

Practical Wireless

**PW**

amateur radio & more!

**MFJ-461 Review -  
More Morse Fun!**

**Low Power  
History**

**Euro-Zone  
Operating**

Satellite Success...

**with the TS-2000**



April 2002

£2.75



9 770141 085051





**SOUTH, 1**

**HEAD OFFICE**  
22 MAIN RD, HOCKLEY, ESSEX, S55 40S

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FAX: 01702 205843

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36% of W&S Catalogue Completed  
**VIEW OR DOWNLOAD OUR CATALOGUE SECTIONS**  
[www.wspic.com](http://www.wspic.com)

Saving:  
W&S Catalogue from wspic.com

## RIGblaster

a marriage of radio and computer

**IT'S NOT A TNC**

### OVER 10,000 ON THE AIR

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

### TRY THAT WITH A TNC!

All programmes and every lead included.  
Just change jumper lead to suit rig's mic  
socket: pin-out

RIGblaster Plus	Auto mic switch 8-pin round (software and cables)	£139.95 B
RIGblaster MB	Auto mic switch 8-pin round (software and cables)	£109.95 B
RIGblaster M4	Auto mic switch 4-pin round (software and cables)	£109.95 B
RIGblaster RJ	Auto mic switch RJ45	£109.95 B
RIGblaster nomic Bp	8-pin mic (software & cables)	£62.95 B
RIGblaster nomic 4p	4-pin mic (software & cables)	£62.95 B
RIGblaster nomic RJ	RJ45 mic (software & cables)	£62.95 B

## YAESU

**FT-1000MP MK-V 200W HF ALL MODE**  
3 YEARS FREE WARRANTY



**SPECIAL OFFER**  
**FREE HEIL GOLD LINE MICROPHONE**  
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).

**£2899**  
Plus £8.00 Carr.

**FT-847 160m - 70cm ALL MODE**  
3 YEARS FREE WARRANTY



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.

**£1149**  
Plus £8.00 Carr.

**FT-100 D 160m - 70cm ALL MODE**  
SAVE



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

**£899**  
Plus £8.00 Carr.

**FT-920AF HF 160m-6m-100W**



100 Watts from 1.8 to 54MHz with dual VFO controls. Supplied with FREE FM unit.

**£1099**  
Plus £8.00 Carr.

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



Switched 280 / 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)

**£69.95**  
Plus £8.00 Carr.

## KENWOOD

**TS-2000 160m - 70cms+23cms OPTION**  
3 YEARS FREE WARRANTY



**+FREE HEIL HM-10 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 benefits of built-in ATU. It's all there in one very compact box. Colour brochures available on request.

**£1695**  
Plus £8.00 Carr.

**TS-570DG 160m - 10m All Mode**  
3 YEARS FREE WARRANTY



**TS-570 Accessories**

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

**INTEREST FREE**  
DEPOSIT £85  
6x MONTHLY £29.97  
OPTION £580.18

**£849**  
Plus £8.00 Carr.

**TS-870 160m - 10m 100W Advanced DSP**



It has 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 automatic ATU, interactive menu system, built-in electronic keyer and 100 memories.

**INTEREST FREE**  
DEPOSIT £135  
6x MONTHLY £47.63  
OPTION £928.22

**£1349**  
Plus £8.00 Carr.

**SGC SG-2020** £599  
Plus £8.00 Carr.



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

## ICOM

**IC-756 PRO II** £2495  
Plus £8.00 Carr.



**NEW**  
**IN STOCK!**  
This is Icom's new Flagship.

**IC-7400 160m - 2m ALL-MODE**



**NEW**  
**IN STOCK!**

**£1499**  
Plus £8.00 Carr.

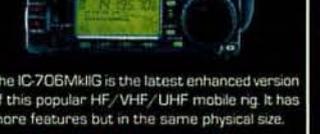
**IC-756PRO 1.8 - 52MHz 100W**  
3 YEARS FREE WARRANTY



**INTEREST FREE**  
DEPOSIT £190  
6x MONTHLY £66.89  
OPTION £1303.66

**£1895**  
Plus £8.00 Carr.

**IC-706iIG 160m - 70cm ALL MODE**  
3 YEARS FREE WARRANTY



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.

**IC-706iIG ACCESSORIES**

AT-180	Auto ATU	£379	B
FL-100	500Hz CW	£59	B
FL-232	350Hz CW	£59	B
FL-103	SSB 2.8kHz	£59	B
FL-223	SSB 1.8kHz	£59	B
DC Lead	(spare)	£16	A
3.5m	sep. cable	£33	A
5m	sep. cable	£49	A

**£849**  
Plus £8.00 Carr.

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



**SAVE £150**  
**LIMITED SPECIAL OFFER!**  
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 including wide-band receive. Plus auto notch, dual vfo, swr meter etc. Plus options including DSP & filters.

## Interest FREE OPTION - ON SELECTED LINES

Pay 10% deposit and 6 low monthly payments - with OPTION to pay balance \* off at ZERO INTEREST or continue monthly payments over 30 months (= 26.8% APR)  
Example: FT-817 £799 Pay deposit £80 plus 6 payments £28.20. After 6 months pay balance of £549.80 interest FREE or 30 months at £28.20. Interest charge over 30 months: £297.10  
W & S PLC IS A LICENSED CREDIT BROKER. OFFER IS SUBJECT TO STATUS.

**FREEPHONE ORDERS: 08000 73 73 88**

**MIDLANDS, SCOTLAND.**

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 £6.00 Carr.

ASK FOR DETAILS  
ALSO AVAILABLE IN KIT FORM

**GZV-4000 40A 5-15V Switch Mode**

**DIAMOND ANTENNA**

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

**£159**  
Plus £8.00 Carr.

**W-CRI PADDLE KEY**

**£44.95**  
Plus £8.00 Carr.

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

**W-GMP 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 11kg

**£76.50**  
Plus £6.00 Carr.

**Kent Morse Practice Oscillator**

- Size 160 x 55 x 97mm
- Weight 280g

**£19.50**  
Plus £2.00 Carr.

**ICOM**

**IC-207H • 2m + 70cm FM** **£279**  
Plus £8.00 Carr.

A great budget class radio for VHF & UHF use.

**IC-2800H • 2m + 70cm FM** **£419**  
Plus £8.00 Carr.

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

**IC-910 • 2m + 70cm ALL MODE** **£1299**  
Plus £8.00 Carr.

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

**ICOM**

**IC-2100H • 2m FM MOBILE** **£229**  
Plus £8.00 Carr.

With Switched 12.5kHz & 25kHz Filters

Rugged design with switched receive filters 12.5/25kHz

**YAESU**

**FT-7100 • 2m/70cm MOBILE** **£399**  
Plus £8.00 Carr.

**NEW**

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-1500M • 2m FM MOBILE** **£159**  
Plus £8.00 Carr.

**SPECIAL OFFER**  
**"SAVE £70"**

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

**KENWOOD**

**TM-D700E • 2m + 70cm FM** **£449**  
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-G707E • 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 cool blue display, easy with 50/35W output. 50W/35W plus 280 memos and five storable operating profiles.

**KENWOOD**

**TH-D7E • 2m + 70cm** **£299**  
Plus £8.00 Carr.

**Data Communicator**

- 144-146MHz
- 430-440MHz

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

144-146MHz Tx/Rx FM  
430-440MHz Tx/Rx FM  
Up to 5W out with Li-Ion battery and "scanner" style coverage from 100kHz to 1300MHz including SSB on receive! This is a great radio to have at all times when you are on your travels.

**THG-71E** **£199**  
Plus £8.00 Carr.

- 144 - 146MHz FM
- 430 - 440MHz FM
- 3 power levels
- 6W (13.8V) 5.5W (UHF) HI
- 0.5W LO 50mW EL
- 200 multi-function memories
- 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 C-408 • 70cm** **£49**  
Plus £6.00 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).

**FT-817 'SPECIAL OFFER'**

**YAESU**

**SAVE £100!** INCLUDES AC CHARGER AND 1 AMP Ni-cad PACK

The amazing FT-817 offers all-modes from 1.8MHz - 440MHz with up to 5 watts out. Buy one of our "WALKABOUTS" antennas at the same time and **SAVE EVEN MORE!** We will give you an extra 10% DISCOUNT on the antenna!

**NEW MINI SM PSU PS-617**  
**£19.95** ~~£8.00~~

**£699 carr.£8**

**ADI**

**ADI AT-600 • 2m / 70cms** **£179**  
Plus £6.00 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 £6.00 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 AR-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 £5.00 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 VX1R • 2m/70cm** **£145**  
Plus £6.00 Carr.

76-999MHz Rx  
144-146, 430-450MHz Tx

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

**'Amazing' FT-817 Screwdriver Antenna**

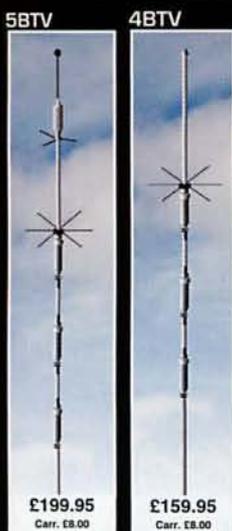
Covers 40m to 70cms up to 150 Watts

Manually slide it to set band and fine tune with 110cm telescopic whip. Supplied with universal table clamp and SO-239 socket, plus 3m radial kit. Can also be mounted on any 3/8" mount. Packed down length just 30cm. **THIS IS NO MIRACLE IT'S THE REAL THING!** (80m kit and other accessories available).

**£149.95 carr.£8**

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

## Get in Front with HUSTLER



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 G3OJV.  
Customers are also telling us how pleased they are with the base verticals. Check the prices!

### HUSTLER Mobile Antennas

Model	Band	Bandwidth	Price
RM-10	10m	150-250kHz	£19.95 B
RM-11	11m	150-250kHz	£19.95 B
RM-12	12m	90-120kHz	£19.95 B
RM-15	15m	100-150kHz	£19.95 B
RM-17	17m	120-150kHz	£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

Model	Band	Bandwidth	Price
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 £6.00 Carr.

IT TALKS TO YOU

"TURN LEFT  
W 2 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.

**NEW NEW NEW**

## CUSHCRAFT COMMUNICATIONS ANTENNAS

## WATSON

## WATSON

## WATSON

### HF HORIZONTAL BEAMS + DIPOLES

### WEP-300B • EARPIECES

£2.95  
Plus £2.00 Carr.

### QS-112 • SPEAKER MIC

£16.95  
Plus £2.00 Carr.

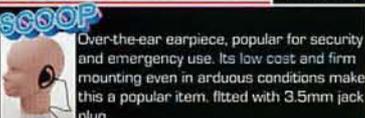
### ATK WALKABOUTS



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!**

MASB	10-20m (5 band) 3 el 2.7m radius 1.2kW	£299.95 C
X-7	10-20m 7 el. 12.5 - 13dB 2kW 6.09m radius	£669.95 D
X-740	40m add on kit for X-7	£269.95 C
A1-S	10-20m 4 el. 8.9dB 2kW 5.49m radius	£529.95 D
A-74	Gives 40m or 30m operation from A-4S	£149.95 C
A3-S	10-20m 3 el. 8dB 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. 8dB 2kW 4.4m radius	£349.95 D
A-103	Gives 30m operation from A3-WS	£149.95 C
D-3	10-20m dipole element 7.88m 2kW	£219.95 C
D-3W	12, 17, 30m 17m dipole element 10.37m 2kW	£219.95 C
D-4	10-40m dipole element 10.92m 2kW	£299.95 C
D-10	40m dipole element 12.88m 2kW	£259.95 C
Ten-3	10m 3 el 8dB 3m radius 2kW	£189.95 C
ASL-2010	13.5-32MHz 8 el. log periodic 6.4dBd 5.88m radius	£749.95 D



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 £6.00 Carr.

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



### YS-130

£79.95  
Plus £8.00 Carr.

Ideal for medium sized VHF antenna systems, the YS-130 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	£99.95 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-WH5	2m 5 el 6.6dBd 0.93m	£26.95 B
144-WH8	2m 8 el. 8.6dBd 1.79m	£37.95 B
144-WH10	2m 10 el 9.7dBd 2.3m	£41.95 B
435-WH8	70cms 8 el. 8.6dBd 0.8m	£29.95 B
435-WH12	70cms 12 el. 12.8dBd 1.51m	£35.95 B
435-WH15	70cms 15 el. 14.2dBd 2.19m	£41.95 B



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 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

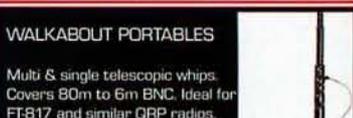
### AVAIR VSWR • POWER METERS



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

AV-200	1.8 - 200MHz 5/20/200/400W	£49.95 B
AV-400	140 - 525MHz 5/20/200/400W	£49.95 B

All fitted with SO-239, PEP, RMS readings, 3W for FSD approx.  
Also available AV20 & AV40 compact meters



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

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

### BASE VHF/UHF VERTICALS

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

Model	Band	Length	Price
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 & 7.5dB length 1.58m	£32.95 B
W-627	6m / 2m / 70cm 2 / 4.5dB length 1.6m	£34.95 B
W-7700HB	2m/70cm whip 3dB / 5.5dB length 1.1m	£24.95 B

ALL WITH TILTOVER BASES.

### CUSHCRAFT VERTICALS

**VR** (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

**VR-GK** Optional guy kit for VR £49.95 B

**VR-6000** 6 band 6m-20m that requires no radials and handles 1.5kW. Stands just 5.8m high and was chosen for the RSCG GR4FLIN vehicle antenna. It works! £329.95 C

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

VISIT US AT.....

# THE PICKETTS LOCK

## AMATEUR RADIO SHOW



# EXCLUSIVE DEALS

SEE US AT **PICKETTS LOCK** ON SAT & SUN

# MARCH 23RD & 24TH.

**SAT: 10AM - 5PM SUN: 10AM - 4PM**

**WE HAVE AN EVEN BIGGER STAND**

## MAIN RED HALL!



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Picketts Lock Lane, Edmonton,  
London N9 OAS.

For full travel guide see our  
website [www.wsplc.com](http://www.wsplc.com) and  
follow the links.



# PW

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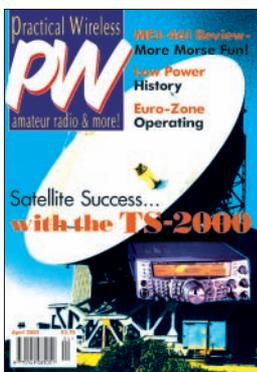
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## Cover Subject

Peter Perera G4AJG's article on working Amateur Radio satellites using the Kenwood TS-2000 gave Bob Kemp, PW's Layout & Design artist the idea for this month's unusual cover. The main image shows one of the huge Satellite dishes at the Goonhilly British Telecom International Earth Station in Cornwall fronted by the Kenwood TS-2000. We think you'll agree the work Bob's put in makes for a very striking cover indeed!

Inset Photograph: Courtesy of Kenwood Electronics UK Ltd  
Design by: Bob Kemp

## April features



### 18 Tex's Tips

This time **Tex Swann G1TEX** follows on from Allan Wightman's advice on antenna installations in last month's Antenna Workshop with an update on improving your reception further.

### 18 Errors & Updates

Useful additions and updates to **Phil Cadman G4JCP's** Valve & Vintage and the Short Wave Receiver project from the March issue.

### 22 Radio Basics

Following on from his dip into component 'Goody Bags' last month, **Rob G3XFD** now describes how to use the resistors and capacitors to your best advantage. There's also a quick lesson on how to identify their values with the help of the resistor colour code chart.

### 24 Satellite Success With The Kenwood TS-2000

**Peter Perera G4AJG** shares his experiences of operating and working Amateur Radio Satellites using the Kenwood TS-2000 transceiver. Read his article to find out how to share in the fun!

### 30 Euro-Zone Amateur Radio Operating

With the Euro currency now the legal tender in many EU countries **Père Sottise** provides some helpful hints and tips for the many British Radio Amateurs planning to travel abroad this year with their radio equipment. Forewarned is forearmed and by following Père's advice you can save money and enjoy trouble-free operating while in the Euro-Zone.

### 35 Low Power Operation

**Dick Pascoe G0BPS**, a keen QRP operator, traces the history of low power from 1949-2001. His article delves into the origins of QRP operating and the many colourful characters who prefer to operate with milliwatts rather than megawatts!

### 38 A Simple QRP Transmitter

**Hannes Coetzee ZS6BZP's** single transistor crystal controlled transmitter project is designed for QRP working but features a wider than usual tuning range. Why not have a go at building one for yourself?

### 42 MFJ-461 Morse Reader Review

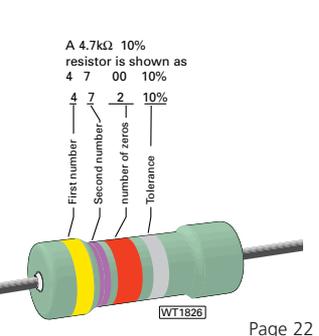
Decoding is fun says **Jonathan Constable M5FUN** following his review of the MFJ-461 pocket Morse reader. With a callsign reflecting Jonathan's enthusiastic approach to Amateur Radio who can argue!

### 46 Antenna Workshop

Picture this - the sun is shining, it's 25°C, you've got your sun hat and shorts and are playing antennas! Sounds too good to be true doesn't it? Join **John Pears W4/G0FSP** as he shares his design of the 'holiday' quad antenna he uses when he retreats to warmer climes during winter.

### 49 Carrying On The Practical Way

**George Dobbs G3RJV** encourages you to test your surplus crystals with the help of his crystal checker.



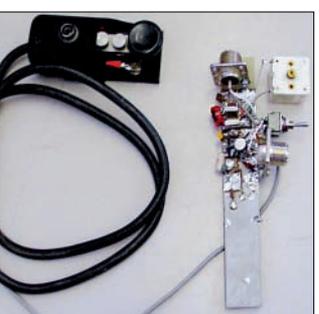
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# April regulars

**9 Rob Mannon's Keylines**  
**Rob G3XFD** introduces another packed issue and reports on interesting feedback from readers on the TW Communicators.

**10 Amateur Radio Waves**  
 There's an interesting post bag this month as readers make 'waves' by writing in with their comments, ideas and opinions.

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

**12 Amateur Radio News & Clubs**  
 The Newsdesk is overflowing this month! Make sure you are right up-to-date by reading our comprehensive news pages and don't forget to check out what activities your local club has planned too!

**52 Valve & Vintage**  
 More memories of early radio days are recalled by **Charles Miller** as he takes his turn in *PW's* vintage 'wireless shop'.

**54 VHF DXer**  
**David Butler G4ASR's** regular report on the v.h.f. bands includes details of increased solar activity and of the Six Metre to Microwaves Convention taking place in early April.

**56 HF Highlights**  
 More new reporters join **Carl Mason GW0VSW's** fold of enthusiastic h.f. band operators in this month's jam-packed column.

**58 Keyboard Comms**  
 If you are interested in sending pictures via PSK31 **Roger Cooke G3LDI** has details of a great website for you to look-up.

**60 DX Destination**  
**Ed Taylor G3SQX's** quarterly column features a report on Roger G4BVY's radio holiday in Mauritius.

**62 In Vision**  
 Have a go at building an ATV transmitter from a kit is the suggestion from ATV reporter **Graham Hankins G8EMX** this month.

**66 Down Under**  
**Chris Edmondson VK4AA/VK3CE** reports on Amateur Radio operation while travelling from Queensland to Melbourne - some 5500km!

**68 Tune In**  
 All the latest h.f. broadcast schedules and news are brought to the pages of *PW* by **Tom Walters**

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

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

**69 Topical Talk**  
 Letters from readers often help to shape the contents of *PW* - we look back on what an important part they have played over the last 70 years.

**Editorial Note:** Due to space limitations in this issue we have been unable to publish Ray Fautley G3ASG's article on the RAF R1155 classic transceiver this month. We hope to publish it in the May issue.



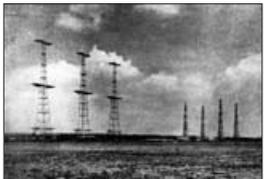
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Page 69. Coming next month.

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Our Radio Scene reporters' contact details in one easy reference point.

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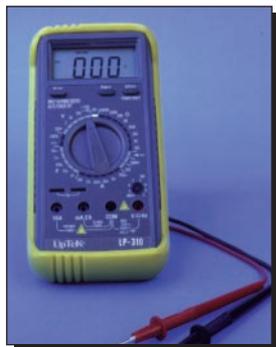
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# rob manniion's **keylines**

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

I don't often get the opportunity to publish formerly confidential information on the Keylines Editorial page...but this month I'm able to let you all into a little secret which was connected with an incident at the Marconi celebrations, at Poldhu, Cornwall in December. And in doing so I can pay tribute to the help provided on the occasion by none other than **Barry Maxwell**, the Radiocommunications Agency's Director of Customer Services.

Barry, is shown right, proudly displaying the framed text of the Queen's official message which was transmitted to Canada during the Century celebrations on the brilliant sunny mid-Winter's day of 12 December 2001. However, and **with his permission**, I'm now able to explain how Barry came to my rescue by enabling a copy of the 'Marconi Special' issue (see inset photograph, previously published on page 29 of the February issue) to be presented to **Guglielmo Marconi**, grandson of the pioneer during the celebratory dinner in the evening.

'Young Barry' (as I irreverently call him) is well known for his impish sense of humour and came to my rescue when I realised I'd not taken a copy of *PW* to present to Marconi's grandson. However, Barry promptly provided the copy he'd brought with him for bedside reading! However, at the time he was coy about sharing that information...fearing (jokingly) he'd be labelled as an 'Anorak'!

Eventually though, Barry gave in...and changed his mind. After all **he does support Amateur Radio** and there a large number of Amateurs working within the Agency and he respects them and their dedication. So, I was very pleased indeed when he'd decided to admit the 'secret'...and even said I could announce he's **"Come out at last!"** (In his words!).

Well, what can I say Barry - other than 'Welcome to the club' - it's a great hobby? And from the dealings we have with the RA - **they take particular interest in the forum provided by the reader's letters as they provide valuable feed-back** - we're all exceptionally pleased with the working relationship with you and your colleagues. So here's to the future of the hobby with the RA's full support!

## The TW Communicators

I selected **Denis Lisney G3MNO's** helpful letter (TW Communicators, letters pages) for publication as it also basically reflects the information contained in the many other letters received from readers on the same subject. **Thank you Denis, and everyone else for all your help.**

The same postbag also brought a very interesting postcard with TW information from **Frank Osborn G2CVO - 94 years old and with handwriting that puts mine to shame!** Nice to hear from you Frank...and I was impressed when I realised that Frank was already **24 years old when PW was first published!**

I even had a telephone call from one reader who had worked **Tom Withers G3HGE** on 7MHz - and also learned that G3HGE lived in Bury St. Edmunds which itself is an amazing coincidence. I say this because readers (who've attended 'PW Club Visits') will have heard my comments that

life seems to be full of amazing coincidences. This now includes the coincidence that the day before I heard that G3HGE lived in Bury St. Edmunds...I'd been visiting the local club in Bury!

However, to cut a funny story short...I have now written to G3HGE, with the suggestion of an in-depth article on the TW range, which must surely now be considered as British Amateur Radio 'Classics'? In the meantime, perhaps **you've still got a 70MHz (or any other band) Communicator yourself?** If so,

perhaps you'd like to share the experience

with other readers, photograph the rig and have your letter published!



## Local Dealer Panel

Although there are far fewer specialist service advertisers in *PW* than was the case 40 to 50 years ago...they still exist to help you with that difficult problem. However, as so many are now concentrated on the 'Local Dealer' panel...we've decided to rename it to reflect the changes.

From this issue of *PW*, the section will become 'Specialist & Local Dealers' and it's there you'll find advertisers providing masts, service information, etc. In particular (we get many letters/telephone calls/E-mails for help on this subject) you'll find Service Manual/Sheet suppliers there, ready to help you!

## Problems With E-mails!

A series of E-mail typing errors of mine has caused a rather embarrassing problem! Instead of typing the reply **"I've passed your E-mails to the News Editor"** I typed **"New" Editor**. The error caused confusion, but I'm pleased to say I'm still here! **Donna G7TZB** (News & Production Editor) says she's too busy to do my job!

**Rob G3XFD**

# practical wireless **services**

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

## Subscriptions

Subscriptions are available at £30 per annum to UK addresses, £38 in Europe and £42 (Airsaver), £49 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Practical Wireless* and *Short Wave Magazine* are available at £60 (UK) £73 (Europe) and £81 (rest of world), £85 (airmail).

## Components For PW Projects

In general all components used in constructing *PW* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article. The printed circuit boards for *PW* projects are available from the *PW* PCB Service, **Kanga Products, Sandford Works, Cobden Street, Long Eaton, Nottingham NG10 1BL. Tel: 0115 - 967 0918. Fax: 0870 - 056 8608.**

## Photocopies & Back Issues

We have a selection of back issues, covering the past three years of *PW*. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for *PW* are £2.50 each and photocopies are £2.50 per article. Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate. A complete review listing for *PW/SWM* is also available from the Editorial Offices for £1 inc P&P.

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## Technical Help

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

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

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.



**Sri Lankan Reader**

**Dear Sir**

I was a regular reader of *Practical Wireless* magazine from 1956 to 1971 here in Sri Lanka. I had to stop buying it due to circumstances beyond my control. However, my son knowing my interest, on joining The British Council Library surprised me with a copy of the April 2001 issue of *Practical Wireless*.

**I was also surprised at the changes in the advertisements!** The ones which caught my eye were the World Space Digital Satellite Receiver and the WinRadio PC Receivers. Also, there was a familiar name, **Gordon King**. Was he the same person whose articles on Servicing helped me a great deal? (June 1956 page 273 *Servicing Radio Receivers* By Gordon. J. King).

I am now 62 and started with the crystal set....my brother and I broke rocks in search of the elusive crystal. Its holder was made from a 'Milkmaid' cover cut with my mother's scissors. The earphones were TMC war surplus headphones.

What a thrill it was to receive a faint whisper...then came battery valves 1S4, 1S5, DF91, DAF91 for regenerative receivers. The received stations were then separated from each other and so was my pocket money from my pocket! The superhet was constructed by a circuit of **Mr F. G. Rayer**. The joy of receiving short wave stations was so interesting that I could not sleep at night.

The Mullard 510 with a pre-amplifier from *PW* by J. Haskell June 1961 page 144 (the player I used was a Collaro) and the amplifier was the envy of my friends. The speaker was a Stentorian.

With the advent of the transistor my construction work stopped **but not my interest in radio and short wave listening**. I now own an AR88 and I am keeping my fingers crossed that a valve will not burn-out since they are not available in Sri Lanka.

I may add that I treasure these back issues of the *Practical Wireless* often reading and enjoy glancing it over and over again. I hope that my letter will be of some interest to other old timers like me...helping them to revive their memories. Best wishes to you all! E-mails from readers sent to [ziegelaar@lgo.lk](mailto:ziegelaar@lgo.lk) will be greatly appreciated.

**Malcolm P. Ziegelaar**  
05 Windsor Avenue  
Dehiwala  
Sri Lanka

**Editor's comment: What a delight to hear from Malcolm Ziegelaar! And yes, it's the same Gordon King (now also G4VfV...who has been associated with *PW* for over 50 years!). I've written to Mr Ziegelaar asking for some photographs of him, his radio and his brother so we can include them in a future issue. I've no doubt also we can ensure that his AR88 continues to provide good service eh readers? (Nudge, nudge and a wink!).**

### The TW Communicators

**Dear Sir**

I'm writing to you with regards to the Editorial 'Can You Help' request panel referring to the 'TW Mystery', on page 29 of the March issue of *PW*, alongside the article by **Ben Nock G4BXD** on the TW Communicators. Although I have never bought or used a TW gear, I did see an early 70MHz Communicator owned (until it was stolen from him) by G3BZG.

We bought (for Post Office research work) some of TW's v.h.f. transmitters at the Dollis Hill research Centre. I think that the TW company was then based in North London, although soon after I visited the factory being built in Bury St. Edmunds. When in the area it eventually became a personal rule that at the local Westerly roundabout, that I drove to TW's factory, and then go and visit my mother and sister who still lived in the area!

I still have (it's a slowly disintegrating copy) an Electroniques catalogue with original adverts for the TW range of products. I feel sure that a factor in what happened, or seems to have happened to both TW and other UK manufacturers was due to the limited customer base. Even the Electroniques organisation eventually disappeared.

