

**PRACTICAL**

# Wireless

THE UK'S BEST SELLING AMATEUR RADIO MAGAZINE

December 1997 £2.20



- KEYLINES**
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**G3XFD & G1TEX REVIEW**

# THE AKD MODEL HF3E

**ON TARGET THE SECOND TIME"**

## FEATURES

QRP CONTEST RESULTS  
AMATEUR RADIO IN GERMANY

## REVIEWS

THE PALSTAR KH-6 50MHz TRANSCEIVER  
THE AKD HF3E TARGET RECEIVER

0.000MHz  
START

30.000MHz  
END

3 MHz/DIV

30.000MHz  
END



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## 1998 Catalogue



- Largest in Europe
- 176 Colour Pages
- 1000 Photographs
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- Technical Specifications
- News Snippets

Now established as the foremost equipment guide this edition is completely new with every page in full colour and almost every item illustrated. For the cost of a magazine you can get the best guide ever.

£2.95 plus £1 postage

### NEW SG-2020 QRP Rig



1.8 - 30MHz £499

Production of Index Laboratory's QRP transceiver has now been taken over by SGC who have completely redesigned it and managed to reduce the price as well! Deliveries should have begun by the time you read this. This transceiver promises to become the QRPers dream machine at a price that is affordable. The basic specification is: USB, LSB and CW 0 - 20 Watts; vastly improved receiver front end; Low battery drain; Improved circuit board layout; Receiver bandpass tuning; Built-in keyer; Full QSK; Size 63 x 152 x 178mm.

### VHF & UHF Band Pass Filters

2m & 70cm Digital Communications



NO MORE PAGER PROBLEMS  
We guarantee this will kill all ORM caused by strong out of band signals - - - or your money back!

DCI-145	£89.95	DCI-435	£119.95
Passband:	144 - 146MHz	Passband:	430 - 440MHz
Loss:	Less than 1 dB	Loss:	Less than 1 dB
Selectivity:	-68dB at 136MHz	Selectivity:	-47dB at 415MHz
	-55dB at 155MHz		-50dB at 455MHz
Power:	200 Watts	Power:	200 Watts

### DC Mobile Lead

£6.95

Standard 12v DC lead for all modern mobiles. 1.9m long fitted 2 x 15A fuses and using standard "T" connector.



### TOP 2m/70cm Mobile Yaesu FT-8100R



£449 Price Match

or £467 inc 3yr Wtty.

Yaesu's new dual band mobile makes the competition look old and out-dated. You get a detachable head, 300 memories, true dual same band rx, CTCSS encode and the best display in the business. This is proving to be one of the best sellers ever - particularly at Our Price!

### TOP 2m/70cm Handy

ADI AT-600

W&S £279

or £314 inc 3yr Wtty.



Reviewed PW August

PW says: "an incredibly well priced radio - amazingly sensitive - audio - worked very well with 12.5kHz channel spacing - An Absolute Cracker"

- CTCSS encode/decode
- Full DTMF + 1750Hz tone
- Alphanumeric memories
- Full duplex
- CTCSS tone reader
- 29 programmable features
- AM airband receiver
- Rx up to 990MHz
- Nicads and charger

ADI 2 Years Warranty

W&S £249



- 3 Power levels - Wideband receive
- 40 Memories plus call channel
- 7 Programmable steps
- Channel or frequency display
- The best sensitivity in the business
- Keypad mic and mounting kit
- CTCSS Encode and Decode!

AR-446 70cm 35W

FULL CTCSS



W&S £269

3W Novice version available

ADI AT-201 2m FM Handy

NEW W&S £149



- 40 Channels
- CTCSS Encode
- CTCSS Decode
- DTMF
- Channel Reasout or
- Frequency Readout
- Set to Set Cloning

JUST ARRIVED  
Look at the Features  
Compare the Price

ADI AT-400 70cm FM Handy

Value W&S £169



- 70cm FM Handy
- 2W output
- 5W on 13.8v
- 1750Hz tone
- Illuminated keypad
- Ultra sensitive
- Wideband Rx
- 20 memories
- Keypad entry
- DTMF
- Uses AA cells

The Novice Rig

Now the standard radio for Novice hams. It's sensitive, cost effective and was featured on Anglia TV

UK's Top Dealer for YAESU, KENWOOD & ICOM

W&S

NEW Ham Radio Electronic Magazine <http://www.monitor.co.uk>



Provides the latest news of our products, prices and topical features. Log on now and read about ham radio plus much more!

TOP HF Base Station

NEW Yaesu FT-920

Plus £100  
Accessory  
Voucher

£1499  
Deal  
Match

5 Year Warranty £115

Yaesu FT-1000MPDC

Plus £100  
Accessory  
Voucher

£1999  
Deal  
Match

5 Year Warranty on FT-1000MPs £115

FT-1000MP £2849 £2199  
FT-1000MPDC £2599 £1999

ICOM IC-756 HF Rig

Plus £50  
Accessory  
Voucher

£1895  
Deal  
Match

- \* 100W of pure Magic
- \* 160 - 6M
- \* SSB - CW - AM - FM
- \* Spectrum display
- \* Auto ATU
- \* Superb DSP built-in
- \* CW Memory keyer
- \* 100% duty cycle
- \* Keypad entry option
- \* DXers choice in the USA

KENWOOD HF RIGS

NEW TS-570

W&S  
£1199

Plus £50  
Accessory  
Voucher

Kenwoods new transceiver that is earning a reputation for offering one of the best receivers in the business. If you are looking for a hot little number that is not too expensive (Radio we mean!), send for brochure.

Yaesu FT-840 HF Rig

Plus £50  
Accessory  
Voucher

£749  
Deal  
Match

NEW Garmin GPS-III

With complete moving map of the UK & Europe

£349.95

The new GPS-III is loaded with a moving map covering millions of miles of motorways, ordinary roads, railways, rivers and shorelines. 12 channel receiver means fast positioning from switch-on, and the display width can be zoomed to cover from 500ft to 5,000 miles. Accurate to approx 45ft the display can be electronically rotated to suit car or hiker use. Just sit the GPS-III on the dashboard and watch your progress as you travel. Powered by 4 x AA cells - truly amazing! Get the best possible deal on this from Waters & Stanton. We have the latest UK version - phone today.

NEW IC-746

We will beat any advertised deal!



160m - 6m 100W  
2m 50W  
Auto ATU  
Spectrum Display  
DSP Noise Unit  
Electronic Keyer

TOP VHF Base Station

ICOM IC-821H 2m/70cm

Plus £50  
Accessory  
Voucher

£1395  
Deal  
Match

- \* 2m/70cm All Mode
- \* 45/40W adjustable
- \* Full duplex
- \* Satellite features
- \* 160 Memories
- \* 9600bps capability
- \* Electronic keyer
- \* IF shift, noise blanker

Yaesu FT-736R 2m/70cm



Special  
£1429  
Or Better!  
PHONE

Offers even better value.

The classic 2m/70cm base station that just goes on and on - plus the options of additional band modules.

ICOM IC-207H 2m/70cm Mobile

Price Down

£329  
Deal  
Match

- \* 2m & 70cm
- \* 50W / 30W
- \* Detachable head
- \* Packet 9600 bps ready
- \* 180 Memory channels
- \* CTCSS & 1750Hz tone

New Batteries



- \* Rechargeable Alkaline
- \* 1.5V cells
- \* No memory effects
- \* Charging mid cycle is OK
- \* 5 year charge shelf life
- \* 3 times capacity of ni-cads
- \* Very low cost

This is a brand new technology which has major advantages over ni-cads. Now you get a 1.5v cell that will hold its charge for up to 5 years and has 3 times the current capacity of normal ni-cads. We are offering these at a very special price direct from Canada. In stock now!

Starter Kit: Comprise 4 x AA cells and dedicated AC wall charger £17.99 + £2 p&p  
4 x AA cell Packs: Ready charged. £4.99 + £1 p&p

W-MM1 Multimode Modem



W&S  
£69.95

NEW

- \* Packet, AMTOR, CW
- \* SSTV, Fax, RTTY
- \* NAVTEX, SYNOP
- \* Transmit and receive
- \* Needs PC 286 or better
- \* Includes software
- \* No external power required
- \* Connects to RS-232

Price Down

ICOM IC-706 MK II

£995  
Deal  
Match

Plus £50  
Accessory  
Voucher



or £1059 inc 5yr Wtty

160-6m 100W 2m 25W ++

We are pleased to endorse the performance and design of the IC-706 Mk II transceiver as the best compact hf mobile bar none. It out performs and out specifies any other model. The only choice left is which dealer you buy it from! We offer you an unbeatable price and an unbeatable back-up service plus optional extended 5 year warranty for an extra £98!

Send for Brochure



Kachina 505DSP HF Transceiver

The 506DSP transceiver is remotely controlled (up to 23m away - so no noise problem!) from your computer. Includes 100W transceiver module, operator control head and software. This has taken the USA by storm

- \* 100W all modes
- \* Runs under Windows 3.1 or 95
- \* Gen. cov. receiver
- \* Variable bandpass filters
- \* 1Hz tuning steps
- \* Antenna impedance chart
- \* RF speech processor
- \* SWR alarm
- \* Full DSP
- \* Full CW break-in
- \* Electronic keyer
- \* 100 memories
- \* Auto notch filter
- \* control head mounts in PC or on desk.

Transceiver £1999.00 (Available November)  
Auto ATU £249.95

NEW Kenwood THG71E

- \* Dual Band 2m/70cm
- \* 200 memories
- \* Alphanumeric Display
- \* Full CTCSS
- \* DTMF
- \* Up to 6W out
- \* Wideband Receive
- \* Illuminated Keypad
- \* PC Compatible
- \* Windows Programming

Send For Brochure



£239.95

Special Purchase £349

£229

IC-T7E Dual Bander



- \* 2m & 70cm Handy
- \* 70 Memories
- \* Full CTCSS
- \* Tone scan function
- \* Up to 4W out
- \* 8 tuning steps
- \* DTMF
- \* Auto power saver
- \* 600mAh 7.2v ni-cad
- \* AC charger and helical

Your chance to purchase this fine handheld at a very special price - whilst stocks last

# MFJ

## Ham Radio Accessories

ORDERS ONLY ON:  
**FREEPHONE**  
0500 73 73 88

### MFJ-784B Filter

£239



- Works with any rx. or tx.
- DSP filter, fully programmable
- 16 Factory pre-sets
- Plugs directly into audio out
- Drives speaker or headset
- Requires 12v at approx 500mA

### MFJ-1278DSPX Data Unit

£399



- Multi-mode
- Packet
- Amtor
- Pactor
- Colour SSTV
- 10 Modes total
- DSP filtering
- Tuning scope
- Simple to use
- Software

### MFJ-948 HF ATU

£129



- 300 Watts PEP 150W CW
- 1.8 - 30MHz - with ease!
- Wire, coax or balanced line
- Balun included for best match
- 30 / 300W power meter - PEP / RMS
- Antenna selector, by-pass etc.

### MFJ-781 DSP Filter

£139



Just arrived, this new DSP filter that is specially designed for CW and data modes.

- Digital Audio Filter
- CW 50, 100, 200, 500Hz
- Amtor, fax, GTOR, PACTOR
- RTTY, SSTV, We-FAX

### MFJ-949 HF ATU

£149



- 160 to 10m 300W PEP 150W CW
- Wire, coax or balanced feed
- Built-in Dummy Load
- 30 / 300W power meter - PEP / RMS
- Antenna selector, by-pass etc.

### MFJ-914 Auto Match

£59.95



Your Auto ATU will now match any aerial when used with this.

**Auto-Tuner Extender**  
Connect between auto tuner and transceiver - no more problems with G5RVs and all those difficult antennas - 160 to 10 metres

### MFJ-812B 2m VSWR

£36.95



- 144 - 148MHz 30 / 300W
- Forward & Reflected Power
- Reads field strength
- Easy to use - convenient size
- Low cost - efficient accessory

### MFJ-921 2m ATU

£69.95



144MHz 200W antenna tuner that helps you get a perfect VSWR every time. Includes VSWR and power meter and fitted SO-239 sockets.

### MFJ-259 HF Analyser

£229



- 1.8MHz - 170MHz
- Digital Readout
- Resonance
- VSWR
- Impedance
- AA batteries or 12v external

Connect to aerial or coax and adjust it in seconds. Turns hours into minutes and ideas into antennas!

### MFJ-864 160M to 70cm

£79.95



- All bands from 1.8MHz to 440MHz
- Cross needle meter - 30 / 300W
- Comprehensive user calibratable
- Separate HF and VHF/UHF sensors
- Illuminated meter (ext. 12V)
- Everything you need in one box
- 185 x 65 x 75mm

### Ameritron 811 1kW

Price Down!



The only currently available HF linear to have passed a full lab. CE test

- 1 kW linear 9dB Gain
- Like a 5 element Monobander!
- Uses low cost 811A tubes
- Built-in rugged AC Supply
- Instant by-pass switch
- PA V/A meter + Grid meter
- Over rated variable capacitors
- Fan cooled for long life
- Very efficient - 600W output
- Easy to tune and connect
- Size 16" x 13.75" x 8"

160 to 10M of DX-Getting Power  
Perfectly matches all 100W rigs

£799

### MFJ-901B HF Atu

Price Down!

£69.95



### MFJ-941E Atu

Price Down!

£109



- 160m to 10m ATU - 300W
- Wires, Coax and Balanced Feed
- Cross Needle VSWR & Power
- 3-Way antenna selector
- By-pass position - Dummy load socket
- Internal Balun - 30 or 300W position
- 260 x 180 x 70mm

### MFJ-260C 300W

£34.95

- Dummy Load
- 50 Ohm
- 300W
- OK to 450MHz
- Air cooled
- SO-239
- Totally enclosed
- Essential item



### MFJ-704 LPF Filter

£39.95

- Low pass filter
- 1.8 - 30MHz
- Cleans up output
- Reduces TVI
- 1kW rating
- SO-239 sockets
- Fully shielded



### MFJ-418 CW Tutor

£79.95



This tutor has taken the USA market by storm. There has never been a better way or more convenient way to learn the code. Unlike other tutors this one not only sends random characters and groups, it also sends complete QSOs, just like the real test. And no QSO is ever the same!

### MFJ-16010 Wire Tuner

£44.95



Covers 1.8MHz to 30MHz and matches any random wire to your hf transceiver. Handles 300 Watts and fitted SO-239. Ideal for portable work.

### MFJ-713 Intermod Filter

NEW

£64.95



A three section high-Q bandpass filter for 145MHz handhelds. Includes rf sensing.

- 144 - 148MHz
- Up 20 50dB rejection
- Defaults to "thru" when off
- Minimum r/T/R required: 50mW
- BNC termination
- Power: PP3 (not supplied)
- Size 70 x 50 x 45mm

### MFJ-9406 6M Trancvr.

£249



### MFJ-250X 1kW load

Price Down!

£34.95



- 1kW Dummy Load
- Oil cooled design
- SO-239 socket
- Ideal for linears
- 1MHz to 400MHz

- 50 - 50.3MHz 10W SSB
- RF speech processing
- 10MHz xtal filter
- Super performance
- Ideal way to 6M DXing

# Waters & Stanton PLC

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# PRACTICAL Wireless

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GDP-430 Hand-Held project this month. Please accept our apologies for any inconvenience caused.

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# NEVADA<sup>®</sup>

**NEW 32 page  
AUTUMN catalogue  
now available**

**SEND A4 S.A.E. FOR YOUR FREE COPY!**



## ALINCO HOT PRODUCTS

### DX-70TH HF Transceiver with 6 mtrs

**£775**  
£8 P&P

- All HF Bands 100W output
- 50MHz 100W output
- General coverage RX
- Remotable front panel
- Receiver pre-amp
- Filters fitted as standard
- Superb TX audio and RX
- Good RX sensitivity
- Full break in on CW
- Speech compressor
- 100 memory channels
- All modes: USB, LSB, CW, AM, FM
- All mode squelch
- CTCSS encoder
- Noise blanker
- Scan facilities
- Quick offset for DX pile-ups
- IF shift control
- Antenna sockets for HF and 6M

### DX-70T 100W HF + 10W 6mtr TX

**£695**  
£8 P&P

Alinco's 10W on 6mtrs version of the DX-70 TH above. Narrow receive filters and CTCSS fitted as standard.

### DR-M06TH 6mtr FM Mobile 50-54MHz



With the new 6 metre repeaters now up and running, this is the ideal radio for the Band. With an optimised receive front end, CTCSS and easy to use controls you will be amazed at the range achievable.

**£249.95**  
£8 P&P

- Repeater shifts
- 100 memories
- CTCSS encoder
- Time-out-timer
- Output 20W

### DR-605E Dual Band Mobile



Easy to use twin band mobile TX that delivers both high power and performance with user friendly features.

**£399.95**  
£8 P&P

- 50W (2m)-35W (70cms)
- 100 memories
- Full Duplex
- CTCSS encoder fitted

### DR-610E Twin Band Mobile



- 136-174/420-470MHz FM
- Channel Scope
- Full duplex
- CTCSS encoder
- AM Airband RX
- 120 memories
- VHF 50W/UHF 35W max

**£499.95**  
£8 P&P

### DJ-G5EY Dual Band Handheld

A brilliant twin band handheld that does everything including spectrum display of adjacent channels. The RX has a superb front end that does not suffer with breakthrough like other handhelds & has CTCSS/DTMF built in as standard.

- Spectrum channel display
- Optional extended receive including Airband 108-173.995MHz 400-511.995MHz 800-999.990MHz
- Full VHF/UHF Duplex
- Over air cloning
- Cross band repeat
- Up to 5W RF output
- 100 memories

**£299.95**  
£8 P&P

### DJ-191E 2 Metre Handheld

A new slim line 2 metre handheld that's easy to use and has an enormous clear display.

- Up to 5W output (with 9.6V NiCad pack)
- 40 memories channels
- Cloning capable
- CTCSS encoder
- DTMF fitted
- Battery save facility
- Scan functions
- Time out timer

**£169.95**  
£8 P&P

### DJ-X10E Scanning Receiver

- 100kHz - 2000MHz
- AM/WFM/NFM/CW/SSB
- 1200 memories
- Channel scope spectrum analyser
- Channel scope peak search
- Keypad lock control
- User friendly features
- Large clear display
- Timer functions
- Battery save facility
- Squelch control
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- Standing Wave Ratio measurements with easy set function.

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- 6 position antenna selector switching.
  - Direct coax 1, coax 2, bypass.
  - Tuned coax 1, coax 2, wire.
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- Standing Wave Ratio measurements with easy set function.

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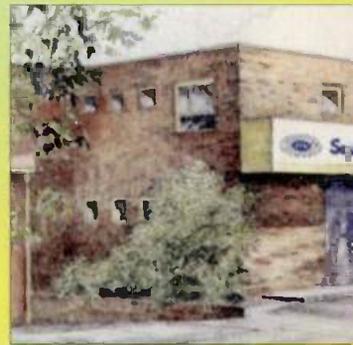
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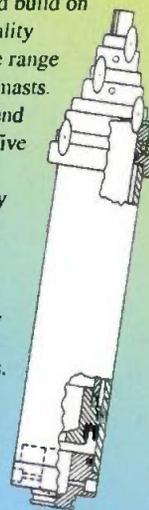
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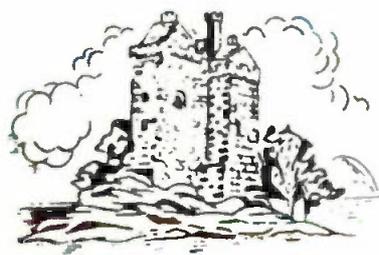


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# EDITOR'S Keylines

Rob Mannion's viewpoint on the World of Amateur Radio

In the past few years I've seen many of my old friends pass on, and I'm grateful to have fond memories of them. However, on occasions we lose someone who is rather 'special' and the late **Bert Newman G2FIX** was most certainly in this category. And I have no doubt that if you read my obituary to Bert (published in the October issue) you will also understand why he was rather special!

Personally speaking I think that there's a reason for everything - and without realising it we're mostly following a preset path (a program if you like!) and it seems ironic that G2FIX became a 'Silent Key' just as it became necessary to introduce a new category into the *PW* and Kenwood Club Spotlight Magazine competition.

The 'Club Spotlight' club magazine competition has been a resounding success. Starting with 11 excellent entries last year we received 26 for the 1997 competition - and these included clubs who serve their members 'nationally'.

Of course, the 'national' type clubs (WAB, BARTG, BATC, etc.) have very high standards indeed for their magazines. So, the panel of judges all agreed that it was best to introduce the new category. And it so happened that the **British Amateur Radio Teledata Group** ('Bartag' to their many friends) scored the highest number of points in the 'national' category.

## Bert's Bell

Having the need to introduce a new award for a rather special group of clubs got me thinking. Then I hit on the idea of commemorating G2FIX in a most appropriate way - by a mounted inscribed bell! Bert was a keen bell-ringer, Radio Amateur 'extraordinaire' and a great communicator (he was a delight to listen to when acting as the Controller of the Royal Air Force Amateur Radio Society Net on the 3.5MHz band).

Then I started the search for a suitable bell. And although the kind members of the RAFARS Net assisted, I was still looking when I was contacted by Bert's family.

