed". (**10**).

Jim G3YLA said: "I really liked the overall quality of production and articles in this entry". (**9.5**).

Well done WARC! Let's hope Warrington will enter again in 2003. If they do it should be an interesting competition!

Excellent Entries

As I've already mentioned...there were some excellent entries this year and the standard was very high indeed. And bearing in mind just how important a club magazine can be to newcomers (and old hands alike) in my opinion they seem to be doing a superb job in promoting, encouraging and informing their readers. In fact, I strongly advise anyone interested in club magazines to contact the Editors of the entries (supplying an s.a.e.) to pick up some ideas themselves. After all...imitation is the sincerest form of flattery!

Two clubs share **36.5** points this year...the first (in alphabetical sequence) is the **Crawley Amateur Radio Club**. Dave Wilkins G5HY (awarding 10 points) said "This is a brilliant magazine - content, etc., is 'top flight' (he had to get a mention in about Gatwick didn't he?) well done". And like myself...Dave thinks this is a future winner!

The second 36.5 points winner is the **Stockport Radio Society** in Cheshire. David Barlow G3PLE commented "Very well presented and interesting with something for all ages...with crisp, larger size typeface. Superb". (**9**).

Jim Bacon G3YLA said: "This is a very successful club judged by the newsletter. How many clubs have a one year plan...let alone a five year plan! Works very well, contains all the info a club member would want". (**9**). So, another potential winner for next year?

Next comes the **Worthing & District Amateur Radio Club** with **36 points**. Dave G5HY (awarded **9.5** points) said "This does the basic task of providing all club information exceptionally well and it's good to read. Very well done"! David G3PLE (awarding **8.5** points) said: "A very good entry with many new features, I especially liked the Airwaves section and contact information".

The Cleddau Amateur Radio Society (based in Haverfordwest in Wales) scored 33.5 points (I awarded them **9.5 points**) and I was most impressed, saying: "What a lovely newsletter. Excellent features, well edited and obvious hard work - keep it up...you've got a winner here...I'd be proud to belong to your club"!

Two clubs shared **33 points** this year, and the first (in alphabetical order) is the **Chelmsford Amateur Radio Society**...an extremely active club! Dave Wilkins G5HY - (awarding **8.5** points) commented enthusiastically "Good club information section, nice font and page lay-out, excellent all round read".

The second club sharing 33 points is another extremely active group...the **Oldham Amateur Radio Club**, based in Lancashire. My comments (I awarded **9** points) on their entry *Old Hams News* (they deserve a point for the title I feel!) were "Traditional A4 layout, friendly and informative...does the job well".

Next Year's Competition

With entries of such a high standard next year's competition should bring some more excellent reading. So, why not enter your own magazine...or better still. if you've not already got a newsletter, start one yourself?

You never know...it could be your club winning the trophy in 2003....**but only if you enter the competition**. Finally, on behalf of the Adjudicators (thanks for your continuing support Gentlemen) I wish you good luck and a full news basket/feature stock!

PW

● Fig. 1: As usual, Hilda Rusbridge (Sister of the late Bert Newman G2FIX) made strenuous efforts to travel up to the Leicester Show representing her late brother. Here she's shown presenting the Bert Newman G2FIX trophy (Bert's Bell) to Edwin Voss PA3GVQ from Holland. Edwin - a keen supporter of the British Amateur Radio rally and show scene - kindly accepted the trophy on behalf of the Benelux QRP Club, winners in the National section of the competition.

Power That Valved Portable!

Phil Cadman G4JCP has several of the once common 90V/1.5V battery-valved portable sets, even though the batteries aren't obtainable any more. But thanks to modern technology...it's possible to power that valved portable once again!

Portable valved radios became popular in the late 1940s, when compact sets using miniature valves and layer-type h.t. batteries were introduced. They remained popular until transistor sets became affordable.

Nowadays though 'All Dry' batteries are, in the main, unobtainable. **It is possible** to make up both h.t. and l.t. batteries using modern cells, but it's expensive! Ideally, a rechargeable battery and a high-efficiency converter are needed.

Despite detail differences, the vast majority of portable sets used a few basic designs. With that in mind, I'm presenting a collection of modules that can be used, in combination, to power almost any battery-valved radio.

Early miniature battery valves had 1.4V, 50mA filaments. Output valves had twin filaments which could be wired either in series (50mA at 2.8V), or in parallel (100mA at 1.4V). A typical set would draw 250mA at 1.4V.

Valve manufacturers then developed a series of valves whose filaments consumed just 25mA. Sets using these valves typically draw 125mA at 1.4V.

While 1.4V-filament valves were expected to run from a 1.5V dry battery, they were designed to operate over quite a large voltage range. However, if a stable l.t. supply was available, valve manufacturers recommended a filament voltage of 1.3V, with an acceptable range from 1.25V to 1.4V.

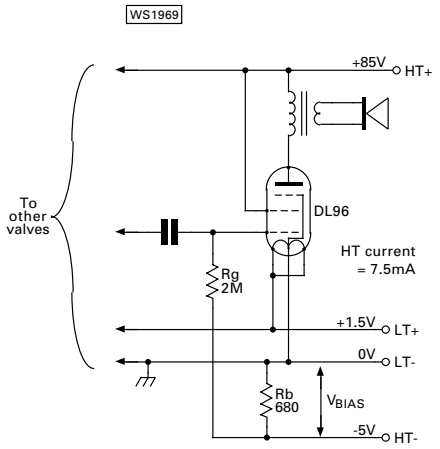


Fig. 1: The essentials of a DL96 audio output stage, a very common circuit used in 90V h.t., 1.5V l.t. battery portable receivers (see text).

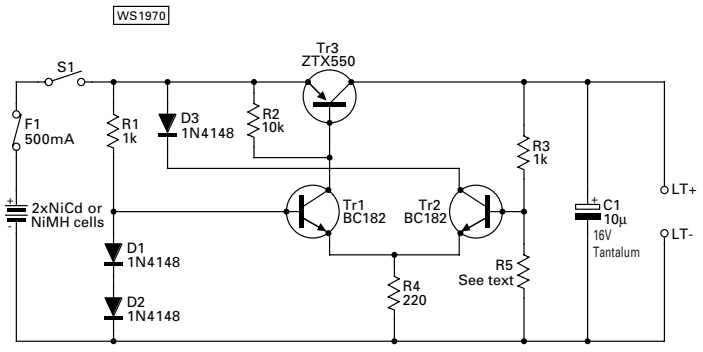


Fig. 2: A linear regulator using two parallel connected ZTX550 transistors (only one shown for clarity). The design shown allows the filaments of 1.4V, parallel-connected valves to be run from two NiCd or NiMH cells, or even from a 2V accumulator (see text).

High Tension

On the h.t. side, 90V became the norm although some sets did use slightly lower voltages. Total h.t. current varied somewhat, but was seldom more than 10mA.

The total power needed to run a set is something between 1.4 and 1.7W (including converter losses). So a 12V rechargeable battery is arguably the most practical source of power.

There's one important thing to bear in mind about battery-valved sets: the h.t. and l.t. supplies do not normally share a common ground. (**Fig. 1**, shows the essentials of a DL96 audio output stage).

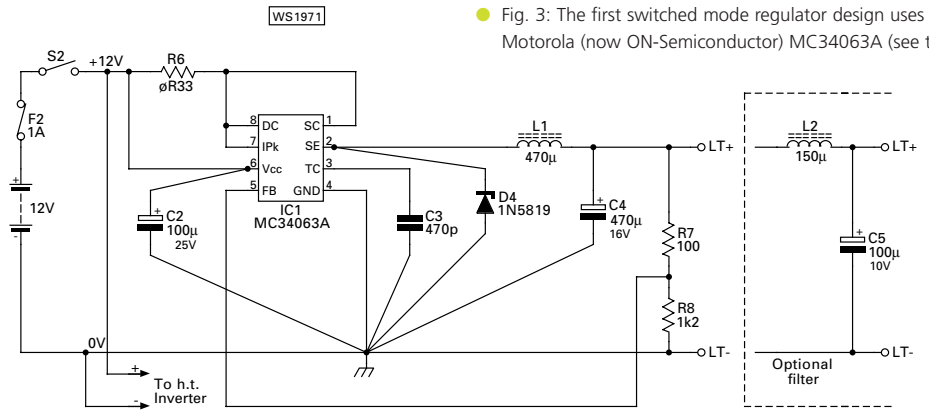
The l.t. battery negative is connected directly to the chassis (ground), while the h.t. battery negative is connected to a low-value resistor (Rb) and to the DL96's grid-leak resistor (Rg). Current flowing through Rb causes a potential to be developed across it.

By choosing the correct value for this resistor, the p.d. can be made equal to the voltage required to bias the DL96. Although this method of biasing reduces the available h.t. voltage, no separate grid bias battery is needed.

Valves in some sets, particularly those with built-in mains supplies, have their filaments connected in series. In these sets the bias for the output valve can be derived from the (usually 7.5V) l.t. supply, thus making a bias resistor unnecessary. Yet I've found many instances where even here, there has been a resistor connected between h.t. negative and chassis. It's clear then, while the l.t. supply needs no d.c. isolation, **the h.t. supply almost certainly will need to be isolated**.

Background Noise

Listening to weak signals demands a low background noise, often too low to be achieved with anything other than a



● Fig. 3: The first switched mode regulator design uses the Motorola (now ON-Semiconductor) MC34063A (see text).

linear regulator. The design shown in, **Fig. 2,** allows the filaments of 1.4V, parallel-connected valves to be run from two NiCd or NiMH cells, or even from a 2V accumulator.

The series-pass element in Fig. 2 is a *pnp* transistor. Normally, positive voltage linear regulators use an ***npn*** transistor here. However, with a *pnp* transistor, the minimum input-output voltage differential can be very low; 200mV or less. A conventional regulator might need 1.5V or more.

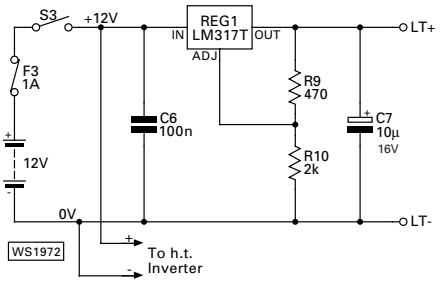
The diodes, D1 and D2 form a crude voltage reference. (A single 1.2V band-gap reference like the 1.235V LM385 is better.) Transistors Tr1 and Tr2 are connected as a long tail pair, albeit the tail resistor is rather 'short' at just 220Ω.

The long-tail pair compares the voltage across D1 and D2 with the voltage at the junction of resistors R3 and R5. If the voltage at the base of Tr2 is higher than the voltage at the base of Tr1 (because the regulator's output voltage is higher than it should be), Tr2 will conduct more heavily and 'steal' current from Tr1.

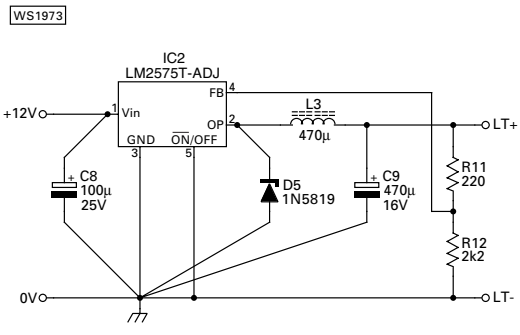
Transistor Tr1 supplies base current to the series-pass transistor Tr3. Any reduction in Tr1's collector current will cause a corresponding reduction in Tr3's collector current. That, in turn, will cause the output voltage of the regulator to fall.

The reverse will be true if the voltage at the junction of resistors R3 and R5 is lower than the voltage across D1 and D2. Consequently, the regulator will always try to maintain a constant output voltage.

With R5 open circuit, the output voltage will be the same as the reference voltage. To increase the output voltage to 1.3V, try around 15kΩ for R5. Better still, make R5 a 25kΩ miniature variable and adjust accordingly.



● Fig. 5: The circuit shown uses the well-known LM317T regulator. With the programming resistors shown (R9 and R10), the device delivers a shade over 6.5V. Capacitor C6 is needed for stability and should not be left out (see text).



● Fig. 6: A National Semiconductor 'Simple Switcher' circuit. The circuit is simpler than that of Fig. 3. (see text).

The Regulator

The regulator shown in Fig. 2, uses a pair of ZTX550s wired in parallel (only one shown for clarity) to provide 250mA at 1.3V. The manufacturer's data sheet shows the ZTX550's gain peaking around a collector current of 100mA.

By splitting the 250mA load current into (approximately) two, the current through each transistor is kept close this figure, and both transistors operate at maximum gain. For load currents below 150mA, use a single ZTX550, just as in Fig. 2.

(This design can be also be used to power 2V-filament valves from three NiCd or NiMH cells. Three changes are needed: R1 and R3 become 2k2Ω, and try 3k9Ω (or thereabouts) for R5).

Now, two warnings: First, do ensure that the power dissipated in the ZTX550(s) is limited. Personally, I recommend keeping below 0.5W for one ZTX550 and below 0.75W for a pair.

Secondly, *pnp* regulators are highly dependent on the regulator's output capacitor for stability.

In Fig. 2, the output capacitor C1 is critical; **check for instability if you change it for another type**. It's not particularly troublesome. It hasn't got the high gain most regulators have, but it'll certainly give a passable impersonation of a medium-wave transmitter if you dare leave C1 out of circuit!

Linear regulators are quiet, but they're not efficient when the input-output voltage differential is relatively large. With a 12V battery as the preferred power source, a switched-mode regulator is the obvious choice, providing any switching noise is acceptable.

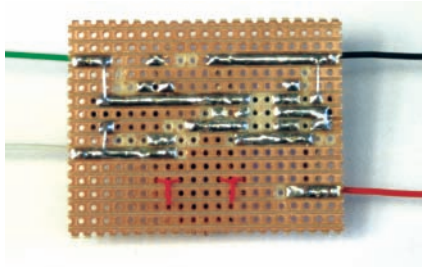
Switched Mode

The two switched-mode regulators I'll be describing are very easy to build, and quite forgiving in terms of lay-out and components. The first design uses the Motorola (**now ON-Semiconductor**) MC34063A; see **Fig. 3**.

Regular *PW* author **Gordon King G4VFV** has covered the basic operation of switched mode regulators in his Looking At... series (July 2002). However, I should point out that **Fig. 3 shows the i.c. connections as viewed from below**. This is done solely to make the circuit 'flow' from left to right, as is customary.

Inside IC1 there's a transistor switch that periodically connects pin 1 of the package to pin 2. The frequency at which the switch operates is determined by C3; 470pF gives a frequency of 20kHz.

The switch's duty cycle is automatically adjusted by the i.c. so as to maintain the voltage at the junction of R7 and R8 at 1.25V. Hence the output voltage is given by 1.25 * (R7 + R8) / R8.



● Fig. 4: Building up the solder on the Veroboard tracks to lower the resistance (see text).

Resistor R6 provides current limiting. As resistors below 1Ω are somewhat rare, I suggest you use two 1Ω resistors in parallel (0.5Ω) for load currents up to 250mA. For load currents between 250mA and 350mA (my recommended maximum with this design) use three 1Ω resistors in parallel (0.33Ω).

When the internal transistor switch is closed, current flows from C2 into C4 via L1. As the switch opens, the current flowing through L1 diverts through D4. The speed at which this happens is so fast ordinary diodes can't cope. **Therefore, D4 must be a Schottky (or equivalent) diode. On no account use an ordinary rectifier diode (like a 1N4007, etc) for D4**.

Fast Switching

Fast switching speeds mean that careful thought must be given to the physical placement of certain critical components. In Fig. 3, the negative ends of C2, C3, D4 and C4, should be 'star' connected. These components should also have short leads and be placed physically close together.

In practice, and particularly when using Veroboard, such a layout is impossible to achieve. Instead of a 'star' connection, the ground tracks (as well as some others) can be built-up with solder to lower their resistance (see **Fig. 4**). Also, the wire from the positive end of C2, and the wire from the cathode end of D4, should be connected as close as possible to their respective

pins of IC1.

Fast switching speeds also generate noise. The MC34063 can be quite bad in this respect as the output pulse train can contain frequency components within the audio band.

Any noise that reaches a valve's filament (Don't forget they're directly heated, with no separate cathode) will be amplified and it may well be audible. Indeed, the 'optional filter' shown in Fig. 3, is essential. If noise remains a problem, changing C3 to a 220pF component may help as this will shift the noise spectrum higher in frequency.

Use modern, low-e.s.r. capacitors for C2 and C4 (and C5). Polystyrene or silvered-mica is a good choice for C3. Inductor L1 should be rated at 1A or more to minimise losses. Inductor L2 also needs to be rated at 1A (or more) but can be any value from 150μH to 1mH or so. You could use a similar component to L1, or alternatively, a scrap switched-mode power supply should yield at least one suitable inductor for free!

Efficiency & Output

Efficiency at 12V input and 1.3V output, is around 58%, and is substantially constant over the design input voltage range of 10V to 15V. At very low output currents there's some loss of regulation, but this is quite normal. (If you need a 2V output, change R7 to 680Ω - the internal reference is 1.25V).

Sets using valves with series-connected filaments require a voltage of 6.5V to 7V. Assuming a minimum input voltage of 10V, the difference between the input and output voltage is simply not enough to warrant a switched-mode design. Indeed, there's no need to look further than a three-terminal adjustable regulator.

The circuit shown, **Fig. 5**, employs the well-known LM317T regulator. With the programming resistors shown (R9 and R10), the device delivers a shade over 6.5V. **Capacitor C6 is needed for stability and should not be left out**. A disc ceramic is fine, as is a polyester. Capacitor C7 is not necessary for stability but it does improve the high frequency response of the regulator.

As in Fig. 3, the input circuit shows an on-off switch and a fuse. There's also a feed for the h.t. inverter. The on-off switch is essential because the set's own on-off switch will be of no use, being positioned after the converter. **Please don't forget the fuse;** a small in-line one is ideal. Wire it as close as possible to the positive terminal of the battery.

Simple Switchers

National Semiconductor have a range of switched-mode regulators called Simple Switchers. I'm including a design - shown in **Fig. 6** - as an alternative to the Motorola chip because of the audible noise problem I've mentioned.

The circuit is simpler than that of Fig. 3. This is because with the LM2575, both the switching frequency and the current limit are fixed internally, at approximately 52kHz and 1.7A, respectively. The LM2575 is, however, more expensive than the MC34063.

The photograph, **Fig. 7**, shows a prototype using the LM2575 I built on p.c.b. laminate. The 5-lead TO220 case does not fit easily into 0.1 inch-pitch Veroboard, unlike the 8-pin d.i.l. MC34063.

More importantly, the copper ground plane allows a true star connection for the negative ends of C8, D5 and C9. Pins three and five of the package can be soldered directly to the copper, and the tab (which is internally connected to pin 3) can be lightly soldered to the copper too. (It's not necessary for heat sinking but it does give some mechanical stability).

