

Practical Wireless

**PW**

amateur radio & more!

# Build

G4VfV's Field Strength Meter

# Funky & Fun

Icom IC-718 Reviewed

# Celebrating

Marconi's Milestone



# Mobile Magic!

## Yaesu FT-7100M

FEBRUARY 2002 £2.75



**WATERS & STANTON**

**e-mail: sales@wsplc.com**  
**on-line catalogue: www.wsplc.com**  
**freephone orders: 08000 73 73 88**

MasterCard

VISA

**HAVE YOU GOT THE POWER?**

**CUSTOMER SERVICE**  
**THE ONLY THING WE WON'T DISCOUNT**

**B-12-18**  
**GEL CELL BATTERY.**

The B-12-18, is a sealed 12V 18Ah lead acid battery that is ideal for portable or noise free mobile operation. Able to run an HF transceiver at up to 100 Watts or QRP for many hours. Size 18w x 16.5h x 7.5d mm, weight 6kg. These are brand new and offered at a fraction of their normal price, just £19.95. (Carr £6.00) Manufactured in USA.

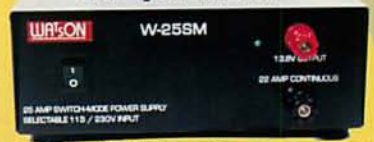


**NOTE:**  
 The illustration shows the 100W "suitcase" station built by Peter Waters, G3QJV, using our gel cell, an IC-706 and a power tool case available from Homebase.

**£19.95** Carr £6.00

**W-25SM**  
**25 AMP SWITCH-MODE POWER SUPPLY.**

**THE QUIET ONE**



Specially designed by Watson to offer extra large terminals and increased terminal spacing to make it easier to attach the thicker HF radio DC cables. 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) excluding terminals. Provided with detachable 13 Amp plug and cable.

**£69.95** Carr £6.00

**YAESU**

**FT-1000MP Mk-V 200W HF All Mode £2899**  
**3 YEARS FREE WARRANTY** Plus £8.00 Carr.

**SPECIAL OFFER**



**SPECIAL OFFER ONLY FROM W&S.**

When you buy the amazing FT-1000 MK V from us, we will offer you FREE the equally amazing Heil Gold Line microphone with dual inserts and matching lead (base stand optional extra).

**FREE HEIL GOLD LINE MICROPHONE**

**FT-847 160m - 70cm All Mode £1199**  
**3 YEARS FREE WARRANTY** Plus £8.00 Carr.

1.8 to 440MHz, this all-in-one station offers unbeatable value. 100W on HF plus 6m, and 50W on 2m and 70cms. You get genuine RF clipping on SSB for up to 6dB gain and there are 4 separate antenna sockets

**Accessories for FT-847**

FC-20 ATU	£219 B	MD-100ABX Mic	£110 B
SP-8 Speaker	£139 B	YF-115C Collins	£99 B
FVS-1A Vce synth	£38 B	YF-115S Collins	£99 B

**FT-100 D 160 - 70cm All Mode £1049**  
**SAVE** Plus £8.00 Carr.

Yaesu's latest version is now available and includes 500Hz CW filter; high stab. oscillator; and CTCSS decoder.

**FT-920AF HF 160m-6m-100w £1099**  
 Plus £8.00 Carr.

100 Watts from 1.8 to 54MHz with dual VFO controls. Features DSP, Shuttle-jog, Internal ATU, 100 memories and built-in message keyer. Supplied with FREE FM unit.

**FT-817 160m - 70cms 5W Portable £799**  
 Plus £8.00 Carr.



FT-817 is an incredible design feat by Yaesu, and world reviews agree that there has never been anything like it. It's not expensive either. So why not get out in the fresh air; or put one in the car; and put the fun back into your radio. Check out the exciting AT & ATX portable antennas elsewhere in our add.

**NEW MINI SM PSU PS-817**  
**£19.95**  
 Plus £2.00 Carr.

**KENWOOD**

**TS-2000 160m - 70cms+23cms option £1695**  
**3 YEARS FREE WARRANTY** Plus £8.00 Carr.

**+FREE HEIL MIC**



The amazing TS-2000 offers coverage from HF to UHF. And you can go right up to 23cms with the optional module Monitor the DX cluster whilst working other DX, optimise your satellite contacts, enjoy the benefit of built-in ATU. It's all there in one very compact box. Colour brochures available on request.

**TS-570D6 160 - 10m All Mode £849**  
**3 YEARS FREE WARRANTY** Plus £8.00 Carr.

Possibly the best value in budget class HF radios. 100 Watts out on all HF bands with DSP and variable CW filtering. Lovely large dial and built-in memory keyer. We even give you a built-in ATU. Great value!

**TS-570 Accessories**

V5-3 Voice synth	£45 A	MC-80 Desk mic	£72 B
DRU-3A Recording	£99 B	PS-33 Power supply	£199 C
H5-5 H'phones	£52 B	SP-23 Speaker	£68 B
MC-90 Desk mic	£187 B	CW filters each	£61 B
		SSB 1.8kHz	£61.95B

**TS-870 HF TRANSCEIVER £1599**  
 Plus £8.00 Carr.



The TS-870S is an all-mode HF transceiver with 160 to 10m amateur band operation including 100kHz to 30MHz general coverage receiver. It provides IF-stage digital signal processing on transmit and receive. This raises the performance to a level that is impossible for analogue circuitry to achieve. Also features 100W output, automatic ATU, interactive menu system, built-in electronic keyer and 100 memories.

**SGC SG-2020 £599**  
 Plus £2.00 Carr.



**0 - 20 Watts Output**  
**SSB CW AM Data**  
**RF & VOGAD Processing**  
**Variable Selectivity (100Hz)**

Ideal for QRP, but with VOGAD and RF speech processing it can sound like 100 Watts! Very low current (4A max) makes it ideal for portable work. Variable selectivity down to 100Hz means no extra filters to purchase.

- \*NEW SG-2020 ADSP now available £799 carriage £8.00
- \*SG-237 mini auto coupler ideal for SG-2020 £369

**ICOM**

**IC-756 PRO II NEW £PHONE**  
 Plus £8.00 Carr.



The new IC-756 PRO II will be arriving shortly. This is an updated version of the IC-756 transceiver, and although it offers the same band coverage and output power, extensive use of DSP circuitry has dramatically improved the bandwidth options. We have not got the full spec yet, so phone for latest info and price which will be around £2500

**IC-746 160m - 2m All-mode £1195**  
**3 YEARS FREE WARRANTY** Plus £8.00 Carr.

**IC-756PRO 1.8 - 52MHz 100W £1895**  
**3 YEARS FREE WARRANTY** Plus £8.00 Carr.

**LAST FEW AT £500 OFF LIST**

<b>IC-756PRO Accessories</b>	SP-20 Speaker	£164 B
CT-17 RS-232	SP-21 Speaker	£74 B
SM-8 Base mic	UT-102 Voice synth	£32 A
SM-20 Base mic	PS-85 Power supply	£266 B

**IC-706iIG 160m - 70cm All Mode £999**  
**3 YEARS FREE WARRANTY** Plus £8.00 Carr.



The IC-706iIG is the latest enhanced version of this popular HF/VHF/UHF mobile rig. It has more features but in the same physical size.

**£50 HEIL VOUCHER**

<b>IC-706iIG ACCESSORIES</b>	FL-223 SSB 1.8kHz	£59 B
AT-180 Auto ATU	DC Lead (spare)	£16 A
FL-100 500Hz CW	3.5m sep cable	£33 A
FL-232 350Hz CW	5m sep cable	£48 A
FL-103 SSB 2.8kHz	Others: please phone	

**IC-718 100W HF £549**  
**SAVE £150** Plus £8.00 Carr.



If you are looking for a radio with pedigree, but without a high price tag, then this may be the one for you. Covers all HF bands plus wideband receive. Plus auto notch, dual vfo, swr meter etc. Plus options including DSP & filters.

**LIMITED SPECIAL OFFER!**

# HEAD OFFICE

22 MAIN RD, HOCKLEY, ESSEX, SS5 4QS ENQUIRIES: 01702 206835/204965 FAX: 01702 205843

# MIDLANDS + NORTH SHOP

BENTLEY BRIDGE, CHESTERFIELD RD, MATLOCK, DERBYSHIRE, DE43 5LE ENQUIRIES: 01629 582380 FAX: 01629 580020

# SCOTLAND + BORDERS SHOP

20, WOODSIDE WAY, GLENROTHES, FIFE KY7 5DF ENQUIRIES: 01592 756962 FAX: 01592 610451-CLOSED MONDAYS

CARRIAGE CHARGE CODES: A=£2, B=£6, C=£8, D: £12

## SECOND HAND LIST

SEE TRADERS TABLE

### RT-11 REMOTE AUTOTUNER

NEW FROM LDG



**£239**  
Plus £8.00 Carr.

ASK FOR DETAILS  
ALSO AVAILABLE IN KIT FORM.

### 6ZV-4000 40A 5-15V Switch Mode



**£159**  
Plus £8.00 Carr.

- \* 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

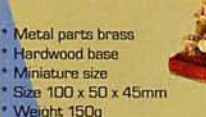
### W-8MV Deluxe Morse Key



- \* Metal parts brass
- \* Hardwood base
- \* Two ball races
- \* Size 140 x 80 x 50mm
- \* Weight 400g

**£39**  
Plus £8.00 Carr.

### W-8MP Morse Key



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

**£29**  
Plus £2.00 Carr.

### Kent Twin-Paddle



- \* Metal parts brass
- \* Heavy metal base
- \* Two ball races
- \* Size 100 x 100 x 40mm
- \* Weight 1.1kg

**£69**  
Plus £8.00 Carr.

### Kent Morse Practice Oscillator

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



**£18.50**  
Plus £2.00 Carr.

## ICOM

### IC-2100H 2M FM Mobile

**£229**  
Plus £8.00 Carr.



Rugged design with switched receive filters 12.5/25kHz

## YAESU

### FT-7100 2m/70cm Mobile

**£Phone**  
Plus £8.00 Carr.

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).

### FT-41R 70cm

**CLEARANCE PRICE**

**£99**  
Plus £8.00 Carr.

### LAST FEW

- \* 430 - 440MHz FM
- \* Two independent VFOs
- \* 151 channels or 75 Alphanumeric
- \* 7 channel steps
- \* 4 power levels
- \* 1.5W 4 x AA cells (FNA-14)
- \* 3.5W @ 9.6V DC (FNB-38)
- \* Alphanumeric
- \* DTMF
- \* CTCSS (optional)

### FT-1500M 2M FM Mobile

**£159**  
Plus £8.00 Carr.



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

## KENWOOD

### TM-D700E 2m + 70cm FM

**£449**  
Plus £8.00 Carr.



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-6707E 2m + 70cm FM

**£289**  
Plus £8.00 Carr.



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**  
Plus £8.00 Carr.



A lovely color blue display, easy to use 50/35W output 50W/35W gain 280 memos and five storage operating profiles.

## KENWOOD

### TH-D7E 2m + 70cm

**£299**  
Plus £8.00 Carr.

### 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

**£269**  
Plus £8.00 Carr.

### NEW With extra wide Rx coverage

Up to 6V out with Li-Ion battery and "scanner" style coverage from 100kHz to 470MHz including SSB on receive! This is a great radio to have at all times when you are on your travels.

### THG-71E

**£199**  
Plus £8.00 Carr.



- \* 144 - 148MHz 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)

## HORA

### HORA G-408 70cm

**£49**  
Plus £8.00 Carr.

### HOCKLEY ONLY

230mW

CTCSS

Digital Display

Very much underrated handy. Covers the full 70cm band. Wideband receive possible. Very compact fits into top pocket. Ideal for use at rallies. Only uses 2x AA batteries (not included).

### SPECIAL OFFER

## ADI

### ADI AT-600 2m/70cms

**£179**  
Plus £8.00 Carr.

### HOCKLEY WAREHOUSE EXCLUSIVE

- \* Dual Band 2m/70cms
- \* Up to 5 Watts out
- \* Airband Receive
- \* Nicad Pack \* CTCSS
- \* Hod Charger

You won't find better value than this. Limited stocks



### ADI AT-201

**£99**  
Plus £8.00 Carr.



- \* 2m Handy
  - \* 2.5W, 5W (13.5V)
  - \* 1750Hz & CTCSS
  - \* Wideband receive
  - \* Drycell case
  - \* Batteries not included
  - \* Full keypad
- Higher power than most palm sized models. Fully illuminated keypad for ease of frequency entry. Channel or frequency readout.

### ADI AT-147 2m 50W

**£199**  
Plus £8.00 Carr.

### Airband Receive



2m FM mobile transceiver. Three power levels 50/10.5W. Displays frequency or channel numbers, and offers Airband AM receive

### YAESU VX5R BLACK OR SILVER

**£PHONE**  
Plus £8.00 Carr.



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.

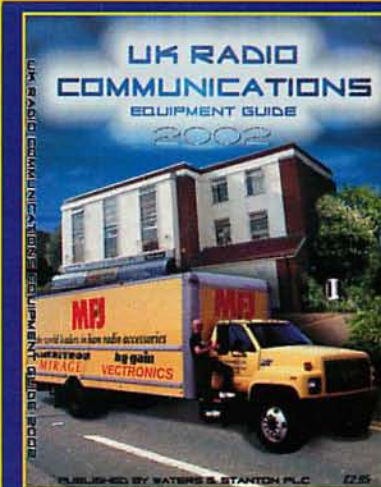
### YAESU VX1B 2m/70cm Handheld

**£145**  
Plus £8.00 Carr.



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

## NEW AND EVEN BIGGER



New 2002 Catalogue  
336 pages  
£2.95  
carr. £1.25



The foremost guide to amateur radio products from the latest transceivers to the smallest of accessories. Full colour pages with comprehensive specifications, there is nothing else like it in the world! There is also some editorial and reviews. Three times the size of many magazines, yet it costs no more.

INCLUDES MONEY SAVING VOUCHERS



Order details on inside Front Cover

CARRIAGE CHARGE CODES: A=£2, B=£6, C=£8, D: £12

## Get in Front with HUSTLER

5BTV 4BTV



### BASE STATION ANTENNAS

Spec	5BTV	4BTV
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 G3QJV.  
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	£22.95 B
RM-20	20m	80-100kHz	£22.95 B
RM-30	30m	50-60kHz	£25.95 B
RM-40	40m	40-50kHz	£25.95 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	£25.95 C
RM-20-S	20m	100-150kHz	£29.95 C
RM-40-S	40m	50-80kHz	£35.95 C
RM-80-S	80m	50-60kHz	£49.95 C

Lower mast sections			
MO-1	54" (FOLD @ 22")		£31.95 C
MO-2	54" (FOLD @ 27")		£31.95 C
MO-3	54" (NON FOLD)		£25.95 C
MO-4	27" (NON FOLD)		£21.95 C

## GARMIN

### STREET PILOT III

£875  
Plus £5.00 Carr.

#### IT TALKS TO YOU

"TURN LEFT  
W 1 MILES"



It talks to you and is supplied with street level mapping, 32Mb storage card and card reader for quick PC programming. Examples of voice info are: "turn left 2 miles," "take 2nd left at next roundabout", "house number 17 is on your left," "turn right in 300ft." These are in stock now. Price around £875

## NEW NEW NEW



### 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	£299.95 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	£269.95 C
A4-S	10-20m 4 el. 8.9dbi 2kW 5.49m radius	£529.95 D
A-744	Gives 40m or 30m operation from A-4S	£149.95 C
A3-S	10-20m 3 el. 8dbi 2kW 4.72m radius	£459.95 D
A-743	Gives 40m or 30m operation from A3-S	£149.95 C
A3-WS	12 & 17m 3 el. 8dbi 2kW 4.4m radius	£349.95 D
A-103	Gives 30m operation from A3-WS	£149.95 C
D-3	10-20m dipole element 1.78m 2kW	£219.95 C
D-3W	12, 17, 30m 17m dipole element 1.037m 2kW	£219.95 C
D-4	10-40m dipole element 1.092m 2kW	£299.95 C
D-40	40m dipole element 12.88m 2kW	£259.95 C
XM-240	40m 2 el. 6dbi 7.3m radius 2kW	£699.95 C
Ten-3	10m 3 el 8dbi 3m radius 2kW	£189.95 C
ASL-2010	13.5-32MHz 8 el. log periodic 4.4dbd 5.86m radius £749.95 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! £299.95 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 £469.95 C

R8-GK Optional guy kit for R8 £49.95 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!! £329.95 C

NEW M32V VERTICAL 20-10m £229.95 C

### WEP-300B Earpieces

£2.95  
Plus £2.00 Carr.



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  
Plus £5.00 Carr.

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



### YS-130

£79.95  
Plus £8.00 Carr.



Ideal for medium sized VHF antenna systems, the YS-150 is a good quality Japanese manufactured product. It is supplied with control box with rotary direction setting, plus upper and lower in-line mast clamps.

### Frequency Counters



Each counter is supplied with internal Ni Cad pack, AC charger and whip antenna

Hunter	10MHz - 3GHz	£59.95 B
FC-130	1MHz - 3GHz	£79.95 B
S. Hunter	10Hz - 3GHz	£149.95 B
S. Searcher	10MHz - 3GHz	£99.95 B

### 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-WHS	2m 5 el. 8.5dbd 0.93m	£26.95 B
144-WH8	2m 8 el. 8.5dbd 1.79m	£37.95 B
144-WH10	2m 10 el. 8.7dbd 2.3m	£41.95 B
435-WH6	70cms 8 el. 8.5dbd 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

### QS-112 Speaker Mic

£16.95  
Plus £2.00 Carr.



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

### SPM-102 Speaker Mic

£9.95  
Plus £2.00 Carr.

**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  
Plus £6.00 Carr.

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 please phone for quote.



### WCT-321 Lapel Talker

£19.95  
Plus £2.00 Carr.

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.

AV200 1B - 200MHz 5/20/200/400W £49.95 B  
AV400 140 - 525MHz 5/20/200/400W £49.95 B  
AV800 18 525MHz 5/20/200/400W £59.95 B  
All fitted with SO-239, FEP/RMS readings, 3W for FSD approx. AV-600 has dual sensors.

### PBX-100 Portable HF

£99.95  
Plus £8.00 Carr.



**80m - 10m 200W**  
The PBX 100 offers 80m - 10m operation (max 4-bands at any time) with a height of just 3.6m. Supplied with ground spike, it takes seconds to erect, yet collapses down to little more than 1m. Like all ground mounted verticals, it benefits from radials, and the radial wire is provided. Use it in the garden, in the countryside or abroad. SO-239 connection.

### 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		
W-2000	0/6/9db 2.5m long	£69.95 C

### Great Value Mobile Whips

W-285	2m 5/8th whip with PL259 base	£14.95 B
W-7900	2m/70cm 5 S 7.5dB length 1.58m	£32.95 B
W-627	6m / 2m / 70cm 2 / 4.5 7.2dB length 1.6m	£34.95 B
W-770HB	2m/70cm whip 3dB / 5.5dB length 1.1m	£24.95 B

ALL WITH TILTOVER BASES

# WATSON

# WATERS & STANTON

## W-25SM 25 Amp Switch-Mode Power Supply

VERY LOW NOISE



"COMPACT & LIGHTWEIGHT"

- \* Output Voltage 13.8V DC
- \* Output Current 22A / 25A peak
- \* Over current protected
- \* Over Voltage Protected
- \* Selectable 115v/230v AC
- \* Size 220 x 180 x 73mm
- \* Weight 1.8kg
- \* 6 Amp terminals on rear panel

**£69.95** PLUS £6 carr.

# little & LARGE

## W-25AM 25A Dual Meter Power Supply

- \* Output Voltage 0 - 15V DC
- \* Output Current 25A (30A Peak)
- \* Over current protected
- \* Dual Meters
- \* 3 Separate DC Outputs
- \* 30A Terminals
- \* 10A Cigar Socket
- \* 6A Lever Terminals
- \* Front Panel Fuse
- \* Supply 230V AC 50Hz
- \* Size 240 x 150 x 230mm
- \* Weight 8.2kg



"ZERO NOISE ANALOGUE DESIGN"

**£89.95** PLUS £8 carr.

WATERS & STANTON PLC, 22 MAIN RD, HOCKLEY, ESSEX, SS5 4QS

TEL:01702 206835 E-MAIL: sales@wsplc.com

ALSO AVAILABLE AT MATLOCK & GLENROTHES STORES

# PW

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## Cover Subject

Our Art Editor **Steve Hunt** performed his own piece of 'magic' to produce this stunning front cover. The FT-7100M is the latest mobile transceiver to come from the Yaesu 'stable' and as **Richard GORSN** discovered during the time he had the unit on review, it proved to be a versatile, down to earth, adaptable rig, suitable for use in both mobile and base station set-ups.

Main Photograph courtesy of: **Yaesu UK Ltd supplied by Norman Dilley, Dartweb internet & graphic solutions**  
Design by: **Steve Hunt**

## February features

### 18 Tex's Tips

Novel ideas and handy hints from *PW* readers are presented by **Tex Swann G1TEX** in his bi-monthly series, designed to inspire you to 'have a go'.

### 22 Radio Basics

**Rob Mannion G3XFD** adds the final the stages to his capacitance/resistance bridge project and shows you how to complete the calibration.

### 24 Review - The Yaesu FT-7100M Mobile Dual-Band Transceiver

**Richard Newton GORSN** discovers the FT-7100M is a 'down to earth' transceiver which would serve the operator well as a either a mobile or a base station rig. Read his review to find out how well this magical mobile performed....

### 28 Celebrating Marconi's Milestone

The 12 December 2001 was an historic day in wireless history, marking 100 years to day that Marconi sent the first Morse signal - the letter 's' - across the Atlantic. **Rob G3XFD** was invited along to the site in Poldhu, Cornwall to mark the occasion, and you can join the celebrations by reading his report

### 30 The Capacitor Vet

**Ron Harris GW8DUP** shows you how to build a capacitor 'vet' to help you check out all those electrolytic capacitors that lurk in your junk box!

### 34 East Meets West in the North

International friendship is often talked about in connection with Amateur Radio and as **Henryk Kotowski SMOJHF's** story on his local Amateur Radio Club in Kvarnberget, Sweden demonstrates... it really does exist.

### 38 Review - The Icom IC-718 HF Transceiver

Funky & Fun is how **Helen Watt 2E0AVH** sums up Icom's IC-718. As an enthusiastic Novice licensee and a busy 14 year-old Helen was only too keen to power-up the rig and get on air!

### 41 Complete your Collection

If your collection of *PW* from 2000 is incomplete why not take advantage of our great offer and buy the whole set with a binder for just £18? Alternatively it would make a great gift for a fellow Amateur just entering the hobby.

### 42 Finding Field Strength

**Gordon King G4VJV** says we should all have this little instrument in our shacks - the field strength meter. So, without further ado Gordon shows you how to build a very simple version that will do the job nicely.

### 43 Errors & Updates

Following on from **Phil Cadman G4JCP's** International Beacon Electronic Timer Project published in Dec 2001 & Jan 2002 issues here's an up-dated circuit untouched by 'gremlins'!

### 44 Antenna Workshop

**Jürgen Hemme HB9ANR** shares his idea for a helical antenna design which he was inspired to build after seeing a fellow Radio Amateur drilling holes in the roof of his car!

### 48 Carrying On The Practical Way

Projects built without the need for printed circuit boards! - How can that be? **George Dobbs G3RJV** shows you how it can be done, with simple projects for you to build.

# February regulars

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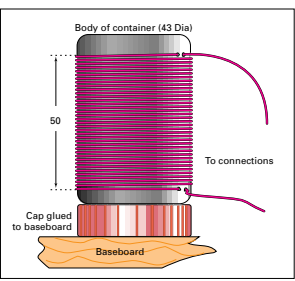
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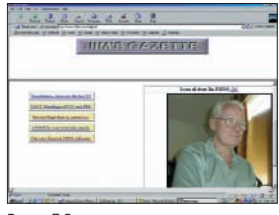
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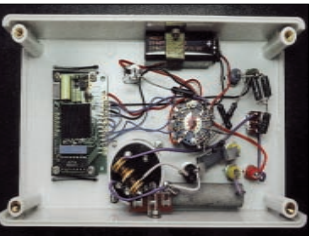
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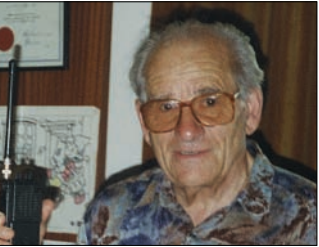
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# Guest **keylines**

This month John Corless EI7IQ, Vice President of the Irish Radio Transmitter's Society accepts the invitation to write in Keylines.

I'm delighted to pen the first Guest Keylines of the year. **Rob G3XFD/EI5IW** has invited me to use 'my turn' on his page to outline the licensing position in Ireland and to comment on the new structure in the UK.

Ireland is one of a few countries, which grants Radio **Experimenters Licences**, as opposed to Amateur Radio Licences. Licensing is administered by The Office of The Director of Telecommunications Regulation, the ODTR for short. The ODTR essentially manages all spectrum in Ireland, including broadcast, PMR, Cellular and other telecomms.

There are two Experimenter's Licences, Class A and Class B. Class A covers the h.f. and v.h.f. and u.h.f. Amateur bands, Class B covers Amateur frequencies above 30MHz only.

Applicants for either Class must successfully sit an examination in elementary theory of radio

communication including elementary magnetism and electricity, and in the knowledge of the operation of simple measuring instruments likely to be employed by a licensed experimenter. Applicants for Class A Licences must pass a 12w.p.m. Morse Code Test. The theory test is of the essay variety, with nine questions on the paper and a three hour time limit.

## Frequency Allocation

Frequency allocation in Ireland is very similar to that in the UK **with the exception of the Four Metre Band**, which extends from 70.125 to 70.450MHz and power is restricted to 50W. **Mobile operation on 70MHz is not permitted.** Licences for 50MHz are granted on special application only and for a period of three years, after which time, re-application must be made. The power limit on 50MHz is 14dBW e.r.p. carrier, and 20dBW e.r.p., PEP.

The 70MHz band is very popular in Ireland for PMR operation, hence the Amateur restrictions. The special application for 50MHz is necessary due to concerns expressed by cable TV system operators, and ODTR concerns, that interference may be caused to Band I TV Broadcasting. **Band I is not currently in use** for TV broadcasting in Ireland, but it appears that the national broadcaster (RTE) has some remaining claim on this allocation.

## Not That Simple

Of course it's not as simple as all that! Once an experimenter is granted a Class A licence, **they can only operate on 7, 14, 21, and 28MHz** for Practical Wireless, February 2002

## a period of one year and operation must be on c.w. only!

After the one year period, licensees may apply for the additional h.f. bands and modes. Restricted Class A licensees, may submit their log showing 250 confirmed c.w. contacts, to gain full h.f. privileges sooner than the year waiting period, if this has been achieved.

Ireland of course has signed up to CEPT. However the continued existence of the 12w.p.m. code requirement, means that visitors with Class A licences, **gained at lower code speeds**, can

only operate Class B. This point is the subject of much correspondence between the IRTS, (the National Society,) and the regulators, and one which is of some considerable embarrassment to Irish Amateurs.

Indeed the National Society has lobbied (admittedly unsuccessfully to

date) for the introduction of a multiple choice test, greater access to examinations, more power and the reduction to 5w.p.m. of the Code test.

## Pleased & Disappointed

I believe the new licensing structure in the UK to be a good move. But I am disappointed that the authorities have chosen yet again to put a label on the new licensees, with the M3 call, as they did with the M5 series previously. I am also curious as to how they (the authorities) intend to police 10W power restriction!

Finally, on a separate point I wish to congratulate everyone involved with *PW* down through the years, on reaching the 70 mark, what a marvellous achievement. I hope that you continue to lead the way for another 70. So, happy Birthday *PW* during 2002 and I'll look forward to seeing you all at the Leicester Show in September!