They wanted to buy the bell and get it mounted and inscribed!

Having suggested the trophy myself I had been fully prepared to 'put my money where my mouth was'. It didn't seem right to suggest the idea and get someone else to pay for it! However, I was delighted that Bert's family wanted to handle that side of things. A most satisfactory conclusion!

I'm hoping that the first award of 'Bert's Bell' will take place at a ceremony in Salisbury very soon in the presence of G2FIX's family and friends. In future years the Salisbury Club have agreed to supply one extra judge for the 'national' category only and wouldn't it be marvellous if Bert's own specialist society - RAFARS were to take part. It would certainly be appropriate!

So, here's to the future of the competition and everyone who has supported it. And I'm hoping that the 'bell will be ringing' to communicate to others and at the same time commemorate G2FIX's dedication to Amateur Radio, bell-ringing and making friends wherever he went, for many years to come. Good luck everyone!

## A FAX From The ARRL

As I was preparing to write this issue of 'Keylines' I received a FAX from the American Radio Relay League Headquarters in the USA. And it appears that I have got it **VERY WRONG** regarding the ARRL's plans for the future of the Handbook (*PW* November) 'Keylines'.

In his FAX demanding that I publish a retraction and 'to take what other steps are necessary' to inform readers that the ARRL have no plans to stop producing *The ARRL Handbook For Radio Amateurs* in book form. **Mark Wilson K1RO**, the ARRL Publications Manager/*QST* Editor, has made their position very clear indeed. In fact the ARRL tell me that they consider (as I do) that the Handbook is of prime importance as a book and in effect it's their 'flagship' publication.

So, although I am very sorry for the confusion caused - I am very pleased indeed that the news is that the all-important ARRL

Handbook is continuing as a book.

And I'm afraid to say that although there are many reasons why the confusion was caused (many of them my own making) I feel sure that if the letters and FAXes I sent to the ARRL President **Rodney Stafford KB6ZV** - registering my mistaken dismay - in July had been answered - the whole catalogue of errors could have been avoided. They could have corrected me there and then! It's frustrating to be so embarrassingly wrong on this occasion but at least there's good news to impart to you all!

## Electronics In Action

As from the February 1998 issue of *PW* we are introducing a new bi-monthly series looking at electronics, applications, projects, techniques and ideas. The new series 'Electronics In Action' is to be compiled by **Tex Swann G1TEX** and will compliment the very successful 'Antennas In Action' which he also compiles, which will continue to appear in the 'opposite' alternative months to the new 'Electronics In Action'.

The new series will enable us to introduce more electronic ideas and projects and 'associated interests' for your interest. It will also make it far easier for the Editorial team to use some of the ideas which come in from you the reader. So, if you've got anything you'd like to discuss...why not write, E-mail or speak to **Tex G1TEX** about it very soon. **He's waiting to hear from you!**

## Open Forum At Convention

During late September I attended the 'Young Amateur of The Year' (YAOTY) presentation and luncheon as the guest of the RSGB at the HF Convention at Old Windsor in Berkshire. It's a splendid occasion and I came away feeling very proud of the young people (see report in the news pages) and their achievements, and pleased at the hard work by the RSGB, everyone involved and the active support of the Radiocommunications Agency the YAOTY award.

Despite the support given by the RA to the YAOTY I had been rather surprised and concerned at some comments expressed by a spokesman from the RA at an 'Open Forum' held during the mid-morning.

During the 'Open Forum' one of the RA's spokesmen clearly stated that the Agency really wish us to negotiate with a united hobby. In other words - with one voice. And although that was only one topic it was surely message 'Number 1'.

One of the next 'topics' however (and perhaps message No. 2?) came as rather a surprise to me and many of the audience! The RA spokesman (talking about the trends of modern private mobile radio communications) told the whereas the trend is for modern communications systems to be using really low powers. "**Radio Amateurs like to use Kilowatts!**"

Standing at the back of the audience I could see and almost feel the reaction. And of course - my own reaction was immediate! Along with others I pointed out that the vast majority of transmitting Amateurs cannot use (and often don't wish to) high power communications because of EMC problems. Indeed - the sizeable QRP contingent in the audience also expressed their surprise at the remark.

After the 'Open Forum' finished I was left wondering. **Are attitudes and staff changing in the RA?** For many years we have dealt with Civil Servants who have been Radio Amateurs themselves and even those who have no direct interest in our hobby have shown a clear understanding of our aims and objectives. It would be a very great shame indeed if new attitudes and lack of understanding from anyone person in this most important Governmental body worked against us.

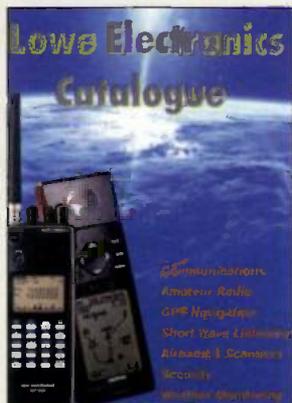
Indeed, as one 'within the very senior in the ranks' RSGB friend told me: "We're going to have to fight our corner Rob". I agree fully with what he said...and let's hope Radio Amateurs in general will agree to fight together!

*Rob Mannion  
G3XFD*

# NEWS 1997

Compiled by Donna Vincent G7TZB

## Lowe Catalogue



Lowe Electronics, who have been in business for the past 30 years, have recently published their first catalogue. The 78-page, colour A4 sized, *Lowe Electronics Catalogue* contains products for use in the Communications, Amateur Radio, GPS Navigation and Scanning fields.

Also included are accessory items, together with antennas, components, connectors and other selected products from Lowe's varied range. To get your copy of this comprehensive catalogue just send **four first class stamps** direct to **Lowe Electronics Ltd., Chesterfield Road, Matlock, Derbyshire DE4 5LE.**

## Fibre Optic Linking

National Transcommunications Limited (NTL) has recently announced its intention to invest £30 million in the building of a new fibre optic link between Belfast and its core network on the mainland to bring them into the international telecoms marketplace. It's intended that this new service will provide an alternative to using British Telecom for carrying 'traffic' between Eire, Northern Ireland and the rest of the UK. This move also marks NTL's desire to be seen as a real alternative to the national PTTs in mainland UK and Ireland.

The NTL network currently stretches from Winchester (south

of England) to Glasgow and Edinburgh in Scotland, reaching out as far as Cardiff, Bristol and Leicester. The network delivers a fast super highway for advanced communications to support the demand for voice, data, video and fast Internet applications throughout the UK.

In order to develop the latest phase of NTL's network, cables will link in a ring Glasgow, Belfast, Dublin and Lytham St. Annes in Lancashire before re-joining the company's existing network in Manchester. Both of the new undersea routes will consist of 48 fibres and the links will provide the first restorable Synchronous Digital Hierarchy (SDH) connections between Northern and Southern Ireland and the mainland. This new service is due to be completed and in operation by May 1998.

## New Alinco From Nevada

Portsmouth-based Nevada Communications have announced that a new h.f. transceiver has recently joined the Alinco range. Complimenting the Alinco DX-70, the newly-introduced DX-77 covers all the Amateur Bands between 1.8 and 30MHz providing c.w., am., s.s.b. and f.m. It's capable of a maximum output of 100W (high) and approximately 10W (low).

Featuring a general coverage receiver the DX-77 will be available in two versions. The basic model will be priced at £675 and the DCX-77T at £775. The DX-77T includes the EJ-33U Electronic Keyer unit, the EJ-34U CTCSS unit and the EJ-35U narrow c.w. filter. Further details are available direct from Nevada Communications at 189 London Road, North End, Portsmouth, Hampshire PO2 9AE. Tel: (01705) 662145, FAX: (01705) 690626.

*Editorial note: We hope to review this new model in PW as soon as it's available.*



## It's 73s From Martin Lynch!

Martin Lynch & Son have recently joined the ever growing number of companies wishing to make their telephone numbers easier to remember. So, with effect from October 1st telephone callers to the Lynch Emporium have been able to dial **0700 73 73 73** for sales enquiries.

Martin says he chose 73 73 73 as his new number because he felt it was an obvious choice for his business and that even newcomers to Amateur Radio would be familiar with the meaning of 73, therefore making it easy to remember for everyone. The old **0181-566 1120** telephone number is still in use and for the time being Martin's Customer Services number will remain as **0181-566 0566**.

So, now you've got no excuse for not remembering to call Martin Lynch!

## Need A Postcard QSL? - Catch A Salmon!

Have you ever wished to have something really different on your QSL card? Ever fancied a magnificent steam locomotive, traction engine or aeroplane? If you have ever longed for any of

these - or wanted a high quality colour postcard view of your town, area of the countryside depicted on your QSL card - there's someone who could help you.

Rob Mannion G3XFD has been searching a long time for a



reasonably priced way of having one of his favourite steam locomotives on a colour postcard as a QSL to reflect his interest in railways and radio. That's how he discovered the large range of postcards produced by **J. Salmon Ltd.**

Based in Sevenoaks in Kent, J. Salmon produce an extremely wide range of colour postcards and Rob saw a selection -

## Classic Television

*Classic Television* is a new publication which has just been launched by **Eagle Eye Publications**. The magazine contains feature articles on all aspects of radio and television from media technology through to trivial snippets of information.

The pilot issue (dated September) contains features on *Dad's Army*, *Robin of Sherwood*, *Carry On* films and much more. Future issues will give an 'airing' to many forgotten programmes as well as looking at shows that are destined to become future 'classics'.

*Classic Television* costs **£1.95** and is gradually being introduced into many independent newsagents so you should be able to find a copy on their shelves. If not, you can order it direct from **Eagle Eye Publications, PO Box 13325, London W5 4GE.** Tel/FAX: 0181-568 9881, E-mail [Eepublictn@aol.com](mailto:Eepublictn@aol.com) enclosing a cheque or postal order for **£2.20**.



including one of his favourite locomotives - in his local shop. He then wrote to the company and found that they are prepared

to overprint existing postcard views to suit Amateur Radio purposes (perhaps the best approach cost-wise) or they can

### Emma's The Young Amateur Of The Year!



Emma Constantine 2E1BVJ receiving one of her many prizes from the RSGB 1997 President Ian Kyle G18AYZ/M10AYZ.

(Photo courtesy of RSGB)



(front) The 1997 YAOTY Runner-Up Mark Haynes 2E0APH standing alongside Emma 2E1BVJ, this year's winner. (Rear, left to right) Dennis Goodwin G4SOT of Icom (UK) Ltd., Hilary Clayton-Smith G4JKS, RSGB President Ian Kyle G18AYZ/M10AYZ, Roger Louth (RA), Vaughan Asque (RA). (Photo by G3XFD)

Emma Constantine 2E1BVJ from West Yorkshire has been awarded the title of Young Amateur of The Year (YAOTY) for 1997. Proud and very confident 15-year-old Emma, accompanied by her parents, was formally 'crowned' with her title at a presentation luncheon organised by the RSGB at the HF Convention at Old Windsor on Sunday September 28.

Emma, the first lady winner of the YAOTY, is a founder member of the Rishworth School Radio Club G0SQA and has been Secretary since the age of 12. She helps to run Novice courses and has recently started lunchtime Morse code sessions. Her Head of Science Tony Vinters G0WFG describes Emma as "an excellent ambassador" for Amateur Radio. She further proved this statement by creating a precedent by delivering a short and very confident speech to the assembled officials and guests.

Runner-up this year was 14-year-old Mark Haynes 2E0APH from Essex who

was also present at the ceremony with his parents. Mark also set up a school radio club and has also taught Morse to two school friends. He's broadcast on BBC Radio Essex about his hobby, is a keen member of the Air Training Corps and is also active on the h.f. bands on QRP - particularly 28MHz. Mark, who received special prizes from the RA, the RSGB, and Icom UK's now traditional 'goody bag' of gifts and Lowe Electronics who presented a Hi-Mound Morse key. Mark also broke with tradition when he addressed the assembly to express his thanks.

Speaking on behalf of the judging panel who comprise of members from the RSGB and the Radiocommunications Agency, Hilary Clayton-Smith G4JKS specifically remarked on the very high quality of the entries for the 1997 award and the significant increase of nominations in 1997.

After congratulations were offered on behalf of the RA, Roger Louth Head of Mobile Service at the Agency and the RSGB 1997 President, Ian Kyle G18AYZ/M10AYZ presented Emma - who hopes to begin training as a Veterinary Surgeon at University soon - with a cheque for £300, and a certificate signed by the President of the Board of Trade and Secretary of State & Industry Margaret Beckett MP. Emma also received prizes of a guided tour of the RA's Baldock Monitoring Station in Hertfordshire, a Palstar KH-6 50MHz hand-held transceiver and a year's free membership of the RSGB, plus a Tandy DX-394 receiver on behalf of the Tandy Organisation. Other prizes included a one week course at the BT Portishead Radio station where she'll learn about international maritime and aeronautical communications and Siskin Electronics donated a Packet Radio Modem.

Everyone on the *Practical Wireless* team sends congratulations to everyone involved in the Young Amateur of The Year Award and we will follow their continuing careers with interest as our hobby approaches the new century.

Editor

create cards from your own photographs.

Full details of prices, designs (with samples) and minimum order numbers can be obtained direct from J. Salmon Ltd., Art Printers & Publishers, 100 London Road, Sevenoaks, Kent TN13 1BN. Tel: (01732) 452381, FAX: (01732) 450951.

### Pure Energy!

A new range of rechargeable alkaline batteries and compatible charger are now available from Waters & Stanton Electronics.

Common NiCad cells need to be periodically discharged to



avoid a low memory charge developing and often don't hold their charge due to their 1.2V rating. However, the new Pure Energy batteries offer a distinct advantage in that they can be charged up to 250 times, require no initial charge, can be 'topped up' at any time, offer a full 1.5V and are said to have a longer shelf life.

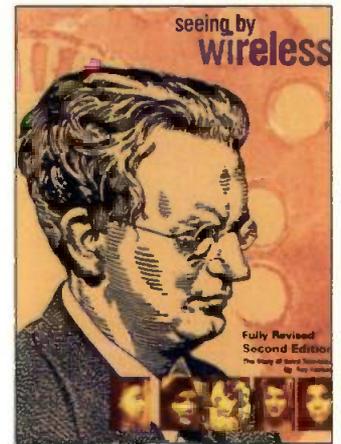
The Pure Energy batteries cost £4.99 for a pack of four and the EnviroCharger, which must be used to charge the batteries, costs £17.99 complete with four AA cells. To place your order or to find out more contact Waters & Stanton on (01702) 206835/204965.

### Seeing By Wireless

Available now from the PW Book Store is *Seeing By Wireless* Second Edition by Ray Herbert. This book (now published by PW Publishing Ltd.) is 'hot off the press' and has been fully revised by the author.

*Seeing by Wireless* is the story of John Logie Baird and Baird Television. It's hard to imagine that television is in fact conceptually older than radio even though it was 1926 before J. L. Baird, often referred to as the 'Father of Television', demonstrated the first true television pictures. This and many other interesting facts are detailed within the pages of Ray's book.

The publication traces the Baird story from the early



demonstrations, which became historical events to International Operations through to Stereoscopic Television. *Seeing by Wireless* gives a fascinating insight, complete with quality photographs, into something that has become an accepted part of everyday life - television.

*Seeing by Wireless* costs just £4.95 plus £1 P&P UK, £2 P&P overseas. To order your copy either use the form on page 82 of this issue or telephone the Credit Card Hotline on (01202) 659930. Order now to avoid disappointment!

### Student Radio Awards

By the time you read this the 1997 Radio 1 Student Radio Awards will have taken place at the Brookes University in Oxford. The event, now in its second year, aims to celebrate the success of Student Radio and to highlight the talents of potential professional broadcasters which has dominated the airwaves in university towns across the UK during the last 12 months.

Student radio, which is part of the NUS and the Student Radio Association, has been developing of the past few years, so much so, that Radio 1 has recognised the need to support this area of broadcasting.

The winners from all the award categories will receive training and work experience packages from Radio 1, including an hour of dedicated air time for the winners of the Best Student Radio Station Award. So, if you're studying at university why not get involved with your student radio station or get one started and who knows next year your station could be one of the entries in the Radio 1 Student Radio Awards.

For more information contact Radio One Awards, c/o NUS Press Office, 461 Holloway Road, London N7 6LJ.

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.

# RECEIVING You

## Letters Received Via The 'Internet'

Many letters intended for 'Receiving You' now arrive via the 'Internet'. And although there's no problem in general with E-Mail, 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 don't forget to include your full postal address and call sign along with your E-Mail hieroglyphics! Editor

PW's Postbag. If your letter is published you'll win a prize.

## This Month's Star Letter

### Loewe Multiple Valves

Dear Sir

I would like to add extra detail to Charles Miller's excellent review of the famous Loewe multiple valve sets in 'Valve & Vintage' (*PW* October, page 50). I have a set in my collection which came from a retired Customs and Excise Inspector in Tottenham some 20 years ago. He told me that it was made there and that he had acquired it during his visits to the factory.

The set dates from about 1928 and has a Bakelite base and is fitted with metallised valve type 3NFB. He told me Loewe made valves as well as sets there, importing the sealed resistors and capacitors from Germany, hence the Customs interest.

About the same time, Marconi tried to get Loewe to pay the Valve Royalty of 12s 6d on each valve assembly in the unit. The case finished up in the Patents Court, with a technical victory for Loewe, who argued that their valves were sufficiently unique to be covered by German Patents, so no Royalty was due.

The Court agreed that this was true, but that there was infringement of Marconi circuit patents, so a reduced Royalty of 7s 6d per complete 3-valve device and 5s for the 2-valve was payable and that Marconi should pay all the costs! Total production of Loewe valves at that time was in the hundreds of thousands per annum - hence the Marconi interest.

Anthony Hopwood  
Worcestershire

**Editor's comment:** What a fascinating story Anthony! Additionally, an Irish reader from Galway, sending me an s.w.l.'s report, also wrote to me saying that several years ago he attended a sale in Galway city itself. Looking through the catalogue he saw that there were several 'Old Fashioned' valves included. He bought them all for £1 and it wasn't until he saw Charles Miller's article did he find out that the strangest looking valve he'd bought at the sale was a Loewe multiple valve. But...perhaps that's "The luck of the Irish" as the saying goes!

### Mobile Home 'Ham'

Dear Sir

As one who has lived in a 'Mobile Home for the last 17 years, I was very interested to read the article 'Mobile Home Ham' by Dennis Hartwell G0VOV, page 42 in the October *PW*. However, I would like to make a couple of points on the subject.

Nowadays, they are more properly called 'Park Homes' as none of them are mobile in the sense that was meant originally. The Pathfinder Village site here (near Exeter), was (to the best of anyone's

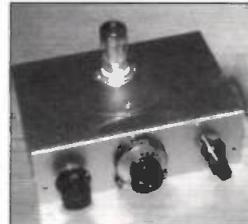
knowledge) the very first Mobile Home site in the United Kingdom. It is also the only site that is actually recognised as a 'Village' in its own right by Ordnance Survey map makers. It's history is interesting, but too long for this note.

A lot of Park Home sites have a 'no aerials' rule. TV and stereo radio are received from a common site aerial system for which one pays a 'connection fee'. There is one in Exeter that I know. When buying a Home on a site, you have to sign an agreement to abide by the site rules, so it's wise to read carefully any

agreement first to check out the restrictions. I have checked and these agreements are **enforceable in law.**

Many sites have overhead power lines for domestic electricity, random wire and vertical aerials are definitely out as I know from experience! I operate on all h.f. bands with a full size G5RV (ends dropped slightly) I also operate on 144 and 430MHz, all quite successfully. Poles and towers are a 'no go' on almost every site. I hope that these points will be of interest to prospective buyers.

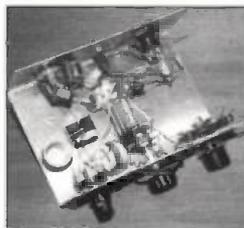
Ron Wilson G3DSV  
Devon



### One Valve Challenge

Dear Sir

Reference the piece entitled 'One Valve Challenge' in the *Practical Wireless* for October 1997. I thought that I would send the enclosed circuit\* (see note below) and photographs in case of interest. You have said that you have no objection to twin-triodes, etc., in the 'one valve' challenge and this has



enabled me to offer mine, which is based on a twin triode.

In the circuit used there are two stages of r.f. amplification followed by a diode detector, then two stages of a.f. amplification. This is a 'double reflex' circuit.

The circuit is based on a design by Sir Douglas Hall, published in the January 1968 issue of *Radio Constructor*. The original circuit uses transistors. MAT 101s, but later revised designs used npn transistors which were silicon.

The receiver covers

from 3.5 to 26MHz in three bands. The small coils are 7/8in plastic formers and reaction is by the Colpitts mode. There is a world of difference between a single triode and a twin triode circuit and this model is very good.

C. M. Lindars  
Somerset

**Editor's comment:** We are unable to reproduce the circuit mentioned by C. M. Lindars because of possible copyright problems. However, the photographs provide some indication of this interesting project. Readers will also be interested to know that C. M. Lindars was the Chief Engineer for the very well known HAC 'one valved receiver' (Heard All Continents) Company who advertised for many years in the Amateur Radio press.