Efficiency is slightly worse than the MC34063...at 55%. If you need a 2V output, change R11 to 1k3Ω (internal reference is 1.23V).

Harmonics & Heterodynes

Running at a steady 52kHz, the LM2575 tends to produce just harmonics, so you may hear heterodyne whistles. If a harmonic of the 52kHz (data sheet limits are 47kHz to 58kHz) switching frequency falls near to a favourite radio station there's not much you can do...except add a second filter stage similar to that shown in Fig. 3.

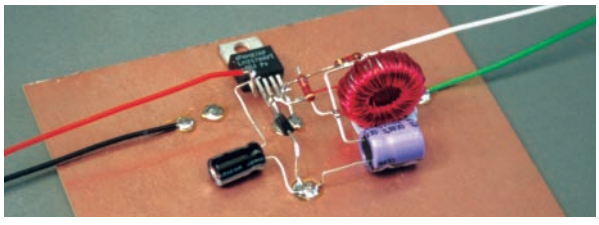


Fig. 7: Photograph showing a prototype using the LM2575 built on p.c.b. laminate. (The 5-lead TO220 case does not fit easily into 0.1 inch-pitch Veroboard) unlike the 8-pin d.i.l. MC34063 (see text).

The LM2575 can supply more current than the MC34063; up to 1A. Even higher currents (up to 3A) can be supplied by the LM2576T-ADJ. The circuit is essentially the same but the component values will be different. (There are easy-to-follow design examples in the device data sheet).

isolation, using a transformer is the obvious way to go.

Switched-mode inverters have the advantage of efficiency, but need specially-wound transformers. So, I decided to stick to low frequencies and use a conventional transformer wired backwards.

While many transformer-based inverters are self-excited, I thought it best to drive the transformer at a fixed frequency, governed by a stable oscillator. I also wanted the performance and efficiency of the inverter to be dependent on the transformer alone, and not on a host of other things as well. The circuit shown in **Fig. 8**, and the photograph, **Fig. 9**, is the result.

How It Works

Looking at Fig. 8, IC3 - the ICM7555 (a CMOS 555) - generates a rectangular wave whose frequency is governed by R13, R14 and C11.

The dual D-type flip-flop (IC4, an HCF4013), produces two anti-phase outputs with exactly 1:1 duty cycle.

Actually, only one D-type is necessary, but you get two in a package and it's a shame to waste one! The output frequency is, therefore, the frequency of the 555 divided by four.

The values shown in Fig. 8 give a drive frequency (to the m.o.s.f.e.t.s) of about 160Hz (many small transformers can be more efficient at higher than mains frequencies). However, it may be worth trying 100nF for C11 (to give 75Hz).

If the inverter's input current goes down for the same output, then leave C11 at 100nF. You can try 340Hz by using 22nF for C11, but I'd suggest this was the upper limit. By the way, a 3W, 10kΩ resistor makes an ideal test load for the inverter.

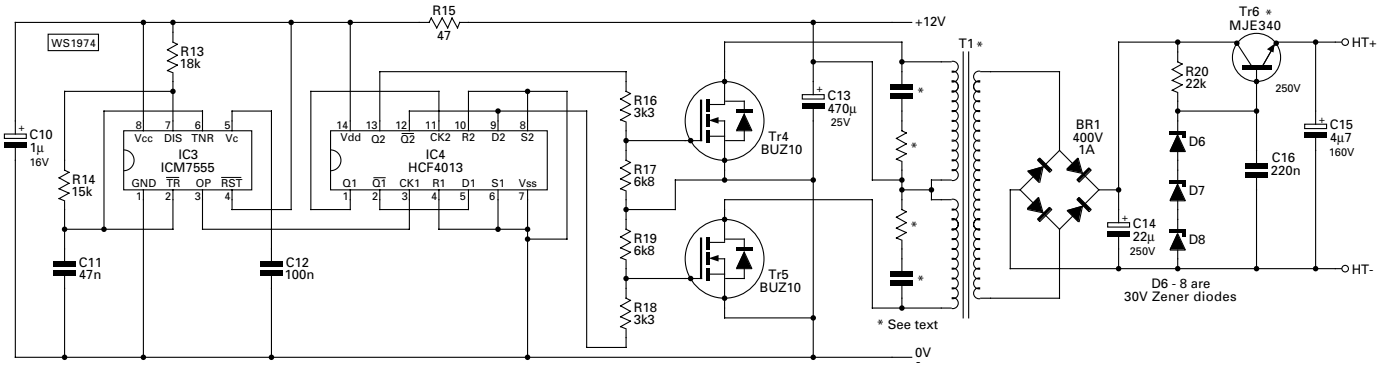


Fig. 8: Many transformer-based inverters are self-excited, but G4JCP preferred to drive the transformer at a fixed frequency, governed by a stable oscillator. The resultant circuit is shown here (see text).

Obtaining High Voltage

There are several methods of obtaining a high voltage from a 12V d.c. supply. But as we need d.c.

Both the ICM7555 and

HCF4013 consume very little power and operate over a wide supply range. Although the HCF4013's outputs are not ideal for driving bipolar power transistors, they are well suited to drive power m.o.s.f.e.t.s.

Unlike bipolar transistors, m.o.s.f.e.t.s are voltage-controlled devices which take no 'd.c.' drive current. A typical power m.o.s.f.e.t. begins to turn on when its gate is about 4V positive with respect to its source. It's fully 'on' when the gate voltage reaches 10V.

The m.o.s.f.e.t.s in Fig. 8 are type BUZ10. They may seem a total over-kill in this application as they can switch up to 23A at 50V. I've specified them because they're inexpensive, readily available and very robust.

Another commonly available power m.o.s.f.e.t. which will work just as well is the IRF520. In fact, any similar device can be substituted providing it has a maximum drain voltage of 50V or more, and an 'on' resistance of 0.5Ω or less.

The potential dividers (R16-R19) in the gate circuits reduce the drive voltage from the 4013; the supply voltage is normally well above that necessary to fully drive the m.o.s.f.e.t.s. Power m.o.s.f.e.t.s switch extremely fast, but here, that's more of a problem than an advantage. The potential dividers do help slow things down a little by adding resistance in the gate circuit, but the m.o.s.f.e.t.s still switch fast enough to cause severe interference.

Right Transformer?

Getting hold of a transformer which produces just the right output voltage may prove difficult. So, to prevent any damage to the set through over-voltage, Tr6 and the three 30V zener diodes prevent the output voltage exceeding 90V. (Change the zeners if you need a different output voltage.) When the input to Tr6 is below 90V, the output will track the input to within a volt or two.

Terminology warning!!! Before I continue, let's get our terminology straight. As the circuit uses a standard mains transformer wired backwards, there's endless opportunity to get confused as to which is the primary and which is the secondary.

So when I talk about the 'primary' and 'secondary', I mean the primary and secondary when it's used as a normal mains transformer. **However, when I'm talking about the transformer as it's wired in Fig. 8, I'll refer to 'our' primary and 'our' secondary to make clear that it's the backwards connection I'm talking about**.

'Our' primary resistance should be as low as possible. We also need to keep losses in the core to a minimum (low flux density) and for 'our' primary to have a high inductance.

Both requirements can be helped by using a transformer with a 230V or 240V primary, and with a much higher VA rating than is actually necessary. The higher VA rating will ensure a large core and low resistance windings, and the extra turns on the transformer mean a higher inductance.

Ideally, 90V should appear across C14 when the supply voltage is 12V. Finding the required step-up ratio is a simple matter of dividing the output voltage by the supply voltage. (In our case: 90V/12V = 7.5) The voltage dropped across the m.o.s.f.e.t.s is so low it can be ignored.

Notice that there's no '1.414' (root-two) factor here, as would be the case if the excitation was a sine-wave. We have a square wave drive and a square wave output; the peak, average and r.m.s. values are all the same.

Transformer Losses

Unfortunately, real transformers have losses; small transformers (like ours) proportionately more so than large transformers. To compensate for these losses, transformer manufacturers adjust the ratio. With no load, the output voltage will always be higher than the rated, full-load voltage.

The transformer I used was a 15VA toroidal, with a twin 115V primary (wired for 230V) and a 25-0-25V secondary. The ratio from the marked primary and secondary voltages gives 230V/25V = 9.2. If that were its actual ratio then with a 12V supply, there would be 110V across C14.

In fact, because the manufacturer has adjusted the ratio to compensate for losses, and the resistance of our primary is now effectively causing a reduction in our supply voltage, only 86V appears across C14. The real ratio is, therefore, approximately 86V/12V = 7.2. (Which is pretty close to what we wanted).

With a 10V supply the output voltage fell to 72V, and rose to 100V with a 14V supply. With ten NiMH cells as the supply, Tr6 and its associated components could probably be removed.

Even more encouraging was the efficiency: over 80%. Toroidal transformers are better than conventional types, although they're more expensive. And bigger is better; use at least a 10VA transformer. (Interestingly, I've found most old transformers are far less lossy than modern examples, so look through your junk box before buying new).

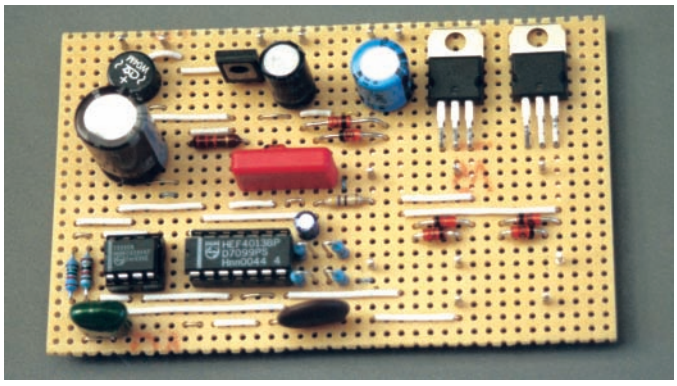


Fig. 9. Completed board - using the circuitry of Fig.8. Note the inverter transformer is not mounted on the board (see text)

Easily Built

The h.t. inverter can easily be built on Veroboard. There are no special precautions, save for keeping the tracks near to the source and drain connections of the m.o.s.f.e.t.s reasonably short.

Also, C13 should, as far as possible, be physically positioned like it's shown in the circuit diagram. Additionally it's a good idea to build up with solder all the tracks that carry current to and from our primary.

The fast switching I referred to earlier **does cause interference**. The sound is very much like the ignition interference that plagued car radios in days gone by. Only adequate (complete!) shielding of the h.t. inverter board, transformer and interconnecting wiring will keep things quiet.

The series CR networks shown connected across our primary are called 'snubbers'. They can significantly reduce the interference caused by high switching speeds. More importantly, they prevent damaging back e.m.f.s, generated by the transformer, from harming the m.o.s.f.e.t.s.

The component values are highly dependent on the transformer's leakage inductance. They need to be chosen while viewing the wave form at each m.o.s.f.e.t.s drain connection.

Unless you are happy to experiment with getting the right component values, wire a 40V, 1W zener diode between the drain and source of each m.o.s.f.e.t. anode to source, cathode to drain. You can connect two 20V zeners in series to make each 40V zener if you wish. The zeners will clamp the drain at 40V, thus protecting the m.o.s.f.e.t.s, but will do nothing to stop any interference.

Safety Note

Now a note on safety. The inverter's nominal output voltage will be 90V...**but depending on the supply voltage, there could be well over 100V across C14**.

Voltages of this magnitude are not as dangerous as mains voltages, but they can shock. And of course, as you snatch your hand away, there's always a sharp section of chassis strategically positioned to do you harm.

When testing, either use a battery or a mains power supply with a floating output. For safety, split the underside of the Veroboard into two separate areas. Both used and unused tracks should be cut between the two areas. Also, the presence of a high voltage should be borne in mind when mounting the modules within the radio.

All the modules I've described are small and light, and are easy enough to fix within a set. The battery pack and transformer are altogether different due to their weight and bulk. They need to be made secure, either by fixing directly to the set's case, or through rigid packing placed around them so they cannot move once in position.

There are relevant web links (data sheets and application notes) plus notes about the design and construction of these modules on my web site at: http://www.valveandvintage.co.uk/pw.

If anyone would like a printed copy, please send a s.a.s.e. direct to me (**not to the *PW* offices**) at: **21 Scotts Green Close, Scotts Green, Dudley, West Midlands DY1 2DX**. Have fun...providing power for that valved portable. Put new life into an old friend!

PW

The MFJ-890 DX Beacon Monitor

Rob Mannion G3XFD reports on an interesting little monitoring timer unit from the MFJ stables in the USA. It's of very special interest to Rob because MFJ got the idea from *PW*'s own beacon monitor!

● Not keen on the Morse Mode? Or finding reading c.w. at 22.w.p.m. a little difficult perhaps? Well, don't worry...Rob Mannion G3XFD says that monitoring the IBP beacon transmitters shouldn't be a problem when you're using the MFJ-890.

I cannot recall a previous occasion when we've had something to review - from a commercial manufacture - which has been developed from a constructional project published in *PW*. And, to be honest, in a way I'm proud of the fact that a manufacturer - in this case MFJ in the USA - has used our idea and expanded on it, resulting in an 'off the shelf' product suitable for those people who don't wish to, or cannot build the original project from *PW*. I've met **Martin Jue K5FLU** (he's the person behind the MFJ logo and is also the 'Boss'!) at the Dayton HamVention in the USA on many occasions. The wealth of ideas coming from MFJ certainly reflects his fascinating background in my opinion!

Martin Jue mentioned in a letter to me that before *PW* ran the series of articles on the IBP system...he'd not heard of it before. However, it's good to see the progress onwards from the original *PW* basic mechanical timers. Ending up with fully electronic units using l.e.d. indicators, to produce the monitor with a built-in receiver capable of synchronising with l.f. transmitters with time pulses derived from supremely accurate Atomic Clock.

Here in the United Kingdom our 'local' Atomic Clock transmitter is transmitted from MSF at Rugby on the l.f. frequency of 60kHz, where British Telecom International transmit the time signals on behalf of the National Physical Laboratory. This powerful transmitter, located between Daventry and Rugby itself - and with the main A5 road running right through the giant BT International Site (l.f. one side, the old h.f. site on the other), provides extremely accurate time-synchronised transmissions which are receivable all over Britain and in Ireland.

● Although the MFJ-890 is a relatively small (and ideal for portable use) G3XFD says that the front panel markings are reasonably clear and easy to read. The red light emitting diodes display is bright and the user can tell at a glance which beacon's transmission is due (see text).

In fact, my relatives in County Galway in the beautiful West of Ireland have clocks which receive the station very well indeed. And invariably they refer to their clocks as showing 'Rugby Time' rather than Galway time!

You may now be wondering why I've mentioned the 'radio clocks' - well...you'll soon find out because it's relevant to this review, as I've already briefly mentioned, the MFJ-890 has a built in receiver. However, the MFJ-890's receiver and use of the incoming synchronising signals is different to that on the domestic radio-controlled clocks normally found in the home.

International Use

The MFJ-980 Beacon monitor is designed for use literally anywhere in the world and because of this it has* (**see note**) to be set by the user to work with the local 'Atomic Clock' radio transmitter. The setting process is done by moving 'jumpers' mounted on the main printed circuit board (p.c.b.).

Full instructions are also provided for the various time zones and settings thereof. Additionally, the unit will 'self test' as you press the necessary buttons on the front panel. All indications of the self-testing are achieved by the display l.e.d.s. blinking. It's altogether helpful, simple and fascinating!

Full instructions are provided by MFJ in the comprehensive detailed miniature manual which accompanies the unit. It's interesting indeed to see just how many foreign based 'Atomic Clock' transmitters there are.

The unit's power supplies (external) are provided via a standard 2.1mm coaxial plug with positive centre and a negative sleeve. A 12V d.c. power supply is required (the review model worked well via a standard 13.8V power supply).

A minimum of 4mA is required for stand-by operation with a maximum of 10mA during synchronisation. A 9V stand-by battery - PP3 size - provides an internal supply for use when the main supply is disconnected.

Setting-up the MFJ-890 couldn't be simpler - by using the **Manual Synch** button you

Inside view of the MFJ-890. The PP3 battery provides power for portable use. (An external power supply lead is provided). The ferrite rod antenna permits - for use within the UK and Ireland - reception of the Rugby MSF transmitter for time synchronisation. Logic switches are provided and instructions given, enabling the unit to be tuned to various Atomic Clock transmissions in different countries (See text).

can set it to a known accurate timing source. I use my own (bought from Argos for £8!) radio controlled clock for this purpose but I've also found that the terrestrial BBC 1 teletext service is also very accurate here in the UK. With the unit switched to the 14.100 setting on the front panel, you then press the button at the hour or any of the 3 minute multiples (9, 12, 15, 18, etc). Incidentally, this control is disabled when the unit is already 'synched', before the button was pressed.

Atomic Synch button. This is pressed to achieve synchronisation - in the UK this will be with MSF at Rugby.

Important note: Unlike many of the readily available Atomic Clocks on sale for domestic use (which usually attempt synchronisation every 15 seconds) - the MFJ-890 synchronises with the radio reference source for 10 minutes at 0300, 0400, 0500, and 0600 (if synchronisation is achieved, the extra 'slots' won't be attempted).

** Providing an accurate time reference source for time-setting is available, the unit can still be used, even when out of range of a radio referenced Atomic Clock standard).*

In Use

In use, once I'd set the timing of the MFJ-890 I found it very convenient and easy to use with my receivers. It's far more portable than my own home-brew version and is ideal for the car - the internal P3 battery will run it for several days. In practice I've found that once 'timed' from my MSF clock- I can leave the unit to itself and during the review period I only had to re-set it once or twice - when the PP3 battery was required for something else!

The case is rugged and there's little that could suffer damage when out and about, although I think the clarity of outline world map could be improved a little. The l.e.d.s are bright enough - even for use on a car dashboard in reasonably bright sunshine.

Altogether I think this ready-made beacon timer, which has the advantage of the built in MSF receiver capability, will be ideal for those who don't want to build the *PW* version. My thanks go to Waters & Stanton PLC for the loan of the review unit. *PW*

Product

The MFJ-890 Beacon Monitor

Company

MFJ Inc.

Contact

Waters & Stanton PLC
Tel: (01702) 206835

Pros and Cons

Pros: *Neat, portable and easy to use. Morse-less monitoring if you wish! All you need now is your H.F. rig!*

Cons: *Clarity of World map outlines on front panel could be improved.*

Price

£99.95 plus £6 P&P

Summary

Ideal purchase if you don't want to build the PW version!

Supplier

Waters & Stanton PLC,
22 Main Road,
Hockley,
Essex SS5 4QS.
Tel: (01702) 206835
FAX: (01702) 205483.