**John Corless EI7IQ**

**Practical Wireless readers please note:** Fancy an early holiday to Ireland this year? The IRTS Annual General meeting and Rally takes place in Knock, County Mayo on Saturday 2 & Sunday 3rd March (Knock has an International Airport!). If you'd like to attend (we'd like to see you in Mayo) either contact me on **00-353-94-81856** (or Irish mobile **00 353 87 98 43 900**) for details or contact Rob G3XFD at the *PW* offices for details because he'll be there too!



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

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## 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.

The Star Letter will receive a voucher worth £10 to spend on items from our Book or other services offered by *Practical Wireless*.

All other letters will receive a £5 voucher.

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



## The Real Radio Ham

Dear Sir

I write with regard to an interesting question posed in Topical Talk (*PW* Sept 2001), asking if there was any connection between **Tony Hancock** and his classic episode 'The Radio Ham' and a **Mr Faulkner VS2DB**, a genuine Radio

Amateur who operated in Kuala Lumpur. The article pointed out that in The Radio Ham Tony Hancock (GLK London) spoke to an operator in Kuala Lumpur (B45 Malaya). The article goes on to ask whether the writers of *Hancock's Half Hour* and *Hancock*, **Ray Galton** and **Alan Simpson** knew about Mr Faulkner and therefore based the Kuala Lumpur character on him.

With great interest I showed the article to my son who happens to co-run the official *Steptoe and Son* Appreciation Society (*Steptoe and Son* is another classic comedy written by Ray Galton and Alan Simpson) and as he naturally has a close association with both gentlemen and their agent **Tessa Le Bars**, he put the question to them. Roy Galton and Alan Simpson can happily inform *Practical Wireless* readers, that when writing the script for the Radio Ham they were both unaware of the existence of Mr Faulkner in Kuala Lumpur and therefore their character, B45 Malaya, is purely coincidental.

Stone me! It's a good as asking the 'lad' himself!

**Mr J. Hill G4LND**  
Preston  
Lancs

**Editor's comment: Thanks Mr Hill - but in a way I'm disappointed as VS2DB seemed to fit the character perfectly!**

televisions and reel-to-reel tape players by various manufacturers. I think that their designs put modern receivers to shame. As an adult, I decided to take the subject up as a hobby and I now have my own website

**mikesradio.freesevers.com** which is gaining popularity. It has been adopted by an American educational establishment. I receive various E-mails asking for spares and service information.

Incidentally, readers from the East Anglian area, who possess vintage valve radio equipment, may be interested in a useful repair contact, **Nigel Horne** (my brother) at **Horne's Electronic Services** Tel: **(01728) 603843**. Nigel also helped inaugurate my website! Best wishes.

**Mike Horne**  
Leeds  
Yorkshire

**Editor's comment: Many readers will agree with you Mike. However, although we don't normally encourage advertising on the reader's letters pages - I've included the information about your brother's services because we receive many letters**

## Can You Help?

Dear Sir

I own a stereo outfit which is manufactured by a firm known as Tensai International. My reason for writing to you is that I wish to replace a hinge on the turntable, however, I can find no trace of the manufacturing company. Could you please tell me if this firm is still in existence or has it been absorbed by another firm? Trusting that you will be able to help me in this matter.

**L. Goodridge**  
**Chy-Carne**  
**146 Birmingham New Road**  
**Wolverhampton**  
**WV4 6NY**

**Editor's comment: Can readers help please?**

## Scrapheap Challenge

Dear Sir

I recently came across a copy of *PW* from January 1998 in which you described in Radio Basics how to build a crystal set using a single diode rectifier and a simple receiver. My neighbour's son is nine years old and showed interest when I asked him if he would like to 'make a radio' in the school holidays.

He and his Dad were a bit dubious though when I said it would be made entirely out of junk. Of course it was a crystal set radio that I had in mind and we made it a rule to only use scrap or recycled material that was unrelated to its original purpose.

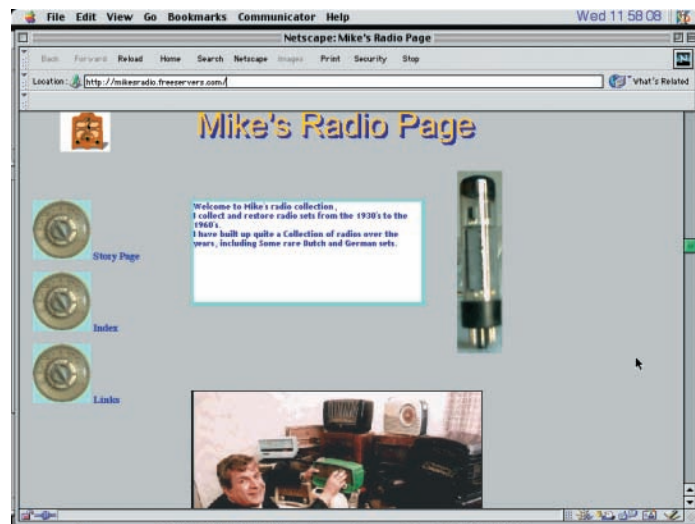
The young lad enjoyed winding the coils using toilet roll tubes (what else?) and wire salvaged from an old transformer. We put taps in both coils - coil two goes in series with the antenna. The detector is tapped at approximately 35% up from the ground - not at the top - giving excellent selectivity with no loss of volume. The antenna taps in near ground e.g. at 15% of 20% up.

## Vintage Radio

Dear Sir

I have noticed in your magazine, various articles on radio nostalgia (i.e., vintage radio) so I'm writing to you to add my enthusiasm to this wonderful subject.

I was brought-up on valve radio and television in the 1950s and early 1960s, as my (now late) father, Denis Horne, was an engineer at that time. He first worked for Ferranti in Moston, Manchester, but moved to Philips after Ferranti sold their radio TV side out to Ekco. He worked for a Philips agent in Headingley, Leeds, towards the demise of the valve era. People living in east Leeds, also used to



bring various sets to our house, so my father could repair them.

As a young lad, I found the whole subject fascinating, seeing such diverse radios,

**from readers trying desperately to trace specialised repair services to keep old favourite valved equipment in working order.**



We needed two variable capacitors - one across the main tuning coil and the other in series with the antenna coil. We used 500ml beer cans with the tops carefully cut off using tinsnips. Use straight sided - not ribbed - soft drink plastic bottles and slip them inside the beer cans. Wrap kitchen foil around the bottles and cover with parcel tape for a 500pF variable that works really well.

The detector was made using a Stanley knife blade, drawing pinned to the base board, with a 2in stub of a HB pencil pressing gently down against it. The pencil is held vertical for a few turns of 22s.w.g. wire around the body. A drawing pin secures this wire which connects to the top of the pencil lead.

Finally, the headphones. At first we used commercial 2kΩ 'phones just to get things working and a germanium diode for the same reason. Then we made headphones from scratch and what tedious work it was! Those tiny mains transformers found in old transistor radios, clocks etc, have primary windings of 2k resistance - enough for two bobbins of 1k each - just like 'real' ones.

A few strips of transformer lamination (nothing wasted!) gave us pole pieces. We then

glued together bobbins to fit round them - end cheeks came from old bits of thin, scrap paxolin and the magnet from a magnetic cupboard door catch. It had a hole in the centre, ideal for fixing, using a **brass** screw. 'Proper' diaphragms are Stalloy (4% Silicon iron) but thin, flat jamjar lids work fine, alternatively you can use circles of reasonably stiff plastic with a strip of lamination glued on.

It was all great fun to make and works really impressively using a germanium diode with about half volume from the Stanley blade. Stations including European ones at night are always separable thanks to the two tuned circuits. The antenna length was 60ft.

I've enclosed a photo of our junk radio, with the headphone innards showing. Anyone else feel like a 'Scrapheap Challenge'?

**Alan Oatey M0AVN**  
**Totnes**

**Editor's comment:**  
**Fascinating basics Alan. Real 'ale' radio perhaps?**

### Thank You Icom

**Dear Sir**

May I through your letters page publicly thank Icom (UK) Ltd., for their very prompt attention.

The other weekend I pulled the microphone plug from my Icom IC-737A. Unbeknown to me, the small screw securing the metal sleeve to the plastic centre had dropped out. This resulted in three fractured leads and no way of knowing 'what went where'!

I posted a request for advice on the Monday morning, thinking that I would be lucky to have a response within ten days. To my delight and amazement I received an answer on the following Wednesday morning.

I say again, thank you, Icom.  
**J. W. Barker G3WAL**  
**Bournemouth**  
**Dorset**

### Dove's Deliberating!

**Dear Sir**

Having just reapplied for my licence (G8KHF) and purchased my first *PW* after an absence of over a decade, imagine my bewilderment at the (what appears to be) vast array of licences and callsigns now in use!

I have to admit to never having been interested in using Morse code and was delighted to see the move away from this particular hurdle being used to limit access to the h.f. bands as, in my opinion, it has served to put off more prospective Amateurs than anything else. It is clear that we are in a period of transition and that another couple of years will see Morse code put in its rightful pigeon hole of just one of a vast number of facets of our hobby, none being any more 'important' than the others.

So now I have two routes to h.f.; something called the Morse Assessment (whatever that may be as I am unable to find a definition of it anywhere, only references to it) or a 5w.p.m. Morse test. Now, it seems pointless learning something that a) I will never use and b) will be removed as requirement in a couple of years, so I need to know what the dickens the Morse assessment is! Assuming this is a straightforward thing to achieve (more a speed hump than a hurdle) it seems I can get myself on h.f. with a 'Foundation Licence' albeit with limited power (no problem to

me as I quite like designing and building QRP rigs).

Now comes the rub. It transpires from my enquiries with the RSGB that, as a full class B holder I am technically competent to design and build rigs for v.h.f. but not for h.f. unless I pass a 5w.p.m. Morse test.

I am pleased to see the licensing regulations moving forward in line with the world we live in; Amateur Radio is a wonderful hobby with something for everyone and I look forward to nurturing and encouraging my seven year-old sons' fascination with listening to people talking from around the world. I want him to experience the same feelings I did when I made my first QSO with a rig I designed and built.

But for the life of me, I can't see the logic in the current situation; Morse code has no relevance to technical ability. If a full class B holder wants to build a rig, he should be able to do so whether or not he (or she) knows a 'foreign language'.

Perhaps I will put my licence back on the shelf for a couple more years until this whole thing is sorted out properly.

**John Dove G8KHF**  
**Greatworth**  
**Banbury**

**Editor's comment: Please don't hesitate John...rejoin us as soon as possible. Amateur Radio needs support and I feel sure the confusion (which always accompanies changes of any sort) will soon be sorted out. So, don't lose out on what you rightly say is a wonderful hobby. I'm intending to put as much pressure as I can to encourage the Radiocommunications Agency to relent on the 28MHz restrictions and self-build kits for Foundation Licensees. Personally, I'm sure that the way forward is to encourage new entrants to build approved kits or designs...because there's no substitute for 'hands on experience' as the successful practical Novice Courses proved to everyone. So, please join us again as soon as you can John!**

**Bargain Basement Works**

**Dear Sir**

*Practical Wireless* reaches "a" the 'airts" as Robbie Burns would say. I placed an advertisement in the December issue of *PW* Bargain Basement section selling a Heathkit g.d.o., which was snapped up by the first caller. However, to date I have received a total of ten calls from all over the country enquiring about the advert. So, if you have a similar item languishing below your bench, why not dig it out and dust it down as it seems there is a large market out there waiting for one!

**John Haliburton  
GM4AQO  
Burntisland  
Fife**

**Editor's comment:  
Bargain Basement reaches where others fail, eh John?**

**An Excellent Service**

**Dear Sir**

Once again important jobs, such as putting up and adjusting antennas are being put on the proverbial 'back burner'! The reason? - *PW* keep coming up with an excellent cover-to-cover read every month - keep up the good work!

I am interested in antenna systems, equipment reviews, both new and vintage and I am

more than spoiled for choice every month. Also, it might be of interest that I used to work on the print production of *Practical Television and SWM* back in the late 1950s early '60s.

Further to the ongoing saga of XYLs and our great hobby. My 'good lady' has always lent a sympathetic ear, she even accompanies me on trips to events such as Longleat and on equipment buying expeditions!

During a convalescence from an operation in 2000 the opportunity arose for a buying trip to the **Shortwave Shop** in Christchurch, Dorset. I was immediately impressed by the friendly greeting that met me, the service which was of the very best, and as such much appreciated.

Subsequently a long weekend in Bournemouth this autumn afforded the chance to visit once again the afore mentioned store, this time accompanied by my XYL! She was greatly impressed by the team and I came away with the excellent Icom R75 receiver with her encouragement to procure the unit!

So with Christmas looming as I write this and the possibility of getting a another 'goodie', my XYL suggested that I get in touch with Shortwave Shop again as they were so 'freindly and helpful'! A 'phone call was all that was required and the goods I ordered duly arrived early

the next day, None of the delivery 'in upto 28 days' here! Great stuff.

I do not have any financial or business interest in the Shortwave Shop and am not related to any of the staff. I am just happy to spread the word about their excellent service.

**R. M. Chambers  
Swindon  
Wiltshire**

**Transformer Needed**

**Dear Sir**

I am writing to you in the hope that you maybe able to help with the following enquiry.

I am the owner of a Yaesu FT-101Z transceiver which has served me well over the years. However, the mains transformer has ceased to operate.

I have tried to get a new one from two major outlets here in Eire and also from Yaesu UK but to no avail. I have also placed an ad in Buy & Sell magazines and newspapers, Do you or any or your readers know where I could get a transformer new or second-hand that I could use with my Yaesu FT-101Z?

I would be most thankful for any information regarding this. Many thanks.

**Pat Downes  
259 Chastworth  
Clogh  
Castlecomer  
Co. Kilkenny  
Eire**

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

**2002**

**February 10**

**11th Northern Cross Radio Rally**

**Contact:** John G7JTH  
**Tel:** (01924) 251822  
**E-mail:** g7jth@wdrs.org.uk  
**Website:** http://www.wdrs.org.uk  
The Northern Cross Rally takes place at Thornes Park Athletics Stadium, Wakefield, W. Yorkshire. There's easy access from M1 junctions 39 & 40 and it will be well signposted. Talk-in will be on 144 and 430MHz. Doors open 1100 (1030 for disabled visitors and Bring & Buy). Usual attractions plus Morse tests on demand.

**February 10**

**Harwell ARS Radio & Computing Rally**

**Contact:** Alan G8NVI  
**Tel:** (01235) 816379  
**Website:** http://www.hamradio.harwell.com

The Harwell club's rally takes place at the Didcot Leisure Centre in its large spacious hall, offering disabled facilities (including lifting), bar, refreshments and good parking. Located three miles from the A34 between Oxford and Newbury (signposted from A34). Doors open from 1030 until 1530.

**February 10**

**Cambridge & District Amateur Radio & Computer Rally**

**Contact:** John G0GKP/Bob G0GVZ  
**Tel:** (01954) 200072/(01223) 413401  
**E-mail:** j.bonner@ntlworld.com/bob.grimes@btinternet.com

The Cambridge rally is to be held at Lordsbridge Arena, Wimpole Road, Barton, near Cambridge. Entry is £2, concessions and disabled, £1.50. Doors open at 1000. There will be a car boot sale, Bring & Buy (mostly under cover) and a bar. Free parking.

**March 9**

**Crystal Palace and District Radio Club Spring Fair**

**Contact:** Bob G300U  
**Tel:** (01737) 552170  
The Spring Fair takes place at St John's Hall, Sylvan Road, London, SE19 between 1030-1300 hours. There will be Amateur Radio, electronics, computing, tools etc., on offer. Admission, including one free drink, is just £1, children free.

**March 17**

**The Norbreck Amateur Radio, Electronics and Computing Exhibition**

**Contact:** Peter Denton G6CGF  
**Tel:** 0151-630 5790  
Organised by the Northern Amateur Radio Societies Association (NARSA) the electronics and computing exhibition takes place at the Norbreck Castle Exhibition Centre, Blackpool. Don't miss the largest single day exhibition in the country! Morse tests will be available on demand.

**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. Editor.**

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'. No FAXes please!

**Editor**



# radio ACTIVE



- The National Space Centre
- Palstar R30 Receiver Review
- Radio Crosses the Atlantic - 100 years on
- Inside Bletchley Park - the home of WWII codebreakers

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### BROADCAST SECTION

- Bandscan Europe
- LM&S

### DXTV Special

This year's DXTV Special, brought to you by Keith Hamer & Garry Smith concentrates on Sporadic-E DXing. Plus, W.J. Williamson takes us back to his early days of DXTV reception.

### Low-End Low Down

Kevin Nice G7TZC reviews Wavecom's W40PC decoder.

### Genesis of a DXpedition - Miscou Capers - Part 1

Canadian correspondent Jacques d'Avignon shares his recent experiences of a mission to avoid interference.

### Racal RA1772 - The best ever?

JW compares the Racal RA1772 and the RA1792 in the best duel stance - back-to-back

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Bob Ellis...topical rants just how they should be...



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**CS201-N** same spec as CS201 "N-type" fitting.....£28.95  
**4 way antenna switch** 0-500Mhz.....£29.95

## ANTENNA ROTATORS

**AR-300XL** Light duty UHF VHF.....£49.95  
**YS-130** Medium duty VHF.....£79.95  
**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  
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**Turbo mag mount** (7") 1/2 or SO239.....£14.95  
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The Following Supplied in 50 metre lengths  
**Enamelled** 16 gauge copper wire.....£9.95  
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**Multi Stranded** Equipment wire.....£9.95  
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**PS-20** 20amp with 25amp surge Dual Meter & Adjustable Voltage 5-15v.....£99.95  
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**10 metre trap** 400W.....£23.95  
**15 metre trap** 400W.....£23.95  
**20 metre trap** 400W.....£23.95  
**40 metre trap** 400W.....£23.95  
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**SPECIAL OFFER**  
**SIRIO 27-4 YAGI BEAM**  
 £79.95 £59.95  
 ● Frequency 26 MHz - 28 MHz  
 ● Dimensions 5725mm x 4030mm x 100mm

All prices plus £6.00 per order



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**LOG PERIODIC MLP32**

Freq. Range 100-1300MHz  
Length 1420mm Wide Band 16 Element directional beam which gives a maximum of 11-13Db Gain Forward and 15Db Gain Front to Back Ratio. Complete with mounting hardware. (The Ultimate Receiving Antenna - a must for the Dedicated Listener.)

**ROTATOR AR-300XL**

- \* Rotation Torque-222Kg
- \* Vertical Load-45Kg
- \* Mast Size - 28-44mm
- \* Control Box-230v AC
- \* Cable-3 core
- \* Direct Compass Bearings (Ideal for Light to Medium Beams, i.e. LOG PERIODIC above.)

**£49.95**



**6" STAND OFF BRACKET**

Complete with 'U' Bolts

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Complete with 'U' Bolts

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25 METRES OF ENAMELLED WIRE INCLUDES 10M PATCH LEAD & INSULATOR

FOR USE ON WITH RECEIVER 0 - 40 Mhz. ALL MODE NO ATU POINTS GREATER SIGNAL THAN OTHER BALUNS. MATCHES ANY LONG WIRE TO 50 OHMS IMPROVED RECEPTION

**£39.95**

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- SINGLE 1 1/4" .....£7.00
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- PL259/6 .....0.75 each
- PL259/7 for mini 8 .....1.00 each
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- BNC (Solder Type) .....1.00 each
- N TYPE for NG58 .....2.50 each
- N TYPE for RG213 .....2.50 each
- S0239 to BNC .....1.50 each
- PL259 to BNC .....2.00 each
- N TYPE to S0239 .....3.00 each
- Amalgam tape 10 metres .....£7.50

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- RG213 MILITARY .....0.85 per mtr.
- MINI RG8 .....0.85 per mtr.
- RG58 STANDARD .....0.35 per mtr.
- RG58 MILITARY .....0.60 per mtr.
- H100 .....£1.10 per mtr.

**WEATHER SATELLITE ANTENNA**

**TURNSTILE 137**  
Freq. 137.5 MHz  
Length 1000mm

This Antenna is designed for external use to receive weather satellite signals.

**£39.95**

Complete with mounting hardware.

**MRW-40 (Rubber Duck)**  
Dedicated for Civil & Military Airband VHF/UHF RX & TX Capabilities  
Length 215mm. PP £2.00

**£19.95**

**UK SCANNING DIRECTORY**  
8th edition

**£19.50**

**£29.95**

**SUPER SCAN STICK**

Freq. Range 0-2000MHz  
Length 1000mm

It will receive all frequencies at all levels unlike a mono band antenna. It has 4 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals. (Ideal for the New Beginner and the Experienced Listener alike.)

**£49.95**

**£39.95**

**SUPER SCAN STICK II**

Freq. Range 0-2000 MHz.  
Length 1500mm.

This is designed for external use. It will receive all frequencies. at all levels unlike a mono band antenna. It has 8 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals plus there is an extra 3db gain over the standard super scan stick. (For the expert who wants that extra sensitivity)

**MULTI SCAN STICK II**

Freq. Range Receive (0-2000MHz) Transmit (144-146 MHz)  
Gain 4.00dbd (420-430 MHz) Gain 6.00dbd Length 1500mm  
Same as Super Scan Stick but with extra gain, makes it an even better antenna for the amateur and expert alike. (Ideal for the Ham Radio user)

**£39.95**

**MULTISCAN STICK**

Freq. Range Receive - 0-2000 MHz.

Transmit 144 - 146 MHz gain 2.5 DBd  
420 - 430 MHz gain 4.5 DBd  
Length 1000 mm.  
Although marginally compromising sensitivity the multi scan stick has within its transmitting capabilities plus gain makes it an excellent antenna for the amateur and expert alike.

Comes complete with mounting hardware and brackets. (Ideal for the amateurs ham radio - user).

**£89.95**

**IVX 2000**

Freq. Range Receive - 0-2000 MHz.

Transmit 50 - 52 MHz gain 2.00DBd  
144 - 146 MHz gain 4.00 DBh  
420 - 430 MHz gain 6.00 DBd  
Length 2.5 m.  
For external use, but at a pinch can be used in the loft. It has been finely tuned to make this Antenna the best there is. It has stainless steel radials and hardware. (THE BEST)

**SUPER SCANAIR BASE (Airband)**

(Stainless Steel)  
Freq. Range Receive 117-140MHz  
Transmit 117-140MHz  
Length 825mm  
Connector-N TYPE

This is a transmitting & receiving antenna designed for the aircraft frequency range. (For the control tower & aircraft listener).

**MWA HF Wire Antenna Mk11**

Freq 0.05Mhz-40Mhz Adjustable comes with 25 metres of H/Grade flexweave antenna wire, 10 metres of military spec RG58 coax cable feeder, insulated guy rope, dog bone & choke balun. All Mods No A.T.U. required. Super Short Wave Antenna.

**£59.95**

**SWP 2000 FREQ. 25 - 2000**

Mhz. Length 515mm.

Multiband good sensitivity for its small size. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. (Good for the car user who doesn't want an external antenna.)

**£29.95**

**SWP HF30**

Freq. Range 0.05-30MHz Length 770mm

Although small, surprisingly sensitive for the H.F. user. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. (Good for the car user who doesn't want an external antenna.)

**£39.95**

**TRI SCAN III**

Freq. Range 25-2000MHz Length 720mm

Desk Top Antenna for indoor use with triple vertical loaded coils. The tri-pod legs are helically wound so as to give it its own unique ground plane. Complete with Smts of low loss coax and BNC plug. (Ideal for Desk Top Use.)

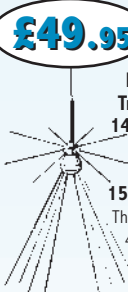
**£39.95**

**ROYAL DISCONE 2000**

(Stainless Steel)

Freq. Range Receive 25-2000MHz  
Transmit 50-52MHz  
144-146MHz 430-440MHz  
900-986MHz 1240-1325MHz Length 1540mm Connector-N TYPE

The Ultimate Discone Design. 4.5DB GAIN OVER STANDARD DISCONE! Highly sensitive, with an amazing range of transmitting frequencies, comes complete with mounting hardware & brackets (The Best There is).

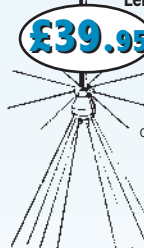


**£49.95**

**SUPER DISCONE**

Freq. Range 25-2000MHz Length 1380mm

Internal or External use (A Tri-Plane Antenna). The angle of the ground planes are specially designed to give maximum receiving performance within the discone design. The Super Discone gives up to 3Db Gain over a standard conventional discone. Comes complete with mounting hardware and brackets. (Ideal for the experienced Enthusiast.)



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**MRW-100**

(Super Gainer) (Rubber Duck) Wideband extra sensitive Dedicated VHF/UHF all mode Length 400mm. PP £2.00

**£19.95**

**MRP-2000 (Preamplifier)**

Freq Range 25-2000 Mhz 9-15v input (Battery not included) 14 db Gain. Complete with lead and BNC connectors.

**£49.95**

**G. SCAN II**

Freq. Range 25-2000 MHz.Length 620 mm.

Magnetic mount Mobile Scanner Antenna. 2 vertical loaded coils for good sensitivity complete with magnetic mount and 4mts of coax, terminated with BNC plug. (Good for when you are driving about)



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**MRP-125 (Preamplifier)**

Freq Range 118-137 Mhz 9-15v input (Battery not included) 14 db Gain Complete with lead and BNC connectors.

**£44.95**

**CIVIL AND MILITARY RECEIVING ANTENNAS**

- AR30 (Length 1000mm GAIN 3.6 & 6.5) .....Price £39.95
- AR50 (Length 1500mm GAIN 5.0 & 7.5) .....Price £64.95



**ADD £6 P&P PER ORDER**

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

Working Together

# Nigerian Connections

South Midlands Communications are supplying Voice of Nigeria with outside broadcast vehicles.



Voice of Nigeria producer Femi Ajeigbe and engineer Felix Ifeakpolunde run acceptance tests on the new outside broadcast vehicles.



Members of the SMC project team with dignitaries from the Voice of Nigeria. Left to right: Ezekiel Ajanya (TAI), Colin Thomas (SMC), John Ameh (VON), John T. Moore (TAI), Ayo Suleiman (VON), John Lightfoot (SMC), Felix Ifeakpolunde (VON) and Femi Ajeigbe (VON), crouched: Jide Phillips (VON).



South Midlands Communications Ltd. (SMC), in conjunction with their partners Theodore Allan International and broadcasting specialists E2E, are supplying two flagship Outside Broadcast (OB) vehicles to the Voice of Nigeria, (VON), the external broadcasting service of the West African country. The two Mercedes 416 Sprinter four-wheel drive vehicles are based at Lagos and the capital Abuja and have been fully equipped with sound broadcasting studio facilities, u.h.f. link (STL) equipment and a SMC v.h.f. two-way radio repeater system. The on-board antennas are supported by a 14 metre Hilomast NX14.

**South Midlands Communications Ltd**  
**Tel: 0238-024 6226**  
**FAX: 0238-024 6206**

One of the OB vehicles with a 12.5 kVA generator, roof working platform with erected guard rails and partially extended NX14 Hilomast supporting a 4-element v.h.f. Yagi and 8-element u.h.f. Yagi. Apart from providing 'stand-alone' recording and VIP interviewing facilities the vehicles are able to communicate and provide on-air programming with the studios in Lagos and Abuja. The studio end installation work will also be carried out by SMC.

New Scanner

# Bearcat's Base

If you are a scanner enthusiast as well as an avid Amateur Radio Operator then read this...

The new Bearcat UBC 780xlt base scanner is now available from Nevada. The UBC 780xlt offers almost continuous coverage from 25 - 1300MHz and is billed as a 'must-have' for the true enthusiast.