### First Use Of Practical Wireless?

Dear Sir

I see in the October *PW*, page 11, the reference to the first issue of the magazine on 24th September 1932. It may be of interest to note that this was **not the first** Newnes weekly to include the words 'Practical Wireless' on the cover, albeit as a sub-title, as you will see from the enclosed photocopy of the cover of *Hobbies and Practical Wireless* for August 20th 1932.

(Editor's note: unfortunately we could not use the photocopy in the magazine).

Although F. J. Camm is not credited with the

Editorship of this magazine, the 16 page Wireless Supplement has two articles under his name and the whole magazine bears the typical hallmarks of the great man!

The next copy which I have, dated December 17th 1932 and subsequent issues are entitled *Hobbies and Wireless Supplement*, but still contain Wireless articles by Camm, Barton Chapple, etc., an indication of the prolific output of these writers and the wide interest in wireless in this period.

I myself, at this time, was still hooked on *The Magnet* and *The Gem* and didn't start reading *PW* until about 1940. So it may not surprise you to know that these days the first articles I read each month is 'Valve & Vintage'!

Best wishes for the continued and successful publication of *PW*.  
**John Goldberg G3ETH**  
Chester

**Editor's comment:** Absolutely fascinating John! As a 'semi vintage' reader of *Eagle* myself I'm a generation behind *Gem & Magnet* readers so it's very interesting to read of your memories of the earlier era. So, please readers...as we approach the centenary of 'Amateur Radio' year in 1998...keep those memories flowing.

## The Oldest Reader?

Dear Sir

When my friends read the Editor's 'Keylines' editorial in the September issue, they commented that I must surely be the oldest reader - however I think I'm certainly not! There must be somebody else 'way out yonder' who has reached their 'personal century' mark!

My friends (there's still a few left) also pull my leg about my never ever throwing anything away so I may well be the only reader who has not only taken *PW* magazine since issue number one, but who still has them on

his library shelves!

As a young schoolboy before the Second World War, I was a keen home constructor and s.w.l. saving my sixpence (old money) per week pocket money to buy tools from Woolworths (the hand drill came in three parts - 6d each), but the pliers were only a tanner, and, of course, I still have both on my workbench! Also, the electric soldering iron, a green 'Solon' type with wider bit, which I seem to remember cost all of 7/6d.

The first test meter was home constructed around a moving iron meter, price 6/6d from Lisle Street, where else? Later the sixpences were saved up to buy an AVO meter...the height of luxury. Yes, I still have both meters as well as the iron, but sadly its element is burnt out.

Unfortunately, I am short of three copies of *PW*, having lent them to a college and they were never returned. They are those for November and December 1950 and July 1980. Can any kind reader help please?  
**Douglas Byrne G3KPO**  
Isle of Wight

## Republish Transmitter Design

Dear Sir

I'm writing in response to the mention you made ('Editor's comment' following the letter entitled 'A Hobby For Life' in 'Receiving You' October *PW*), about the 4-valve transmitter originally designed and built by Steve Appleyard G3PND. I for one would like to see it reprinted!

In the early 1950s I built something similar from *PW*. Since then I have since bought some *PW*'s from that period in the hope of finding the circuit and information again.

The one I made was a 3 valve transmitter. It was crystal controlled, working on 3.5MHz and with valve number 2 being a buffer, it went on 14MHz very well. (about 20W out to a G5RV).

## Enjoying The Hobby

Dear Sir

I am very new to the field of Amateur Radio, having decided that I would like to have another bash at it listening to Radio Amateurs, and eventually, perhaps, even have a go at transmitting myself.

As a youngster I built a simple radio, on tag-board as I recall. It was not very effective, but it gave me a tremendous feeling of achievement and many hours of pleasure.

Now, I worry. I see reviews in your magazine for expensive radio equipment, which has been professionally designed, uses high quality components, thoroughly tested and extremely well marketed. You then proceed on review of the equipment to tell us all that it actually does the job it was designed for. Well, so it should!

There is no excuse for expensive modern day equipment not to fulfil its design specification. With the modern CAD packages for electronic systems and manufacturing methods with good quality control, there is every reason to expect the equipment to perform reliably.

Gripe almost over! I have no objections to anyone spending whatever amount of money they want on their hobby. The 'name of the game' after all is enjoyment. But please, let us all get away from pseudo-mystic. Expensive 'Kit' is not necessary for the continued enjoyment of one's hobby.

The articles by the Rev. George Dobbs G3RJV are superb in this respect. I realise that

many people may not have the time of the inclination to build 'Kit' for themselves. But for the people who do, these articles are entertaining, informative and at times, a challenge.

My skills as an amateur electronics constructor may well leave a lot to be desired. There are vast gaps in my knowledge of radio theory and amateur radio. But still I press on, recycling as many parts as possible, buying second-hand helps to keep the cost down for me, as does buying components in bulk as and when I can afford them. Hunting for 'bits' is part of the fun.

The argument that specialist parts are needed to enjoy Amateur Radio albeit on a simple level is a myth. I accept that there will be limits on performance of 'home-brewed' equipment, which professionally designed and built equipment will not have, but so what? I can live with that and I suspect so can many other people.

Well, perhaps having somewhat out of the mainstream views, my message really is simple. There is only one thing important in this hobby - apart from necessary good conduct and operational rules - and that is enjoy yourself. Thanks for a really good magazine.

**Steve Capriati**  
Lancashire

**Editor's comment:** Good luck in the hobby Steve and I've no doubt we'll meet at one of the specialist 'QRP' rallies and eventually on the air - perhaps using 'one valved' receivers with home-brewed transmitters?

The transmitter worked well on a.m. via cathode modulation, using a carbon microphone that needed a good shake every now and then as the granules used to pack together! My receiver was the HRO Senior.

I hope you have enough requests for a reprint. Best wishes and YECHID DA from West Wales!

**Sam Rees GW0NLB**  
Dyfed

**Editor's reply:** I have asked Phil Cadman G4JCP to take another look at this circuit in his 'Valve & Vintage' column during 1998. Phil's own 'speciality' interest is older projects from *PW* and readers interested in this aspect are asked to write directly to him.

## New Style PW Cover

Dear Sir

It's me again...your keenest reader and I'm writing to say I like the new style magazine cover very much. And I've had

a thought (please! no jokes about rare events!): What about throwing out a challenge to the readers to come up with a circuit idea/modification that makes use of the 'unused' pin on the microphone socket on a lot of the older generation 144MHz transceivers?

Most of the older sets, e.g. FT-227R, IC-240, etc. are fitted with 4-pin microphone sockets, but only use three of them for connecting the microphone, two for the microphone audio and the third for p.t.t. control, this leaves one lonely neglected little pin, with nothing to do...sad!

As I mentioned before, I use this pin, together with an outboard CTCSS circuit connected in the microphone lead to add this function to an old IC-240 - the audio from the circuit entering through third pin and being fed in beyond the audio tailoring stages of the microphone audio, which would otherwise filter the sub-carrier tone out.

I'm sure that there must be quite a few out

there who have come up with far more ingenious uses for this otherwise 'spare' pin and whilst many may think twice before getting the knives and forks into a new 'all singing and dancing' rig, costing megabucks and requiring a microscope to see what you are doing! These older sets are less intimidating when it comes to taking the lid off. Anyway, like I said, it was just a thought.

**Gareth Jones GW4KJW**  
Gwent

**Editor's comment:** Good idea Gareth! Please send any ideas and circuits to Tex Swann G1TEX here in the Broadstone offices for use in a new series. For further information on this matter please see 'Keylines' in this issue.

Send your letters to the PW Offices, marking it clearly for 'Receiving You'



Zoë says:  
"keep the News and  
those Club magazines  
coming!"

# CLUB Spotlight

Compiled by Zoë Crabb

## Special Event Station

Recently the Droitwich Spa Amateur Radio Club operated a Special Event Station with the callsign **GB2SER** at the Hanbury Steam Rally in North Worcestershire. Hanbury is just south of Bromsgrove, in sight of the BBC Droitwich transmitting masts, and is supposed to be the village which the BBC called 'Ambridge' in The Archers radio series. The rally was in aid of Hanbury Parish Church, which needs some restoration.

The Rally attracted hundreds of visitors from all over the country with its display of coal and oil fired Traction engines, as well as stationary engines. There were also displays of ex army scout cars, trucks and jeeps as well as a display of classic cars including an immaculate Model T Ford.

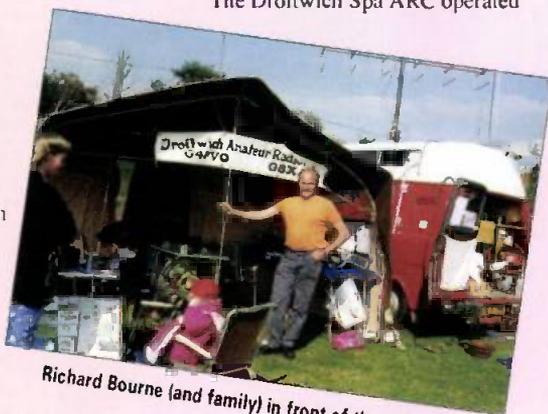
In other arenas were displays of country crafts and the usual stalls and beer tents! It was a really hot, fine day and a marvellous occasion.

over the Saturday and Sunday, on h.f. with an Icom rig running 100W into a G5RV suspended from two ex-Army 25ft masts. The club also operated on v.h.f. with a Yaesu FT-290R Mk1 with a 100W linear into a 6-element quad loop antenna, as well as on 70cm (430MHz).

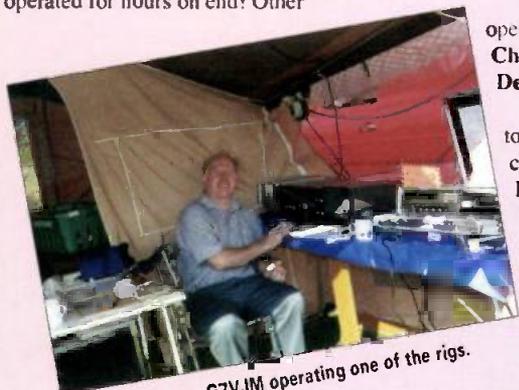
A number of club members helped out with operating the rigs and setting-up the station, the stalwart however, being the club Chairman **Eddie Cotton G4PQZ** who operated for hours on end! Other



A general view of some of the engines.



Richard Bourne (and family) in front of the club tent.



Chris Margetts G7VJM operating one of the rigs.

operators in the Sunday were **Chris Margetts G7VJM** and **Derek Thorpe G4RCB**.

Also, the club would like to make a special mention of club member **Richard Bourne**, who although not licensed yet, provided a lot of the man power in setting-up the station and a good deal of equipment. Richard hopes to pass the RAE in the near future and is already studying for the

Morse exam.

## Rewarding Year For Bangor

The Bangor & District Amateur Radio Society (G13XRQ) have had their most rewarding year ever - on at least four accounts. Firstly, they have just celebrated their 30th anniversary with a major rally that attracted traders from England and Scotland and right across GI.

Secondly, the Society has just moved into a new home, the 'State Room' at the Clandeboye Lodge Hotel, on the outskirts of the town. Thirdly, it's been their most financially successful year in their history, and last but not least, with 64 fully paid-up members, it's the largest radio club in Northern Ireland (and perhaps EI as well!).

At the Society's AGM, the Chairman **Stewart Mackay G14OCK**, Secretary **Harry Squance G14JTF** and Treasurer **Terry Barnes G13USS** were all re-elected. **Keith Burnside G14IYO**, a well-known Ulster Television Presenter, was elected as Vice-Chairman and Editor of the Society's magazine *Contact*.

Other officers were **Roy Finlay G10WYN**, PRO, and **Tony Harvey G17VIW** as Equipment Officer. The committee is as follows: **Norman Newell G13YMY**, **Merrill McNinch G16JGB**, **Bertie Drain G14POC**, **Myles Boyle G10VTS**, **Keith Stevenson G10SSA** and **Jeff Smith M10AEX**.

The Society meet on the first Wednesday of each month and a full programme of speakers and events has been organised for the coming months. Anyone wanting further information should contact **Stewart G14OCK**, QTHR or telephone on (01247) 454049.

## New Meeting Dates

The Ynys Mon Radio Users Group will, as from October, hold their meetings every 2nd and 4th Wednesdays of the month at the Scout Hall, Llangefni, opposite the Kwik Save shop, at 7.30pm. More events are scheduled to run throughout the year with the club's callsign **MW0AER**. Further information from **Tony Anziani GW4ZWN**, Secretary, on (01407) 832197 anytime.

## Junk Sale

The Lincoln & District Amateur Radio Society (LADARS) will be holding a Junk Sale on Thursday 27 November at 8pm in the Concert Room at the Lincoln Post Office Club (the LADARS usual meeting place), this is located on Dunkirk Road, off Burton Road, in the uphill parts of Lincoln. The price of tables for selling 'junk' costs £1 each and admission is 50p for people not wanting a table.

Last year, it was the Society's first attempt at running such an event, and overall they were pleased with the evening's attendance and it went very well. The Society hope that this year the success will continue!

As well as the usual radio and electronics 'junk', CYMA Computer Systems will also be present. This is a new, local company which can supply PC spares for upgrades, etc. They also sell new and second user systems at reasonable prices. There will also be a raffle and tickets will be on sale throughout the evening.

Anyone interested in radio or computing will be most welcome to attend the night, also any new members who wish may join LADARS. Further information from **Paul Ward G4RVM**, Secretary, on (01522) 537751.

## Duxford Radio Society

Rob Mannion G3XFD recently had an interesting QSO with Max Westley G4WEZ, of The Duxford Radio Society, who has kindly sent in some information about the Society and its history.

The Society originated when members of the Special Forces Signals Section and friends operated a Special Event Station at Duxford Airfield. This was to celebrate the 40th Anniversary of D-Day and VE Day back in 1984/85 respectively, and at the same time putting on exhibitions of war-time radio sets.

Formed as the Duxford Airfield Radio Society in 1986, the name was reduced to Duxford Radio Society in July 1989. From 1986, when GB2IWM was issued as the permanent callsign, co-operation with the Imperial War Museum (IWM) Department of Exhibits and Firearms produced displays appropriate to the special events for which Duxford is well known.

The Society aims to serve the Museum and the interests of its members by active work in documentation, collation, restoration, putting on exhibitions of IWM and members' artefacts, publishing a Newsletter of activities, articles on specific equipment or techniques, as well as increasing the usage of GB2IWM (by a larger roster of operators).



So far, GB2IWM has operated from the Operations Block, behind Hangar 5, used for fighter aircraft control in the Second World War and then during 1990-91 the school room, with more space for exhibits and for the public to move around. The Society now have their own two buildings (permanent) by the Gibraltar Gun, one which has the inner Radio Station room and an outer room which houses the radio equipment display, hopefully, this will eventually be open to the public.

The other building is the restoration workshop and also houses an active display of working restored radios. These rooms are currently only open when members are in attendance.

During the big display days, when Flying aircraft and Military vehicles draw large numbers of spectators, GB2IWM uses mainly s.s.b. with modern rigs, but on other days old c.w. only 'rock-bound' sets have been used.

While the first priorities are the IWM's collection of mainly army and RAF gear, including American items used by British and Allied Forces, items from other countries are desirable for comparison. There is Naval equipment but it does tend to be rather large and mainly kept on HMS *Belfast*!

The Society is now on a recruiting drive, seeking kindred spirits, not only Amateur radio operators but men and women who can contribute to the project, either from their own past experience or by cataloguing, research and literature or technical manuals, by translation from the several languages used by the allied forces, even from Japanese, since the IWM has some captured radios.

To fit in with the museum's policy, with respect to having only one outside organisation to deal with and insurance requirements, the regularly attending members of the DRS have joined the

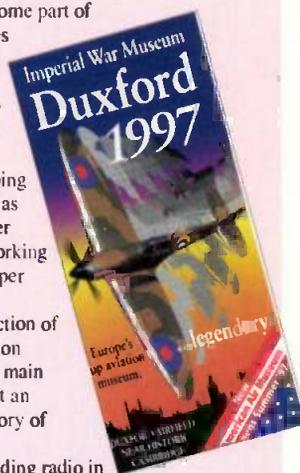
Duxford Aviation Society (DAS) forming its Radio Section. In fact, it can be said that the DRS has itself become part of the DAS and abides by the rules of the parent body.

However, it is only necessary for DRS members to join DAS if they are going to attend regularly as access is then easier and free, but 12 working visits are required per year.

The Radio Section of the Duxford Aviation Society have three main aims. 1) To support an interest in the History of Radio in Military employment, including radio in all Armed Forces, Para-Military and Clandestine (Resistance) Groups and extending to radio equipment of other countries for comparison.

2) To support an interest in and assist in the provision of an exhibition of radio equipment in accommodation provided by the Imperial War Museum, Duxford. To restore radio equipment in preparation for use or display and 3) The operation of an amateur radio station with the callsign GB2IWM (or other callsigns that may be provided during special events), using both modern and historic equipment in accordance with the provisions of the amateur licence.

Further information about the Society can be obtained by writing to: Duxford Radio Society, c/o Imperial War Museum, Duxford Airfield, Cambridge CB2 4QR.



## Spotlight Trophy North of The Border!

The 1997 winner of the *Practical Wireless* & Kenwood 'Club Spotlight' Club Magazine Trophy is The Cockszie & Port Seton Club, based in the Lothians near Edinburgh in Scotland. However, due to the much increased entries - we had 26 clubs entering this year compared to the 11 in 1996 - the judging was delayed as the panel of adjudicators worked 'overtime' and as they are scattered all over the country - it took some organising!

And although the full results and photographs of the presentations will not appear until the next issue of *PW* - the 'Club Spotlight' trophy, sponsored by Kenwood UK, will be presented to the Cockszie & Port Seton Club at a ceremony at the Leicester Show at Granby Halls on Friday 17th October.

## New Category

The much greater interest shown by Amateur Radio Clubs all over Britain and abroad has meant that a new category - to be formally introduced in 1998 - will be introduced to cater for the 'national' type clubs who entered their very professionally produced magazines and newsletters.

All the judges on the panel, Dave Wilkins G5HY of Kenwood, David Barlow G3PLE, Jim Bacon G3YLA, Rob Mannion G3XFD and myself, thought it only fair to introduce the new category and an appropriate award. And as fate would have it, we were given the opportunity to honour the memory of the late Bert Newman G2FIX who died in July.

The new award will be presented to the winners in the new category, The British Amateur Radio Teledata Group (BARTG). For further information on BATRG's success and the new trophy - please see 'Keylines' in this issue.

## Lighthouse Activity

The Sutherland & District Amateur Radio Club took part in the lighthouse weekend back on the 23/24 August 1997 from Tarbat Ness Lighthouse IO87CU, which is located on a Northern peninsula of land where the Donoch and Moray firths meet.

Tarbat Ness is the second highest lighthouse in Scotland at 146ft 7 1/4in. It was built in 1837 at a cost of £7300 and was designed by Christopher Stephenson, the cousin of Robert Louis Stephenson, who was the well



(L to R) John Miller GM4JAE, Len 'POPS' Boothroyd (s.w.l.), Derek Gill GM0HLV, Charlie Baird GM7ASN, Frank Baird MM1AUD, Ian Cowan GM0HNJ, Kevin Boothroyd GM1FYS.

known builder and inventor of 'The Stephenson's Rocket', the world's first locomotive.

It's a fitting tribute to Stephenson that the Light is now powered by Locomotive Headlamps, 20 of them, all producing four flashes per minute, some 180,000 candle power (that's a lot of candles!) and it's visible for over 20 miles. The Lighthouse has just been repainted from top to bottom, at a cost of over 12 times what it cost to build in 1837!

Everybody enjoyed the weekend and over 550 contacts were made from as far as Indonesia, USA, Canada, South Africa, Honolulu, Israel and most of Europe.

The antenna was a G5RV, sloped from the top of the lighthouse to just over three metres above ground. It worked extremely well, the rig, a Yaesu FT-767GX, running just 10W!

The tent was provided by The Tain Scout Group, who paid the club a visit on the Saturday evening, so thanks go to them and Tom Lane, the Lighthouse Keeper, for the help they gave the club to make it such a wonderful week. Here's to the next lighthouse event!



(L to R) Peter Anderson (Tain Scout Patrol Leader) and seven of the Tain Scouts: Kevin Boothroyd GM1FYS is on the microphone, logging is Charlie Baird GM7ASN and giving a talk on amateur radio is Derek Gill GM0HLV.



# Varactor Diode?

Ian Poole G3YWX sets out to answer the question What is A ...  
Varactor Diode.

**A**part from being used purely for rectification, semiconductor diodes have a number of other properties which can be put to good use in a variety of applications. One such property is that they exhibit a change in capacitance when a reverse bias is varied. As a result of this phenomenon diodes designed and used for this application are called varactor (variable reactance) or varicap (variable capacitance) diodes.

The capacitance change can be used in a variety of ways. One of the most obvious is for applying frequency modulation to a signal from a varying audio voltage in an oscillator or in a phase reactance modulator.

Frequency synthesisers make widespread use of varactors. They need to use the control voltage in the phase locked loop (p.l.l.) to control the frequency of the oscillator.