**Denis Lisney G3MNO**  
Harrow  
Middlesex

**Editor's reply: Thank you Denis (and the many others readers, who wrote, E-mailed and telephoned us on this subject). Please see Keylines for further comments.**

### Foundation Response From The RA

**Dear Sir**

I read with interest the criticisms of the Foundation licence in the January edition of *PW*. I welcome all constructive feedback, it is an opportunity to hear everybody's views. I also recognise that usually it is those with strongly held views that are moved to write and in

return I ask that authors recognise that we try to meet the wishes of the majority.

Most of the comments appear to be based on an inaccurate impression. For example, Mr Aspinall says "My objections would ease enormously if they [foundation licensees] were only allowed to use self-built equipment constructed from approved kits" I am pleased to say they can and this was the intention from very early on in the deliberations on the Foundation Licence and has been clearly stated in all announcements.

Eric Threw asks "Why therefore cannot we (the losers in this operation) just carry out the short Morse requirement without having to sit a 10 hour exam." You can. Any existing class B licensee, full or Novice/Intermediate, may take the Morse Assessment and obtain an M3 licence. That is all you need and the pass is valid immediately. The only delay to operating your own station is the arrival of the callsign. The RLC has a 5 working day target from receipt of a valid application to mailing your licence validation document.

There is also some misunderstanding about access to h.f. The words in section 10 of the Foundation syllabus are taken directly from the Radio Regulations which are an International Treaty which all administrations sign up to. We are obliged to administer a Morse test to all amateurs wishing access to frequencies below 30MHz.

The next World Radio Conference in 2003 (WRC-03) has an Agenda item to discuss section S25 of the Regulations which govern Amateur Radio. It is likely that the class A/class B distinction will be removed and all amateurs, Foundation, Intermediate and full, will have access to h.f.

Mr Aspinall is correct in his analysis of the numbers of amateurs over the years. Between 1200 and 1300 entered the hobby each year from 1963 to 1976, rising to 1700 in 1979, peaking at 8500 in 1984 and now falling to under half the steady, pre CB boom figure and



showing steady further decline. That coupled with a steadily rising average age within the hobby, currently well over 50, is a very clear indication for the future unless that trend can be substantially changed.

He also suggests there is no good evidence that encouraging the next generation into Amateur Radio will lead to more entering radio as a career. Is that a good impression to give? Amateurs enjoy a comparatively large slice of the radio spectrum at a cost which is truly insignificant compared to what commercial enterprise would offer. The reasons administrations adopt a benevolent view is partly historical, partly to do what they can to redress a shortage of good engineers in radio and other disciplines and partly in recognition of the good work and development carried out by many amateurs. I must question the wisdom of chipping away at these foundations.

**Alan Betts**  
**Radiocommunications Agency**  
**London**

#### Answering Mr Aspinall Dear Sir

I feel that the main points of the rambling diatribe from G3RXH should be answered as fully (and hopefully succinctly!) as possible.

So far as 'black boxes' are concerned .... I am a qualified Telecommunications and Aircraft Radio Engineer, and have run my own business for over 20 years designing and building all sorts of weird and wonderful one-off systems to customer requirements. I am quite capable of designing and building my own equipment. Why the heck should I? The black boxes that Mr Aspinall disparages so much in his letter are technically far superior to anything he

will ever build, and aesthetically far more pleasing. If your ego, Mr Aspinall, is satisfied by building your own equipment so be it, but some of us have better things to do with our time.

Towards the start of his letter Mr Aspinall states (Reference the Foundation Licence) 'My objection would ease enormously if they were only allowed to use self-built equipment..... from a range of approved kits.....'. Later on he states that 'there's a risk that home-brewed ..... equipment used by anyone may cause interference to other radio users ....', and later still '.... not all full licensees these days are technically equipped to build much themselves ....', so how does he imagine that a Foundation Class licensee will manage it? I suspect that Mr Aspinall doesn't have as much experience in building equipment as he would like us to think, or he would be aware that even with a kit there is no guarantee that it will perform to specification. How long do you think Mr Aspinall, that magazines like *Practical Wireless*, *Short Wave Magazine* and *RadCom* would continue to be published without 'black box' advertising? Just have a look through any of these magazines and see how much of their advertising revenue comes from manufacturers or stockists of black boxes. Without it the price would be so high that they wouldn't survive more than a couple of months! Mr Aspinall doesn't believe that just because statistics show a decline in Radio Amateurs it's actually happening - but then says that because the RA have no statistics to show the number of professional radio engineers who were previously Amateurs that this can have any relevance. Let's get this right Mr Aspinall, if the statistics show something is

happening you don't believe it, but if someone says something without any statistics to prove it you still don't believe it! Over 63,000 Amateur Radio Licences were issued in 1994 and less than 58,000 in 2001. Now unless I'm mistaken that represents a decline of just less than 10% in seven years, but perhaps Mr Aspinall works to a different maths system to me. The fact that there were only 9000 licenses in 1960 is of no consequence - it's about as relevant as saying that there were none at all in 1850!

Mr Aspinall seems to think that the spin-off from the CB boom in the 1980s and 1990s works in favour of his argument - in actual fact it is the reverse, without it the figures would undoubtedly show an even longer period of decline. I'm not too enamoured of the Foundation Licensing system as it stands but I don't hide that fact by taking personal swipes at magazine editors and RA employees and presuming that because a person isn't a British National he doesn't have a valid opinion!

Whether Mr Aspinall likes it or not we live in a world where things have to be paid for. If Amateur Radio licence numbers continue to decline the administrative costs per user will become astronomical - or maybe totally uneconomical so far as the 'Powers That Be' are concerned.....

The RA and the RSGB are trying to address a very real problem - they may not have it completely right but your attitude of burying your head in the sand and pretending that the problem doesn't exist certainly isn't going to help anyone.

Join the rest of us in the 21st Century (for better or worse) Mr Aspinall.

**Brian Groome G1WPG**  
**Wareham**  
**Dorset**

## amateur radio rallies

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

#### March 17

##### Norbreck Amateur Radio, Electronics & Computing Exhibition

**Contact:** Peter Denton G6CGF  
**Tel:** 0151-630 5790

This event organised by the Northern Amateur Radio Societies Association (NARSA) 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.

#### March 23/24

##### London Amateur Radio & Computer Show

**Tel:** (01923) 893929  
**FAX:** (01923) 678770

**Website:** [www.radiosport.co.uk](http://www.radiosport.co.uk)

The London Amateur Radio & Computer Show will be held at the Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London. Doors open at 1000 each day, daily admission is £3 for adults, £2.50 for OAPs and under 14s. There will be trade stands, special interest groups, Bring & Buy and lots more.

#### April 7

##### The 45th Northern Mobile Rally & Computer Fair

**Contact:** Gerald G0UFI  
**Tel:** (01765) 640695

**Website:** [www.harrogaterally.co.uk](http://www.harrogaterally.co.uk)

The 45th Northern Mobile Rally & Computer Fair takes place at the Sports Hall of the Harrogate Ladies College, Clarence Drive, Harrogate. For more information call or check out the website.

#### April 14

##### Cambridgeshire Repeater Group Annual Rally

**Contact:** Paul Dyke G0LUC  
**Tel:** (01462) 683574

**E-mail:** [g0luc@btinternet.com](mailto:g0luc@btinternet.com)

**Website:** [www.gb3pi.org.uk](http://www.gb3pi.org.uk)

The Cambridgeshire Repeater Group Annual Rally is taking place at the Bottisham Village College, Bottisham, which is six miles east of Cambridge. Access is via A14 and A1303. Features include a large hall, car boot sale, Bring & Buy and the group's renowned auction of radio and electronic equipment. Doors open at 1030 and admission is £1.50. Refreshments will be available and there will also be a Talk-in on S22.

#### April 21

##### The 18th Yeovil QRP Convention

**Contact:** Derek M1WOB  
**Tel:** (01935) 414452

**E-mail:** [m1wob@tiscali.co.uk](mailto:m1wob@tiscali.co.uk)

The 18th Yeovil QRP convention takes place at the Digby Hall, Hound Street, Sherborne, Dorset. Doors open at 1000. Talk-in on S22 GB2LOW. There will be three lectures by notable speakers, superb in-hall catering, trade stands, Bring & Buy, Construction Challenge and lots more.

#### April 28

##### Aldridge & Barr Beacon ARC Rally

**Contact:** Charles  
**Tel:** (01922) 636162

The Aldridge & Barr Amateur Radio Club (West Midlands) will be holding their 3rd Surplus Radio & Electrical Sale at the Aldridge Community Centre, Anchor Meadow, Middlemore Lane, Aldridge, from 1030 until 1430. Admission is just 50p.

#### April 28

##### Andover Radio Amateur Club

**Contact:** Terry G8ALR/Jim G4NWJ  
**Tel:** (01980) 629346/(01980) 610594

The Andover club are again holding their Spring Boot Sale at the Village hall in Wildhern, Andover, Hampshire. Full details are available from Terry G8ALR or Jim G4NWJ.

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 call sign with your E-Mail. All letters intended for publication must be

clearly marked 'For Publication'.

Editor







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3 Core.....	0.45p per metre
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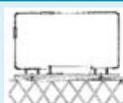
PS-20 20amp with 25amp surge Dual Meter & Adjustable Voltage 5-15v.....	£99.95
PS-30 30amp with 35amp surge Dual Meter & Adjustable Voltage 5-15v.....	£119.95

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40 metre trap 400W.....	£23.95
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BAHF-4 FREQ:10-15-20-40 Mtrs LENGTH: 1.70m HEIGHT: 1.20m POWER: 300 Watts.....	£129.95
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## HF YAGI

<b>HBV-2 2 BAND 2 ELEMENT TRAPPED BEAM</b> FREQ:20-40 Mtrs GAIN:4dBd BOOM:5.00m LONGEST ELEMENT:13.00m POWER:1600 Watts.....	£329.95
<b>ADEX-3300 3 BAND 3 ELEMENT TRAPPED BEAM</b> FREQ:10-15-20 Mtrs GAIN:8 dBd BOOM:4.42m LONGEST ELE:8.46m POWER:2000 Watts.....	£269.95
<b>ADEX-6400 6 BAND 4 ELEMENT TRAPPED BEAM</b> FREQ:10-12-15-17-20-30 Mtrs GAIN:7.5 dBd BOOM:4.27m LONGEST ELE:10.00m POWER:2000 Watts.....	£499.95
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## HF VERTICALS

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<b>EVX4000 4 BAND VERTICAL</b> FREQ:10-15-20-40 Mtrs GAIN:3.5 dBd HEIGHT:6.50m POWER:2000 Watts (without radials) POWER:500 Watts (with optional radials).....	£99.95
OPTIONAL 10-15-20mtr radial kit.....	£34.95
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<b>EVX5000 5 BAND VERTICAL</b> FREQ:10-15-20-40-80 Mtrs GAIN:3.5 dBd HEIGHT:7.30m POWER:2000 Watts (without radials) POWER:500 Watts (with optional radials).....	£139.95
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Gain:3.0/5.5 dB  
Power:200 Watts  
Con:SO239  
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Gain:0/3 dB  
Power:50 Watts  
Con:SO239  
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Gain:6.0/8 dB  
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# TEX'S

## TIPS & TOPICS

**H**ello and welcome to the occasional column that, although it's called Tex's Tips and Topics, its really about your ideas, tips and tricks. Though this month it's really just the one tip, that's an addition to last month's Antenna Workshop!

An interesting letter arrived from PW's occasional author Allan Wightman, as a follow-up to the his Antenna Workshop in the March issue of PW. It's not often that Allan can find the time to get off his ladders to write...but this time he thought "There's a tip for PW readers in this one" - hence the letter to me.

Alan tells me that he'd had to return to the disabled Amateur - whose antenna problems were the subject of Antenna Workshop - to do a very unusual job indeed. He wrote: "I've done some unusual

jobs in my time - including fabricating a Faraday screen over a wooden shed used for radio monitoring purposes - but which also had interference from a nearby powerful transmitter - but I've just finished laying my first chicken wire netting 'ground plane' earth mat on a garage roof". I liked the play on words Alan!

It turns out that Allan had to revisit his customer and he found that the disabled Amateur was using a 'loaded' (Alan's term - it was in fact a Pro-AM 7MHz mobile whip) attached to a metal plate using a three-magnet mobile antenna base. The Amateur was getting good results, even though the antenna was mounted in the middle of the garage's flat roof (See March issue) with only a simple ground-plane provided by two heavy wires crossing the roof diagonally and connected the earthy side of the mobile mounting.

### Simple Solution

With ideas buzzing in his head (so Allan told me in the letter) he thought he had a simple solution. Allan then explained to the customer how he'd been involved in providing a simple - but very effective Faraday screen - at the radio monitoring site. So, why not use some chicken wire netting on the roof to provide an improved earth mat/groundplane?

Unfortunately for Allan, The idea was accepted immediately! So, when Allan was next passing he found the roll of galvanised netting waiting for him and it was a simple job to roll it out over the roof, anchoring it at the sides with galvanised nails. The netting strips were then soldered at intervals (it's easy to solder when new). Soldering is best done with a butane hand torch, by wrapping solder around the joints to be made and then

wrapping them in one layer of aluminium foil - **with the roofing felt underneath being protected by an old tin tray or something similar during the soldering.** Apply the gas torch - wait for the flux smoke to disappear and the job's done!

The finished job left the mobile antenna base sitting right in the centre of the garage roof. The Amateur has opted to use this for 7MHz options, but the whip could be changed quite easily by an able-bodied person.

When it comes to relaying the roof - with a heavy quality roofing felt the netting will be left in place - sandwiched (A chicken sandwich Alan?) under the new layer, or else laid on the roof itself, with the new felt laid over it. Neat idea eh? Allan is now waiting for his first Amateur Radio customer to ask him to lay chicken wire netting under their lawn. Anyone got a turf cutting machine for hire?

Tex

## Errors & Updates

### Valve & Vintage PW March 2002 p42.

An early, uncorrected, version of Fig. 1, the circuit diagram of the Low Voltage Valved Receiver, was printed on page 42 of the March 2002 issue of PW. The corrected diagram is shown here.

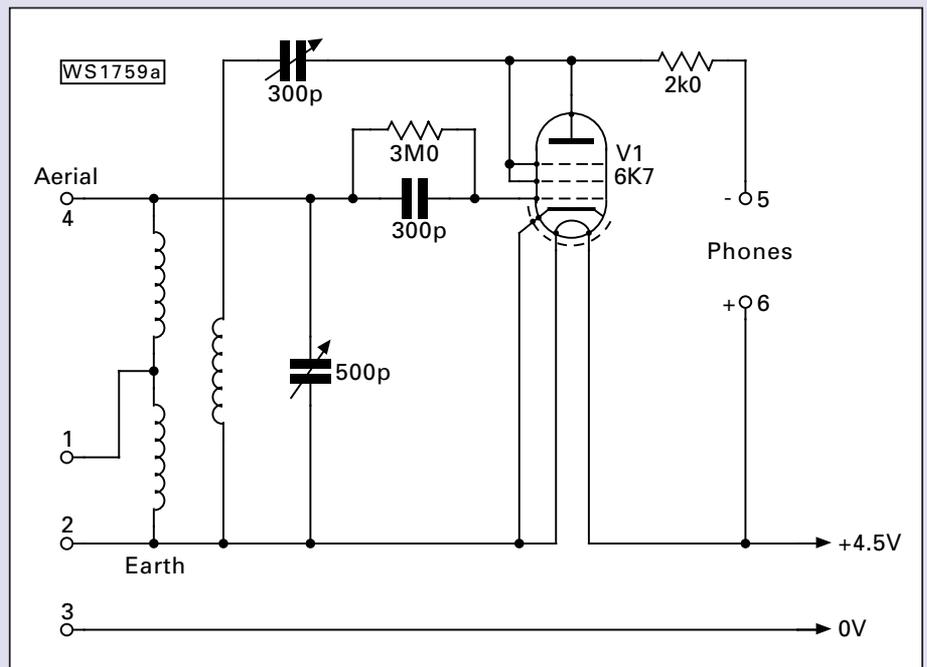
### Above And Beyond

#### A Simple Short Wave Receiver PW March 2002 p38.

On page 39 of the description of the project, in the third column, in the paragraph beginning "The value of the capacitor C2...." that reference should have been to "...the capacitor C4...". Also the reference to 'C2' in the formula in the fourth line of the same paragraph should be changed to 'C4'.

Again on page 39, in the right hand column, third from final line the reference to "C4" should be changed to 'C6'. Then immediately over the page, the reference to "Resistor R4.." should be 'Resistor R3..' And finally in the Shopping List, the 220µF capacitor referred to as "C8", should refer to 'C11' instead.

**My sincere apologies for these errors. Editor.**



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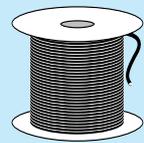
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vhf-uhf radios

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2 YR G'EE

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receivers

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garmin gps

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Superb quick fit dash mount for hand-helds. £9.99.

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special interest

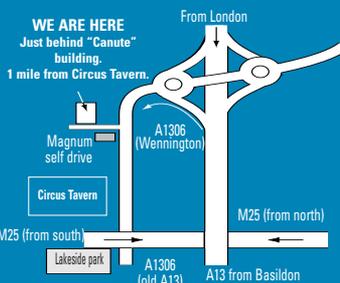
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# Radio Basics

Last month Rob Mannion G3XFD described the advantages of buying components in 'Goody Bags'. And now that you've (hopefully!) stocked up with capacitors and resistors, Rob describes how to use them to best advantage.

**N**ow that you've (hopefully) got a good quantity of resistors and capacitors from the 'Goody Bags' I recommended, we'd better look at how best to sort, store and use them to advantage. **To start...I'm going to suggest you spend some time now so that you can save even more time later!**

Firstly, I strongly recommend that despite the temptation to leave sorting out the small components (resistors and capacitors) until they're needed - that you actually do it as soon as you can. I recommend this because (from much personal experience and anguish) I've made the mistake of not sorting out what's needed before starting a project.

Hunting for a necessary component can lead to frustration and can make your eyes play tricks on you, especially when you're desperate to get something finished. Believe me - it's all too easy for your eyes to convince your brain, or vice versa, that the component you're looking at is the correct value when in fact it's not!

The basic resistor colour code is provided in the diagram, Fig. 1. It's simple and easy to use, but you do have to take some precautions, especially when the body/background colour used by the manufacturer can darken the coloured bands - and this can be made worse when the component is dirty

from being in storage.

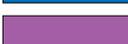
The diagram, Fig. 2, shows a typical resistor, 4.7kΩ (4,700Ω - the Ω sign represents ohms) a very common value which often appears in Radio Basics (RB) circuits. Please refer to the colour chart to follow the identification.

The first colour on the example resistor is Yellow, representing 4, which is followed by violet which represents 7, and this is followed by the red band. **The last band is important and represents the multiplier - number of noughts.** In this case it means that two noughts (zero if you wish). Thus the bands represent 4 - 7 - 0 - 0 or 4,700 ohms.

In radio constructional work we find it more convenient to say 'Four point Seven K'. The reference decimal 'point' 7 is used so because 700 is actually 7/10ths or 0.7 of 1000 - hence 4.7kΩ.

Resistor colour codes can play tricks on the eyes, especially if they are small 1/8th watt types and it's best to have good lighting in the workshop. For the older constructors - I include myself in this category - who are at the bifocal lens stage of life I urge you to consider one of the illuminated workshop combined lamps/low power magnifying lens units.

Often equipped with a 'daylight' bulb of around 60W the workbench lamp/lens units are very cheap nowadays and be of immense help in radio constructional work. In fact, I thoroughly recommend them

Resistor colour code				
Numbers		Tolerance	±%	
Black		0	None	20
Brown		1	Silver	 10
Red		2	Gold	 5
Orange		3	Red	 2
Yellow		4	Brown	 1
Green		5	Green	 0.5
Blue		6	Blue	 0.25
Violet		7	Violet	 0.1
Grey		8		
White		9		

● Fig. 1: The basic resistor colour code. The first coloured band is the first figure, followed by another coloured band representing another figure. The third band usually represents the 'Multiplier (see text).

for everyone to use, as they help relieve eyestrain.

## A Final Check!

Until you become more experienced, there's always a chance you might get caught out with colour codes...especially on low values. For example, if you came across (or needed) a 47Ω resistor you might be misled into thinking it would only carry the coloured rings representing 4 (Yellow) and 7 (Violet) **whereas in fact it would carry Yellow, Violet and Black!**

Why black? Well in answering, don't forget the last band is the multiplier and zero multiplied by zero is zero! So, the 47Ω resistor would be Yellow, Violet and Black. On the other hand a 470Ω resistor would display the following identification: **Yellow, Violet, Brown.** The Brown colour represents the figure 1, meaning that there is one zero (or nought) to be added.

However, even when you are experienced, if you've ever got any doubt on the values of a resistor (some come with extra bands which have been added to show special tolerances, etc.) it's always best to check

out the values with your test-meter. Don't be concerned if your test-meter shows that the resistance is 10 to 15% different to that expected. In practice this is quite common.

The only resistor types which are really accurate (sometimes as with ±1% of the stated value - which is usually marked on the side of the component) are wire wound types. However, although these types are accurate, you should be aware that they can only be used in a circuit where their inductance (the wire winding can appear to the circuit to be a small coil).

Generally speaking, you should try to avoid any wire wound resistance in a radio frequency (r.f.) circuit, unless it's specified you can use them. (At v.h.f. the self-inductance of a wire wound resistor can act like a small choke...some which can be used to advantage!).

I won't go into any more details regarding wire wound types. This is because they're normally very clearly marked with details printed in miniature writing (get that lens out!) on the side of the component.

However, before leaving this aspect of resistor, I recommend

that you snap up wire wound types when you see them as when they're bought new (if you can get them) they're very expensive. I recently had to buy a specific value for a project and it cost the equivalent of one of the Goody Bags!

## Sorting & Storing

When it comes to sorting and storing wire-ended resistors there are as many choices as there seems to be values! If you have the funds available there's nothing to stop you going to one of the many d.i.y. outlets and buy a suitable unit with as many plastic sliding drawers as you require.

Although more expensive I heartily recommend that you purchase a metal framed cabinet - if you're to buy rather than build (as I'm about to suggest). Try to avoid the all plastic cabinets, many plastic materials 'work harden' in natural sunlight as the ultra-violet rays gradually effect the strength of the material. Don't forget, that if you've got a workshop in the garage or in a shed, the ultra-violet will come streaming in even on an apparently dull day!

Even though most of the steel-framed (the outside cabinet is steel, often enamelled and fairly rigid) multiple drawer units sold at d.i.y. outlets tend to be made in China nowadays, they seem quite robust. I was quite surprised recently when I discovered that the extremely robust all-steel toolbox with drop in tool compartment was made in China! That old joke 'I've got a Chinese Copy' has turned full circle now because the ideas are originating in that cheap labour country now, they don't need our ideas, only our custom (incidentally, it's an excellent tool box and I bought it from Halfords for £17).

## Lack Of Space

The problem for many of us when it comes to storing

components is space or the lack of it! My little custom-made wooden shack had that problem at first. I could have easily filled it up with

that I could tailor it to my own requirements...something you can very easily do yourself, by modifying my own approach. I don't claim it as an original

sold - choose one to suit your needs...bearing in mind the size of your fingers, dexterity and then number of resistors to be stored), a backing board, adhesive, time and patience! Then all you need to do is to cut the tube into short sections, just a little longer than the resistors to be stored in them (use a little jig made out of two pieces of wood so that you saw cuts are straight).

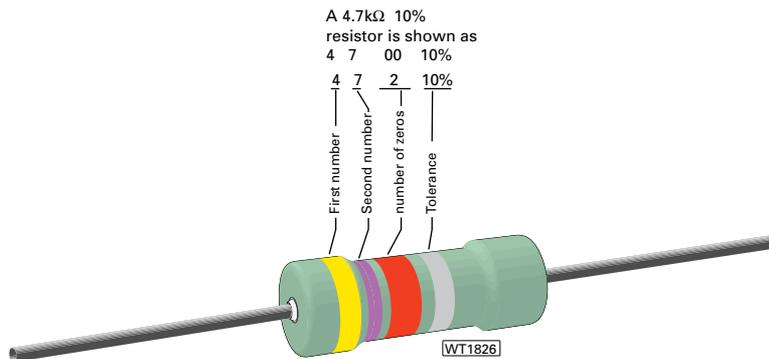
Once you've got enough of the tubes for the storage rack you're making (they can be made to fit in any convenient corner of the workshop) you can then stick one end of the cut tube onto the backing board with adhesive. You can also use a little adhesive to attach adjacent tubes to each other.

A thin strip of plastic, card or any other suitable material can be arranged to cover the open ends of the tubes if they're to be used mounted on a wall or transported...so that they don't fall out and you have to re-sort them! The value of the component stored in each tube can then be written/typed out on a strip of paper and stuck inside the tube.

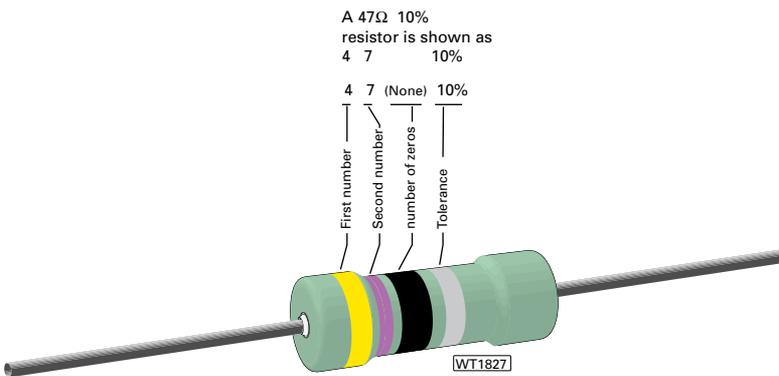
Another idea is to make groups of 20 or so tubes, stuck down onto the base board - in similar fashion to the plastic moulded pencil/pen office 'tidies' you can buy. Provided with a little carrying handle and lid - with the value of the resistors stored directly below each section of the lid itself and component identification is simple.

Try the idea for yourself, it's extremely simple and the advantage to you is that

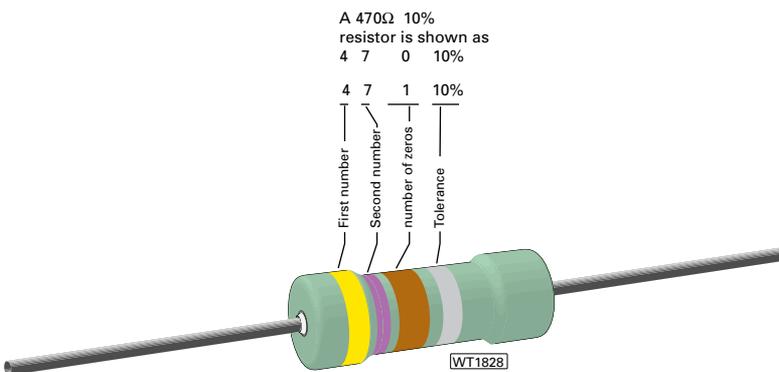
you can make the baseboard and subsequent size/shape of the storage unit to suit yourself! Happy sorting and storing!



● Fig. 2: In this example the resistor is a 4.7kΩ value (4700 ohms). Silver represents tolerance in percentage terms (see text).



● Fig. 3: This example is included to demonstrate how it's possible to misunderstand the colour code on a component. The resistor shown is actually a 47Ω resistor. Note that the last coloured ring - Black - actually refers to the fact that there's no multiplier (see text).