Features of the UBC 780xlt include:

- Trunktracking
- A 2 line alphanumeric display
- PC Control
- CTCSS/DCS
- SmartScanner,
- VFO control
- 500 channels:



Weighing in at 1.33kg and measuring 195(W) x 177(D) x 72mm(H) and costing **£349** we are sure you can squeeze one into your shack! The Bearcat also comes complete with a UK mains adaptor, telescopic antenna, car cigar adaptor and mounting bracket.

**Nevada,**  
**Unit 1, Fitzherbert Spur,**  
**Farlington, Portsmouth PO6 1TT**  
**Tel: 0239-231 3090**  
**E-mail: info@nevada.co.uk**  
**Website: www.nevada.co.uk**

Web Browsing

# Radio Club Site

If you enjoy browsing the world-wide web for news of Amateur Radio Clubs' activities in your area here's one to try....

The Flight Refuelling Amateur Radio Club's website can be found at [www.frars.org.uk/](http://www.frars.org.uk/) and is packed with club news and events, information on RAE courses, latest news and much more. The Flight Refuelling ARC meet on Wednesday evenings, but the h.f. and v.h.f. shacks are available for use during the Sunday social evenings, as well as Wednesdays. The FRARS holds the very popular Hamfest Rally on the second Sunday of August every year.



Special Event

# Cray Valley RS Win Mast & Raise Money!

The Cray Valley Radio Society recently activated GB2FB and raised over £2000 for the Royal National Institute for the Blind.

Over the weekend 14/15 September 2001 the special event station **GB2FB** was put on air by members of the Cray Valley Radio Society in Kent. The club ran three h.f. stations and one v.h.f. station from the 9th Dartford Scout Hut for a total of 30 hours around the clock. The main station consisted of a FT-1000MP, 400W Amp and a 3-ele Tec beam. Several companies helped out by sponsoring the event, one of which was Waters & Stanton who loaned the club equipment to use.

During the 30 hour event the clubhouse was open for the public to drop in and see what was going on. Almost 2000 QSOs were established with some of the best DX being between the EM1HO

Ukrainian base in Antarctica and ZL7 Chatham Island.

Not only did the club raise a total of £2167 for the Royal National Institute for the Blind but they also won the prize for the most money raised during the event. The prize was an Adapt-a-mast donated by **Tennamast (Scotland) Ltd.**, which no doubt will be very useful for future club on-the-air events. So, the PW team think you'll agree that the Cray Valley RS deserve a big round of applause for their efforts.

If you'd like to join the Cray Valley RS or want more information on their activities please contact Nobby at [g0vjg@aol.com](mailto:g0vjg@aol.com) For more information on the Adapt-a-mast produced by Tennamast (Scotland) Ltd., or any of their other masts contact **Norrie Brown GM4VHZ** direct at **81 Mains Road, Beith, Ayrshire KA15 2HT. Tel: (01505) 503824** or E-mail: [nbrown@tennamast.com](mailto:nbrown@tennamast.com)





# Tex's

Hello and welcome to 'Tips & Topics', an occasional column of tips, tricks and ideas. This column is for you the reader, to show some of the ideas you use to make this hobby easier or more fun!

## Tips & Topics

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

Let me start off with a tip from **Dave Ackrill G0DJA** who says that when he makes joins in the twin feeder for his antenna system, he uses the electrical connector, more usually known as a 'choc-block'. Dave then keeps the joint dry by: wrapping it in self amalgamating tape, then arranges that the joint is inside an old 35mm film carton.

The film carton is the type with a lid that clicks onto the top of the main body and Dave makes two holes in the cap and two in the bottom of the canister. The ends of the thinner feeder are put through the bottom of the canister. The other feeder is then passed through the holes in the lid before joining the two together with the choc-block connectors, add the self amalgamating tape, put the connectors inside the carton and click the lid on.

### Very Snug

If you are careful, the holes in the lid and canister can be a very snug fit for the wire, keeping water out, or you could use something like hot glue to seal them. If you want real 'belt and braces' then fill the carton

E				T					
I		A		N		M			
S	U	R	W	D	K	G	O		
H	V	F	L	P	J	B	X	C	Y
5	4	3	2	1	6	/	7	8	9
Key to use		?	.	'	-	,	:		
dit		dah							

Fig. 2: Published originally in 1932, then again in *PW* in 1986, this Morse recognition chart has been extended to cover numbers and punctuation symbols.

with resin or petroleum jelly to keep the moisture out.

You can use the same idea to help keep moisture out of the connections in coaxial cables or connectors. Many home-brew, and even some commercially made, antennas often leave the coaxial connectors exposed to the rain, snow and pollution of the atmosphere. The canisters may not be fully weatherproof, but it will keep the worst off....

### That's The Tonic

Now to the next idea that's just the tonic! The idea comes from **John Marter** who has been rummaging around in his medicine cabinet and has come up with a splendid idea of using old plastic containers, like those that vitamins or that tablets are supplied in, as coil formers.

The outline of how it works is shown in the illustration of **Fig. 1**. If you have several identical bottles, then one top cap may be glued or otherwise attached to the baseboard/chassis and each coil can be screwed into place as it is needed. Ideally the connecting leads should be as short as possible.

### Instant Morse

Now to an 'Instant Morse' crib sheet, **Fig. 2**, ideal for anyone aspiring to take the new Morse

assessment to gain access to the h.f. bands using a new M3 series call sign that should be heard on the bands as you read this magazine. There is no single person who can claim the credit for this crib sheet as it came from an original 1932 publication, that was brought to *PW* readers' attention by Joan Ham in a

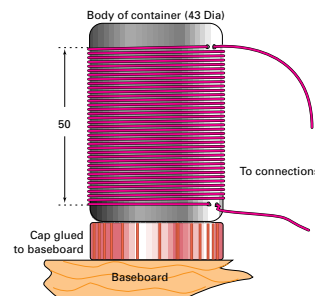


Fig. 1: John Marter's medicine bottle coil former.

letter that was published in the May 1986 issue of *PW*.

In her letter Joan mentioned that she had come across the sheet during an archive search of the Chalkpit's Museum (Amberly, West Sussex) stock of old publications and was immediately struck by the chart as a means of decoding Morse code rather easily.

To use the chart (which I've extended from the original, to include numbers and some punctuation symbols. G1TEX), all you really need to know is that the

black blocks represent dashes (dah) and the white block dots (dit).

### Read Downwards

The chart is read in a downwards direction (rather like a hopscotch pattern) by received di or dah. As you progress down the rows, you choose only the black (dah) or white (di) immediately below the step you are on.

Imagine you hear the Morse signal for the letter F (di - di - dah - dit). On row one take the left hand white (di) block, on row two take the left hand block again (di) on row three, choose black (dah) before on row four you are left on the white block (dit) marked F by the longer 'end-of-character' pause. Then start from the top again with the next character.

Obviously you may stop on the first row if the Morse character is an E (di) or a T (dah), or progress on to the fifth (numbers) row or to the final sixth (punctuation) row. There is only one symbol not covered by this chart, and that is the error (Oh bug..r it!) signal of eight dots (di - di - di - di - di - di - di - dit), meaning the last symbol I sent was wrong!

Congratulations go to both Dave and John who both receive *PW* BookStore vouchers. And as I cannot decide which is the more worthy of the extra 'best-idea' voucher, (and because it's almost Christmas as I write this) I've decided to give both of them a winter bonus extra voucher. *Tex*

As an incentive, each published 'Tip' gets a £5 Book service voucher for the author. The best idea each month gets an additional £5 voucher as well. So, get writing! G1TEX

# HAYDON

Communications



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1.8-30MHz (200W PEP) mobile antenna - no ATU required. Length 102" (52" collapsed). Fits 3/8 mount (SO239 feed point)  
**INTRO PRICE £129.95** delivery £10  
 Optional magnetic base .....£24.95  
 Optional body mount (hole).....£12.99  
 Roof bar mount requires cable kit.....£9.95  
 Cable kit.....£7.99

## Q-TEK PENETRATOR

"WE'VE SOLD 100s ALL OVER EUROPE"  
 ★ 1.8 - 60MHz HF vertical ★ 15 foot high ★ No ATU or ground radials required ★ (200W PEP).  
**ONLY £179.95** delivery £10  
 Wire version now available 45ft long end fed. (1.8-60MHz) spec. as above. Price £159.95.

## Q-TEK ZL SPECIALS

2m	5ele (boom 45"/9dBd)	£49.95
2m	7ele (boom 60"/11dBd)	£54.95
2m	12ele (boom 126"/13.8dBd)	£79.95
70cm	7ele (boom 28"/11dBd)	£39.95
70cm	12ele (boom 48"/13.8dBd)	£59.95

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2m	8ele (boom 125"/11dBd)	£64.95
2m	11ele (boom 156"/12.7dBd)	£94.95
2m	5ele crossed (boom 64"/9dBd)	£79.95
2m	8ele crossed (boom 126"/11dBd)	£99.95
4m	3ele (boom 45"/7dBd)	£56.95
4m	5ele (boom 128"/9dBd)	£69.95
6m	3ele (boom 72"/7dBd)	£59.95
6m	5ele (boom 142"/9dBd)	£79.95
70cm	13ele (boom 76"/12dBd)	£46.95
70cm	13ele crossed (boom 83"/12dBd)	£79.95

## DELUXE G5RV

Multi-stranded PVC coated heavy duty flexweave wire. All parts replaceable. Stainless steel and galvanised fittings. Full size - 102ft.  
**ONLY £42.95**  
 Half size 51ft. Only **£36.95**  
 Carriage £6.50.

Choke Balun Inline balun for G5RV.....£24.95 P&P £3

## STANDARD G5RV

Full size 102ft .....£24.00 P&P £6  
 Half size 51ft .....£21.00 P&P £6

## Q-TEK INDUCTORS

80mtr inductors + wire to convert 1/2 size G5RV into full size. (Adds 8ft either end) .....£24.95 P&P £2.50 (a pair)

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5m length 300Ω twin feeder h/duty .....£5.00 P&P £3  
 10m length 300Ω twin feeder h/duty.....£10.00 P&P £3

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1.1 Balun	£25.00 P&P £2
4.1 Balun	£25.00 P&P £2
6.1 Balun	£25.00 P&P £2
40 mtrs Traps	(a pair) £25.00 P&P £4
80 mtrs Traps	(a pair) £25.00 P&P £4
10 mtrs Traps	(a pair) £25.00 P&P £4
15 mtrs Traps	(a pair) £25.00 P&P £4
20 mtrs Traps	(a pair) £25.00 P&P £4

## CUSHCRAFT ANTENNA SALE

MA5V	New vertical 10, 12, 15, 17, 20m	£229.95	£215.00
MA5B	Mini beam 10, 12, 15, 17, 20m	£299.95	£269.95
A3S	3 ele beam 10, 15, 20m	£479.95	£389.95
A4S	4 ele beam (10-20m)	£529.95	£449.95
R6000	Vertical 6, 10, 12, 15, 17, 20m	£329.95	£289.95
X-7	7 ele 10, 15, 20m	£669.95	£579.95

## Q-TEK COLINEARS

QT-100	GF 144/70, 3/6dB (1.1m)	£39.95
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QT-300	GF 144/70, 6.5/9dB (3m)	£69.95
QT-500	GF 144/70, 8.5/11dB (5.4m)	£125.95
QT-627	GF 50/144/70, 2.15/6.2/8.4dBi (2.4m)	£69.95

## MOBILE ANTENNAS

DB-770M	2m/70cm (3.5-5.8dB) 1m PL-259	£24.95
DB-7900	2m/70cm (5.5-7.2dB) 1.6m PL-259	£39.95
PL-62M	6m + 2m (1.4m) PL-259	£19.99
MA5M	(20-10m) 3/8" fitting 5 band	£29.99
NR-2000	NEW. 2m/70cm + 23cm mobile	£39.95
NR-627	NEW. 6m/2m/70cm mobile	£54.95

## COPPER ANTENNA WIRE

Enamelled (50m roll)	£12.95 P&P £5
Hard drawn (50m roll)	£13.95 P&P £5
Multi-Stranded (Grey PVC) (50m roll)	£9.95 P&P £4
Flexweave (H/duty 50 mtrs)	£30.00 P&P £5
Flexweave H/duty (20 mtrs)	£15.95 P&P £5
Special offer Flexweave H/duty (50 mtrs)	£30.00 £15.00 P&P £5
Flexweave (PVC coated 20 mtrs)	£18.95 P&P £5
Flexweave (PVC coated 50 mtrs)	£40.00 P&P £6.50
Copper plated earth rod (4ft)	£13.00 P&P £6
Copper plated earth rod (4ft) + 10m wire	£18.99 P&P £6

## RECHARGEABLE ALKALINE CELLS

Starter kit includes charger & 4 x AA cells.  
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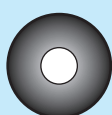
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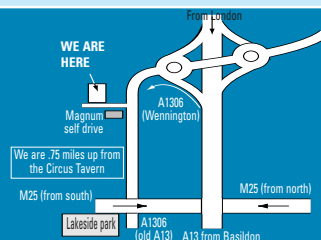
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# Radio Basics

This month Rob Mannion G3XFD describes the final stages, completion and calibration of the Radio Basics Capacitor/Resistance bridge.

Assembling and soldering-up the Radio Basics (RB) C/R bridge is not at all difficult - especially if you use the 'Copper Islands' technique which I described in last month's column (it also featured in the review on page 49 of the January issue).

To provide you with some guidance on construction, the heading photograph, along with the annotated photograph in Fig. 1, shows the inside rear view of one of the three prototypes I made (none of the others were assembled into a case - the one shown will be kept in my workshop as I've already found it to be very useful! (It replaces that which was built from the 1960s PW design I mentioned earlier).

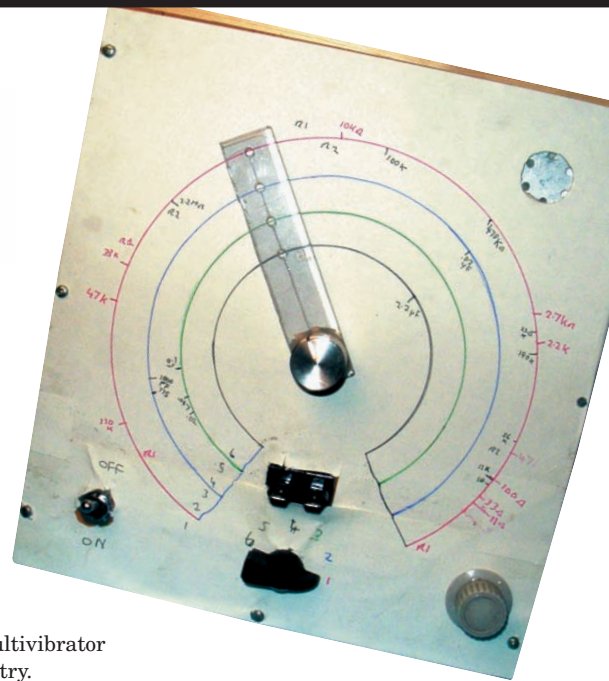
You can either build it on

two separate boards or assemble it on one board in the same fashion I've adopted - but ensuring that a saw-cut across the board totally isolates the audio amplifier stage and the multivibrator and bridge circuitry.

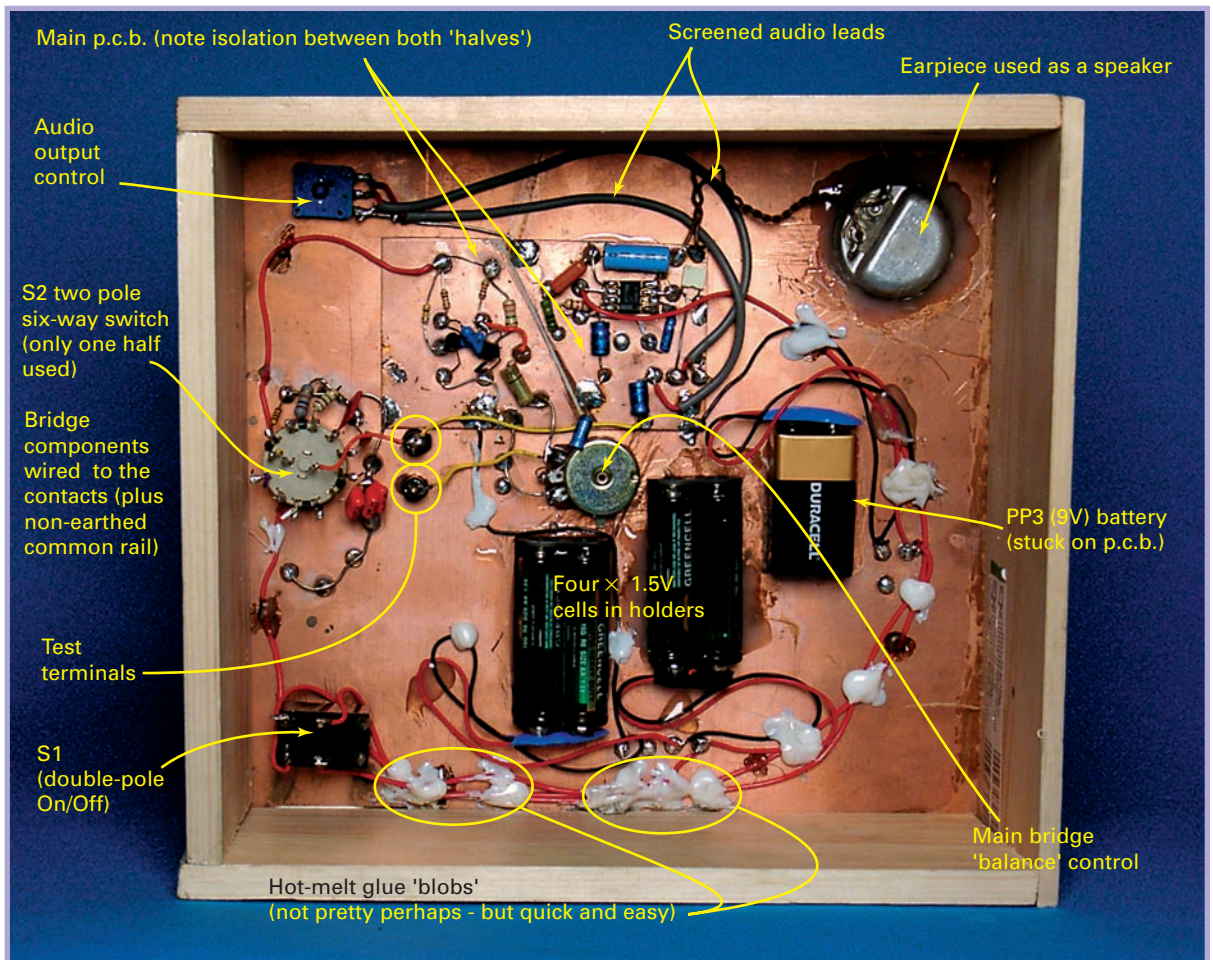
Remember to (**Most important**) ensure that when you assemble the circuitry that the only links between the two sections (as shown in Fig. 2 on page 25 in the January issue) are via C7 and C8.

## Switching & Linking

Now let's take a look at the switching and linking that



- Rob G3XFD built several prototype C/R bridges and this version is built into a back-less wooden framework casing. The on/off switch is at the far left, the six position range switch is centre bottom (with self-gripping terminals for holding test items immediately above). The knob of the far right controls audio output, and the audio output device is at the top right (see text).



● Fig. 1: Inside rear view of the C/R bridge unit. Loose wiring is anchored to the chassis with 'hot melt' glue. Note the positioning of the power supply batteries (see text).

we've got to tackle - but don't worry...it's relatively simple and very straightforward (Fig.2). The necessary switching for the six ranges on the C/R bridge is carried out by S2 (I used a two-pole, six way unit, leaving one side unused, but you may also use a single-pole six way if you have one to hand). However, don't forget that the 'earthy' ends (those that all connect to the common negative (-) rail on the multivibrator/bridge circuitry only link to that board).

Wiring up the switching circuitry for S2 is very simple and you can check it as you go with your testmeter (set to resistance ranges). Wiring for S1a and b is also simple - just make sure that you wire it so that power is supplied to both circuits from their respective power sources) when the switch is on. It's quite easy to get yourself mixed up and have one on and one off! Again it's simple to check this by using your test meter - first to check continuity by setting it to resistance/continuity, and then by making sure the line voltage is present on the respective boards.

Take the usual precautions (when using high gain audio i.e. amplifiers) by placing the decoupling capacitor as close as possible to the audio input of the LM386 (pin 3 in this case) to reduce instability problems. As a precaution, I also screened the audio input cabling (from the centre tag - indicated by the arrow on R9), to pin three's connector on the audio board (see annotated photograph).

The screening is necessary because of the (previously highlighted) potent, all-pervading nature of the signal from the multivibrator as I've already mentioned.

The screened cable I used came from a discarded cassette recorder microphone. It's extremely common and is easily recognised because the screen wires (seven to 15 strands of tinned copper wire) are spirally wound around the colour coded core. Well worth salvaging for further use as it's easier to use than the fiendishly difficult-to-solder-and-work braided fibre and copper wire flex often found in headphone leads!

## Headphone & Speaker

As previously mentioned, although the C/R bridge only has a limited audio output...it will drive a small loudspeaker unit. However, small loudspeakers vary a great deal in sensitivity.

In the end I've opted to use one of the many telephone earpiece units I've got lying around the shack. They provide excellent output levels at the frequencies we use for the multivibrator. (Available from **Birketts** in Lincoln and **Sycom**, see adverts in this issue) the earpiece units only cost around 50p or so and are very small and easy to fit.

However, at some settings of the bridge - audio output will be quite low and although I put my ear to the box, this might not always be convenient so, it's worthwhile fitting an earphone socket, so that you can use a pair of low impedance headphones. But if you do, don't forget to wire it up so that a mono type signal is presented to stereo headphone...it's annoying to get the null indicator tone in one ear only\*!

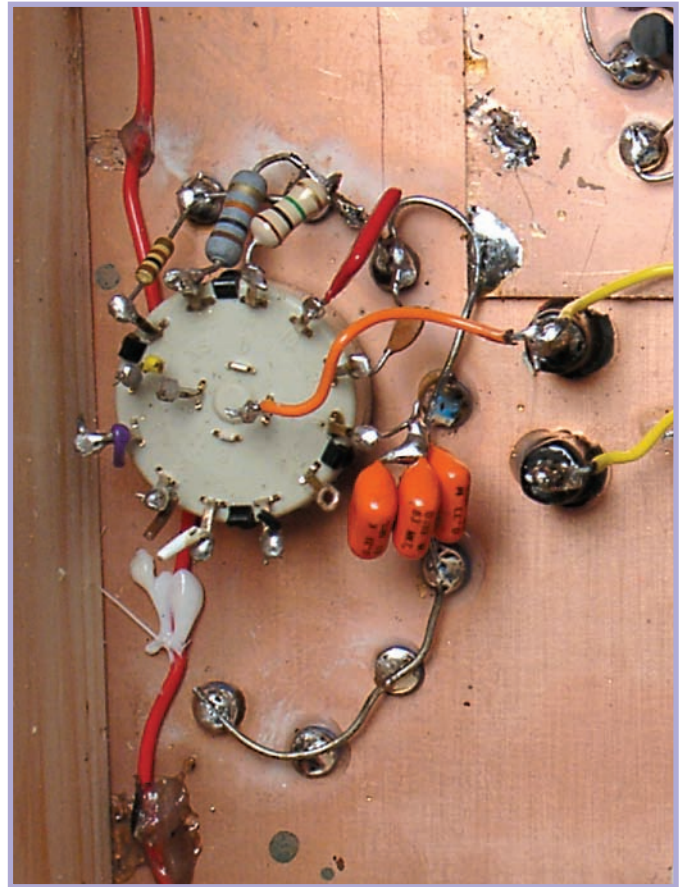
**\*Note:** Although of course this could be an advantage if you've got better hearing in one ear than in the other. If this is the case, wire up the jack socket accordingly - to your own advantage!

## Testing Time

It's best to buy high quality close tolerance components for R6, 7, and 8 and C4, 5 and 6. Specify this to your supplier and ask for the closest tolerance types they have available. In this way you can make your own bridge to be as accurate as possible. **But please remember that although it won't be a laboratory grade instrument - it will give very useful results.**

When you've finished building the circuitry - testing is simple. Power up the amplifier and listen for a slight hum when you apply a dampened finger onto the slider (centre tag) of R9. With the volume turned right up you should also hear the hiss of the amplifier's output.

To test the multivibrator just (temporarily using a wire



● Fig. 2: Closer view the main board, showing the range selection switch and bridge components. Note that the 'common' rail' for the capacitors and resistors forming the bridge unit are not soldered to the main chassis (see text).

link) connect the test terminal side of C3 directly to the positive side of C7. You should then hear the piercing (almost whistle-like) signal). If you don't hear it...check your wiring and connections. When all's well - you'll be ready to start calibration.

## Calibration & Operation

To start preparing for calibration, score a central line down the cursor you've prepared (I made mine from the lid of a cassette case) and then drill equally spaced holes carefully along this line. Then (by placing coloured pens through the holes) rotate the cursor and trace out the scale lines. You can use three colours (with one scale one side, and another on the other side) or make six scales if you wish.

To calibrate - switch the power on and place a known value of resistor or capacitor (ranges 1 to 3 are resistance, 4, 5, 6 are capacitance) on the test terminals (crocodile clips attached to terminals are

satisfactory) and then rotate the cursor. **Do it carefully and slowly** and note where the tone of the multivibrator disappears (the null). That's where you'll appreciate the large scale as it makes finding the null easier! If there's no discernible null try the next range up or down\*. If you get a good null...mark that value at the point on the scale in use. Repeat the operation for as many standard values as you have. You can eventually seal the scale with clear varnish if you wish.

In practice you'll find the bridge to be very useful in checking low and high resistances...and especially finding the value of those bargain variable capacitors. You'll soon find it very easy to use and I'll be talking about it again later. Enjoy using your simple C/R bridge!

\* If there's no detectable null - the component will either be faulty or out of the range of the instrument. (This is easy to confirm by trying another component).

PNW

Richard Newton  
GORSN was “very impressed with the ease and simplicity of use, and the obvious thought Yaesu have put into the straightforward way in which the FT-7100M can be operated”. Read on to find out more!



● Richard GORSN was generally very impressed with the Yaesu FT-7100M - especially on the receiving side. “It’s nice and easy to use” he says.

# Yaesu FT-7100M

## Dual-Band Mobile Transceiver

As usual, I was very pleased when I received another invitation to evaluate a transceiver on behalf of *PW* readers...and this time it was the Yaesu FT-7100M - a dual-band mobile transceiver covering the Amateur Radio 144 and 430MHz bands. It arrived safely and on unpacking it I was immediately impressed with the look of the radio.

The transceiver smartly finished in dark grey plastic and the controls are well spaced. Additionally the radio gave me the impression of being a straightforward no-nonsense unit. However, the first thing that struck me with the '7100M was its small and neat format, incorporating the heat sink into the case of the radio...managing to make the cooling fan look as part of the

unit as is possible.

One of the most encouraging things was the size of the display. Considering the compact nature of the radio, which measures 140 x 38 x 166mm (without knobs and protrusions) the display is a good size and when turned on it proved to be easily readable and uncluttered.

### Power Settings

The FT-7100M has a large heat sink and cooling fan due to the fact that it offers a high power setting of 50W on 144 and 35W on 430MHz. But if you do not fancy punching the ether with quite so much gusto...Yaesu have provided some setting options: 5, 10, 20 or the full powers already mentioned.

For mobile use the Yaesu FT-7100M has various options to assist the operator. These include a detachable head and

with a kit (purchased as an optional extra) it's possible to mount the head remotely from the main body of the rig. (**Very useful** ...especially in more modern vehicles where space is a premium.