The International Beacon Project Explained

The International Beacon Project (IBP system is a free-to-use network of 18 automatic transmitters operating 24 hours a day, seven days a week throughout the year. The 18 beacons each use a Kenwood TS-50 transceiver in transmit mode only. The beacons transmit in a special, un-changing, sequence in three minute cycles, starting on the hour and repeating every three minutes (three minutes past, six minutes past, nine minutes past, and so on). Each transmitter sends its callsign in Morse code at 22w.p.m., and then sends a four Morse dashes - all within a 10 second 'slot'. The first dash is at 100W, the second is sent at 10W and the third is sent at 1W. The final dash is sent at 100mW. Equipped with the MFJ-890 all you need is a good receiver and you can evaluate propagation conditions immediately!

The Internationally allocated IBP beacon frequencies are **14.100**, **18.110**, **21.150**, **24.930** and **28.200MHz**. The first in the 'chain' of beacons, and the 'heart' of the system, is **4U1UN**, based at the United Nations in New York. To explain the system let's look at what this beacon does. On the hour 4U1UN starts its transmission by sending its callsign on 14.1MHz, followed by the four power indicating Morse dashes. It then immediately switches up to 18.110MHz and repeats the process, repeating the transmissions on the remaining IBP frequencies, then shuts down, awaiting the start of the next cycle.

The 18 IBP transmitters (operate in a sequence travelling around the globe in a westwards direction are:

Beacon 1:	**4U1UN**, first in the sequence, is in New York.
Beacon 2:	**VE8AT** is in Northern Canada.
Beacon 3:	**W6WX** on the West Coast USA.
Beacon 4:	**KH6WO** is in Hawaii.
Beacon 5:	**ZL6B** is in New Zealand.
Beacon 6:	**VK6RBP** is in Australia.
Beacon 7:	**JA2IGY** is in Japan.
Beacon 8:	**RR90** is in Russia.
Beacon 9:	**VR2B** is in Hong Kong.
Beacon 10:	**4S7B** is in Sri Lanka.
Beacon 11:	**ZS6DN** is in South Africa.
Beacon 12:	**5Z4B** is Kenya.
Beacon 13:	**4X6TU** is in Israel,
Beacon 14:	**OH2B** is in Finland.
Beacon 15:	**CS3B** is in Madeira (Atlantic).
Beacon 16:	**LU4AA** is in Argentina.
Beacon 17:	**OA4B** is in Peru.
Beacon 18:	**YV5B** is in Venezuela.

The idea behind the system is to enable any listener to evaluate prevailing propagational conditions on the appropriate band by listening to the IBP frequency on their own h.f. rig. The more beacons heard the better and if all four of the power level dashes are heard...the better the chance of a lower powered transmissions chasing that DX! The only problem is that relatively few Amateurs can read Morse at 22w.p.m. And that's where the MFJ Beacon Monitor comes in to play as even the user with no Morse knowledge at all can use the system. All you do is to follow the l.e.d.s as they indicate which beacon is due on next.

G3XFD

Carrying On The Practical Way

"When I throw away a musical greetings card, I am tossing out more computer power than existed in the entire world in 1948". **Denis Waitley**

Christmas is just round the corner and the Rev. George Dobbs G3RJV has some more ideas for 'Family Fun'. This year he suggests some simple short-wave reception projects...after you've read the thought-provoking quotation!

As with the world, so with this column, the December issue is the time for peace and goodwill in the workshop. Over the years I have suggested little projects for retreating to the workbench to build something to please the younger members of the family.

So, what could be a better justification for warming up the soldering iron than making a little something for the children, or grandchildren? And (for those without a direct family), or nephews and nieces?

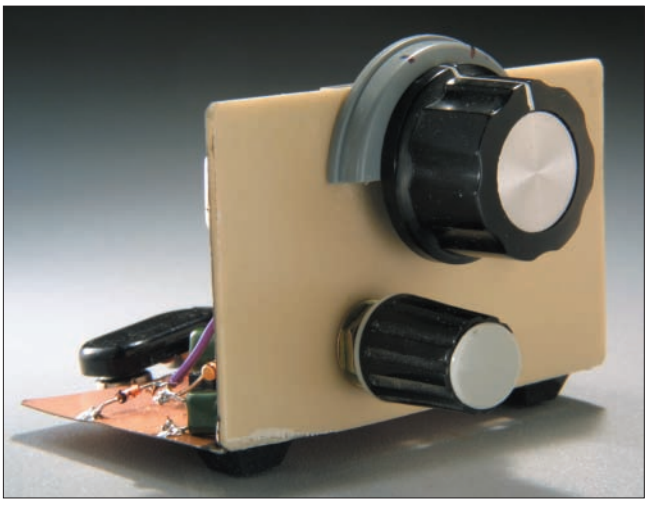
In previous years I have looked at the perennial crystal set and even suggested that a short-wave crystal set might be a good way of exciting young interest. They are certainly easy to make and use very few parts, so the results can be almost instantaneous; always a pleasing attribute with the young. The faithful *PW* readers did not disappoint me. For as soon as a suggested short-wave crystal set darkened these pages, I had several useful suggestions for improvement based upon the experiences of readers.

Catch Twenty Two!

The short-wave crystal set is a minor branch of the Catch-22 principle. **It's easy to make and difficult to get to work!**

The problems lie in the two basic requirements of a good receiver. The first is **Sensitivity**: being able to hear that stations. Secondly there's **Selectivity:** sorting out the stations **you want** from the stations you **don't want**.

The basic crystal radio relies on a single tuned circuit to select individual stations. Its sensitivity relies on the strength of the signal that can be delivered by the antenna. There is no other power source in the receiver although there are some little circuit tricks to conserve as much of the radio frequency signal as possible.



Simplicity itself ... but this little receiver will provide short wave coverage and bring extra Christmas cheer into the workshop says G3RJV.

One obvious answer is to use a large antenna to gather as much radio frequency signal as possible. But simple answers are often flawed. The problem here is that connecting a large antenna to the single tuned circuit will damp the circuit so much that the selectivity becomes very poor. You will hear loud stations… but most of them at the same time ... and weak stations will be swamped by the loud ones.

So, as several readers suggested to me, the secret of a successful short-wave crystal set usually lies in the coupling of the antenna to the tuned circuit. So what follows are a few ideas sent to me by helpful readers.

Simple & Common

The circuit, **Fig. 1**, shows a very simple, and common, way of coupling an antenna to a simple receiver. The antenna is capacitively coupled via a variable capacitor or trimmer.

In use, the amount of signal reaching the receiver depends upon the value of the capacitor. This can be varied according to the requirements of individual signals and band conditions. When tuning the receiver, the coupling capacitor is adjusted for the best compromise results of sensitivity and selectivity.

In practice the required value of the variable capacitance depends upon the antenna in use. Many people use the popular polyvaricon variable capacitors, which usually have a maximum capacitance in the order of 300pF. However, variable capacitors with a maximum value of only 100pF would probably be suitable.

The answer is to try and see what works best! This circuit is so basic that it could be added on to any of the circuit ideas that follow.

Inductive Tappings

The circuit, **Fig. 2**, shows the circuit of a complete crystal set but this time inductive tappings on the tuning coil are used to improve the performance.

Winding coils for a short-wave crystal set is a very subjective pursuit! The process depends upon what you have to hand and what frequency the set is required to tune.

For example, winding 60 turns of thin enamelled copper wire on a 35mm film canister will give an inductance in the order of 70µH. A typical polyvaricon variable capacitor used with such a coil will tune from the top end of the medium wave band to about 6MHz. Trying to duplicate results with home-wound coils is difficult, so again, it's a 'try and see' job.

In the arrangement suggested, the coil has several tapped points along the winding (I would suggest adding a tap at every five turns). Providing a tapping means pulling out a loop of wire, twisting it to form a pigtail and scraping off the enamelled coating. The bare copper can then be tinned with solder to provide an electrical connection at this point on the coil.

Tapping points are useful! The antenna input point to the tuned circuit and the output point to the diode detector can then both be adjusted along the tappings to find the best results.

The diagram, **Fig. 3**, shows the antenna being fed to the tuned circuit by inductive link coupling. In reality this a **radio frequency transformer**.

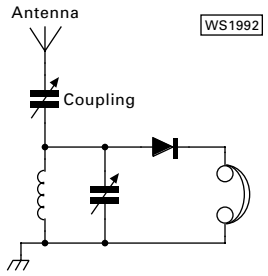


Fig. 1: A very simple, and common, way of coupling an antenna to a crystal set. The antenna is capacitively coupled via a variable capacitor or trimmer.

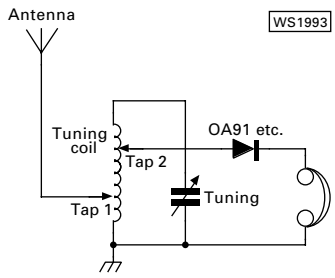


Fig. 2: The circuit of a complete crystal set but this time inductive tappings on the tuning coil are used to improve the performance (see text).

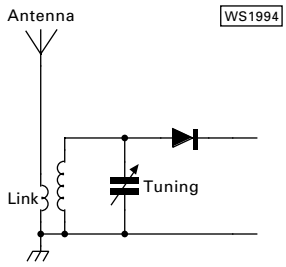


Fig. 3: In this circuit the antenna being fed to the tuned circuit by inductive link coupling. In reality this a radio frequency (r.f.) transformer (see text).

In practice the link winding is a smaller coil wound over, or close to, the main tuned circuit coil. The number of turns and the closeness of the coupling again depend upon the antenna being used. For a 60 turn tuning coil, I would suggest about five turns.

Try the link wound over the 'earthy' end of the tuning coil and if the coupling is too much, locate it below the main winding. True experimenters might like to have a link winding that they can slide along the former to vary the amount of coupling. (Similar to the sliding coil-tuning arrangements on vintage crystal sets).

More Sophisticated

A more sophisticated arrangement, in **Fig. 4**, uses two tuned circuits. This is real fun! The input consists of two identical (as possible) tuned circuits placed close to each other to allow inductive coupling.

Each tuned circuit has a tapped coil to enable matching to the antenna and the detector circuit. This is real hands-on receiver operating. The two tuned circuits both have to be tuned to the required frequency with the taps being adjusted for the best results.

Moving the coils nearer or further part can also vary the coupling. An alternative coupling method is to introduce capacitive top-coupling (This means adding a small value of capacitance between the top of each coil).

I'd suggest a variable capacitor or trimmer with a maximum value of 50 or 100pF. An earthed screen can also be placed between the coils to enable the capacitor to be the main source of radio signal coupling.

Everything I've suggested may all seem to be a lot of fuss… **and it is!** But it can be fun attempting to get the best results from very simple equipment. However, if you really want to build a relatively simple but viable short-wave receiver, why not revert to the MK484 tuned radio frequency (t.r.f.) radio chip?

Short Wave MK484

Last year I described how the MK484 integrated circuit (i.c.) (or 'chip') radio, which is the replacement for the once popular ZN414 chip, can be used into the lower short-wave range. Then I described a very simple radio capable of driving a pair of headphones and (**Fig. 5**) shows an upgrade on this circuit which enables the MK484 to drive a loudspeaker.

The left of the circuit is the basic MK484 arrangement. The chip only requires about 1.5V, which is supplied by a chain of four diodes with a pre-set potentiometer and series transistor. This allows the MK484 supply to be varied from about 1.5 to 0.5V. This circuit arrangement was frequently seen in past designs for the ZN414.

The output from the radio chip is fed via a volume control to a standard LM386 audio amplifier circuit. It's very simple indeed.

The antenna is fed to the tuned circuit of the MK484. Once again we are back to single tuned circuits at the front of a short-wave receiver!

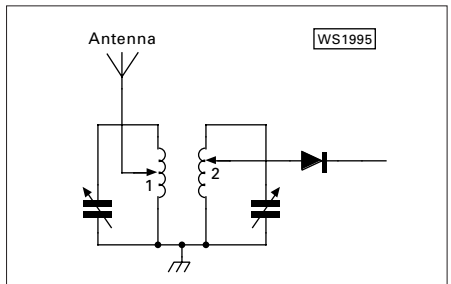


Fig. 4: A more sophisticated arrangement using two tuned circuits. The input consists of two identical (as closely matched in characteristics as possible) tuned circuits placed close to each other to allow inductive coupling (see text).

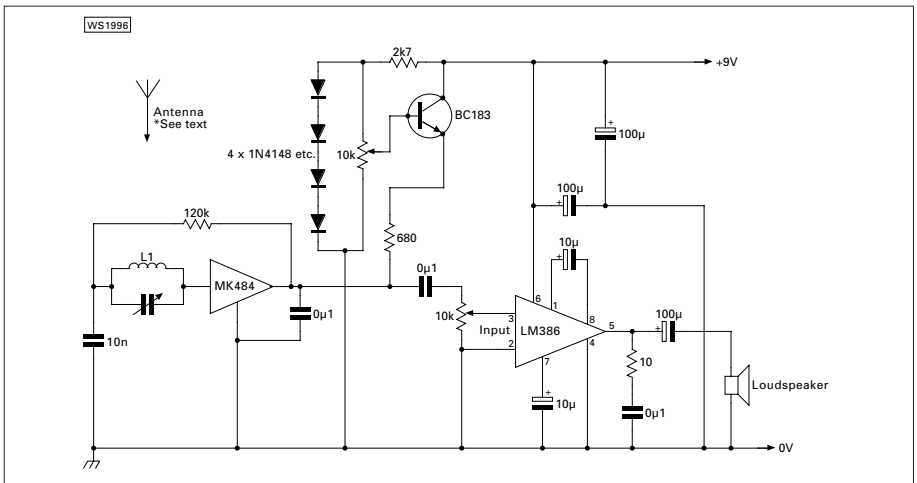


Fig. 5: An additional amplifier unit makes it possible for the MK484 receiver to operate a loudspeaker (see text).

Variable capacitive coupling works quite well with this circuit (see Fig. 1). There are several options for getting the antenna signal to the receiver. You could begin again at Fig. 1 and work down!

But remember that the MK484 tuned circuit is isolated from ground. **So you must not add any earth connections to the tuned circuit**. Try it and have fun...and I wish you all a happy Christmas! *PW*

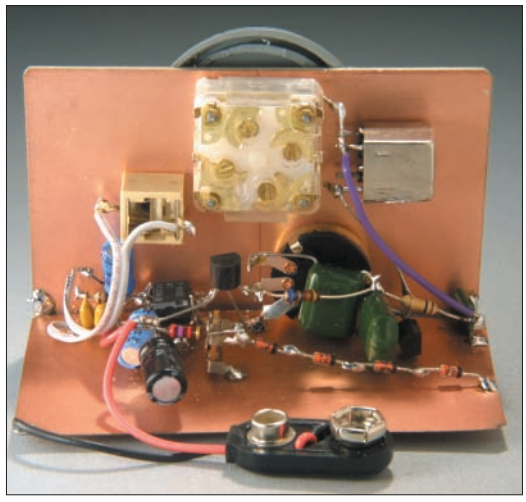


Fig. 6: Rear view of the COTPW short wave receiver. The main tuning inductor can be seen mounted (within its screening can) on the right of the polyvaricon tuning capacitor. See text for specific advice on the tuning input requirements for the MK484.

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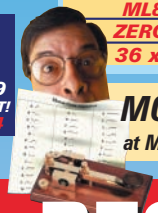

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Chris Taylor G0WTZ

Chris has been with ML&S for over 12 Years. In this time he has kept a keen interest in the hobby. He currently enjoys QRP with the FT-817 and also enjoys Data Modes. As a biker you do not catch him mobile too often but when you do he is usually to be found on Top Band. As Sales Director Chris always has his calculator at the ready to give you that famous "Taylor made Package" Give him a call today with your wish list and he will be happy to work out a deal for you."

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Neill G4HLX installing a toroid during the construction of the Elecraft K2 transceiver kit (see text).

Building & Using The El

Neill Taylor G4HLX, well known for organising the *PW* 144MHz QRP contest...has recently enjoyed building a high performance kit transceiver. It was quite an experience and no surface mount devices were involved!

I've always thought of a soldering iron as an essential tool for Amateur Radio. It's just as important as a microphone or Morse key in my opinion!

However, an all home-constructed station is rare nowadays. If a high-performance station is required, with all the operational conveniences offered by modern transceivers, most Amateurs buy equipment made by one of the big commercial manufacturers.

Home construction is mostly confined to accessories and add-ons to a commercial rig at the heart of the station. Well, that's how G4HLX operated, until I came across the K2, an h.f. transceiver designed by **Wayne Burdick N6KR** and **Eric Swartz WA6HHQ**, and supplied as a kit by Elecraft, their small company in Aptos, California in the USA.

High Performance

According to the comments I'd heard, the K2 was a kit which provided high performance - especially in the receiver. It also included all the main operational features that are needed on today's Amateur bands.

I couldn't believe it as I read of K2 users abandoning expensive commercial transceivers in favour of a kit! Yet these opinions were supported by lab measurements made by the **American Amateur Radio Relay League** (**ARRL**) and published in their journal *QST*. The article indicated quite superb receiver performance, with excellent sensitivity, third-order intercept point, and overall blocking dynamic range.

"The K2's receiver performance compares very favorably to that of the samples of the high-end radios we've recently examined"...so wrote ARRL's Lab supervisor **Ed Hare W1RFI** (*QST*, March 2000, complete with American spelling in the quotation!).

Since I was on the look-out for a portable rig, particularly one with a good receiver - high dynamic range and sharp intermediate frequency filters were a must - I decided to order a K2. I was particularly attracted by the prospect of building it from a kit and I wasn't disappointed by my decision.

Built at a steady pace over the winter months, it was a real pleasure. The completed K2 has turned out to be a performer that entirely lives up to its reputation.

It's a very well thought-out design offering performance to seriously rival the top of the range of the 'big three' Amateur Radio equipment manufacturers. There's a full set of features to make it a joy to operate, albeit at low transmit power in its basic form.

The Concept

The Elecraft K2 in concept is a small, light, easily transported h.f. c.w and (optionally) s.s.b. transceiver covering, in its basic form, the 3.5, 7, 10, 14, 18, 21, 24 and 28MHz Amateur bands, with 1.8MHz an optional extra.

Output power is variable from 1 to over 10W. A 100W optional power amplifier (p.a.) is also now available. A 12V supply is required. (an optional internal rechargeable battery can be used for portable operation).

A true variable-width crystal filter is featured in the receiver. The dual variable frequency oscillators (v.f.o.s) have split-frequency capability, and three tuning rates. It also has RIT/XIT, and ten memories which also store mode and other settings.

An iambic c.w. keyer with a nine message memory is included. A menu system is used to set a range of configuration settings, and many of the settings are stored separately for each band.

Additional options include noise blanker, an active audio filter. A serial interface for computer control, and a versatile internal automatic antenna tuning unit (a.a.t.u) are available.

Substantial Project

Building the Elecraft K2 **is a substantial project and it's not really suitable for a beginner**. On the other hand, the clarity of the instruction manual, the standard of the printed circuit boards (p.c.b.s) and the quality of the components supplied, make it a straightforward process.