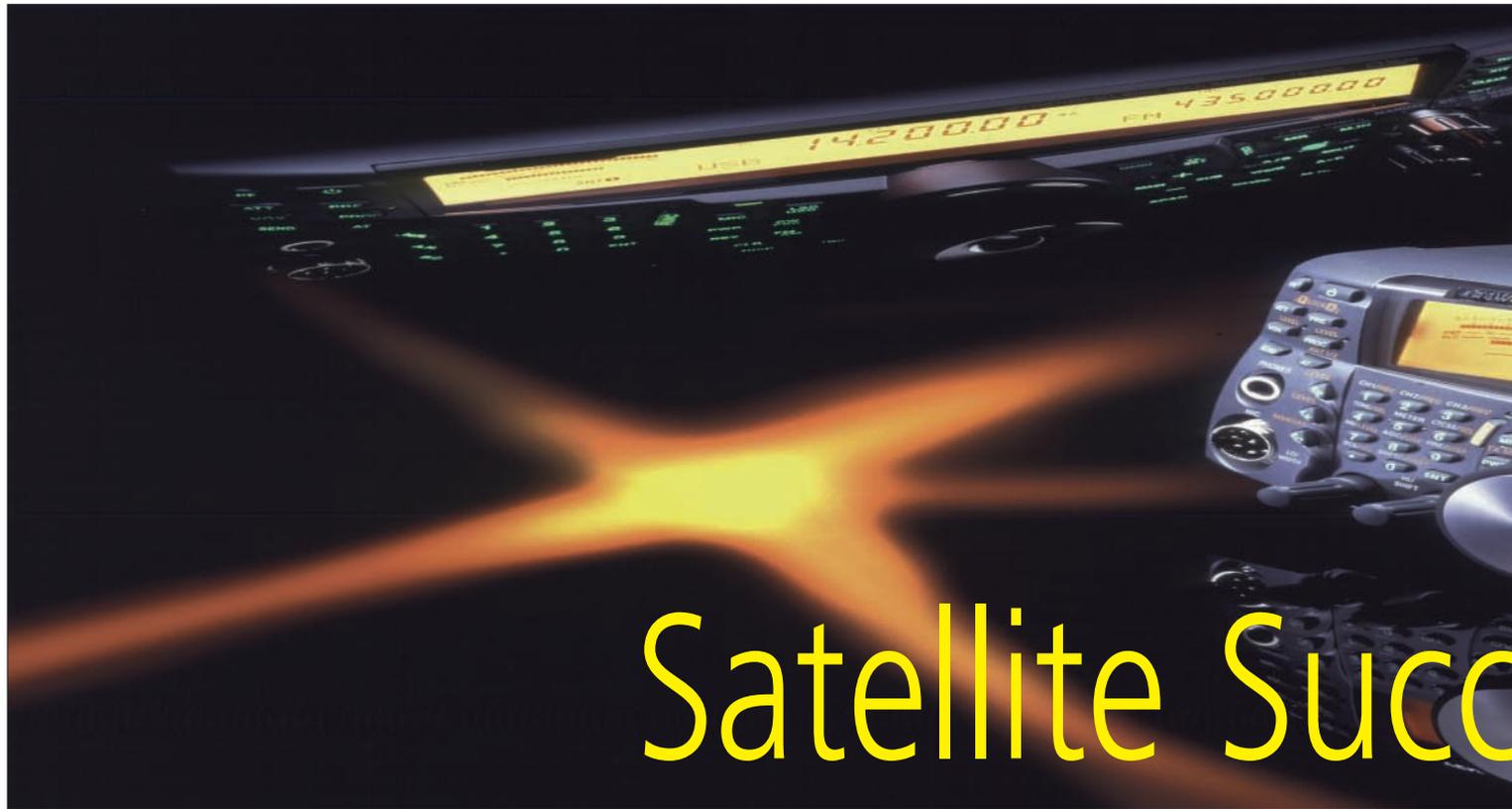
● Fig. 4: The resistor shown here is a 470Ω (four hundred and seventy ohms) value. Note that the last colour is in fact Brown. This means that there's one multiplier (a zero) to be added - making it 4 (yellow) 7 (violet) 0 Brown. Don't be misled into thinking that the resistor is a 471Ω value, (see text).

cupboards for components after I'd installed the wooden shelving.

Instead, I decided to use a system I had adopted many years ago - with the advantage

but have not seen anyone else using the same idea!

To make the storage unit all you need is several lengths of the relatively soft plastic piping (various diameters are



# Satellite Succo

Introduced into the UK market about a year ago, the Kenwood TS-2000 is a multi-mode, multi-band transceiver, packed with a profuse range of features and facilities. The transceiver covers the h.f., v.h.f., u.h.f., the S and L bands. It covers 13 Amateur bands in all, on all modes transmit and receive. A dealer modification is available to extend the receive only capability, enabling reception of Weather satellites and aircraft frequencies.

To achieve this complex but

compact design, the Kenwood designers have used computer based digital technology. The main CPU operates at 100MHz, and utilises two 16bit Digital Signal Processing (DSP) chips; the DSP features 24 bit A/D and D/A converters.

## General Construction

Overall dimensions are 281 x 107 x 371mm. Beneath the top and bottom 1.2mm steel covers, lies a robust 4mm tri-sectional die cast chassis. Below the top cover is a

1.2mm anodised screen, which is securely bolted on to the top of the die-cast chassis and a further separate 1mm plate screens the antenna tuning unit (a.t.u.) compartment. These provide excellent mechanical and electrical screening properties.

For L-band operation on the 1200MHz band, Kenwood supply an optional unit, UT-20, which fits into a side compartment of the die-cast chassis. The front panel hinges downwards for service access. A thermostatically controlled fan is provided.

## Front Panel

Using two menus and dual function keys, the controls are grouped in two parts of the front panel, 35 controls and buttons on the left and 26 on the right, including three concentric controls. These controls divide further into sub buttons with the **Func** (function) and **C-IN/Call** buttons on the front panel. A single button, different in shape and size and colour to the rest, enables the Satellite mode to be entered, a total of 10 memories are available to enter each



Peter Perera G4AJG really has had some fun operating on the Amateur Radio satellites...with the help of the Kenwood TS-2000. Read on to share the experience!



# Success with the TS-2000

Photo courtesy of Kenwood Electronics UK.

satellite designation and its mode of operation, f.m., l.s.b./u.s.b., and FSK etc.

A button marked **Trace**, enables up-link and down-link frequencies to be tracked upwards together or in reverse together. For doppler correction either up-link or down-link can be independently adjusted but still maintaining the Trace feature. Two v.f.o.s are provided for the main transceiver and an **A/B** button toggles between the two. A control button marked **CTRL** enables either the main Transceiver or the **AM/FM** sub-receiver functions. The main receiver operates on a.m., c.w., s.s.b., f.m. and FSK, and the second or sub receiver only on a.m./f.m. bands (This sub receiver can be switched on and off as required, by pushing the concentric knob marked **SUB/AF/SQL**, on the front panel.

One of the controls marked **MULTI/CH** carries out a variety of functions including setting of tuning rates ranging from 1kHz to 1MHz. Fine tuning is adjustable down to 10Hz steps. The main tuning control is centrally located. A smaller knob marked **RIT/SUB** on the top right of the panel tunes the sub- receiver.

A button marked **ATT** for the main receiver provides r.f. attenuation of 12dB, while another

marked **Pre** at top left of panel provides r.f. pre-amplification for both receivers. Internally separate pre-amplification is provided for each band. (I found that this should be switched on for all satellite operations).

PL259 connector for 144MHz and an N socket for 430MHz. An N socket on a flying lead is provided for the 1296MHz (23cm) antenna.

The transceiver has a 13.8V d.c. supply socket for connection to the external power supply, 9-Pin

for a 50/144/440MHz/1.2GHz linear amplifier. There's also an accessory connector, ACC2, for an Ext TNC/RTTY terminal and an exclusive 7-pin DIN connection point for an h.f. linear amplifier. (an RCA type connector is provided for a third h.f. antenna for receiving only below 30MHz.



● Peter uses the G3RUH modified 600mm dish with DB6NT 2.4GHz pre-amplifier.

## Rear Panel

There are a total of 15 connections available for use. These comprise two HF/50MHz PL259 connectors for separate antennas, a ground post for earth connection, two c.w. key jacks. (one for a paddle type, to work with the built-in electronic keyer and the other for a standard key). There's an external antenna tuner connection terminal, a

full duplex, asynchronous, RS232C socket for a computer connection (a connection point is provided for a secondary RC 2000 remote panel, for mobile use).

Two external speaker sockets are provided for outputs from the Main and Sub Receivers. (These are menu selectable and provide a choice of three options).

A connection point is provided

## First Encounter

The first encounter with the transceiver can be a little daunting and it will certainly take a little time to work round the various features and modes! It's almost essential to keep the 143-page manual close at hand to quickly check out any particular function.

The manual itself is quite well structured, and easy to read. It starts off with a 'quick start' introductory chapter, followed by a detailed explanation of the 60-item menu, which then takes you through the more detailed descriptions of the rest of the transceiver.

## Antenna Connections

Two h.f. antenna connections are provided and can be selected by operating buttons marked **Func** and button **Ant1/2**. This button, used on its own, also switches the antenna tuner.

The front display shows the antenna that's in use. For instance, an h.f. beam can be connected to one, and a 50MHz or long wire antenna to the other.

The automatic antenna tuner (a.a.t.u.), tunes each antenna and more importantly, its tuning capacitor setting is memorised together with the setting of each frequency for the frequency selected. An audible c.w. warning sounds if the s.w.r. is excessive, useful especially when you're carrying out antenna tests.

As I've mentioned already, there's an RCA connector provided on the rear panel for a receive only antenna feed for frequencies below 30MHz which is enabled via Menu 18.

### Frequency Lock Features

Both electrical and mechanical means are available for 'locking onto a given frequency. These include mechanically, by sliding a friction clutch at the bottom inner edge of the main tuning knob. Sliding it to left to gives free rotation of the knob or to the right locks it firmly.

Locking can also be done electrically, by using the **Func** and **Att/Lock** buttons to toggle the lock

on or off. When it's locked electronically, **F Lock** appears on the display. At the same time certain defined keys and controls only are disabled. Alternatively...a **Lock All** feature is also available when all keys and controls are disabled

### Useful Safety Feature

I found the **Transmit Inhibit Function** to be a very useful safety feature, when using down-converters on 2.4GHz. This protects the receive path from accidental operation of the **Send** button, which could push r.f. power up the wrong way to the down converter.

### Digital Signal Processing

Digital Signal Processing is provided in both the i.f. and a.f. stages. The bandwidth of the i.f. signal can be varied in steps at both the high and low ends, via two separate knobs provided on the front panel.

The TS-2000's DSP is a very effective feature especially on a.m. and c.w. modes giving a significant reduction in both adjacent channel QRM and band noise. In the c.w.

mode a centre shift feature is also available to tune out any adjacent interfering signal. (I also found it useful when copying telemetry from AO-40, reducing the bandwidth at the top end significantly improved copy.

The DSP is also provided at the a.f. stage with heterodyne cancelling features available, both automatically and manually. In the latter mode it acts as a manual a.f. notch on all modes, most effective in c.w. mode and the c.w. 'auto tune' is a further feature avoiding the necessity to continually re-adjust the tone.

### Noise Reduction

Apart from the standard Noise blanker designed to reduce pulse noise, such as vehicle ignition, Kenwood have introduced two types of noise reduction techniques, acting digitally. These they term **LAC** - Line Enhancer Method **NR1** and **SPAC** Speech Processing/Auto correlation **NR2**. This latter employs a special statistical /correlation algorithm to lift up low-level signals from the noise floor.

The correlation time is user adjustable in 10 steps between 2-20ms. These settings showed a significant improvement in signal clarity in the c.w. mode

The NR2 setting automatically forms a filter profile centred about the signal and enables cleaner s.s.b. signals. In practice, I found they produced a marked improvement in signal clarity. To reduce the total system noise produced between the 2.4GHz receive antenna and the receiver, the use of the beat cancel feature together with NR1 was effective.

### Satellite Operation

**Table 1**, lists the various satellites worked during the period of radio evaluation. The antennas I used were multi element crossed Yagis, on v.h.f. and u.h.f. bands and prime focus dishes for S band AO-40 Satellite operation. The antenna system was controlled by an automatic tracking device, driving motors providing both elevation and azimuth movement.

The feed from the 600mm dish is led into a suitable down-converter, which converts the incoming 2.4GHz signal from the AO-40 Satellite to an intermediate frequency band of 144-145MHz ,

to be detected on the transceiver's v.h.f. band. Two of these down-converters were ex-TV items modified with Murata filters, to give lower noise and re-crystalled at 8.125MHz to give the correct frequencies.

The down-converter finally selected was a custom-built unit from SSB Electronics GMBH. This has a noise factor of 0.8dB and gain of 25dB.

The lack of a 13.8V d.c. supply (at say 30mA maximum) at the 144 and 430MHz antenna terminals, was a bit of a let down. I say this because, the peripheral satellite equipment such as the already mentioned 2.4Ghz to 144MHz down-converters, require the d.c. supply to be fed via the r.f. coaxial feeder.

Maybe in future production models the supply could be incorporated? This would also enable external mast mounted pre-amplifiers to be used for reception of low signal satellites such as AO-10.

### No Problems

There were no problems at all when I operated on the latest and most ambitious Amateur satellite, AO-40. And even at poor 'Squint angles' (i.e. orientation of satellite antenna to your ground station) and I made many DX contacts.

The beacon could easily be located and even visually seen on the ARCP computer screen display sub window. The Trace mode enabled by pressing the **Trace** button, provides the reverse mode tracking to be set, so that the operating frequency and transmitting frequency are kept in track. However, you can make independent adjustments on either, yet keeping the up and down tracking intact. It was very useful to separately include (in one of the spare memory channels) the beacon frequency. This is so that it can be instantly switched in, to use with the that excellent program *AO-40Rcv* by AE4JY. The use of another telemetry programme, *P3T* and the G3RUH, PSK dedicated modem was also very smooth and flawless.

### Signal-To-Noise

Of the three down converters used the SSB 2000 (I first used it on AO-13 combination) provided the best signal-to-noise ratio and as the

Satellite Identity	Uplink Freq: (MHz)	Downlink Freq: (MHz)	Beacon Freq: (MHz)	Mode
AO-10	435.025-435.175	145.83-145.98	145.810±	SSB
AO-40	435.765-435.515	2401.225-2401.475	2401.323±	FSK,CW,SSB
FO-20	145.900-145.999	435.900-435.800	435.795	CW,SSB
UO-22	145.900-145.975	435.120	435.120	9600FSK
KO-23	145.850-145.900	435.175	435.175	9600FSK
KO-25	145.980-145.870	436.503	436.503	9600FSK
AO-27	145.850-145.870	436.795		FM
FO-29	145.900-145.999	435.900-435.800	435.795	CW,SSB
UO-36	145.960	437.025-437.400		
RS-12	145.910-145.950	29.41-29.45	29.408/454	CW,SSB, Mode A
RS-12	21.21-21.250	29.410-29.450	29.408/454	CW,SSB, Mode K
RS-12	21.21-21.25	145.910-145.950	145.912-145.959	CW, SSB, Mode T
RS-13	145.96-145.146	29.96-29.50	29.458-29.504	Mode A
RS-13	21.260-21.300	29.46-29.50	29.458-29.504	Mode K
RS-13	21.26-21.30	145.960-145.146	145.862-145.908	Mode T
RS-15	145.860.145.900	29.36-29.40	29.353-29.398	
ISS	149.990	145.800		Packet & Voice

**Note:** Where the ± symbol is shown, then Doppler shift must be taken into account. **AO40 is of course the new Phase 3D Satellite.**

● Table 1: The table shows a selection of the satellites worked by Peter G4AJG.

Date/Time (UTC)	Freq. (MHz)	Call Sign	Comment
12.23.01 19:48:49	50.125	VY1JA	Keep it up-OK Si
12.23.01 19:50:41	14084	FM5DX	Paul
12.23.01 19:50:22	14201	W5RRR	NASA ARS Houston
12.23.01 19:52:00	28.367	WB9PVA /MOVIL	CQ

● Table 2: The table shows part of a typical display of information as shown on the PCTI display, when running the Kenwood ARCP2000 Computer Programme.

radio's inherent noise was very low, the combination gave the best performance. This was further enhanced with the SSB 2000 +G3RUH Patch and 0.3 f/D dish combination when reception was truly outstanding.

### Numerical Display

In **SATL** mode you can read directly on the front panel numerical display of the 2.4GHz signal, i.e. the 2401.350MHz translated from the down converter i.f. frequency of 145.323MHz (Another a nice feature). To enable this feature, you have to access the memory mode and select menu 25 and set display to **On** by pressing the (+) button and follow the short set of instructions on Page 79 on the manual.

In SATL receive mode you can also directly read the located S-Band beacon signal on say 2401.325MHz in its separate memory setting. At the same time there's a bonus reduction of r.f. power output on the 144MHz band and offers a measure of protection to the down- converter

This limits operation of this satellite, except when it is outside this frequency range due to the Doppler shift.

### Doppler Effect

With all satellites, the Doppler effect causes the received frequency **to rise as the satellite approaches** the receiving station and **to drop as it recedes** from the station. So either manual or automatic frequency correction has to be provided.

The RS232 port on the radio can be connected and configured to accept corrections from an automatic tracking source such as a PC based *Winorbit* Programme.

If you run the *RCP* programme however, then it's not possible to run a terminal that automatically controls the receiver for Doppler corrections at the same time. This is because the RS232 port would be required to run the *RCP* programme. (Here a second RS232 connector or suitable access points for TTL levels would be very helpful indeed).

incorporated into the main panel's l.c.d. unit. Its functions are selected by pressing a push button on the front keypad, below the meter. Each press of this key switches the meter between the **ALC**, **SWR** and **Compression** modes. (The latter functions only when the compressor itself is on for either a.m., s.s.b., f.m. modes).

The top of the meter is calibrated in S-units, reading up to the top end being S9 + 60dB. (The power scale shows 100W at the top end). A momentary peak hold facility is available for each of the above indications.

The s.w.r. function is unfortunately available only for the antennas on the h.f./50MHz bands. It's a pity that the designers decided to leave s.w.r. indications on 144 and 430MHz out...it would have been very useful

10dB signal to noise measurements seem to indicate the following: For an S9 indication, pre-amplifier on, the input signal p.d. required is about 5.4µV on 144MHz. For 430MHz it was about 4.8µV, the corresponding threshold values being about .06µV.

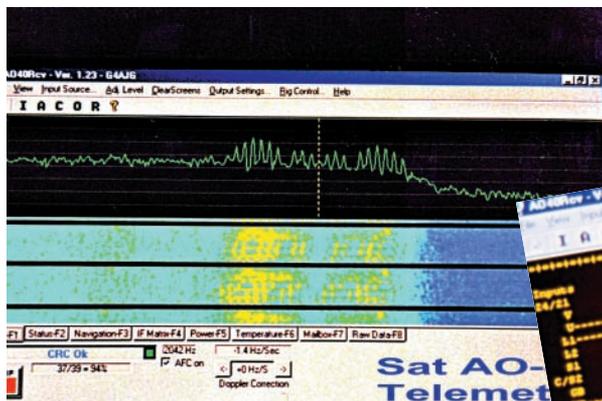
### Performance On 23cm

The radio under test had a 23cm module fitted and it was capable of operating between 1240 and 1400MHz. On transmit the output power is about 10W into a dummy load. (The separately tuneable receive and transmit frequencies are displayed on the front panel).

To test its performance I used a Wimo 22t Helix, initially on one of the Kent beacons, reception was a good S8-9.

However, on using the same antenna on 23cm on AO-40, it was quite apparent that even under optimum conditions of attitude-nearer apogee and low squint, no return signal was detected. Using a 1m dish and a scaled version of the G3RUH 600mm feed, a short helix, a low level c.w. signal was detected on the 13cm downlink.

I soon realised that to successfully operate on the L-band uplink, a suitable linear power amplifier of between 30-50W is needed for s.s.b., capable of producing between 2.5 and 5kW Effective Isotropic Radiated Power (e.i.r.p) using perhaps a prime-focus dish of over a metre in diameter. **Further experiments remain to be done in this area and my comments are no reflection whatsoever of the performance of the transceiver on 23cm.**



● Screen grabs of different features of the AO40Rcv programme

against accidental keying of the send button. But most importantly, I found that to make this absolutely foolproof, its best to switch the 144MHz transmitter off using menu access before commencing operations on AO-40. This is another very attractive feature on the TS-2000.

Of the other satellites used AO-27 was the only one to prove problematic, as the transceiver generates a heterodyne note at the Satellite's nominal frequency. In fact the manual shows several beat harmonics, and its a little unfortunate that one of these, at 436.799MHz should coincide.

### Russian Simplicity

Operating the Russian RS12/13 was simplicity itself! All I used was a simple 28MHz sloping dipole and a wall mounted 144MHz vertical. This is where the seamless h.f./v.h.f. cross-band ability of the Kenwood TS-2000 comes into its own. I found that both c.w. and s.s.b. transatlantic signals were loud and clear and a pleasure to work.

### The S-Meter

The S-meter on the transceiver is a multi-function type, which is



● A rather crowded working environment.

especially for mobile use.

The bottom of the meter shows the filter bandwidth settings in receive modes. This is

coupled visually to the frequency bandwidth scales operated by two front panel controls marked **Lo/Width** and **Hi/shift** located at the bottom left of the front panel.

The sensitivity of the meter with the pre-amplifier on seemed low and did not reflect the audio of the signal received. I made a comparison made switching the same signal between this radio and my FT-736 when the latter showed a positive reading the Kenwood failed to show any indication even though the Kenwood audio was louder than the Yaesu.

However, independent lab tests measuring input sensitivity for

virtually the same level whether I was 150mm or even 1m from the microphone.

### The ARCP Control Program

The ARCP software (an optional accessory) is supplied on a CD-ROM and is designed to work on a PC running Windows 95/98/2000. It also worked on Windows XP. (The connection required between the radio and the computer is via a standard straight RS232 cable).

Connecting speeds can be set from 4800 to 57600bps. Both my computers had no difficulty in operating across this span. (Its display and functions are very impressive indeed).

With the program all the various controls are now expanded to fill the v.d.u. screen and access is made simpler. Full frequency display is shown, 'virtually' displaying the radio's display panel. Complete operation on all modes is possible via the computer screen.

#### Three unique and very useful functions provided on the RCP display are:

1: The complete display of the Menu. Hold the mouse cursor over the button marked Menu and you can see at a glance all the settings you have set and alteration of any one of them is quickly carried out with the click of the computer mouse.

2: Scan function - a visual graphical display of stations across the user selected bandwidth. Very useful in detecting the main telemetry beacon on Satellite AO-40 and deciding where to set a calling frequency. Also useful to observe Doppler shifts.

3: Packet Cluster display. If you wish to operate the DX Cluster mode on screen, a useful feature, is a button on the bottom right hand corner of the screen, which brings up a sub screen and all the DX cluster information is displayed in a more easily readable format than the rapidly moving display appearing on the l.c.d. panel.

4: At the top of the screen there's a clever facility called **Audio Editor** which enables the user to set a variety of **Low Pass, High Pass, Band Pass and Equaliser** filters, with a corresponding graphical display of the filter display.

A very comprehensive on screen **Help** menu is also provided and serves as a quick guide to all

the functions on the radio. A print-out facility enables the Help file to be printed for reference purposes

Incidentally, I used the programme on both an early P133 Compaq Laptop with 80Mb RAM and a more recent Dell 4100 operating at 850MHz and 125Mb Ram with equal ease.

To make the DX Packet cluster Tune Facility via GB7DXH work, I connected a 144/430MHz vertical and an h.f. wire antenna to the



appropriate sockets at and accessed the PCT mode via the transceiver's menu 49 and its sub-menus

For instance, sub menu 49a enables the AUTO TUNE function. When a DX cluster data is received, an alarm in the form a beep or Morse code sounds. The packet information and the frequency data is then displayed on the l.c.d. display and on the PCT screen, if the ARCP Control programme is on. You can also set the radio so that the transmitter frequency can be auto-tuned to give any listed station a call.

To gain rapid access to the PCT mode, you can log the frequencies to the memory, so all you have to do to access this mode, is to press **M/VFO** button on the front panel and all the parameters get automatically set up for immediate access.

In order to operate the RCP Control programme and at the same time be able to use a separate Packet programme, a secondary RS232 port it would have been useful. To do this in its present form one would have to use an external TNC connected to the accessory socket ACC-2 at the back.

### Memory Features

The radio has 300 memory channels numbered 00 to 299, spread across three memory banks, 0, 1 and 2. For storing operating frequencies, modes and other data

the last 10 channels 290 to 299 are designed for programming v.f.o. tuning and scanning ranges.

In Satellite mode there are 10 separate channels for storing satellite data in alpha-numeric format. For instance, you could store the AO-40 up-link and down-link frequency and mode data (As I did). This was very convenient so that once you press the Satellite button and move the scroll facility, you set up the

connector and the manual gives a detailed description of the facilities and connections available for modes such as SSTV, packet, Pactor, AMTOR G-tor, PSK31, etc.). When downloading 9.6k data from say UO-22 front panel, i.e.d. indicators marked **Sta** and **Con** operate in the usual way, confirming status and connection.

### Voice Synthesiser

The optional VS-3 voice synthesiser module is a user installable plug-in optional unit. It's quite straightforward to install under the bottom cover. A number of announcements are available and clearly detailed in the manual. Examples are frequency, menu numbers, S-meter readings etc. You can program the front panel **PF** key so that the displayed information is also announced.

### Digital Recording

Another user installable optional unit is the DRU-3A digital recording unit. This can record on three separate channels, the first for a duration of 30 seconds and the other two 15 seconds each. This enables a pre recorded CQ call to be made for example. You can also combine the three channels to give a full minute of recording time to perhaps playback to the other station a recording of their signal at your QTH.

### Power Requirements

The transceiver requires 13.6V d.c. and consumes 2.65A on standby, 18A on 430MHz, 9A on 1296MHz and 20.5A on h.f., 50 and 144MHz.

The Kenwood Power unit PS-33 meets these requirements easily. It is a traditional linear Power unit with a very substantial mains transformer, 25A rectifier stack, large capacitors and a solid-state regulator board. Fan assisted, thermostatically controlled cooling is provided at the rear of the unit.

relevant frequency for immediate access.

A scroll function enables browsing/viewing and manipulation of memory contents. A separate memory control programme is available to enable direct uploading of data into the memory banks.

### Built-In TNC

The built in TNC is a simple two i.c. device based on AX25 protocol. It seems the designers had the DX cluster working primarily in mind and in this mode and on other terrestrial packet modes it works very efficiently. It also works on 1200/9600Baud AFSK on satellites working on these modes such as UO-22.

However, by being a half duplex mode TNC, the upload file speed was less efficient than my Symek TNC2H-DK9SJ, which is based on the G3RUH 9600 baud system. For serious UO-22 use an external TNC works better and to connect such a TNC accessory socket ACC2 is available. (This socket is a 13 terminal Din

**Certainly A Winner!**

Kenwood have certainly produced a winner here with the TS-2000 and its features are advanced enough to give Radio Amateurs cutting edge technology at a reasonable price (basic price £1699) by today's standards. If Kenwood feel fit to also incorporate some of the suggestions I've made...it can only better an already excellent design. My thanks to David Wilkins of Kenwood Electronics UK for loan of this equipment to enable me to write this feature.

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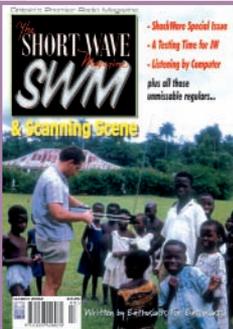
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# April 2002 SWM

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- Martin Peters concludes his journey through the world of alternative listening - Internet Radio - Part 3.
- Something a little different this month from John Wilson, the diminutive, but spectacular computer controlled h.f. receiver - the Ten-Tec RX-320 - all the way from Dolly Parton Parkway.

- Kevin Nice reports on his recent visit to the RA's Baldock monitoring station.
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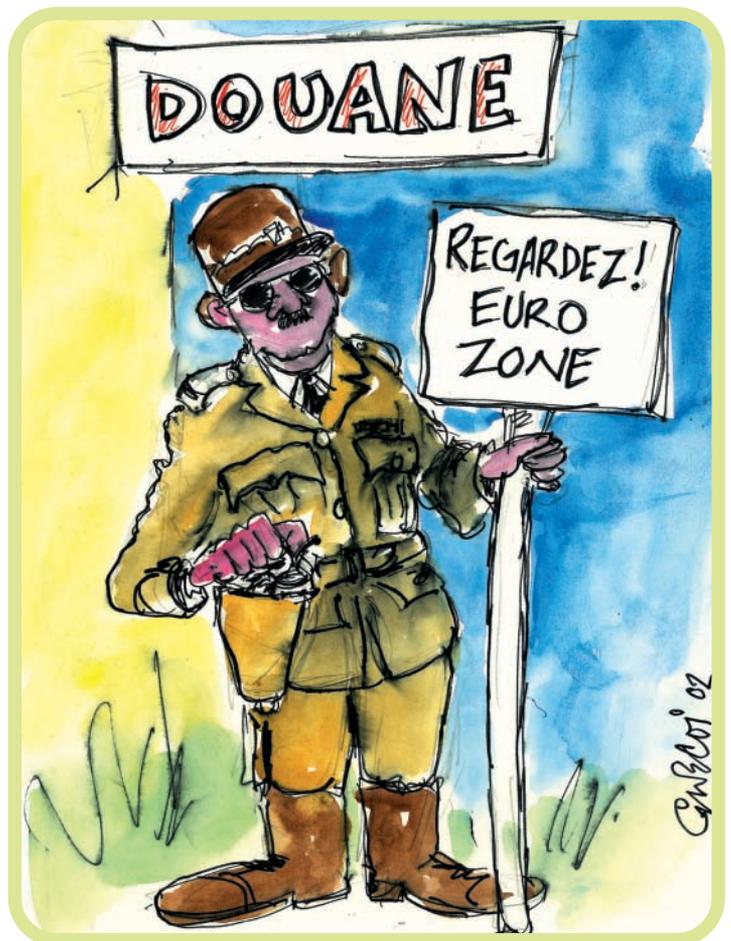
Writing from the European Union headquarters in Brussels, Père Sottise provides helpful advice for British Radio Amateurs operating in the newly instituted Euro monetary zone for the first time. Forewarned, you can save money and avoid problems in Euroland!