In use, FT-7100M is provided with two separate frequency displays controlled by separate volume and squelch controls. This gives the operator the advantage of being able to monitor two frequencies simultaneously, and even two on the same band if necessary.

As supplied, the transceiver is equipped with a simple mobile mounting bracket, a comprehensive owner's manual and a standard fist microphone. The microphone has four function buttons, and these can be assigned to control a multitude of features including: transmitting a 1750Hz, changing bands, selecting power levels and switching

between memories and v.f.o.s....to mention but a few!

### Super Look

In my opinion the Yaesu FT-7100M is a super radio to look at. The absence of complicated controls and loads of 'bells and whistles' is somewhat comforting in these modern times!

The front panel is adorned by eminently sensible 'one push' button type controls for all those features an operator, especially a mobile operator, requires. Incidentally, I have to say that **I was very impressed** with the ease and simplicity of use, and the obvious thought Yaesu have put into the straightforward way in which this radio can be operated.

On the air the operator has instant access to band control, switching between v.f.o and



memories, reverse frequency operation (when in repeater mode) and changing the power output level. The CTCSS tone is also easily set (the FT-7100M offers full CTCSS operation, together with DCS as well).

## Advanced Features

Like other modern rigs the FT-7100M has more advanced features hidden away in a user's set-up menu. The first feature that caught my eye was the extended receive coverage.

According to the handbook, the Yaesu FT-7100M offers extended receive capability within the following ranges: 108-180.000MHz (a.m. mode is selected by the radio in the Airband), 320-480MHz and 810

poll each other and confirm that you are in communication range and also alerts you when you're out of communication range).

## Impressive Memories

The FT-7100M has an impressive array of memories - 262 altogether! These consist of 120 standard memories and 11 'special' memories for each band.

The 11 special memories consist of five pairs of five programmable band scan limits and one **Home** channel for each band. This channel is more commonly named a **Call** channel and is for your favourite channel on each band. A single press of a front panel

another Yaesu feature... 'Smart Search'. This is a useful feature when visiting a new area as you can set the radio to make a sweep of an entire band and save all the busy frequencies to 50 volatile or 'soft memory' locations. (This means that should you wish to keep what the radio has found you will need to transfer the frequency to a dedicated memory channel, as the Smart Search memories are reused by the radio on a rolling basis regardless of contents).

I've used Smart Search to great effect both when searching for active repeaters in an area I'm unfamiliar with. (Also useful at rallies to find out who is about and where they are!).

### Product

Yaesu FT-7100M f.m. dual-band mobile transceiver.

### Company

Yaesu (UK) Ltd.

**Contact:** Sales

**Tel:** (01962) 866667

### Price

£399 inc. VAT

### Pros & Cons

**Pros:** It performed well. It's a well-made, sturdy unit. It's also simple and easy-to-use, but also enjoys some excellent features. I was also extremely impressed with the receive performance of the rig.

**Cons:** Some adverse reports on the transmitted audio (see separate reply panel from Yaesu).

### Summary

"The Yaesu FT-7100M is a down-to-earth rig, which I'm sure, would give good service as a mobile or base station radio. The radio's strengths lie in its simplicity of use and adaptability in the allocation of memories and menu set-up features. And as I have said, I could not have been more pleased with the receive capability and performance of the radio". **GORSN.**

### Thanks

My thanks for the loan of the FT-7100M go to **Yaesu UK Ltd, 12 Sun Valley Business Park, Winnall Close, Winchester, Hampshire SO23 0LB.**

● Inside view of FT-7100M (top side of chassis view).



-999.990MHz (cellular telephone channels blocked).

The extended ranges are obviously in addition to full transmit and receive facilities on the following Amateur Bands: 144-146MHz and 430 - 440MHz.

The transceiver supports 9600bps packet operation from a dedicated mini DIN socket on the rear of the radio.

There are some familiar Yaesu features on the FT-7100M...including ARTS. This is Automatic Range Transponder System. (This relies on others having Yaesu radios with the same function and allows the transceivers to

button instantly recalls this memory.

Incidentally, the FT-7100M offers an excellent feature as far as memories are concerned. You can actually re-configure the allocation of the 120 standard memories and take from one band and give to the other!

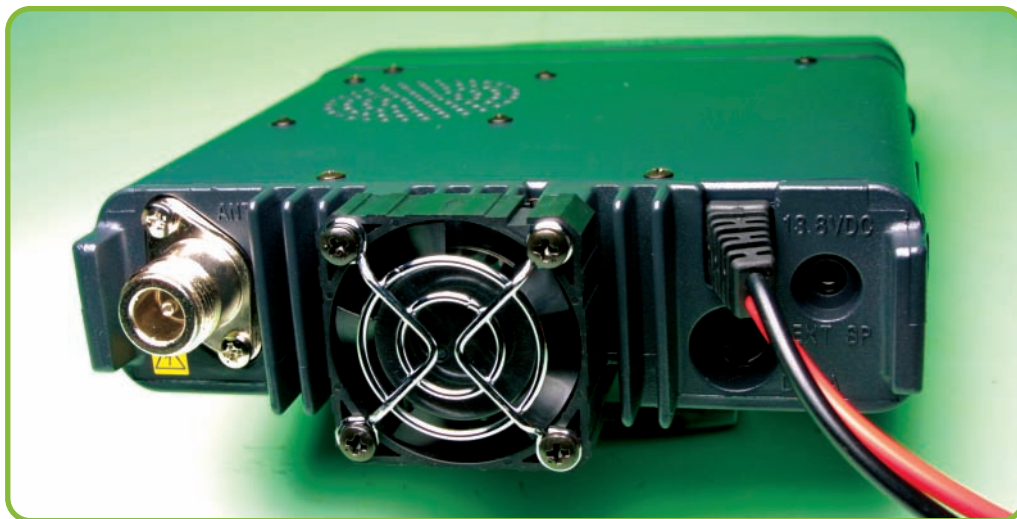
For example, if you only do a limited amount of operating in the u.h.f. band, but have many frequencies that interest you in the v.h.f. band, you can reduce the memories available for u.h.f. This then increases the amount available in v.h.f. or vice versa.

The FT-7100M also shares

The first thing you see when you turn the rig on is the superb display, the voltage is momentarily displayed on the sub band portion of the display. A useful little feature that can be quite a shock in the car until you run the engine!

## Club Station

Having not had much luck working mobile and working through our local repeater **GB3SC**, I decided to take the Yaesu FT-7100M along to my club in Blandford Forum in Dorset. The antenna installation there comprises of a 5/8 over 5/8 vertical for the



● Richard GORSN comments that the Yaesu designers have even managed to make the integral cooling fan look as it really is integral! (See text).

144MHz band about 10 metres up a mast. The location is about 61 metres above sea level.

A friend and colleague of mine, **Bob Knight G6DZM**, put the FT-7100M through its paces. He called my father-in-law, **Terry Wood G7VJJ** on an arranged schedule. Terry lives in Bournemouth - about 23km away from the club. Bob spoke to Terry using the 5W setting and Terry gave us a good signal report.

Terry mentioned that there seemed to be something a little strange with the transmitted audio from the Yaesu FT-7100M. He went onto describe

and found a QSO just ending on a simplex frequency. I called **Frank Lobban G4JQW**. Frank was located in Poole, about 25 km away from us.

Frank gave us an excellent signal report but then mentioned that he thought there may be a problem with our audio. Once again it was a report stating it seemed “overdriven and clipped, in some instances almost distorted”, he suggested that it might be r.f. feedback. Concerned it was the set-up at our end we put the club rig, an old Icom 290 in place of the FT-7100M.

deal of time helping us out with reports so a big “Thank you” goes to G4JQW.

## Impressive Receiver

Although we tried to get more reports, the band was very quiet. So we decided to see what the Yaesu FT-7100M would do on receive....and boy was I impressed!

I tuned the Yaesu FT-7100M to the low power local information service frequency for Bournemouth International Airport on 121.950MHz. And although I’m uncertain what the output power of this transmission is...I used to live about 5km from the airport and some hand-held receivers would struggle to hear this transmission from there. Imagine how amazed I was when at a distance of approximately 26km the FT-7100M burst into life and we were listening to the departure information.

Considering that the Airband signal was in a.m. and the distance we were away from the source, the signal strength and audio quality was very good indeed. Spurred on by this success I then tuned round and had some excellent results with local u.h.f and v.h.f. frequencies.



● In his review of the FT-7100M GORSN remarks on the size and clarity of the main tuning display on the transceiver (Seen here on trials at Richard’s club, near Blandford Forum in Dorset).

that it sounded a little “overdriven”. Bob tried holding the microphone further away from him but this did not seem to make much of a difference.

I took on the microphone

Frank reported that the club rig had wonderful audio and was much better in comparison to the Yaesu FT-7100M. Frank, who was just going off the air when I called him, spent a good

**The Yaesu FT-7100M quickly proved itself to be an excellent receiver.** It even seemed to cope well with pager and similar interference...no matter what antenna it was



● Operating from their club station in Blandford Forum - Bob Knight G6DZM (sitting) and Richard GORSN put the Yaesu FT-7100M through its paces (see text).

connected to. As far as its receive capabilities were concerned it seemed to impress the club's top s.w.l. **Terry Bain 2E1EJC** and that's no mean feat, believe me!

## Pleasure To Operate

I was now feeling much better about the Yaesu FT-7100M, it had proved itself a pleasure to operate and a very impressive receiver. However, I was still concerned over the reports I'd received on the transmitted audio.

So, to get some answers I decided to employ the use of a shack that had been tried and tested on previous reviews. Yes...it was time to ask my father-in-law Terry G7VJJ for the use of his facilities once again!

We set up the Yaesu FT-7100M in his shack and attached it to his W2000 Tri Band antenna covering the 144, 50, and 430MHz bands. Although we did try for contacts on the 430MHz, this band is very quiet in our neck of the woods and our efforts were in vain.

However, **Phil G3XBZ** in Poole returned my call on 145.5MHz. Phil was operating an old Kenwood hand-held with its own helical antenna, sat on the top of a power supply in his

shack. He was running about 5W and we reduced our output to match his. We both gave each other very favourable signal reports.

Phil was about 5km away from us and I was delighted when Phil said: "It's got good powerful audio Richard, crisp and clean"...then came the sting in the tail..."but I think you are speaking too close to the microphone as it's clipping rather". But in actual fact **I was being very careful** where I was holding the microphone, it was almost at arm's reach!

Terry then took the microphone and had a chat with Phil, and this time Phil reported that the clipping had become worse! However, he did go onto say that the problem with the audio did not detract too much from the contact, and it was quite adequate to have a chat.

Having had a very enjoyable QSO with Phil we were called by **Gil 2E1HUJ**. Gil was mobile in a village called Three Legged Cross, about 8km away from us and was trying out his brand new Kenwood hand-held connected to a Comet mobile whip. Considering he was only running his 5W...Gil was a huge signal with us (end stopping on the meter in fact).

Gil gave us a very good

signal report. At the end of another very enjoyable contact I asked him to give his opinion on the audio from the FT-7100M. Without hesitation he reported "Well the audio was not as pure as it could have been".

My faith in the receive side of the Yaesu FT-7100M was further underlined when we were called by (a now well established and trusted radio acquaintance) **James 2E1EMK** in Pewsey in Wiltshire. At a distance of about 70km James was by far the furthest contact I'd achieved using the Yaesu FT-7100M.

James commented immediately on the audio, having heard the previous conversation with Gil. "It's not too bad up here Richard, as I'm running my Yaesu FT-100 though, perhaps they like talking to each other"!

James has given me reports in the past and therefore was able to provide a good comparison. He also told me that the audio from the FT-7100M was not the best he had heard, but wasn't too bad. He reported: "It's a bit topky, you've got a bit of sibilance there".

Sibilance eh! My first thought was that I hoped it was not catching and that modern medicine had a cure. But looking at a dictionary I was soon able to establish that it has several meanings, these seemed to be; "shutting off or shyness" and also there was a reference to "sickness". **(Please see comment panel (right) with a reply from Yaesu UK Ltd.)**

## Mobile & Shack Use

Having used the Yaesu FT-7100M both mobile and in the shack I would say that on the whole it performed well. It's a well-made, sturdy unit. It's also simple and easy-to-use, but also enjoys some excellent features. I was also extremely impressed with the receive performance of the rig.

While using the Yaesu FT-7100M I had great fun listening round the bands. I also had some enjoyable contacts, meeting some old friends and making some new ones on the air, and that's what it's all about is it not?

PNW

### On seeing a courtesy copy of the GORSN review Paul Bigwood G3WYW, from Yaesu UK commented:

"Thank you for giving me the opportunity to comment on the review of our new FT-7100 Transceiver.

I was very concerned with the comments about the audio quality when working through the reviewer's local repeater and via simplex, and had our engineers check the deviation and speech quality of the sample when we got it back. They reported no problems and so I took it home to check out myself.

I was able to check it out thoroughly, as the testing coincided with me having a few days off work with an injured back. I did get one report of sibilant distortion when working through my local repeater GB3NE after I had asked for an audio quality report, but not when working on the 430MHz repeater GB3AW or 144MHz GB3RD. I changed the microphone just in case, but no difference was noticed. It was then that I checked the manual & saw that the radio has wide and narrow deviation settings! (GB3NE is a 12.5kHz deviation repeater and the transmit deviation was set to the wide position, corresponding to 25kHz. I was obviously over deviating the transmitter when working into GB3NE, but not when working into the other repeaters. Subsequent checking in the lab showed that is possible to over deviate the radio by speaking either too close to the microphone or too loudly and this can cause the sibilant distortion. I found that holding the microphone about 6in from my mouth, and speaking at a normal voice level was perfectly satisfactory". **Paul Bigwood G3WYW Project Sales Manager Yaesu UK Ltd.**



**Rob Mannion  
G3XFD - didn't  
need asking twice  
to visit his home  
county of  
Cornwall...  
especially when it  
was to join in the  
centenary  
celebrations of  
Marconi's great  
Transatlantic  
wireless triumph in  
1901. He also met  
the great man's  
grandson....what a  
great day it was!**

**T**he Lizard peninsula is known for its windy weather and mists - especially in December, but I'm delighted to report that the 12 December 2001 was an absolutely perfect day for the very special 100th year celebrations of Marconi's triumph in spanning the Atlantic in 1901.

Indeed, it was fortunate that the weather was so good because the number of visitors attending (other than the official guests) far exceeded expectations - and with seemingly hundreds walking up the hill from the Poldhu Cove car park (plus those using the free mini-bus service) I would not be surprised to have heard that well over 2000 people attended during the day.

### New Building

At the top of the hill, only a 100 or so metres from the old Poldhu Hotel (now a residential nursing home) an attractive new wooden building ('Very green in contemporary terms as it's been designed to blend in with the scenery) awaits the visitors.

Alongside - for the day only - was a huge marquee which withstood the steady, very cold, breeze very well whilst the official opening ceremony was held. Speakers from BBC Radio Cornwall (who now have a massive website with much on the Marconi event on [www.bbc.co.uk/cornwall](http://www.bbc.co.uk/cornwall)), the National Trust, Poldhu Amateur Radio Club then presented speeches on the event.

Representing the Duke of Cornwall (H.R.H. Prince Charles) who was unable to attend this

● The new Poldhu Amateur Radio Club headquarters on the 12 December 2001, a stunningly beautiful day, exactly 100 years after Guglielmo Marconi's one-way transatlantic wireless telegraphy transmission. (All photos by G3XFD).



### BUCKINGHAM PALACE

**Her Excellency the Governor General of Canada  
and the people of Canada.**

One hundred years ago, on 12th December 1901, Guglielmo Marconi successfully transmitted the first wireless signal across the Atlantic. He believed, contrary to contemporary scientific opinion, that radio waves would follow the curvature of the earth. This first wireless signal consisted of three dots - Morse code for the letter 's' - and was sent from Poldhu in Cornwall to Signal Hill in St. John's Newfoundland.

Those early experiments quickly led onto the development of broadcast radio, television, radar, satellite communications, mobile 'phones and many other innovations. Every major step along the way has resulted in better, more effective communications between people all over the world.

As we celebrate Marconi's great achievement of 100 years ago, I am pleased, as Queen of both Canada and the United Kingdom, to send you the most cordial greeting and wish you all prosperity in the twenty first century. We all know that electronic communications will continue to improve our lives in way it is difficult to imagine today.

**ELIZABETH R.**

**12th December, 2001**

● This is the text of the message read live over the air from Poldhu (on the 14MHz Amateur Band) to St. John's, Newfoundland. Reception - both ways - was superb 'Armchair' copy both ways and the sentiment and goodwill in the atmosphere at both ends of the QSO was tangible. A memorable moment for all - especially when Lady Mary Holborrow - using a 'straight' Morse key sent the letter 'S' in Morse to mark the centenary.



● Lady Mary Holborrow, The Lord Lieutenant of Cornwall (centre) represented the Duke of Cornwall (unable to be present on the truly historic day) with Guglielmo Marconi, grandson of the great wireless pioneer, to her left. Standing to Lady Mary's right is Carolyn Rule MOADA, the main organiser and motivator for the whole project, representing the Poldhu Amateur Radio Club.

most important historic event, **Lady Mary Holborrow**, the Lord Lieutenant of Cornwall took his place in a delightfully friendly and informal manner. Her jokes and charms made the beautiful day seem even brighter!

Introductions and speeches over, Lady Mary then cut the ribbon to declare the building open. Only (literally) finished days before - it comes complete with Amateur Radio stations, special displays and many historical photographs, exhibits and a great deal to interest

visitors ranging from casual to the licensed Radio Amateur. **You must visit it** - you won't be disappointed!

## Special Greetings

Under the supervision of **Carolyn Rule M0ADA** and husband **John G0JVR**, Lady Mary sent a greetings message (reproduced separately on page 28) to **VO1S**, operated by the **Society of Newfoundland Radio Amateurs (SONRA)** St. John's in Newfoundland. All went



● A very brief pause at GB100GM for the photographer! The station was much in demand and greeting messages were received from notable people, including Sir Bernard Lovell, and also from the special event station at the Crookhaven (Irish Republic) station, another of the famous Marconi historic sites.



● Committee members of the Poldhu Amateur Radio Club photographed accepting the donation of a Palstar 50A power supply given by Mike Devereux G3SED of Nevada, who was unable to attend and entrusted it to G3XFD to deliver!

successfully - including the transmission of the three dots for the S (Rounds of applause for Lady Mary - a complete radio 'novice' operating the key).

Meanwhile the special event h.f. stations were operating using Kenwood TS-570D transceivers (one donated by **Kenwood**, and the other by the **Radiocommunications Agency**) were extremely busy. I even had a short time operating on 7MHz where I was delighted to receive goodwill messages from **Sir Bernard Lovell** - the Radio Astronomer - and also managed to work the Irish Special event station working from Crookhaven

including our own ATV men making a documentary!

## Celebratory Dinner

The Centennial Dinner took place at the Polurrian Hotel in Mullion the same evening with around 150 guests attending and enjoying a sumptuous meal - accompanied by a professional pianist who ended up playing requests for myself and Gordon Bussey (Author of *Marconi's Atlantic Leap* - who was a delightful dining companion!)

However, the evening speeches and bouquet



● Carolyn M0ADA, husband John G0JVR audience (and broadcasters...note 'hamsters on sticks' microphone booms) listen to the historic messages greetings being returned from St., John's Newfoundland.

presentations were eclipsed for me when **Barry Maxwell** of the Radiocommunications Agency presented young

in Eire, another of Marconi's historic sites. A proud moment for me bearing in mind my 'Irish Whiskey' callsign!

It all seemed chaotic at the time...with what seemed to be hundreds of TV news cameramen and news hounds about...

Guglielmo Marconi with a copy of the December 2001 'Marconi' Special issue. What a day, what an evening and what a lump I had in my throat when I was in the presence of Marconi's grandson. A great privilege indeed!

PW



● Barry Maxwell, Director of Customer Services of the Radiocommunications Agency, presents a copy of the 'Marconi Special' (December 2001) edition of *Practical Wireless* to Guglielmo Marconi, with the centre-page special pull-out poster displayed.

# The CAPACITOR VET

Donning a white coat and stethoscope, Ron Harris GW8DUP, presents his Capacitor Vet to check over all those electrolytic capacitors that are lurking in the junk box. You can verify their condition and their capacity all with his simple machine.

I'm rather a hoarder and can't resist bargains, that's why I have a drawer full of various electrolytic capacitors. My condition is so intense, I even have some 50 year old valved radio types!

The quality of electrolytic capacitors weakens with long periods of disuse. It's even more severe in the case of the high voltage or older types so much so, that it would be most unwise to simply reconnect and 'switch on'. The capacitor and other components could easily come to a 'sticky end!'.

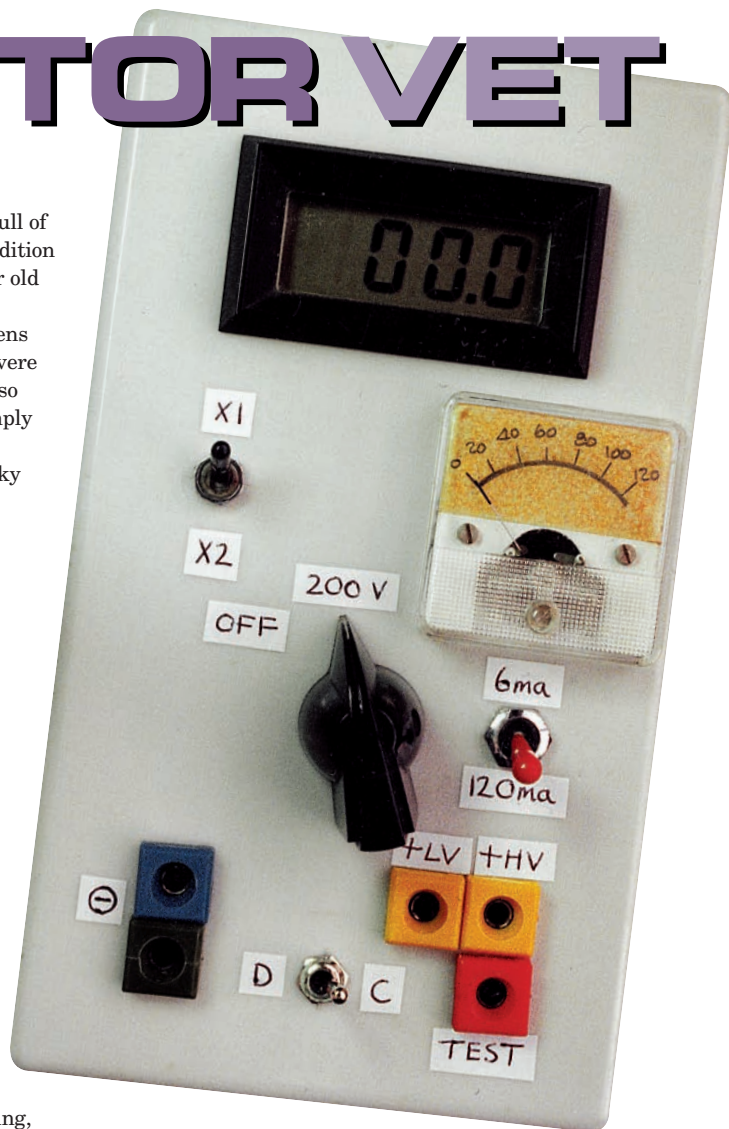
What's required is a means of testing and then possibly rebuilding the oxide film dielectric layer under controlled conditions (reforming). Hence my 'Capacitor Vet'. A simple device to do all of this.

## High And Low

As I needed to deal with both low and high voltage types, I felt that the design would be more useful if it had two ranges of polarisation voltages available, say 50V and 400V d.c. These were supplied by convenient transformers and rectifiers that I had available. As fully electronically variable supplies are quite complex, I opted for the electrical solution using a Variac (a special variable tapped transformer) feeding the primaries as shown in Fig. 1.

Apart from monitoring charge voltage and current also leakage current after charging, there was need to estimate the capacitance after reforming. Modern 'computer grade' capacitors are often 30,000µF or more, which is usually above the limit of standard Bridges/Meters.

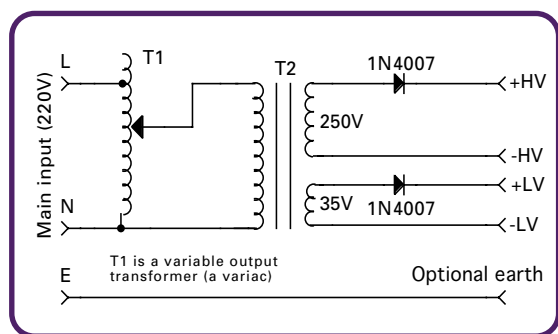
I made use of the 'Time Constant' formula, i.e.  $T=C \cdot R$ . Where T = time in seconds to charge to 63% or discharge to 37% of full charge voltage. C = capacity in microfarads and R = resistance in megohms. Using a discharge resistor of 1000Ω, the number of seconds to discharge to 37% will give the capacitance in thousands of microfarads, e.g. 30secs = 30,000µF.



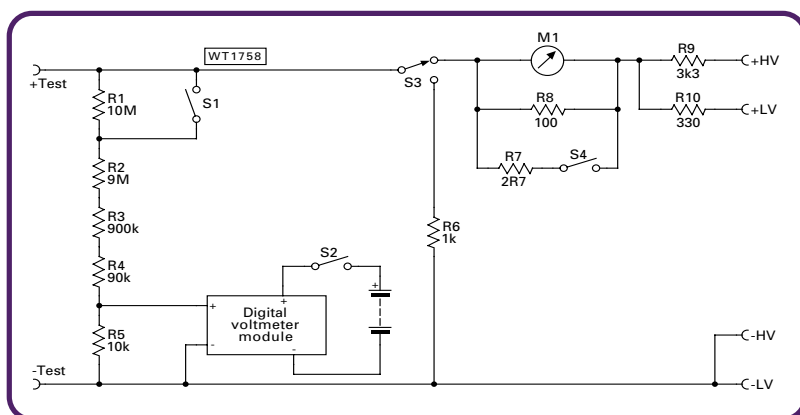
## Circuit Diagram

The circuit diagram of the Capacitor Vet is shown in Fig. 2. The capacitor under test is connected to the test terminals, the voltage across which is measured by the digital voltage module (d.v.m.). This is in reality a battery operated module with a basic sensitivity of 199.9mV.

Scaling resistors R2-R5 give the d.v.m. set-up the ability to read up to 0-199.9V. Switch S1 in the



● Fig 1: Ron suggests that a variable output transformer (T1) or Variac is a suitable means of getting variable output voltage from nothing to over 400V.



● Fig. 2: This is the simple circuit of the Capacitor Vet.

resistor chain, adds the facility to read 400V when in circuit across the chain.

The polarising d.c. is derived from a very simple external transformer and rectifier, which is fed from the a.c. mains via a Variac. Note, there's no need for the conventional reservoir/smoothing capacitor as this function is provided by the capacitor under test.

The d.c. is connected via the Input terminals (LV or HV) with the appropriate current limiting resistor (R9 or R10) to M1 which has a 1mA movement but is configured as a 5mA unit by shunt resistor R8, which is sufficient for checking leakage current.

Shunt resistor R7 is switched by S3 to increase the meter scaling to 150mA protecting it from charging pulses and possible short circuits in the test capacitor. Switch S4 is normally set to charge the capacitor via M1, but can be changed over to discharge via R6, not only for safety, but also to estimate capacitance.

## Layout & Construction

The photograph, **Fig. 3**, gives a good general idea of the layout and construction, which is quite straightforward. The plastic case provides excellent insulation and is also very easy to drill, etc. There is no printed board so simple 'point to point' wiring is fine. No prize for spotting the rotary wafer switch in the middle of the box! I reused a previous DMM Project, which had been gathering dust for some time. I just added the extra 'bits' one weekend!