Varactor diodes are also used in voltage controlled filters. Often these filters are controlled by microprocessors where the tuning data is sent to a digital to analogue converter, where the data is converted into an analogue voltage to control the varactor diodes used in the filter.

## How They Work

Previously we have already seen that the key area for semiconductor diodes occurs in the junction between the *N* type and *P* type semiconductors. The same is true for varactor diodes. Here the area called the depletion layer does not allow current to flow and acts as if it's a plate capacitor as shown in Fig. 1.

When a reverse bias is applied the depletion layer widens effectively

increasing the gap between the plates and the capacitance becomes less as shown in Fig. 2. In this way, a varactor becomes a voltage controlled capacitor.

Varactor diodes are always run with a reverse bias. A forward bias is avoided because the diode starts to conduct and this has the effect of reducing the 'Q' of the tuned circuit.

The actual capacitance range which is obtained depends upon a number of factors. One is the area of the junction.

Another factor is the width of the depletion region for a given voltage. This is governed by the doping concentration and it is normally adjusted to give a relatively abrupt junction which results in a greater capacitance change.

Diodes typically operate with reverse bias ranging from around a couple of volts up to 20V and higher. Some may even operate up to as much as 60V, although at the top end of the range comparatively little change in capacitance is seen.

## Tuning Range

Obviously the most important characteristic of a diode are its tuning range. Normally two voltage points are specified, one at the top of the range and the other near the bottom at the minimum useable voltage.

It's obviously important to select a diode which combines the correct capacitance range for the available tuning voltage range. The higher voltage specified is normally the maximum reverse bias and this should not be exceeded otherwise breakdown may occur.

An important characteristic of any varactor diode is its *Q*. This is particularly important in a number of applications.

For oscillators used in frequency

synthesisers it affects the noise performance. High *Q* diodes enable a higher *Q* tuned circuit to be achieved, and in turn this reduces the phase noise produced by the circuit.

For filters the *Q* is again very important. A high *Q* diode will enable the filter to give a sharper response, whereas a low *Q* diode will increase the losses. The *Q* of a diode is simply the ratio of the capacitive reactance and the bulk resistance, ie  $Q = X_c/R_s$  at a specified frequency.

Reference may also be made to abrupt and hyper-abrupt diodes. These diodes have a very sharp junction and small changes in voltage give relatively large percentage changes in capacitance. These diodes are particularly useful when oscillators or filters need to be 'swept' over large frequency ranges.

## Back-To-Back

Varactor diodes can be used in a variety of ways. However, one of the most common is in a back-to-back arrangement like that shown in Fig. 3.

The use of the diodes in the configuration shown in Fig. 3 prevents the alternating r.f. voltage in the circuit from driving the diodes into forward conduction. However, it does mean that the total capacitance of the diode combination is only half that of each diode, assuming they have the same capacitance.

The control voltage is applied through a resistor in the control voltage line and a capacitor to ground to act as a filter. High value resistors, around 10kΩ are generally used as the feed impedance to the diodes is high.

PW

Fig. 1: A Varactor diode.

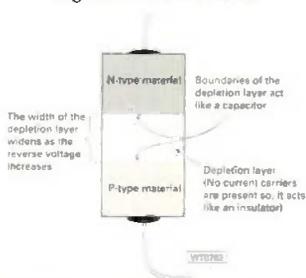


Fig. 2: Relationship between voltage and capacitance for a Varactor diode.

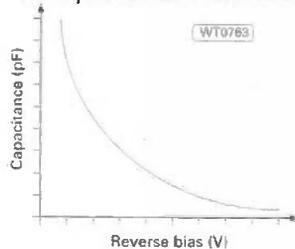
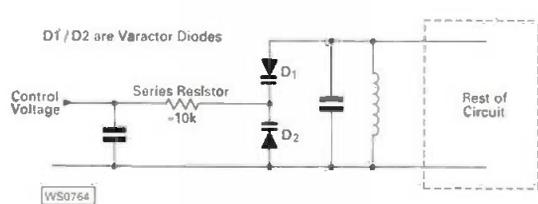


Fig. 3: A tuned circuit using varactor diodes.



**Next Time**  
I'll be taking a look at the Pin diode

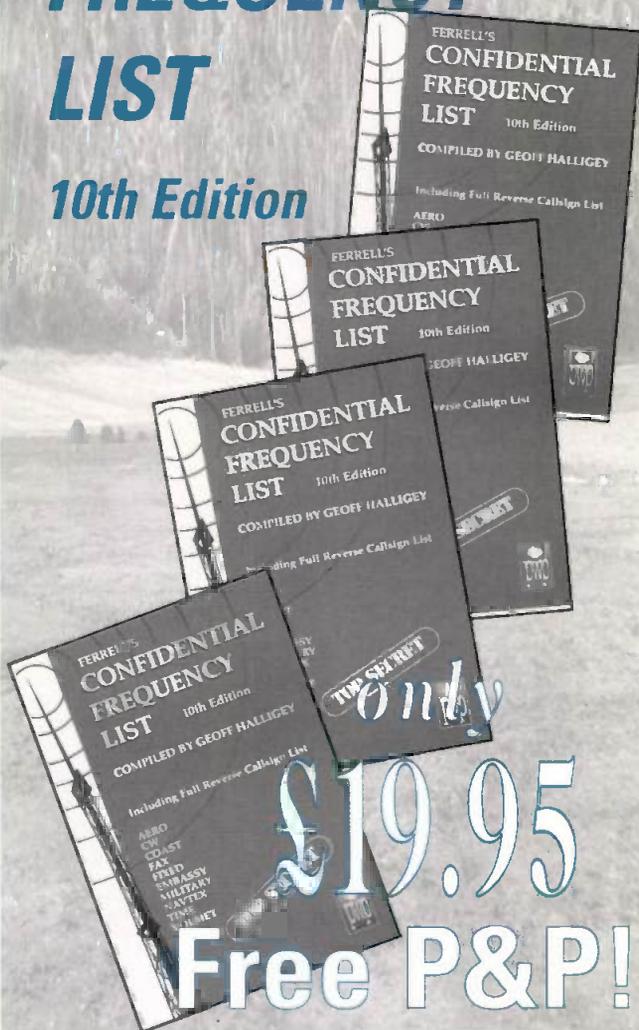


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# RADIO Diary

Compiled by Zoë Crabb

## 1997

**November 15:** The London Amateur Radio & Computer Christmas Rally is to be held at the Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London. Doors open at 10am to 5pm each day. Admission is £2.50 for adults, £1.50 for pensioners and £1.50 for under 14s. With around 100 exhibitors, special interest groups a huge Bring & Buy stand, disabled facilities, bars and restaurants, it's the event with something to interest every radio and computer enthusiast. **RadioSport Ltd.**, 126 Mount Pleasant Lane, Bricket Wood, Herts AL2 3XD or telephone on (01923) 893929.

**November 23:** The Bishop Auckland Radio Amateurs Club (BARAC) Rally will take place at Spennymoor Leisure Centre, County Durham, a new venue. There will be the usual stalls, Bring & Buy, catering and bar facilities. The venue also boasts good parking with easy access to a large ground floor hall for disabled visitors and traders. There is lots to do for the family within the confines of the Leisure Centre for those of the family not quite so interested in radio. Doors open at 1100 (1030 for disabled visitors). Admission is £1 (under 14s free of charge with adult). Talk-in on S22. **Mike G0PRQ** on (01388) 766264.

**November 30:** The Portland Amateur Radio Club are holding their 3rd Annual Rally at the Burton Cliff Hotel, Burton Bradstock, Near Bridport, Dorset. Doors open at 11am. Attractions include well known amateur radio traders and dealers, crafts and hobby stalls, computer suppliers, local radio clubs, RAYNET display, raffle, Bring & Buy and an excellent choice of food with a bar open all day. Talk-in on S22 and SU22. Further

information from: **The Rally Organisation**, 29 Court Barton, Weston, Portland, Dorset DT5 2HJ or telephone on (01305) 823373.

**December 7:** The SDX Cluster Support Group & Scottish DX Convention are holding their 3rd SDX Glasgow Rally at the Maryhill Community Halls, Maryhill Road, Glasgow. There will be a variety of special interest groups with stands and displays and Morse test sessions will be available throughout the day. Once again, the famous Jackie & Sandra Cafe will be open for business throughout the day, serving hot and cold snacks, tea, coffee and soft drinks. Doors open at 10.30 for Bring & Buy registration and the cafe is also open for this time. Adults - £3. Senior Citizens - £2 and children under 14 - free of charge with an adult. **John Dundas G1M0PS** on 0141-638 7670 or Packet @ **GB7SAN/GB7SDX** or E-mail: [j.m.dundas@btinternet.com](mailto:j.m.dundas@btinternet.com)

**December 7:** The 40th Northern Mobile Rally (Harrrogate) is to be held at the Flower Hall, Great Yorkshire Showground, Harrogate, North Yorkshire. **Gerald Brady G0UFL**, Rally Manager on (01765) 640229.

**December 14:** The Leeds & District Xmas Radio & Computer Rally is to be held at the Pudsey Civic Centre (Dawsons Corner). All the usual traders will be there, there will also be a talk-in, a licensed bar and disabled facilities, etc. Further information from **John Mortimer** on (01943) 874650 (Bookings Manager), **Gordon Ryder** on 0113-255 0626 (Rally Manager) or from **Malcolm Robertson** on 0113-225 3379 (Club Secretary).

\*December 14: The Ventham Amateur Radio Club will hold its annual

If you wish to have your Rally featured in Radio Diary, all you have to do is to put together as much information about the Rally as possible, i.e. date, location, time, who to contact, etc., and send it to Zoë Crabb at the PW Editorial Office.

rally at the Watford Leisure Centre, Horseshoe Lane, Garston, Watford, Hertfordshire, from 1000 to 1600. The Leisure Centre is located off the A405 near junction 6 of the M1 and junction 21A of the M25. Attractions will include trade stands, Bring & Buy, grand raffle, cafe, licensed bar and free car parking. Morse tests will be available. For further details call (01923) 262180 or for trade information call (01923) 265572.

## 1998

**January 18:** The Oldham ARC Mobile Rally is to be held at the Queen Elizabeth Hall, Civic Centre, West Street, Oldham, Lancashire. Doors open at 1100 (1030 for disabled visitors). The event features all the usual traders plus a Bring & Buy stall. Morse tests are available on demand and there is a talk-in on S22 via **GB4ORC**, commencing at 0730. Mobile Contact prize up to 1400. There will be refreshments and free parking available. (01706) 846143 or 0161-652 4164.

**February 1:** The 13th South Essex Amateur Radio Society Radio Rally will take place at the Paddocks, Long Road, Canvey Island, Essex. This is one of the biggest and best rallies in Essex. (the Paddocks is situated at the end of the A130). Doors open at 1030. Features include amateur radio, computer and electronic component exhibitors, a Bring & Buy, RSGB Morse testing on demand (two passport photos required), home-made refreshments, free car parking with space outside main doors for any disabled visitors. Admission is £1. **David G4UVJ** on (01268) 697978.

\*Practical Wireless & SWM in attendance

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

The Editorial staff of PW cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers. If you have any queries about a particular event, please contact the organisers direct. Editor



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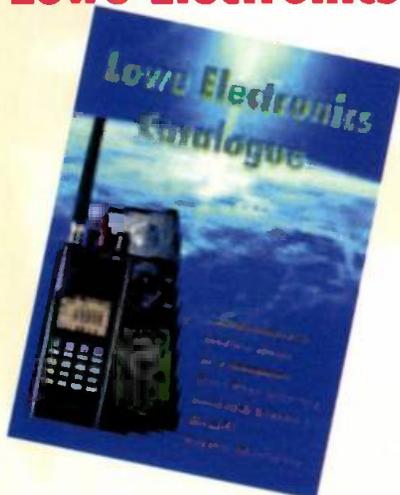
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# Practical Wireless 1997 144MHz QRP Contest Results



It's good to see Novice Licence holders operating in the contest. Here Graham 2E1BUG is operating G6MXP as part of the Poole team's efforts.

Despite the fact that Neill Taylor G4HLX has been working in America for most of 1997 once again he's found time to organise PW's 'fun' contest and now it's time to see just how well your entry did this year!

For the 15th *Practical Wireless* 144MHz QRP Contest, held on the 15th of June 1997, we seem to have had a mixture of familiar and unusual happenings! The one complete break with tradition was the weather, which left many portable groups cold and wet.

Amongst the top positions in the results table, however, I see that the stalwarts have managed to pull off a good performance. And this was despite the combination of appalling weather and poor propagation.

## Wafflers Win

The accompanying tables tell the full story of how the entrants fared this year. The overall winners are the 'North Wales Wafflers' GW0NWR/P, a group comprising of Dave Bevan GW4DMR, Ted Shipton GW0DSJ, Rick Price GW0VMW, Albert Hall GW0RCZ, Barrie Mee GW7EXH and Tony Cartwright 2W1FPK.

After being runners up last year, and in 1994, the 'North Wales Wafflers' have finally achieved a very convincing win, to gain the coveted PW QRP Contest Winners' Cup. They also win the special prize of an Alinco DJ-190 hand-held transceiver, kindly donated by Mike Devereux G3SED of Nevada Communications.

In second place are the Oldham Radio Club G1ORC/P, equalling their highest position achieved in 1993. Their special prize is a Solar

Panel kindly donated by Bob Keyes GW4IED of Key Solar Products.

The Oldham Radio Club have been taking part in the PW contest almost every year since its inception. And whereas other groups have come and gone, they have been consistent in their good performance.

An analysis of the relative scores of all groups in all 15 annual contests since 1983 shows G1ORC/P in second position overall (the outright leaders are still the 'Bug Bashers' group who dominated the results table in the early years of the contest).

## Leading Scottish Station

The leading Scottish station this year was once again the Cockenzie and Port Seton Amateur Radio Club GM0CLN/P,

although this time by a narrower margin over their nearest rivals. They have again been awarded the Tennamast Trophy in Memoriam to Frank Hall GM8BZX, kindly donated and supported by Norrie Brown GM4VHZ of Tennamast.

## New Trophy

A new trophy this year, kindly donated by your generous editor, Rob Mannion G3XFD, is the PW EI/GI Trophy Clock. This will be awarded to Peter Lowrie G17JYK/P, who not only beat the friendly competition from Eire, but was also placed 8th overall, and fourth placed single operator.

This year's leading single operator was PW contest veteran Dave Hewitt GW8ZRE/P, for the second successive year.

As usual PW Contest certificates will be awarded to the leading

Pos.	Callsign	Points	Pos.	Callsign	Points
1	GW0NWR/P	12120	41	G6MXP/P	795
2	G1ORC/P	6136	42	GW4SZV	782
3	GW8ZRE/P	5886	43	GM4VEQ/P	736
4	G4SR5/P	4645	44	G0OKD	636
5	G1POS/P	2793	45	M0BAQ/P	600
6	GW7LDD/P	2717	46	G0TYM/P	572
7	G3RIK/P	2688	47	G4DFV/P	546
8	G17JYK/P	2576	48	G0XKO	528
9	GM0CLN/P	2575	49	M0AVB/P	495
10	G3BPK/P	2310	50	G2HRP	468
11	G8AWO/P	2242	51	G7NRO/P	462
12	GW4NLP	2190	52	GM1YGV/P	450
13	G8DDY/P	2142	53	G7HAH	420
14	GM4HEL/P	2090	54	G8WYR	410
15	G0PJY/P	2052	55	G3MAE/P	407
16	E16ARB/P	1995	56	G0A0H	396
17	GW4IDS/P	1843	57	G1JGE/P	385
18	G0T0J/P	1792	58	G3NFB	376
19	G00WJ/P	1776	59	G0RRC	351
20	G0XBM/P	1760	60	G0LJD/P	310
21	G70CI/P	1710	61	G6EDB	288
22	GM4ZUK/P	1672	62	G7TUA	225
23	G4HRS/P	1647	63	G7KNU	204
24	G0VHF/P	1587	64	GM3RTJ/P	180
25	G0BPS	1500	65	M1BGR	180
26	G0CRW/P	1395	66	G0RVU/P	168
27	M0APO/P	1330	67	G0PZR/P	152
28	E12SOR/P	1281	68	E12IB/P	144
29	G0LXP/P	1119	69	PE1EWR	140
30	G0SRC/P	1110	70	G7XYZ	114
31	G6WIR/P	1035	71	G4NHT	90
32	G0DLR	960	72	G0EHP	88
33	G1WOR/P	936	73	G0LGX	84
34	G5ZG/P	915	74	M1AWQ	76
35	G5M5/P	882	75	E1G0T/S/P	66
36	G3LRS/P	876	76	G7HO	21
37	GW0TPH/P	871	76	F1TVV	21
38	GM7SX/P	848	78	M1FSTUN	5
39	GW3LNR/P	840	79	G6EXT/P	1
40	G1WKS/P	825			

Table 1

stations in the various categories, and also to the leading station in each locator square (see table), to keep alive the local competition that many operators seem to enjoy.

## Adjudicator Absent

Adjudication of the contest has been somewhat hampered this year by your adjudicator being

### Leading multi-operator stations

Pos	Name	Call	Score	OSO	Squ	Loc	Ant	a.s.l.(m)	TX/RX
1	North Wales Wafflers	GW0NWR/P	12120	303	40	IO82	2x17Y	560	FT736
2	Oldham Radio Club	G1ORC/P	6136	236	26	IO93	2x9Y	660	FT290R
3	Stroud Radio Society	G4SR5/P	4645	163	30	IO81	2x11Y	200	FT221R
7	Rochdale & District ARS	G3RIK/P	2688	128	21	IO83	8Y	410	FT290R
9	Cockenzie & Port Seton ARC	GM0CLN/P	2575	103	25	IO85	3x14Y	415	IC275E
10	Wigan - Douglas Valley ARS	G3BPK/P	2310	110	21	IO83	11Y	140	IC751E
11	Mark Gray & Ron Gray	G8AWO/P	2242	118	19	IO91	12Z	125	FT236
12	White Noise Listening Soc	G0WNL/P	2190	146	15	IO81	2x15Y	320	FT290R
14	Clyde Coast Contest Group	GM4HEL/P	2090	95	22	IO74	9Y	710	FT290R2
15	Peter, Dave & Graham	G0PJY/P	2052	108	26	IO83	2x2Q	?	IC290

Table 2

### Leading single operator stations

Pos	Name	Call	Score	OSO	Squ	Loc	Ant	a.s.l.(m)	TX/RX
3	Dave Hewitt	GW8ZRE/P	5886	218	27	IO83	7Z	275	TR751E
5	Jon Page	G1POS/P	2793	133	21	IO92	10Y	300	FT480R
6	Miko Baguley	GW7LDD/P	2717	143	19	IO82	2x9Y	360	FT290R2
8	Peter Lowrie	G17JYK/P	2576	112	23	IO74	13Y	150	FT290R
13	Peter Thompson	G8DDY/P	2142	119	18	IO90	2x11Y	780	FT221
16	John O'Sullivan	E16ARB/P	1995	84	25	IO63	9Y	440	FT290R
22	Allan Duncan	GM4ZUK/P	1672	88	19	IO86	2x13Y	70	TVV144a
27	Barry Williams	M0APO/P	1330	95	14	IO93	12Z	335	IC901E
37	Alan Horne	GW0TPH/P	871	67	13	IO83	4Y	600	FT290R2
38	Andy Williams	GM7SX/P	848	53	16	IO85	9Y	730	FT290R2

Table 3

### Leading Stations

<b>Overall Winners</b>	<b>North Wales Wafflers</b>	<b>GW0NWR/P</b>
<b>Runners Up</b>	<b>Oldham Radio Club</b>	<b>G1ORC/P</b>
<b>Leading Single Operator</b>	<b>Dave Hewitt</b>	<b>GW8ZRE/P</b>
<b>Runner-up Single Op.</b>	<b>Jon Page</b>	<b>G1POS/P</b>
<b>Leading Fixed Station</b>	<b>Dragonslayers ORP Group</b>	<b>G0BPS</b>
<b>Leading English Station</b>	<b>Oldham Radio Club</b>	<b>G1ORC/P</b>
<b>Leading Welsh Station</b>	<b>North Wales Wafflers</b>	<b>GW1VDF/P</b>
<b>Leading Scottish Station</b>	<b>Cockenzie &amp; Port Seton ARC</b>	<b>GM0CLN/P</b>
<b>Leading N. Ireland Station</b>	<b>Peter Lowrie</b>	<b>G17JYK/P</b>
<b>Leading Eire Station</b>	<b>John O'Sullivan</b>	<b>EI6ARB/P</b>

Table 4

### Leading stations using a single antenna

Pos	Name	Calisign	Antenna
3	Dave Hewitt	GW8ZRE/P	7-element ZL-special
5	Jon Page	G1POS/P	MET 10 element yagi
7	Rochdale & District ARS	G3RIK/P	8 element yagi
8	Peter Lowrie	G17JYK/P	Cushcraft 13B2 Boomer
10	Wigan - Douglas Valley ARS	G3BKP/P	11-element yagi
11	Mark Gray & Ron Gray	GBAWQ/P	12-element ZL-special
14	Clyde Coast Contest Group	GM4HEL/P	Tonna 9-element yagi
16	John O'Sullivan	EI6ARB/P	Maspro 9-element yagi
17	Dave Habro & Dan Esdaile	GW4IDF/P	Tonna 17-element yagi
18	Castle Contest Group	G0TOU/P	7-element ZL-special

Table 5

Great weather and a great 'Take off' for the British mainland over the Irish Sea" said Peter Lowrie G17JYK/P. It must have been a good site because Peter won the newly-introduced EI/GI Trophy for the highest scoring Irish entry!



absent from the country for most of the year! My work has taken me to California for a prolonged stay, so that was why, as some of you noticed, G4HLX was not on the air on 15th of June.