In the European Union's Directive AR/00023/968/142002/UBH the EU's overseer for Amateur Radio co-operation Père Sottise announces the procedures which are now necessary for British Radio Amateurs (and those from other EU countries who have not joined the Euro) to operate legally outside their own countries. **The additional legislation is necessary as the introduction of the Euro by-passes the CEPT agreement and those countries not within the Euro-zone have in effect 'non recognised' currencies for CEPT purposes.**

The EU - foreseeing the problems involved with Amateur Radio operation abroad from those countries now operating with non-Euro currencies, have laid out the ground rules for legal, trouble free operations away from the home country. By following the rules Radio Amateurs challenged for their licence can avoid on-the-spot heavy surcharges from EU radio authorities, and other officials of the countries involved. You can also save money on the collection of QSL cards.

### Euro Licence Directive

Père Sottise writes: "British Amateurs - along with those from the other EU countries not within the Euro-zone now, in effect, **have Amateur Radio Licences which although completely legal in their own countries** - are not



carrying the name of the actual country being traversed/operated from).

**An example:** For most British Radio Amateurs travelling abroad with their families by car, the first country they enter will be France and Père Sottise has the following

**Euro equivalent of the cost of the Amateur Radio Licence in cash (Your bank will provide the exchange rate information).** This should be done so that when demanded by officials, the correct amount can be handed over. In return a receipt will be given by the official to the travelling Amateur and eventually the full amount can be claimed back from the UK Government on production of the five-part, 20 page documents **EURO.UKLICENCE.UBF142002**, in which pages 1 to 20 on each of these five documents are to be filled out by the claimant, before being countersigned by the provider of the Euros (your bank) and a registered European

# Euro-zone Amateur Radio Operating

considered as being paid up-to-date in the Euro-zone. Because of this certain precautions should be taken, including carrying the equivalent price of the cost of your Licence in Euros (**in notes**,

advice to give.

**Carry The equivalent:** Firstly, as already advised, the Radio Amateur intending to travel through France and all other Euro-zones **must at all times carry the**

Notary/Solicitor. (Full lists of UK based, EU registered Solicitors are available on EU form **EU/NOTARY/UK/UBF142002**. The Registered Notary is entitled to charge a fee for providing the

signature but the British based Amateur can reclaim the cost of this by claiming on EU form **EU/UK15UBF142002**, which itself can be obtained on the multi-purpose form **EU/UK/CONFUSION/142002** which is available from certain main post offices form **EU/UK/CON/SIG/NIA/FIND/142002** lists these offices.

In exceptional circumstances (this is especially the case in Mediterranean coastal countries) an extra amount may be required by the demanding officials. This amount - varying according to the rank of the official and where you are - is needed to expedite the bureaucracy involved. By paying this extra surcharge the Amateur involved will on occasions save much time.

Additionally, the EU strongly advises all British/non Euro-zone Radio Amateurs to **carry original receipts (copies not acceptable)** for the cost of their equipment, with the costs declared in Euros. The receipt must be stamped and authenticated (On EU form **EU/BANK/UK/142002/DDS0**) by the Manager of the nearest main Clearing Bank from the Amateur's home area, so as to provide proof on demand from any officials demanding to see the documentation.

**Translations:** Although translations of the relevant original receipts for the cost of the Amateur Radio equipment **are not strictly necessary** (into French/German/Italian and Spanish) such translations are advised. (**EU directive 0000/569123/AR/CEPT142002** refers) to enable roadblocks/security checks to be passed through with minimal delay.

Alternatively, in the case where the British/non Euro-zone Amateur does not have the translations, a surcharge in Euros (notes, carrying the name of the country involved) is payable. This surcharge will vary - the higher the rank of the individual inspecting officer - the higher the surcharge. (Monsieur Sottise points out that in the Mediterranean countries the officials - to avoid delaying Amateurs during inspections any more than they consider necessary - seem to be demanding immediate payment of the surcharge in Euros. The visiting Amateur must ensure that a receipt is given, otherwise claims for subsequent refunds

will not be successful (EU form **EU.RECEIPT/TIP/142002** explains).

**Typical Surcharge:** A typical surcharge can easily be evaluated. For example a hand-held transceiver for the 144MHz bands would attract a surcharge of 15 Euros throughout most of the EU. However, in the Mediterranean countries the surcharge would be



- Be prepared for Euro Zone surcharges when you travel with your Amateur Radio equipment in countries which have adopted the Euro currency. Writing from EU headquarters in Brussels, Père Sottise provides much useful guidance and advice. Follow his directions and you won't be fooled by bureaucracy!

approximately **30 to 40 Euros per inspecting officer.**

## Equipment Sealed

If a British Amateur has been stopped by the officials of the country being visited, and the Euro equivalent of the price of their licence has been paid\* once the officials will allow you drive on/carry on operating - after issuing you with an official temporary Licence.

The licence (published in the language of the country involved) will permit you to be able to operate in that country. A sticker carrying the EU reference **EU/SOT/UK142002/?????** (? indicates callsign being used) will then be placed on the equipment. In effect the equipment will be considered as being 'sealed & approved' for that country alone.

On entering another EU country the Amateur should be prepared to undergo the same procedure (The procedures are carried out more often in the Mediterranean countries - and a special surcharge may be demanded for the sticker, in addition to the other costs. This depends entirely on the decision of local officials, the number involved and the speed at which

the visiting non Euro-zone Amateur wishes to pass through the formalities.

**\*Editorial note regarding free licences:** If you are in possession of an Amateur Radio Licence issued free of charge here in the UK- you are advised to apply for form **EU/GRATIS/AR/008972342/142002/UK/CYM/GAEL** (the UK letters denotes English language

**\*Note:** American Dollar bills found in letters (by the special detectors now being provided throughout the Euro Zone) will be automatically removed from the postal chain. The letters will then be opened, the Dollars being removed and then they will be replaced by the equivalent in Euros. The sender of the letter will then be sent an additional surcharge of 5 Euros, plus a postal opening charge of 5 Euros, plus the VAT of the country involved, together (for UK letters) with the VAT of the UK plus the extra surcharge\* (with VAT added to this) demanded by Consignia (formerly known as the Royal Mail).

**\*Editorial note:** This surcharge with VAT on top of VAT will have already been experienced by readers who have been sent gifts from (for example) the USA and the sender has forgotten to mark the item as a 'gift'. The recipient is charged for opening the package, with VAT added on top of the duty demanded **Editor.**

## European Rallies

"Finally (writes Père Sottise from EU headquarters in Brussels)...I have some good news for British Radio enthusiasts who attend the various Amateur Radio Meetings (we know them as rallies. **Editor**) in the Euro- zone. The good news is that because **Ryan Air** - the Irish Airline specialising in cheaper fares, operates from the Euro-zone (Ireland has abandoned the Punt for the Euro) many obstacles have been overcome - especially as the airline now flies to Friedrichshafen on Lake Constance (Bodensee) from the UK...making travel to the popular Hamfest much more attractive.

Because (in effect) by flying in a Euro-zone aircraft the UK Radio enthusiast **will be considered to be in Euro-zone territory immediately** and many of the obstacles will be overcome. Providing that the very low priced seats are available (they are often sold out as much as one year in advance) travel to Germany will be available for the price of only one Amateur Radio surcharge! (**EU Directive EU/RA/TRAVEL/00239857/142002** refers).

The last word must go to Père Sottise who finished his letter to PW with: "**Bon Voyage mes amis...and enjoy your vacance in the Euro- zone!**" **PW**

version whereas the suffix CYM denotes Welsh language, and GAEL, Scottish Gaelic language versions). On applying for the form from your local EU regional office, **please delete the languages not required** - otherwise you will be automatically sent the form in English, Welsh (South & North Dialects, Scottish Gaelic) together with the automatic receipt of the official EU languages version.

## Green Stamp Disappears

Collecting QSL cards - whether it be for DX QSOs or closer European contacts - still remains a popular aspect of the Amateur Radio hobby. However on 'Euro Day' a traditional method of payment (for European QSLs at least) disappeared overnight as the 'Green Stamp' (the ubiquitous Dollar bill) was replaced by the 5 Euro note.

To advise keen QSL card collectors Père Sottise writes: "When sending QSL cards direct - 5 Euro notes must replace the US\$ note. **It is illegal\* to use anything other than the Euro note within the Euro Zone.** (**EU directive EU/QSL/US\$/£/142002** refers).

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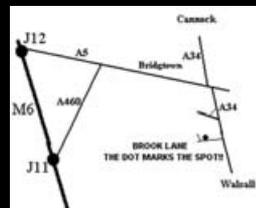
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IN STOCK



• The man who started the modern G-QRP Club with an advert in Short Wave Magazine! The Rev. George Dobbs G3RJV and his wife Jo - about to enjoy the club's 20th anniversary cake - accompanied by Chairman Gordon Bennett G3DNF.

Firstly though, together we should look at the origins of those three little letters QRP! They can mean so much.

The original author of the 'Q' codes would never have thought that several of these codes would become nouns, and that it might also become a group of letters that would bring together such a large body of people throughout the world. Much friendship and

a short wave listener (s.w.l.), **John Whitehead.**

With the national power limit of 150W The QRP Research Society even then stuck to a 5W input limit. The QSL card, **Fig. 1**, shown from **G2HAW** to **GC2CNC** dated 3 Oct 1953 clearly shows under the call sign the name of the QRP Research Society.

The QRP Society, later to become the QRP Research Society soon grew with a monthly newsletter *QRP* discussing the activities of its members. The articles could just as easily be from *Sprat* the journal of the G-QRP Club as the content was often similar. Produced on their kitchen table by **Mrs Whitehead** and then duplicated, over 200 were sent out each month.

# Low Power Operation...

## it's got a long history

**Dick Pascoe G0BPS, a regular author for PW and a keen low power operator, takes a look at the History of QRP 1949 - 2001. Some keen types might be operating at the milliwatt level, but they've certainly got a powerful and interesting background!**

**T**o most British Amateur Radio operators the start of the G-QRP club would be seen as the foundation of this part of our hobby. Many in fact, consider that the history of QRP started when the **Rev. George Dobbs G3RJV** put his first request in *Short Wave Magazine* in 1974 asking for anyone interested in low power operating to contact him.

Without doubt G3RJV's short step in the beginning of the life of low power operating started the rise to fame of our present UK club. It's now the largest QRP club in the world with others getting closer all the time.

However, the ancestry of a QRP club goes back further than 1974. In fact, it goes even further back into history before the American QRP club (ARCI) was founded in 1961.

enthusiasm are based on that little acronym/abbreviation QRP.

### The QRP Research Society

The original, and **first QRP club (that we know of)** was founded not long after the end of the

I have in my possession copies of almost all the journals published during the life of this club through 1949 and the early 1950s. Even an outline of a rally held by them in 1954, showing an ATV display!

One supplement to the August 1952 issue of *QRP* by **C. E. Sutton G3ANQ** where he

mentions "two schools exist side by side - QRP and QRO" and "the influx of many who can only be described as untutored or unskilled". (Isn't this the phrase we still hear occasionally today?).

Unfortunately the Society faded into oblivion in early 1956 when the founder and secretary changed jobs. His promotion

involved longer hours and less time at the radio and copier machine. His letter to members dated 28 January 1956 says that he must resign the post of secretary, as he: "Had to make a



• Fig.1: The original QRP Research Society had a 5W input limit. The QSL card, shown from G2HAW to GC2CNC dated 3 Oct 1953 clearly shows under the call sign the name of the QRP Research Society (see text).

Second World War in 1949 "to widen interest in the Low Power field of Amateur Radio" (1). What's even more surprising is that this new club was founded not by a licensed Amateur, but by



● Fig. 4: George G3RJV awarded the QRP ARCI 'Hall of Fame' by their President Paula WB9TBU.

choice between his hobby and his work".

It would appear that no one was able to take over and the Society faded into oblivion. Just think, 1999 would have been their 50th birthday!

### Five Years Later...

Nothing outstanding happened on the QRP front until five years later in 1961 when the late

● Fig. 2: It was a letter from G3RJV published in *Short Wave Magazine* which started it all. Unfortunately though...G3RJV can't remember which month it appeared in the magazine and the *PWSWMM* Editorial staff got diverted on discovering so many old friends and memories! Those were the days eh?

**Harry Blomquest K6JSS** founded the **QRP Amateur Radio Club International (QRP-ARCI)** (See ref. 2). However at this time the club required a voluntary **input power level of 100W** in an attempt at that time to "reduce the QRM on the bands and make ham radio more enjoyable". Sound familiar? It should do we are still getting the same QRM now!

The QRP-ACI club progressed and grew, gaining several hundred members over the years. In about 1977 the then president of the QRP ARCI, **Tom K8IF** was becoming unhappy with the 100W image that had also become unpopular amongst the members.

A poll of the membership was taken and there was overwhelming support for a 5W level. It took almost four years, but eventually the 100W image

vanished and the ARCI was truly a QRP club. It was in the late 1970s that the club finally accepted the definition of QRP as 5W c.w. and 10W s.s.b.

In 1970, **Ade Weiss WORSF** had started a journal called the *Milliwatt* the National Journal of **QRPP**. The small 'p' denotes a power level of **less than one 1W**. This journal lasted until 1975 and has become almost cult reading by QRP enthusiasts, reprints changing hands often.

### Gathering On 3.560MHz

Now it's time to get back to 1974 and the letter from George G3RJV in *SWM* (Fig. 2). The request from George had followed a period in time when several Amateurs used to gather around 3.560MHz. Each using just 3W output from (often home-brew) rigs.

The numbers slowly grew until George put out his call to arms and the G-QRP club was founded. It took a long time for the membership to grow to 100, and even longer to get to the 1000 mark, but the explosion in interest in this part of the hobby ensured that by the time the club got to its 20th birthday in

few weeks later becoming one of the top clubs in the world.

Foreign members of the G-QRP club have often started QRP clubs in their own country. The list is long but just in Europe we have the Benelux QRP Club, The EA-QRP Club, the EI-QRP Club, the OK-QRP Club, the I-QRP Club and more recently the DL-QRP club.

Throughout the world QRP clubs have sprung out of nowhere, almost every state in the USA has its own, and many unusual ones can be found in other places.

### Rochdale Mini Convention

Visitors to the annual G-QRP Mini Convention, held in Rochdale, Lancashire have often been astounded by the camaraderie found amongst enthusiasts. This gathering attracts visitors from around the world yet it takes place in a small church hall in Rochdale each year with about 350 visitors attending. The Parish Church of Sudden in Rochdale is the 'home' (actually the Vicarage is just down the road!) of Rev. George Dobbs G3RJV.



● Fig. 3: The G-QRP Club stand at the Dayton HamVention in 1993, with G3RJV, Dick G0BPS and friends. The late Don Watson GW3RJV - himself a pioneer in home-brewing and QRP operations is on the right of the photograph.

1994 it had **almost 10,000 members**.

Most of the increase in interest has been down to George and a few helpers who over the years have travelled the world, spreading the word. Visiting Dayton in USA almost annually.

The way the G-QRP club is run has also gained interest from abroad. I well remember sitting at the breakfast table with George G3RJV and Doug KI6DS from California in 1993.... Doug telling us that he wanted to start a Californian QRP club and run it just like ours. NorCal was founded just a

The ARCI event called the 'Four Days in May' has also become a huge event by comparison to Rochdale! Held in conjunction with the huge Dayton HamVention in Dayton Ohio, **Fig. 3**, the ARCI started it as a small gathering in one hotel room back in the late 1980s.

Today there are several hundred gathered for the four days of events. Starting with the lectures on the Thursday, there are also visits to the HamVention during the following days. Several British speakers have appeared here with George G3RJV being one



● Fig. 5: Inductees of the ARCI 'Hall of Fame' 1997. Left to right - Doug KI6DS, Dick GOBPS, Mike WA8MLQ

of the highlights. They just love our accent! However, they still don't attract the same numbers as Rochdale!

Evening events often go on until the small hours. The banquet during the weekend is the time for presentations and the highlight of the 'Hall of Fame' awards. This is the ARCI's way of rewarding hard working in the field of QRP. Four British G-QRP members have been given this honour so far: **G3RJV**, **GM3OXX**, **G8PG** and **G0BPS** (see Figs. 4 and 5).

The Californian convention organised by NorCal (Northern California QRP Club) for the past few years is a much smaller event. It's much like the Rochdale event...except in effect it's a QRP gathering attached to a radio rally much like Dayton.

British speakers have also been invited and I found it an excellent venue. However, the poor ARRL speaker had an audience of 11 in a room for 300 whereas our room for 100 was jam packed with over 200 listeners with some standing in the aisle outside!

## Well Known

In any part of society certain people become well known for the work they do or the writing they publish. In this hobby there have been few amateurs who have 'led the field' without doubt one is the Rev George Dobbs G3RJV...the man who almost single-handedly started it all again back in 1974. His work over the past 20 plus years has been imprinted

on the hobby and will never be forgotten.

Another stalwart, perhaps less well known in the UK (but well known to *PW* readers through G3RJV's writing) is the late **Doug DeMaw W1FB** (Fig.



● Fig. 6: The late Doug DeMaw W1FB in his workshop, along with some of his world famous home-brewed QRP equipment (see text).



● Fig. 7: The founder of the Michigan QRP Club Lowell KB8FR and his wife Robin NI9R, photographed with the author (see text).



● Fig. 8: In the Czech Republic Peter Doudera OK1CZ, has almost single-handedly dragged QRP to the forefront in his country.

6). A hugely successful writer and QRPer. Known by thousands in the USA he was an idol to many QRPer over there, and to many here in the UK. George and I visited him at his Michigan home in 1993 and the picture shows him in his workshop.

Today, one of the most successful operators in the world of QRP is unknown to most in the UK. However, in the USA **Randy Rand AA2U** has truly 'been there and done it all' with DXCC with milliwatts to mention just one.

One of the first States-side QRP clubs was the **Michigan QRP Club**, which was founded by **Lowell Corbin KB8FR** and his wife **Robin NI9R**, Fig. 7.

They're a wonderful couple with a great sense of humour!

In the Czech Republic there's **Peter Doudera OK1CZ**, Fig. 8. He has almost single handedly dragged QRP to the forefront in his country.

**Pete Halpin PE1MHO** in Holland who recently gained the first 50MHz DXCC certificate and at QRP too! Pete regularly attends the Rochdale convention.

In Germany, **Peter Zenker DL2FI** who along with the magazine *Funk Amateur* has ensured that the German QRPer got their own club, **DL-QRP**. There are also many more individual members of clubs throughout the world, each doing their bit to promote the hobby.

In my book *Introducing QRP*

George G3RJV said in his leader "These days it is hardly possible to open an Amateur Radio magazine without seeing at least one item on QRP". This seems doubly so since he wrote that in 1996.

## Early QRP Contacts

In the early days low power contacts were almost exclusively on c.w. with the odd s.s.b. operator struggling against the odds. Today though, the modern computer based programs using sound cards such as PSK31 have ensured a further explosion in the numbers of QRP operators as they see just what can be achieved with low power levels. Where will we be in another 20 years I wonder?

Even with all the friendliness throughout the QRP world there are still problems and it took many years, right up until the late 1980s for the power levels to become truly International. The USA stuck to 5W **output...whilst the UK used input power or 3W out!**

Negotiations soon brought forth a compromise and the 5W output level stuck. There are now discussions to make the overall power level 5W **for all modes**.

There has also been much discussion about the new data modes and power levels. But all that will have to wait for the next and future follow-on of the history of QRP some years hence in *PW*.

Whatever happens and wherever you turn in the Amateur Radio world, mention the secret password 'QRP' and doors open, friends are made...often for life. The thrill is back and you can really enjoy the hobby again...thanks to the challenge of low power operating!

*PW*

## References & Information panel

- (1) Taken from the QRP Society membership data form given to new members.
- (2) The quotes on the ARCI are from their magazine *QRP Quarterly* October 1995.

The G-QRP club membership secretary is **John Leak G0BXO, Flat 7, 56 Heath Crescent, Halifax HX1 2PW**. Further information on the above or on other clubs may be obtained from the author, QTHR or via E-mail at: **G0BPS@ggrp.com**

Dick Pascoe G0BPS is currently the SSB & Data Manager of the G-QRP Club. (He is also on the Board of Directors of the QRP-ARCI. The only non-American member! **Editor**)

**Hannes Coetzee ZS6BZP describes his single transistor, crystal controlled transmitter with a wider than usual tuning range. Try building it - your transmitter could be as successful as the Springboks!**

**T**he method of pushing the frequency capability of crystal controlled oscillators is now quite well known. The technique, sometimes known as the Super VXO technique, has been described by **George Dobbs G3RJV**<sup>†1</sup> in his column, Carrying On The Practical Way (COTPW), in *PW*. The technique has also been called the 'rock-bending' principle, as demonstrated in the *ARRL Handbook*<sup>†2</sup> with the description of the 'Rock-Bending Receiver'. Now I've applied the technique to an old favourite transmitter design<sup>†3</sup>, with the resultant simple, one transistor c.w. transmitter that has a very useful tuning range. Some additional information is also presented to enable interested readers to adapt it to other bands than 7MHz.

### Simple Transmitter

My first successful home-brew QRP project was the construction of the simple transmitter described by **Roger Davies ZS5ZD**, in the March 1984 edition of *Radio-ZS* our journal here in South Africa (the circuit is as shown in **Fig. 1**). This was back in my early student days long ago in the 1980s. But the project's success wetted my appetite for more home-brew transmitter and receiver projects, though operating them also emphasized the shortcomings

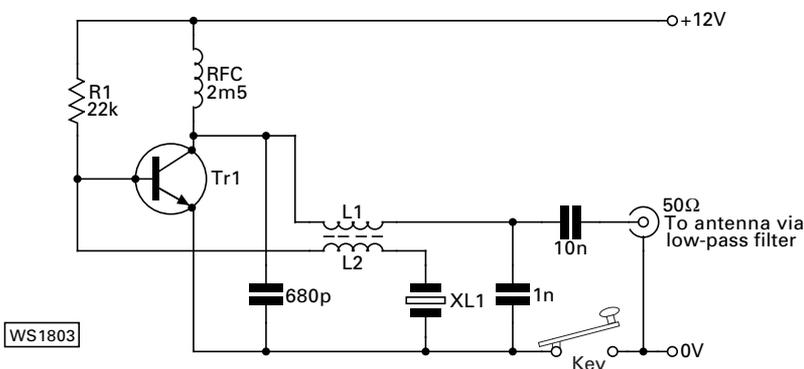
simple, single transistor, crystal controlled transmitter.

### Principle of Operation

Now let's look at the principles of operation. The transistor is biased into conduction by the 22kΩ resistor feeding current into the base. Frequency selective feedback is implemented with an additional winding on the low pass filter inductor, feeding a small amount of the output of the amplifier back to the input through a crystal, which causes the circuit to oscillate.



● The ZS6BZP transmitter ready to go.



● Fig. 1: This simple QRP transmitter by ZS5ZD was the start-point for Hannes own project in *PW*.

The transmitting frequency is determined by operating the crystal close to the series (low impedance) resonance point. The resultant very elementary transmitter has though, very acceptable performance. Output power can be increased by reducing

ability to 'spot' the operating frequency on a home-brew receiver (without an accurate frequency read-out) was also sorely missed.

Of course, adding all the required features would add to the complexity of the circuit, but the end product would achieve a better level of user friendliness. If it could be achieved with the addition of only a few extra passive components, the result would be a very useful and simple little transmitter that can accompany you anywhere.

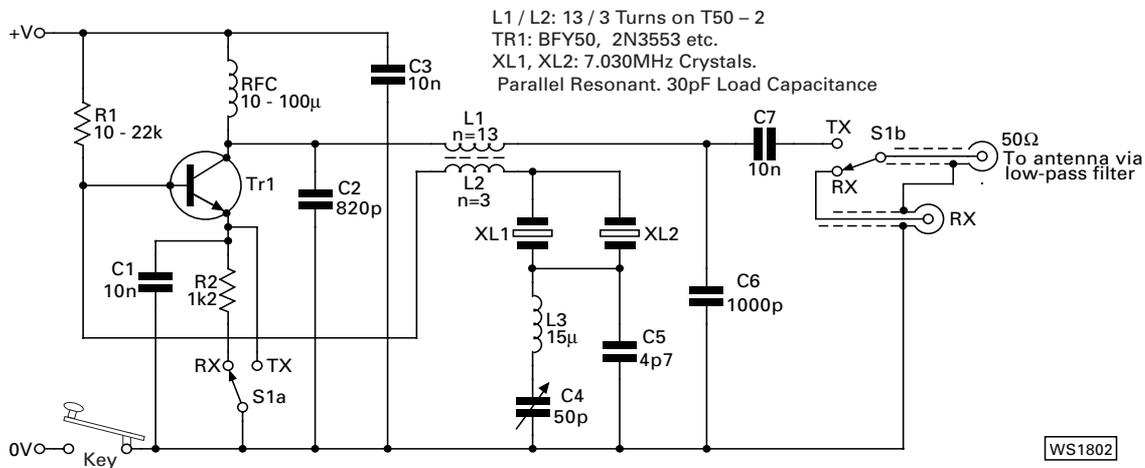
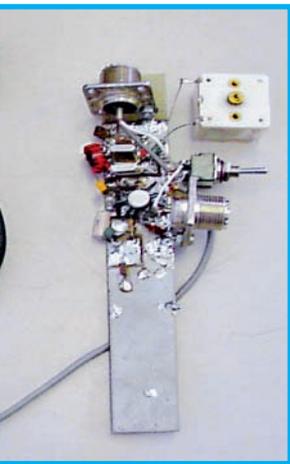
# QRP + Wide - A SIMPLE QRP TRF

of some of these simple designs. The main shortcoming of the original simple design is that it's 'rock bound', in other words has a limited frequency range, determined by control of one or more crystals. Since then a lot of serious experimenting was done by dedicated Amateurs, often in the wee hours. The breakthroughs of some of these people are implemented in a revisit to this

the value of the 22kΩ resistor to 10kΩ. Although normally a crystal controlled transmitter ensures a clean, drift free signal, it also seriously limits operation to a very small segment of the band. The transmitter also lacks transmit/receive changeover facilities when sharing the same antenna with a separate receiver. And to complete the groan list: The

### Pulling Frequency

Adding a combination of a series inductor and variable capacitor between the crystal and the ground connection increases the ability to 'pull' the operating frequency. There's no need to use an expensive high Q inductor, a moulded choke performs just as well. The addition of the 4.7pF capacitor across the tuned circuit



WS1802

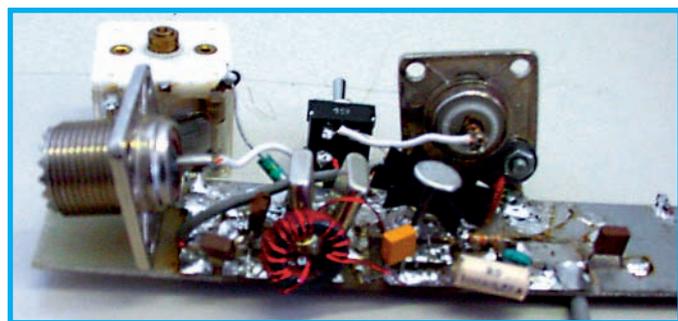
enhances the 'tune-ability' even further. (I've found that 4-5pF is close to the stray capacitance of the crystal in its holder.)

● Fig. 2: Using two crystals and a few other components allows a much greater tuning range. (See text for more details).

received signal. The resistor is switched out of the circuit

of the toroidal core. The feedback winding is then added over the primary winding.

● A major benefit of working on the lower h.f. bands is the ease of which tests and measurements can be made. A cheap and nasty 10MHz oscilloscope connected to the output load will tell you a lot about your transmitted signal.