Experience has taught me...take

your time over construction, double-checking that everything is being done correctly! Completion of the basic K2 is estimated to take a total of about 40 hours - in my case it was a little less than this, divided into many sessions over several weeks.

No special tools are required, but it was a good excuse to buy a new temperature-controlled soldering iron. I also bought a new pair of side-cutters, good flush-cutting ones to trim component leads as close to the board as possible.

A standard multimeter is needed, but no special test equipment is required. **The K2 circuit itself contains all the measuring devices needed for testing and alignment**.

Unpacking the kit, **Fig. 1**, is a little daunting, there are so many bits! But they are well organised into labelled bags, and flicking through the instruction manual soon gives you a sense of confidence.

Incidentally, the manual **really is excellen**t, with detailed, unambiguous step-by-step instructions, and helpful clear illustrations. To aid with identification of the components, the complete parts inventory includes photographs of most of them. (The manual is also available to download from the Elecraft website).

Three Boards

The K2 circuitry is accommodated on three main p.c.b.s (plus any optional modules). They're connected by multi-pin plugs and sockets, and all input/output connectors are also on the boards. **So there's almost no wiring to do** – assembly is mainly the business of installing components onto the p.c.b.s. These are very good quality, with plated-through holes and component outlines and identifications printed on both sides.

The three main boards in the basic K2 are (**1**) **control board**, which has the microprocessor and related circuits, as well as the audio output stage; (**2**) the **front panel board**, which holds the display and control push-button switches and potentiometers; and (**3**) the **r.f. board**, which has the main transmitter and receiver circuits.

Construction proceeds in stages through the three boards, with tests to be performed at the end of each, ensuring that everything has been done correctly. Early in the assembly, you complete the built-in digital voltmeter and frequency counter, to be used when setting-up.

Great Moment!

A great moment arrives...at the end of the second stage of the r.f. board assembly, when the receiver is working on the 7MHz band...you can connect up an antenna and hear signals!

When I got to the second stage...I was at once re-assured that I was building a superior receiver. Signals were being so clearly heard above a quiet background noise level (in contrast to the constant 'mush' of noise that I had become accustomed to) on 7MHz.

Toroids & Transformers

One of the more time-consuming aspects of construction is the winding of toroid inductors and transformers. **There are over 20 of these, Fig. 2**, although some have only a few turns. In fact I found they could be wound quite quickly, and again the instructions are very clear.

However, if you really can't face all the toroid winding, it's possible to buy them ready-wound from a third party supplier. **But my advice is just to get on with it and wind them** - it's 'good for the soul' in my opinion!

Alignment Straightforward

Alignment is done by making a few measurements and adjusting menu settings: for example, to correctly define the beat frequency oscillator (b.f.o.) frequency for each filter setting.

The process of v.f.o. linearisation for all the bands is handled entirely automatically by the microprocessor! You just select the appropriate menu item and sit back for a few minutes while the process is worked through.

Peaking of the bandpass filters for each band is done by adjusting trimmer and inductor cores for maximum power output. The built-in power meter is quite adequate for this purpose.

Optional Modules

The optional module kits are up to the same standard as the main unit, and each came with similarly clear instructions. The s.s.b. board, which most owners will want to add, has a higher density of components than the other boards, and thus demands even more care in assembly. A really fine tip soldering iron is particularly useful here. **However, nowhere in any of the circuits are surface-mount components used, so the tricky business of handling and mounting these is avoided**.

I completed construction of the K2 and nearly all the optional boards, **Fig. 3**, with no problems whatsoever. Double-checking component placing before soldering (as recommended) caught any mistakes I'd made. Everything was finished without having to de-solder or correct anything!

All resistance checks and voltage measurements at every stage fell neatly in the range advised in the manual. It really couldn't have been any smoother.

ecraft K2 HF Transceiver

● Fig. 1: "The kit looks a little daunting at first" says G4HLX "but it's beautifully packed and easy to identify". (see text).

A Problem?

If, however, I had problems...it was good to know that help was available. Firstly, there's the 'troubleshooting' section in the manual. Secondly,

Elecraft's support service can be contacted by E-mail. Although I had no need to use this myself, it's clear from comments of people who've done so, that the service is prompt and efficient.

Thirdly, **there's the most useful resource of all**: the Elecraft E-mail list. This is an E-mail reflector to which anyone can subscribe, and exchange messages in a forum of many owners of Elecraft rigs.

Using the 'reflector'...you can post a query about anything about which you are uncertain, and get responses from others who have been through just the same problem. Even if you never have to do this, it's interesting to read the discussions on the E-mail list!

You may subscribe to the e-mail list if you're just thinking about ordering a K2 kit. (You'll learn a lot from the discussions and experiences of other users!). You can subscribe on the website **http://mailman.qth.net/mailman/listinfo/elecraft** I selected the option for the 'digest' version (this sends a single daily E-mail compilation of all the day's messages).

The other invaluable resource for K2 constructors and operators is the Elecraft Web site, **www.elecraft.com** which contains a wealth of information.

What You Get

Now let's take a look at what you actually get for all this effort in constructing a K2! To start...the K2 is particularly well suited to the c.w. operator (s.s.b. is also well catered for...if you've included the s.s.b. option).

The v.f.o. is tuned by the main dial with a frequency step of 10, 50 or 1000Hz. Specific frequencies can be entered on the keypad. **Band Up/Down** buttons switch through all amateur bands from 1.8 to 30MHz (assuming the 1.8MHz option is installed). On each band the frequencies for both v.f.o.s A and B, are stored, and can be easily put into split frequency use.

Mode settings (c.w., l.s.b., u.s.b.), tuning step, automatic gain control (a.g.c.) speed (slow/fast), pre-amplifier and input attenuator on/off, and other settings are all stored separately for each band.

The receiver can be tuned outside of each Amateur band, but performance falls off due to the bandeaus filters - **it's not a general coverage receive**r. Receiver and transmitter incremental tuning (RIT/XIT) are provided, the maximum frequency shift being programmable through menu options up to ±4.8kHz maximum. Ten memories are available for storing frequencies and other settings.

Crystal Filtering

A key feature of the K2's receiver is the crystal filtering, provided by a variable-bandwidth 5-pole filter followed by a further 2-pole filter. All are at the single i.f. of 4.915MHz.

The bandwidth for c.w. can be set to any value from under 200Hz to about 2kHz. Four values can be stored and easily selected by pressing the **XFIL** button which toggles through all four.

The optional s.s.b. board has its own 7-pole crystal filter of about 2.2kHz width - this is always used on transmit. However, while on s.s.b. receive you can chose four further settings selected by the XFIL button, either using the s.s.b. filter or the main variable-width filter.

For each of the settings a different carrier insertion frequency can also be set, permitting a kind of 'i.f. shift' as well as 'i.f. width' capability. All this can take quite a lot of setting-up to really optimise to your preferences...but by starting with the values suggested in the manual gives a configuration that's certainly good enough to get going with.

Solid State Switching

The K2's transmit/receive switching is all solid state, and provides smooth full break-in c.w. operation. Voice operated (VOX) transmission is available on s.s.b. (this option also includes an effective speech processor circuit, with compression level settable in the menu).

The internal iambic c.w. keyer can send at speeds from 9 to 50w.p.m., and has nine c.w. message memories which are easy to programme and to play back, including repeating and chaining of messages.

Each message memory is 250 bytes long, ample for CQ calls and standard QSO information. A fast play-back mode can be set whereby a single button press will start the sending of a selected message. Various parameters of the keyer behaviour can be adjusted in the menu settings. Of course, a 'straight' key can be used instead if you prefer!

Power Output

Power output is continually variable from approximately 1 up to around 15W (maximum power varies by band and according to supply voltage). As the power control is turned, the display shows the requested output power (a nice feature), and similarly as the c.w. keyer speed control is turned, the w.p.m. value is displayed.

When the 'tune' button is pressed a carrier is sent and its measured output power is displayed. If the optional a.a.t.u. is installed, this shows both forward and reverse power, and a display of s.w.r. value is also possible.

The LCD Display

Normally the main l.c.d. display, **Fig. 4** on the completed and 'ready to go' transceiver) shows the operating frequency, of course, but by pressing the **Display** button, it will show the supply voltage and

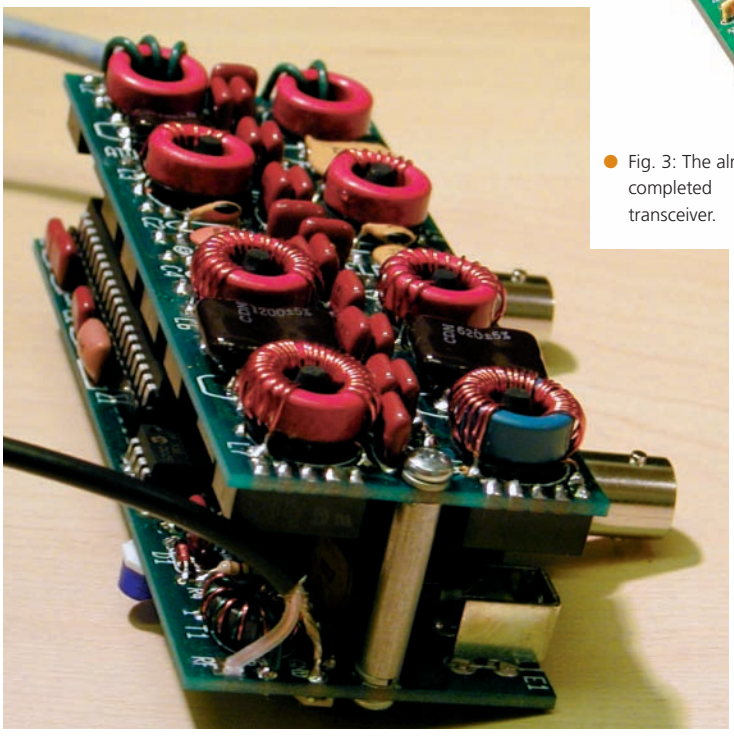

Fig. 2: Toroidal type inductors form an essential part of the kit construction. Troubled by toroids? Don't worry there's a way out! (See text).

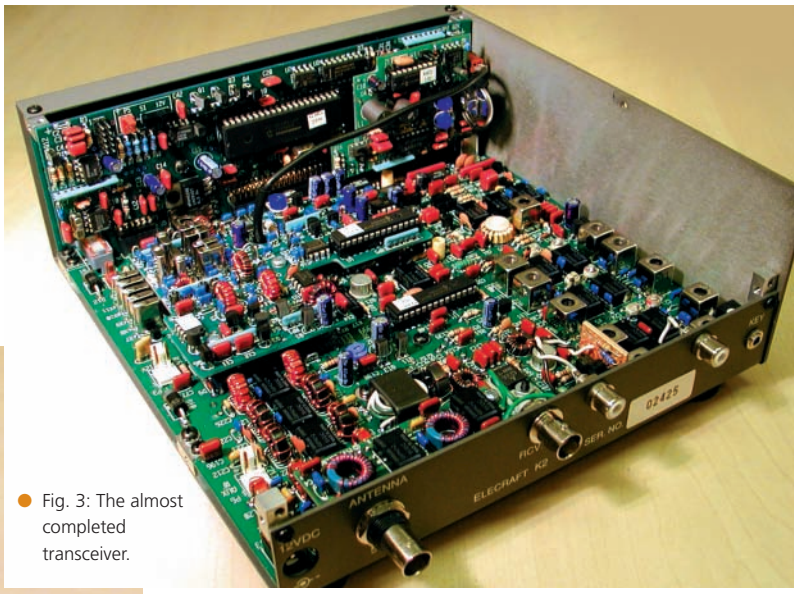

Fig. 3: The almost completed transceiver.

total current consumption (very useful!). **A maximum current can be set via a menu option, and output power is then limited to keep the current below this value**.

If the optional audio filter module is installed, this also provides a real-time clock, so that another press of **Display** shows the current date and time. A vast range of menu settings can be displayed...and many settings and parameters can be adjusted this way.

There are two programmable front-panel buttons, which can be set to perform your choice of functions, to save delving into the menus for common operations. Also available is an optional computer I/O interface, allowing remote computer control of most of the K2's functions.

Audio Filter

The optional active audio filter provides a very narrow (80Hz) bandwidth which really pulls c.w. signals out of the noise. It can be switched in or out with a single button press, or can be configured to give either one or two stages of filtering. It also provides a low-pass filtering of received s.s.b. audio.

I've found that combining the sharp audio filter with a narrow setting of the crystal filter has enabled me to copy c.w. signals that are simply inaudible on my other transceiver (a current model from a Japanese manufacturer).

Another option is a noise-blanker, which is effective for pulse-type noise, such as car engine ignition interference, electrical motor noise, etc. It has two pulse-width settings and two threshold level settings, selectable by front-panel key presses. The K2's noise blanker eliminates ignition noise effectively.

If the 1.8MHz board is fitted, this also provides a separate receive antenna input. This is commonly used by 'Top Band' DX enthusiasts.

Internal Battery

The internal battery option is a 2.9Ah sealed lead-acid type. It's charged whenever an external supply of sufficient voltage is connected. Carefully design minimises the K2's current consumption and menu settings allow savings such as switching off the l.c.d. display illumination and using only a single l.e.d. in the S-meter/power output indicator.

With the internal battery the K2 really is a compact unit (its size is 85 x 200 x 250mm). I found its portability very effective when I used it on a camping holiday in France, with a wire antenna slung over a nearby tree.

Despite relatively poor band conditions, I had good QSOs including several transatlantic, and one very satisfactory contact with G3XGC/P in Cambridge who was using his K2 and an **indoor** dipole, exchanging 559/549 reports on 7MHz.

Automatic Antenna Tuner

The final *piece de resistance* is the automatic antenna tuner unit (a.a.t.u). This option (lots more toroids to wind!) matches a wide range of antenna impedances on all bands. The specification says it will match up to 10:1 s.w.r., and I found that this meant that any random length piece of wire could be matched.

It works by switching (with latching relays) a combination of 256 inductance values with 256 capacitance values in two configurations. Within a few seconds it finds the optimum combination, the measured s.w.r. being shown on the l.c.d. display.

The a.a.t.u. remembers the setting for each band, instantly recalling it when you later switch back to the band. I've used this very effectively with my random-length doublet fed with 300Ω ribbon cable and a 4:1 balun. The effect is like having a tuned multi-band antenna.

The a.a.t.u also provides two separate antenna connectors (all r.f. connectors are BNC), so you can switch between two antennas by a single button press (this selection is also remembered on a per-band basis).

Transverter Bands

A feature I also particularly like is the definition of up to three extra **Transverter** bands (If enabled, they appear as extra bands above 28MHz). Ideal for use with v.h.f./u.h.f. transverters, the extra bands retain separate stored per-band settings like the normal bands, together with some specific items such as the frequency to be displayed and any offset to be applied if the local oscillator in the transverter is not exactly accurate. I have used this very effectively with a 28/144MHz transverter and the effect is just as if the K2 has a 144MHz band.

● Fig. 4: Ready to go...a home-brewed high specification transceiver (see text).

The performance of this combination is quite superb. Using it in portable 144MHz contests, **the receiver certainly surpasses anything that I've used before, in 30 years of v.h.f. contesting.**

Good Design

Every aspect of the K2 appears to be the product of good design, and well thought-out functions that match what's actually needed for effective operation. (Not just the endless addition of the bells and whistles found on some other rigs).

The resulting simple but highly optimised design results in a performance that I believe would be hard to beat...even if I had an unlimited budget. Of course, K2 owners would like to say, it's not only the design, but the standard of construction that gives it the edge!

Purists may say that kit building is not true home-brew. But I can confirm that a great deal of satisfaction is to be had from using a good transceiver that you've constructed yourself. This was, of course, well appreciated in the days of Heathkit, and it's good to have it return now, in the days of Elecraft.

PW

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Ordering Your Own K2

The K2 kit can be ordered online from the Elecraft website, www.elecraft.com for shipping directly from the USA. The basic K2 kit is currently priced at $599, the s.s.b. option an additional $89. The other options range from $35 for the 1.8MHz board up to $159 for the a.a.t.u. Delivery is additional to this, and of course UK Customs will impose an import charge (I was charged 17% VAT plus a Parcel Force administration fee). Adding all these costs together, at the exchange rate current in September 2002 you could expect to spend in the region of £520 for the basic kit, rising to around £880 for a K2 with all the options described in this article (i.e. omitting only the 100W p.a and computer control interface).

Antenna Workshop

Peter Dodd G3LDO comes into view, operating bicycle mobile on the h.f. bands, using a modified Firestik CB antenna!

Some of you many have come to Amateur Radio via an interest in CB. If so, you might have a Firestik antenna still in your loft or garage. This article explains how one of these can be the basis for a good mobile h.f. antenna.

On h.f. a common form of mobile antenna is the helical whip, an antenna that comprises a fibreglass whip with the loading coil wound along its whole length. This technique, known as continuous loading, does away with the mechanical construction problems that may be encountered with other coil loaded designs.

Fibreglass whips are cheap, light, and exhibit much less wind resistance than centre loaded vertical antennas. Many commercial helical whips use non-linear pitch winding, using wider spacing (and sometimes thicker wire) for the lower portion of the antenna.

A lightweight antenna for bicycle mobile based on a large Firestik antenna, modified for use on the 28MHz band. The antenna is mounted on an aluminium plate fixed to the bike carrier.

The coil section of the Q-TEK five-band h.f. mobile antenna for instance, has 133 turns wound on a 13mm diameter one metre long fibreglass whip. The Q-TEK antenna uses a wire that, at 6.7m is longer than λ/4 at 28MHz. Resonance setting and multi-band operating often use a plug-in capacitor top resonator, or short whip, **Fig. 1**, (known in the USA as a 'stinger').

Antenna Designs

The 27MHz CB era brought about some interesting helical mobile antenna designs. I have two such antennas that bear the brand name 'Firestik'. The longest is two metres long, wound with 5.4m of wire, with a very pronounced non-linear pitch winding. It starts with one turn per 60mm at the base and becomes close wound at the top.

I removed eight turns from the top of the antenna and found it to be an excellent antenna for mobile 28MHz DX, out-performing the Texas Bugcatcher on this band. An example of my modified antenna is shown in the heading photograph.

The second Firestik antenna is shorter at only 1.4m long, wound with 190 turns, using a similar pronounced non-linear pitch winding as the first antenna. This one starts at one turn per 50mm at the base becoming close wound at the top.

I removed 20 of the 40 close wound turns from the top of the short Firestik antenna, to try

multi-band operating. A telescopic antenna from an old transistor radio was fixed to the exposed section of fibreglass using a small section of metal tubing and a hose clamp.