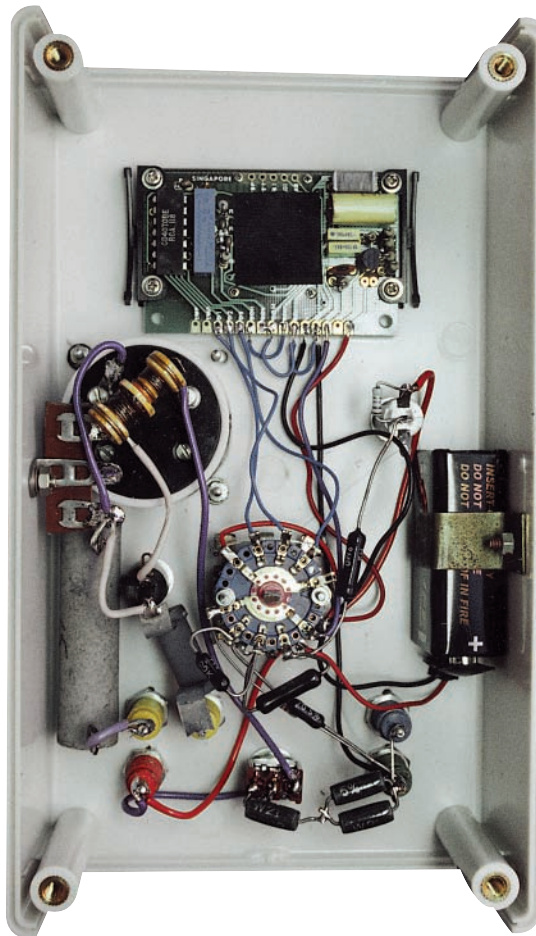
## Transformer Choice

Transformer choice is really a function of ingenuity and the size of the 'spares' box! However, there are a number of guidelines. Charging current need not exceed 20-30mA, so small units are ok. When the test capacitor is fully charged, the only current drawn is due to the leakage (usually <1mA), so that the voltage available is very near to the peak value of the a.c. output of the transformer under 'No Load' conditions, ie. considerably higher than you might have expected!

**Safety Warning!** A Variac transformer is an 'Auto-transformer', i.e. has one continuous winding so that the output terminal is **not electrically isolated from the a.c. mains**. It must always be treated as an extension of the mains. Remember that the Variac can boost the mains to around 270V.

## In Use

In this semiconductor age we have grown accustomed to supply rails of only a few tens



● Fig. 3: Small and simple, the Capacitor Vet may be laid out to suit the available box.

of volts. And although we are well aware of the dangers of the a.c. mains, it is quite easy to forget that the d.c. side of valve equipment is all hazardous and make a serious mistake.

Switch S3 is normally left closed until leakage current measurement is required and should always be returned to the closed condition afterwards. Constructors may prefer to use a push-to-break switch to avoid mistakes!

**Further Warning:** A fully charged 100,000µF 'Computer Type' makes a rather good 'Spot Welder' (as many a test prod will testify!), so please take care and adopt a simple 'Safe Working Procedure', as follows:

- 1) Equipment properly earthed.
- 2) Test capacitor placed on a safe, stable surface.
- 3) Connect/Disconnect Only when 'Off'.
- 4) Cover all exposed terminals.
- 5) Set Variac to Zero before switching 'On'.
- 6) Do not leave unattended.
- 7) Discharge capacitor before removing them from the Vet.

## Reforming Slowly

Reforming a capacitor is basically a slow careful process. The applied voltage is gradually increased while checking that the charge current remains low (20-30mA) and

tapers off as charge builds up. It's a good idea to allow the capacitor periods of time at part charge so that the oxide film can stabilise before raising voltage again.

Always be prepared to switch off if there is a sudden increase in current, or even a 'Short'. Once the capacitor has been stable at full rated voltage for a period, the capacitance can be checked. Simply move S4 to D (Discharge) and note the number of seconds taken for the voltage to fall to 37%, i.e. for a 40V capacitor = 14.8V, this gives an approximation of the capacitance in 1000's of microfarads. ((Note: manufacturing tolerance is usually +50% of marked capacity).

## Diode Tests

I have found the 'Vet' very useful for diode tests, such as checking the peak inverse voltage rating (p.i.v.) of diodes/bridges which have unfamiliar or unmarked diodes. Note: Now the d.c. supply will require a small value (8µF) capacitor to provide charge storage.

The rectifier d.c. + and - terminals are connected to the corresponding test terminals and with S3 set to 5mA, the applied voltage is gradually raised. M1 will remain at zero until, eventually, a tiny deflection will be seen. The voltage at this point will be very close to the p.i.v. rating. If a small further increase (even 1V) is made, M1 will sharply increase deflection. Do not continue as excess reverse current could damage the rectifier.

The 'Vetting' process is simple and safe! *PW*

### Shopping List

#### Resistors

<i>Wire-wound 3W 5%</i>		
2R7	1	R7
100	1	R8
330	1	R10
1k	1	R6
<i>Wire-wound 12W 5%</i>		
3k3	1	R9*
<i>Metal film 1%</i>		
10k	1	R5
90k	1	R4
900k	1	R3
9M	1	R2
10M	1	R1

\*May be made up of four times 3K3 3W (ww) in series/parallel

#### Miscellaneous

Meter (1mA 400Ω Maplin RW94C), DVM Module (Maplin GW01B) Switches four off (SPDT), a suitable plastic box, and for the d.v.m. module you'll need a 9V battery and connecting lead.

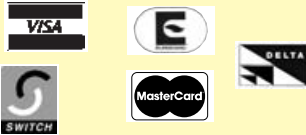
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G-450C Rotator light duty CE c/w control box & 25m cable RRP £379 .....**RWP £325.00**

G-650C Rotator medium duty CE c/w control box & 25m cable RRP £499 .....**RWP £425.00**

**OPTIONS**

- GC-038B Mast clamp (brown) .....**RWP £25.00**
- GC-038G Mast clamp (green) .....**RWP £25.00**
- GC-048 Mast clamp for G-2800SDX .....**RWP £39.00**
- GS-050 Stay bearing (small type).....**RWP £29.00**
- GS-065 Stay bearing (medium type)....**RWP £45.00**

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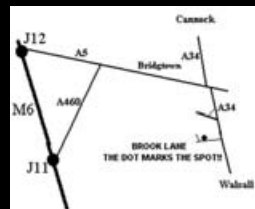
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AKD	4001	4m TRANSCEIVER	£130	ICOM	UT-84	TONE SQUELCH UNIT	£25	TAGRA	22AMP POWER SUPPLY	£70
AKD	6001	6m FM TRANSCEIVER	£135	ICOM	IC-2SET	2M HANDY	£89	TENTEC	SCOUT + MODULES	£30
ALINCO	DJ-580E	270CM HANDY TRANSCEIVER	£140	ICOM	IC-R71E	RECEIVER	£399	TIMEWAVE	DSP-9+	£125
ALINCO	DJ-G1	HANDY TRANSCEIVER	£120	JRC	JST-245 DSP	HF 50MHz 1500w AC BASE TRANSCEIVER	£1,295	TOKYO HY-POWER	HL-30V 2M and 25W AMPLIFIER	£75
ALINCO	DJ-G5EY	DUAL BAND HANDY RECEIVER	£199	JRC	NRD-535	HF RECEIVER	£600	TOKYO HY-POWER	HL-37V LINEAR AMPLIFIER	£60
ALINCO	DJ-X1	RECEIVER	£90	KANTRONICS	KAM PLUS	TNC	£220	TONNA	7000E	£130
ALINCO	DJ-X10	WIDE BAND RECEIVER	£275	KENWOOD	DFC-230	FREQUENCY CONTROLLER	£70	TRIO	R-2000	£300
ALINCO	DR-140	2M MOBILE TRANSCEIVER	£120	KENWOOD	PS-20	10A POWER SUPPLY FITS TR-9130 ETC	£55	TRIO	TR-9130	£250
ALINCO	DR-150E	2M 50W MOBILE TRANSCEIVER	£140	KENWOOD	PS-430	POWER SUPPLY	£100	TRIO	TRIO 9130	£250
ALINCO	DR-M06	6M FM TRANSCEIVER	£160	KENWOOD	PS-50	POWER SUPPLY	£145	TRIO	TS-780	£275
ALINCO	DR-M065X	6M 10Watt MOBILE TRANSCEIVER	£140	KENWOOD	R-5000	RECEIVER	£499	WELZ	AC-38M	£50
ALINCO	EDX-1	ATU	£140	KENWOOD	SP-950	LOUDSPEAKER	£90	WELZ	SP-15M	£20
AOR	AR-1500	HANDY SCANNER 0-1500M /72	£99	KENWOOD	SW-2000	SWR METER	£60	YAESU	FC-102	£200
AOR	AR-3000	WIDE RECEIVER	£350	KENWOOD	TH-22E	2M HANDY TRANSCEIVER	£89	YAESU	FC-20	£175
AOR	AR-3000A	WIDE RECEIVER	£475	KENWOOD	TH-25E	HANDY TRANSCEIVER	£49	YAESU	FC-902	£140
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AOR	AR-3030	HF RECEIVER	£399	KENWOOD	TH-75E	270 HANDY TRANSCEIVER	£125	YAESU	FP700	£100
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DAIWA	CN-540	SWR & PWR MTR	£30	KENWOOD	TS-120	HF SOLID STATE MOBILE	£225	YAESU	FT-23R	£180
DAIWA	CN-630	SWR & PWR MTR	£40	KENWOOD	TS-450S	HF TRANSCEIVER	£499	YAESU	FT-2500M	£190
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DATONG	FL-2	FILTER	£60	KENWOOD	TS-530SP	HF MAINS 100Watt TRANSCEIVER	£275	YAESU	FT-290Rmk11	£180
DRAKE	MN7 ATU	300 WATT INPUT	£140	KENWOOD	TS-680	HF 6M MOBILE/BASE TRANSCEIVER	£400	YAESU	FT-411E	£99
DRAKE	R7	HF RECEIVER	£550	KENWOOD	TS-690SAT	HF 6M Inc ATU	£650	YAESU	FT-41R	£120
DRAKE	R-8E	HF RECEIVER	£499	KENWOOD	TS-711E	SM BASE STATION TRANSCEIVER	£399	YAESU	FT-470	£140
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ICOM	IC-275H	2m MULTIMODE 100W TRANSCEIVER	£575	KENWOOD	VS-1	VOICE SYTHESISER	£30	YAESU	FT-7400	£160
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ICOM	IC-728	HF TRANSCEIVER	£399	KENWOOD	YK-88S-1	2.4KHz SSB NARROW FILTER 8.83MHz IF	£40	YAESU	FT-7B	£199
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ICOM	PS-15	20A POWER SUPPLY FITS ALL ICOM	£110							
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ICOM	R-75	HF RECEIVER	£400							
ICOM	SP-20	SPEAKER	£120							
ICOM	SP-21	LOUDSPEAKER, BOXED	£55							

# Henryk Kotowski SM0JHF tells how international friendship wins through in his local Amateur Radio club situated in Kvarnberget, just outside of Stockholm in Sweden

● Fabian DJ1YFK pictured at the club's site.



**O**ur world has become smaller but not safer. Conflicts and hatred have reached a level that not many people living today have experienced themselves.

Is it the solar activity that influences humans to fight against each other? However, this story is not about peace talks or final confrontation but about International friendship.

North of Stockholm in Sweden there is a secluded place where international friendship thrives in spite of the sun spots, differences in language, mentality, religion, profession, age, background and whatever else one can use as an excuse to hate others and struggle for. This place, called Kvarnberget, is a hill with an impressive Amateur Radio club station.

Hidden in a sea of pine and birch trees, Kvarnberget is not easy to find. Even though it's already very well known in Sweden and quite well known in other countries.

● Maciek SQ9DDD.



unique too. There are nine antenna towers supporting some extraordinary arrays for almost all frequencies available for use by the Radio Amateurs in Sweden.

Originally, in the 1960s the club site was a microwave propagation research station but when the radio club was founded, towers and Amateur antennas were erected. There is still space on the site for more and I am sure a lot of new equipment and antennas are already being planned.

## International City

In the past 20 years Stockholm has become a truly

The Kvarnberget radio club is unique in many ways. There are over 40 paying members, but around ten times more Amateur Radio operators from the Stockholm area also have access to the facilities through their supporting clubs.

The facilities and the club are



● David WB6RAB/SM0XEU operating the rig while Martin OK1FMD/SM0WYB closely watches..

international city. Not only has there been an increasing number of short and long-term visitors, but also a steady stream of immigrants entering Stockholm from all over the world. These immigrants have help to create an atmosphere typical for multi-cultural multi-ethnic cities of the 21st century.

Looking through the members' list of the Kvarnberget radio club depicts the trends of visitors. Many of the members are long-term visitors, with many work in Stockholm. Quite a few are immigrants who have settled in Sweden themselves. Several are so called 'second generation' immigrants in that their parents migrated to Sweden.

Some of the club members have experience of living abroad for longer periods and have their own, first-hand knowledge of how it feels to be a

# East Meets West in The North

'foreigner'. For example, the v.h.f. and u.h.f. wizard of the club **Per SM0DFP**, spent a few years in Far East and has been quite active from Malaysia as 9M2FP; Australia as VK8FP as well as several other places.

The master antenna designer of the club, who is responsible for the huge h.f. quad arrays is **Waldemar SM0TQX**, who was previously SP5DZJ in Warsaw, Poland. The best contest operator in the club is

28MHz, before flying off again to the airport and back to Paris in a matter of half a day!

People travel a lot nowadays and I do it, too. I find it enlightening to be able to meet local Amateur Radio operators in person, learn something about their reality, their problems and their solutions!

I still consider a radio contact as a substitute for a personal encounter. All the book keeping, DX entities, contest points are of secondary value for me. A radio contact is so easy today.

The extremely advanced equipment put at our disposal, larger and better antennas, computers and the Internet assisting us in everything, all of it makes a standard '5 & 9' or contest exchange actually



● Kamal 4S7AB.

## Something for Everyone

Some of our members are ardent h.f. contesters, others consider anything under 1GHz as d.c. some will design multi-element arrays while others can't get a simple dipole to work properly! And others can apply the latest computer technology and others still don't know the difference between the front and the back of any directional array. There is room for everyone here - young and old, modern and conservative, black and white, rich and poor.

The long tradition of Swedish tolerance and hospitality, experience in solving international disputes, helping the needing and spreading the welfare, all of it bears fruit in the Kvarnberget club.

I am sure I have not listed all factors contributing to this unprejudiced openness, impartial approach to fellows of the Amateur Radio global community. I just wanted to open the eyes of *PW* readers and maybe stimulate others to follow in the steps of the Kvarnberget gang.

Obviously, no group of people is totally homogeneous. It can happen that some members won't say "hello" to you or will never accept you as a fellow Amateur Radio operator because of your accent or place of birth.

It would be untrue of me to say that that everything always runs smoothly in the club. No society is free of prejudice, stupidity and ignorance. It happens that immigrants hate (most of all) other immigrants, stupid people hate the bright ones, etc. The pictures here show a few of recent visitors from other countries, other continents.

I can honestly say that I know of no other Amateur Radio Club like Kvarnberget, which draws like minded fellows from around the world - it truly is a case of East meeting West in the North!

*PW*

### Why not Visit?

If you are thinking of planning a trip to Stockholm, why not arrange to sample some of Swedish hospitality offered by the Kvarnberget club? To arrange a visit and find out more look at the club website at

<http://ham.te.hik.se/clubs/~sk0ux/>



● Waldemar SM0TQX is the Kvarnberget club's master antenna designer, here he demonstrates the Amateur Radio Station to Roman US5WDX.

**Carlos SM0C** who has lived in several South American countries.

## Meeting Guests

Over the years the Amateur Radio club at Kvarnberget has become a natural meeting point for guests from the East and West. It seems to have something of an almost magnetic attraction for anyone with genuine interest in Amateur Radio.

For example **Jorge LU6AF** from Argentina, while in Paris, France took a flight to Stockholm, was met and collected by one of the club members, saw the place, talked to some friends back home on



● Teemu SM0WKA, Jorgen M0AXP/OZ3CF/PA1CF and Goran SM0DRD operating from the Kvarnberget club station.

effortless and... boring. So, let us use our state-of-art clobber to make real friends, also off the air.

The joint effort in Kvarnberget by Amateur Radio operators whose various background, experience, knowledge, manners, methods and styles of practising has created a place of new possibilities and opportunities, has also created a place that conveys hope for the future. All-in-all it's something of a melting pot of what must be truly world-wide Amateur Radio.



● Carlos CX7CO and Ramon XE1KK

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C	-.-.	P	-. --	2	..---
D	-. -.	Q	-- .-	3	...--
E	..-	R	-. .-	4	....-
F	..-. -	S	...-	5	.....
G	-. --			6	-----
H	....			7	-----
I	..				
J	-. -.-				
K	-.-				
L	-. .-				
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# Discovering The Icom IC-718



● The Icom IC-718...great fun says Helen 2E0AVH!

Product	Icom IC-718 h.f. transceiver
Company	Icom (UK) Ltd
Contact	Sales
Tel	(01227) 741741

**Helen Watt 2E0AVH takes a look at the Icom IC-718 from the Novice Radio Amateur's, and busy 14-year old student's point of view on behalf of all those in the same situation, writing it up in the idiom of her age group!**

● Keen young Helen Watt 2E0AVH enjoying using the IC-718. She enjoys using s.s.b., c.w., and PSK31. (Photo G3ZBU)

I was very fortunate indeed to be chosen by the Editor to write an article specifically from the point of view of a Novice (now Intermediate) Licensee, taking a look at the 'entry level' IC-718 h.f. transceiver.

First impressions were that the transceiver was a perfect size, for a teenager's desk - 240mm length and width by about 105mm height. The tuning knob was about 50mm diameter, which is a great size and you can actually hold it and accurately tune signals!

## Really Cool!

The IC-718 transceiver's also really 'cool' because it's a nice smart black all over with a funky orange backlit l.c.d. display. And there's matching orange numbers on the numeric keypad - how groovy is that?

There aren't too many knobs on the rig - just enough to control the basics. But most things can be adjusted with the buttons of which there are 26 including power.

Now the fun started when we Dad (Alister G3ZBU) and I connected it up - we used a 12V 5.7AH lead acid battery because there's no in-built

a.c. power supply on the IC-718. Dad then erected a 7MHz dipole so we could see what we could work on that band and 21MHz.

The transceiver has a built-in attenuator and pre-amplifier, but may I just ask why they can be put on at the same time? What's the point?

We decided on 7MHz because this is the band where the signals are strongest and so any deficiencies in the transceiver would become apparent. So, everything was ready and it was switched on...but there wasn't any sound!

Dad said "Helen, why doesn't it work? There's no sound coming from it!". In reply I immediately went over and examined it - and with a slight twist of my wrist I turned the RF/squelch and Hey Presto! There was a sudden burst of life.

It turned out that the **RF/Squelch** control was a dual function. This is unlike most other receivers with squelch and an r.f. gain control that is normally left fully clockwise.

## Watt's 50W!

The IC-718 transceiver is capable of putting out 100W which is far in excess of the Novice (Intermediate) requirements, so Dad's first priority

was to adjust the power to 50W. His motto is "If all else fails, **read the instructions**"...and because there's power adjustment knob on the front panel, we decided to search through the instruction manual.

We discovered that you can use the **Set** button to change a lot of features, power being one of them. Then you just use the tuning knob in conjunction with up-and-down control. We would not have found this without the instructions - there isn't an F1 button for help (moral...**read the manual!**).

When changing power you can see numbers from L through to 99 and H. Dad set it to read 50, as he thought it would give out 50W. But (usually) wise Dad was mistaken! The battery voltage affects the output; and you really need an accurate external power meter (although we found that the values are not far off those quoted).

## On The Air

Next we went on the air; I contacted YT6A (Yugoslavia, with 5+9 reports both ways. I also heard a Scout station from Operate (Portugal). The next weekend I did some operating on 21MHz in a CQWW phone contest and worked from Canada to Russia at about one QSO a minute!

Then my friend **Richard Gale 2E0AVG** had a go and contacted 11 countries, got 25 QSOs and 7 CQ zones. Then Dad had a go and got 24 contacts and seven CQ zones.

The 2E0 callsign caused a lot of grief because many people couldn't understand it and didn't even know what country it was! However, the further away we worked, the easier it became and one American commented that Richard had a "very neat" callsign"!

After that, the next weekend, the Club Calls contest was taking place on 'Top Band'. Here I

worked 29 stations in just over an hour, six of them were club stations.

Richard then took over and got 14 QSOs, eight of which were club stations. Dad then had a go and got 23 in 48 minutes. Many people stopped briefly during the busy contest to say how good the quality of our signal was.

Looking back...it was really good fun, and so easy to operate, you just 'turn the knob and go basically'. Richard, Dad and I all got such similar results too - Dad was bursting with pride for us!

For operation on c.w. the IC-718 has a built in electronic keyer which needs to be defeated if you use a straight key like I use. The manual had to be referred to because all else failed! I forgot Dad's golden rule) and for this you have to use a different setting, and power up the rig with the **Set** button pressed..

Dad connected the transceiver up to his laptop and received PSK31 with *WinPSKse* software and I played around with that, it was really good and I decoded a Polish station who was working **2E0RAF**. The *WinPSKse* program can decode two QSOs simultaneously by clicking the right and left mouse buttons anywhere on the audio spectrum display; try it....it's great fun. **PSK31 needs a stable receiver and there was no noticeable drift on this rig at all.**

Richard Gale 2E0AVG joined in the fun and worked some good DX with the budget-priced IC-718. (Photo G3ZBU)



As an experiment we tried to see how low it would go in receive mode and the answer is 30kHz. This allows you to receive the lowest bands, which are 73 and 136kHz.

## Small & Light

The IC-718 is so small and light it's really easily taken up the garden to adjust antenna tuning units. Even though the rig has a built in s.w.r. meter on its l.c.d. display, it didn't exactly match the results from an external meter. You have to take the readings with a pinch of salt...that's why most people seem use external meters with their transceivers...whatever make they may be.

There is an adjustable noise blanker on the rig. The default position was set at 50 (which didn't really do anything) but when turned up it effectively got rid of impulse noise. However, if it was

turned up too high it would distort s.s.b. signals, so it's a control to be used carefully.

The Icom IC-718 was great fun too and was also a very nice little rig that was easy to operate. We all enjoyed playing about with it and it was very versatile and puts out more than enough power for Novices like myself. Guess what I'm going to ask for next Christmas? Thank you Icom for loaning it to me!

## Pros & Cons

**Pros:** The Icom IC-718 was great fun too and was also very nice little rig that was easy to operate. We all enjoyed playing about with it. Very versatile and puts out more than enough power for Novices like myself.

**Cons:** No internal power supply. **And you must read the manual!**

## Price

£699.99 RRP inc. VAT

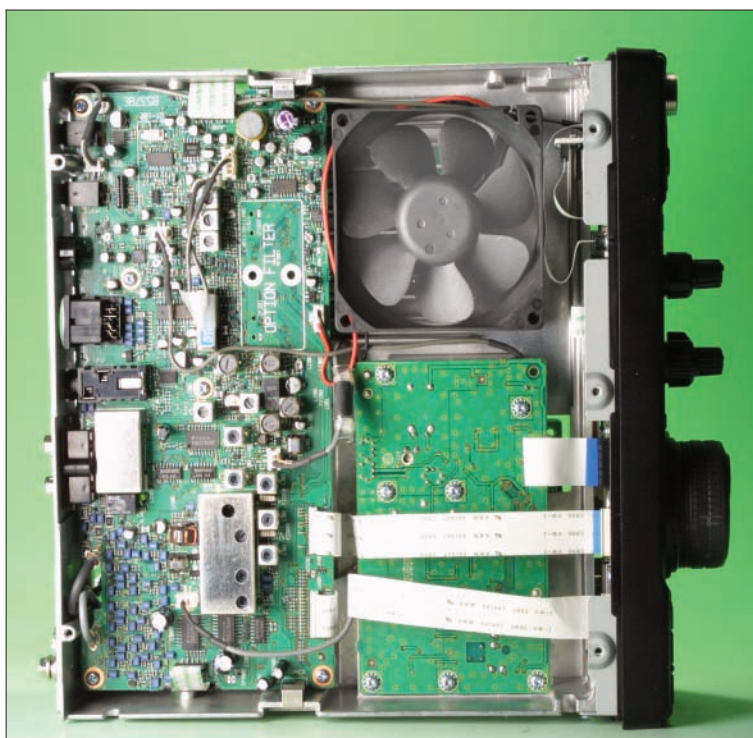
## Summary

Very versatile and puts out more than enough power for Novices like myself.

## Thanks

My thanks for the loan of the review transceiver go to **Icom (UK) Ltd., Sea Street, Herne Bay, Kent CT6 8LD. Tel: (01227) 741741, FAX: (01227) 741742. E-mail: info@icomuk.co.uk**

Dad, Alister G3ZBU provided the antenna erecting expertise and support for daughter Helen and also enjoyed using the IC-718 too!



Small and light it may be (no internal power supply) but the IC-718 is no light-weight performer and is well equipped with good heat-sinking and cooling.



Rear panel view of the IC-718.

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# Finding Field Strength The Sim

Gordon King G4VFFV takes a breather from preparing his Looking At series to present a useful little instrument - the field strength meter, which we should all have in our shack.

It's convenient and important to be able to monitor the signal field in and around the shack and QTH arising from radiated r.f. This can be done definitively, though expensively, by means of a sensitive and accurately calibrated commercial field strength meter (FSM), or less accurately and with minimal sensitivity - though far less costly - by the simple indicator (FSI) which I'm describing here.

Let's say we're working the 14MHz band using a half-wave dipole (about 10 metres long) to which the r.f. input is 100W. At this level then the electric field strength in free-space at 14 metres distance from the antenna would theoretically be 5V per metre (5V/m), e.g.,  $100^{0.5} \times 7/14$ .

This simply means that the r.f. across a metre of space 14 metres from the antenna would have a strength of 5V. The trick is knowing how to measure the voltage!

## Too Close

If measured too close to the transmitting antenna the result will be the near-field strength. A certain distance is required for the electric (E) and magnetic (M) components of the wave to link together and form what is known as a plane wave....EM radiation then commences. (This happens when the distance is not less than two times the square of the greatest dimension of the aerial, divided by the wavelength of

the radiation).

With the 14MHz dipole example, therefore, the distance works out to 10 metres ( $2 \times 10^2 / 20$ ). This is the start of the far-field distance. (The near field is regarded as distances closer to the radiating antenna than this).

With a compressed antenna **smaller than a half wavelength**, such as a helical, frame, small loop, etc., the far-field distance **cannot be less than the radiated wavelength divided by  $2\pi$** . At 14MHz, for instance, this means that the far-field distance can never be less than a little over three metres ( $20/6.28$ ).

## Simple Device

The circuit of the simple FSI device is given in Fig. 1. It's based on a simple peak-to-peak detector circuit (sometimes known as a voltage-doubler), which connects to a sensitive moving-coil meter movement.

The detector circuit proper merely consists of two diodes and two capacitors. These are housed, along with the meter movement, in a metal case with a BNC socket at the top and a terminal at the bottom.

Basically, a peak-to-peak detector operates as follows: During negative swings of the input signal diode D1 conducts and C1 charges to a value related to the signal's negative peak.

During positive swings D1 is back-biased while diode D2 conducts and C2 charges to a value related to the signal's positive peak.

With successive half cycles C1 charge is

Fig. 1: Basic construction of a prototype. The meter resistor is not shown, but can be included inside the meter movement case or the enclosure. (The text reveals how the resistor value is calculated).