● Fig. 3: It's said that "beauty is in the eye of the beholder", and in simplistic terms this is a beautiful sight.

during transmitting, allowing the transmitter to run at full power on transmit.

## Notes and warnings

I feel that there's a few notes and warnings that I should make for those who haven't worked with this system before:

- If the transmitter doesn't want to work at first, the phasing of the feedback winding may be wrong. Simply reversing the connections can often solve the problem.
- The value of the emitter resistor can be reduced if the circuit fails to produce a signal when it is keyed during reception ('netting'). However, use the biggest value resistor (lowest output) that will ensure reliable operation.
- Don't be tempted to get too much of a good thing: I've made the mistake of using a v.h.f. transistor, with some very unstable results. It is better to stick to cheap modern 'audio' transistors. There should be no surprise v.h.f. oscillations!
- Don't try to over-extend the tuning range either. The c.w. 'note' and the output power will suffer. A tuning range of 20kHz on 7MHz will cover a lot of activity, except maybe the c.w. 'machine guns' at the low end of the band.
- The purity of the transmitted signal will also suffer if the output power is increased too much. This is a simple one-transistor circuit, and as such we must respect its limits.

To squeeze the final couple of kilohertz shift out of the circuit, another identical crystal is added in parallel with the existing one (aka Super VXO). This additional crystal enables a frequency pulling capability of several kilohertz to be extended to a few tens of kilohertz. Using crystals cut for the QRP

during transmitting, allowing the transmitter to run at full power on transmit.

## Copper Groundplane

It is probably easiest to build the transmitter on the copper side of a blank piece of copper clad board with the copper side serving as the groundplane. This technique is also known as 'ugly' or 'dead bug' construction and the ground plane helps to keep

# TRANSMITTER

frequency of 7.030MHz, it should be possible to operate from around 7.010 to 7.030MHz. A very worthwhile improvement indeed.

Adding a 1.2kΩ resistor in the emitter leg reduces the current through the transistor dramatically, and thus the output power. Now the transmitter has sufficient level to allow zero-beating with a

things calm at r.f. Probably the only potentially difficult part is the winding the toroidal inductor. Remember that the number of turns is determined by the number of times the wire passes through the 'hole' on the middle. So, half turns are not possible. Wind the primary first (highest number of turns) and spread the windings evenly over nearly the total area

## Other Bands

Operation on other bands is possible by changing the crystals, the number of turns on the output filter inductor, the values of the output filter capacitors and the series tuned circuit. For example, on 3.5MHz, use 17+3 turns on the toroid and 1.8nF capacitors. For the determining components, a 33uH moulded choke in series with a 100pF variable capacitor will do the trick.

So, there you have it, a simple, very useful transmitter can be made quickly and cheaply. Build it, operate it and enjoy it!

PW

### References:

- ‡1 Carrying on the Practical Way - p31 *Practical Wireless* Jan 1998, by George Dobbs G3RJV
- ‡2 A Rock-Bending Receiver for 7MHz - p17.68 *The ARRL Handbook for Radio Amateurs, Seventy-Sixth Edition*
- ‡3 R2-00 QRP Transmitter by R.W. Davis ZS5ZD - *Radio-ZS* March 1984.

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Jonathan Constable M5FUN is an enthusiastic operator who was very proud to get his callsign, which reflects his interests and enjoyment of Amateur Radio. So, as he's a very keen young chap *PW* gave him a job to do trying out an interesting Morse decoder unit.

● You can judge the size of the MFJ-461 by the comparing it with a standard pen. Small isn't it?

**P**robably the main essence of Amateur Radio is having **FUN** and I count myself extremely lucky in being able to get an appropriate callsign to reflect just how much enjoyment the hobby can provide. And the MFJ-461 Morse reader is another way of having fun and enjoy the c.w. mode to best advantage.

To be honest, I was quite surprised (but delighted) when a letter from the Editor arrived asking me if I'd like to try out the unit on behalf of readers and write a short report on it. The letter asked me to 'phone the Broadstone office and speak to **Donna G7TZB** - *PW*'s News & Production Editor- if I was interested. Needless to say...I telephoned immediately I got the letter!

### Neatly Into Pocket

My review package was soon on it's way, and when it arrived I was surprised how small it was!



● Jonathan Constable M5FUN believes in living up to the meaning on his callsign! As he's so keen *PW* thought it would be a good idea for him to try out the MFJ-461 to encourage others to have a go themselves.

Measuring only 67 x 42mm, it fits neatly into your pocket or rucksack, making it ideal for those large or small excursions which will allow you to practice reading the c.w. off air. So,

there's no excuse not to be on the air and listening!

The unit is powered by a single PP3 9V battery. This in my opinion, should run the decoder for a good month's

use when used every day for an hour or so.

Created by MFJ Enterprises in the United States, this highly useful decoder, is a pleasure to have in the shack, although perhaps slightly difficult to use at first. **But once you have tuned in and set the input control** you can decode most reasonably sent Morse code.

When the unit is decoding Morse, it displays the characters on a 32 character liquid crystal display screen (l.c.d.), which is highly visible in most light conditions. However, as happens with most Morse decoding units, this piece of equipment is around one character behind when displaying the incoming Morse. This can be misleading and confusing when you are mentally decoding the incoming c.w. along with reading it on the l.c.d. screen.

### In Synchronisation

The MFJ-461 features a red light emitting diode (l.e.d.), which flashes 'in synchronisation' ('In sync') when the unit is decoding. The l.e.d. actually flashes in the same way as the individual incoming characters. In other words, it's actually flashing c.w. at you! So it's actually possible to read the l.e.d. itself. This is a great benefit when you are using a

# Decoding Is Fun... With The MFJ-461 Morse Reader



- The miniature top panel is simple and easy to use, however, the main 'tuning control is situated on the side of the unit, on the opposite side to the l.c.d screen (see text)



- The MFJ-461 opened up to show battery housing and controls. The p.c.b. mounted potentiometer (under the power leads) is the 'Tuning' control which has to be adjusted whilst the unit is placed near to the receiver speaker, or connected with the jack-plug-to-jack-plug lead supplied by MFJ (see text).



- With battery in place the small holes provided for 'tuning' and setting adjustments can be seen in the back panel (see text).

direct link from your radio to the unit as it enables easier tuning.

## Four modes

The MFJ-461 Morse decoder features four modes, these allow the received Morse characters to be displayed in different ways. Two of the modes also display the speed that you're receiving at.

In use the unit can cope with

up to 99 words per minute (w.p.m.), so it can handle most c.w. you'll likely to hear on the Amateur Radio bands. (I have tested the unit on speeds of up to 60w.p.m. and it has proved to be very capable).

Cleverly, MFJ have designed this unit so that you can link it directly to your radio via a jack-to-jack plug lead. However, use of this lead doesn't allow you to hear the incoming Morse itself, so you have to rely on the l.e.d.

for tuning accuracy.

But there is the bonus...in that your family won't hear you whilst you are operating late at night. You know...making all those annoying bleeps that Radio Amateurs seem to generate!

As well as direct linking to your radio, you can also link the unit to your computer, direct to your COM port using a setting of 19200 Baud rate. This enables you to display the characters on a much larger screen and this, I've no doubt, will prove very useful indeed for anyone with poor or partial sight keen to learn the code.

## Ready To Decode

When it arrives the Morse decoder is ready to decode at around speeds of 15-20w.p.m. as soon as it's switched on. This is helpful as there's no warm-up time so you can get on the air quickly. Despite this, the unit takes around one to two seconds to switch and re-synchronise between speeds that are either much faster or much slower.

In some cases when on the air I have also found it necessary to alter the input control to obtain the correct decoding. Thankfully this was not always the case as it can be a rather fiddly job to adjust the control.

## Exceptionally Useful

One particular feature of this unit is the ability to 'play back' the last 140 characters that were received. **This is exceptionally useful in contests**, especially when you are sending a short exchange and writing or typing the details. It ensures you don't miss any of those vital details...just like having a special Morse logger at your side in a contest!

I tested the Morse reader on two different radios and made 37 contacts and monitored many others. The unit is priced at £84.95, although this may seem a touch expensive, this unit, with careful use, is delightful to have in the shack. I enjoyed using it *PW*...when do I get to try something else please?

*PW*

### Product

MFJ-461 pocket Morse decoder

### Company

Waters & Stanton

Contact: Sales

Tel: (01702) 206835

### Pros & Cons

**Pros:** Very neat and portable. A high highly useful decoder. It's a pleasure to have in the shack. I found it **is exceptionally useful in contests**

**Cons:** Perhaps slightly difficult to use at first. But once you have tuned in and set the input control you can decode most reasonably sent Morse code.

### Price

£84.95 plus £3 P&P

### Summary

The MFJ-461 ensures you don't miss any of those vital details...just like having a special Morse logger at your side!

### Thanks

My thanks go to **Waters & Stanton PLC, 22 Main Road, Hockley, Essex SS5 4QS, Tel: (01702) 206835, FAX: (01702) 205843**, for the loan of the unit.

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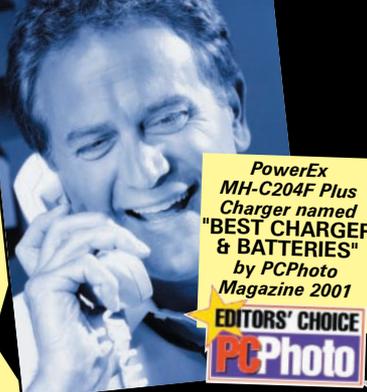
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# Antenna Workshop

**John Pears W4/G0FSP describes the antenna at his winter hideout in Florida. Picture the scene, the sun's shining, the temperature's around 25°C, you've only got shorts, sun hat and sun block, and you're playing antennas.**

**T**his article is about the development and construction of a three-band quad antenna for the 14, 21 and 28MHz bands, an antenna that's been in service for the last two winters in Florida. Not that I profess to be an antenna expert, I just like constructing antennas and seeing how they work and this antenna performs very well. So, this article doesn't present new or original ideas, despite this it should give you an idea what fun you can have playing with antennas. However, before I describe the antenna itself, I hope you'll tolerate a little history lesson!

## Short History

First a short history of the cubical quad antenna! In 1939 a missionary radio station, HCJB in Quito, Ecuador, brought a new 10kW transmitter into operation, feeding a four-element Yagi array. The combination of the 3000m elevation, low air pressure associated with storms, and raindrops accumulating on the ends of the antenna elements, all combined to produce some spectacular firework displays.

Coronal discharge at the antenna ends were common, and occasionally a metre long standing arcs where produced. The resultant heat would melt the ends of the radiators, and de-tune the system. The station engineer at the time, Clarence J Moore W9LZX, worked out a partial, but temporary, solution by installing hollow copper balls as used in flush toilets at the ends of the elements.

The smoother ends decreased the number of firework displays. Continuing to work on the problem Clarence, finally developed the concept of bending the ends of the elements towards each

After some consideration of the space available, I calculated that I could hang a 14MHz 2-element quad from one of the pine trees. Rotation was by cord from the shack. I recall from W3FQJ's book, that a parasitic quad director is easier to match, giving higher gain and a better radiation pattern, than a driven element and reflector combination.

The limited space also determined the maximum element spacing that I could achieve. It worked out at about  $0.1\lambda$ , which was not a problem, as the gain of a 2-element quad is relatively constant with element spacing of  $0.08$  to  $0.22\lambda$ , the radiation resistance being around  $40$ - $140\Omega$  as element spacing increases from  $0.07$  to  $0.25\lambda$ . I could find a reasonable match to coaxial cable. The top of the quad could be no higher than  $10m$ , though not a problem, as the quad antenna is less sensitive to being near ground.

## Bamboo Patch

I have a neighbour with a fine bamboo 'patch' at the rear of the property, who told me to "help myself", which I did! The canes are up to  $12m$  long, and provide a source of building material for the next few years! Element wire, cord, rope and cable clips were acquired from the local hardware store, and the coaxial cable was already in stock.

It was a pleasure to shop in the Ace Hardware store, all the assistants were about my age, and very knowledgeable about the products on offer. It's the sort of place where you could buy a single nut and bolt, or  $11b$  of nails in a brown paper bag.

The 14MHz quad worked very well, giving me up to three S-point gain over my G5RV. I was so pleased that I then built a second quad, this time for 21/28MHz, with band switching achieved manually (a switch operated by light-weight cord). I tried feeding

# The Holiday Quad

other, until they touched, creating the quad loop. Further tests and experiments led to the classic cubical quad antenna of today.

## My Quad

Now for the shorter history of my quad. Since I retired some years ago I have been 'wintering' in south western Florida, and always go on air with the call sign W4/G0FSP. The holiday home has on its northern, rear, boundary a row of pine trees about  $20m$  high. These have provided, over the years, support for the various dipoles, and verticals that I have built. The radio room is located on the same side of the property.

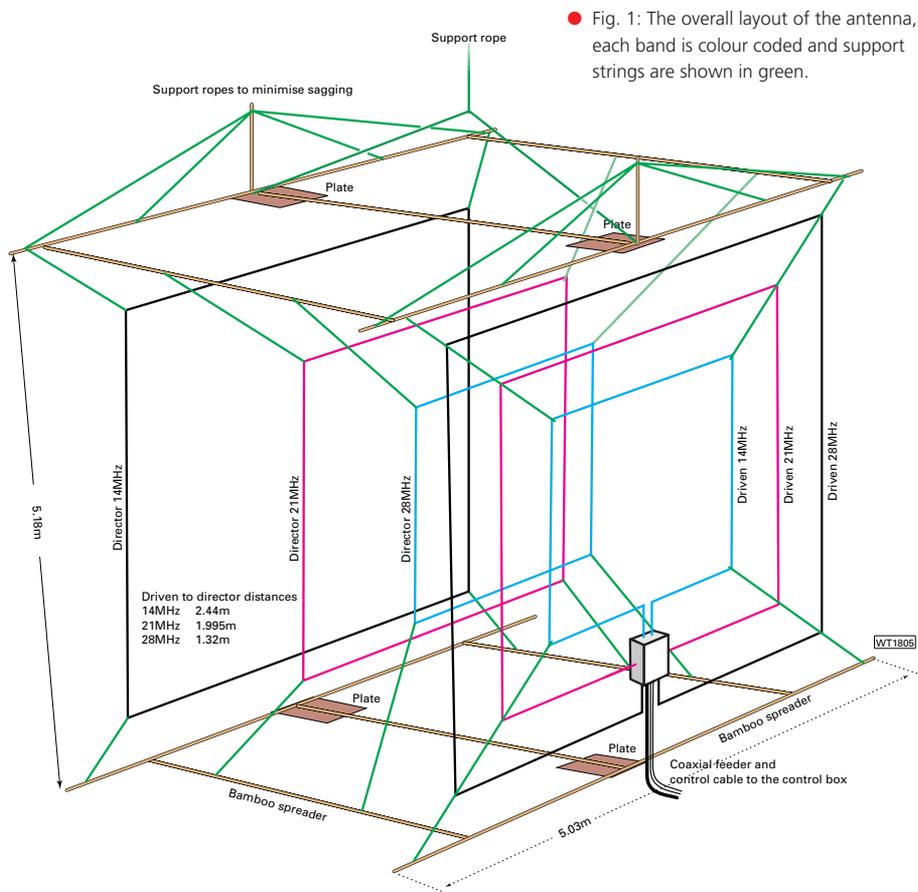
My interest in quad antennas started after I had read a copy of - *73 Vertical, Beam and Triangle Antennas* by Edward M Noll W3FQJ. Another very useful book, from which I learnt a great deal, was *Cubical Quad Antennas*, by **William Orr W6SAI**, and **Stuart Cowan W2LX**.

this antenna with only one feed point but I found it very difficult to obtain a usable match. So, this idea was abandoned. At the end of the holiday both antennas were taken down and stored away for the next year.

## Multiple Band

The following year as I set up the radio station, I decided to create a multiple band antenna and combine both quads. I added smaller elements to the bamboo frame work that supported the original 14MHz antenna. A two-relay circuit was used for band switching, the 12V d.c., heavy duty (10A) DC relays and the balun were purchased at the Ft Myers hamfest, and were built into an old plastic box.

The new quad construction is outlined in **Fig. 1**. The two top fixings have an additional short vertical length of cane, to provide the support for a cord preventing the ends of the main canes from drooping. All nuts and bolts used were stainless steel.



● Fig. 1: The overall layout of the antenna, each band is colour coded and support strings are shown in green.

cable. The quad is fed with about short length (8m) of RG8 coaxial cable, giving a perfect match on all bands.

I had over 100m of insulated stranded antenna wire to hand, and this was used for the quad elements. The elements were cut using using the formulae.

$$\text{Driven} = \frac{285}{f(\text{MHz})} \text{ (m) (or } \frac{948}{f(\text{MHz})} \text{ (feet))}$$

$$\text{Director} = \frac{271}{f(\text{MHz})} \text{ (m) (or } \frac{935}{f(\text{MHz})} \text{ (feet))}$$

The driven elements were cut just a bit longer than calculated, as it's easier to cut bits off than to solder pieces on.

The old carpenter's maximum of measure twice and cut once also applies to cutting wire for antennas. I had great problems getting a good match on 21MHz, and after a lot of head scratching found that I had cut the director 3m too long. It must have been all that sun.

There is some reaction between elements and I've found the best away to cut for resonance, is to creep up on it, cutting only a small amount on each element at a time. Slow and sneaky, but it works! I had no problems in getting a good match on all three bands, and the 1:1.5 bandwidth was 170kHz on 14MHz, but 280kHz on 21MHz, rising to 470kHz on 28MHz.

The quad always out performed the G5RV configured as an inverted vee at a height of about 15m. In fact the quad was lower overall, but benefits with its directivity. I suspect the conditions at the QTH might help propagation, in that the holiday bungalow is built on sandy soil, only about 1.5m above a salt water canal.

One of the best signal reports I remember was during the G-QRP winter Sports, a 599 on 28MHz, from **George GM3OXX**, both of us running QRP. You don't need to be in Florida to use this quad, it just makes operating far more pleasant!

PW

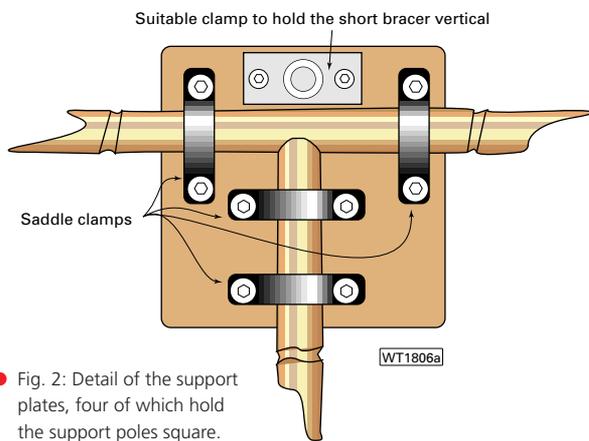
The four main fixing plates are made from painted plywood along the lines of **Fig. 2**. Light cord and a short section of elastic, helps to keep the elements nice and square, (I have to admit that I am one of those people who thinks that if it looks right it has to work well).

As there's some coupling between the driven elements, I've found it very important to keep them as far apart from one another, as possible within the given space. I used light rope for the main verticals, the anti-droop supports, and the hanging support. Lengths of heavier anchor rope are used for the main rope, as the quad weighs in at about 18kg.

The main support rope passes over a pulley, making lowering and raising easier (if it got too windy). The pulley support rope also of anchor rope being left in place during the holiday. The switch box and any thing else that I have not talked about, was fixed in place using cable ties (**Fig. 3**).

## Nice & Square

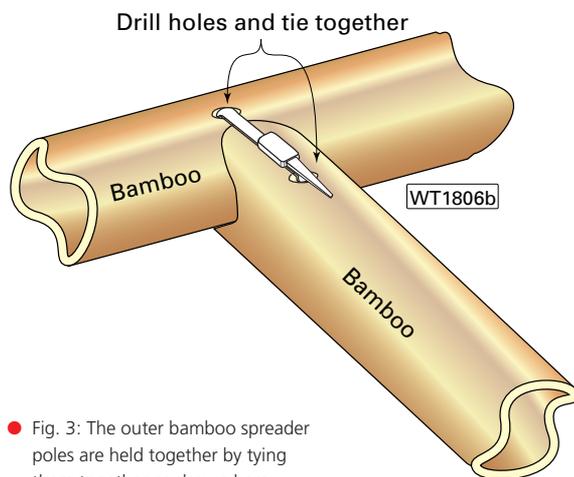
As you can imagine it does take time to set the quad up nice and square, and I have found that to counter balance the weight of the coaxial feed and switch box, a one litre plastic bottle with the contents (water) carefully adjusted until the quad sits square, but do leave the cap on or else the contents



● Fig. 2: Detail of the support plates, four of which hold the support poles square.

will escape when the quad is lowered. The main support rope goes through a clip on the bottom section, and is attached to a concrete building block.

All the canes were taped using electrical insulation tape to keep out the weather, and the main canes have been in use for several years and are still in good shape. I use the very latest in antenna rotating technology (string to the bottom corners), the only problem was that I only had 180° coverage, great for Europe and North America, but I've got a G5RV if I wanted to work other directions. Being a member of FISTS and the G-QRP club my main working mode is c.w. so, I trimmed the driven elements accordingly, using an antenna analyser at the radio room end of the coaxial

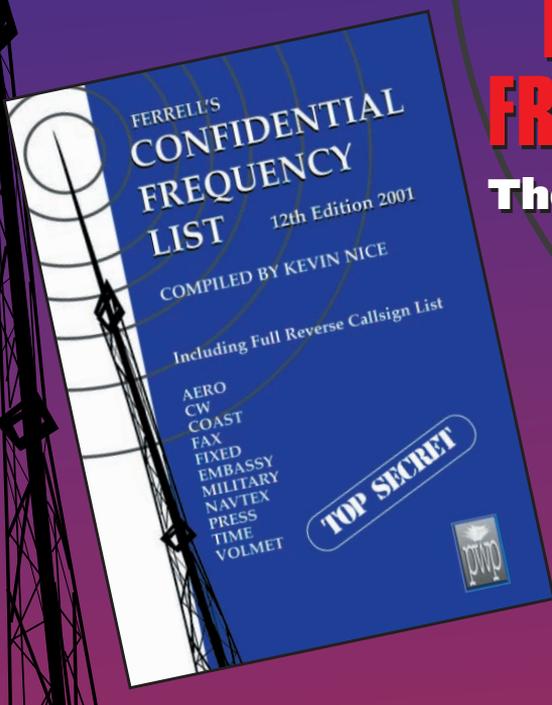


● Fig. 3: The outer bamboo spreader poles are held together by tying them together as shown here.

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# Carrying On The Practical Way

This month the Rev. George Dobbs G3RJV encourages you to 'have a go' testing surplus crystals. However, first things first...you can start the process after reading the appropriate quotation!

*"One can do nothing with nothing, but one can do plenty with little".*

**Adrian Hallet**

Many Amateur Radio 'Old Timers'...including G3RJV look back with fondness on the heyday of the government surplus market. When I began Amateur Radio I lived in Grimsby, on the Lincolnshire coast. In the mid 1950s, even a modest sized town like Grimsby had a radio parts and surplus shop and a government surplus market stall.

Most of my early radio construction was done using parts culled from surplus equipment. I can clearly recall searching for, and sometimes finding, Amateur band crystals in boxes of large Bakelite 10XJ format crystals. And although it's easy for older Amateurs to shake their heads and say "It's not like that anymore". True – it isn't, **but there are still bargain and surplus items to be found.**

We can look to the huge consumer electronics, mobile phone and computer markets and find parts and devices made by the multi-thousand and try to adapt them for our particular use. In spite of the rush to surface mount everything; there are still useful bargains to be had.

One example is the wide range of quartz crystals that are now available at inexpensive prices. Very few of them are in the Amateur bands frequency range, but they can lend themselves to several uses in the workshop.

## Ladder Filters

Over the last few years, many superhet receiver designs



● This crystal tester is to provided with a smart case...but George G3RJV says you should build several, hiding them until the day when you'll certainly need one!

have appeared in the Amateur Radio magazines using crystal ladder filters at the intermediate frequency. And of course, not to be left out...PW had its own version!

In the April 2000 edition of this column, I offered a simple 3.5MHz receiver, which I called the FBRX. It used cheap crystals from the TV industry on a frequency of 8.863256MHz, which is twice the PAL colour burst reference frequency. Four of these crystals were used in a ladder filter with a fifth in a VXO circuit to make the beat frequency oscillator.

Many designs for crystal ladder filters using inexpensive crystals have been featured in Amateur Radio receiver projects. I quote an example of such a filter in Fig. 1, and this is a very useful little filter circuit.

The filter uses the very inexpensive TV colour burst reference 4.43MHz crystals with a useful bandwidth of 1.5kHz and a very usable input and output impedance of 500Ω. However, one of the problems with this design could be the notoriously poor quality control on the production of 4.433MHz crystals.

Although only four crystals are used, there could be enough production frequency difference in the individual crystals to result in a poor filter. Fortunately they're cheap enough for you to buy extra crystals and test their frequency to find four that are close enough to be useful. Incidentally, one of the off-frequency crystals could be used in the beat frequency oscillator (b.f.o.).

## Making A Filter

Making a ladder filter using the colour burst crystals requires a bench test oscillator and some method of measuring the frequency of the oscillations. Such a test oscillator is not only useful when building ladder filters, but can also serve a whole variety of purposes.

The test oscillator can do everything from checking that junk box crystals will actually oscillate, to determining the frequency of those annoying unmarked crystals. I've always had some kind of circuit to perform this task tucked away in my workshop. So this time, I'm offering a few circuit ideas to perform this useful function.

The diagram, Fig. 2, shows a simple crystal test oscillator using a field effect transistor (f.e.t.). It's based on a circuit of the 1970s from Jan Crystals. In this circuit the crystal provides a feedback path between the Drain (D) and the Gate (G) of the f.e.t.

My board used a J310 device but the more common 2N3819 works well in the Fig. 1 circuit. The trimmer capacitor provides some capacitive loading for the crystal.

The output goes a small length (in my case about 600mm or 2ft) of pick-up wire. This acts as an antenna so that a short-wave receiver tuned to the appropriate frequency can pick up the output from the oscillator. This means that the crystal can be tested without the need for a frequency counter.

Many readers will have a modern receiver with a digital frequency scale, which will allow an accurate reading of the frequency. The receiver should be capable of receiving c.w. or s.s.b. transmissions as the signal will require a beat frequency note (utilising a b.f.o.) to be heard.

## More Sophisticated

The diagram, Fig. 3, shows a rather more sophisticated circuit, which includes an oscillator and a buffer stage. The oscillator is a Colpitts type using a bipolar transistor.

I used the 2N2222 device because I have lots of them. Any similar 'gainy' bipolar transistor with a fairly high

$F_t$  should do the job. The feedback path is via the two 220pF capacitors. These values enable the oscillator to 'fire' with crystals in the 2 to 20MHz range. (Lower frequency crystals will probably require higher values of capacitance).

The oscillator is directly coupled to an emitter follower buffer stage. The output comes directly off the emitter resistor, and in this case I've assumed the output will go to a frequency counter. As in Fig. 2, the output could also be to a length of wire, which radiates a signal for a nearby short-wave receiver.

Sometimes a crystal may require to be tested under simulated operating conditions. To this end, Fig. 3a shows how series or parallel loading may be added to the test oscillator. In the inductive loading, a core-adjustable coil is used, although I have seen the medium wave coil from a small transistor radio, complete with ferrite rod, used in this application.

## Indicating Crystal Tester

The diagram, Fig. 4, shows a familiar circuit that I used in a presentation at the Dayton HamVention some years ago and is my version of the i.e.d. indicating crystal tester. (There are several variations of this circuit around in the Amateur Radio literature).

Let's now look at how it works: The idea of the circuit in Fig. 4, is to get the crystal to oscillate. The output signal is then rectified to produce a d.c. voltage, this voltage is then used to illuminate the i.e.d. indicator.

As an oscillator a bipolar Colpitts oscillator circuit is used, which feeds a pair of diodes. I've also included an optional frequency counter output taken directly from the oscillator.

A second bipolar transistor is used as a d.c. amplifier to illuminate an i.e.d. placed in the collector circuit. Again a whole range of bipolar transistors would serve in this design.

The circuit, like the other two, uses a couple of short crocodile clip leads to connect to the crystal. There are several alternative crystal mountings...so the clip leads make life easier.

Power is applied with a push switch...making the operation easy and convenient. All you do is...clip on the crystal and press the button to perform a test.