As it happened, I found that ARRL were running a 'VHF QSO party' on that same day. It was an event with a rather similar flavour to our own QRP contest, even down to an identical scoring system on 144MHz.

However, I confess that W6/G4HLX was not active in that American event either. This was

because I hadn't got round to assembling a station yet (too many other delights of Southern California to enjoy!).

So, shortly after the closing date for entries, my son Ben G8EQX (yes, he's got my old call sign) packaged up all the logs in his suitcase and brought them with him to San Diego. This was when with the rest of the family, he came to stay with me for the summer.

Those few entries which were submitted late were a nuisance, so their score has been penalised by 5%. The two which arrived very late were lucky to be included at all, as special arrangements had to be made for me to obtain the logs!

My 'temporary export' to the USA led to the results being published a month later than usual. This was as anticipated and announced with the rules in June PW.

The full detailed results list will, as usual, be sent to all those who provide an s.a.e. with their entries, or if you send one now to the PW offices at Broadstone. And of course, they will be available, soon after publication of this

"Hurry up with that QSO...my arm's getting tired"! Members of the Poole Radio Society operating G6MXL/P on the Dorset hills.

issue, on our Internet Web pages at <http://www.rmplc.co.uk/eduweb/sites/ntaylor/pwqrp.html> This Web site also has an archive of results of previous year's contests, back to 1991, and other contest information. This year however, I will not be distributing the tables via the Packet radio network.

### Comments & Reports

The comments and reports I've received this year make interesting reading, and for example the Oldham group, G1ORC/P were amongst those for whom the weather at their elevated site, on Kinder Scout: "made working conditions somewhat uncomfortable. We were in cloud all day with visibility about 50 yards, it almost bamboozled the Peak District Wardens who eventually came across us and reported that they had only located us through sound, and homed in on the radio"!

**Mike Baguley** GW7LQD/P on the other hand notes that: "last year's superb weather was replaced by grey skies, intermittent rain and wind".

At the winner's site, the North Wales Wafflers GW0NWR/P, who set up their station on the Saturday report that: "despite putting

### Leading stations in each locator square

Square	Name	Calisign	No entrants in square
IO62	Michael Kieley & Patrick Keogh	EI2IB/P	1
IO63	John O'Sullivan	EI6ARB/P	3
IO70	Davia Blackford	G3NPB	2
IO72	Aberporth Amateur Radio Club	GW4SZV	1
IO74	Peter Lowrie	G17JYK/P	2
IO76	R. Johnstons	GM1YGV/P	2
IO80	Poole Radio Society	G6MXL/P	2
IO81	Stroud Radio Society	G4SR5/P	4
IO82	North Wales Wafflers	GW0NWR/P	7
IO83	Dave Hewitt	GW8ZRE/P	7
IO84	Castle Contest Group	G0TOU/P	2
IO85	Cockenzie & Port Seton ARC	GM0CLN/P	3
IO86	Allan Duncan	GM4ZUK/P	1
IO90	Peter Thompson	GBDDY/P	4
IO91	Mark Gray & Ron Gray	GBAWQ/P	4
IO92	Jon Page	G1POS/P	7
IO93	Oldham Radio Club	G1ORC/P	7
IO94	Drunken Skunk Contest Group	G0LPX/P	6
JO00	Southdown ARS Ladies	G0HRJ/P	1
JO01	Windbreakers Contest Group	G0VNF/P	11
JO02	Roy Smith	G0RRC	1
JO10	Pascal Delmotté	FT1VY	1
JO11	Frank Laanen	PE1EWR	1

Table 6

waterproof gear on we all ended up soaking that night"!

For Jon Page G1POS/P, the runner-up single operator, it was: "the first time that I have had to do the contest in the rain". Arriving at his site on the Saturday, he realised that he had "forgotten the box with all the nuts and bolts in". But with no transport, having been given a lift to the site by his wife, he had to improvise. "I used bits of fence wire to hold the mast together and managed to make ten elements of the 14-element. All of this in the pouring rain".

However, while operators in Wales and the Midlands of England were struggling to keep dry, others were more fortunate. The Mid-Argyll Amateur Radio

Society GM3RTJ/P report that: "the weather once again was superb with all of us getting quite sunburned".

### Weather & Propagation

Accompanying the poor weather in many parts was rather poor radio propagation conditions in all parts. Most stations did not enjoy any exceptional DX, although as usual those stations in good sites and with good antennas managed to work some very good distances.

But also (as usual), many stations were delighted with what they did manage to work. Peter Lowrie G17JYK/P, for example, says: "I was fortunate to work GI/E17NET/P in IO65 on Rathlin Island for a new square for me



and for my first contact on 144MHz s.s.b. with the island".

**Dave Hewitt**

**GW8ZRE/P** was also pleased to contact **GI/EI7NET**: saying that it was "nice to work IO65 for the first time". Dave also noted a welcome high level of activity in some areas: "Lots of activity from **GM/GI/EI**. I turned the aerial north and was amazed that I worked so many stations".

The Scottish winners, The Cockenzie and Port Seton Club, **GM0CLN/P**, also remarked on "a noticeable increase in 'quality' Scottish entries. Another improvement was the level of **EI/GI** activity". Sadly though, the activity reported was barely reflected in the number of **EI** and **GI** logs received and we somehow need to encourage those who participate on the day to send in their entries. The new **PW EI/GI** Trophy Clock should be an inducement, we hope!

From Cornwall, **David Blackford G3NPB**, reported a lot of local activity: "this year, of my 47 contacts, 38 were Cornish stations". However he doubts that stations in other areas spend much time with their antennas directed to the south-west and asks that "perhaps you could remind stations that there is activity in IO70 and it's another multiplier". (I can

sympathise here, for some operators it can be frustrating failing to get a contact into a square where there really ought to be some activity).

**Andy Williams**

**GM7SXI**, heard one contest station calling **CQ** with these words: "Gentlemen, we are pleading on bended knee for someone in **JO03**"!

Newcomers to the delights of v.h.f. contests discovered some of the unexpected difficulties. For example, **Phil Davies M0AYB/P**, had a task to contend with that will sound familiar to many portable operators: "I was kept busy turning the antenna and 'shooing off' the cows. I don't really mind them licking the car, but I object to them nibbling the windscreen wipers"!

**The Clyde Coast Contest Group**

**GM4HEL/P**, after the steep climb to their 710m a.s.l. site to set up station on the Saturday, found it hard to get any sleep, as in mid-June at that location that "it was still very light at 2330"! The "impromptu karaoke from **GM7GDE** and his **YL**'s tent did nothing for the other operators trying to get some sleep"! Their final weary comments was "The sun returned at 0500 just to make sure tired operators were at their best for an early start"!

More seriously, on the climb to the site of the Oldham club, **G1ORC/P** reports that "one of the club members, **Ian Firby**, who came along to assist in carrying the equipment up the hill slipped and fractured his ankle on the way down". (Bad luck **Ian**. I hope everything's okay now!).

### My Job

A few words now about my job as adjudicator! And I'm pleased to say this is made very much easier by the care which many entrants take in presenting their logs and covering information clearly and as required by the rules.

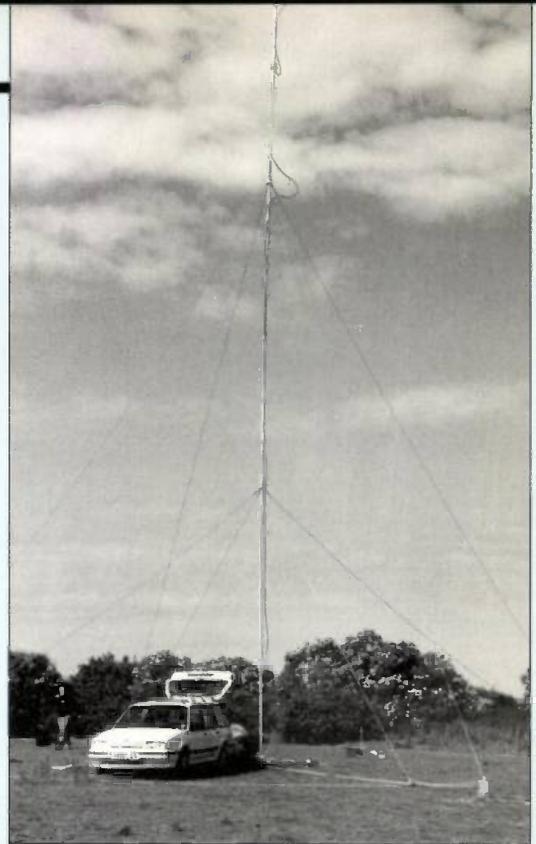
However, there are a substantial number of entrants who still provide incomplete information. The problems include missing list of squares worked, laid out wrongly (e.g. log columns in the wrong order) or logs which are generally hard to read.

The way some entrants provide the covering information I sometimes wonder if they have, in fact, ever read the rules! Serious transgressors will find that their score has been penalised, but I wonder if I'm not too lenient on some others! So, let this be a warning: 1998 might be the 'get tough' year, and more entrants will lose points if they haven't provided the information required.

More than one quarter of the entries received were written on the Cover Sheet and Log Sheet stationery downloaded from the Web site. This really does help as I know instantly where to look for the information I need, and can do the log cross-checks much quicker when there is a standard format.

### Third Sunday

The **PW 144MHz QRP** contest has always been held on the third Sunday in June (actually there was one exception, around 1985). Although this has led to some inevitable clashes with other events, for example a few local radio rallies, it has been



A most appropriate callsign - **GOVHF/P** (Go-VHF-Portable?), a beautiful day and a magnificent looking antenna system for the 'Windbreakers Contest Group' at Walton-On-The-Naze.

generally very popular timing and we shall certainly not change it.

In recent years, the date has also allowed co-ordination with a leg of the **RSGB Backpackers' event**. Very often, though, the date of the contest has also been 'Father's Day'. Responses to this fall into two categories: The **Silverthorn Radio Club G2HR/P** tell me that 'we certainly lost some of our team members this year because it clashed with Father's Day - that was their excuse, anyway'!

On the other hand the more common remark is like this one from **John Rudd G7OCI/P**: "my other operator **G7OKV** is able to 'escape' as the contest falls on 'Father's Day', so he is able to

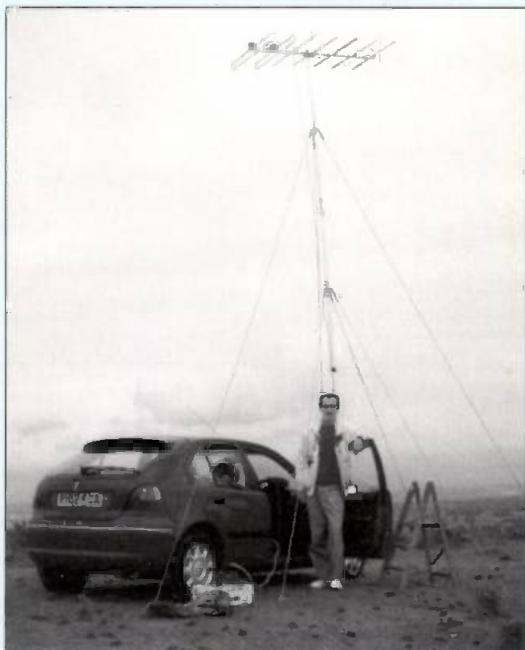
have his treat!

Next year, the third Sunday is later in the month, since June starts on a Monday, putting the contest right on the summer solstice, **21st of June 1998**, with the same duration as this year, **0900 - 1600UTC**. So, mark this in your new diaries, and start planning now!

Thank-you to all who took part in this year's **QRP** contest, and for the enthusiasm which maintains it as the lively, friendly, fun event that we have. Perhaps **David G3NPB**, echoes the thoughts of many when he writes this comment year after year: "as always, it's the highlight of my Amateur Radio year"!

So, here's looking forward to 1998!

**Neill Taylor G4HLX**



Intrepid (and experienced!) single-operator entrant **Dave Hewitt G8ZRE** operating as **GW8ZRE/P** in the 1997 contest.

Practical Wireless, December 1997

Once again on behalf of the Editorial team and all those who take part in the **PW 144MHz QRP Contest** I have to thank the **Neill** for the tremendous hard work organising and adjudicating the event requires on his part. Additionally this year, **Dr Taylor** has had the extra problem of having to do the job whilst being on the West Coast of the USA for most of the time! It meant that the entire **Taylor** family were involved - and the contest entries being flown to the USA. So, again **Neill** I thank you on behalf of everybody - we all appreciate your commitment and dedication and hope this wonderfully friendly and important event will continue for many years to come.

**Rob Mannion G3XFD**, Editor *Practical Wireless*

# Topping's Timed Out

By Colin Topping GM6HGW

**Colin Topping  
GM6HGW has  
come up with  
a simple  
transmitter  
'time-out' unit**

This unit was designed to fit two criteria. One that it should limit the transmissions to a known maximum (but be capable of being terminated at any time within the period) and that it should be both cheap and simple to build. I think I've managed to achieve all those needs!

The circuit of the unit is shown in Fig. 1, and as you can see it is very simple, a single 555 timer chip and a few other components. In its simplicity the workings are easy to understand. The integrated circuit IC1 is connected as a 'single shot' mode. As shown, the output (pin 3) of IC1 is low and will remain there until triggered by taking pin 2 low using S2, the 'Start' switch.

Immediately after S2 shorts to 0V the timing capacitor C1 starts to charge through R1 and the voltage across it rises with a time controlled by R1 and the capacity of C1 itself. At the same time the voltage on pin 3 shoots up to a maximum value, which switches on relay RL1 connecting the common to the normally open contact.

When the voltage across C1 reaches a predetermined value (a known percentage of the supply voltage) the timer takes the voltage on pin three low. This allows the relay RL1 to switch off, returning RL1 to its normal state.

At any time during the time period pressing S1 will (almost) instantly take the voltage on C1 above the threshold point and effectively terminate the timing period. The purpose of diodes D1 and D2 is to protect the integrated timer from the voltage 'kick' (back e.m.f.) caused by rapid changes of current (at switch over) in the coil of relay RL1.

You could have two separate resistors serving the part of R1, each selected by a single pole two-way switch. This is the system I've implemented on my version of the timer - with settings of one and four minutes.

I've not included a shopping list as the unit is so simple - you could use whatever size components that are to hand. Relay RL1 should

have a 12V coil, and may have more contacts than those shown. For easiest time setting I've found that, for R1, the small screwdriver slotted multi-turn 'Cermet' units are best suited.

## Simple Construction

I've shown a simple construction diagram, Fig. 2, of one small

layout made on the ubiquitous Veroboard. Using a piece seven tracks wide by 16 holes long, there are only four track breaks needed at C7, D7, E7 and F7. But you don't have to follow this particular layout, but it is small.

So don't sit there get your soldering irons out. No time out for laggards!

PW

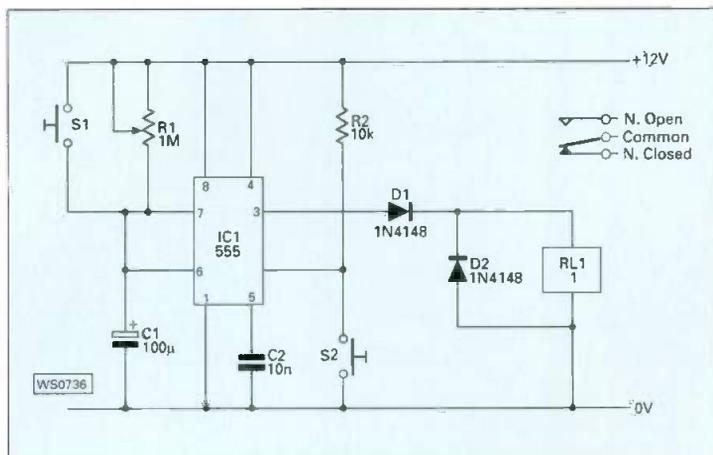


Fig. 1: This is the simple circuit of Colin's timer (the unmarked pin on IC1 is pin 2). See the text for a description of how it works.

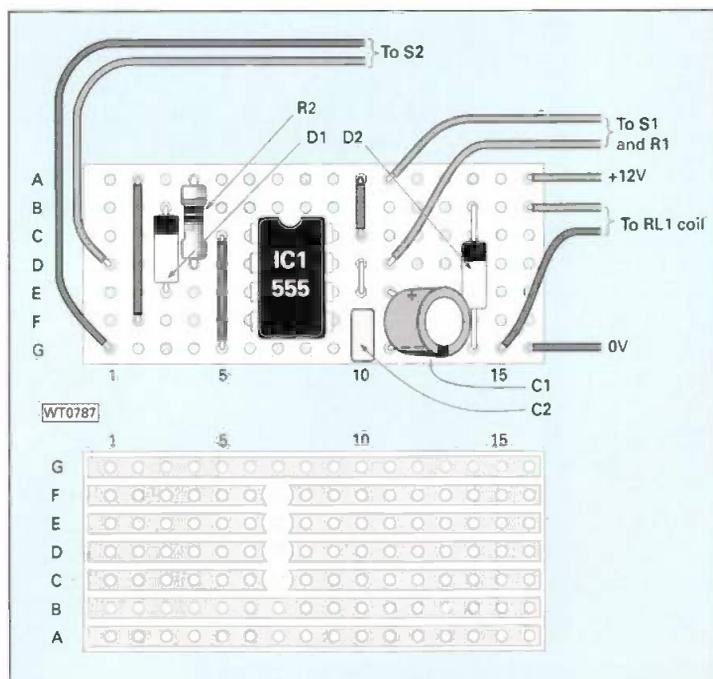


Fig. 2: Following this Veroboard layout allows a small unit size to be achieved.



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- Opto Explorer ..... Our price **£795.95**
- Opto Lynx ..... Our price **£129.95**
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- Handheld scanner ● 500kHz-1300MHz
- All mode ● 1000 channels with alpha tag.

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### AR-8000

Wideband handheld scanner covers 500kHz-1900MHz (all mode).

SPECIAL OFFER

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### YUPITERU MVT-7100EX (UK)

100kHz-1650MHz. Wideband scanner with SSB. RRP ~~£349.95~~

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Matches all hand helds. Can be worn on the belt or attached to the quick release body holster.

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# PalStar KH-6

## Low Cost, High Quality & A

By Richard Newton GORSN

*Richard Newton GORSN says a sensible 50MHz hand-held has been a long time coming but now it's here he's convinced it was worth the wait!*

As a Novice Instructor I have long awaited the arrival of a sensible 50MHz hand-held f.m. transceiver that would be accessible to all, including Novice licensees. I am just amazed it took this long!

Therefore I was delighted when I saw the advert for the new Palstar KH-6 50MHz hand-held. My delight then turned to utter excitement when the team from *PW* contacted me to ask whether I would put it through its paces.

The Palstar KH-6 is a 50MHz hand-held transceiver, it covers 50-54MHz. It is supplied with a small helical antenna, carry strap and a belt clip. The battery pack is designed to take dry cell or NiCad type batteries. A sealed NiCad battery pack and charger are available as an optional extra.

### Simple By Design

The KH-6 is simple by design and easy to operate. Both of these observations are very much to the radio's credit. The top panel has the **On/Off** and **volume** rotary knob and the **squelch** rotary knob.

The radio features a BNC antenna connection. It also has the standard 'Speaker Mic' jack plug connections. I connected a Speaker Mic that I use with my Icom hand-held, and this worked very well indeed.

The side panel of the KH-6 is 'home' to the **Press-to-Talk** button and the **Up/Down** buttons. It tunes using 10kHz steps, however 5kHz can be added to any frequency by use of a front panel button. For quick tuning, 1MHz steps can be achieved by the use of the '**F**' key and Up or

Down together.

The front panel buttons are used to access this little transceiver's many features. They are also used to access the KH-6's five standard memories and the 'Call' memory.

The KH-6 has all the features I would want in a radio of this type. It has full CTCSS encode and decode, five memories that can be very easily programmed and scanned.

There is a 'Call' channel that can be programmed for easy, one button access to a frequency. This could be used for your local repeater, the call frequency or perhaps a local Net frequency for example.

One of the features that immediately struck me was the display of the KH-6. The frequency read out is large and easily seen, even when the 5kHz step is activated. Other display items such as Low Power select and the 'S' Meter reading are also well defined and the back light is excellent.

The KH-6 is a splendid looking little radio. It's the size a hand-held should be. When you hold it, you know you are holding a radio!

However, the transceiver is small enough to be highly portable and by no means cumbersome. It's well finished in grey metal and plastic and I think the whole design is very tasteful.

### Two Power Settings

The KH-6 has two power settings. With it's 12V supply it offers a choice of 5W on high power and 1W on low power.