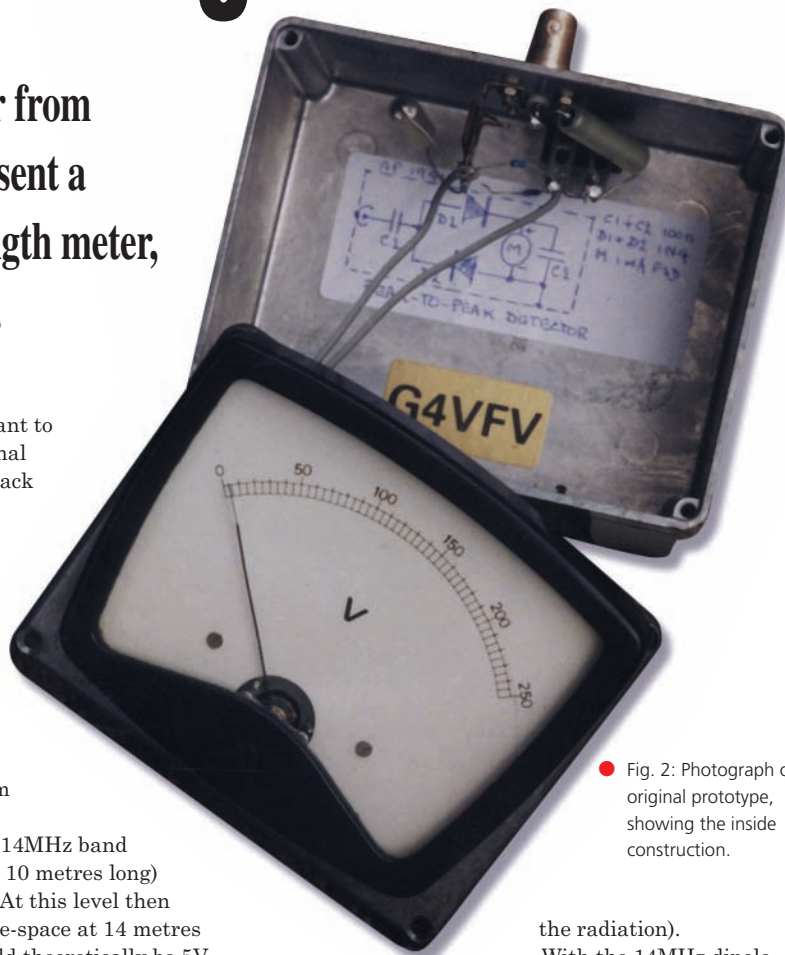
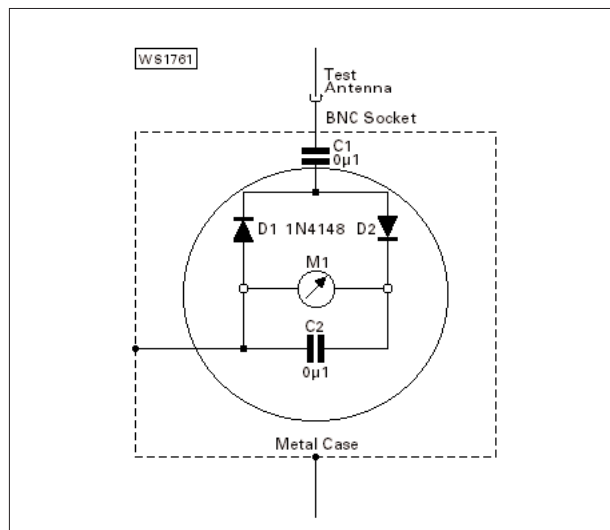


Fig. 2: Photograph of original prototype, showing the inside construction.

# ple Way!

progressively transferred to C2, so that the voltage across C2 and hence across the meter relates to the sum of the signal's positive and negative peaks.

An early prototype employed a relatively insensitive meter of around 850µA full-scale. Although this provided reasonable indications of r.f., a more sensitive movement of around 50µA full-scale should be sought.

However, since the aim is to obtain an indication of the charge acquired by C2 it's desirable to change the function to a voltmeter of the highest possible sensitivity. This is easily achieved merely by including a resistor in series with the meter movement.

For instance, to read 0.25V full-scale ( $V=0.25$ ) deflection on a 50µA ( $I = 50 \times 10^{-6}$ ) movement, the series resistor (R) should have a value of approximately 5kΩ ( $R=V/I$  or  $0.25/50 \times 10^{-6}$ ). For voltage reading accuracy the relatively low resistance of the moving coil would be deducted from the 5kΩ, but this hardly applies to the application in hand!

## Possible Switch

It would, of course, be possible to include a switch to select any required series resistor - 20kΩ for 1V full-scale (20kΩ per volt sensitivity), 40kΩ for 2V full-scale, etc. Actually, the smallest loading across C2 the better, consistent with the requirement.

In practice I've experimented with an inexpensive high impedance digital voltmeter, reading down to a millivolt or so. Frankly, I was amazed by how sensitive the readout became with such a basic circuit - from very low mains frequency to v.h.f.!

## Pick-Up Sensitivity

It will be appreciated, of course, that the effective sensitivity is also related to the nature of pickup antenna or wire used. For a good few applications a one metre wire connected to the BNC socket is likely

to be adequate.

For enhanced pickup an additional wire can be connected to the bottom terminal, serving rather like a counterpoise! To locate items 'hot' to r.f. in the shack, only a short sensing wire to the BNC socket may be all that's necessary.

## Basic Calibration

Some basic form of calibration could be explored using a metre long dipole established in a plane corresponding to that of a transmitting antenna. For example, a horizontal 29MHz half-wave transmitting dipole could be established in the garden with the FSI connected to its own horizontal one-metre wire.

Transmitter power and FSI positioning could then be arranged to provide full-scale deflection. Once established, the transmit power could be decreased in suitable steps while noting the meter deflection down from full-scale.

Of course, you'll realise that the indicator cannot be expected to compete with commercial models. It isn't meant to as it's neither particularly sensitive nor flat in frequency response.

However, this simple little device does lend itself to experimentation. This includes the addition of high input impedance front-end solid-state amplification and high impedance digital metering, as already mentioned.

So, altogether...it's worthwhile making one for your own workshop. As I've said...it's very useful!



● Gordon G4VFV demonstrating an early prototype in action in the shack (hanging on the door, left) responding to the r.f. being radiated from the short helical antenna of a 144MHz hand-held transceiver.

PW

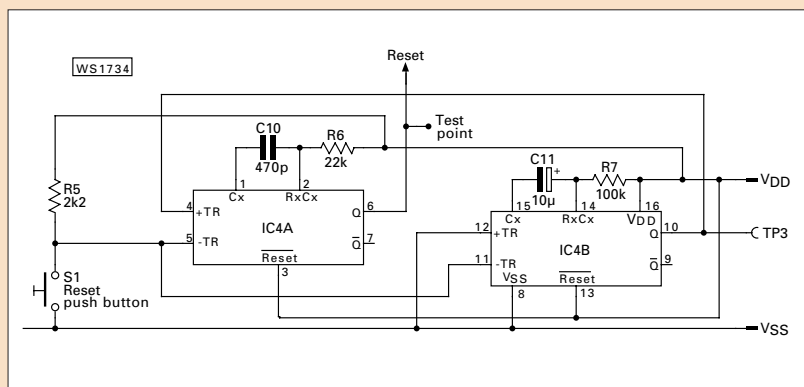
## Errors & Updates

The PW International Beacon Project Electronic Timer part 2, by **Phil Cadman G4JCP** on pages 32-35 of the January 2002 issue of *PW*.

Santa's gremlins left us with rather red faces when the wrong version of the diagram of **Fig. 3** (p34) was printed instead of the updated diagram shown here. If you would like to update the drawing in your magazine then the following additions need to be made:

- 1) The wire connected to pin 3 of IC4A should be connected to pin 13 of IC4B. These should then both be connected to the positive supply line labelled V<sub>DD</sub>.
- 2) The supply lines to IC4 do not have their pins numbers marked. Please add on to IC4B the pin number "8" to the line labelled V<sub>SS</sub>. And on the line labelled V<sub>DD</sub> please add the pin number "16".

My profound apologies for these mistakes and any inconvenience that they might have caused. **Editor**



# Antenna Workshop

**Jürgen Hemme  
HB9ANR tells  
of the day he  
saw a fellow  
Swiss Radio  
Amateur  
drilling holes in  
his brand-new  
Audi car, and of  
the lessons he  
learnt!**

If you happen to see someone with a power drill and savage looking bits approaching a new automobile, then you can be sure they means business - whether it's the owner or not! Well, the someone I saw was my colleague, Hans fitting an antenna mounting base right in the middle of his Audi's rear end.

Some time later, when I saw the completed job, a slender mobile whip rose from the boot area of the Audi. It was a shortened h.f. antenna for transmitting from the car.

"Are you sure you've drilled the holes in the right spot?" I asked...trying to tease him.

"It's an antenna designed for the 14MHz band" Hans said, beaming, "just three metres long, and it's made from a fishing rod".

Looking at the smooth outline of the antenna, it seemed to be missing something: "Where's the loading coil?" I queried. All mobile antennas I'd seen for short wave had loading coils, either at the base or at the centre - this one didn't have one at all.

## No Loading Coil

"With this antenna, no loading coil is needed," explained Hans, "look at the spiral winding: that's a helically wound antenna. It's my own design". And he started telling me about radio contacts he had made with this antenna on side-band-telephony with American Amateurs, all from his car, an Audi.

Hans is the owner of an HB9 call with a two letter suffix. I knew, that he had been in the hobby a long time. I also knew that he had studied the book *Single Sideband Principles and Circuits*<sup>†</sup> soon after it was published.

My friend Hans studied the book so well, that soon afterwards he'd built himself a shoebox sized s.s.b. transceiver. A piece of equipment which at that time was 'state-of-the-art' and that others could only dream about.

The receiver that Hans built was a single conversion superhet with 9MHz as the intermediate frequency (i.f.). The local oscillator (l.o.) tuning coverage was from 5-5.5MHz. The beauty of this combination of l.o. and i.f. is that you can cover the 3.5MHz (80m) and the 14MHz (20m) band with very few circuit changes.

When using the l.o. below the input signal, the two frequencies combine to give you coverage of

the 14MHz (20m) band. And conversely when the l.o. is on the high side of the input signal, you cover the 3.5MHz band. No oscillator switching required! It was an elegant system that appeared in the early 1960s.

## Memories Back

While listening to Hans' description of his mobile antenna, memories flashed back from the time when I was a boy, aged 14. Then, the great thing was riding a bike while listening to radio. I'd made myself a pocket set with a battery driven one-valved radio clamped to the handlebars.

Wearing headphones while listening and with a hazel branch supporting the wire antenna running back to the carrying rack above the rear wheel - that's how I cycled and received Radio Hamburg (the station was on the medium wave band, of course.)

Years later, there was Ralf, who, I remember as always wearing a red sweater, and who had an ex-army radio on his bike. With a quarter-wave whip antenna and the bike's frame as ground-plane, this was Ralf's mobile station. With perhaps a watt or two of power, he'd got as far as England when using amplitude-modulated (a.m.) signals on 28MHz - via short skip in summer.

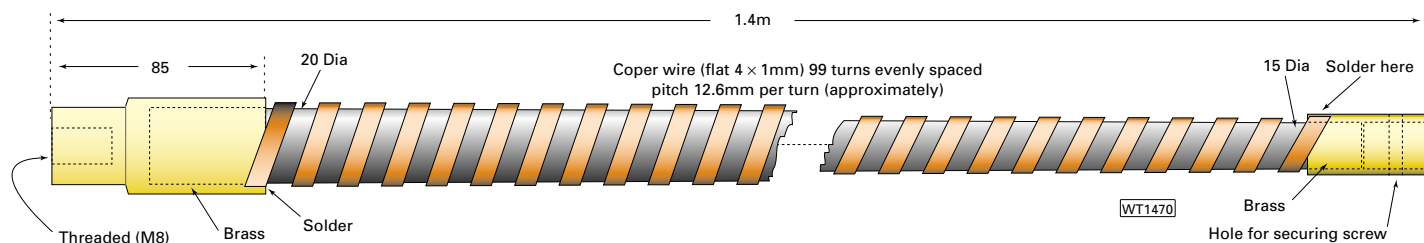
The sound of further explanation from Hans brought me back out of my bout of dreamy nostalgia. From Hans I learnt that, in one of the large department stores in Zurich, he'd found low-priced fishing rods made from fibreglass. The fishing rods were in two sections, they were lightweight and were a little over two and half metres long when joined together.

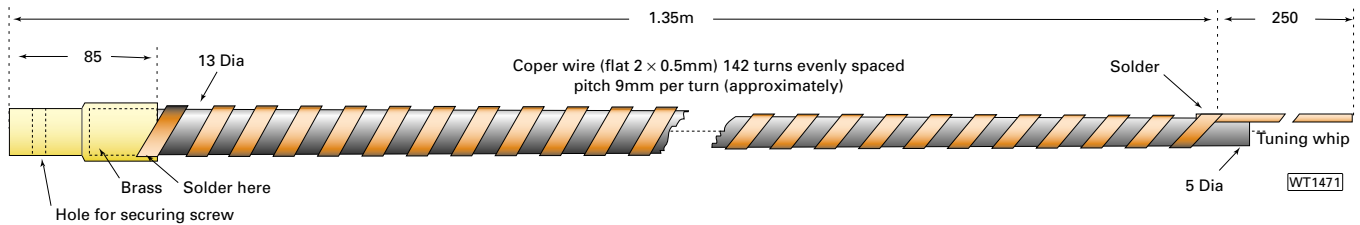
At the handle end of the rod, it had a diameter of some 20mm. At the tip of the upper section the diameter had tapered down around five millimetres. The fibreglass rod served as a carrier for the spiral winding of the 14MHz band antenna.

I've shown the arrangement, in **Fig.s 1 and 2**, that Hans used on his antenna, with brass ferrules made to fit on the ends of the sections. The brass sections were machined to fit and were all glued into place using an epoxy resin glue with good heat resisting properties.

I've made only one change to Hans' original design and that is the through hole for a locking screw. This may be fitted if the sections are not a particularly tight fit.

● Fig. 1: The lower section of the helically wound antenna consists of 99 turn of flat section copper wire (4 x 1mm) with turns spaced at approximately 12.5mm per turn. The brass sections at top and bottom will probably need to be manufactured to fit well. See text for more detail.





Although the electrical length of the winding was one quarter of a wavelength (approx. 5m), physically it measured three metres in total length (with the tuning rod and fittings). A useful saving, as it was 40% shorter - that's the point of helically wound antenna elements.

## Solid mounting

To create a solid mounting system, the fishing rod's handle was glued into a brass tube that created both a solid mechanical mounting and good electrical contact. The bottom end had an 8mm inner thread for quick assembly. A piece of rigid wire on the tip of the upper section served to fine-tune the resonant frequency of the antenna.

"Look at it as being something between a wide and a close tuned circuit" that's how Hans explained his concept of antennas which, have been shortened by partly coiling them up.

"If you pull the spiral windings of the helix completely apart, you get a regular stretched out antenna wire with distributed inductance and capacity to ground. Regular antennas are what I would call a wide tuned circuits" said Hans. (I nodded approvingly).

"Now, imagine the helix compressed to a small coil. There you have the concentrated inductance of a close tuned circuit. By connecting a physical tuning capacitor to the close tuned circuit, then it may be tuned to the same frequency as the stretched out antenna wire - except that there's rather less radiation!"

"What about bandwidth?" I queried.

"That changes, as the bandwidth now is much smaller" Hans continued, "because the circuit  $Q$  goes up. And the  $Q$  of the antenna rises because the loading by radiation is, of course, missing!"

Hans continued, "Consider, the antenna as a transducer that is the interface between the energy bound up in the tank circuit of a transmitter and the radiation energy contained in the electro-magnetic field that is the far-field signal, incidentally the same relationship exists between the far-field, the antenna and the input circuitry of a receiver".

As I listened to Hans, his explanation all fell into place as he continued with his impromptu lecture: "Antennas of reduced length have smaller bandwidth, i.e. higher  $Q$  and therefore more r.f. current circulating in the antenna. Power losses increase with the square of this current".

Hans went on to explain why he'd made the winding from copper strip rather than the more usual round wire (*strip profile has more surface for a given weight, giving lower losses so, reducing the losses due to circulating currents, shown separately.* Editor). Hans also explained that to obtain quarter wave performance, it was necessary to wind approximately half a wavelength of copper strip onto the rod.

Helical antenna windings should be coated and sealed with varnish or epoxy cement after all tuning is finished. This will protect the antenna from weather and will lock the turns in place, thus avoid detuning.

Curiosity and the hope of having a reasonable, yet inconspicuous antenna for myself, made me fasten a similar helically wound antenna on the balcony of our flat, using the railing as the ground-plane. There wasn't much of a resonance dip, but 50W of r.f. power fed to it, was accepted happily with a low standing wave ratio.

After plenty of calling, with only a few contacts and meagre signal strength reports, I worked out for myself that the rusty iron railing acted more like a dummy load than a ground-plane. So, I set about improving the railing earth plane.

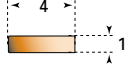

All that brushing and cleaning of the metal railings had an effect, in that my signal reports were a little better. But why did Hans and his helix work so much greater distances from the car?

Later I realised that when Hans had been driving to the office, across those lovely hills overlooking Zurich that he must have found an ideal spot for his mobile operation. Clearly, the world looks different from above - which was equally true for his antenna.

Since that time, I've talked with many other Amateurs, and they all seem to agree that an outstanding location often does more for an antenna's performance than anything else. After trying it for myself. I then understood why Hans had always been so keen on mobile operation!

● Fig 2: The upper section of the antenna uses smaller cross-section copper strip (2 x 0.5mm) with 142 turns spaced rather closer together than the lower section. The tuning whip should be rather longer than shown here and trimmed to give a good match over the band area of interest. See text for more details.

pw

Rectangular section	Circular section
Cross sectional area 4mm <sup>2</sup>	Cross sectional area 4mm <sup>2</sup>
$[Length \times breadth] \text{ mm}^2$	$[\pi r^2] \text{ mm}^2$ or $[\frac{\pi d^2}{4}]$
Surface area 10mm <sup>2</sup> per mm length	Surface area 7.09mm <sup>2</sup> per mm length
$[(4+4+1) \times 1] \text{ mm}^2$	$[\pi d \times 1] \text{ mm}^2$ or $[2\pi r \times 1]$
	
<b>References:</b> ‡ <i>Single Sideband Principles and Circuits</i> (E.W. Pappenfus et al, Collins Radio Company, McGrawhill, 1964)	

**Cross sections comparison**  
 The two types of cross section are shown here side by side. For a given weight per unit length, a flat cross section wire has slightly lower losses at r.f. due to the fact that r.f. tends to flow in the subsurface area of the wire.

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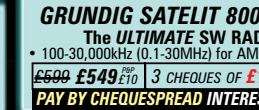
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# Carrying On The Practical Way

This month the Rev. George Dobbs G3RJV aims to keep you busy with some ideas for “Projects Without Printed Circuit Boards”. But as usual...the quotation comes first!

● Fig. 2a: Photograph shows the layout using Perfboard (see text). In appearance it looks rather like a conventional p.c.b.

“Now does my project gather to a head” (Prospero - from *The Tempest* - by William Shakespeare)

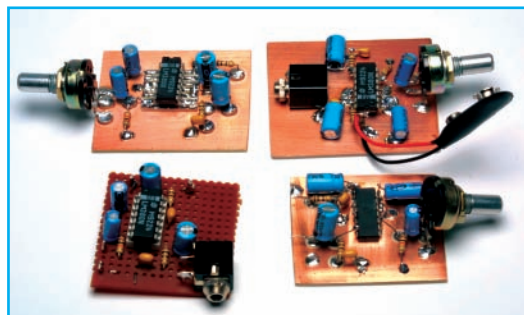
I enjoy meeting COTPW readers and at the Rochdale QRP Convention last October I had a long conversation with a reader who asked for further details of the methods of building little projects. Most COTPW projects don't require a printed circuit board (p.c.b.) but the reader wanted suggestions on my methods. So, to help him and others I've chosen a simple project and described four methods of building it.

## Integrated Circuit

To illustrate the different building methods, I chose a project using an integrated circuit (i.c.) and few external components. Having then seen my approach, the reader can extend the ideas to their own projects.

I decided to use the standard LM380 circuit shown in Fig. 1, as a general-purpose audio amplifier. When I build up a simple circuit, such as this, I simply gather the parts, mount the i.c. and add the other parts around it. **Note:** For this project I've using the more common 14-pin version, rather than the 8-pin version that's available.

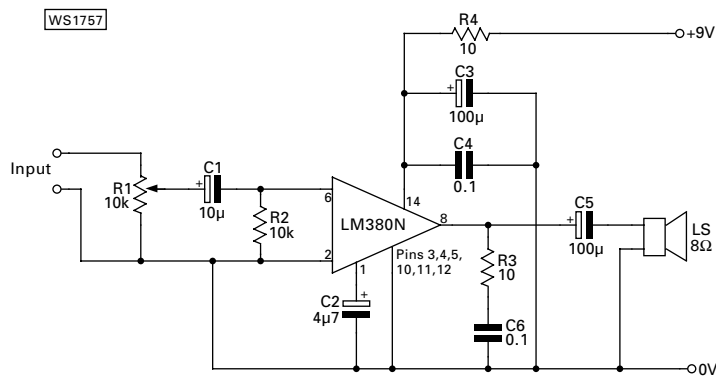
For the less experienced constructor, this article is illustrated as annotated photographs to provide should a good idea of the placement of the parts. They also illustrate one of the physical characteristics of the LM380...that the centre three pins on each side act as a heat sink.



● You'll never get 'bored' with G3RJV's ideas for construction using alternatives for printed circuit boards. George says that there's a board/matrix system to suit your needs.

## Using Perfboard

My first method uses Perfboard, which is an insulated composite board with a matrix of holes spaced at 2.54mm (0.1in) - the standard i.c. pin spacing. Perfboard



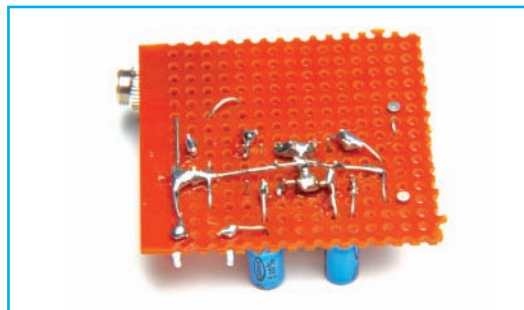
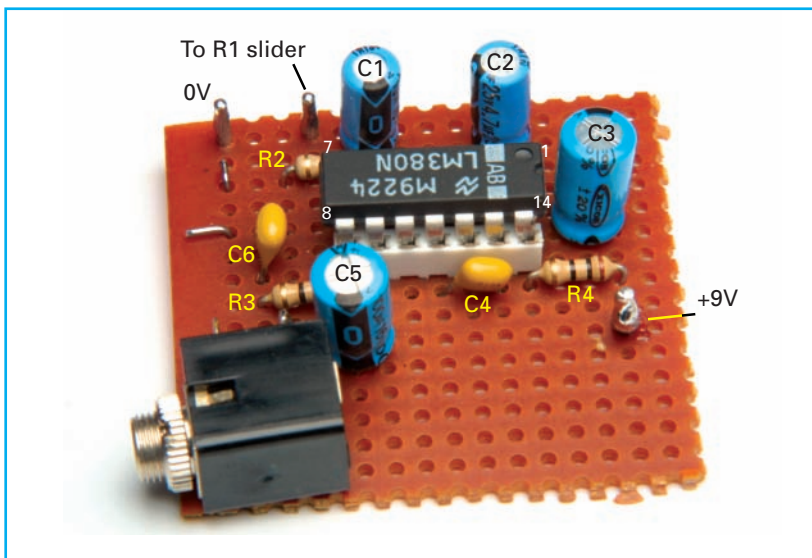
● Fig. 1: To demonstrate the various alternative construction methods, G3RJV used the standard circuit of the LM380 audio amplifier. (see text for more detail).

has no copper tracks, but can provide a very neat method of construction, though it can be expensive. The photograph, Fig. 2a, shows the layout which in appearance looks rather like a conventional p.c.b.

When using Perfboard the individual components have their leads pushed through the holes of the matrix. The excess lead lengths are then used to make the interconnections.

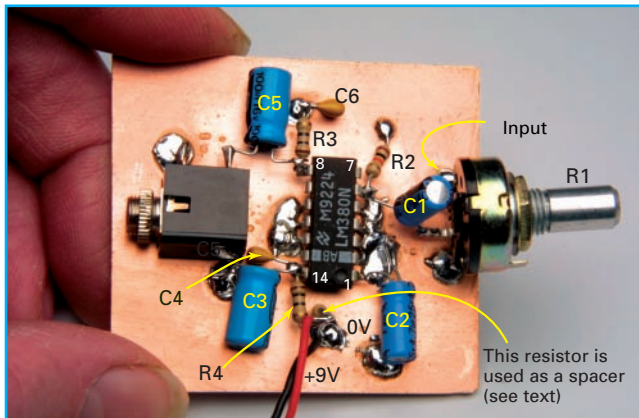
Connecting points are usually **under the board** and soldered in place, Fig. 2b. If the lead is too short or extra 'tracks' are required, wire off-cuts left over from other components can be used...in effect making d.i.y. 'tracks'.

In the example shown, I connected the three grounded leads in the centre of each set of i.c. pins by passing a ground connection wire down the centre of the

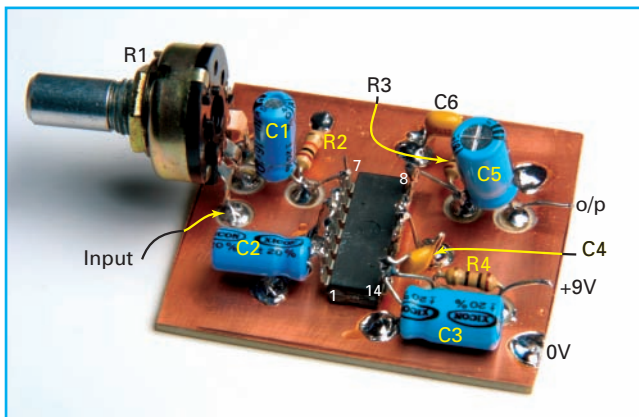


● Fig. 2b: Flipping the board of Fig. 2a over, to view the underside (see text).

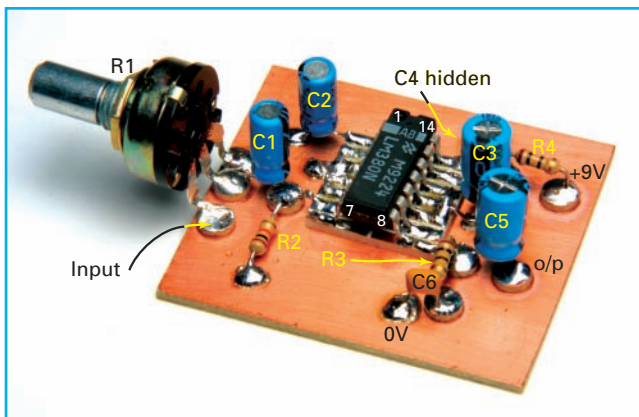




● Fig. 3: Ugly style construction, where all connections are direct, or to the earth plane (see text).



● Fig. 4: Dead-bug construction along with the cut island technique, can be combined, as shown here (see text).



● Fig. 5: Island technique using commercial islands available from Duncan G4DFV (see separate panel).

device. This ground lead is extended as a 'T' below pins 7 and 8 for an input and output ground connection.

An i.c. holder was used, but **this isn't strictly necessary**. My example also used Vero-pins as terminations for the input, output and supply connections, but sections of wire could be used instead. The overall effect is neat and easy to follow.

## Ugly Construction

Next, **Fig. 3**, comes 'ugly construction'...my preferred method for COTPW projects. It's

very easy, cheap **and ugly!** The whole circuit is mounted above a piece of copper clad board using surplus scraps of p.c.b. material.