One of these simple, inexpensive, test oscillators ought to be part of every constructors test bench. They're something to hide on a shelf or in a drawer until that day (and it will come!) when you'll certainly need it!

PW

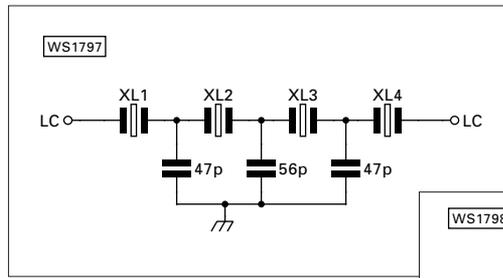


Fig. 2: A simple crystal test oscillator using a field effect transistor (f.e.t.). In this circuit the crystal provides a feedback path between the Drain (D) and the Gate (G) of the f.e.t. (see text).

Fig. 1: Crystal ladder filters using inexpensive crystals have been featured in Amateur Radio receiver projects and G3RJV says this is a very useful little filter circuit (see text).

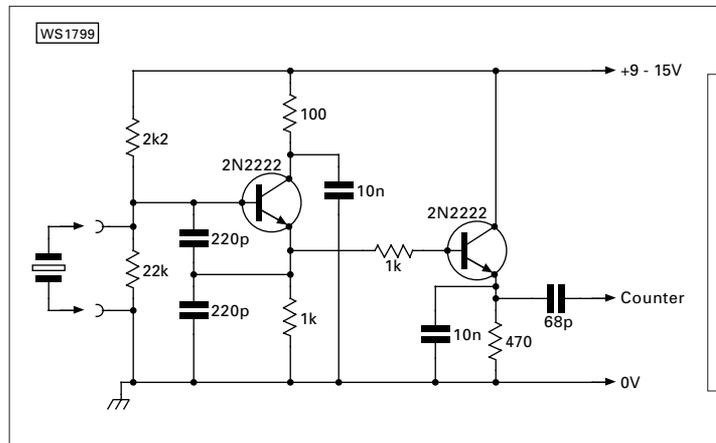
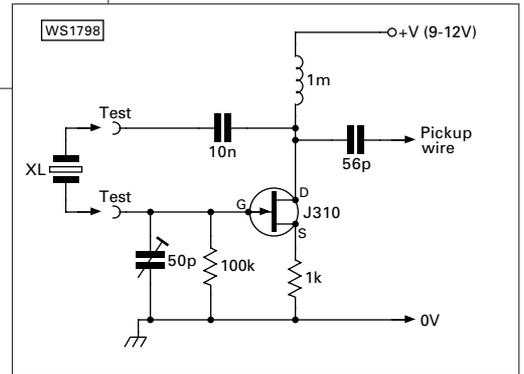


Fig. 3: A rather more sophisticated circuit, which includes an oscillator and a buffer stage. The oscillator is a Colpitts type using a bipolar transistor. Fig. 3a (inset) shows how series or parallel loading may be added to the test oscillator (see text).

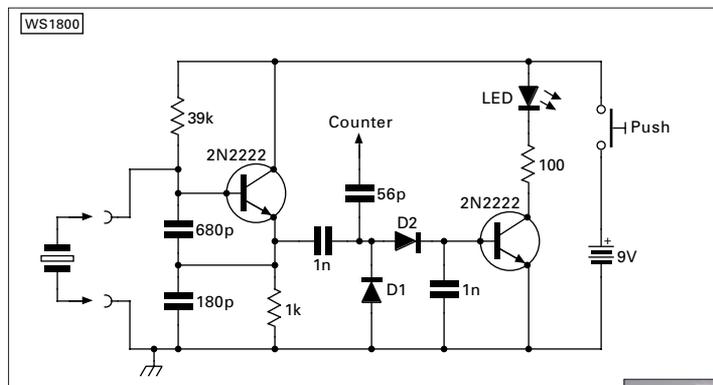
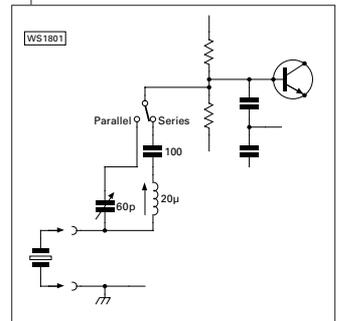


Fig. 5 (right): Inside the 'smart' showing off version crystal tester!

Fig. 4: The G3RJV version of a i.e.d. indicating version of a test oscillator (see text).

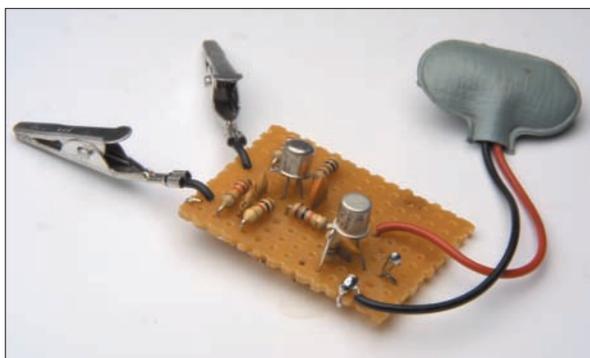
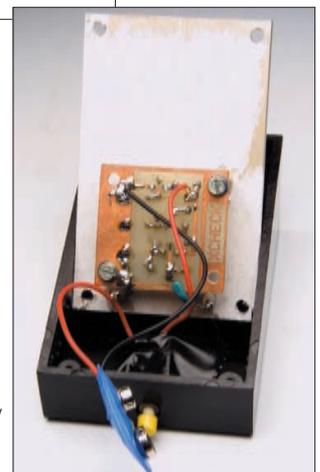


Fig. 6: In the article G3RJV suggests building the practical minimalist version of the tester and hiding it away until you need it...as you certainly will one day! (see text).



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# Value & Vintage

The darkened area and eerie glow from elderly 1940s radar screens perched on the vintage 'wireless shop counter' tell us that Charles Miller is in charge this month ...continuing the story of his RAF adventures!

Continuing *Miller's Memoirs* (January 2002): It might have been the efforts of Derek and myself in keeping the RAF's Stenigot radar transmitters - Louth, Lincolnshire - going had given us an ill-deserved reputation for technical ability. On the other hand, the top brass at the camp it could have been their seizing a golden opportunity to get rid of us, because in the following January we were sent on detachment to the Isle of Wight to attend to the Chain Home (CH) radar in that 'Pearl of the South'.

However, **please don't think for one moment** that I'm knocking the Island. I have subsequently visited it in summer and found it to be delightful. But it wasn't so, in the winter when we arrived after a storm-tossed crossing in a paddle steamer which bore a plaque enumerating the soldiers she had rescued from the Dunkirk beaches back in 1940.

The ferry trip provided a bright spot because as we were in uniform, we were permitted to go down into the engine room and watch the mighty machinery at work. A most impressive sight.

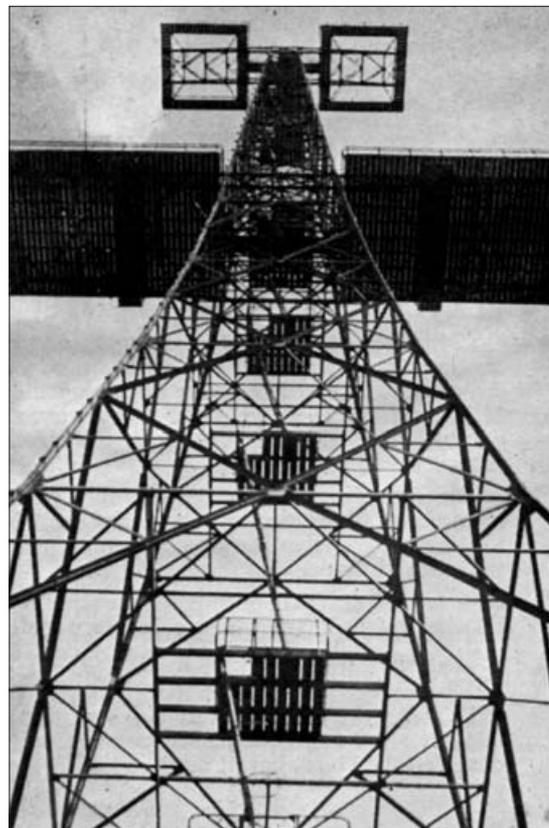
Not so impressive was the arrival at Ryde pierhead. Here we disembarked onto an ancient tramcar which appeared to have been designed by Roland Emmett on an off day!

## Train To Ventnor

We then puffed along in a delightful steam train to Ventnor, passing through the long tunnel which led to the station, seemingly cut out of the hillside and perched precariously high above the town overlooking the sea. Finally, we arrived at the RAF station late at night.

Ushered to our quarters - one look at them horrified us! The inhabitants looked to a man to be bull-happy; everything was neat and tidy and the lino on the floor gleamed from perpetual polishing.

"We can't stay here"! said Derek, and off he went in search of a better 'ole. He returned triumphant, saying that he had found just place for us. This turned out to



● Fig. 2: Looking up at one of the transmitting towers (see text).

be a scruffy billet full of comfortable clutter. Several card games were in progress and on one bed lay an airman practising upon a trombone. It was a 'home from home'.

Our introduction to the CH radar gear next day was not so propitious. Neither of the two main transmitters was in working order, as had apparently been the case for several months.

Instead, the emergency stand-by set had been pressed into service. This type of air-cooled transmitter was normally housed in an underground bunker, known as 'Buried T' on the edge of a radar site, which in too many cases filled up with rain water during the winter and ruined the gear.

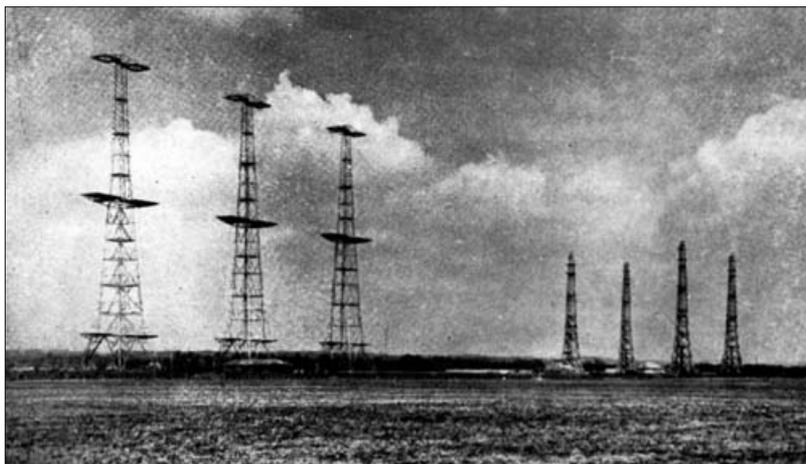
However, this example must have been rescued before meeting a watery fate and it did in fact work quite well, pumping out about 25kW on a good day. It probably would have given around five minute's warning of a Sopwith Camel flying flat-out over Ryde pier!

## Essential Transformer

Derek and I set about trying to get the main transmitters working, only to come up against the brick wall of a certain small but essential high voltage transformer being virtually impossible to obtain. (I could hardly believe it when I discovered that this was the **very same type** as I'd bought as ex-Government surplus a year or two before for use in my home-made oscilloscope!). All we could do was to hope that the Russians wouldn't come whilst we were there.

The vital transformers did eventually arrive and in due course we had the main transmitters up and running. This was in time for a diabolical regime which required us to operate a dawn-till-dusk watch (presumably the Russians didn't work at night).

Since the watch necessitated our getting up an hour before dawn and returning to our quarters an



● A typical Chain Home (CH) radar site, with three of the (usual) four 110 metre (360ft) steel transmitting antenna towers, and the four 74m (240 ft) wooden receiving masts. (All photographs from Author's collection).

hour after dusk we never saw the daylight for weeks on end. Even when the days did lengthen out, our hours lengthened with them, so we were no better off.

To pile confusion upon confusion, RAF Ventnor had adopted a non-synchronous calendar. It was so bizarre that I would pardon you for thinking that I am making this up – **but I'm not.**

The week was shunted around so that Thursday equalled Monday. Thus the working week ran from Thursday to Monday, with Tuesday taking the place of Saturday and Wednesday the place of Sunday.

You may imagine (correctly) that we hardly knew whether we were coming or going. With hindsight, the only possible reason I can see for this ridiculous routine was that it was an elaborate ploy to fool the Russians, who might be expected to launch an attack on a normal weekend, when we ordinarily would not be working. The KGB must have laughed their socks off at this!

## Watch For Submarines

The whole thing was crowned by a supreme piece of idiocy when we were ordered to return to the transmitters one night to mount a watch for a sunken submarine. It was useless to protest that CH gear wouldn't see anything under about 5,000 feet **above sea level**, so we had to sit there fuming and wondering how we had managed to win the war. We couldn't wait to get back to the comparative sanity of Stenigot.

Before that happy event, however, I was sent off on my own on an altogether pointless detachment to a moribund Chain Home Low (CHL) station called RAF Humberstone. The CHL had been developed to detect low-altitude raiders and thus to fill the gap left by CH; it worked on frequencies around 200MHz, employing a large rectangular dish receiving array mounted on a 180 foot tower.

Since I had had no training whatsoever on this gear I could see no possible reason for my having been sent there. In any case, there was no other technical bod on the site, not even a radar operator to man the receiver, the complement consisting of a RAF Police Sergeant, a corporal under him, an Admin sergeant and an AC 'plonk' Clerk General Duties. There was also a maniacal Flight Lieutenant called Nutt, whom I did not meet for some time.

## Bleak Spurnhead

There was no RAF accommodation at the Humberstone site, so everyone but Nutt lived in 'civilian billets', consisting of two primitive bungalows on Spurnhead...as bleak a seaside location as imaginable. The water supply was provided by a pump in the back garden, where the daily toilet had to be performed in the freezing cold, whilst the 'usual office' was a noisome earth closet where a bundle of torn-up newspaper hung from a nail. (You soon learned powerful night continence in that place).

Our landlady was an ill-favoured but predatory female whose cooking suggested that she might have graduated from Lucretia Borgia's Academy for Young Women. I did not feel that I was going to be happy in this place.

To make matters worse, I received a most curious welcome upon my arrival at Humberstone. The two sergeants took me to one side and warned me that if the Police Corporal 'tried anything on' I was to tell them at once and they would 'see to him'.

What exactly the corporal might 'try on' was not specified, so I was left to wonder if he was a sadist or a

pederast (a gentleman who preferred another gentleman to a young lady!). Neither alternative offered a pleasant prospect as I was to have the room adjoining his in one of the bungalows.

In the event, the Corporal exhibited a considerable interest in the landlady's slatternly daughter, which reassured me in one respect but left me apprehensive of violent physical assault. The fact that, although uncouth, he was perfectly polite to me did little to comfort me – he might have been a Jekyll and Hyde type who could suddenly become bestial, possibly when the moon was full. Even the eccentricity of RAF Ventnor was more attractive than this situation – and what was I doing here anyway? And what had been the fate of my predecessor at Humberstone?

After arriving at the site each morning, I saw no one else until going-home time. Presumably the two Station Police (SPs) sat around in the Guardroom whilst the Admin Sergeant and his sidekick administered whatever there possibly could be to administer in this place.

Since there was no one to give me any orders, I spent my days just as I wished. To pass the time I taught myself how to operate the CHL gear, which appeared to be in perfect working order.

When tracking aircraft palled there was always a lot of time left over for working on one of my home-made radio receivers.

## Nutt On Horizon

Eventually, Flight Lieutenant Nutt appeared on the horizon. He appeared to be clueless on matters technical or administrative and could give me no idea of what was supposed to be going on!

Neither did Nutt care as long as he could pursue his hobby of hunting rabbits with his 0.45in service revolver. Since this type of weapon had a long range and would drop an Elephant in its tracks, I locked myself in the bomb-proof operations block whenever I heard him blazing away.

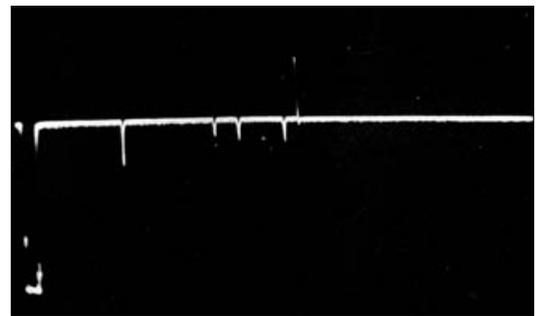
At last there came a chink of light in the darkness. A message arrived from on high that a big NATO exercise was to take place during the next fortnight, in which all air defences would be put to the test.

Could I have been sent to Humberside to make sure it was in operating order? Unfortunately this only raised more queries. In that case, (a) why hadn't I been told, (b) why didn't they send a proper CHL mechanic and (c) why didn't they send operators as well? Perhaps deep in the Air Ministry archives are the answers to these questions, held to be of great military importance and not to be revealed for a 100 years!

However, I'm afraid you'll have to wait for the June issue for the next exciting instalment of *Miller's Memoirs!* Cheerio until then!



● A typical Chain Home Low (CHL) radar site, showing the 56m (185ft) steel tower with the rotating array mounted on top (see text).



● Photograph of a trace on the receiver's c.r.t. screen on CH equipment. Far left is 'grass' and permanent echoes, first deep trace to the right is an aircraft, plus three further aircraft traces further out. Faintly, in the centre, is the upward trace of the marker pulse, linked to a range indicator calibrated in miles.

PW

# VHF DXER

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REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

**T**he excellent F2-layer propagation continued unabated during January enabling world-wide contacts to be made on the 50MHz band. My records show that the band was open every single day to North America with numerous c.w. and s.s.b contacts being made with stations in Canada and the USA.

There were also many contacts being made into the Caribbean area especially in the period January 12-18. As expected there were no openings to the Far East but many were reported to central Asia and the Middle East. With only one or two brief exceptions there were no openings into the continent of Africa. There were very few winter Sporadic-E (Sp-E) openings noted on the 50MHz band.

Events were reported on January 9, 11 and 26, perhaps this is indicative of solar maximum where an increase in geomagnetic activity causes an apparent reduction in Sp-E events. The active Sun however produced many auroral back-scatter openings during January, most of them weak and generally restricted to stations in the north of England, Ireland and Scotland. Some of the events reached the 144MHz band but nothing spectacular was reported.

Tropospheric conditions on the 144MHz band and higher frequencies were rather poor. The only period worthy of note was between January 1-5 when contacts up to 1000km or so were made from southern England to stations located in Scandinavia and western Europe.

## SOLAR PEAK

According to **Dr. Tony Phillips** (NASA) evidence is mounting that some solar cycles are doubled-peaked. The ongoing solar maximum may itself be a double and the second peak has arrived.

Approximately every 11 years solar activity reaches fever pitch. Solar flares erupt near sunspots on a daily basis. Coronal mass ejections, billion ton clouds of magnetised gas, fly away from the Sun and buffet the planets.

Even the Sun's awesome magnetic field (as large as the solar system itself) grows unstable and flips. This is a turbulent time called solar maximum.

The most recent and ongoing solar maximum peaked in mid-2000 and sunspot counts were higher than they had been in ten years and solar activity was intense. After that, sunspot counts slowly declined and the Sun was relatively quiet for month long stretches.

Solar activity was subsiding but now, as any 50MHz operator will tell you, it's back again. The Sun is again peppered with spots and eruptions are frequent.

**David Hathaway**, a solar physicist at the NASA Marshall Space Flight Center reports that the current solar cycle appears to be double-peaked and the second peak has arrived. Scientists track solar cycles by counting the number of sunspots. These are cooler planet-sized areas on the Sun where intense magnetic loops poke through the visible surface.

David recalls that sunspot counts peaked in 2000 some months earlier than expected. The subsequent dip towards solar minimum seemed premature and indeed it was. Before long the

RU4CE (Russia), UN3G, UN7QX (Kazakhstan) and UT2IC (Ukraine).

**Colin Ranson G8LBS** (Suffolk JO02) reports catching the Sp-E opening on January 11. Between 1745-1845UTC he made 12 s.s.b. contacts with stations in Austria, Bulgaria, Croatia, Romania, Slovenia and Yugoslavia. All signals were very strong with the exception of YT1VP who was running only 300mW output, nevertheless he was putting in a good 55 signal. He mentions that there was surprisingly little activity considering the large signals and

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## THIS MONTH DAVID BUTLER G4ASR HAS DETAILS OF INCREASED SOLAR ACTIVITY AND YOUR USUAL DX REPORTS.

---

sunspot counts reversed course and began to climb toward a second maximum that now appears to be only a few percent smaller than the first.

The solar maximum eleven years ago was very much the same. A first peak arrived in mid-1989 followed by a smaller maximum in early 1991. In fact, if the ongoing cycle proves to be a double, it will be the third such double-peaked cycle in a row.

## THE 50MHz BAND

At my QTH (Herefordshire IO81) the excellent F2-layer propagation which I described last time continued into January. During the first two weeks of the month contacts on c.w. and s.s.b. were made with the stations of C6AIE (Bahamas), D44TD (Cape Verde), FM5WD (Martinique), FY5KE (French Guiana), PJ2MI (Netherland Antilles), PY5MD (Brazil), SU1SK (Egypt), UN6P (Kazakhstan), YV4YC (Venezuela), 9Y4AT and 9Y4YC (Trinidad). Contacts were also made with stations located in Israel, Lebanon, Canada and USA.

On January 17 there was a tremendous opening to South America, the Caribbean area and North America. Between 1200-1700UTC QSOs were made with CO8DM, CO8LY (Cuba), HP2CWB (Panama), P49MR (Aruba), TG9NX (Guatemala), WP4KJJ (Puerto Rico), YV1DIG, YV4FJK, YV4GLD, YV4GMC (Venezuela) and 50 contacts with stations in Canada and USA! Only one contact was made on c.w!

The openings continued on a daily basis through to the end of the month but were generally brief. New contacts included the stations of EY8CQ (Tajikistan), JY4NE (Jordan),

he surmised that it caught most people on the hop.

Colin also reports making s.s.b. contacts during another Sp-E opening on December 31. Between 1640-1720UTC the 50MHz band was open to stations located in much the same areas but also including Italy and UR5TW (KN39) in Ukraine. A few days prior to this opening between December 24-28 he made contacts via F2 propagation into Canada, USA, Mexico, the Caribbean islands, Venezuela in South America and D44TC in Cape Verde Islands.

**Andy Adams G0KZG/MM** has sent me a report from the Royal Research Ship *Charles Darwin* located west of Angola (J152). He mentions that on January 31 he made s.s.b. contacts via trans-equatorial propagation (t.e.p.) with stations in Greece, Malta, Italy, Portugal, Spain and EH9IB in Ceuta and Melilla.

Andy then sailed to Durban, South Africa via Walvis Bay, Namibia making more contacts via t.e.p. on the way. He left the ship on February 25 and will return at the end of April in Australia for a trip from Fremantle to the Seychelles. He reckons this is much better than plodding around the north Atlantic Ocean!

**Stephen Bunting MOBPO** (London IO91) reports that he was active on the 144MHz band during the excellent tropo opening on December 9. Because his home is screened by rising ground he drove to a local hilltop park and operated as a portable station from the back of his car.

Steve used a Trio transceiver and a 70W solid-state amplifier into a 9-element F9FT Yagi. He made a total of 63 s.s.b. contacts with stations in Belgium, Denmark, Germany and

The Netherlands. His longest distance contacts included DL4KUG (JO64) at 941km, DL9MS (JO54) at 852km and OZ1BEF (JO46) at 801km. Operating portable with relatively simple equipment from a local high spot is a great way to increase your DX capabilities on the v.h.f. and u.h.f. bands. Why don't you try it sometime?

## MONDAY EVENINGS

Angie Sitton G0HGA reminds me that Monday evenings are c.w. activity nights on the 144MHz band. For those that don't know the idea of activity nights on the v.h.f. bands was first implemented many years ago by the RSGB

interfering signal on the c.w. meteor scatter calling frequency was identified as the Maroc-Tubsat satellite which was launched in December 2001. Another signal operating on an intermittent basis from the satellite was identified on 436.075MHz.

Transmissions from Maroc-Tubsat fell silent on January 23 but it is not known why or if the signals will resume again. According to the Amateur Satellite Organisation - AMSAT - the frequencies were not co-ordinated with the International Amateur Radio Union (IARU) and is therefore classified as an intruder. It's important to document and report such interference because under the ITU Radio

A few brief Sp-E openings on the 50MHz band may be noted towards the end of April. Auroral activity should be high, favouring stations in northern England, Ireland and Scotland. This period usually produces some large scale events enabling long distance contacts to be made on both the 50 and 144MHz bands. The Lyrids meteor shower occurs between April 19-24 and will provide the m.s. enthusiast with DX contacts on all the v.h.f. bands.

## DEADLINES

That's it again for another month. Please let me know what DX you have been working on the v.h.f. bands. Forward any news, views, comments or photographs 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

**The Six Metre to Microwaves Convention**  
**6 April 2002 from 1000 hours**  
**Reaseheath College, Nantwich,**  
**Cheshire CW5 6DF**

This event organised by members of the RSGB VHF committee, VHF contest committee, Microwave committee and the UK Six Metre Group promises to be the UK premier convention for everyone interested in the bands from 50MHz through to Microwaves.

The convention will feature lecture programmes from top-notch 50MHz DXers, v.h.f. and microwave personalities throughout Saturday. The UKSMG will also be holding their AGM at the event. RSGB Contest Committee awards and other v.h.f. presentations will be made during the day.

A large hall will house stands for RSGB committees and the UK Six Metre Group, DXCC field checking will be provided by G4BWP on the UKSMG stand. There will be traders specialising in v.h.f. and microwave components, equipment and publications. The RSGB book stand will also be in attendance.

Snacks and licenced bar facilities will be available during the day. A DX Dinner will be held in the evening. Overnight bed and breakfast accommodation in single rooms can be provided on campus.

The convention will close at 1200 hours on Sunday 7 April but no scheduled events will take place on Sunday. Advanced package bookings for admission, DX dinner and bed and breakfast are being handled by RSGB. Day visitors for the convention only may pay at the door on the day although it is recommended that advance bookings are made to bypass the queues.

Directions for Reaseheath College can be found at <http://www.streetmap.co.uk> by entering the post code CW5 6DF. The venue is located just 5 miles from Junction 16 on the M6. The nearest railway station is Crewe. Visitors from further afield may use Manchester airport, conveniently located 30 miles from Reaseheath College.

See the RSGB Website at <http://www.rsgb.org> for up-to-date details of lecture streams and booking information.



● Have you worked all continents on the 50MHz band yet?

v.h.f. committee as a means of generating much wanted activity. In recent years the idea just seemed to fizzle out so it is good to see its resurrection.

Angie is particularly keen to promote the use of c.w. on the 144MHz band. She has set up an E-mail reflector which is publicised on the Two Metre c.w. Group homepage at <http://www.qsl.net/g0hga/2mCW.htm> You can also access the group at <http://www.groups.yahoo.com/group/twometr.ecw/> It's purpose is to encourage newcomers to c.w. activity on the 144MHz band and to exchange information.

Angie hopes that members will post details about auroral, Sp-E and other DX alerts along with beam headings and to use the reflector to make DX and local skeds. The group is open to all licensed Amateurs and s.w.l.s and you can sign up by logging onto the website.

## WORLD-WIDE INTERFERENCE

A rather disturbing report of world-wide interference on 144.100MHz was noted during several days in January. The source of the

Regulations any country may put any station on any frequency as long as no harmful interference is caused to stations of other countries operating within the Table of Frequency Allocations.

If you hear interfering transmissions you should note the date, time and any identifying characteristics such as what was transmitted and send a report to the IARU Monitoring Service (IARUMS) coordinator of your national radio society. In the UK the RSGB intruder watch representative is **Chris Cummings G4BOH** (E-mail: [iw@rsgb.org.uk](mailto:iw@rsgb.org.uk)). If Amateurs do not report interference from an intruder the country which put it there could claim it as legitimate under international regulations.

## FORECAST

By the time you read this most, if not all, of the world-wide F2-layer propagation may have disappeared from the 50MHz band. However, during March and April this will be replaced with trans-equatorial propagation to southern Africa. These type of openings favour stations located in southern England although some large events will enable stations in northern UK to participate.

# HF HIGHLIGHTS

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

I have finally managed to replace my old full-size G5RV with a Carolina Windom 40 from Radio Works. This now hangs from my mast in a less than ideal configuration, however, initial impressions are very favourable.

There has certainly been a big improvement in received DX signals on the higher bands especially 24/28MHz. At just 20m (66ft) long it may just be what you need if you have restricted space for an antenna. Hopefully a review will appear in a future issue of *PW*!