The rig also features a 'power save' function, which is important for a waffler like me, as the battery pack

does not last long. An attachment to allow connection to external power is available as an optional extra.

In my opinion there will be no problem using the all new 50MHz repeaters with the Palstar KH-6. As I have already motioned it's fitted with CTCSS, it also has 'Repeater shift' function.

The repeater shift function itself is very easy to activate. It's a single button press operation. However, I could not find a way to easily reverse the repeater setting, so that the repeater input frequency could be monitored.

The flexi-whip antenna that is supplied with the KH-6 is rather small. It's neat looking and works well for short range communications such as around a rally site, but for anything else I am afraid it's of little use.

There is, however, a somewhat longer flexi-whip antenna available as an optional extra. This is about the most needed 'optional' extra I have ever come across!

I was loaned this longer antenna with the review radio and the difference was staggering. The efficiency of the KH-6 was tripled at the very least.

### Making Contacts

It never ceases to amaze me that a band as diverse and exciting as 50MHz has been so neglected for so long. There is some 50MHz activity in my area so, I was looking forward to getting some contacts under my belt.

My first QSO using the KH-6 was a little bit of a cheat, as I set-up a sked with **Steve GIYNY**. I used the

REVIEW

# Accessible To All

KH-6 mobile, using the long flexi-whip stuck out of the window (the passenger window I hasten to add!).

The initial trial did not go too well, the range seemed to be less than 144MHz would have taken us, however, there were many variants at work here, not least of which was the rather difficult to control antenna! What this test did illustrate though was the excellent audio the KH-6 boasts both on transmit and receive.

When I got home Steve and I tried again. Steve lives about 19km away from my home, we are both pretty well at sea level and we have the conurbations of Bournemouth and Christchurch between us.

I could just about hear Steve when I was using the long antenna on the KH-6. Steve could hear me in the background but that was about it. And even as I say that I still reckon that's a quite impressive for a hand-held over that distance and terrain.

I then connected the KH-6 to my W2000 triple band vertical for 50, 144 and 433MHz. As you can imagine this made somewhat of a difference.

With my triple band vertical in place my revised signal report from Steve was 5 and 9. And as I started to explain to Steve that I had not heard anything on the band I was proved wrong, as always!

Peter GOROJ in Christchurch and Alan G7MYI in Cranborne some 24 to 32km away called in to say hello and give me a report. Both Peter and Alan gave me very good signal reports and very favourable reports on the transmitted audio. They were telling me that a couple of Novice stations they knew had got KH-6s and were using them to good effect.

As I was sat at my computer typing the final draft of this review I

had the KH-6 just sat on the table monitoring the local Net frequency. All of a sudden up 'popped' Jerry G7JEZ.

I had a chat with Jerry who was in QSO with Stan G1LUM, who sadly I could not hear as I was using the small flexi-whip antenna. We were then joined by Alan G7MYI from his home in the Cranborne area. To my amazement I could hear him.

Then to my utter surprise Alan said he could also hear me. A trip of about 24-32km on a hand-held with a small whip antenna, this I thought was very impressive.

Despite all this the 50MHz band still seems rather quiet. Although I expect some prefer it that way!

I'm certain that this wonderful KH-6 hand-held will go a long way to encourage a lot of people onto this band, at least I hope so. The 50MHz band has so much to offer.

Good short-to-medium range and medium-to-long range communications are achievable on 50MHz with good conditions or repeaters. Not forgetting the fantastic DX when conditions are really good. Well done to Palstar for doing what so many others should have done ages ago!

## Exciting And Diverse

The Palstar KH-6 is simple but effective. I think it represents excellent value for money.

Amateur Radio is exciting because of its diversity and sense of adventure in things new and old, a fact some of us seem to forget sometimes. So, no matter if your interest is Packet radio, f.m. DXing, local 'chit chat' or having a bit of company in the car, the Palstar KH-6 is a low cost high quality way to



The KH-6 operates from a battery pack which is designed to take dry cell or NiCad type batteries. Also shown here is the sealed NiCad battery pack which is available as an optional extra (see text).

## Manufacturer's Specifications

### General

Frequency range	50 - 54MHz
Frequency control	Phase Lock Loop (PLL) Synthesiser
Frequency stability	± 0.001%
Operating temperature	-10°C - +55°C (14 to 131°F)
Power source	DC 7.2-12V
Dimensions	55 x 130 x 36mm
Weight	0.4kg without battery
Antenna connection	BNC (50Ω)

### Transmit

Power output @ 12V	High 5W - Low 1W
Frequency modulation	Narrow band f.m. 5kHz maximum
Current drain	900mA @ full power
Distortion	3% normal @ 3kHz deviation
Microphone sensitivity	6mV nominal

### Receive

Circuit type	Superheterodyne - Dual Conversion
Intermediate frequency	First i.f. 10.7MHz Second i.f. 455kHz
Audio output	400mW
Standby current	35mA w/o battery save
Sensitivity	0.3µV

experience a fun band, I look forward to meeting you all on 51.51MHz!

My thanks go to Nevada of 189 London Road, North End, Portsmouth, Hampshire PO2 9AE. Tel: (01705) 662145, FAX: (01705) 690626 for the loan of the Palstar KH-6 for review. The KH-6 complete with small whip antenna, carry strap and a belt clip costs £149, the HF-50L Flexi Antenna costs £12.95, the NP-126 NiCad Pack (12V), £29.95 and the Nic/060 NiCad Mains Charger, £9.95. Other accessories are also available, details of which can be obtained direct from Nevada.

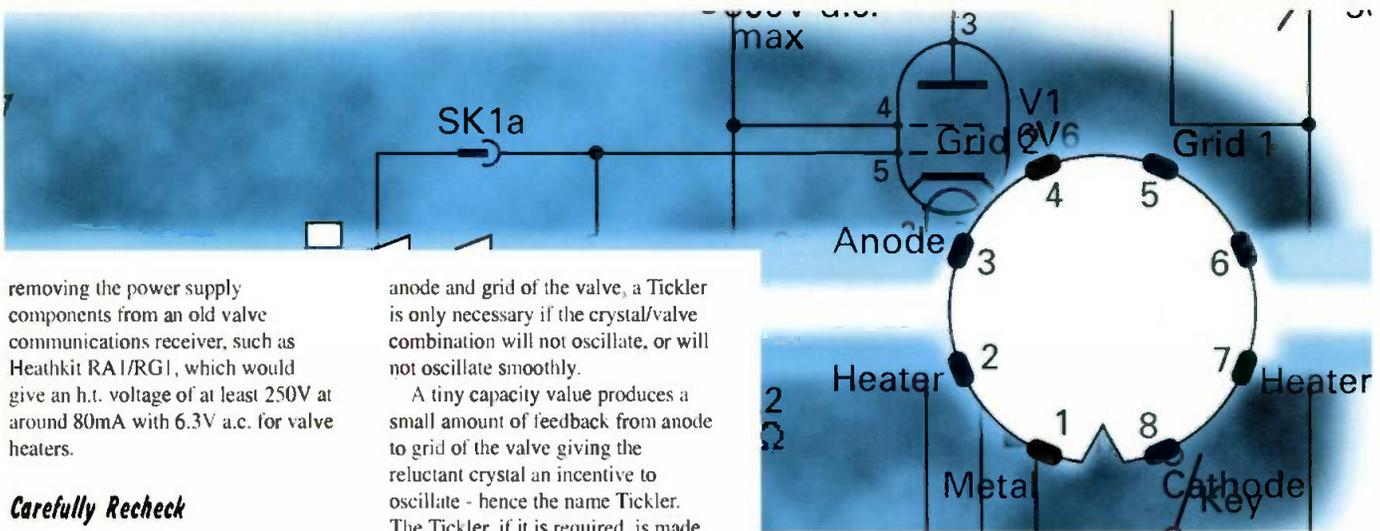
Simple by design and easy to operate. The top panel houses the On/Off and volume rotary control together with the squelch control.

PW









removing the power supply components from an old valve communications receiver, such as Heathkit RA1/RG1, which would give an h.t. voltage of at least 250V at around 80mA with 6.3V a.c. for valve heaters.

### Carefully Recheck

After completing the construction, but before applying power, carefully recheck the wiring accuracy, a power meter with a 50Ω dummy load should be inserted onto the coaxial socket, a crystal into its socket and the unit connected to the p.s.u.

Set capacitor C6 about mid-range and C7 at maximum capacitance. After a couple of minutes warming up period, the h.t. can be switched on and the Morse key depressed.

Then C6 should be quickly rotated to resonance (a dip in the meter current). Loading capacitor C7 can then be adjusted for maximum into the load and C6 readjusted to dip as necessary.

Readjustment of both C6 and C7 should be carried out to put the maximum r.f. power into the 50Ω load. The set is now ready to be connected to the antenna via a low-pass filter.

Although the Pi-match could go direct to the antenna, I use another (external) a.t.u. Having adjusted the tuning you can now check the sound of the keying with a receiver.

### Tickled Crystals

Some of the older type of crystals may not oscillate, or they may just oscillate spasmodically giving a 'chirping' note. This problem can often be cured with a 'Tickler'. The 'Tickler' is a small value capacitor (made from a short length of twin figure-of-eight well insulated wire). Fitted in the circuit between

anode and grid of the valve, a Tickler is only necessary if the crystal/valve combination will not oscillate, or will not oscillate smoothly.

A tiny capacity value produces a small amount of feedback from anode to grid of the valve giving the reluctant crystal an incentive to oscillate - hence the name Tickler. The Tickler, if it is required, is made of a short length of well insulated figure-of-eight twin wire, shown in Fig. 6.

At one end, the wires are slightly separated and soldered to the anode and grid pins (3 and 5) on the valve socket. The shortest possible Tickler should be used and a little trial and error will be needed starting with a 25mm length. Always switch off the power supply before adjusting the tickler.

### Conclusion

The single valve transmitter is a simple, and quite inexpensive almost QRP level transmitter which will make an interesting and 'different' project for the home constructor. For the old timers, it should bring back happy days.

For the newcomer, weaned on low voltage transistor circuits, it will give an introduction to the wonderful magic of valves. The project is simple to make, simple to operate and will produce excellent results.

### Warning

I must give a warning to the many home constructors only familiar with the low voltages associated with transistor equipment. With valved transmitters, high voltages are present and great care should be taken.

PW

### Shopping List

#### Capacitors

<i>Polyester layer 400V (min) working</i>		
4.7nF	5	C1, 2, 4, 5
<i>1kV (min) high voltage disc ceramic</i>		
1n	1	C3
<i>Variable (airspaced preferable)</i>		
365pF	1	C6
365+365pF	1	C7 (a and b)
<i>Electrolytic 450V working (minimum)</i>		
16μF	2	C8, 9

#### Resistors

##### Carbon resistor (0.5W)

22kΩ	1	R1
<i>Carbon resistor 2W rating</i>		
220Ω	1	R3
15kΩ	1	R2

#### Valves

6V6GT	1	V1 (metal jacketed preferred) or 6L6GT
EZ81	1	V2

#### Inductors

2.5mH	2	RFC1, 2
10H	1	L2
L1		see text
RFC3		see text
T1		is a 300-0-300V + 6.3V (@1A) + 6.3V (@1.5A)

#### Miscellaneous

You will also need two valve bases (get them from the valve supplier at the same time), a 50 (or 100)mA meter, a suitable box/chassis a suitable crystal and socket, adequately insulated hook-up wire (separated from mains cable perhaps), suitable switches for S1 and S2.

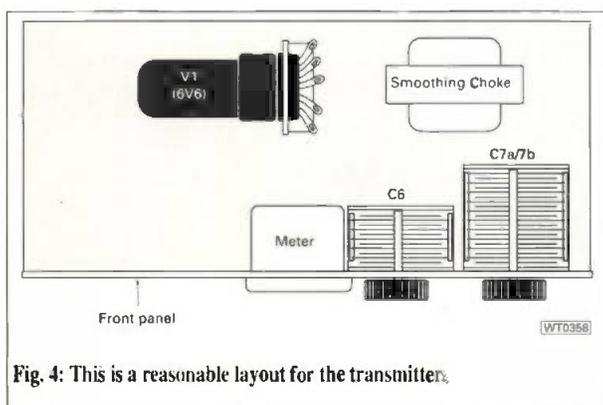


Fig. 4: This is a reasonable layout for the transmitter.

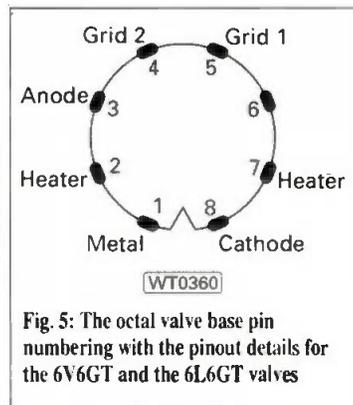


Fig. 5: The octal valve base pin numbering with the pinout details for the 6V6GT and the 6L6GT valves

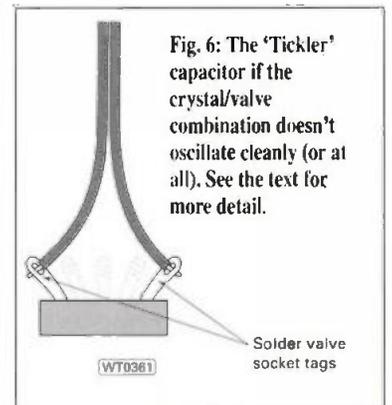


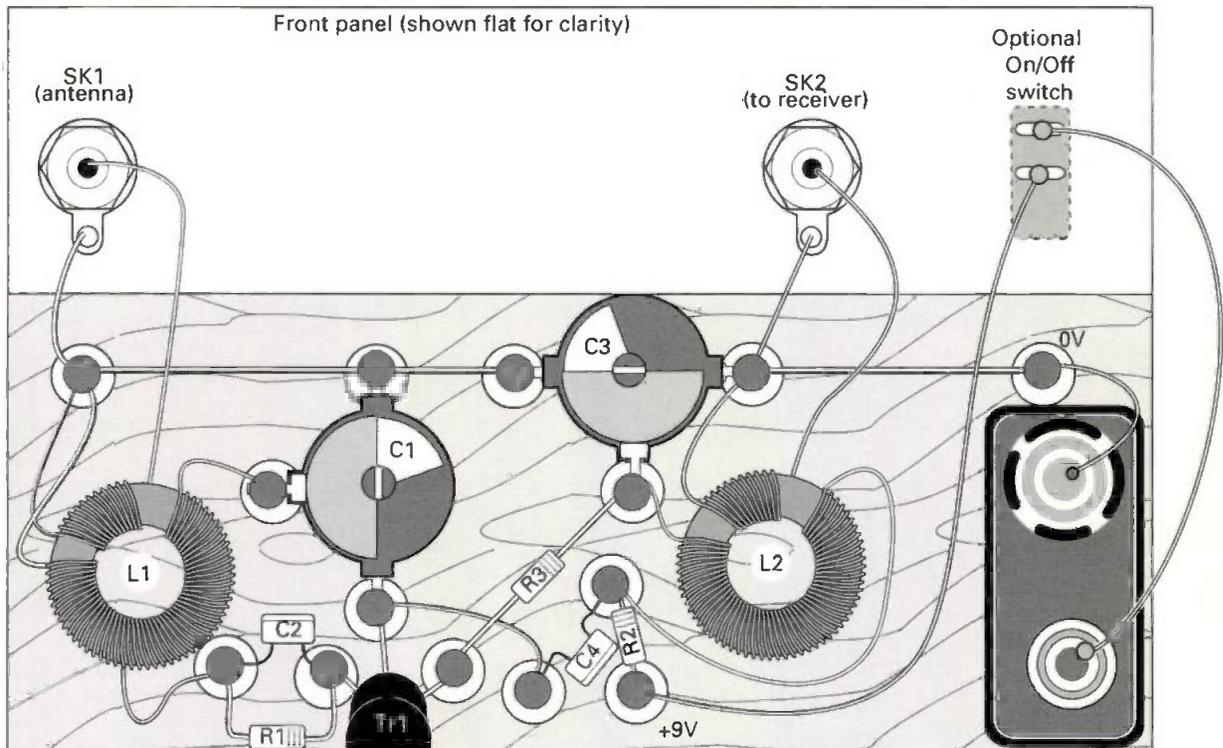
Fig. 6: The 'Tickler' capacitor if the crystal/valve combination doesn't oscillate cleanly (or at all). See the text for more detail.

# Errors & Updates

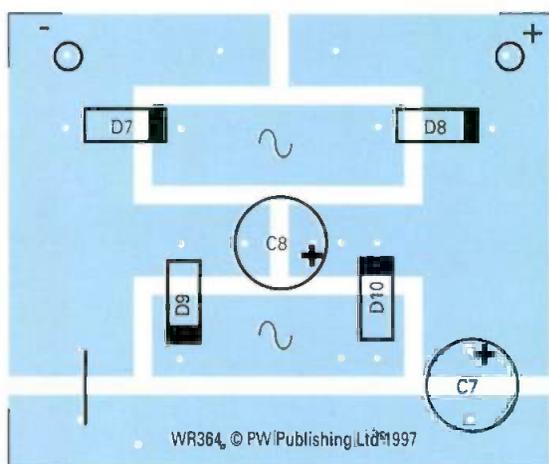
## Back To The Drawing-Pin Board, page 52 PW October 1997

The gremlins managed to get at the overlay drawing of Steve Ortmayer's 7MHz pre-amplifier. However, the circuit diagram escaped their attention, and this is correct. A revised overlay diagram is shown here and replaces Fig. 2 on page 52 of the October issue of *PW*. In this correct version the end of R2 is connected to L2 as in circuit design.

*My apologies for this mistake. Editor*



## Carrying On The Practical Way, pages 72/73 PW November 1997



In the article on creating your own p.s.u. on a standard 'island' style board, the gremlins were at it again. In Fig. 3 on page 73 an extraneous thin line appeared touching D3 in the overlay drawing. The overlay drawing of Fig. 5 is also unfortunately the wrong one, please insert the drawing shown here

*My apologies for these mistakes. Editor*

# SIMPLE AS

# 1 2 3

## The Trio JR-599 Receiver & T-599 Transmitter

By Ben Nock G4BXD

*Ben Nock G4BXD takes a look at a receiver and transmitter combination from the Trio 'stable'. And in his opinion they form a 'classic' combination' now available for a very reasonable price on the second-hand market.*

The late 1960s through to the early 1970s saw the introduction of the Trio JR-599 communications receiver and its matching transmitter, the T-599S. Available on the second-hand market, I think these 'separates' could provide a cheap, easy introduction to the world of h.f. operating without the need for taking out a second mortgage!

As well as being available at a reasonable price, the receiver has the additional attraction of being capable of modification and additions. The factory 'up-graded' version being renamed the 'Custom Special'.

The Custom Special receiver has the extra i.f. filters needed for a.m. and f.m. reception. Another version has a 144MHz converter fitted (the M version), whilst another (the X version), has both the 144 and a 50MHz converters fitted.

### The JR-599 Receiver

The JR-599 receiver is fully transistorised, and it's the same with the transmitter with the exception of a valve driver and a pair of p.a.

valves. (I've outlined the specifications for both the sets in Table 1).

The receiver uses 26 transistors, 5 f.e.t.s, one integrated circuit and 35 diodes. A 3SK22 device is used in the r.f., 1st mixer, 2nd mixer and v.f.o. circuits, the remaining transistors being of the 2SC460, 2SC378, 2SC733 variety.

The audio output stage is a 2SD90 and 2SB473 devices in a transformerless configuration. A TA7045M i.c. is used as the 1st i.f. amplifier. (The block diagram of the receiver is shown in Fig. 1).

In its basic form the receiver tunes the familiar 'old' amateur bands of 1.8, 3.5, 7, 14, 21 and 28MHz, plus reception of the WWV frequency standard on 10MHz. No coverage of the WARC bands, with the exception of 10MHz as mentioned, is available.

The M version includes a 144MHz converter, which is tuned using the 28MHz range on the receiver. The same technique is used for the X version which includes converters for 144 and 50MHz converter.

### Double Conversion

The receiver, the front panel layout of which is shown in Fig. 1a, employs standard double conversion superhet principles. It incorporates a first 'broadband' i.f. of 8.295 to 8.895MHz feeding the second mixer to produce a fixed second i.f. of 3.395MHz. The second i.f. is where the various filters are fitted and where the selectivity factor is set.

If all the filters, c.w., s.s.b., a.m. and f.m. are fitted then selectivities of 500Hz for c.w., 2.5kHz for s.s.b., 5kHz for a.m. and 25kHz for f.m. are available.

An unusual feature of the receiver is that the i.f. filter can be selected either manually. This is regardless of the mode being received, or it can be left in an 'auto' mode that selects the more normal filter dependent upon the setting of the mode switch itself (for example: the 500Hz filter for c.w. reception).

A 10 position crystal oscillator is used in the first mixer stage with the main v.f.o. operating between 5.5 to 4.9MHz, employed in the second. In addition to the main v.f.o. tuning dial, a separate receiver incremental tuning (RIT) control is provided, and this will be useful if the receiver is used in conjunction with a separate transmitter.