Added Section

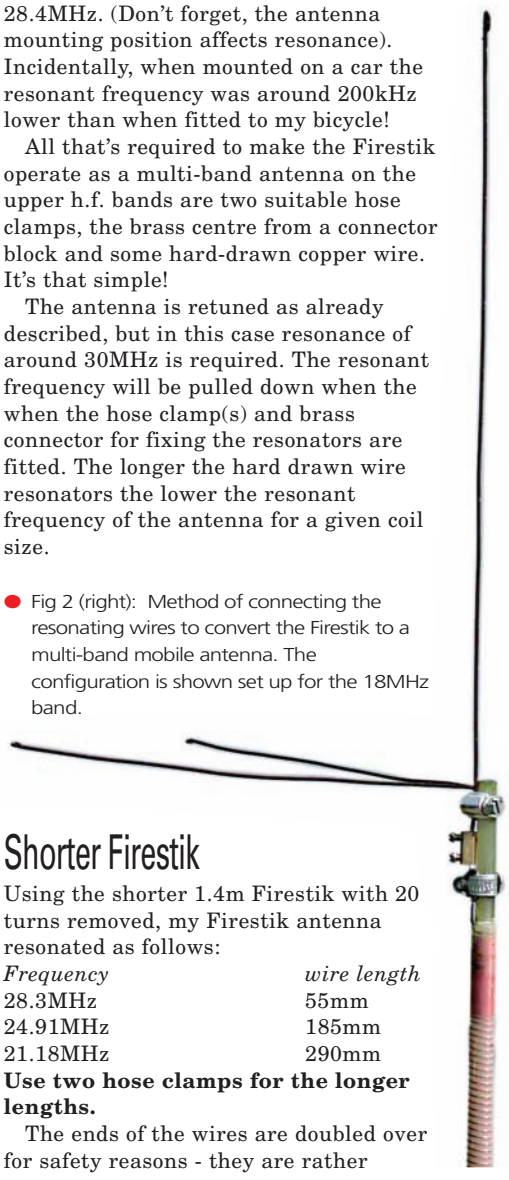
The end of the helix wire was soldered to the added section. By altering the length of the telescopic section the antenna could be tuned to any frequency between 14 to 25MHz. However, the antenna would not tune to the 28MHz band because of the mass of metal at the top, even after the top section was fully telescoped!

I used this antenna for several years and found the top section was not very robust, requiring some further thought. So, now to the Firestik where you should carefully cut away the shrink-wrap insulation that protects the coil (making it possible to remove a few turns from the top of the antenna to change the resonant frequency).

When installed on its intended mobile mount and using an antenna analyser or s.w.r. meter, one or two turns are snipped off and the antenna's new resonance point found. Repeat the process until the new resonance point is 28.4MHz. (Don't forget, the antenna mounting position affects resonance). Incidentally, when mounted on a car the resonant frequency was around 200kHz lower than when fitted to my bicycle!

All that's required to make the Firestik operate as a multi-band antenna on the upper h.f. bands are two suitable hose clamps, the brass centre from a connector block and some hard-drawn copper wire. It's that simple!

The antenna is retuned as already described, but in this case resonance of around 30MHz is required. The resonant frequency will be pulled down when the when the hose clamp(s) and brass connector for fixing the resonators are fitted. The longer the hard drawn wire resonators the lower the resonant frequency of the antenna for a given coil size.



● Fig 2 (right): Method of connecting the resonating wires to convert the Firestik to a multi-band mobile antenna. The configuration is shown set up for the 18MHz band.

Shorter Firestik

Using the shorter 1.4m Firestik with 20 turns removed, my Firestik antenna resonated as follows:

Frequency	*wire length*
28.3MHz	55mm
24.91MHz	185mm
21.18MHz	290mm

Use two hose clamps for the longer lengths.

The ends of the wires are doubled over for safety reasons - they are rather sharp. The lengths quoted above do not allow for this. Other methods of making the ends of the wires less dangerous is to use a short piece of shrink wrap or plastic insulation tape at the tips of the wires.

● Fig 1 (left): Top of a Q-TEK five-band h.f. mobile antenna, which uses a basic tapered coil section with a selection of plug-in whips.

To operate lower than 21MHz the wire length becomes rather long and a better method is to use a partial capacity hat made from an extra length of wire bent in a V-shape. For the 18MHz band (my favourite mobile operating band) the 21MHz stinger is assisted by the wire V, as shown in **Fig. 2**. Each of the 'leg' wires is 250mm long.

The apex of the V shape is bent 90° from the horizontal so that it can be clamped to the top of the Firestik with a hose clamp. This configuration also allows for a degree of tuning. With the V wires very close together my antenna resonated at 18.49MHz. With the wires set to 180° the antenna resonated at 17.96MHz. The antenna can be made to work on the 14MHz band, by adding a second V section. In this case each wire is 320mm long.

Roll Your Own

If you haven't got a Firestik antenna sitting up in the attic or garage, it's perfectly feasible to 'roll-your-own'. Although I'm not going to provide much in the way detail this time, I would just like to mention that *PW* has published designs for helically wound antennas.

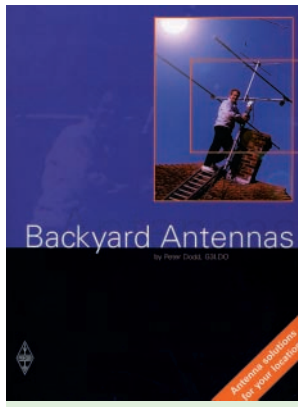
If you have the antenna book *More Out Of Thin Air* then there's a splendid project for a helically wound portable operations antenna from the late **Doug DeMaw W1FB**. Doug's design for a 3.5MHz antenna, at almost four metres long overall, is probably longer than you'd like to use on the back of a bicycle. But the article is not to be missed if you're looking for some ideas to make your own linear loaded antenna.

Three Canes

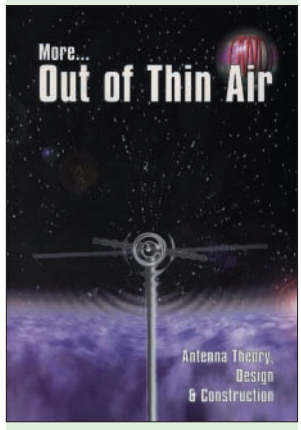
Another article, that's worth getting hold of to have a look at is called Three Canes In A Mounting. This article, by **Brian Shersby G0ISL**, appeared in the March 1994 issue of *PW*. This is a design for the 1.8MHz band, and although designed for portable operation rather than mobile, it really is a 'roll your own', as it consists of helically windings on three canes (hence the name).

Brian's design is made from three wound sections, and is definitely too big to fit on a bicycle, as it's around 6.3m high, but would lend itself to multi-band operation by differing numbers of sections. An adjustable top section, rather than just a fixed length of steel whip, would also make adjusting the tuning easier.

So get out and operate more: either roll your own! Or use a modified Firestik. *PW*



● Peter Dodd G3LDO has published many books on antennas. His latest - *Backyard Antennas* would make a great Christmas present in the stocking of a recently licenced M3. Mention this article - in your request and our Book Store will send it out for £18.99 (free P&P).



● Doug DeMaw W1FB's design for an helically wound portable 3.5MHz antenna is just one of the projects to be found in *More Out Of Thin Air*, available from our Book Store for £6.95 including P&P.

Valve&Vintage

The brown dustcoat and the piles of *PW*s from the 1950s announce the fact that it's Phil Cadman G4JCP's in the 'wireless shop' this month. And is that an old valved car radio on the bench? Read on to find out...!

A very warm welcome to my festive final column of 2002. Over the last 12 months I've collected quite a few comments and queries from those of you who have written to me. So this time, I'm taking the opportunity to tie up some loose ends and to ask for help on a number of points.

Some months ago I mentioned how the ECH83 - a 12V h.t. triode-heptode intended for use in car radios - was widely believed to be nothing more than a specially selected ECH81, its mains-voltage counterpart. A few weeks ago, **Chris Colebrook** E-mailed to say that he'd measured an ECH83 on a valve characteristics meter, **and had found its characteristics identical to those of an ECH81**. (Case well and truly proved, I think).

But why, **if they are the same valves**, are the maximum ratings of the ECH83 so much lower than those of the ECH81? Were Mullard just being cautious, or did the different ratings add weight to the deception? Perhaps one day, Mullard will finally own up!

One publication that's been mentioned by several people this year is the *Practical Wireless Circuits* book. I've never seen a copy myself, but it does sound like a thoroughly enjoyable - and interesting - read. I wonder if anyone else remembers the book and knows anything of its history*. **(See note).**

Someone I know who does remember buying a copy, way back in 1940, is **William Kinghorn M0WKB**. He tells me that it was the first real book of radio circuits he ever bought, and that he feels it would be well worthwhile featuring some of the designs in the Valve and Vintage column. Well, I'm game. Has anyone got any favourite circuits from the book?

Note * *A copy of this book is being sent to Phil. Basically it's a selection of circuits published within PW itself. In various editions and format it was published from the 1930s to the early 1970s. However, the pre-war style edition is by far the most common.* **Editor.**

September Special

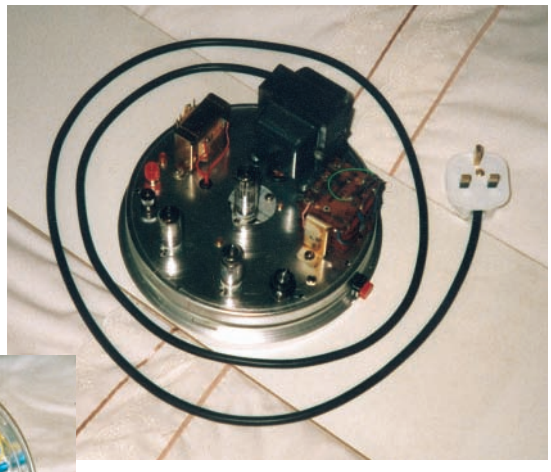
My September special on *Practical Wireless* Blueprints stirred the memory of **Fred Herod G4DZV**. He once bought a four-valve radio kit from **Stern Radio** when they were in Fleet Street. It was a portable set with a ferrite rod antenna. (A little unusual, perhaps, for a set of such vintage).

● Fig. 2: Close up view of Ken Draper's unusual chassis project (see text).

Fred tells me that his first mains-powered radio was a *PW* design which used two EF50 valves. It's from some time in the 1950s, but neither of us can track it down. Does anyone remember in which issue of *PW* the design was published? It might be worth resurrecting the circuit with EF80s in place of the EF50s. That would be a excellent way to make use of some old TV valves.

Two-valve t.r.f. sets might be fine for most of us, but **Les Jones** from **Baldock in Hertfordshire** isn't so easily satisfied. Les is a big fan of Denco coils and tells me that for his retirement project, he's going to build a battery-valved (B7G), dual-conversion communications receiver. Fortunately, he's already got a complete set of coils and i.f.t.s for the receiver. Good luck, Les...do keep us informed.

Actually, Les isn't the only person contemplating a serious receiver project. **Wally Bell** - who I mentioned last time - is also planning to build a valved double-conversion superhet. But topping the 'you must be mad' stakes is **Ted Edwards G8HLJ** from the **Wirral**. He's written to me a couple of times telling of his desire to build a copy of the first version of **G.R.B. Thornley's G2DAF** receiver. And his second version. And his third version too!



● Fig. 1: No it's not an unusual cake! Instead, it's a novel chassis idea used by reader Ken Draper who - bearing in mind where he lives - could have borrowed the idea from the BBC TV's 'Last of the Summer Wine' team! (See text).

Actually, Ted admits that the second and third versions he refers to are not usually differentiated by others familiar with the G2DAF receiver. Still, Ted does consider there to be three versions because of the significant changes G2DAF made to the design over the years. The 4th Edition of the *RSGB Radio Communication Handbook* describes the first version while the 5th Edition covers the Mark 2 receiver.

Most Old Timers well remember the G2DAF receiver, but for those with fewer turns on the p.a. coil, let me say that the receiver was quite impressive. The first version used 20 valves mounted on a 16-inch (410mm) square chassis. Surplus crystals were used in the oscillator stage and the crystal filter. Later versions used commercial crystal filters.

Now, Ted wants some help (I'll bet!) from us. He's having difficulty getting hold of authentic components for each of the receivers, particularly the later versions, and so he'd like to hear from anyone who has any G2DAF components. Ted's address is: **43 Hoose Court, Market Street, Hoylake, Wirral CH47 5AB**.

It's been suggested that someone (don't

look at me!) could compile a list of enthusiasts - not just G2DAF fans - who either have surplus components available, or who are looking for scarce components for projects. Electronics enthusiasts collect all kinds of components on the off-chance they might be useful. But the reality is, most of them will never be used. Much better that some find their way to other enthusiasts who have projects ready and waiting.

Interestingly, Ted also told me that G2DAF was reputed to have worked on a transistorised version of his receiver. I'd not heard that, so can anyone throw any light on this assertion? One final query: are there any front-panel transfers still available? These were easily obtainable at one time; some were simply printed on self-adhesive plastic, while others were of the 'waterslide' type.

I seem to recall these kinds of transfers from model aircraft kits. They were paper backed and had to be soaked in (warm?) water. After a while the transfers became detached from the backing and you then 'slithered' them into position. They were so thin that after drying, the plastic base virtually disappeared. A coat of lacquer applied over the panel then made them secure.

Components Source

One source of obscure components that I've come across is the **Vintage British Radio Components Co.**, which is run by **John Barrington Gray**. His address is: **132 Lincoln Way, Corby, Northamptonshire NN18 9HW**. Recently, John kindly sent me copies of articles about low-voltage receivers written by a young **Frank Rayer**, later to become **G3OGR**.

In the June 1948 issue of *PW*, Frank described several experimental low-voltage receiver circuits. He also defined the characteristics of both valves and coils suitable for use in low-voltage receivers.

The following month, Frank Rayer described his 6K7 Pocket Receiver, the one that I featured earlier this year. For a time, young Frank was keenly experimenting with several kinds of regenerative receiver all powered by l.t. batteries.

On a similar note, can I ask (again) for anyone involved with college/university projects for undergraduates to think about producing characteristic curves for valves operated at low anode (and screen) voltages? It seems to me that the design and construction of a piece of test equipment which automatically furnishes variable voltages to a valve, and then measures and records the current taken by each electrode, would be an ideal - and useful - project. The display, in three dimensions, of tetrode/pentode data is another thing I'd personally very much like to see attempted.

Construction Activity

The arrival of cooler weather and shorter days usually heralds an increase in construction activity. Certainly, **Ken Draper** from **Honley near Holmfirth** (shades of Last of the Summer Wine) is looking forward to the time he can again begin work on his projects. Gardening, decorating and all kinds of other Summer activities - even visitors - have severely curtailed Ken's constructional pursuits.

One of Ken's completed projects is shown in the photograph, **Fig. 1**. No, the chassis **is not a sponge cake tin** (I forget what it actually is) but it could be! Cake tins were once used for small projects (yes, they appeared in *PW* too!), although I don't know how suitable modern cookware would be for the purpose.

The point is: try something different this Winter. Not only does Ken have a useful little amplifier, he also has quite a talking point when other enthusiasts call.

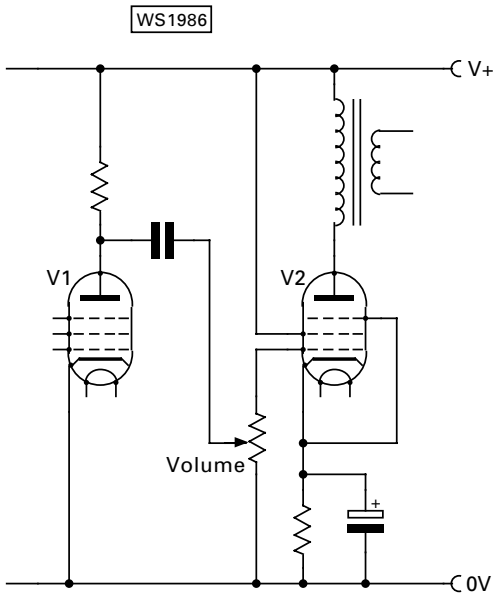


Fig. 3: Part of a circuit published in the September/October 1959 issue of PW - you'll see that the volume control is wired 'backwards' (see text).

Curious Method

Now for a query of my own. In the late 1950s and early 60s, a rather curious method of wiring volume controls gained limited popularity. If you take a look at **Fig. 3**, in which is shown part of a circuit published in the September/October* 1959 issue of *PW* - you'll see that the volume control is wired 'backwards'. (The anode of V1 is usually connected to the top of the volume control, and the slider feeds the control grid of V2. But this arrangement is the reverse).

The Sept/Oct date is correct! The combined issue of PW came about because of a printer's strike, the only known occasion where PW almost didn't appear at all! **Editor.*

The practice wasn't limited to valved circuits. I've seen transistor circuits with exactly the same backwards connection. There appears to be no merit whatsoever in wiring a volume control in this way. And I wonder how and why the practice ever began in the first place. I've never seen any explanation as to why volume controls should be wired like this, so can anyone please tell me?

I can see three (at least) disadvantages with this method: Firstly, the a.c. load on V1 varies enormously as the volume is adjusted. In addition, the load becomes increasingly reactive as the volume is reduced to zero (the valve 'sees' the coupling capacitor connected to earth).

Secondly, at low volume settings, the coupling capacitor and the small resistance between the slider and earth form a high-pass filter. The human ear is far less sensitive to low-level bass frequencies than to middle frequencies. Instead of boosting bass frequencies at low volume settings (as loudness controls do), here in this circuit bass frequencies are actually attenuated!

Finally, there's the human ear's non-linear response to sound to consider. Put simply, the sensitivity of the ear (to changes in sound intensity) is logarithmic. Using a linear-taper potentiometer as a volume control is not wholly satisfactory; the sound level increases quickly at first and then seems to hardly alter over much of the remaining rotation of the control.

Logarithmic Taper

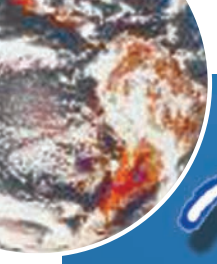
To match the ear's logarithmic response, it's necessary to use a potentiometer with a logarithmic taper. This produces the same increase in loudness for the same angular rotation of the control regardless of the absolute position of the slider.

A backward-wired logarithmic potentiometer in conjunction with the output impedance of V1, will tend to produce a similar effect to using a linear potentiometer. Using a backward-wired linear potentiometer produces an even worse result; just like using a potentiometer with an anti-log' taper.

Interestingly, I've even seen this backward connection used as an attenuator between the antenna and a receiver. (See the *RSGB Radio Communication Handbook*, 5th Edition, page 4.21.).

Ah, well. Time to wind down my volume I think. Do please send your comments and letters - and any answers to the above questions - to me, either via the ***PW* offices**, via E-mail to **phil@valveandvintage.co.uk** or direct to: **21 Scotts Green Close, Scotts Green, Dudley, West Midlands DY1 2DX**.