## DX NEWS

There's news of an operation from Midway Island, which counts as OC-030 for the IOTA programme. **Jim G3RTE** and **Phil G3SWH** will be active from Midway on both s.s.b. and c.w. between 30 March and 6 April 2002. Midway was 27 in Europe and 55 world-wide in the 425 *DX News* 'Most Wanted DXCC Countries' survey in 2001, so there should be plenty of operators hoping to work the island.

Propagation permitting the main objective will be to work as many Europeans on as many bands as possible. Two stations will be on air



● The shack of John Laffey G0WHP.

covering all bands from 7-28MHz and the expedition has set a target of 10,000 QSOs with an approximate 50/50% split between c.w. and s.s.b. The special callsign **W4M** has been issued and Phil will handle all QSLs.

## YOUR REPORTS

On to your reports now and the 3.5MHz band where **Eric Masters G0KRT** in Worcester Park, Surrey has been enjoying some QRPP. **Running just 90mW** Eric worked DJ9IE/QRP (Germany) 2107 followed by PA1SL (Netherlands), OQ7CC (Belgium) and IK1FVO (Italy) later at 2300UTC. Eric was using his new FT-817 with a modified W3EDP antenna and has been very pleased with the rig so far, especially when using such low power.

**Roy Walker G0TAK** near Kendal, Cumbria has had another busy month judging by his vast QRP log. His 5W contacts using c.w. include OK1HFP (Czech Republic) 1950, SP3BLF

(Poland) 2236 and well known GQRP Club member and Dxr George GM3OOX (Scotland) who was running just 1W. A change of mode to PSK allowed contacts with EI2FN (Ireland) at 2013 and OM3TLE (Slovak Republic) at 2113UTC.

## THE 7 & 14MHz BANDS

In Milton Keynes **Sean Gilbert G4UCJ** has been using his new IC-756 on 7MHz where he found conditions good using an indoor antenna mounted in his loft. Using c.w. Sean worked 7X4AN (Algeria), VK8AV (Australia) 2053,

(Netherlands), OE5KEN (Austria) and S51CK (Slovenia) all made the log around 1430UTC.

Also enjoying some time on the 14MHz band was **Mike Baker G3SUK** in Stowmarket, Suffolk who used his IC-746 with 70W and a Windom antenna to work 7S5ARA (Sweden), CT1AGI (Portugal), OE5GL (Austria), VK3EGN (Australia), ZL2FS and ZL3RG (New Zealand) on s.s.b. around 0830UTC.

## THE 21 & 28MHz BANDS

In Bishopston near Swansea **Robin Trebilcock GW3ZCF** used his IC-775 and 40m loop to work

## CARL MASON GW0VSW HAS A PACKED COLUMN THIS MONTH AS HE WELCOMES YET MORE NEW REPORTERS!

CN8YR (Morocco) 2252, PP7JR (Brazil) 0012, JW8AJA (Svalbard) 0038, and PZ5RA (Suriname) at 0103UTC.

A warm welcome to new reporter **John Laffey G0WHP**, Litcham, Norfolk who completed building a new shack just a few months ago. Station equipment includes an FT-1000MP MkV and FT-817 and the antenna is a simple dipole 110m (360ft) long and raised about 20m (60ft) off the ground. It is erected well away from the shack in a private wood with permission of the owner. John was pleased to work VK3DQW/QRP (Australia) at 0932 on 14MHz running just 10W s.s.b. receiving a 4/1report.

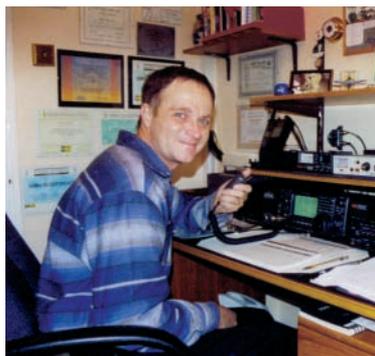
Also new to the column is **Martyn Medcalf M3VAM**, Chelmsford, Essex who has enjoyed operating with his new callsign this month. Martyn's station includes an IC-746, Heil boom headset and a long wire antenna - 8.2m (27ft) long which is tuned with a SGC-237 auto a.t.u. fixed 5.4m (18ft) above ground.

Restrictions prevent other antennas being used but that has not stopped Martyn. His contacts on 7MHz s.s.b. include EA5ZD (Spain), RU2FA (Kaliningradsk), SM3TLG (Sweden), F5MMX (France) and SP5STAR (Poland) all around 1500UTC. On 14MHz EI8FH (Ireland), PA3HEP

JA9LX (Japan) 0937, ZL3TS (New Zealand) 1019, BX4AAC (Taiwan) 1203, 5R8DA (Madagascar) 1221, W7MHC (U.S.A.) 1551, OY4TN (Faroe Islands) 1604 and finally ZS6AVP (South Africa) at 1721UTC on 21MHz using PSK31 at 50W.

The 28MHz band has been very lively during the day and despite other chores **Ted Trowell G2HKU** on the Isle of Sheppy in Kent managed a few hours here working JY9NX (Jordan) and ZD8Z (Ascension Island) at 1200 and slightly later at 1500UTC CX3HF (Uruguay), LW9DAH (Argentina), K6NA in San Diego (U.S.A.) and VE6KG (Canada). The rig was a Ten Tec Omni V, 70W c.w. and a G5RV antenna.

Finally on to the log of **Peter Lowrie M15JK** in Newtonabbey Northern Ireland who used s.s.b. to work ZS6LSM (South Africa) at 1127 followed by T77CD (San Marino) at 1529UTC, both are new countries on this band. Earlier 10W f.m. contacts include ES2SW (Estonia), UR5SEL (Ukraine), LY2BFP (Lithuania), EA3HK (Spain) HA4ZZ (Hungary) and OE7JPI (Austria) all between 1100 and 1148UTC.



● Martyn Medcalf M3VAM/G1EFL.

## SIGNING OFF

That's about all there's space for this month. Once again, my thanks to all our reporters for the vast amount of information received. I'm afraid that space limitations have meant that I have had to be very selective, but I do try to fit you all in the column. Have a good DX filled month

73, Carl GW0VSW

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SDW-22/17-30W	17/30m	2 Trap	41ft	£87.45
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SDW-46W	12/17/30/40m	6 Trap	46ft	£209.95
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E-MAIL: [rcooke@g3ldi.freemove.co.uk](mailto:rcooke@g3ldi.freemove.co.uk)

PACKET: G3LDI @ GB7LDI

In spite of the dissenters who say that packet radio is dead, I still receive Newsletters from very active groups. Apart from the AAPRA and VARPA Newsletters from Australia and Canada respectively, the UK ones are still producing lots of activity.

*Digicom*, the Newsletter of the MAXPAK group, is now available via E-mail, a very convenient and cheap method of distribution. In the latest issue, information on the GB7WV Site Refurbishment is given, together with pictures of the new cabinet.

Chris G0CNG, the Chairman of MAXPAK, did the work, and a fine job he has made of it. See Fig. 1.

Looking at the list of equipment inside the cabinet, I would say that the death of packet radio is greatly exaggerated! Obviously with 4 Spirit 9k6 TNCs and 3 Tiny2s with radios and power supplies, there is a lot of investment here.

It's great to see that radio is still taking preference to telephone. The MAXPAK AGM takes place at the Perton Community Centre on Monday 3 April, so please attend if you can. The Newsletter is well produced and well worth having, lots of useful information, so why not join, help is needed on the committee!

## SUFFOLK DATA GROUP

The Suffolk Data Group is another very active group and they produce a very comprehensive Newsletter. It usually runs to a dozen or so pages, crammed with useful information. The last one I received (unless I have lost one in the piles of papers surrounding my desk!) is the Summer edition. In there you will find news on the BBS, Nodes and latest membership details. They have a packet advice line (PAL), social meetings, antenna information, and an interesting article on setting up Flexnet32 for 9k6 and TCP/IP. New members are always most welcome, so if you live in Suffolk, this would be the group to join.

## MEANWHILE IN GLOUCESTERSHIRE

The Gloucestershire Repeater Group's

Newsletter is another regular that I receive. It's very interesting to note that the Foot and Mouth disease crisis has even had an effect on Amateur Radio. Apparently access to certain node sites has been prohibited for several months due to this situation. Luckily, the gear has not failed, due to the reliable engineering no doubt!

The group is different to some of the others, in that all the repeaters are catered for under the one umbrella of the Gloucester Repeater Group. This includes the voice

mode; in fact it's always worth a read, even for old-timers!

Tutorials in other modes are there too and by following the various pages, time can pass quite quickly with lots of interesting links. Various software packages are available as well as operating information, links to clubs and other Newsgroups, a contest calendar, and soundcard software.

## SENDING PICTURES VIA PSK

If you are active on PSK31 then take a look at Fig. 3. This can be accessed from a link on the [www.rttyinfo.net](http://www.rttyinfo.net) site

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## ROGER G3LDI ASKS YOU TO SEND IN YOUR PACKET NEWSLETTERS, HAS LOTS OF WEBSITES TO TRY INCLUDING ONE TO HELP SEND PICTURES VIA PSK31!

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repeaters; most Amateur clubs seem to keep their voice and data repeaters separate.

One piece of good news is that Jon Colley G4XJC, will eventually have all his computer equipment returned to him, following a police investigation. You may remember that there were some dubious pictures passed around the network, and Jon happened to be the fall guy for this particular unfortunate incident.

Jon is still waiting, however, to hear from the RA regarding the re-instatement of his personal licence and his NOV for GB7XJC. I find his treatment particularly galling, especially when you take a listen over 28MHz and hear all the illegal CB operation, then take a look on 6.6MHz and between 3.4 and 3.5MHz and hear all the illegal activity there. Thousands of f.m. and s.s.b. stations, all operating with impunity!

So, the good news is as far as maintaining interest in radio is concerned; so if your group is still active, let me know about it. Send me your Newsletter, via E-mail if you like, so it won't cost much and I can extract goodies from it. Nothing succeeds like success and if you have a successful local group, share it, don't keep it secret!!

## RTTY INFORMATION

If you are a newcomer to the RTTY mode there's lots of information at [www.rttyinfo.net](http://www.rttyinfo.net) See Fig. 2. The RTTY for Beginners section covers the basics of the

Have you ever wished you could see what the person on the other end of a QSO looked like? If so KH6TY has put together a collection of utilities that makes it possible to send a postage-stamp sized color photograph of you, during a PSK31 QSO, to the person on the other end, in about eight minutes.

In the same time, you can also send a card, such as a PSK31 QSL card, in larger size, but using only 16 colors. The communication path must be perfect for this to happen, but this is very often the case with PSK31!

The technique is simply to encode pictures as text, transmit the text by PSK31, and then decode the text back into a picture at the other end. I will use the call, KH6TY, for the following example, which assumes the operating system is Windows 95 or 98. Just replace KH6TY with your own call.

## GETTING THE NECESSARY UTILITIES

- 1 Download and install the picture viewing and editing utility, IrfanView32.
- 2 Download the encoding utility, B1XHEX.EXE.
- 3 Download and install the decoding utility, Decode Shell Extension.

## Preparing a picture for sending

- 1 Extract (crop) and save a 60x80 pixel image (4800 pixels) from a larger .JPG picture file using Irfanview.

- Using BIXHEX.EXE, encode the picture, which will automatically create a file titled KH6TY.HQX.
- Save KH6TY.HQX in your PSK31 'send' folder. This needs to be done only once per picture.

### Transmitting the encoded picture file

- Instruct the receiving station to open a log file called 'KH6TY.TXT'.
- When the receiving station is ready, transmit DE KH6TY followed by a carriage return (this is very important), and send the file, KH6TY.HQX.
- At the end of the picture transmission, transmit END DE KH6TY.

### Receiving the picture

- When the receiving station sees END DE KH6TY, he closes the receive log.
- The receiving station then goes to the PSK31 log folder, right-clicks on KH6TY.TXT, and decodes KH6TY.TXT into KH6TY.JPG.
- To view the picture, he simply double-clicks on KH6TY.JPG.

### TIPS

- Put a shortcut to the PSK31 log folder on the Windows Start menu. This will give you easy access to all the picture files with all the functions of Windows Explorer. An easy way to do this is just to hold down the left mouse button, 'drag' the folder onto the Start button, and release the mouse button.
- If you send the same picture most of the time, prepare the picture by editing the picture file to add **DE KH6TY and a carriage return** to the beginning of the picture file. The carriage return will help to isolate the picture file from any garbage characters already accumulating in the log file of the receiving station before the picture is sent. It's also helpful to add **END DE KH6TY** to the end of the picture file, so sending your station identification is not forgotten and does not have to be typed every time.
- If you are sending a picture of yourself, use a close-up image for the best likeness of yourself in postage-stamp size. If you crop out a picture from a digitised photograph that is about 640x480 pixels in size and the width of that picture section is about 1/10 of the original picture width, you will be able to use it without resizing, and it will be as sharp as the original. Try to use as few colors as possible and keep the image file size under 1.3K.
- There is a neat \$15 shareware utility, Explorer Extensions that can encode a picture directly into a text file (.txt) and

will decode it back into a picture, with nothing more than a few clicks of the mouse button.

- If you want to experiment with sending pictures without having to create one, just right-click on any image on this page, save it to disk, encode the picture, and try sending it. All these images are under, or around, 1.3K in size and will transmit in about 8 minutes, leaving plenty of time for station identification before and after picture transmission.

**Ekki DF4OR**, in a very welcome gesture, is about to undertake the maintenance of WF1B RTTY software. He has been assured of financial support by a number of Amateurs and, though he is not aiming to make any money on maintaining and upgrading the program, he does want to be certain that he can cover the expenses involved in keeping the programming libraries current.

The RTTY software will continue to be free. Among other sites, RTTY can also be downloaded from:

[www.sk3bg.se/contest/download.htm](http://www.sk3bg.se/contest/download.htm) See

**Fig. 4**. Other related software is also available on the rtyinfo site, including the latest Cabrillo converter for use with the WF1B program.

### COURSE ON CD-ROM

An E-mail arrived from Mr. Wood, about an interesting RAE course website offering the course on CD-ROM. Basically it's a free and is downloadable from the site but it is quite big (20Mb). If you're interested take a look at [www.ukradioamateur.org](http://www.ukradioamateur.org) (Fig. 5).

Anyone struggling to download the file or who does not have web access can write to or phone Mr. Wood and he will be only too pleased to help where he can. His contact details are as follows: **Mr A.S. Wood M1BNK, 50 Chatham Road, Hartlepool TS24 8QG. Tel: (01429) 280052 or E-mail: [alec\\_wood@ntlworld.com](mailto:alec_wood@ntlworld.com)**

### WINTER BARTG

The winter issue of the BARTG magazine *Datacom* includes some interesting historical articles, mostly detailing old RTTY machines, dating back to the Second World War. Obviously to an old G3, this would be just what we were raised on! There are still a dedicated few who remain to this day using machinery instead of the electronic counterpart.

Articles are always welcome for the magazine, so if you have something you think might be of interest, why not send it to the editor? Have a look at the web-site: [www.bartg.demon.co.uk](http://www.bartg.demon.co.uk) That's all for this month so until next time 'Keep Keyboarding' See you next month.

*Roger G3LDR*



Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.

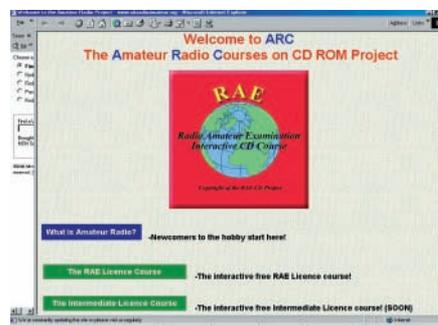


Fig. 5.

# DX DESTINATION

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**M**ore and more Radio Amateurs are travelling. I suppose this is partly a result of the 'greying' of our numbers - the average age of Radio Amateurs is around 50 and many of us have more disposable cash. We still feel fit and youthful and would like to expand our horizons.

What better than to travel the world with a radio? We are fortunate to be living in an era when air travel is still not too expensive, in fact, the further you fly, the cheaper it becomes, relatively speaking.

Most radio equipment is compact and can be carried as part of a baggage allowance with something to spare. The perennial problem is the antenna, on a DX holiday you are normally fairly restricted. But this is no barrier to success, as I have explained on previous occasions. So this time we're going to hear from a reader who decided to take the plunge.

## SOUTHERN HEMISPHERE

Let's journey south of the equator with **Roger Dixon G4BVY**. He told me about a visit he made to Mauritius - not just for radio, but as part of a winter holiday. So, before we learn about his exploits, here are a few basic facts about the country.

The map shown in **Fig. 1** shows where Mauritius is. It's to the east of Madagascar in the Indian Ocean, is quite small, about the size of Leicestershire, and is surrounded by coral reefs. It's an independent country within the Commonwealth, and because of its location, is a favourite holiday destination.

Now let's let Roger take up the story. "For some years I have been talking about taking radio equipment abroad to activate 'somewhere rare'. However, a combination of apathy and lack of planning has prevented this. Last year we booked our winter holiday further in advance than usual, which allowed me to plan a radio expedition around it".

The first task was to find out about obtaining a reciprocal licence for Mauritius. Roger continues, "The internet allowed me to find the point of contact in the Mauritius Telecommunications Authority, and download the licence application form. I got in contact with a fellow G station who had been there previously and with the Amateur Radio society in Mauritius. This was 10 weeks before we were due to depart, and I had already submitted my licence paperwork and received permission to operate from the hotel where I was staying".

My experience is that hotels are generally flexible about operating, of course you have to ask first, but then staff sometimes even help with putting up antennas. Getting a licence though can be more time-consuming, as Roger found out!

"To cut a long saga short, my licence was eventually approved less than 24 hours before I was due to depart. It transpired that elections in September had resulted in the first change of Government since independence and this had

equipment in hand baggage, and personnel at Heathrow seemed uninterested in what I was carrying! After arrival in Mauritius, I had to visit the capital, Port Louis, to collect my radio licence. At this point my wife was virtually offered a job, as the Telecommunications Authority needed a financial controller!"

Roger's hotel is shown in **Fig. 2**, you can see the antenna, a doublet fed with balanced line. This type of antenna is easy to carry, and effective.

## ED G3SQX REPORTS ON G4BVY'S VISIT TO MAURITIUS, ACCOMPANIED BY HIS AMATEUR RADIO EQUIPMENT.

slowed down the decision making process.

"As far as h.f. equipment was concerned, my IC-706 was ideal in size and weight, but I needed a compact power supply. I added an SEC-1223 switched mode p.s.u., which is smaller and lighter than the transceiver and exceptionally clean in terms of r.f. emissions. The first time I tried it the TV was on in the lounge and I

scared myself until I realised that the 15kHz 'buzzes' across the h.f. bands were actually coming from the TV"! (I concur with Roger on this - the p.s.u. is excellent, and well suited to DX holidays).

### AIRPORT SECURITY

At the time Roger made his trip, in early 2001, **security was not as tight as it is now.**

Roger takes up the tale: "I had all the radio

"I wanted to operate on a number of bands to take advantage of conditions, so some form of multi-band antenna was needed. The final choice was a 33ft centre-fed wire, with 300Ω ribbon feeder to an MFJ-971 antenna tuning unit. When we got to the hotel, we decided to use the hotel building and a handy palm tree as the supports. My patented method of a tennis ball, a piece of cotton and some rope provided entertainment for the other guests at the hotel!"

"After an initial moment of doubt, 3B8/G4BVY was on the air. Initial tuning around 14MHz produced only noise, and I was convinced that the radio had not survived the journey. Looking at a great circle map, you realise that the nearest countries are two hops away and Europe is at least three. This is rather different to having loud Italians and so on almost next door. More careful listening proved that there were signals there, they were however rather weaker than expected".

### FASCINATING EVENT

There is a definite advantage in being able to operate several modes. Roger says, "I was very much in demand though it proved very difficult to get a pile-up going on s.s.b. There were exceptions: I worked 50 JAs in 20 minutes and had to work split frequency and receive over a 10kHz range. Fortunately I had taken my Morse key and in the end over 80% of the contacts were on c.w".

Even though the main purpose of Roger's trip was a holiday, he managed to fit his operating in without too much difficulty. "My favourite times to operate were just after lunch and just before my evening meal, although I did try a couple of early morning stints. There was also a very late night session while watching the England v Spain match live on satellite TV! In total, I made 1000



● Fig. 1: Map showing the position of the island of Mauritius.



● Fig. 2: G4BVY's antenna at the Shandrani Hotel in Mauritius.

QSOs in 65 countries, with 158 on 14MHz, 79 on 18MHz, 248 on 21MHz, 407 on 24MHz, and 108 on 28MHz. When I returned home there were already 10 direct QSL cards awaiting attention!"

Roger concludes: "Having finally got around to taking Amateur Radio gear abroad I can

OH2WI	24904.0	3B8/G4BVY		1126	27 Feb 2001
JF2KOZ	18084.0	3B8/G4BVY	correction	1444	27 Feb 2001
RV9CX	18083.8	3B8/G4BVY	Russians ZOO...	1450	27 Feb 2001
DS5RNM	18083.9	3B8/G4BVY	fb	1452	27 Feb 2001
G4ASR	18084.0	3B8/G4BVY	Roger on his hols - wkld co-chn	1516	27 Feb 2001
SV1CEI	24906.0	3B8/G4BVY	simplex	1511	28 Feb 2001
JR2BJE	24906.0	3B8/G4BVY		1513	28 Feb 2001
HA9OA	14026.2	3B8/G4BVY		2011	28 Feb 2001
G0FYD	14026.3	3B8/G4BVY	579	2027	28 Feb 2001
K8JP	14026.0	3B8/G4BVY		2100	28 Feb 2001
WP4F	14026.0	3B8/G4BVY		2113	28 Feb 2001
JP2RDH	21191.8	3B8/G4BVY	simplex	1204	01 Mar 2001
W1MU	14035.6	3B8/G4BVY		0314	02 Mar 2001
J12YUO	24914.4	3B8/G4BVY	CQ	0950	02 Mar 2001
ON4ON	24915.0	3B8/G4BVY		0951	02 Mar 2001
JF1KKV	24914.3	3B8/G4BVY	qrz..	1011	02 Mar 2001
ON4CGS	24914.1	3B8/G4BVY	CQ CQ	1037	02 Mar 2001
JA3THL	21028.0	3B8/G4BVY	CQ	1400	02 Mar 2001
UR5FEO	21027.9	3B8/G4BVY	GOOD SIGNAL	1440	02 Mar 2001
SP8BRQ	28033.8	3B8/G4BVY		0648	03 Mar 2001
OK1WWJ	28034.0	3B8/G4BVY	CQ CQ No Takers	0706	03 Mar 2001
UA3AVR	28033.9	3B8/G4BVY		0712	03 Mar 2001
OK2PAY	21028.0	3B8/G4BVY		0745	03 Mar 2001
JJ1QJP	24905.0	3B8/G4BVY	CQ CQ No Takers	1031	03 Mar 2001
JA2TBS	24905.0	3B8/G4BVY		1041	03 Mar 2001

● Fig. 3: DX Cluster spots, circulated instantly world-wide, can produce an immediate pile-up!

seriously recommend it! It was probably the most fascinating event in 28 years of operating".

Anyone who has done something similar will agree. You get a really different outlook when you are the DX being chased, instead of the one doing the chasing!

## SUDDENLY A PILE-UP!

When operating from a semi-rare location, be prepared to deal with a pile-up. You don't have to go to Mauritius to experience this - it could happen while you were in the Isle of Man! It's even more likely if you venture on to the WARC bands, **which are still considered** a little new and unusual.

Be prepared, if you are not ready, a pile-up will come as a bit of a shock. Suddenly there are 50 stations where there was one. The DX cluster is now world-wide, as you can see from the spots that 3B8/G4BVY attracted during his visit (Fig. 3).

As soon as you are spotted, everyone appears at once! If you really just want to chat, and don't feel like dealing with it, simply say that you're closing down. Pile-ups are an acquired taste, and some Amateurs are very uneasy with the idea.

On the other hand, working the pile-ups is probably why you are there in the first place, but what do you do? The first thing to say is that the folks who are calling you don't want to know your name or QTH. They want a report - 59(9) is fine and they want your QSL card. Your job is to make contest-style QSOs as fast as you can.

Listen to a good DXpedition operator to see what is expected.

If you are indeed in the middle of a contest, you would normally work on a single frequency, and do the best you can. Otherwise, you quickly have to decide whether to work 'split, that is, to listen on a range of frequencies other than your

transmitting frequency. Why do this? Because there will inevitably be strong stations still transmitting (and obliterating you) while you are returning to someone else. And if you listen over a range of frequencies instead of just one, you are more likely to be able to pick out a station to work.

In my experience, when more than about ten stations are calling, you should immediately ask stations to call off your frequency. If the pile-up dies down, go back to single-frequency operation again.

By the way, if you think you will be working more than a few hundred stations, it's **very** much easier deal with logging and c.w. sending if you can take along a laptop computer with suitable software. Fig. 4 gives a list of free programs you may like to try.

## MASTER OF THE ART

Operator **G3SXW** is a master of the art of pile-ups, having operated from dozens of locations around the world. He thinks that the chaos sometimes heard can be alleviated if the DX station **manages** the pile-up well. Here are some suggestions which he offers to anyone in that situation:

**Pick out a call:** Pick a signal and reply to it even if it's only a part call. Then persist until a two-way contact is completed with that station. If it's just a wall of noise listen at the edge of the pile-up.

**Be brief:** Only transmit your callsign, RS(T) then

confirm ('TU on c.w.) for each contact. If you got the callsign wrong first time, repeat it before passing on. Give your own call every 3-5 contacts at most.

**Be regular:** Transmit consistently so the pile-up quickly recognises your flow and rhythm. Transmit every few seconds, even if only 'QRZ?' - don't leave long gaps.

**Announcements:** Transmit a clear message every few minutes. Include your QSL route, DXCC country (if not self-evident), and any QSYs or mode changes planned.

**Be in charge:** You call the shots: give clear and brief instructions and stick to them.

**Frequency usage:** Aim to minimise band occupancy while maximising QSO rate. On c.w. ask for 'up2', on s.s.b. use a maximum of 20kHz. The pile-up will spread of its own volition. Shift your receive frequency in a regular fashion so the pile-up follows you.

**Speed:** Operate as fast as you can accurately manage - maximum 35w.p.m. on c.w.

**Close down:** Clearly announce close down - power-cuts or military invasion are the only excuses for leaving the pile-up hanging!

## DIPOLE OR DOUBLET?

In connection with my articles on antennas, **John G3URE**, asked me the difference between a dipole and a doublet. In reply, my reading of the distinction **is in the matter of feeding.**

A dipole is designed to be resonant, so will usually be a half-wave fed with coaxial cable, with impedance matched to the antenna. The term doublet describes a centre-fed antenna, similar in appearance to a dipole. However, the antenna uses feeder which is not matched to the antenna. Since the antenna is designed for multi-band use, the impedance on each band will vary. The feeder must be symmetrical and low-loss, even under conditions of high s.w.r. (the case on most bands), and so open-wire or ladder-line is appropriate. The symmetry is preserved all the way to the shack, where an a.t.u. which will accept balanced feeder must be used.

Many thanks to G4BVY and G3SXW for their contributions. Next time I'll be giving some tips on operating closer to home, in 'Backpacker' and similar v.h.f. events. The deadline for the July column is the middle of April.

*73, Ed G3SQX*

● Fig. 4: Web resources for DX Destination readers.

WEBSITE ADDRESS	DETAIL OF SITE
<a href="http://www.mauritius.net">www.mauritius.net</a>	Information about the island of Mauritius, with other useful links
<a href="http://www.qsl.net/oh2mnc/license.htm">www.qsl.net/oh2mnc/license.htm</a>	Licence requirements world-wide and tips on DX operating
<a href="http://www.dxholiday.com">www.dxholiday.com</a>	QTHs that can be used for a DX Holiday and other good articles
<a href="http://www.ei5di.com">www.ei5di.com</a>	Download logging software, including a free DXpedition program (SDX)
<a href="http://oh2aq.kolumbus.com/dxs">oh2aq.kolumbus.com/dxs</a>	DX cluster on the web - DX spots from around the world

# IN VISION

GRAHAM HANKINS G8EMX

17 COTTESBROOK ROAD  
ACOCKS GREEN  
BIRMINGHAM  
B27 6LE

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

**B**uilding a piece of electronic hardware from a 'kit of bits' can be fun, instructive and rewarding. It can also turn out to be challenging if it doesn't work properly, or has missing parts, or poor instructions!