Separate detector stages, balanced ring, diode and ratio, are used to resolve s.s.b., a.m. and f.m. signals respectively. In addition to the v.f.o., there's provision for a crystal oscillator with up to five crystal controlled frequencies selectable by switch.

As the crystals replace the v.f.o., and can be between 4.9 and 5.5MHz, each crystal used will in fact give a crystal controlled channel on every band. For example, using a crystal of 5.4MHz will result in monitoring of 1.9, 3.6, 7.1, 14.1, 21.1, 28.1, 28.6, 29.2MHz frequencies.

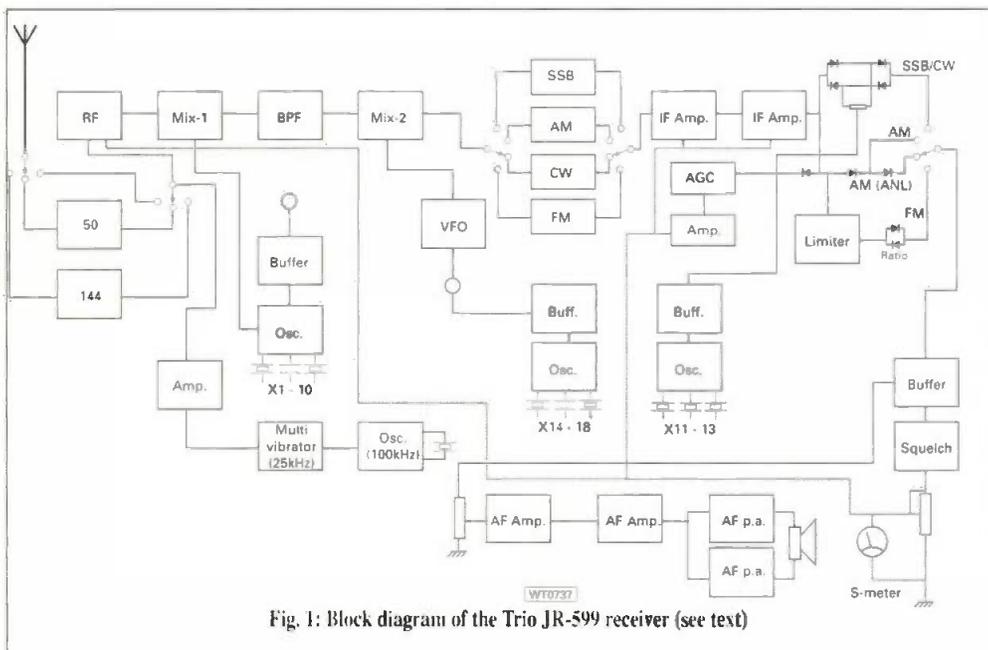
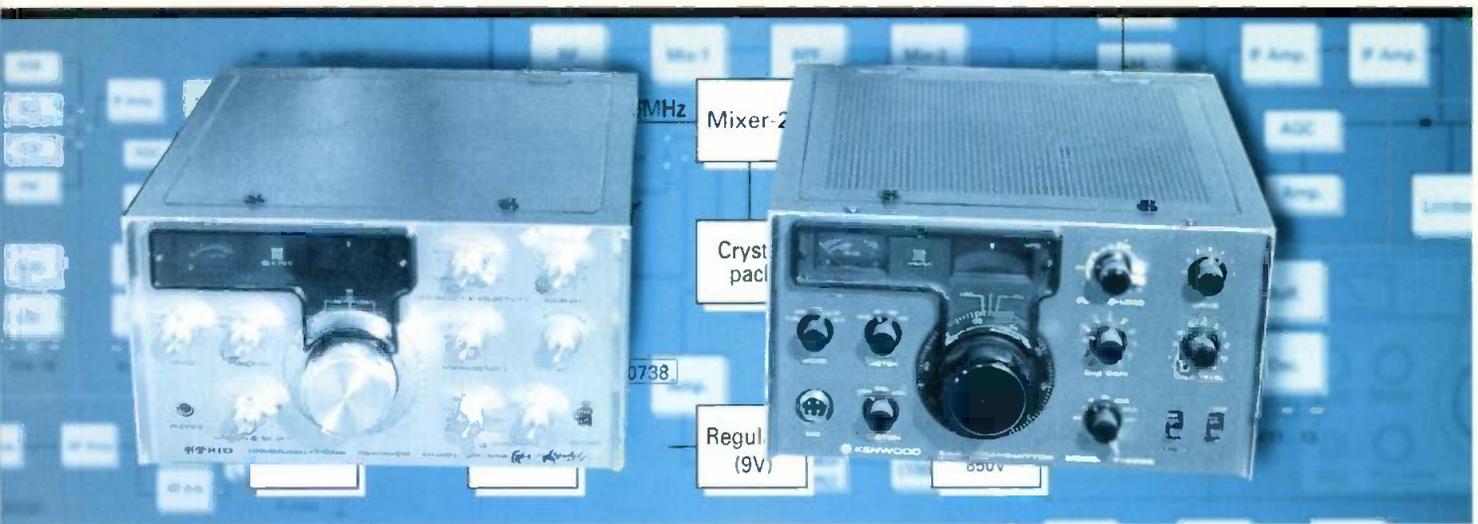


Fig. 1: Block diagram of the Trio JR-599 receiver (see text)



A front panel switch operates a stepped resistive attenuator fitted in the antenna feed line. This facility provides fixed levels of r.f. reductions of 20, 40 and 60dB (a fully variable r.f. gain is not fitted to the set).

A 100kHz crystal oscillator is provided as a calibrator. This also drives a 25kHz multivibrator to supply 100 and 25kHz frequency marker pips.

Amplified a.g.c. voltage is used to drive both the S-meter circuit and provide gain regulation for the r.f. and i.f. amplifier stages, with the a.g.c. response time being selectable between fast and slow.

The receiver includes a built-in mains power supply unit and consumption is only 15W. However, it can also be run of a separate 12V source, a rear panel switch selecting the supply, and 1A supply is required for this option.

The rear panel also contains the antenna sockets (both h.f. and v.h.f. if fitted). It's also where the speaker terminals and a remote socket (for use with the matching transmitter) are located.

### The T-599S Transmitter

The matching T-599S transmitter employs 30 transistors, four f.e.t.s, one integrated circuit, 38 diodes and three valves. The s.s.b., generated at 3.395MHz, is mixed with the v.f.o. to give a first mix of 8.895 to 8.295MHz, this is further mixed with a switched crystal oscillator to give the required operating frequency.

The mixing frequencies and intermediate frequencies are the same as the receiver. Because of this the pair can be used in transceiver operation with either v.f.o. controlling the operating frequency.

All the stages employ semiconductors with the exception of the driver stage, a 12BY7A, and the power amplifier stage which utilises a pair of S2001, or 6146Bs.

with a standard Pi type output circuit. The block diagram for the transmitter is shown in Fig. 2 and the front panel layout in Fig. 2a.

A built-in semiconductor power supply provides 850V for the p.a. stage valves and the various other supplies required by the set. Other facilities include automatic voice-controlled transmit-receive (VOX) operation, block bias keying for c.w. work and provision of sidetone monitoring.

The front panel mounted meter can be switched to monitor various parameters. These include the a.l.c. level, the p.a. stage cathode current, the r.f. output or the p.a. stage h.t. voltage.

The rear panel of the transmitter houses the main antenna socket and the receiver antenna output. There are also sockets for a.l.c. voltage feed from a linear, c.w. key socket, a low power transverter output and 'p.a. disable switch', a switch selecting transceiver or 'separates operation'.

Mains is applied through the rear-mounted power cable and there's a matching remote socket for use with the receiver. A rear mounted fan is provided to supply forced air cooling for the p.a. valves.

Whilst the pair are obviously styled to match each other a strange thing is that although the receiver is badged as a Trio the transmitter is badged as a Kenwood. Because of this, I think it was possible that versions badged in either logo were available.

I also believe there may have been slight differences in case colour available. The pair reviewed for this article were in silver for the receiver and dark grey for the transmitter, but the matching sets were the same colour.

(Incidentally...a matching speaker, the SP-55, was available to finish off the styling of these units).

### In Use

So much for the technical details...but what are the units like in use! And to start, the receiver does lack the now familiar i.f. shift, and facilities like an audio notch filter, it has only one v.f.o. and no memories to fill. But as a straightforward, Amateur bands communication set, it does perform very well.

Feeding the receiver with a decent antenna there are plenty of signals to hear, and the s.s.b. filter proved to be quite adequate to the job on the crowded 7 and 14MHz bands. However, replacement of the r.f. and mixer f.e.t.s with lower noise and better quality devices could possibly improve the set a little.

In operation, the transmitter unit's mode switch has a Tune position. This apparently puts the transmitter into transmit mode without the microphone amplifier or p.a. stage being connected, thus allowing the tuning of the drive

Table: 1

Trio JR-599 Receiver Frequency Coverage

Band	Coverage
1.8MHz	1.8 to 2.30MHz
3.5MHz	3.5 to 4MHz
7MHz	7 to 7.5MHz
14MHz	14 to 14.5MHz
21MHz	21 to 21.5MHz
28MHz	28 to 28.5MHz
28.5MHz	28.5 to 29.1MHz
29.1MHz	29.1 to 29.7MHz
50MHz	50 to 53.4MHz (Model X Only)
144MHz	144 to 146MHz (Model M, X only)
WWV	10MHz

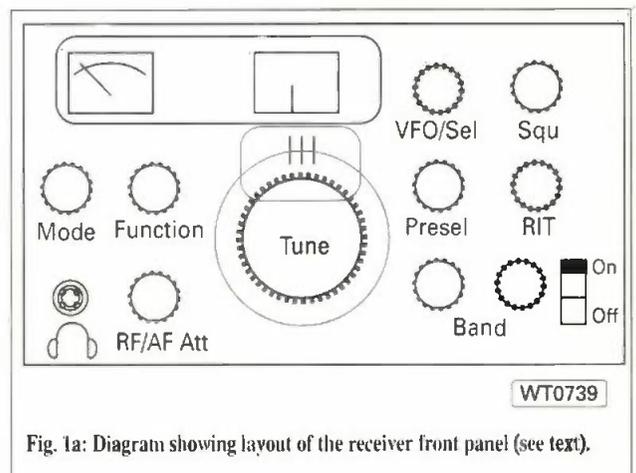


Fig. 1a: Diagram showing layout of the receiver front panel (see text).

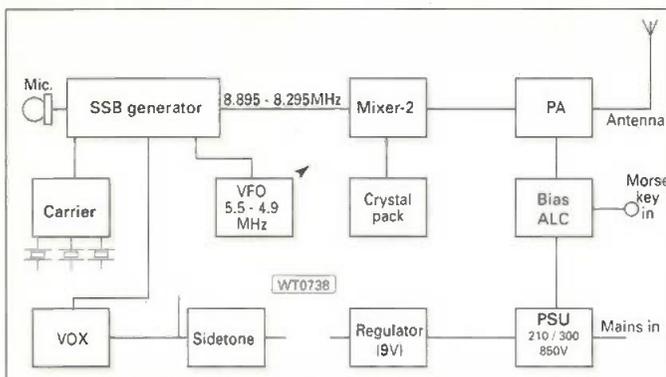


Fig. 2: Block diagram of the T-599S transmitter (see text).

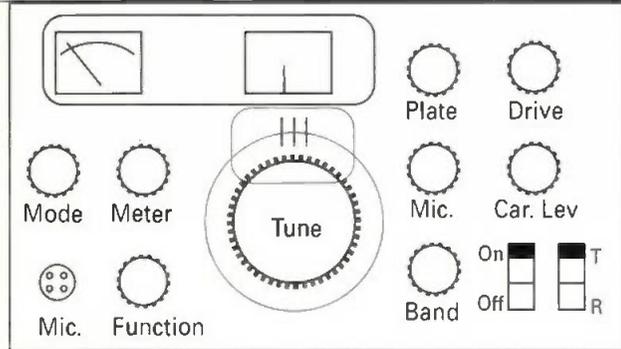


Fig. 2a: Diagram showing layout of the transmitter front panel (see text).

control first.

With the mode switch to c.w., and the key pressed (if connected) the p.a. is engaged and the normal procedure of 'dip' and 'load' for a Pi-output is undertaken with the p.a. 'plate' and 'load' controls. (You should remember of course, not to hold key down in the un-dipped state for too long if you wish to keep the p.a. bottles for a long time!)

### No 'Top' Band

Whilst the transmitter can drive an external transverter, to match the 50 or 144MHz coverage option on the receiver, the transmitter does not

cover the 1.8MHz band. So, with no additional crystal positions or spare banks on the band change switch, it cannot be added easily. The front panel layout is shown in Fig. 2a.

In conclusion, it's my opinion that if a Trio JR-599 and T-599 combination can be obtained, in good condition and at a reasonable cost you're on to a good thing. I'm sure any newcomer to the bands would be able to enjoy many hours of fun, without the worry of a bank overdraft!

PW

## Manufacturer's Specifications

### Trio JR-599

**Sensitivity (c.w./s.s.b.)**  
 1.8 to 21MHz 0.5µV for S/N 10dB or more (Image ratio >50dB)  
 28MHz band 1.5µV for S/N 10dB or more  
 50MHz band 1/5µV for S/N 10dB or more  
 144MHz band 2µV for S/N 10dB or more

### Sensitivity (a.m.)

1.8 - 21MHz 2µV S/N 10dB or more  
 28MHz band 4µV S/N 10dB or more  
 50MHz band 2µV S/N 10dB or more  
 144MHz band 3µV S/N 10dB or more

### Selectivity

On s.s.b. -6dB at ±1.1kHz, -60dB at ±2.5kHz  
 On c.w. -6dB at ±250Hz, -60dB at ±750Hz  
 On a.m. -6dB at ±2.5kHz, -60dB at ±5kHz  
 On f.m. -6dB at ±30kHz

**Dimensions:** 270 x 140 x 310mm

**Weight:** 5.7kg

### Trio T-599 Transmitter

#### Frequency coverage

Band	Coverage
1.8MHz	(Note: no coverage)
3.5MHz	3.5 to 4MHz
7MHz	7 to 7.3MHz
14MHz	14 to 14.35MHz
21MHz	21 to 21.45MHz
28MHz	28 to 28.5MHz
28MHz	28.5 to 29.1MHz
28MHz	29.1 to 29.7MHz

#### Modes:

s.s.b., c.w., a.m.

#### Power amp.

stage input: (s.s.b./c.w.) 3.5 to 21MHz 160W 28MHz 140W

#### Amplitude mod.

p.a. stage input: 3.5 to 21MHz 80W (28MHz 60W)

#### Carrier suppression:

-40dB or more

#### Unwanted sideband:

-40dB or more

#### Output impedance:

50 to 70Ω

#### Microphone input impedance:

impedance: 600Ω or 50kΩ (switch selectable)

**Dimensions:** 270 x 140 x 310mm

**Weight:** 12.5kg



Fig. 3: Photograph illustrating the inside cabinet view of the JR-599 receiver. The built-in 144MHz converter can be seen at the top centre right, with space for the optional 50MHz converter alongside (see text).



Fig. 4: Inside view of the T-599S transmitter. The p.a. stage is on the top right within the screened compartment, and the v.f.o. on the bottom left. Linking between the variable capacitor control shafts and the capacitors is by substantial 'non slip' chain drives!

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EF89	1.60	QQV03-6	12.00	6AK5	1.45	12H6	4.70	Set of AR88 valves	£35.25.		£35.25	240V transformer, output 18.5V, 26V, 29V, 35A and 26V, 5A £35.25 ea.
EF91	1.55	QQV03-10	7.65	6AL5	1.00	12HG7	7.70	Set of AR88 valves	£35.25.		£35.25	240V transformer, output 18.5V, 26V, 29V, 35A and 26V, 5A £35.25 ea.
EF95	1.45	QQV03-20A	14.00	6AM6	1.65	13CW4	32.90	Set of AR88 valves	£35.25.		£35.25	240V transformer, output 18.5V, 26V, 29V, 35A and 26V, 5A £35.25 ea.
EL32	1.45	QQV06-40A	22.00	6AM8A	4.10	813	29.15	Set of AR88 valves	£35.25.		£35.25	240V transformer, output 18.5V, 26V, 29V, 35A and 26V, 5A £35.25 ea.
EL34S	7.10	QY4-250	103.85	6AT6	1.95	5744WB	8.75	Set of AR88 valves	£35.25.		£35.25	240V transformer, output 18.5V, 26V, 29V, 35A and 26V, 5A £35.25 ea.
EL34B	7.20	SP61	3.25	6AU6GT	5.20	5763	8.85	Set of AR88 valves	£35.25.		£35.25	240V transformer, output 18.5V, 26V, 29V, 35A and 26V, 5A £35.25 ea.
EL36	3.50	TD03-10	33.50	6AU6	1.80	5963/ECC82	4.00	Set of AR88 valves	£35.25.		£35.25	240V transformer, output 18.5V, 26V, 29V, 35A and 26V, 5A £35.25 ea.
EL41	4.75	U19	12.20	6BJ8	4.10	6115A	299.95	Set of AR88 valves	£35.25.		£35.25	240V transformer, output 18.5V, 26V, 29V, 35A and 26V, 5A £35.25 ea.

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# 'Doug' DeMaw W1FB

## A Personal Tribute From Rev. George Dobbs G3RJV

It was with great sadness that I heard the news of the death of Doug DeMaw W1FB. After fighting leukaemia for several months, Doug died on September 28th 1997, aged 71.

I first got to know Doug through his writing in the early 1970s. At that time I was attempting to update my Amateur Radio technology from valves to solid state.

My local library was generous enough to keep copies of *QST* and in their pages I found Doug as a 'fellow traveller'. He was then W1CER, and had just become the Technical Editor of the ARRL (Amateur Radio Relay League).

At the time Doug was shifting the emphasis of the ARRL *QST* magazine from valve to solid state design. My early introduction to transistor circuit design and the first solid state projects I built came directly from his writing. It was lucid, it was interesting and I understood it!

### Licensed As W8HNS

Milton F. 'Doug' DeMaw was first licenced in 1950 as W8HNS. He was the son of a farmer in North Michigan. And Doug always spoke of his early days with a great fondness.

The family grew their vegetables and frequently hunted their own meat. Doug began his working life as an engineer at the University of Michigan, then working with an aeronautical research company in San Diego.

He also worked in radio and television engineering at WWTW and WATT radio in Cadillac, Michigan. Additionally, Doug was also chief engineer and part-time DJ for Radio WATT.

### Founded Avtronics

In 1960 Doug founded Avtronics in Traverse City, a company manufacturing low frequency radio beacons for civilian airports. He sold Avtronics in 1963, and began Comaire Electronics, manufacturing v.h.f. and u.h.f. amateur radio equipment.

During his time running Avtronics, Doug established the *VHFer* magazine. This was taken over by Loren Parks K7AAD, when Doug joined the ARRL staff in

1965.

Doug began his work on the ARRL Headquarters staff as an assistant Technical Editor. In 1968 he was promoted to *The ARRL Handbook* Editor and Laboratory Supervisor.

In 1970 he succeeded the late **George Grammer W1DF**, as Senior Technical Editor and Technical Department Manager. This marked the beginning of what I can only call the 'Golden years' of *QST* magazine. Every issue seemed to be full of good technical articles and worthwhile projects to build.

### Produced Books

Doug DeMaw produced and wrote several books during his time with the ARRL. His book *Solid State Design For The Radio Amateur*, which he co-authored with **Wes Hayward W7ZOI**, was the classic.

Personally, I believe *Solid State Design* to be probably the best technical book ever written on Amateur Radio. It was written exactly 20 years ago and I still use it constantly in my radio construction activities. I understand that the co-authorship was not an easy road...but it has entertained and informed me for all its 20 years.

Doug served on the ARRL staff for over 18 years and is said to have written more than 200 technical articles in *QST* magazine. He earned several patents for his research work and practically invented the concept of QRP construction.

Doug had a great love for low power h.f. band Amateur Radio and his many articles were largely responsible for popularising QRP operation with home made equipment. Doug's wife, **Jean Wickk**, also worked on the staff of the ARRL and their son **David** is licenced as **N8HLE**.

### Retired Early

Doug retired early, in 1983, on the death of his father, and returned to live in the family farm in Michigan. It was then I believe he did some of his best writing.

The small series of what I call



Doug DeMaw W1FB & the Rev. George Dobbs G3RJV.

his 'farm books', are outstanding. These include: *W1FB's QRP Notebook*, *W1FB's Design Notebook* and *W1FB's Antenna Notebook* and they are three

books that I read constantly!

It's not difficult to work out that W1FB was my hero. I have been inspired by his work for many years and he has kept the hobby alive for so many people.

It's a lucky man indeed who can come to know a hero as a friend and I am glad to say that happened with Doug. When I began my writing for amateur radio magazines, Doug DeMaw was my model.

The ARRL staff used to say of Doug: "he wrote it once and it was done"! In the 1980s I was more than pleased when he subscribed to *SPRAT*, the journal I edit for the G-QRP Club and absolutely delighted when he began to write to me about *SPRAT* and even about the articles I wrote for UK radio magazines.

### Visited In 1992

We exchanged mail for several years and I first visited Doug at the end of a trip to the Dayton HamVention in 1992. **Dick Pascoe G0BPS**, and I did the day's drive from central Ohio to northern Michigan to visit the Oak Hills Farm.