A very Merry Christmas, and a happy New Year to all. See you in 2003! *PW*



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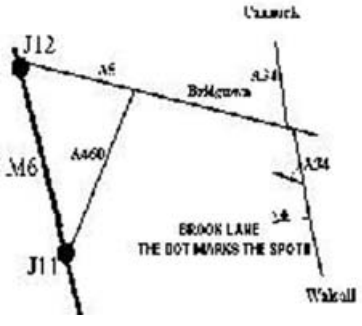

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YAESU	FT-847	HF / 2 / 6 / 70cm BASE TRANSCEIVER	£900.00
YAESU	FT-920AF	HF/6M BASE WITH DSP	£899.00
YAESU	FT-ONE	HF BASE TRANSCEIVER	£450.00
YAESU	FTV-901	TRANSVERTER Inc 2m Mod	£165.00
YAESU	FV-707	VFO UNIT	£99.00
YAESU	MD-100A8X	DESK MICROPHONE	£80.00
YAESU	MH-34B4B	SPEAKER MICROPHONE For VX5R VX-1R	£15.00
YAESU	MH-35	SPEAKER MICROPHONE	£10.00
YAESU	MMB-16	MOUNTING BRACKET	£20.00
YAESU	NT-29	CHARGER	£30.00
YAESU	PA11U	PSU FOR FRG-100	£20.00
YAESU	VR-120	RECEIVER FM /WFM/AM	£99.00
YAESU	VR-5000	TOP RANGE SCANNER RECEIVER	£450.00
YAESU	VX-1R	HANDHELD TRANSCEIVER	£120.00
YAESU	VX-5R	2 / 70 / 6 HANDIE 5W	£220.00
YAESU	XF-114SN	2KHz SSB FILTER	£60.00
YAESU	YO-100	SCOPE VERY RARE!	£150.00
YUPITERU	MVT-225	AIRBAND SCANNER	£150.00
YUPITERU	MVT-7300	MULTIBAND HANDHELD SCANNER	£199.00
YUPITERU	OP-90	CASE	£10.00
YUPITERU	VT-125	AIRBAND SCANNER	£120.00

Please note, the equipment listed may

have been sold / updated, please ring

01922-414796 to check availabilty

VHF DXER

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REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

THIS MONTH DAVID BUTLER G4ASR HAS REPORTS OF DX CONTACTS ON ALL THE VHF AND UHF BANDS

There were a number of different propagation events during the months of August and September, enabling DXers to work something new on all bands from 50MHz through to Microwaves. The 50MHz band was fairly quiet during August but nevertheless there were some good openings for the more alert operator. During the evening of August 1 there was a multi-hop Sporadic-E event with c.w. contacts being made with USA stations in the W1,W2 and W3 call areas.

In the early afternoon of August 8 there was a brief opening to the stations of VU2ZAP (India) and 8Q7ZZ (Maldives) and in the evening of August 24 there was a tremendous trans-equatorial propagation (t.e.p.) opening to stations in South America and southern Africa. Stations known to have been worked from the UK included AY2DEK, LU1DZK, LW1DZ, LW3DX, LU5EMM, LU9DFN (Argentina), ZR6DXB, ZS6BTE, ZS6WB (South Africa) and 9Q1A (Congo).

Another t.e.p. event occurred during the evening of August 31 this time to the Brazilian stations of PP1CZ, PY1NX, PY1RO, PY1SL, PY2BT and PY2XB. Nine trans-equatorial openings occurred during September 1, 3, 8, 12, 19, 20, 22, 27 and 28 to Brazil (PY), Gabon (TR), Malawi (7Q), Namibia (V5), Nigeria (5N) and South Africa (ZS).

Stewart Reeve G1HHO (Dorset IO90) reports catching his first t.e.p. opening of the season on September 20 when he made s.s.b. contacts with ZR6DXB and ZR6ZL. On September 27 he found ZS6AVP, ZS6NK, ZS6OB, ZS6XJ and on the following day the station of 5N6NDP for a new country. The first sign of this winter's F2 propagation season was recorded by stations in southern England and Wales when the station of VK6JQ (Australia) was worked on 50.110MHz c.w. between 0930-1030UTC on September 28.

Although Sp-E propagation was noted on the 50MHz band for much of August the openings were poor with very little DX to be worked. However, on August 11 the ionisation was much more intense enabling a late-season Sp-E opening to occur on the 144MHz band. The band was open for up to an hour to stations in Spain (EA), Ceuta & Melilla (EA9) and Morocco (CN). At my QTH (Herefordshire IO81) contacts on s.s.b. were made between 1230-1315UTC with the stations of EA3DHR, EA5AGR, EA7AJ, EA7ERP and best DX of the event EA9IB at 1830km.

The Perseids meteor shower, peaked on August 12 but was considered quite poor, with no defined peak. Most meteor scatter work is carried out on the 144MHz band using either high speed Morse, single sideband (s.s.b.) or data (FSK441).

Using 400W and an 18-element DL6WU Yagi I spent a few hours listening on and around the s.s.b. calling frequency 144.200MHz. Six contacts were made with the stations of LA0BY/P (Norway) at 1125km, EA3TI (Spain) 1220km, SM3VAC (Sweden) 1700km, OH1XT (Finland) 1822km, I8MPO (Italy) 1830km and OH5LK (KP30) at 2071km.

During August and September a number of auroral back-scatter events took place allowing DX contacts to be made on the 50, 70 and 144MHz bands. Most were fairly small events but one that commenced on Saturday September 7 was tremendous, especially as it coincided with the Region 1 144MHz contest. Activity was very high with many QRO contest stations located on elevated points throughout Europe. It was brilliant!

Damien F4AZF (France JN38) reports working the s.s.b. stations of G4LOH (IO94), GW8IZR (IO73) and GI6ATZ (IO74) at 1061km. He uses an Icom IC-275H transceiver running 120W into a group of four Yagi antennas. Also running an IC-275H transceiver and four Yagis was the contest station OM/S57C/P operating from Slovakia. **Branko S57C** mentions making 12 contest QSOs via the aurora the best of which were c.w. contacts with the stations of G4FUF at 1415km and GM4ZUK/P at 1736km.

After years of persistence the Scottish contest station of **Allan Duncan GM4ZUK/P** (IO86) did extraordinarily well. Running a Kenwood TS-940S driving a Mutek TVVF144a transverter and a Henry Tempo 2002 amplifier (2 x 8874) 400W into a group of four 13-element Cushcraft Yagis he made a total of 359 contest contacts. Of these 168 QSOs were made via the aurora with c.w. stations located in Belarus (EW), Belgium (ON), Czech Republic (OK), Denmark (OZ), England (G), Finland (OH), France (F), Germany (DL), Latvia (YL), Lithuania (LY), Netherlands (PA), Norway (LA), Poland (SP), Scotland (GM), Slovakia (OM), Sweden (SM) and Switzerland (HB9).

When you consider that each contact averaged around 1000km you can then imagine the total score that GM4ZUK/P attained. His top six c.w. contacts were with the stations of YL3AG (1602km), LY2IC (1650km), OM0C (1678km), OM/S57C/P (1736km), LY2BIL (1745km) and OH5LK (1747km). You can see photographs of his contest station at **www.qrz.com/gm4zuk**

Tropo conditions during much of September were very good enabling contacts to be made on the v.h.f., u.h.f. and microwave bands with stations up to 1500km away. These 'lifts' in conditions are the most common form of v.h.f. propagation and sometimes last for days at a time. During these periods many stations will be active, especially the DX operators who use c.w. and s.s.b. communications. However, unlike most other weak-signal propagation modes tropospheric openings can often be observed when using f.m. equipment.

Jonathan Kempster M5AEO comments that it amazes him what readers of this column are achieving on the v.h.f. bands. One area that he has always been interested in is working longer distances via tropospheric propagation. His best contact via tropo was a few months ago when he worked into Derby whilst using 430MHz f.m. from his home QTH in Milton Keynes.

Jonathan mentions that it always gives him a big thrill when that sort of event happens. **Dolan Morrison GM0LZE** (IO68) also reports that during a recent tropo lift he contacted many stations in Norway (LA) and the Faroe Islands (OY) via the LA6PU f.m. repeater located in Trondheim.

Of course the use of c.w. and s.s.b. is much more effective during tropospheric openings because of the narrower bandwidths involved. Also many s.s.b. operators will run higher power and use beam antennas. **Pierre Metenier F4CKV** located in central France found conditions very good towards the UK between September 14-16. On the 144MHz band he contacted a total of 67 stations located in England, Guernsey, Ireland, Scotland and Wales. All QSOs were made on s.s.b. and included the stations of 2E1IDX,

GW1MCD, MW1MFY, M1EGB and M5BXB. His furthest distance contacts were with EI5FK at 1033km, GI6ATZ (1038km), GI4SNA (1099km), GM4YXI (1261km), MM3ERP (1269km) and GM3POI (1436km). His best DX was made at 0816UTC on September 15 with the station of MM5DWW (Shetland Islands IO89) at a distance of 1467km.

Bryn Howell-Pryce G4ZHI (Oxfordshire IO91) mentions that tropo conditions on September 15 were tremendous. He had planned to do some work around the house but conditions just kept going on and on. Running 100W on the 430MHz band to a M2 long Yagi his best s.s.b. contacts included the stations of EA1EBJ (Spain), EA2KP (IN83), F1GPL (France), F4CKV (JN16), F6APE (IN97) and HB9AA (Switzerland).

Reg Woolley G8VHI (Northamptonshire IO92) reports that he hasn't been too active recently. That's because his XYL has recently given birth to a baby boy. Congratulations Kim and Reg!

It does appear however that Reg managed to sneak into the shack when Kim wasn't looking! During the good tropo conditions he made s.s.b. contacts on the 144MHz band with the stations of EA1FDI/P (IN52), F/PA2CHR (IN77) and TM9R (JN04).

Reg is also active on the 430MHz band running an Icom IC-451 transceiver and 100W amplifier into a pair of 23-element CueDee Yagis with an MGF1302 mast-head pre-amplifier. Some of the DX worked on this band included the stations of DK2NH (Germany), DL2NUD (JO63), EA1FDI/P (IN52), LA2PHA (Norway) and SM6HYG (Sweden).

Conditions on the 1.3GHz band were even better with contacts being made with OZ1CTZ, OZ2OE, OZ6OL (Denmark), SM7FMX at 1010km and SM6HYG at 1040km. For the 1.3GHz band Reg uses a Yaesu FT-847 transceiver driving a very old Microwave Modules transverter.

To increase receive sensitivity he uses an external low-noise amplifier and on transmit he boosts the power output with a solid-state 30W amplifier feeding a 67-element Yagi. Further contacts made on the 1.3GHz band during the period included F1MOZ (IN53), DK2NH, DL2NUD, DC4BK and other stations in central Germany. He also heard the HB9F (1296.945MHz) beacon which runs low power from an elevated site in Switzerland.

MARITIME MOBILE

Andy Adams G0KZG/MM has transferred from the Royal Research Ship *Charles Darwin* (following a trip around Africa and Far East) to the RRS *Discovery*. He is active on the 144MHz band using a Yaesu FT-847 transceiver and a Linear Amp UK Discovery 3CX800 amplifier running 800W into an 11-element F9FT Yagi. And before you ask - Yes, he does have a high power permit.

Andy considered operating on the 50MHz band but he doesn't know of any Yagis that will stand up to the 100m.p.h. plus winds in the North Atlantic! Along with c.w. and s.s.b. Andy will also be operating with high speed morse (h.s.c.w.) and data (FSK441) for weak-signal meteor scatter communications. During September/October he operated from various 'wet' locator squares between northern Scotland and Porcupine Seabight approximately 200km south-west of Ireland. He is currently sailing on his second trip to areas around Iceland and Greenland and is due to arrive back in Southampton on December 20.

● The contest shack antenna system at the station of OK1DIG.

Andy's working frequency for h.s.c.w. schedules is 144.120MHz, using 2.5 minute periods with G0KZG/MM operating during the first (even) period. Random m.s. operation will be carried out on 144.125MHz. Andy will also operate using FSK441 on 144.360MHz, operating during the first 30-second period. Look out for G0KZG/MM between 0400-0600UTC for schedules and between 1800-2100UTC for random operation on 144.125 and 144.360MHz.

There may be some operation during weekday afternoons but please remember that Andy has to work on the ship and that all radio operation can only be in his free time. Andy requests that when first calling him you send only your callsign. When he hears your callsign he will then send it for one period only.

When you hear your callsign you then send both calls and signal report as normal. This procedure makes it much easier, especially under poor conditions, for Andy to work out who is calling from up to 20 plus stations all on the same frequency.

INTERNET LINKING

Rod Johnston GW7RDV reports hearing some unusual DX signals on the 144MHz band recently. He thinks it may be some form of Amateur Radio/Internet link as the signals on 145.2875 and 145.3375MHz are outside of the Amateur Satellite allocation. Rod mentions that he has resolved North American and other DX callsigns on the band. He asks how these 'nets' may be accessed with details of other protocols such as time-out periods and input frequencies.

As you probably know it's possible for those with Internet access to communicate with friends and family around the world by using voice and video. This requires the computer to have a camera, microphone and soundcard fitted. Some Radio Amateurs have taken this a step further by linking an f.m. transceiver (either v.h.f. or u.h.f.) to the computer sound card. If a similar link takes place on the remote computer and both computers are linked together via the Internet you can have a radio to radio contact with the Internet providing the link in the middle.

To use the system all you need is an f.m. transceiver or hand-held that can access a local v.h.f. or u.h.f. simplex channel or repeater which is connected to the internet linking station. You don't need access to the Internet, all the linking takes place in the shack of the Radio Amateur providing the gateway. The audio quality is normally excellent with DX stations sounding just like locals.

Repeaters represent a big investment in both time and money and the aim of the Internet Radio Linking Project (IRLP) is to increase activity on the repeater and simplex channels. UK simplex nodes can be found on 51.920, 51.930, 145.2875 and 145.3375MHz. There are many more nodes on the 430MHz band and these can be found on and around 430.025, 431.200 and 434.500MHz.

At the present time UK gateways may only operate when the licence holder is in the shack so you may not hear the node all the time. Currently there are over 600 repeaters around the world already linked to the internet. Further details of IRLP can be found at **http://www.ukirlp.co.uk**

Thanks for your letters and good luck with the DX. See you again next month.

73 David G4ASR

HF HIGHLIGHTS

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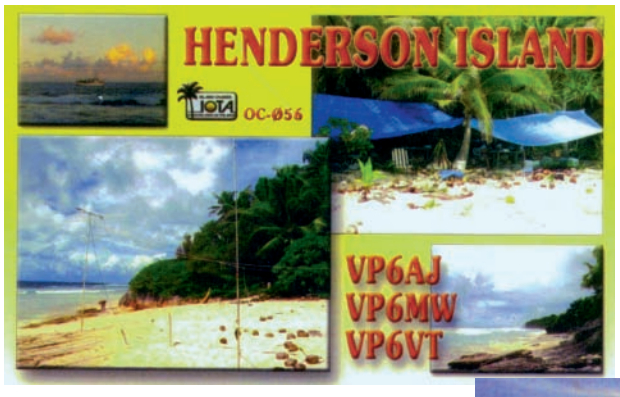
REPORTS, INFORMATION AND PHOTOGRAPHS TO ME PLEASE BY THE 15TH OF EACH MONTH.

New reporter **Dave Akrill G0DJA** who lives in Wakefield starts us off this month with our **first ever** 5MHz report. Having just received his Notice Of Variation (NOV) to operate on the band he has modified his IC-706MkIIG to be able to transmit on 5MHz.

Dave said in his letter "This was a fairly straightforward modification, as all I had to do was remove one SMD diode. I had been listening on the band for a couple of weeks interrupted only by my holidays. Within minutes of doing the modification I joined a net at 2125UTC with G4FZN in Richmond, North Yorkshire acting as the Net Control Station. Several operators had called in including G4JTR (Reading), G4LOE (Solihull), G3XOU (Tavistock), GI4VIV (Kircubbin), GI0HWO (Larne) and GM0HMR (Invergordon. All transmissions were on 5.398.50MHz (Channel FE) s.s.b. and during the net, one operator received an E-mail report saying that



A QSL from VP6VT received by Paul M0CCQ for his contact on 28MHz s.s.b. and VP6DI QSL worked by GW0VSW on 21MHz c.w.

some stations were being heard over in Germany!

Dave continues "I finally signed out at 2207UTC. The antenna I use is a doublet, which is set up as an inverted V with the apex at the top of a pole mounted to the side of my house. This is tuned via a Z-Match ASTU. Being the 60 metre band the radiation is probably mainly NVIS, which is useful given that the propagation experiment is supposed to involve this mode of transmission". Thanks Dave, an interesting report.

Roy Walker G0TAK, Kendall has also been spending a good deal of time on the 5MHz band using a variety of modes. Roy says "I've cut a reference dipole for 5.332.5MHz, the mean of the five allocated channels, which has been arranged as a 'horizontal V' with a centre height of 5m. During the first month of activity I was able to work 43 stations, some on a number of occasions, to establish conditions on this band at this time of year. A locator map is being maintained to establish what pattern of contacts is being made using the reference dipole".

CARL MASON GW0VSW HAS NEWS OF THE FIRST 5MHZ REPORT TO BE SUBMITTED TO HIS COLUMN!

Roy has modified his TS-570DG and using this rig contacted G3AKF (Daventry), G3PLX (Kendal) and G3PSM (Southampton) using PSK31 around 1915UTC and 'on the key' worked G2MJ (Preston) 0945, GI4VIV (Newtownards) 1040 and GW4ALG/QRP (Chepstow) at 1952UTC.

THE 7MHz BAND

The 7MHz band is favoured by **Frank Armstrong GW3CNM** in Holywell who operates almost exclusively between 7000 and 7010kHz. Frank say's "It's a long time since I wrote to

PW, more years than I care to remember! I began operating again this August after a few years break and was surprised at just how much good DX there is around providing you have good ears! I use a TS-830M with an amplifier to a vertical-wave antenna over an extensive buried ground system. As my location is about 230 metres above sea level I have an unobstructed low-angle view of the sea for most of the northern half of the compass which helps when working the weaker stations".

Frank's c.w. reached, J8/AC4LN (St. Vincent) 0200, YV50HW (Venezuela) 0300, KH6ZM (Hawaii) 0400, XQ1ZW (Chile) and TK5MP (Corsica) at 0500, A25/V51AS (Botswana) and BW3/UA3VCS (Taiwan) 1800, SU9BN (Egypt) and ZL2ALJ (New Zealand) 1900, E21EJC (Thailand), 9M6AAC (West Malaysia), DU9/N0NM (Philippines) and A61AJ (United Arab Emirates) at 2100, PZ5RA (Surinam), C56/G4IRN (The Gambia) and VK6RZ (Australia) at 2200 and finally XY0TA (Burma) at 2300UTC. As you can see from this log, the 7MHz band is anything but dead and has some good DX on it if you are prepared to lose some sleep finding it! (Welcome back Frank!).