Using this method, begin by cleaning the board with a mild abrasive to expose clean copper for ease of soldering. Then you can mount the i.c. in place by the grounded pins.

The photograph, **Fig. 3**, should help you to lay out the board, where the LM380 is mounted conventionally. I then prepare the i.c. by bending out the non-grounded pins at 90° to lift them clear of the board. Next, I begin by soldering the ground pins in the centre of both sides of the i.c. to the copper ground-plane.

In ugly construction the grounded leads are soldered to the copper board. The free ends then soldered to the required part of the circuit in 'free space' above the board with the grounded parts providing the rigidity.

## Floating Connections

'Floating' connections may be required where no grounded components are present to hold them in place. Here I prefer to use a resistor of a high value (4.7MΩ or higher - rarely used values) as a 'stand off' - using it with one end grounded - the resulting extra leakage in most circuits will make no difference.

If there are bare wires above the board carrying

the supply voltage, they can be held up with extra capacitors. They can be 0.1μF or 10nF...adding extra decoupling without interfering with the circuit.

Transistors and i.c.s are often mounted upside-down (leads up) with the 'Ugly' system, gaining it the name 'dead-bug construction'. This can be confusing for beginners who often have enough trouble sorting out the pin connections the correct way up! To help, the photograph, **Fig. 4** shows an inverted layout for the LM380, used 'dead-bug' style.

## Three & Four

Methods three and four are examples of similar methods...sometimes called 'Island' or

'pad' construction. Copper clad board provides a ground plane, but the non-grounded ends of the components are connected to copper pads, mounted (and insulated) on the ground-plane.

The cheapest way is to cut small squares of copper clad board (about 5mm square) using tin snips and attach them to the ground-plane board with Cyanoacrylate Adhesive (Super Glue). These provide connecting pads for the parts; the grounded ends being directly soldered to the copper clad board.

Photograph **Fig. 5**, shows the **Copper Island Construction Outfit** supplied by **Duncan Walters G4DFV** in use<sup>‡</sup>. This comes complete, including 5mm round pads and specially etched pads to suit standard i.c. pin-outs and Toko inductors (see information panel).

Pre-planning is required because the pads need to be all mounted in place before the soldering begins. The constructor can lay out the pads prior to gluing them in place, testing the spacing with the actual parts.

**Warning:** The use of Cyanoacrylate adhesive requires all the usual safety precautions associated with this adhesive, including cleaning the boards to expose clear copper and removing grease. The finished result provides a clean and clear layout.

## Circular Cut Islands

Finally, there's a variant of the Copper Island method...using a special tool to **cut circular copper islands directly into the p.c.b.** This provides a 5mm disc, insulated from the rest of the board which can then be used exactly as in the method above.

To make circular islands I used the **NJ Island Pad Cutter**, a diamond tipped end mill for use in a Dremel or similar high speed p.c.b. drill. This is specially made for the **New Jersey QRP Club** and will soon be available in the UK.

In use, the drill (mounted in a stand) is brought down on to the p.c.b. surface, making a round Island. This also made a neat board.

The four variants on the non-etched p.c.b. are practical and easy to use. Although the example circuit is simple, more complex project are easily achieved. So, get that soldering iron out and get busy on those projects!

PNW

### ‡ Specialist Suppliers

The Copper Island Construction Outfit is available from **Duncan Walters G4DFV, 11 King George V Avenue, Mansfield NG18 4ER. Tel: (01623) 46443. Note: The Copper Island Construction Outfit was reviewed on page 49 of the January 2002 issue and also featured in Radio Basics, page 24 of the same issue. Editor.**

The NJ Island Pad Cutter is available from **George Heron N2APB**, E-mailed details from [n2apb@amsat.org](mailto:n2apb@amsat.org) or by mail to **2419 Feather Mae Court, Forest Hill, MD 21050, USA**. Or see the GQRP Club Website at [www.gqrp.com](http://www.gqrp.com)

# Value & Vintage

This month  
Ben Nock  
G4BXD looks  
at Second  
World War  
aircraft radio  
equipment and  
reports on his  
flight of a  
lifetime...in a  
two seater  
*Spitfire!*

A very happy New Year to you all! I hope you had a good Christmas and that you're looking forward to another fine year of vintage and radio related topics...and the V&V pages is where you'll certainly find it!

My own year ended on a rather superb high note. I achieved the ambition of a lifetime in that I got to fly a *Spitfire!* High above the fens of Cambridgeshire I was able to cut the bright blue yonder with the grace of a machine which, for someone bought up on war films, epitomised the war years and adorns many an enthusiast's bedroom wall.

My command of the English language is insufficient to do justice to the feelings and emotions present during that flight. Even as a qualified aircraft pilot myself I had experienced nothing like it before. The grace, the power, the sheer delight were beyond mere words. It would take another poet like Byron to do it justice....and I'm no Byron!

The only thing lacking was, of course, the stereotypical banter in the headphones. No longer was there the "Septic calling Pimpernel leader" (from the 1952 made Battle of Britain film *Angels One Five*, starring Jack Hawkins, John Gregson and Michael Dennis), or the "Make Angels one five", no "Tally Ho's" or "Bandits", just the rather unassuming calls of a modern control tower.

## Fighter Radio Equipment

The flight in the wonderful *Spitfire* did make me give some thought to the radios used during the war years. Typical fighter sets were the early use of the RAF's TR1196 h.f. and the later American-made SCR-522 v.h.f. set.



• A happy day for G4BXD, war bird ready to go (see text).



• The TR-1196 set, transmitter at the top, receiver on lower right with the power supply unit on lower left (see text).

The TR-1196 set is (a quite compact for its time) four channel h.f. transmitter-receiver operating between 4.3 and 6.7MHz, a similar frequency range to that of the TR9 set. Both the receiver and transmitter are crystal controlled, with the transmit crystal frequency being that required for the actual output. The receiver crystal would be either plus or minus 460kHz, the i.f. frequency of the set.

In use the TR-1196 was intended to be used with a short capacitive antenna with a maximum length of 28ft (8.5m). This length could be achieved when the set was fitted to bombers, etc., with a wire antenna strung between fuselage and tail. However, in much smaller fighters the wire would have been 'loaded' (in the same fashion as h.f. mobile antennas) to achieve the best results.

The TR-1196 set consists of a main chassis which houses the supply plugs, the antenna and earth connections and the microphone/headset connectors. Into these are fitted the receiver, transmitter and power supply units facilitating quick and easy changes in the event of a unit failure.

Frequency selection is via a control box equipped with four buttons which would have been mounted near the pilot. An actuator in the set's main chassis connects via shafts to the transmitter and receiver transmitter units. This provided mechanical 'click stops' around to select the required channel.

## Valves & Design

The receiver is a standard 6-valved superhet. The transmitter is a 3-valved design, comprising master oscillator, power amplifier (p.a.) stage and modulator and the power output was fairly low, probably less than 1W.

The transmitter output tuning has four separate roller coaster coils. One is selected for each channel, A, B, C or D, and they also form part of the r.f. input stage for the receiver.

In use the TR-1196 was powered by the aircraft's 26V d.c. supply with internal rotary generator provided the 6.3V heater voltage and the 250V h.t. (I'll bring you more fighter sets next time I present this column).

## Racal Sets Collected

Three new Racal sets have recently found their way into my collection recently: two 'back' or 'manpacks' and a receiver. The first - the Racal Squadcal is a manpack set of around the 1960s vintage, tuning 2 to 7MHz with 29 crystal -controlled channels.

Modes available on the Squadcal are c.w., a.m., and s.s.b. c.w. The r.f. output, in the order of 5W or so, is fed to a whip or dipole with a built-in antenna tuner.

A small meter is provided to monitor battery voltage and aerial current and there are twin hand-set connectors, one for the operator and one for a commander to use. The set has the unusual feature (for Racal) of running off three 'lantern' batteries, the type with the curly spring centre-connectors, providing 18V in total.

The Racal TRA-967B is a much more recent and smaller set, operating on v.h.f., tuning 30 to 79.975MHz in 25kHz steps. Mode of operation is n.b.f.m. only and facilities include a 'whisper' option, so as not to give away the set's position when you're suddenly called.

There's also a re-broadcast facility, which would allow two sets to be connected and the signal passed on via another frequency. The r.f. output is fed to either a whip for portable use or a dipole for fixed station operation to give extended range.

My other 'new' item is the Racal RA-1217 receiver...a 1 to 30MHz set capable of receiving c.w., modulated c.w. (m.c.w.), double sideband (d.s.b.) and s.s.b. A mechanical digital tuning presentation gives a frequency readout down to 200Hz.

The receiver is a quad conversion superhet with a first i.f. of 40MHz, with the second of 2-3MHz, the third on 1.6MHz with the fourth being either 100 or 455kHz. Up to five filters can be fitted at the 1.6MHz IF stage offering 13, 8, 3, 1.2kHz, together with 500 and 200Hz bandwidth options.

A rather cheap looking edge meter (certainly by Racal standards) fitted centrally on the front panel monitors r.f. or a.f. levels.

## Thanks Australia!

Well that's about all I have space for now, and I must say a big "thank you" to **Simon VK2UA**, **Raffy VK2RF**, **Richard VK2XRC** and **Ian VK2ZIO**, for the welcome during my visit to Australia in November. I'll bring you details of an interesting transmitter I acquired on the trip next time!

As always I can be contacted at: **62 Cobden Street, Kidderminster, Worcestershire DY11 6RP**, or via E-mail at **G4BXD@qsl.net** and you're also welcome to have a look at my web pages at **www.qsl.net/g4bxd**

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● Inside the TR-1196 receiver section, with the p.s.u. behind and the transmitter roller coasters on right.



● The Racal Squadcal transceiver, a typical Racal plastic cased set (see text).



● The Racal TRA-967B in its carrying case. The four tuning knobs select the frequency in 25kHz steps (see text).



● The Racal RA-1217 receiver - rack mounting option - slim styling with fairly easy digital readout (see text).

# VHF DXER

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REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

**F**or some years now I've been suggesting that you really must try to be active on the v.h.f. bands during the period of the Leonids meteor shower.

The reason I've promoted this shower is that every 33 years or so the associated comet Tempel-Tuttle swings around the Sun causing a dramatic increase in meteor activity. When Earth passes through this stream of material the small bits burn up in the atmosphere creating ionisation from which v.h.f. signals can be scattered.

Most meteor showers generally produce fairly short lived reflections during which time contacts are made. However, throughout the peak years of the Leonids shower the reflections may be numerous. This allows E-layer propagation to last many minutes at a time over a period of something like 12 hours when the shower is above the horizon.

I've been observing the Leonids meteor shower for many years and have noted increased activity since 1997. The Leonids normally run between November 14-21 with the main activity occurring around November 17-18.

Some years have been exceptional and others not quite as good. In 2001 the shower peak occurred on Sunday November 18 and I'm hoping that many of you noted my prediction in this column a few months ago, **as this time it was truly spectacular.** In Europe the shower rose above the horizon around 2300UTC on Saturday night and set around 1300UTC on Sunday giving over 12 hours of potential v.h.f. DX activity. Although c.w. and s.s.b. contacts started to be made from around 2300UTC most activity was in the period 0400-1100UTC.

## FANTASTIC SHOWER

**Matt Cabban G0XDI** (Hertfordshire IO91) also reckons it was a fantastic shower. Although he didn't think it was as good as the mega event in 1998 it still provided him with more DX than he had ever worked before via meteor scatter. He was active between 0145-1115UTC on November 18 and then later in the day between 2315-0245UTC.

According to Matt (ex-G1WPF) the shower peaked around 0600-0800UTC and provided many long bursts of s.s.b. signals. He remarks he was lucky to find a clear frequency on 144.206MHz and concentrated on beaming north-east looking for stations in Finland, Sweden and Russia.

In total Matt made 82 contacts with stations located in 17 countries. These included Austria (OE), Bosnia (T9), Croatia

(9A), Czech Republic (OK), Denmark (OZ), Estonia (ES), Finland (OH), Germany (DL), Hungary (HA), Italy (I), Lithuania (LY), Poland (SP), Norway (LA), Russia (UA), Slovakia (OM), Slovenia (S5) and Sweden (SM). His longest distance contacts were with the stations of RX1AS (KO59) 2121km, OH8NXE (KP25) 2112km, RU1AA (KP40) 2101km, OH4EA (KP32) 2026km and OH2BNH (KP20) at 1840km. All of these signals were 59 bothways showing how intense the event was.

Yep, this is 144MHz not 14MHz!

Dave was active from midnight through to 1130UTC on November 18 making 114 QSOs and then later in the day from 2300UTC through to 0145UTC on November 19 picking up a further 10 stations. His top five DX contacts were YO2GJH (KN35) 2243km, OH5LK (KP30) 2071km, ES5RY (KO38) 1977km, SM2CKR (KP03) 1922km and ES2WX (KO29) at 1908km. Other stations in the log included HA8MV (KN06), OM3TZZ (JN88),

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## THIS TIME AROUND DAVID BUTLER G4ASR HAS REPORTS OF A SPECTACULAR LEONIDS METEOR SHOWER.

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My results were remarkably similar. I was active on the 144MHz band between 0400-1130UTC and noted that the shower was exceptional between 0630-0830UTC. During this period many bursts lasting minutes at a time were heard giving the impression that a Sporadic-E opening was in progress.

I was using a Kenwood TS-790E transceiver with a miComm 0.3dB noise figure preamplifier, 400W from a pair of 8874 triodes and a 10M long 18-element DL6WU Yagi. I settled down on 144.225MHz and made 81 s.s.b. contacts with stations in 17 countries.

Unlike Matt (who was beaming mostly north-east) I didn't contact any stations in Denmark, Estonia, Finland and Russia. From my QTH (Herefordshire IO81) I was pointing mainly south-east and managed to find nearly all countries that Matt worked plus stations located in Corsica (TK), France (F), Spain (EA) and Ukraine (US). My top five contacts were US5WU (KO20) 1900km, YU1LA (KN04) 1898km, YU7VA (KN05) 1852km, I8MPO (JN70) 1829km and HA0MK (KN08) at 1802km. Other DX stations worked included EB4ENN, HA8BI/7, LY2SA, TK5EP and T94DU. The most frustrating 'gotaway' was the station of RX1AS who I heard at good strength on a few occasions. I live in hope that one day I'll contact this station located 2260km away!

Another station that didn't manage to work RX1AS was **Dave Edwards G7RAU** (Isle of Wight IO90). This was surprising as Dave managed to make 124 s.s.b. contacts with stations in 21 countries! They were located in DL, ES, F, HA, HB9, I, LA, LY, OE, OH, OK, OM, SM, SP, S5, TK, T9, UB, YO, YU and 9A.

LY2BIL (KO24), LY3ED (KO14) and YT1VV (JN94).

"A great Leonids shower this time" remarks **Claudio I4XCC** (JN63) who reckoned that this was the best m.s. event since becoming active in 1974. He made 143 QSOs with stations in 22 countries. All contacts were made on random s.s.b. between 0400-1100UTC.

Claudio reports making eight contacts over 2000km, the best being SM2CKR (KP03) at 2275km, followed by OH8K (KP23) at 2268km and RX1AS (KO59) at 2157km. He also worked EI2FSB and EI5FK (both in IO51), EI3GE (IO63), GI6ATZ (IO74), GM3POI (IO88), GM4YXI (IO87), GW8ASA, GW8JLY and GW4HBK (both in IO81) and GW4VEQ (IO73). A total of 36 G-stations were also contacted, too numerous to mention, but including G3BNE, G3PHO, G7PUJ, M1BTR and M5FUN.

**John Lemay G4ZTR** (Essex JO01) mentions having missed this shower in previous years but managed to catch this one. "It was fantastic"! Running 400W into a 12-element M2 Yagi John completed 53 s.s.b. contacts between 0650-1030UTC. His DX contacts made around 144.200MHz included HA0MK, I8MPO, LY2BIL, RX1AS, SM1A, S51MQ and US5WU.

**Vidas LY2SA** reports that it was a great Leonids shower and that at his QTH (KO14) the 144MHz band was full of DX stations between 0200-0900UTC. He thinks the peak was between 0600-0800UTC and that the reflections during this time were very near the 1998 storm level.

Vidas uses an Icom IC-821H transceiver,

250W amplifier and a 16-element KLM Yagi. With this he was able to make 100 s.s.b. contacts with stations in 21 countries including four in England and one in Scotland. His top five DX contacts were the stations of F6FHP (IN94) 1987km, F4ARU (IN94) 1971km, F/G8MBI (JN04) 1931km, F4BKV and F6CRP (both in IN95) at 1929km.

## HIGH POWER NOT NEEDED

Please don't think that you need high power and a large antenna array to work DX stations via meteor scatter. **Reg Woolley G8VHI** (Warwickshire IO92) runs 50W output and reports contacting the Russian station RX1AS some 2140km away. Reg popped into the shack at 0800TC, turned on the rig and the first station he heard was RX1AS who promptly came back to his call. Some people have all the luck!

Reg reports being active on the 144MHz band until 1215UTC and making a total of 25 s.s.b. contacts. Among the DX worked were the stations of ES2RJ and ES2WX (both in KO28), OH1XT (KP01), LY2BAW (KO25) and RU1AA (KP40). Contacts with TK5EP (Corsica) and T94DU (Bosnia-Herzegovina) were new countries.

In the opinion of **Giuliano Artico I3LGP** (JN55) the Leonids 2001 were very good and in spite of his small station, an Icom IC-746 transceiver and a 17-element F9FT Yagi a number of good contacts were made. Between 0330-0930UTC Giuliano made 20 QSOs with stations in Balearic Islands, Belgium, Bulgaria, Estonia, France, Lithuania, Norway, Poland, Romania and Russia. He also made s.s.b. contacts with the stations of EI2CA(IO62), G4ASR (IO81), G4RRA (IO91), G7RAU (IO90), G16ATZ (IO74) and GM4YXI (IO87).

The 144MHz station of **Tim Kirby G4VXE** (Windsor IO91) is hardly optimised for DX. Living in rented accommodation precludes a large v.h.f. array that he would wish to have. Currently Tim is making do with a 2-element HB9CV antenna fixed onto a 2M long glass-fibre pole on the balcony. The rig he uses is a Yaesu FT-847 with 100W on the 50MHz band and 50W on the 144 and 430MHz bands.

In the past Tim has enjoyed making many m.s. contacts and was intrigued to see what the Leonids shower would be like. Listening on 144.200MHz at around 0930UTC on Sunday morning Tim was thrilled to hear good bursts from a number of stations including I4XCC, IZ5EME and others. It wasn't until he heard the station of 9A2DE (Croatia) calling CQ with no-one coming back that he picked up the microphone.

Tim remarks that he was both surprised and delighted to make a complete two-way contact especially with such a small station set-up. On the 50MHz band the reflections were almost continuous and the propagation sounded more like a Sporadic E opening. Using the FT-847 transceiver and a small mobile-whip he was able to make QSOs with a number of German and Czech Republic stations.

Tim hopes that his results will encourage



● An antenna for every occasion.

others who don't imagine a mode such as meteor scatter to be within their capability to have a go. Of course the use of WSJT or high-speed morse and digital signal processing techniques can make either mode very viable even with relatively low power and a small antenna.

**Philip GOISW** (Cumbria IO84) uses an Icom IC-746 transceiver running 50W into a Create 25-element log-periodic antenna on a 3M long boom. He mentions that Sunday November 18 "was brilliant" with the 144MHz band being open at his QTH into France, Italy and the Balkans. He made s.s.b. contacts with the stations of I4XCC at 1680km, S57EA at 1550km and F6FHP at 1100km.

Philip also mentions that he is active using WSJT (FSK441) a digital mode for weak signal meteor scatter communication. You can download the free software from the Internet at [www.vhfdx.de/wsjt/](http://www.vhfdx.de/wsjt/)

Apparently GOISW is the only active station in IO84 to use meteor scatter and he has received many E-mails requesting schedules, especially from German stations. To operate on WSJT he uses a lead containing a miniature VOX unit which plugs between his IC-746 transceiver and the computer soundcard.

As an aside, I don't use any interface whatsoever between my v.h.f. transceivers and the laptop. I simply use screened wire between the sound card and the transceiver audio in/out. I don't even use the laptop COM port to carry out the transmit/receive switching. This is

accomplished by vox control on each of my transceivers. It's simple and effective. Running 50W on 144.370MHz the station of GOISW has recently made WSJT contacts with DG6JF/P (JO33), DK3XM (JO43), DL4ANT (JN49), F6FHP (IN94) and OZ1IEP (JO55).

As you've probably noticed all the Leonid reports were from operators making s.s.b. contacts during the shower. That's because during a major shower the use of s.s.b. is much quicker than making c.w. or WSJT contacts. The use of c.w. and WSJT have their place of course.

My preference and that of many others is to use c.w. during auroral and tropo events and WSJT for any time outside of a meteor shower period. The other point worth noting is the number of countries that many operators were contacting.

With most propagation modes you normally contact stations in specific geographical areas appropriate to that mode. For example during an aurora

you generally work stations in northern Europe. A Sporadic-E opening at 144MHz can often be very geographically selective, maybe working stations in one or two countries.

The great advantage of meteor scatter is that so many different paths are available at the same time. Therefore the choice is yours as to where you beam and which countries you want to contact. It really is a great v.h.f. DX mode. If you weren't on during the Leonids shower in 2001 then this year's shower may be your last chance of a lifetime.

Predictions are that meteor scatter propagation in the period November 17-18 2002 will be even better than last year! So start planning your activities now and later in the year I'll devote a column to the operational practices involved with meteor scatter communication.

## DEADLINES

That's it again for another month but before I go there's just space to inform you that the 50MHz band has been excellent with world-wide DX contacts being made with every continent. The months of February and March are best for working into Australia, so try beaming short path between 0900-1100UTC and you may be lucky.

Please forward any reports or photographs (preferably by e-mail) to the address and by the date given at the top of the column. 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.

**A**s I write this month's column there has been much excitement on the h.f. bands. The world's most wanted DXCC Entity has been worked again thanks to the efforts of **Ed 4L4FN**.

Ed works for the United Nations Food Programme in North Korea and has finally had verbal permission to operate Amateur Radio from North Korea. To date 200 plus stations have already been able to log 4L4FN/P5 on 14 and/or 28MHz.

Ed is still waiting for written permission, which he hopes, will arrive within the next few weeks. This is not a DXpedition but Ed will try to operate as much as possible using s.s.b. and a dipole antenna. Suggested frequencies are 14205 and 28575kHz operating split 5-15kHz up with times between 1400-1500 and 2200-2300UTC. There are plans to construct a small beam for both bands early in the New Year and for activity using c.w. and digital modes.

Ed expects to be in North Korea until June or July 2002. Please QSL via **Bruce Paige KK5DO, PO Box 310, Alief, TX 77411 USA**, who will wait for the final written licence before printing the cards. Bruce will post updates on Ed's activities at <http://www.amsatnet.com/p5.html>

## PITCAIRN IN IARU

The International Amateur Radio Union announced that The Pitcairn Island Amateur Radio Association has been admitted as an IARU member effective 16 November 2001. This makes the Pitcairn Islands namely Pitcairn, Henderson, Ducie and Oeno to be considered a DXCC Political Entity.

Consequently, Ducie Island, which is separated from Pitcairn Island by 350 plus kilometres, has become a DXCC 'Geographic Separation Entity'. It gets confusing doesn't it!

The ARRL in turn announced that starting from 16 November at 0000UTC, Ducie Island (OTA OC-182, CQ zone 32, ITU zone 63) will be eligible for DXCC credit. This credit will only count for contacts dated from 16 November 2001 onwards.

A DXpedition from Mangareva (French Polynesia) is already underway to activate this 'new one' but is taking longer than expected due to severe weather. Hopefully by the time you read this the group will have landed successfully and started their operation.

## NEW DXCC AWARD

A new DXCC Award will be available from January 2002. The

certificate will be given for working 100 different DXCC entities on the current DXCC List while operating with a transmitter power of 5W or less. Applications for the **QRP DXCC Award** will be accepted for contacts made anytime since 15 November 1945.

The award is not endorseable and is separate and distinct from the traditional DXCC award program (credits are not assigned to other DXCC awards). Certificates will be dated, but not

LZ1MC (Bulgaria) and finally OD5/OK1MU (Lebanon).

New reporter **Colin Evans M1BUU/MOCGH**, Keighly, Yorkshire, uses a dipole cut for this band that is just five metres up and seems to be doing very well with it. Stations logged include 4N1JA (Yugoslavia) 1026, LA1YKA (Norway) 1114 and SM0OWX (Sweden) using an FT-817 and just 2.5W of s.s.b. Nice to hear from you Colin and good luck with the QRP!

## CARL MASON PRESENTS A JAM-PACKED EDITION OF YOUR HF REPORTS THIS MONTH.

numbered and QSL cards will not be required but applicants **must** certify the authenticity of their logs.

For further information (including application forms) look at <http://www.arrl.org/awards/dxcc/qrp/index.html> I am sure that many QRP operators will welcome this new certificate.

## YOUR REPORTS

It looks like you have all enjoyed some good propagation this month. **Mike Baker G3SUK**, Stowmarket, Suffolk used his IC-746 with 70W of s.s.b. to work CU3DJ (Azores), IT9RYH (Italy), ER1QQ (Moldova), YO5OXN (Romania), LA9HW (Norway) and OZ4PAX (Denmark) in the evening on 7MHz between 2030 and 2158UTC.

In Bishopston near Swansea **Robin Trebilcock GW3ZCF** used c.w. to work FG5HM (Guadeloupe) at 2325UTC followed by s.s.b. contacts with FS/AH8DX (French St. Martin) and 8P6SH (Barbados) around midnight. Using PSK31 JA1FGI (Japan) 1637 and HK4SPX (Colombia) at 2251UTC all made the log using an IC-775 and 40m loop. Robin also found time to operate portable from St. Davids in West Wales using an IC-706 and 10m of wire for the antenna. The DX worked between 2035 and 2359UTC, once again with PSK included PS7TKS (Brazil), CP6EV (Bolivia), KP4K (Puerto Rico) and CN8NM (Morocco).

On to 18MHz now where **Roy Walker G0TAK**, Cleveleys was very pleased to work BZ4DHI (China) on c.w. at 1323UTC using his TS570DG and 30W. Roy's other contacts on this band were all made between 1350 and 2030UTC with his QRP Plus and 5W of c.w. They included YL2PQ (Latvia), UT9IF (Asiatic Russia), OZ/DK9LO (Denmark),

## THE 21 & 24MHZ BANDS

For **Ted Trowell G2HKU** on the Isle of Sheppy, Kent it has been a quiet month with just the occasional hour of operating! Highlights on 21MHz include VK5GN (Australia) 1400, 9J2BO (Zambia) 1600, VU2TMP (India) 1900 and CO3JK (Cuba) at 2000UTC. All contacts using a Ten-Tec Omni V and G5RVF antenna. Looks like you picked the best times to operate Ted!

There was a surprise for **Don McLean G3NOF**, Yeovil, Somerset on 21MHz whilst calling for an arranged sked. A call came from **K7WMS**, which is the callsign for **Washington Middle School Amateur Radio Club** in Miles City, Montana at 1415UTC.

The operator of K7WMS, a teacher, asked if Don would be prepared to talk to some of his students. It seems their usual contacts were only with stations in the USA. Don was more than happy to do this and eventually spoke to five students aged 11 to 14 on a variety of subjects including geography and world history. Don says "I found it enormously satisfying to be able to use Amateur Radio for a useful purpose and enjoyed a very interesting QSO for well over half an hour". Shortly after this Don worked BV2RS (Tawain) 1306 and F6AUS/HI9 (Dominican Republic) at 1912UTC on 24MHz.