I have built four kits of bits that become working pieces of Amateur Television hardware these were two 24cm (1.3GHz) ATV transmitters and two 24cm receivers. But all this was a few years ago so, as an ATV project over the coming months of In Vision, I am going to construct a new ATV station in this column, and try it on air.

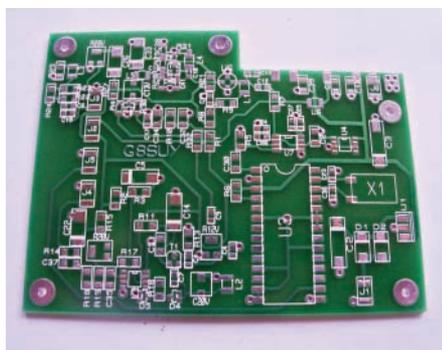
The transmitters I built were both from Solent 1W kits distributed by the *Worthing Video Repeater Group* and advertised in the British Amateur TV Club's magazine CQ-TV. The Solent transmitter used 'conventional' components i.e. wire-ended resistors etc, and discrete transistors with a final frequency oscillator, thus avoiding multiplier stages and harmonics. Provided component lead lengths were cut very short, the oscillator ran at 1.3GHz, driving two amplifiers and a power amplifier.

The Solent kit is still available, with some modifications and improved components, although the Worthing Group currently states: "The transmitter, now on its fourth version, is now on its final run. Only a small number of kits remain so get in quick if you would like to be the owner of one of the most reliable and robust ATV units". For contact details on the Worthing Group look at <http://www.videorepeater.co.uk>

## NEW KIT ON THE BLOCK

There is a 'new kit on the block'. The G8SUY 24cm ATV transmitter uses surface-mounted components on a single-sided p.c.b. and provides two output frequencies - 1259MHz for repeater input, 1265MHz for simplex ATV contacts.

As with most new designs, a brick p.a. provides approximately 2W r.f. output. Surface mount transistors and integrated circuits perform the conventional tasks, with a large, single-chip phase locked loop, referenced to a crystal for frequency stability. A CCIR video



● Printed circuit board for G8SUY 1270MHz transmitter showing the pads for the surface mounted components. The brick p.a. will be mounted in the top right hand corner of the p.c.b.

pre-emphasis and sound sub-carrier are included. .

A few days after I had posted my payment to **Andy Parnell G8SUY** designer and distributor of the kit, a padded bag containing the p.c.b., all components, six sheets of A4 circuit description and recommended construction, arrived at my door.

Before you begin constructing any kit, **it's essential to appreciate that SMDs are small, very small.** Normal handling is impractical, so

## GRAHAM G8EMX ENCOURAGES YOU TO TRY BUILDING ATV TRANSMITTERS FROM KITS AND REMINDS US OF THE BATC RALLY DATE.

tweezers and an illuminated magnifier are almost obligatory, as is a fine-point soldering iron and 32swg solder.

Most kits recommend mounting resistors first - they are the most easily identified and least temperature sensitive, but check the component layout on the p.c.b. - some component numbers may be best fitted before others. Andy's kit includes some constructional tips to maximise output power and chroma gain, and adds: "If you have any problems please don't hesitate to contact me, I do offer a 'get you going' service, if the p.c.b. is undamaged".

I have watched SMDs fitted manually, but professionally, at a major communications company. A hint is to put solder on the copper land first, then use the tweezers to slide one end of the SMD onto the molten solder and remove the heat. This holds the component in position while the other end is soldered, finally, re-solder the first joint. I'll tell you how I manage all the transmitter's resistors next time!

## TOPICS COVERED

The British Amateur TV Club's latest magazine, CQ-TV 197, dated February 2002, is packed with TV and ATV topics. Among them are BATC President **Mike Cox** giving his personal view of Digital Terrestrial TV, **Paul Holland G3TZO** with the latest satellite TV scene, and **Ian Waters G3KKD** revisiting 70cm (435MHz) ATV using a narrow-band ATV system.

Perhaps you can help BATC Treasurer **Brian Summers G8GQS**? He wants a Pye Mark.6 Image Orthicon BBC outside broadcast camera, 1963 vintage. Don't we all! Brian is restoring an ex-broadcast mobile control room - yes he is - and is anxious to add one of these

Pye cameras to it. If you can help, E-mail: [BrianSummers@thersgb.net](mailto:BrianSummers@thersgb.net)

**Richard Parkes G7MFO** is the BATC's ATV Contest organiser and would like to remind everyone that the Joint European Summer Fun ATV Contest takes place on the weekend of 8&9th June. Fast Scan ATV on all bands, from 1800GMT Saturday to 1200GMT on the Sunday.

The Foot and Mouth epidemic obviously reduced entries last year, so Richard is more

optimistic for 2002: "I am hoping you all have been busy putting together your station for this year's contest! Please send in your results, even if you only work one station one way...you might come first!".

After much exchanging of E-mails and 'last second' decisions on dates to meet printers deadlines for CQ-TV, the BATC will be holding its ATV Rally and General Meeting (GM) at Shuttleworth, near Bedford, on Sunday 16 June, with a dinner, social gathering and overnight accommodation available on the Saturday evening.

Three factors had to be co-ordinated before the BATC Rally and GM could be settled, these being choice and availability of venue, and enough key members of the BATC's committee able to attend. Several of them work in broadcasting, so trying to find a date when all are available is always a problem, particularly on a weekend in high Summer.

The BATC has used the Shuttleworth College in Bedford in the past but moved to Bletchley Park when a club member associated with Bletchley offered to organise the rally there. Then the feature film Enigma hit cinemas all over the country, and suddenly everyone had heard of codebreaking and flocked to visit the Cryptography Museum, which started to open every weekend. **So the BATC Rally had to move!**

A school in Milton Keynes was considered, but a committee decision favoured returning to Shuttleworth, where there was on-site overnight accommodation and an excellent lecture theatre, so the decision was made. If I don't see you at the BATC Rally, P5 until next time!

*Graham G8EMX*

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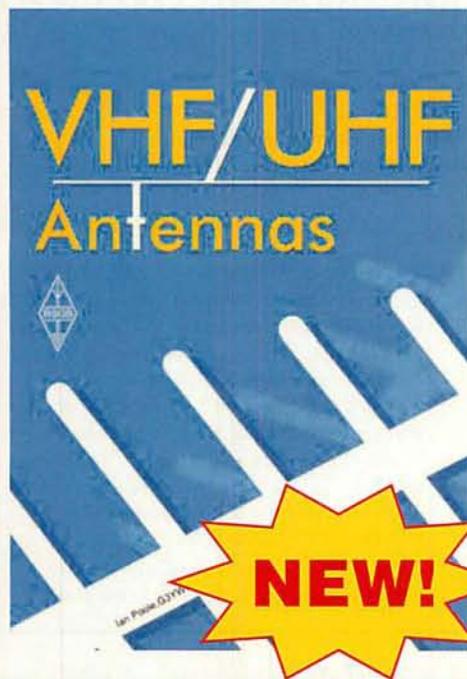
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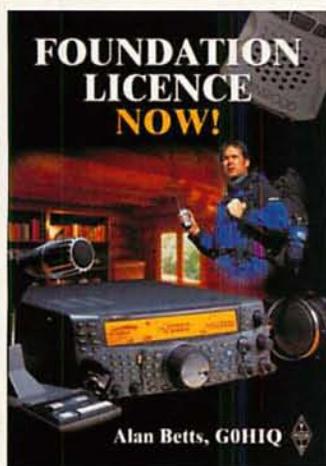
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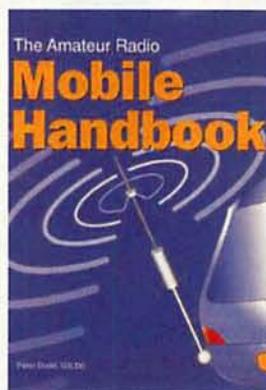
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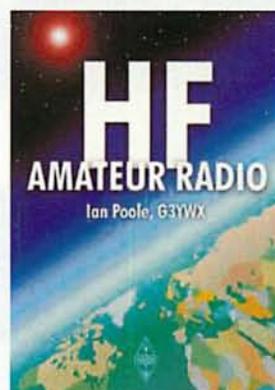
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**W**armest greetings to you all, and a rather belated Happy New Year! Speaking of belated, I have, of course, done it again and submitted my column dangerously late. (So late we're having to publish it this month instead of last!. Ed) Poor **Donna G7TZB** in the PW editorial office now **knows** to expect anything and everything from Down Under to be on the absolute ragged edge! Sorry, next time she'll get the column bang on time which will shock everyone silly. (Do I detect mad laughter from Poole?)

Speaking of 'late' brings me neatly to my first topic of the month - What Not To Do in Life. I beg your pardon? As they say in the classics, 'all will be revealed'!

You see, I've just returned to the office after four weeks away, and I must say the break was long overdue. But, in fact, I hadn't even planned a holiday at all! No, I was lucky, it wasn't a trip to hospital; absolutely on the spur of the moment I gathered up the three young children, threw some clothes into suitcases,

a week. It's the way of so many jobs these days. One works like blazes until one of a few things happens: you retire, die on the job, have a breakdown, or something like that. In my case, it was my wife who had had enough and unfortunately decided to leave me and our three young kids.

Not surprisingly, I had but moments to closely examine where things had gone wrong and work out what to do. And so the holiday was a very, very good start! We spent Christmas with the family down South and I

the drive, I called a mate in Sydney on 10MHz and chatted for a while, but that was the sum total of radio for the outward journey. The radio then percolated away on the VKS-737 'outback chat channels' all night as the kilometres vanished under the wheels.

My children, aged six, ten and 14, recognise culinary masterpieces when we see them, so we stopped at McDonald's in Beaudesert... and Warwick... and Moree... and Coonabarabran... and Dubbo... and Parkes... In fact, I think we stopped at every

---

## CHRIS EDMONDSON VK4AA/VK3CE, A LITTLE LATER THAN USUAL, SENDS A ROUND-UP OF RADIO NEWS FROM AUSTRALIA.

---

got to have a bit of on-air fun while driving around with the kids. In all, in our couple of weeks away, we covered 5500km, which left

single McDonald's between here and Melbourne, and as that's just over 1800km (a bit over 1100 miles I think) you might imagine there's a fair few of them!

Just as well, actually. We stopped for them but little else, arriving in Melbourne at 1pm the next afternoon, where a couple of hundred litres of petrol gurgled into the tanks. (The 4WD holds 240 litres of fuel. I make that a bit over 50 gallons if I'm working it out right). You can go a fair way on it. And yes, Australia's been metric since about 1970!

I simply drove all night, passed by the famous radio telescope at Parkes NSW, bang on dawn, then meandered through the rest of the state in some stupid race to escape the domestic troubles and see the rest of the family.

### DAY OR NIGHT ON 10MHz

It wasn't really until we set off to come back again that I discovered what a fabulous short-haul band 10MHz is! Day or night, I could raise my old friend **Chris VK5CC/2** on that band, who spent hours making sure I stayed alert and wide awake for that daunting drive. The report from 1000km away was rarely less than 5x9, and often **far** more.

Chris was using a vertical antenna to produce his outstanding signals, while my car sported the huge Outbacker antenna I'm usually heard raving about. In the past I've worked VE7 and W1 on 1.8MHz from the mobile, and got a handy 5x9 + 40 the other night on 7MHz from Canada. This is a serious antenna!

Logic would obviously dictate that 10MHz would behave like a cross between 7 and



● On his drive from his home in Queensland to visit family in Melbourne Chris passed by the famous radio telescope at Parkes New South Wales.

and drove to Melbourne, returning by way of Sydney.

So what's wrong with that? Simple. For the last 15 years I have worked around 100 hours

us more than enough time to play as much radio as we desired!

The first day, however, saw virtually no radio at all after sunset. We pulled out of the driveway at home at 5pm, set the GPS to monitor the trip and point us in the right direction, and headed off with no particular plans on stopping anywhere. Only 200km into

14MHz, and mercy me, it does. I don't remember whether you folk get voice on 10MHz, but if you do, this is one band which really demands a second look. You'd absolutely plaster all of Europe on 30MHz and get the odd rewarding DX to make it extra worth while.

You know, they say "Use it or Lose it" when looking at our bands, but when was the last time **you** accepted the challenge of activating a band you might not have tried before? There's only a handful of Amateurs in this country compared to yours, but you could just about be guaranteed of an answer to a CQ on 10,120kHz day or night out here!

God help us all if they ever let the JAs loose on the 18MHz band! They're wall-to-wall on 21MHz just about all day over here and the 18MHz seems quite a bit more lively than the 21MHz band.

Head up another WARC to 24MHz and what do you find? Out here, not too much to be honest. We have full power voice privileges there, too, but I have worked only a handful of stations on that band in the past few years. But there's little question that more stations are being heard on the WARC bands, and that spells good news as far as I can see.

## OUTBACKERS LARGE & SMALL!

I've raved about Terlin Outbacker antennas for a long time. The courier delivered the latest Terlin masterpiece the other day, and after I'd stopped laughing and cooing "Isn't it cute!" I put it on air, where the laughter was replaced by a very surprised look.

You see, I'd written about the sweet little Yaesu FT-817 all-band all-mode portable a while back, but really stretching its legs on the air was somewhat limited by available antennas. They were too good! Even on the monster antenna on the car I was getting pretty fair reports out of the USA on 14MHz... with only 2.5W!

Okay, I guess you can set up portable somewhere and run out huge wire antennas, but will you **really** want to do that after lugging all the gear for miles as you trudge through the bush, set up camp and all that?

I guess there's a couple of options for radios like the FT-817. You could get a small tuning unit and run it into a fence wire or you could look for a suitable, compact all-band antenna. In Australia you'll find lots of wire fences which stretch literally for miles, but you may not be quite so lucky in the UK.

Perhaps the owner of Outbacker antennas has a wicked sense of humour or something,

but the maker of the biggest mobile antenna I've ever seen now makes the **smallest** h.f. antenna I've ever seen. Known as the 'Joey', the antenna is about 1m (3ft) long and covers all bands from 3.5-144MHz. It's actually rated at 20W p.e.p., so I guess you could run a variety of radios with it.

The trick is, though, that the Joey is designed for operation sitting on the ground! So, to check it out, you lie there on the ground with the rig in front of you and discover to your surprise that it goes like a ripper!

I attached a (3.6m) 12ft wire to the earth



● Choppers like this one played a big part in trying to douse the flames of the recent Sydney bush fires. They are able to pick up up to 9000 litres (9 tons) of water in 45 seconds and then dump it onto the fires below!

point on the FT-817 (the counterpoise) then set it up in the middle of the front lawn at home, first checking carefully that no nasty snakes were headed my way. Believe me, here in the rainforest it pays to check!

The antenna connects to the SO239 connector on the rear of the radio. This makes great sense as attaching something this large to a panel-mounted BNC connector is just begging for trouble!

I heard several F and G stations on 14MHz and actually got half a report out of one of them. No matter how hard the poor chap tried, he couldn't quite read my callsign, although he knew I was using an FT-817 in Australia. If you're reading this, Nigel, write to me!

Putting the Joey on the air was a revelation. This little contraption looks like a scaled-down 'big' antenna and wouldn't be an impossibility to cart up the mountain for a portable event.

A number of readers have asked me to provide more information about these great Aussie antennas. Perhaps the easiest way is to look at the Internet-based site for Terlin. It's at <http://www.outbacker.com.au>

By the way, I was planning to send in a photo of the antenna attached to the FT-817 but have to admit that a couple of days ago I managed to blow the final f.e.t. in the poor thing. I hear whispers this is happening a fair bit in early examples of these radios due to the huge amount of spectrum the radio must cover.

Yaesu identified the problem and has since introduced a fix for it on the production line.

Models filtering out to dealers are now free of the problem, but mine has 'gone' twice now.

What I heard via a reader and a user list was that there's a dealer update detailing ana.l.c. mod which can be applied to earlier radios. It seems the radio uses a wide range of a.l.c. control on the p.a. to get the same gain from 1.8 - 430MHz, but it isn't exactly foolproof.

The a.l.c. mod requires a few changes to sampling and a.l.c. voltage swing but details are sketchy as Yaesu already has more than 15,000 of these radios 'out there'. I guess time will tell.

## FINALLY

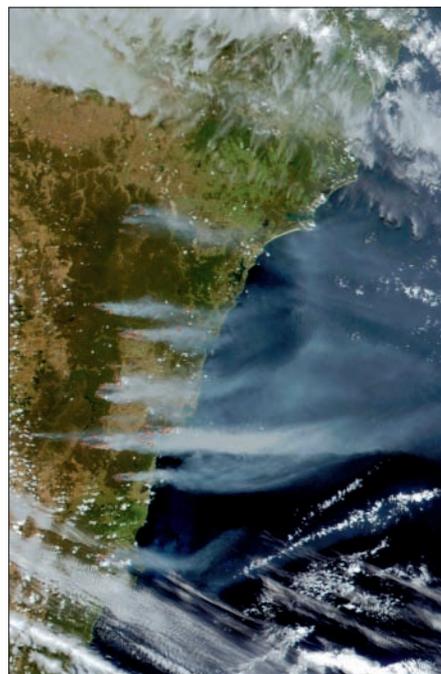
Finally, shown below is a satellite photo taken during the dreadful bush fires around Sydney. I drove home right through the middle of this mess with the three children aboard. It really makes you realise how very vulnerable we all are, but seriously, I have to wonder at the sheer stupidity of some people building homes where they do.

My house could never be destroyed

in a bush fire, I live close to a rain forest. Perhaps people need to think a lot more than they do.

Cheers until next time and as always I invite you to write to say G'Day!

*Vy 73 Chris VK4AA/VK3CE*



● Satellite photo showing the smoke trails over Sydney.



# TUNE-IN

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The radio repercussions of the war in Afghanistan rumble on. **Radio Free Europe/Radio Liberty** (RFE/RL) has revived **Radio Free Afghanistan**, in the main languages of the country - Dari and Pashto.

Radio Free Afghanistan stopped broadcasting in 1993, after the USA reckoned that Afghanistan was free. But they reckoned without the Taliban, who plunged Afghanistan back into turmoil. But now that the Taliban are vanquished, the thinking at US-funded RFE/RL seems to be the reverse of before - the country is free, so let's start broadcasting again.

New short wave transmitters for the service will be built in Kuwait in due course, at the site of

new cutbacks (the third in recent years) would lead to poorer programmes.

The committee's fears were increased when the man who took a firm line against the Action Committee, **Jean Larin**, was named recently as the new top boss at RCI. The Action Committee has vowed to continue its defensive stand. You can find their latest views at [www.geocities.com/rciaction](http://www.geocities.com/rciaction)

Jean Larin has not yet shown his hand as regards new programmes, but meanwhile, the plot thickens, as the former boss, **Bob O'Reilly**, has weighed in with his ideas for the future. He suggested that RCI be separated from its parent entity, the Canadian Broadcasting Corporation, to become an independent agency under Canada's

Service director **Mark Byford** wrote a letter to the *Zimbabwe Herald* newspaper, declaring that the World Service was not anti-Zimbabwe, not motivated by political ends, and not connected to an organisation that was transmitting controversial news and views to Zimbabwe.

## NEW STATION

A new station called **Shortwave Radio Africa**, employing ex-Zimbabwe journalists, is broadcasting to Zimbabwe from London, with a transmitter probably in South Africa. The SW Radio Africa website can be found at [www.swradioafrica.com](http://www.swradioafrica.com) but you may have difficulty getting to it.

There is also a new transmission from the new-look **Deutsche Welle** in the Romani language (one of the languages spoken by the 'travelling people'). The transmission is timed **1830-1900**. The new Director of DW, **Erik Bettermann** said "This gives these people the opportunity to learn in their own language about current events and subjects which are relevant for them."

If you've been trying to hear **Radio Yuogslavia** on short wave and failed, it could be because of - surprise, surprise, lack of money. The station simply owed too much to the Bjeljina electric company in Bosnia, where the station's shortwave transmitters are located. So you'll have to make do with text and audio on the website at



## TOM WALTERS HAS PLENTY FOR YOU TO LISTEN OUT FOR THIS MONTH ON THE BROADCAST BANDS.

VOA's present medium wave relay. Meanwhile, transmission is from other sites, and the schedule is: 1300-1400 on 11.920, 15.525, 17.725; 1700-1800 on 6.170, 9.785, 11.920 and at 0300-0400 on 7.230, 15.345 and 17.725MHz.

It's a case of one step forward and another back in the rather hectic political world in which **RFE/RL** operates. The Russian government says that it may revoke the station's licence to broadcast via transmitters in Russia if their proposed broadcasts to the North Caucasus region in Chechen, Avar and Circassian are deemed to be 'biased and prejudiced'. There is a lot at stake here, as RFE/RL's Russian Service is heard throughout Russia on an extensive network of f.m. and medium wave transmitters.

For UK readers the moves being made by RFE/RL are far away in obscure lands. Not so the latest coup from **World Radio Network**. They've arranged for **China Radio International** (CRI) to be heard seven days a week on what once was called 'Radio Luxembourg', the very high power 1440kHz (208m) m.w. transmitter. The programmes will be specially produced in Beijing for a European audience, and will be in French, English and German. The potential audience is some 500 million Europeans who have home or car radios.

## CANADIAN TROUBLES

There are more schemes afoot at troubled **Radio Canada International** (RCI). Following an abrupt change of management and programmes last summer, some disgruntled and suspicious RCI employees formed the **RCI Action Committee**. They were fearful not only for their jobs, but also for the reputation of RCI as a world-class purveyor of news and information. They thought that the

Ministry of Foreign Affairs. (Not very likely!)

Probably the fuss will all die down and RCI will run a more slimline, but still effective programme and technical schedule. International broadcasters can't afford to stand still.

Meanwhile, it could be that **Kol Israel** will economise by cutting all transmissions in languages other than Hebrew and Arabic. Catch the station in English while you can at 0500-0515 on 6.280, 9.435, 11.605, 17.545; 1130-1135 on 15.640, 17.545; 1700-1730 on 11.605, 15.650 and at 2000-2005 on 6.280, 9.435, 11.605, 15.640, 15.650MHz.

While we're on the bad news, **Iceland** may soon stop all its shortwave broadcasts. After some time off air, transmissions in Icelandic, primarily for the country's fishermen, were restored. But for reasons of, you've guessed it - money, they may go again. Meanwhile listen at, 1215-1300 on 13.865; 1755-1825 on 12.120 (Europe). 1410-1440 and 1835-1905 on 13.865; 2300-2335 on 12.120MHz. (Thanks to Media Network for this information).

At the time of writing, a considerable punch-up was developing over broadcasts to Zimbabwe, re reporting about the March presidential elections. In the firing line of criticism from Zimbabwe was the **BBC World Service**. World



[www.radioyu.org](http://www.radioyu.org) while they get themselves sorted out.

All this in a month when space-based radios XM and Sirius seem to be flying happily, and **Trans World Radio** and **IRIB** (Islamic Republic of Iran Broadcasting) announce

the construction of huge 1mW short wave transmitters. Confusing? It sure is, for professionals as well as listeners!

That's all for this month, so until next time, good listening and don't forget to let me know of any interesting stations you come across as you scan the broadcast bands.

*Eye for now. Tom*

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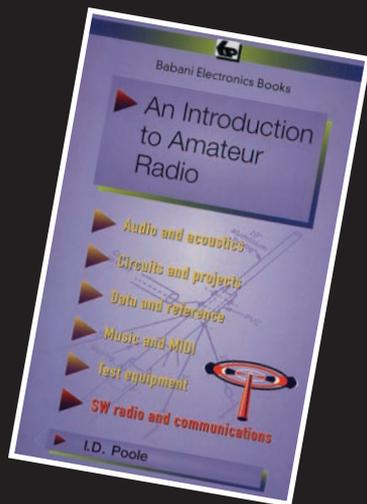
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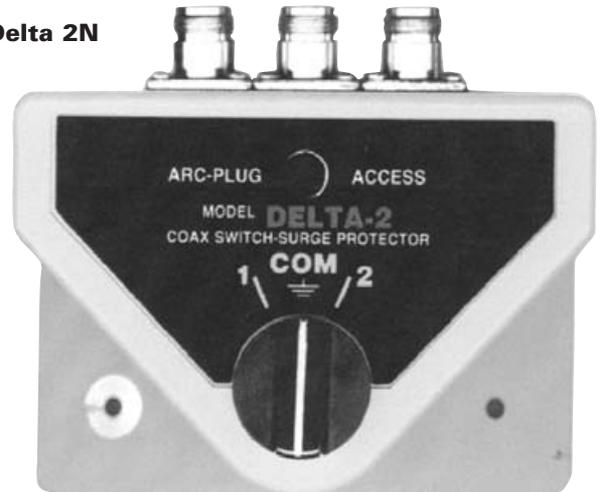
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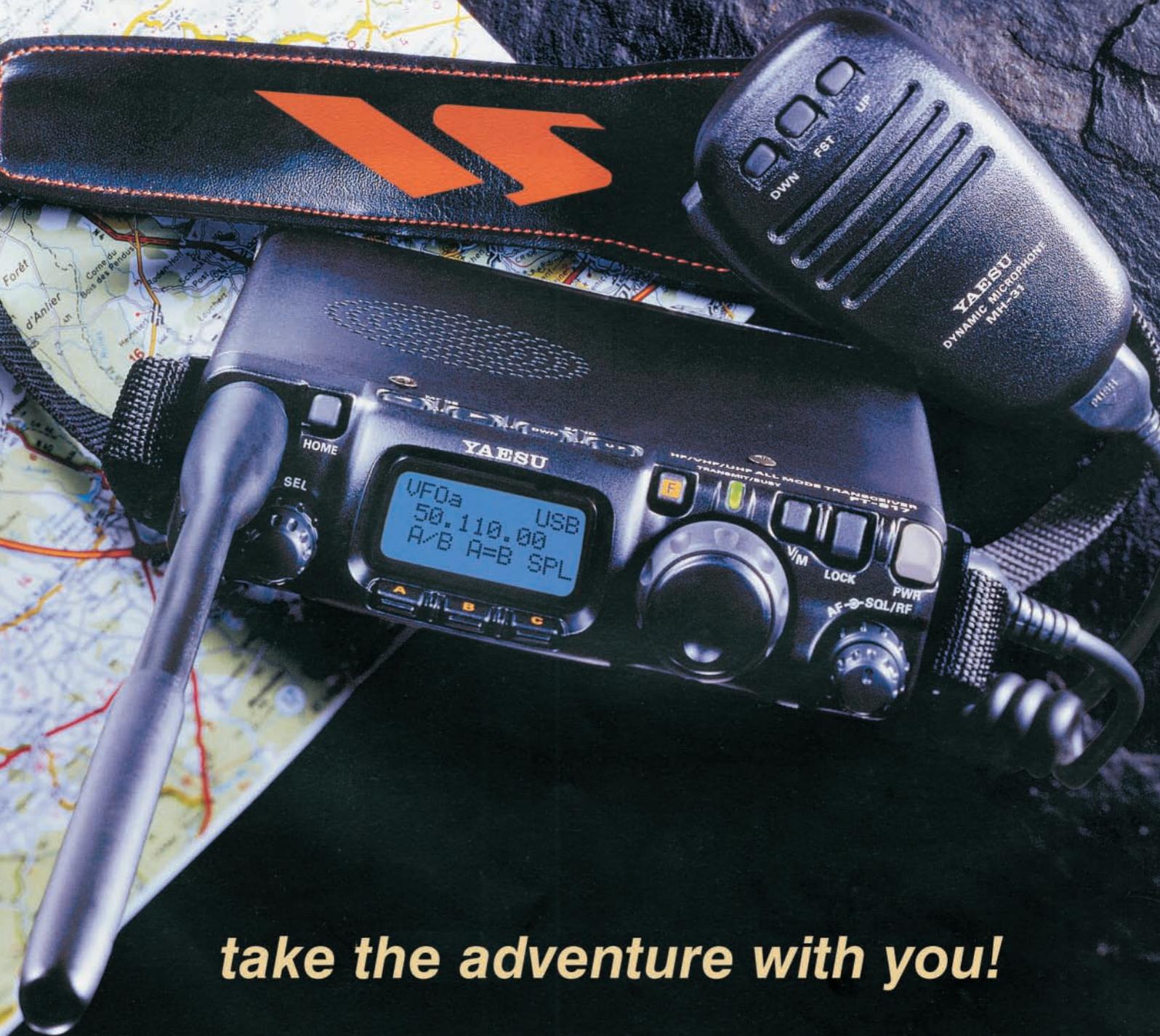


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