THE 14 & 18MHz BANDS

On to 14MHz now and the log of **Colin Topping MM3ACL**, Gauldry, Fife who was pleased to have a short QSO with JA3GFA (Japan) in the town of Yamatokohriyama at 1928UTC receiving a 4/2 report using a IC-706MkIIG, home-brew a.t.u. and G5RV antenna.

Keen PSK operator **Steve Bainbridge M1SWB/M3SWB** from Liverpool enjoyed a late evening at the keyboard finding PT2TF (Brazil), k2SVB (U.S.A.) in Sanderson, Florida, Z36A (Macedonia), OX3DB (Greenland) and VE9BUF (Canada) around 2300UTC. The rig was an IC-706MkIIG with 10W to a long wire antenna.

Steve is the **M3** QSL manager for the RSGB

and if any of you with an M3 call wish to contact him you can do so at **steve.b@m1swb.freeserve.co.uk** Steve will also help any readers who are interested in PSK31.

Martyn Medcalf M3VAM, Chelmsford also favoured the 14MHz band logging s.s.b. contacts with EA1EAG (Spain), YL5W (Latvia), 9A7ZZ (Coatia), OL5Y (Czech Republic), UX0FF (Ukraine), ER27A (Moldovia) and IS0/DK7DR (Sardinia) between 1130 and 1515UTC. His equipment was an IC-746 with a SGC237 tuner and 8.2 metres of wire.

Welcome now to **Mike Knight M3KGT/2E1BFH** who enjoys operating mobile around his home in Wellingborough, Northamptonshire. Using an IC-706MkIIG and just 10W to a Maldo HMC-6S antenna, Mike lists contacts on 18MHz with VK7KPB (Australia) 0630, EU6NN (Belarus) 1340, CU1AX (Azores) 1355, LZ1BJ/1 (Bulgaria) 1430, 9K2AR (Kuwait) 1515, 7X2DG (Algeria) 1635, HK4CZE (Colombia) 2146, OH3RM (Finland) 2147 and N2CW/P3 (Cyprus) at 2210UTC. Mike has used a Miracle Whip antenna on his car with some success but has now fitted a stainless steel whip coupled to an Icom AH-4 auto tuner to enable all band operation at the push of a button!

● The QSL card received by Steve M3SWB confirming a PSK31 contact with Jean-Guy in Canada.

THE 21 & 24MHz BANDS

Alan Tait MM3ALL/GM7NNG, Erskine, Renfrewshire, is yet another new reporter and has been doing very well on 21MHz with low power s.s.b. Using an FT-817 with 5W output to a Miracle Whip antenna. Alan's QRP contacts included CK3AT (Canada) a special prefix to mark the 125th Anniversary of Japanese immigration to Canada, YT1AD (Yugoslavia), RL3A (European Russia), PA0AJA (Netherlands) and W4MYA (USA) in Goochland, Virginia between 1345 and 2130UTC from his QTH, which is only 20 metres above sea level!

Also on 21MHz was **Mark Hampton M5MDH** who used his TS-2000 and an indoor dipole to work 5C2MI (Morocco) on AF-065, FM5GU (Martinique), VO1MP (Canada) on NA-027, 5K0Z (San Andreas & Providencia) and HK3JJH (Columbia) between 2209 and 2350UTC.

Operating mobile again was **Mark Taylor G0LGJ**, Dereham who used a FT-100 at 100W and a Pro-AM mono band antenna to work UP6P (Kazakhstan) 1356, TU2DP (Ivory Coast) 1743, 9M2/JI1ETU (West Malaysia) 1744, VU2PAI (India) 1750, 9V1UV (Singapore) 1806 and 4S7AB (Sri Lanka) at 1829UTC.

Here in Bishopston, South Wales **Robin Trebilcock GW3ZCF** returned from a holiday in France to find the bands 'poor' for most of the time but still managed to work ZS6RL (South Africa) 1647, CP6EB (Bolivia) 1952, L59EOC (Argentina) and OD5ZX (Lebanon) at 2000UTC using PSK31. Switching to s.s.b. Robin worked 9M2/JI1ETU (West Malaysia) 1850 and ZD9IR (Tristan da Cuhna) QSL via ZS6EZ at 1905UTC using an IC-756 Pro with 50W output to a 40m horizontal loop.

On to 24MHz now and the log of **Ted Trowell G2HKU** on the Isle of Sheppy who used a Ten Tec Omni V with 70W c.w. and G5RV to work HZ1AB (Saudi Arabia) at 1500 followed by PY2DX (Brazil) at 2000UTC.

Meanwhile **Mike Baker G3SUK**, Stowmarket worked a few stations a little closer to home including SM0OWX (Sweden) at 1137 and 9H1NB (Malta) at 1544 UTC using an IC-746 and 80W s.s.b. to a Carolina Windom.

In the village of Rhuddlan, North Wales lives another new reporter, **Paul Bridle MW3ARD/GW6CHD** who sent in a large logbook covering several bands. His 24MHz s.s.b. contacts include SV2CXI (Greece) 0957, 9K2SQ (Kuwait) 1304, 9H1DE (Malta) 1427, WP4U (Puerto Rico) 1513, KV1VSJ (U.S.A.) in Massachusetts 1623 and 4X4FR (Israel) at 1624UTC. All contacts were made using an FT-847 and FC-20 auto tuner and a home-made dipole.

● Mike M3KGT's mobile set up includes a stainless steel whip with Icom a.t.u and Miracle Whip antennas. Both are working very well.

THE 28MHz BAND

The 28MHz band is where **Mike Turnbull G7PWL** in Whitley Bay has enjoyed a spot of short wave listening. During an afternoon session between 1300 and 1530UTC Mike heard CN8ZG (Morocco), DH8LAM (Germany), EA8AST (Canary Islands), IT9ZTX (Italy), MW0TJD (Wales), SV3EXY (Greece), UR3EO (Ukraine), PY2VA (Brazil), VE3TSC (Canada) and W5OU (USA) in Cleveland, Ohio. Not bad going when you hear what receiver was used.

Mike say's "I don't normally keep a logbook of the stations I hear but a moment of madness came upon me after finding a receiver I had not used for sometime. This was not a 'black box' but simply a home-made receiver built from a description and circuit by **R.J. Howgego G4DTC** that appeared in the September 1981 issue of *PW*. The main difference is that to simplify tuning I fitted a variable resistor at the antenna input of a coil. Once it was dusted off and powered up I tuned on several bands and found the best activity was on 28MHz. All the stations listed in my report were heard on a random length of wire which is in my loft".

Mike usually uses a Sony ICF2001D or Grundig Satellite 3400 for his short wave listening and his report shows just what can be achieved with simple equipment.

On to **Paul Burgess M0CCQ** in Ellesmere, Cheshire now, who missed out on the recent Ducie Island Dxpedition but was pleased this month to receive a card for his 28MHz contact with VP6VT on Henderson Island. The uninhabited island is the fourth largest of the Pitcairn Group and only occasionally visited by Pitcairners who make the voyage in longboats.

The VP6DI team activated this rare IOTA OC-056 on the way home from Ducie and made over 4,200 QSOs in approximately 40 hours. Paul's s.s.b. log includes DS5CKP and 6M0MM (South Korea), XT1YQQ (Burkina Faso), 5N6EAM (Nigeria), VP8DEY (Falkland Islands), VK9NS (Australia) on Norfolk Island and C98DC (Mozambique) using a FT-920 and 300W to a 5-element Yagi 8 metres high.

SIGNING OFF

With so many reporters this month it has been hard to fit you all in and I hope I have managed to include the best of your logbooks. Keep up the good work and have a good DX filled month!

73, Carl GW0VSW

KEYBOARD COMMS

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THE DRIFT
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E-MAIL: rcooke@g3ldi.freeserve.co.uk
PACKET: G3LDI @ GB7LDI

THIS MONTH ROGER G3LDI LOOKS AT UNSOLICITED E-MAILS AND WHAT CAN BE DONE TO STOP THEM!

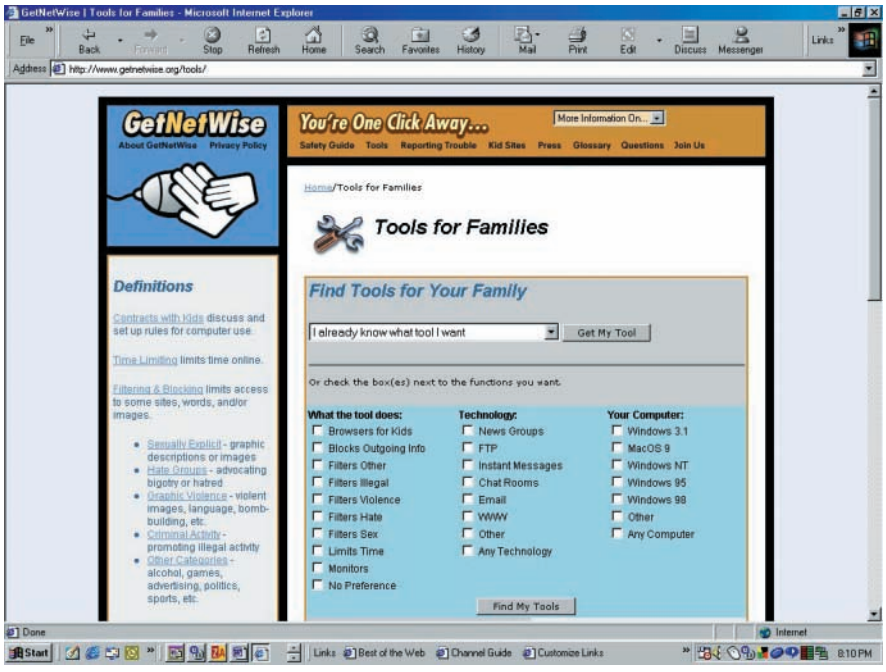
The Internet spamming (unsolicited E-mail) situation is not humorous at all. In fact it's extremely annoying, time consuming, boring, very worrying for those that have children, and bordering on the illegal. In fact, some of the explicit spammers are totally illegal in my opinion.

Paedophilia is there, explicit films, pictures, and sites offering growths to various parts of the human anatomy. Then there are the offers from the USA for cheap mortgages, financial freedom by taking out loans and money making schemes by the hundred or even thousand, making you a millionaire in a week with only three minutes work a day. If I had a scheme like that would I advertise it?

I have had dozens of E-mails from Africans suddenly finding themselves bereaved and within spitting distance of about 400 million pounds. All they need is a bank account - **yours** - into which to deposit this wealth, and then they will give you 20%, all yours! Yeah, pull the other one it has bells on!

There is no such thing as a free lunch! Believe it, don't be fooled by these wasters. The Internet is fast becoming a cess-pit of garbage that nobody wants, well, I say that, but I suppose I should not be too judgmental. After all, not all the monkeys are in the Zoo!

These scams must pay, or they would not bother to send the garbage in the first place. However, it's extremely annoying to be bombarded with more and more garbage every time you download your E-mail. Then, just as you have cleared your desk and filled your waste paper basket, sitting down for an evening meal, the phone rings, and bingo – away we go again. "Congratulations, you have won a holiday". Well, you can rid yourself of the garbage on the telephone by calling the Telephone Preference Service on 0207-291 3320, or E-mail **tps@dma.org.uk** or look at the website **www.tpsonline.org.uk** You will receive no more cold calls on the phone **but it's not quite so easy on the Internet**.



MAIL ROBOTS

Mail robots are trawling the Internet, looking at just about every website they can find, extracting E-mail addresses, and then selling these on in lists of millions. Even if your E-mail address is hidden in HTML code, the robot will still find it!

I have invoked junk E-mail lists, Adult senders E-mail lists, created rules that must occupy a large portion of my hard drive now, and still I get this stuff sent to me every day. I know the easy way out is to change my E-mail address, but then I also have several reflector addresses.

One way of fooling the robots on a website is to give your E-mail address with one character wrong. Then explain to the reader to substitute that character with the correct one. However, that won't work for too long.

The robots generate E-mail addresses galore by changing characters one at a time, and sending the mail. Junk mail can then be sent from the bulk senders with no chance of having them bounced. I have tried bouncing mail using a front-end program called *Mailwasher*. This can delete mail before you download it, but most of the 'bounced' mail comes back to you as undeliverable.

I wanted to see how long it took for junk mail to be generated so I set up a new account with a different ISP, and a new E-mail address. I didn't send any E-mails, but I put an advert on a free advert site.

Within a week, I had received over 150 replies! Great, but there was not **one** real reply to my advert, just a load of junk mail!

I received the following from somebody who has had a similar experience to me, especially with reference to pornography (this is my main concern).

After letting the authorities know about the paedophile porn that I received yesterday morning, I received the following, which may prove useful for others:

Thank you very much for your report to the Internet Watch Foundation. We have been inundated with reports of this E-mail which links to a website that has been assessed as potentially illegal under the UK Protection Of

Children Act. We have therefore notified details of the location of the images on the Internet and the origins of the E-mail to the National Criminal Intelligence Service (NCIS). The NCIS will disseminate these details to the relevant national law enforcement agency via Interpol. Please see ***http://www.iwf.org.uk/hotline/whathappens.htm****This gives you more information on how your report is processed.*

If you wish to submit any future reports to us please only use our online form at **http://www.iwf.org.uk/hotline/report.htm.** *This starts our logging procedure and highlights to us websites that we are already aware of. This increases our efficiency and is appreciated. If the site you are reporting is from an unsolicited E-mail please include the Internet Headers in the description field if possible.*

With regard to unsolicited E-mail it may be helpful to contact your Internet Service Provider (ISP) for advice on their anti-Spam (unsolicited E-mail) policies and also for you to consider using software to filter incoming mail.

A good site to look at is **http://www.getnetwise.org/tools (Fig. 1).** *Here you will find details of the various types of software, some of which can be downloaded for free. If you click on the 'Tools for Families' icon, you can fill in a questionnaire designed to help identify the most suitable software for your needs.*

More information on Spam is available at the UK Internet Service Providers Association website at **http://www.ispa.org.uk/html/consumer_spam.htm (Fig. 2)** *If there is a persistent E-mailer then it is also possible to block some E-mail addresses. Check the pull down menus on your software.* ***It is usually best not to respond to any icons within an email or attachment, which claim to give you an opportunity to be removed from the sender's list. A response from you simply confirms that a 'real person' has been found, and could increase rather than reduce spamming of your address.*** *(This is a very valid point and the advice is sound, so follow it, don't be tempted to respond in any way).*

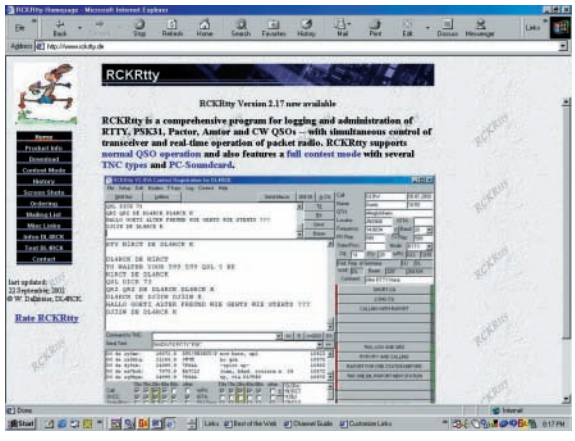
We do appreciate the disturbing nature of the site, and hope this provides some reassurance.
TR
Internet Content Analyst
Internet Watch Foundation
http://www.iwf.org.uk

I do hope that you find this information useful and that some of you at least will follow up the advice given. I am sure you are just as fed up as me with the proliferation of this rubbish and the sooner we can improve it the better.

NEW RCKRTTY

The new version of RCKRtty, V2.17, by **Walter Dallmeier DL4RCK**,
has been uploaded to his homepage at:
http://www.rckrtty.de (**Fig. 3**). Don't forget to uninstall any previous version of RCKRtty that you may be using. Here are some of the changes to the new version:

* Update PSKCore.dll V1.15
* Update the master.cal file, 09.09.2002
* Fixed bug with reading the frequency from a FT-1000MP
* Frequency for DX-announcement for PR has now the right format
* Added support of the Buckmaster CDRom call database
* Many minor changes
* Networking: When starting the program as a slave station the
* PC-clock synchronised immediately to the master-PC clock.
* Fixed a Multi-problem for EU-stations in the WAEDC contest.



070 CLUB

The 070 Club was founded by the Penn-Ohio DX Society because a few members got hooked on PSK31. However, they soon noticed that, except for rag chewing, there wasn't a heck of a lot for the PSK crowd to do. Here's what they have to say:

So, we started out as a free award program by offering stickers for working so many PSK stations, up to 300. Soon we came up with the idea of offering endorsements to the certificate for working the lower 48 states, WAC, joining in the Rumble, etc. Some of the members earned so many endorsements their certificates looked like a travelling salesman's suitcase!'

The endorsements have titles such as: Try '30 on 30', '17 on 17' or '12 on 12', for example. Or the 'Worked All OZ', 'SV Triband', or the 'China Clipper'. The club continues to evolve and now offers more programs than ever. They have already passed the 225 member mark with no end in sight.

If this is your 'cup of tea' then in order to join, just go to the website at **http://hometown.aol.com/n3dqu/podxs070.htm** Claiming awards and anyone of the 17 or so endorsements is as simple as sending an E-mail message to KA3X. His address is **jhudak3rd@aol.com** or **Jay Hudak KA3X, 212 Beechwood Blvd, Pulaski, PA 16143**. Attach your log files as a .txt file and any requisite QSL image as a .jpg. Jay N3DQU runs the website and he can be reached at **N3DQU@aol.com**.

PROPVIEW

Dave AA6YQ developed a program called *PropView* (**www.qsl.net/dxlab/**) last year. It forecast, in a graphical format, the predicted propagation on paths selected by the user.

Now, Dave has taken a further step for DX users who can now generate the 'actual propagation' as distinguished from the predicted levels. The basis for the new application lies in the NCDXF/IARU beacon network (**http://ncdxf.org/beacon.htm**), 18 stations around the world broadcasting on the 5 bands 14-28MHz.

PropView now creates a beacon-monitoring schedule for your location by band, or bearing, or by an arbitrary set of beacons. If you run Commander, *PropView* can automatically QSY your radio and even rotate your beam at the appropriate moment. At the end of the exercise you will have a snapshot of actual propagation.

Please note though that time is critical to the exercise. Get *AboutTime* at **www.arachnoid.com/abouttime/index.html** it's free and will synchronise to the second! Another one that I have mentioned before and still run, is *Dimension 4*. This can be downloaded free at **www.thinkman.com**

Download all the free propagation material at **www.qsl.net/dxlab,** part of a suite of programs for the DX operator that could be very useful for the serious DXer.

That's it for another month so all that's left for me to say is a very Happy Christmas to all my readers and thanks for sending information and Club Newsletters. Please keep it up!

The next column is a brand new year and I should have some news of interest in a method that may just produce a rejuvenation of a high-speed packet network. Watch this space!

Roger G3LDI

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GRAHAM G8EMX HAS NEWS ON AN ATV VIDEO, REPORTS ON THE DONINGTON RALLY AND LOOKS FORWARD TO ATV IN 2003!