## THE 28MHZ BAND

Finally, on to the log of **Peter Lowrie MI5JYK**, Newtonabbey Northern Ireland who used 'real QRP' on 28MHz s.s.b. working UX5UO (Ukraine), ER3DW (Moldovia), YO3BBM (Romania) and RA3QK (European Russia) around 1230UTC running just 500mW.

That's about all there is space for this month. Thanks to **Mauro I1JQJ** and the *425DX News* for the DX information and to you all for your letters and E-mails. Keep up the good work.

73, Carl GW0VSW



• The new DXCC Award is now available, check out the ARRL's website for full details.

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Computers are multi-tasking these days in the average Amateur's shack, especially if you are running data modes, log-keeping, word-processing, not to mention all the other tasks of rig control, antenna pointing and so on. Most have CD/DVD players, possibly two hard drives, several internal cards etc., plus loads of memory. Add all these up and you may be on the borderline of your power supply rating. It might not be that simple either!

So, carry out these simple checks, do a few sums to see if you need to update. Add up the total wattage demands of your system and then check the power supply to see if it's adequate. Yes, the system may run anyway, but it's like plugging too many appliances into one extension lead - one of these days it's going to blow!

A good rule of thumb is 150W for M/B, CPU, and RAM and then 12W for each card and device (including fans). You can see how a 200W or even a 230W supply may not be enough.

Here's a list - your actual wattage may differ slightly, so the best thing to do is check the documentation that came with each of your peripherals:

If you have a 200W power supply, you are limited to only four IDE devices, e.g. **Two hard drives, ZIP and a CD add additional IDE devices and you're overloading.** Remember wattages of

various makes/models can vary. The only way to really verify them is to look up the specs in the manual or a label on the component itself. But the above list is a good rule of thumb.

A 300W power supply really should be the minimum for a halfway decent system, 350W is a little better (more breathing room). Of course you don't add in any external peripherals that have their own power supply. Having said this, deciding if a power supply is adequate or not isn't quite as simple as adding (or estimating) the total watts used by the items/devices you use and seeing if it matches the total wattage rating of the supply.

## SUBMITTING CONTEST LOGS

**Eddie Schneider W6/G0AZT** is a regular entrant in h.f. data contests and has written about the submission of logs. Following the events of 11 Sept, postal delays will be inevitable and some contest organisers will no longer accept postal logs anyway.

So, it looks as though all logs for future contests will have to be submitted via E-mail. I suppose this has advantages, it will save postage, and if a standard format is the norm, then this is a rule that is going to become predominant in all contesting, not just data contests.

## ROGER COOKE G3LDI REMINDS YOU NOT TO OVERLOAD YOUR POWER SUPPLY AND SAYS CABRILLO IS HERE TO STAY!

Power supplies have a few different circuits that put out different voltages. In the majority of today's motherboards the more important ones are for +3.3, +5 and +12V (there are also ones for -5, -12 and +12 standby).

The wattage rating of a power supply is based on the sum of the output capabilities of all these different circuits. But different items/devices use different voltages and the power supply must be able to meet the needs in/of each of the respective circuits.

Drives (CD ROM or disk), CPUs, memory, fans and motherboards draw on different circuits. As such, it's completely possible to have two power supplies with a given wattage rating and where one puts out enough of the proper voltages to power the CPU/memory/motherboard while the other doesn't. Likewise, one of these power supplies could be fine for powering a given number of IDE devices, while the other isn't.

The bottom line is if you really want to determine if a power supply is adequate or not you have to look at the power draw of all the components you intend to use, which circuits they draw from, and then look at the specifications for the supply in question to see what its capabilities are for putting out sufficient power on those circuits. In other words, buy a large rated supply in the first place!

The standard acceptable format is Cabrillo. The following is an extract from a long article written by Eddie, which can be found at [www.n2hos/digital/goaztlog.html](http://www.n2hos/digital/goaztlog.html) see **Fig. 1**.

Logs for the 2001 CQWW RTTY contest should go to [cqwwrtty@kkn.net](mailto:cqwwrtty@kkn.net) There are generally four options for submitting logs for the major RTTY contests.

Please follow closely the following log submission rules for the specific contest. The options, in order of preference, are as follows:

1. Electronically, using the Cabrillo format.
2. Electronically, using the relevant files produced by your logging software, e.g. all and sum.
3. By mail, using only a correctly formatted and packaged 3.5in disk with the information specified in alternatives 1 or 2 above. Note, larger disks will not be accepted.

By mail, on paper, either hand written or computer generated. However, if the log contains more than 100 entries in a CQWW contest, this option is not available; only options 1, 2 or 3 may be used.

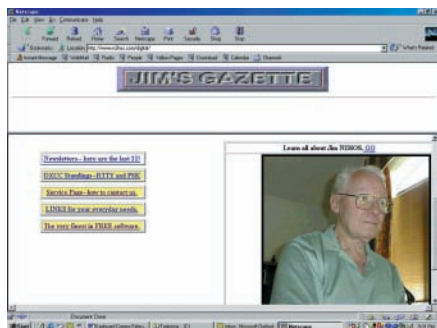
## ELECTRONICALLY SUBMITTED LOGS

The Cabrillo format is here to stay. From November 2000, the ARRL accepts only Cabrillo formatted entries for electronically submitted logs. Both RTTY CQWW-DX and CQWW-WPX now require this format for any log produced by your logging software and containing more than 100 QSOs. BARTG Sprint, BARTG HF, SARTG, SCC and EAWW will also be requesting this format.

As more and more contest organisers realise the simplicity of a Cabrillo formatted log, they

Peripheral	Wattage
High-wattage AGP card	20 - 30W
Average PCI card	5W
Cached SCSI controller PCI card	20-25W
Floppy drive	5W
10/100 NIC	4W
50x Atapi CD-ROM	10 - 25W
10x Atapi DVD-ROM	10 - 25W
8x/4x/32x SCSI CD-R/RW	17W
SCSI CD-ROM	12W
RAM	10W per 128MB
Ultra2 SCSI PCI card	5W
5200r.p.m. IDE hard drive	5W - 11W
7200r.p.m. IDE hard drive	5W - 15W





● Fig.1

will no doubt follow suit in the not too distant future. If your favourite contest logging software does not support the Cabrillo format yet, get in contact with the author. An alternative would be to purchase a converter utility and/or log checking software from WT4I.

One of the main features of a correctly formatted Cabrillo log is that **all** the contest-specific data required is written to just **one** log file. There is no need to send a summary, dupe or multiplier sheet and generally, separate band files are no longer required either.

Besides simplifying the entire process of log submission for the entrant, Internet bandwidth is reduced and assuming that the checkers have appropriate log checking software, their lives are made a whole lot easier.

Contest managers, usually unpaid, are trying to reduce the delay in posting the results, so you can appreciate that spending time and effort having to ask for missing data could be well spent actually checking the logs and finalising the results. Log submission deadlines are also being reduced in an effort to expedite the results.

Sophisticated log checking software is now available to any contest manager. This software is also available to testers who would like to thoroughly check their logs before submitting them.

If you operate in a single band class but make contacts on other bands to relieve boredom or help out friends, please submit **Check** logs for those bands. If you don't submit a check log for those other bands, the other station(s) you worked on your non-competitive band, will lose credit for those QSOs.

### So in a nutshell the guidelines for Cabrillo logs are:

1. Fully complete the Cabrillo Header. Include E-mail address in Soapbox. Rename the file with your callsign.log. Zip it as callsign.zip. Put your call sign and class of entry in the Subject header of the e-mail. Attach the zipped file. Send the thing but only to the **current**-mail specified in the contest rules. Wait for a robotic or personal confirmation. Sit back, relax and wait for the final results.

If your score has been greatly reduced, either invest in log checking software or copy the exchanges more carefully and **thoroughly** review your log before submitting it.

1. Keep these notes as a handy reference.

### For non Cabrillorised logs you should:

1. Fully complete the summary sheet (name, E-mail and **full** postal address).
2. Rename the required files as: your callsign.all, .sum.
3. Put your call sign and class of entry in the Subject header of the e-mail.
4. **Only** send your .all and .sum files preferably zipped. Do **not** include them within the text of the E-mail.
- 5 - 10. Same as above.

### For submissions on disk remember:

1. Only send 3.5in floppies, very few modern computers have 5<sup>1</sup>/<sub>4</sub>in drives!
2. Rename all required files as: your callsign.x .
3. Enclose a complete and signed summary sheet.
4. Label the outside of the disk with your callsign, contest name and entry class.
5. Pack the disk in a disk mailer or padded envelope.
6. Buy Airmail postage rate stamps and add an Airmail sticker if the package has to travel outside your own continent. Packages with surface or reduced rates will probably arrive after the results have been published!
7. Do **not** Register the package. Not only does this slow down the post office handling process because everyone handling it, has to sign the Registration book, it is also inconvenient for the manager to have to be available to sign for it.
- 8 - 10. See above.

### If you are submitting your entry on paper:

1. If your log is computer generated and contains more than 100 entries, go to the previous paragraph. We are in the computer age folks!
2. Hand written logs must be legible. No inky spider's feet please.
3. Besides logging the contest exchange, band, time etc. all multipliers, points per contact and score claimed, **must** be included in the log. For CQWW, one entrant submitted a paper log with 811 contacts with no points/Q and other missing data. Once again, it is not the contest manager's responsibility to score your entry. If essential data is missing, don't be surprised if your log lands up in the Check Log category.
4. Pack your paperwork securely.
5. Send it to the correct postal address as outlined in the **current** rules.
- 6 - 10. You guessed, see above.!
11. If you want a copy of the results, make sure you enclose an address label and enough return postage. 1 IRC/\$ for non US/VE mail is not enough.
12. For next year, save trees and seriously consider sending a disk or an electronic log!

The full article is well worth downloading and printing as a reference, (look at <http://www.kkn.net/~trey/cabrillo/>) especially if you are an avid contester. For the full Cabrillo tools, look at: [www.cabrillotools.com/index2.html](http://www.cabrillotools.com/index2.html) as shown in Fig. 2.

### CORRECTION

In a previous column I mentioned a DXCC program and it turns out the website address I gave was incorrect - sorry - try [www.qsl.net/va3cr/](http://www.qsl.net/va3cr/) Then follow the link to Enter the Ham Radio Software Site. The file is available by selecting the Dxcc4Win option, which downloads a file called DxccV10.zip. Thanks to **Dave G0DJA** for this information. (I have checked, it and it works fine.)

### SPRING CONTEST

The BARTG Spring RTTY contest takes place from 0200GMT on Saturday 17 March to 0200GMT until Monday 19 March 2002. Single operator and s.w.l. stations are permitted a maximum 30 hours operation. Rest periods may not be less than three hours per period. Multi-operator stations may work the full 48 hour contest period.

The Categories are:

1. Single Operator All Band
2. Single operator Single band
3. Multi-operator All band
4. Multi-operator Multi-transmitter
5. Short Wave Listener

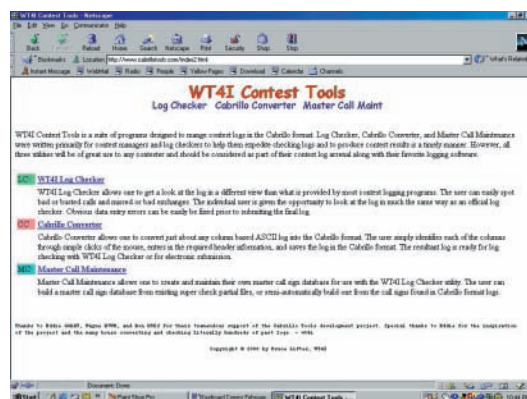
Categories 1, 2 and 3 are single transmitter only. No station may enter more than one category. The contest will take place on the 3.5, 7.0, 14, 21 and 28MHz Amateur bands.

All contest or check logs should be sent to:

**John Barber GW4SKA, PO Box 611, Cardiff, Wales.CF24 4UN** or via E-mail to: [ska@bartg.demon.co.uk](mailto:ska@bartg.demon.co.uk) Please note E-mail logs will only be accepted if sent as plain (or zipped) text files, with one file for summary and one file per band, named in the format callsign.sum, callsign.10, callsign.15 etc. No BIN or other format files will be accepted. For details of the full rules, scoring etc., look at the BARTG web site at [www.bartg.demon.co.uk](http://www.bartg.demon.co.uk)

That's all for this month, so cheerio until next time.

*Roger G3ADI*



● Fig.2

# IN VISION

BY GRAHAM HANKINS G8EMX

17 COTTESBROOK ROAD  
ACOCKS GREEN  
BIRMINGHAM  
B27 6LE

E-MAIL: [graham@ghank.demon.uk](mailto:graham@ghank.demon.uk)

**T**he British Amateur Television Club (BATC) is intensifying its drive to build its UK and world-wide membership to more than 2000. **The BATC is a club for everyone who has a 'thirst' for television as a communications medium.**

Although its 'core' function has traditionally been to cater for the transmitting Radio Amateur who also puts out pictures, today's BATC member could be a vintage broadcast television enthusiast; or watching the skies for new 'birds' as fresh satellites are launched with extra TV channels.

The complex electronic circuits and computing techniques of TV systems maybe the member's particular fascination. Or, artistic, editorial and production of TV footage could be the draw. All these diverse aspects of television are welcome in the BATC.

To help with the drive for new members the BATC intends to visit more of the major rallies and exhibitions in 2002 and apologises to anyone who came looking for a club stand during 2001 - lack of personal transport prevented several appearances. With the dates for the London Show at Pickets Lock having been fixed for the 23/24th March and the Leicester Show at Donington Park later in the year, the BATC hopes to see old and new members there and hopefully at some other rallies too.

Having a club stand at a rally demonstrates that the club is still active. The BATC table usually shows where all the ATV repeaters are located, there is a 24cm (1.3GHz) transmitter and receiver for visitors to examine, plus copies of the excellent *Introduction to Amateur Television* written by **Mike Wooding G6IQM** and the BATC's chairman, **Trevor Brown G8CJS**. Plus, of course, facilities for members to renew, and newcomers to join the club!

If conditions are particularly favourable, the local ATV repeater may be being monitored and used at a show. Favourable conditions means that the venue is within the coverage of a repeater and that an antenna can be fed to the position of the BATC stand. The London show is ideal for this, with the North London Television Group's Enfield repeater, **GB3EN**, so close.



● On-air activity on 1.3GHz. The BATC would like some recordings of your ATV contacts for the DVD being planned (see text).

To further publicise ATV and the work of the club, the BATC committee is considering the production of a Digital Versatile Disc (DVD) about ATV. The DVD is now an established video medium, delivering very high quality pictures in a format that has been well received by the buying and viewing public. So, the club needs some video of ATV activity to put on the disc!

At the last London show that I attended for the club, several ATV operators offered to send me some tapes showing off-air contacts.

and software. I will give you more details of what will be at the rally and where it will be in my next column in the May issue.

Meanwhile, why not visit the club's web site? You will even find photos of the committee there! The site accepts credit card subscriptions and a selection of ATV software can be downloaded too - check out: <http://www.batc.org.uk>

## BASIC QUESTIONS - SIMPLE ANSWERS

As I was finalising this edition of In Vision I

## GRAHAM HANKINS PRESENTS HIS FIRST COLUMN FOR 2002 REPORTING ON THE BATC'S RECRUITMENT DRIVE.

Unfortunately, I never actually received any!

So it's time for another **prompt** - if there are **any** recordings of Amateur TV, any band, simplex or repeater that individuals or clubs would like to send to the BATC, please contact me. It's footage we need, there are plenty of editors - amateur and professional - within the club who can produce an acceptable final DVD.

The BATC can sometimes come to **you!** Several of the committee have, over the years, been invited to Amateur Radio Society meetings around the country to present ATV to local Amateurs. I remember going all the way to Newbury and back in one evening!

So, if any local club would like an ATV evening, please contact me, I will circulate committee and the wider membership and if a local speaker can be found we will try our best to come along. **If the person from a club near Derby wishes to contact me again, I will try to visit you this year.** Sorry, but without a car it was quite impractical previously.

### ANNUAL RALLY

Meanwhile, the British ATV Club is planning its own annual rally, which has been at Bletchley Park, the wartime home of codebreaking, for the past couple of years. And here there's good and bad news.

The good news is that the Bletchley Park Museum of Cryptography is now opening every weekend - the bad news is that the BATC needs to find yet another venue - the club used the Park during one of the closed weekends. Information is that rally organiser Dave McQue is looking for a school in Milton Keynes.

The BATC Rally is an ideal opportunity to discover the really diverse world of Amateur television - refurbished ex-broadcast cameras and studios, live ATV links from portable stations, repeaters and satellites, ATV circuit boards, kits

received an E-mail from someone I knew within the ATV hobby, posing some fairly basic questions about ATV. In case this awareness level is more prevalent than I imagined, here are the answers that the person requested.

**Q:** What is Slowscan ATV?

**A:** Slowscan ATV basically handles still pictures over a narrow bandwidth and can send pictures, or images, long distances over the short-wave Amateur bands. There are numerous computer programmes for SSTV and some limited motion may now be possible within the audio spectrum, but it's not a mode I am fully familiar with.

**Q:** What is Fastscan ATV?

**A:** Fast scan ATV is 'normal television' as watched by millions at home every night (at least!) 625 lines, 50 frames per second, colour, sound and real-time motion. Amateur TV may not achieve the full technical specification of broadcast TV, but it can and often does come very close.

**Q:** What about picture content?

**A:** The content of your pictures must comply with your Amateur Radio licence - you are not operating an entertainment TV channel. The technical quality of the received picture is graded with a 'P' number. P5 would be a noise free, good definition, fully locked ie near 'broadcast' standard. Amateur pictures below this, as noise and other visible faults increased, would be given reports from P4 downwards.

So, P5 until next time!

Graham G8EMX

# TUNE-IN

**TOM WALTERS**

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Well, I wish I could bring you right up-to-date on the situation in Afghanistan with regards to radio transmissions, but as before, everything in that part of the world is so fluid that the scene changes week by week. At press time, there was talk of possible transmissions 1300-1430UTC on **9.950MHz** from the **Voice of Afghanistan**, and that **Radio Afghanistan** was now in operation once again.

The news was very uncertain (early December). However, when you read this, the news will undoubtedly have moved on

6.180MHz. The great advantage of the way the frequency information is presented on this site is that you can choose quite small target areas. The new slogan for DW is "We are wherever you are". It's a claim that they seem likely to fulfil.

Meanwhile, is the BBC as secure as it ought to be? 'Told you so' could be the tart comment on some people's lips, following the news that **Merlin Communications** has been sold to **Vosper Thornycroft** for the very large sum of £95 million.

When Merlin was formed, the BBC World Service sold most of its radio transmission



jamming, was at time of writing to be heard on **Radio Free Europe/Radio Liberty** doing its worst to their Persian service at 0430-0730 on 9.585, 12.015, 15.290; 1400-1700 on 9.435, 11.730, 15.195 (to 1500), 15.410 (from 1500) and 2000-2300UTC on 7.280 and 9.835MHz. Was it something the Americans said? Almost certainly. Perhaps relations became a little less friendly once the Taliban in Persia's neighbour Afghanistan were on the run?

Meanwhile, the **Voice of America** is having a go at reaching the hearts and minds of all those Uzbeks who have been doing battle against the Taliban, while America uses Uzbekistan as a base. The VOA have increased their 15 minutes Uzbek daily transmission to 30 minutes between 1500-1530UTC, and plan an additional session from 1230-1300UTC. The VOA have also upped their transmissions in Arabic and Farsi, and also have on the stocks a huge expansion in Arabic for the whole Middle East.

## SIGN OF THE TIMES

In a sign of the times, **XM Satellite Radio** is up and running coast-to-coast in the USA. They hope to have lots of receivers in cars soon. To be launched next year is **Sirius Radio**, with the same aim in mind.

Meanwhile in Britain, **DAB** (the Eureka 147 digital system) is now quite widely available. You can, for instance, hear BBC World Service loud and clear all over London and manufacturers such as Goodmans are producing radios at not unreasonable prices, with a projected hand-held miniature DAB receiver from Roke Manor. All the competing digital systems are, needless to say, incompatible, joining **WorldSpace**, on which the **BBC** can be heard in Africa and Asia and soon in the USA.

For good solid information on short wave, it's time to consult the new editions of those essential publications the *World Radio TV Handbook* and *Passport to World Band Radio*. A useful guide to consult for international transmissions in English is the new edition of the *Global Broadcasting Guide*, which is published by the Association for International Broadcasting. All of these publications are available from the PW Book Store or via the AIB's web site [www.aib.org.uk](http://www.aib.org.uk)

That's all for this month so until next time keep tuning round those broadcast bands and don't forget to let me know of any interesting finds.

*Eye for now, Tom*

## TOM WALTERS HAS THE LATEST BROADCAST SCHEDULES FOR YOU TO TUNE IN TO.

considerably. Those of you with internet access can find the latest at **Communications World** from the VOA at [http://www.trsc.com/cw/cw\\_scripts.html](http://www.trsc.com/cw/cw_scripts.html) or from **Media Network** at <http://www.rnw.nl/realradio/index.html>.

Last month I reported that the BBC has decided to move all its media 'eggs' into one basket, by bringing together **BBC World Service Radio**, **BBC World TV** and the on-line services, so that whether you are listener, viewer or surfer, or any combination of the three, you can get the best of the BBC, wherever you go. Now the giant of German overseas broadcasting **Deutsche Welle** (DW) has announced similar plans.

The new internet address for DW is [www.dw-world.de](http://www.dw-world.de) and both the address and the site reflect the way DW-tv and DW-radio have now merged with DW on-line to form a single information service. On the website, there is a big concentration on the on-line service, which you can access as soon as you've chosen your language.

Obtaining frequency information is a bit tortuous, but try the route 'dx-program', 'interactive world map', and click on your area of choice. For Western Europe this reveals the schedule in English as 0600-1900 on 6.140; 1800-1830 & 1900-1930 on 3.995 and at 2000-2045UTC on

facilities to Merlin. Now those facilities are owned by Vosper, which has many other interests, including ship-building. Whatever will the BBC do if Vosper decide to sell off some of the transmitters and/or transmission facilities? On the other hand, perhaps it will never happen...

## TROUBLE IN MONGOLIA?

What's the matter with the **Voice of Mongolia**? This was the question raised in an E-mail I received the other day. The answer is not a lot.

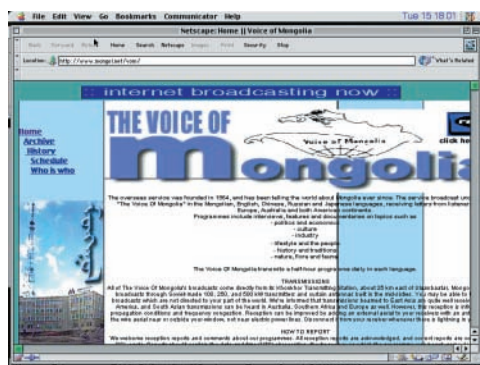
Voice of Mongolia's website was unobtainable for a while, but it's back on-line now, with a new address, [www.mongol.net/vom](http://www.mongol.net/vom) and none the worse for the experience, either! You'll find very quickly from their easy-to-use site that their schedule

runs at: 1030-1100 on 12.085, 1500-1530 on 12.015 and at 2000-2030UTC on 12.015MHz. Well worth a listen, to a most individual and attractive station, situated in a very inhospitable land, but populated by intensely friendly people.

Things are really buzzing in Nigeria at the moment. A network of digital f.m.

stations is planned and some domestic services can now be heard on short wave. Try 0430-1915 on 7.275 (Abuja), and 3.326 (Lagos), 6.025 (Enugu) and 6.050MHz (Ibadan). The Voice of Nigeria uses 7.255 and 15.120MHz.

That old bane of short wave listeners' lives,



# Trader's Table

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MISCELLANEOUS  
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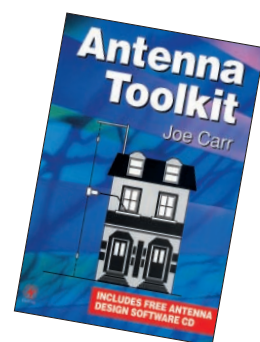
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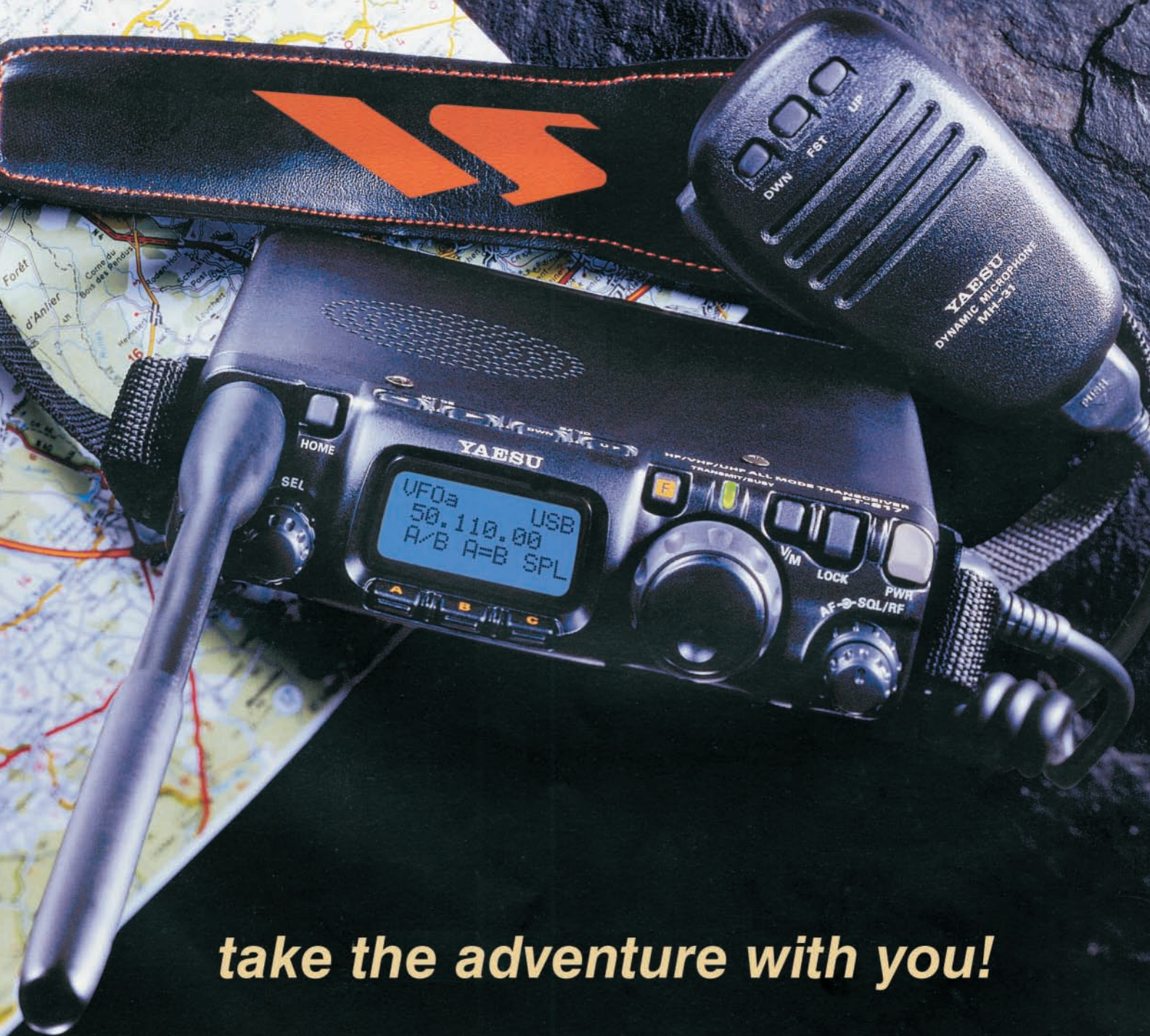


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