After several months of compiling camcorder footage, then many hours in front of a hot video recorder (VCR), a VHS video showing the basics of Amateur Television (ATV) has been produced. A few copies were distributed to the keener enquirers at the Donington Show in September.

It has always been difficult for the ATV newcomer to get started. The famous 'white book' titled *An Introduction to ATV*, published by the British Amateur Television Club (BATC) is still a valuable reference, but all today's Radio Amateur usually asks is "what do I need, and where do I get it"? And when they do ask that, we give them something to read, or stand there talking at rallies. Not, perhaps, the best way to encourage actual Amateur TV.

Although the BATCs committee has discussed a video, there's nothing ready yet. So, setting the Donington rally as a deadline, I decided to put something together myself.

EDITING!

Now when you start using two VCRs for editing, it's time to actually read the instruction books to discover what all those various inputs – phono, SCART1, SCART2, S-Video do and how to select them! And don't forget the sound.

Surprisingly, I found the the voice commentary the most difficult. A script was essential, so too was never, (absolutely never) handling a 'live' microphone!

Gradually, over many evenings, a few minutes (sometimes, only seconds) more would be added to the 'master' tape. Voice-over commentary was rehearsed and recorded onto Minidisc (MD) before transfer to video tape; MD is much quicker to 'rewind', wipe or cue-up than cassette tape, gives digital quality and pre-recording allows audio dubbing only when the voice-over is without hesitation! On the VCRs, the various Line sockets were used to connect between machines, never try copying r.f. to r.f., the vision quality will suffer too much.

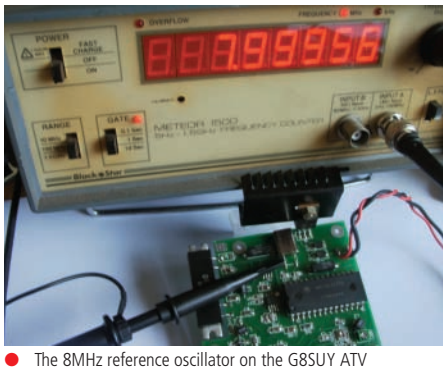
After a couple of set-backs, a few copies were ready. The video has been kept deliberately short, just under 15 minutes, so duplications were not too time-consuming. More copies will be available when the sound commentary has been improved for some sequencies. My thanks to members of the North London Television Group for providing some on-air footage.

DONINGTON RALLY

From an ATV viewpoint, the Donington rally was the busiest and most significant so far this year, with the BATC gaining several new and renewed members. The lecture stream on the Saturday opened with an illustrated talk on ATV by **Giles Read G1MFG**.

Giles covered 70cm (432MHz) and 24cm (1.3GHz) fixed and portable ATV, with an antenna strapped to a hilltop farm gatepost in one photo! Giles concluded his presentation with a miniature camera and transmitter inside a radio controlled car, treating the audience to pictures of feet and legs as the model raced across the floor between the chairs!

The Donington rally was the final opportunity for me to buy spare voltage regulators, phono, bnc, 'N' type sockets and a case for the G8SUY 24cm ATV transmitter so that I could power it up to report in this column! I also needed a pack of trimmer tools, to find one that fitted the variable components.



The 8MHz reference oscillator on the G8SUY ATV transmitter tests ok.

The G8SUY 24cm transmitter set-up procedure requires the board to be linked to give the repeater access frequency, then monitoring a voltage point while adjusting the oscillator trimmer. Even without the power amplifier connected, a frequency counter should find 1249MHz if the r.f. functions are working. Video deviation and audio sub-carrier can be approximately set using a local receiver, but final adjustment is best achieved by on air reports.

Unfortunately, the setting up didn't go as planned. The monitored voltage was too high (nearly the supply of 8V) and adjusting the trimmer had no effect. Now the most three most essential items of test equipment are a digital multimeter, a frequency counter and an oscilloscope with probe.

The meter confirmed that both regulated supplies were okay, and the oscilloscope displayed the crystal reference oscillator on the phase locked loop (p.l.l.) chip. But there was no output from the 1.3GHz divider into the p.l.l. Voltage checks indicated that the buffer amplifier feeding the p.a. may be faulty (8V drops to 1.7V across a 100Ω resistor?) So, it looks like a replacement i.c. is needed, (or I'll use **Andy Parnell's** 'get you going' service!).

OTHER NEWS

Issue 200 of the BATC's quarterly magazine *CQ-TV* was published in October. The club had been unable to find a 'Project 200' to mark this milestone issue, but editor **Ian Pawson** said: "The cover is gold laminated, and there are 52 pages of gold-standard contents too, including two in colour"!

The RSGB is using an Amateur Radio demonstration vehicle, which I think is a brilliant idea. With the callsign **GB4FUN,** the unit visits schools and events to encourage the young and not-so-young to explore radio communications. **Carlos Eavis G0AKI,** who looks after GB4FUN, has asked if the BATC could help put an ATV station into the travelling exhibition so the club is considering how best to do this.

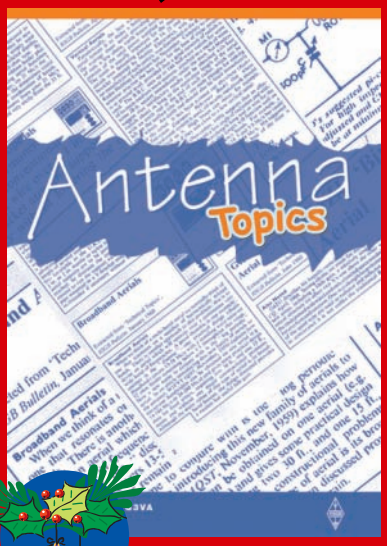
Looking ahead to next year, the 2003 ATV season begins with the Winter Cumulatives contest. These are four separate weekly activity periods, starting on Tuesday 7 January then Wednesday January 15 etc. 1900 to 2359UTC each session. Fast scan ATV, all bands.

It's a popular choice to be portable for contests, working ATV stations from the top of a hill. But the problem has always been supporting an antenna. This could have been resolved by a range of tripod-supported, free standing, lightweight masts, which are available from a supplier commonly seen at rallies. I purchased their top model, which could also be extended by a length of aluminium masting, but its own height should be quite adequate for normal use.

That's it from the ATV scene for 2002! Hope to see you at the new London Show venue, Ware or even, maybe, on air in January? Best wishes, a Merry Christmas and very Happy New Year to everyone,

Graham G8EMX

NEW LATEST PUBLICATIONS FROM THE RSGB



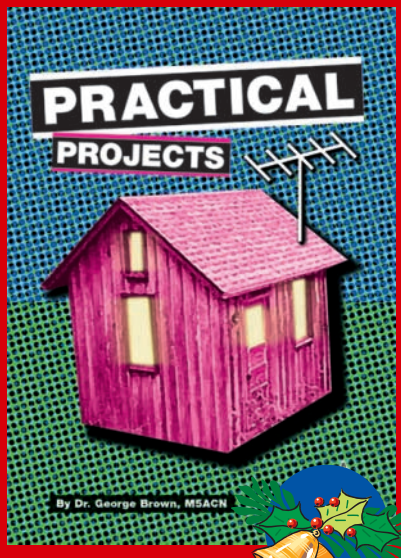
Antenna Topics by Pat Hawker, G3VA

If you are interested in antennas this book is a goldmine of information and ideas on the subject. Pat Hawker has been writing his "Technical Topics" column in Radcom since 1958 and has produced much excellent work in this time. This book is a chronological collection of cuttings of Pat's words over the years. Hundreds of areas and subjects are covered and many a good idea is included. Carefully indexed this book is not only a great reference work but also a history of over forty years of antenna design.

ONLY £18.99 +p&p

297x210mm

PRACTICAL PROJECTS

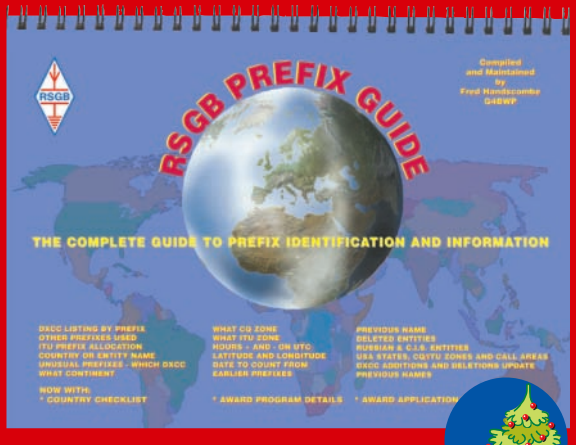


Packed with around fifty "weekend projects" Practical Projects is a book of simple construction projects for the radio amateur and those just interested in electronics. A wide variety of radio ideas are covered with everything from an 80m Transceiver, Antennas, ATUs and simple electronic keyers all included. Other simple electronic designs are such as dry battery testers, mobile microphones and various meters and monitors are also added. The book also contains a handy section on "now I've built it what shall I do with it?" questions answered. This book is excellent for those just looking for interesting ideas to construct and for the newcomers to the hobby looking to expand their knowledge.

240x174mm

ONLY £12.99 +p&p

RSGB Prefix Guide



ONLY £8.99 +p&p

Ever wondered what that "unusual" callsign was?

The fully updated "RSGB Prefix Guide" answers the question. The World's most comprehensive list of prefixes is newly revised and improved. Not just a listing of prefixes and their entities the guide provides a host of useful additional material. References include a prefix's continent, CQ Zone, ITU Zone, Latitude and Longitude and many other details.
The new edition still includes all the elements that have made the book so popular over the years such as the DXCC deleted entities, Russian & CIS entities etc. With this edition the book has had many new elements included for the first time. The popular DXCC checklist has been added along with details of various award programs IOTA, CQ WAZ, DXCC, WAS and others. This book is an excellent tool for the beginner and the experienced hand alike. Designed with a "lay flat" wire binding for ease of use the new "Prefix Guide" is a must for every shack.

210 by 297 mm

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TUNE-IN

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TOM WALTERS REPORTS ON THE INTERNATIONAL BROADCASTING CONVENTION AND ROUNDS-UP THE LATEST BROADCAST BAND SCHEDULES

Last month I promised to report on **DRM (Digital Radio Mondiale)** as seen at the **International Broadcasting Convention (IBC)**, so here's my findings.

There was considerable interest at the DRM stand. Digital short wave signals from all over the world were being transmitted into IBC by the DRM process.

In a nice little trick, visitors could see their pictures on a DRM receiver, the pictures were sent by Internet to Hilversum and then back on short wave from **Radio Netherland**'s site on Flevoland. This was on **2.5070MHz**, which has propagation conditions suitable for local transmission. But the world-wide transmissions were using all the frequency bands, including transatlantic paths.

By next year (2003) **Deutsche Welle**, whose engineering boss **Peter Senger** has taken a strong lead in developing the revolutionary system of transmitting digital signals via short, medium and long wave, expects to be transmitting in Europe on the DRM system. By 2004 we should see the first commercial receivers available, and a mass marketing of DRM is planned for 2005.

During the IBC conference a working DRM receiver was displayed - at last we could see the idea becoming reality! The receiver was, it's true, a little bit on the bulky side, but within bounds of portability, although it worked!

Digital Radio Mondiale won't bring out receivers themselves, but they are encouraging manufacturers to go ahead with construction as soon as possible. It should also be possible for manufacturers to integrate DRM modules into existing receivers.

Software to add onto radios is now being intensively tested too, and should be available by December. Good support is promised from DRM for those who want to try the system out for themselves in advance of commercial sets coming onto the market.

If you want to be first in line to experience DRM, you can register online to take part in the **Software Radio Project**, which will begin in December this year. Register at **www.drm.org**

It was pointed out at the IBC that at present some 7000 hours of short wave programming is broadcast into Europe each day. Most broadcasters are using multiple channels to achieve even a moderate result. With DRM, each broadcaster will need only one single channel. The bandwidth required for DRM is no more than that needed for conventional analogue signals.

If DRM can keep to their launch schedule, in two or three years we should be experiencing a transformation in the quality of international radio broadcasting.

WORLD-WIDE BROADCASTING NEWS

There's news this month of an interesting reverse-flow model for international radio broadcasting. Instead of the bigger country broadcasting to the smaller ones, New Zealand has set up the first national Pacific network. It's called **Niu FM**, taking broadcasting from Pacific communities and making them audible in major cities in New Zealand, 24 hours a day, seven days a week. The idea is to give the people in the remote areas of the Pacific a chance to make their voices heard.

Radio New Zealand International keeps going in spite of what seem like endless cuts or increases in expenditure. Their schedule from 03 October 2002 is: 0506-0795 on 15.340 Pacific, Europe; 0706-1105 on 11.675 Pacific, Asia, USA; 1206-1305 on 15.175 NW Pacific, SE Asia; 1306-1650 on 6.095 Pacific (for sport commentaries, and weather warnings); 1650-1750 on 11.980 NE Pacific, and some islands (Mon-Fri); 1751-2050 Pacific, Europe and at 0951-0505 on 17.675MHz Pacific, West Coast USA. Of course signals are mainly intended for the Pacific, but you may get some results elsewhere.

Radio Free Europe/Radio Liberty (REF/RL) has given up its transmissions in Czech after 52 years. The USA, says the official statement, needs the 650,000 dollars to extend broadcasting to other countries in connection with its fight against terrorism.

Meanwhile, a rumpus has been going on for several months over whether REF/RL can safely continue to keep its broadcasting centre in the Czech capital Prague. There have been rumours that the building might be attacked, and there have been suggestions that operations should be removed to another country. It would be a big shame, said **Czech President Havel**, who got the US broadcaster to come to Prague in 1995. Havel commented "We experienced with our skin what an importance had the message of freedom which had been sent by Free Europe, the Voice of America and the BBC at the time of the totalitarian regime".

Also from Eastern Europe comes the news that **Radio Yugoslavia** will restart shortwave broadcasts. For a long time now, it has only been possible to hear Radio Yugoslavia on the Internet at **www.radioyu.org** Official permission has now been given for programmes to be transmitted from the short wave site in Bijeljina in Bosnia-Herzogovina, although no date for the restart has been announced.

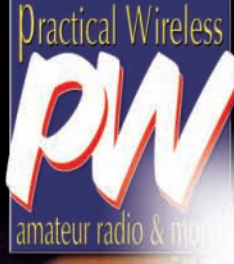
The **Voice of America** is up to something, although exactly what is not clear. There may be further regional services like **Radio Sawa**, (the VOA Arabic service for the Middle East); and there will definitely be joint ventures with RFE/RL and **Radio Free Asia**.

The **BBC World Service** is extending its f.m. and a.m. rebroadcasts arrangements in Mexico, with five stations taking the Spanish service. Rebroadcasting on other people's local air is becoming standard practice among the bigger broadcasters.

Netherlands-based religious **Radio Voice of Hope** is extending its transmissions to southern Sudan. Shortwave transmissions are now at: 0430-0500 on 12.060 and 15.320MHz (Sat-Tue), emanating from Madagascar, in Arabic and English, with additional f.m. coverage from Koboko in Uganda to reach across the Sudanese border.

Finally, struggling satellite USA operator **XM Satellite Radio**, until now transmitting to radios installed in road vehicles, has brought out a small portable receiver. Will it help to boost the flagging fortunes of the company, or will short medium long wave still be more effective in the immediate future? More news as I get it!

Bye for now, Tom



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topical talk

Deliberate Jamming

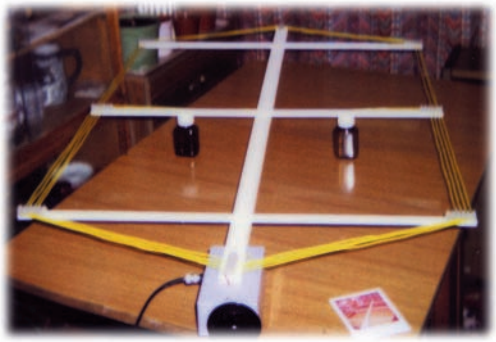

Fig. 1: A simple tuned loop antenna for 7MHz would be suitable for 'DFing' a nuisance transmitter. This loop (shown only for illustration purposes) by Richard Marris G2BZQ is designed for 3.5MHz and was published in the August 2001 *PW*.

This month's column concentrates on the deliberate jamming/interference to Amateur Radio QSOs. And it seems, from G3XFD's experience, that this problem was a major topic during some recent *PW* Club Visits.

Our Editor visited the **Lincoln Short Wave Club**, **Moorlands & District Amateur Radio Society**, (near Stoke on Trent), and then finally the **Rochdale QRP Convention** on 9, 10 and 12th October. The discussions and general 'chat' after the *PW* talks made him realise that the 'jamming' station on 14.1MHz - is not the only problem on the bands! The problems caused by the 'Scratchers & Whistlers' on 7MHz...in particular were causing concern. If you have Digital Signal Processing (DSP)..a flick of the appropriate **Carrier Notch/Multiple Carrier Notch** switch removes the problem. But not everyone has a DSP equipped rig.

Our Editor's experience on 7MHz band demonstrates that often the nuisance transmissions try to disrupt group or net QSOs and even Special Event callsigns...and this is where having a group on air can help track down the offender/offenders. The information can then be passed on to the Amateur Radio Observation Service (AROS) and the Radiocommunications Agency. **But never, never...take direct action yourself** and never acknowledge you're suffering from deliberate interference on the air. **Don't inadvertently give them a signal report!**

Direction Finding

Using a loop antenna, **Fig. 1**, you can obtain the bearings of nuisance transmitters. It's very simple...having arranged for friends to be prepared to take a bearing (at least two are required, three or more are better) you can break transmission during your 'over'. The Scratcher - **not being able to listen while transmitting** - carries on transmitting - allowing the pre-arranged DF bearings to be taken by your partners.

The bearings (best done by listening for a null rather than peak signal) are then recorded. After the QSO, confirmation and cross-checking of bearings from other operators can be done by telephone between co-operating stations. A similar method - known as 'Huff-Duff' was extremely successful during the Second World War, against U-Boats...despite their extremely short transmitting periods. Any 'fix' and other details obtained can then be passed on to the RA and AROS for their action.

Short Bursts

Everyone agreed that once the nuisance transmitters realise there's a chance of giving their position away - they'll probably resort to very short transmissions. That in turn will reduce the nuisance effect dramatically!

When asked by one reader what he'd hope to be the outcome...G3XFD replied "I'd like to find out - from comments that came out during any court case following prosecution by the RA...why the defendant caused the nuisance in the first place". He finished by saying..."If we know what's behind the strange behaviour...there may be a chance to stop it happening again"! *PW*

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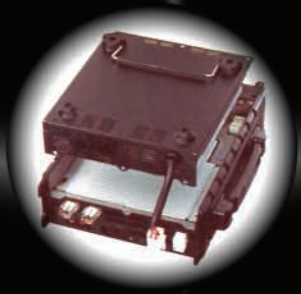

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