It was a visit to a deity! The farm house lies just outside the tiny village of Luther among the lakes and forests of north Michigan.

The house is beautifully restored and much of the surrounding land has been left to return to the wild. Here Doug followed his other great loves, black powder shooting, hunting and cooking with natural ingredients.

We were served wild deer and onions gathered from the local forest. **Jean DeMaw** was a lovely hostess as well as being a keen shot with a muzzled loaded rifle!

On my next visit to the Oak Hills Farm, I was presented with a wooden plaque which had my callsign burned on a deer jawbone. It had the inscription: "*Primitive Man Endorsement. In recognition of the accomplishments of Rev. George*

Doug DeMaw W1FB was G3RJV's hero and George was delighted to play the part of 'Mountain man & Buckskinner' in tribute to his friend.



*Dobbs G3RJV, who has demonstrated at Luther, Michigan, his skill and deadly marksmanship with primitive muzzle-loading weapons, for having eaten wild deer meat and for quaffing native grog at the Luther tavern. Rev. Dobbs has earned the title of Mountain Man and Buckskinner. By the hand of Doug DeMaw W1FB, 1994".*

I also cherish a small cup fashioned from deer horn by Doug and presented to me on condition that it would only ever contain spirits!

### Hall Of Fame

In 1992, the American QRP ARCI, revived the 'QRP Hall of Fame Award' and Doug was the first named recipient. I was also chosen to receive the award at the same time as Doug.

My own Amateur Radio writing is modelled on Doug's style and I have always tried to make it as interesting and worthwhile as his work. Doug was presented with his plaque first and after I received mine I joined him, I looked up to him and said, "I don't know why they gave me one of these"!

Doug looked down from his great height and in the deep voice, that always reminded me of James Stewart said: "I reckon for about the same reason they gave me one". And that...without doubt, is the nicest thing anyone has ever said to me!

The last contact I had with Doug DeMaw was about 10 days before his death. He sent me an E-mail. It was a joke about a nun. (Nothing else). An era in Amateur Radio has ended!

PW



**Rob Mannion G3XFD** updates his opinion on the original 'Target' receiver manufactured in the UK by AKD. And as this model comes equipped with software for use with computers, **Tex Swann G1TEX** also reports on his findings 'on the computing side'.



Looking back at the review I did on the original 'Target' receiver from AKD which was published in the November 1996 issue of *PW*...I can remember being rather impressed with the budget-priced unit sat on the desk in front of me.

Time has flown by, it's over a year since the original receiver arrived on the market and now it's been joined by a more 'up market' version - with some rather special facilities.

### Horses For Courses

It's a case of 'Horses For Courses' in this joint 'opinion' prepared by **Tex Swann G1TEX** and myself. I'm looking at the general receiving side and **Tex** is looking at the computing department - and his comments follow mine. So, what's arrived this time...is there any difference?

I was immediately impressed when I opened the packaging following **Tex's** turn with the new AKD receiver. What immediately strikes you is the neat finish and tidy look about the cabinet. It looks 'finished' and the controls are comfortable to use.

And as I usually do - I took a long and critical look - and then used the receiver on the bands. And what a surprise - a good little receiver has been made even better!

Sensitivity, selectivity and general receiver operator seem to have been improved greatly. The 'switchyness' of the synthesiser steps seem to be much less noticeable and the l.c.d. 'dial' on this model (illuminated) was clear and easy-to-read.

On the broadcast bands the receiver was quite excellent for its class. The 'acid' test down on the south coast is trying to receive the BBC World Service on 648kHz. Quite a challenge - and it did very well.

Up on the h.f. broadcasting bands I did a lot of listening and quite frankly I was again very impressed. The internal speaker was good and the (rather misnamed) 'headphone' output socket proved to give very adequate good quality drive to an 8Ω hi-fi loudspeaker. So, as I worked on another job for *PW* I listened - and enjoyed!

### On The Air

During one evening I actually used the receiver during c.w. QSOs on 3.5MHz - very successfully. Okay, the selectivity is not up to the standard of my narrow filtered Alinco DX-70, but it proved very good indeed for a general purpose and still relatively budget priced receiver.

Both s.s.b. and c.w. reception

modes were easy to use and the receiver provided very acceptable performance. The only difficulty occurred whenever the station being received was awkwardly set for the synthesiser. But I quickly learned to tune up or down slightly before tuning in with the 'clarifier'.

The supplied antenna was adequate, but the receiver now works very well indeed on the 'main station' antenna, with switchable attenuation available on the rear of the receiver.

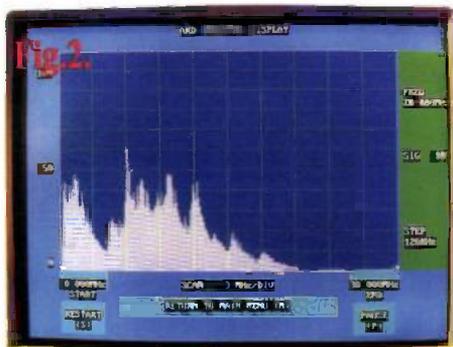
Using the supplied mains 'plug-in' power unit the receiver worked extremely well down to approximately 600kHz. Then the receiver became very sensitive to harmonics obviously being received from the power supply itself. I proved this because the same effect happened when I used a similar p.s.u. on the receiver.

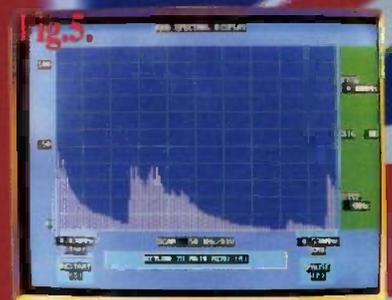
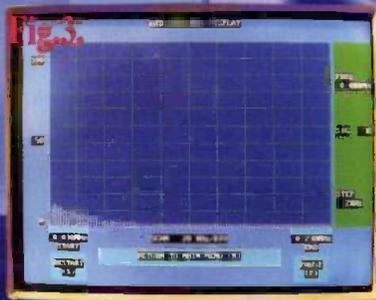
The extremely annoying 'buzz' (obviously harmonics from the power supply, disappeared totally when I ran the receiver from a 12V d.c. battery source (an old car battery I keep in the shack). Using this, the receiver proved to be very quiet and superb in its class and I was able to receive some fascinating signals down to well below the 73kHz Amateur band. Even the l.f. aircraft beacons were romping in. Most impressive!

When I used the receiver on my main station (electronically smoothed and filtered) p.s.u. the l.f. performance was almost as good as on a battery supply. But I must point out that my comments are not a criticism of the receiver (it's obviously more towards the power supply) - but perhaps they only draw attention to its sensitivity!

### What's The Score?

So, what's the score from G3XFD for the Target? Well, I'm pleased to say that I feel that the receiver is a little





gem. I thoroughly enjoyed using it and found the neat, tidy and 'no fussy' case and presentation to be to my liking.

I also think that with the simple presentation styling adopted by AKD, that the receiver could be incorporated into a portable station. I'd certainly consider this option as I could then concentrate on making a transmitter to suit my requirements. With this in mind I've recommended to AKD that they consider making the same receiver available without the software, because at around £200 or so...it would be a very competitive little receiver indeed.

Now it's Tex's turn to try receiver: so...over to you G1TEX:

All received Rob! I won't dwell on the basic reception capabilities of the new Target HF3E receiver from AKD, I'm sure that Rob will have said enough about it!

Instead I'm going to concentrate on the computer side of its use. The items that set this version of the receiver apart from its earlier model are two new leads and two 1.4Mbyte disks with IBM PC software on them. The software breaks down into two distinct parts.

The first of the two pieces of software I shall deal with is the AKD Receiver Control Software©. The initial issue of the software is a DOS based product that users of Windows (either 3.11 or 95) are warned to exit to the DOS (C:\) prompt before trying to run the program.

### Procedure In Detail

The installation procedure is given in good detail in the slim, but complete manual. The commands needed to run the control program that is automatically put into the 'CA\AKD'

should be typed in to run it. The more adventurous could create their own batch file to run the programs from the DOS prompt (and if needed could call up windows again after it has terminated).

Once the software is installed on the hard drive comes the time to fit the control cable. The cable is fitted to the parallel (printer) port of the host computer and connects to a special nine pin socket on the rear of the rig. I experienced no problems at all in use, although I felt a switch box to select either the printer or the control cable would be a distinct advantage to many users.

One option would be to fit a second printer interface card and use this for the printer. However, after some period of use with both pieces of software I came to the conclusion that the switcher box was the better of the two. But I'll explain more about this later.

### Calibration Mode

On first running, the software goes through a calibration mode. (Before carrying this out you must disconnect the antenna from the unit). This has two effects: one is that it checks to see how fast the display of the host computer is, and how fast the display can be updated.

The second part of the calibration checks the maximum and minimum signal strength readings from the particular receiver. A zero signal strength check is then made, followed by a full signal level, where the receiver is tuned to an internally generated carrier.

All the required steps for self calibration are quickly done and the various parameters are stored in a file. When running the control program (shown in Fig. 1), you can drive the

frequency and mode from computer stored memories (500 as opposed to the 10 of the rig alone) or directly by selecting frequency and mode.

You can recalibrate the signal strength set-up whenever you wish to as it is on the start-up menu. I then tried out the spectral display mode, in Figs 2 & 3, I've shown two typical displays.

When in spectrum mode, you chose the start frequency, then the scan width from six options (Fig. 4). The six options are bandwidths from 200kHz to a full 30MHz. In Fig. 2 I've shown a scan of the complete 30kHz to 30MHz spectrum scanned in 120kHz steps.

I was so distracted by the enormous signals in the short wave band that I almost missed the small signals in the 28MHz band. I would never have found these without the spectrum display!

The photograph Fig. 5 is of the bottom 500kHz spectrum where there are the large signals of the long wave band and the lower part of the medium wave band shown. One of the things I felt needed 'looking' at with the original AKD receiver was the noise floor on the l.f. band when using the supplied p.s.u.

Now with this spectral display I could look at it directly. I removed the antenna and chose a 30-230kHz display and I was rewarded with the display shown in Fig. 3. I found that the noise was now subjectively better than the original p.s.u. and rig.

The new regulated p.s.u. certainly works well, I found I could listen to the long wave stations with ease and the various utility stations came in quite strongly. I felt this really was a distinct improvement over the original Target receiver.

## The Other Software

But now to the other software supplied with the AKD Target HF3 and that is a copy of FAX and RTTY reception software. I am not particularly familiar with this type of software and to make the most of it I needed to take a couple of books home with me for some 'homework'.

The 'Tarfax' data mode software installs itself as easily as the receiver control software, but this time chooses a sub-directory called 'WEATHER'. From within this sub-directory, typing the command 'Tarfax' starts the program up.

When using this software another lead must be plugged into the 3.5mm socket on a flying lead on the parallel port plug, and the parallel port plug must be disconnected from the host computer.

To complete the connections the other end of this new cable, fitted with a single nine-pin plug (like a PC mouse so you need a converter if your machine has only got a 25-way serial port) is connected into the serial socket of the host PC.

It's at this point I'll go back to the switcher box or a second printer port dilemma I mentioned earlier. If the printer port is left connected it is impossible to use the radio's own controls, other than the volume and Clarify ones.

So, even if you have a second printer port, you would still have to unplug the radio from it, and this must be done at the computer end. I think that the best option to aim for is definitely a switcher box. But the type I would recommend is the type where all 25 ways are switched between output sockets, so that the radio is completely isolated.

Now back to the screen, on choosing RTTY working from the initial menu a simple DOS style communications window is displayed. In the top part of the screen the incoming decoded text is shown. Undemeath are indicators of the upper and lower frequency limit of the incoming audio tones, and if the decoded text seem to be in order.

Other than choosing which serial port is to be used, there is no other setting up to do, and I found that it worked quite well. Incoming text was displayed with only the occasional error that was due to a poor r.f. signal.

One nice touch with this decoding

software was by pressing 'H' a histogram of the audio passband of the audio signal was displayed. With little experience of this part of the hobby, and not knowing the sound I should be listening for, this alone was a great help.

The FAX software is a copy of NASA marine software, licenced especially for use with the AKD Target radio. However, as FAX via radio was even more of a 'black-hole' than RTTY, I needed more books to get me going and in the end a change of keyboard.

If there was an histogram screen, such as that available in decoding RTTY then it would have been much easier. In fact, I spent a period using the RTTY histogram screen 'training' my ears to the sound of a FAX signal so that I could get the audio signal right by using the Clarifier control.

This training paid off, as I found it easy then to tune around and looks at the various incoming FAX signals. However, I was unable to correct the tremendous slant on the 'picture'. It was this slant that, being unable to correct, I assumed I had to 'tweak' the Clarifier control.

After a change of keyboard all went much better. (I had a cheap one that I'd had to re-assign keys to produce the slashes. And the slash keys control the slant correction of the FAX decoding).

I also tried out JVFAX software which gave a much better more stable on-screen display of the incoming FAX signal. And I have to admit I'd recommend changing to this software when using the Target in this mode.

If you do use this software as I did, the recommended interface is a 'standard' comparator. Another advantage of this shareware (Try-before-buy) is that it also has a slow-scan TV capability not part of the Tarfax software.

All-in-all I felt that the AKD Receiver Control Software© worked well and did the job of controlling the frequency and mode of the rig. I found the spectrum display very useful allowing the whole 30MHz or a smaller portion to be scanned for activity.

Have I got anything against it? As with version one of any software, there were things I would have found useful. And with feedback I'm sure AKD will arrange to include as many as possible in the next version of the control software.

But with the FAX and RTTY decoding software, I feel they are both a little on the simple side to keep everyone happy. If I could I would keep the AKD receiver (and I would like to keep it!) it's a very nice and simple rig to operate at all times I would change to a rather more comprehensive decoding software package.

**Editorial Note:** AKD are looking to include HamComm and JVFax discs in the HF3E package. They have obtained permission from HamComm but are having difficulty contacting JVFax for their permission. Can anyone help? In the interim there is a registration form with each HF3E receiver to enable customers to receive their free discs, as and when (if?) permission to supply is obtained.

## Receiver Improved

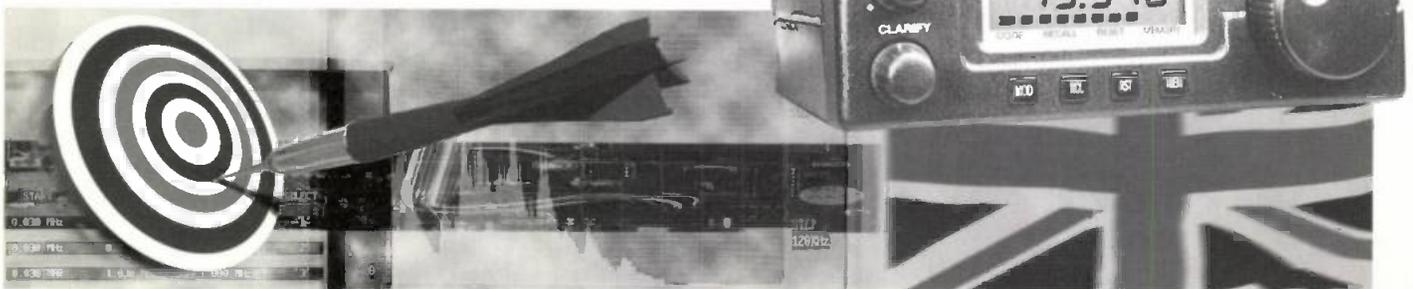
As to the radio side of the package I feel that the receiver itself has been improved and it gives a very clean sounding tone on a strong a.m. signal. But for my personal preference I would pass the audio to a selectable filter for long periods of listening to s.s.b. work.

I find listening to an audio signal with a large high frequency content very tiring. I found the audio of the Target receiver on s.s.b. to be just a little 'bright'. This is a personal preference and is not in any way a criticism of the AKD itself.

The set is very stable in frequency, it's small and light, using little power at 12V and is an interesting package with all the control and decode interface cables thrown in. All-in-all I feel it still good value for money. So, it's now time for me to hand back to Rob to 'sign-off'!

Thanks Tex! And our joint 'thanks' go to Val Wagstaffe and colleagues at AKD, Unit 5, Parsons Green Estate, Boulton Road, Stevenage, Hertfordshire SG1 4QG. FAX: (01438) 357591 for the loan of the receiver which costs £299 and is available from all leading stockists of AKD products or direct from AKD via their Mail Order Sales Dept. Contact Val on (01438) 351710 for a catalogue and further info on the HF3E.

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# Antenna Workshop

By Gerald Stancey G3MCK

*Gerald Stancey G3MCK shows his Preferences, when he says there's only one antenna for the typical amateur.*

When it comes to antennas, I've been told I am prejudiced, and I have to admit, it's true. I am prejudiced when it comes to antennas. I think the dipole is the premier antenna for the typical amateur. It is cheap, easy to install, effective and is good where electromagnetic compatibility (e.m.c.) or just plain radio interference (r.f.i.) is a problem.

The many standard handbooks give charts which show in great detail the properties of dipoles. But let's see what they mean for the typical amateur who puts up a horizontal dipole at about 10m above the ground.

With a dipole up at about at 10m, the s.w.r. on 3.5MHz should be close to unity. The s.w.r. figure may rise to about 2:1 on 10MHz, and then fall back down to about 1.5:1 on all the other h.f. bands.

Hence, with such an acceptable s.w.r. figure, an a.t.u. will not normally be needed. This removes a potential source of losses and of course it's one less box in the shack.

On 3.5 and 7MHz the dipole's horizontal radiation pattern will be virtually omni-directional. This means that you don't have to consider in which direction you erect it.

On the higher bands the maximum radiation is broadside to the wire. However, it is a broad beam, the lobe is about 90° wide, so it is not too important to align the antenna correctly. (If you can select from two dipoles erected at right angles all-round coverage will be available).

## The Classic Dipole

The illustration of Fig. 1 shows the layout of the classic dipole, and this is of course an ideal arrangement for a dipole. Note that the feeder comes away at right angles for as far as possible then runs close to the ground.

The approach illustrated minimises r.f. pick up on the outer, or braid of the coaxial cable. On the dipole length B-X is the same as C-X, point A is a support point on the house.

There are purists who may wish to insert a balun at point 'X' in Fig. 1. But this is not usually necessary on the lower h.f. bands where the ratio of the length of the dipole to the diameter of the coaxial cable is very large.

In most cases 'pick up' on the braid is more likely to be caused by the feeder running too close to the dipole. And, if this is the case, then fitting a balun will do very little to prevent this.

However, there are known cases where the inclusion of a balun has cured an e.m.c. problem so keep an open mind on this. On the other hand excluding the balun does remove one other potential source of losses and also enables you to easily test that all is well.

Now I'm coming to the perennial problem of the length of the dipole. Here you should remember that the correct length of a dipole, at any one frequency, is a little less than half a wave-length.

But, the 'little less' figure depends on the dipole's height above the ground, the diameter of the wire and the nature of the ground beneath it. (Equations are available which to some degree take account of these variables which can make the maths side easier to work out).

Happily you can ignore these equations for the length of dipoles, as all you need to do is to adjust the dipole for minimum s.w.r. using a reflectometer type of s.w.r. meter.

A bridge, such as the one described by the Rev. George Dobbs G3RJV, in *PW* January 1997 is ideal. (A laboratory instrument, such as a Wheatstone bridge type of resistance measuring bridge is not satisfactory for this purpose).

In the real world of amateur radio, due to lack of space, it may not be possible to erect a dipole in the manner shown in Fig. 1. Fortunately however, all is not lost.

A dipole will accept quite a lot of abuse before its effectiveness is severely degraded. (There are two widely used methods of 'abusing' a dipole and these are to shorten it, or, the other method is to bend it).

In practice, either shortening or bending a dipole, will increase the losses or reduce the bandwidth. They will also lower the feed impedance which will probably show as an increase in the s.w.r.

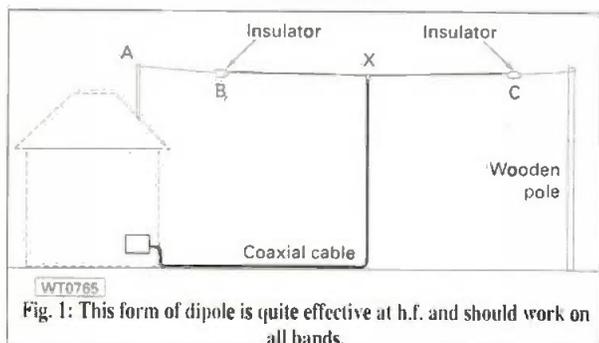
But, on the plus side, if the length is not reduced by more than about 50% or the bending is done with care, losses should be acceptable and the s.w.r. should be no greater than two or three to one.

So, let's go into various implementations of these shortening an, or, bending dipole elements. As with the full size dipole all the following configurations are adjusted to give minimum s.w.r. using a reflectometer type of instrument.

## The Loaded Dipole

Physically shortening a dipole is shown in Fig. 2. It shows how a short dipole can be brought to resonance by means of a loading stub. **And although this antenna may look like a G5RV but beware, it isn't.** The top (AB) should be made as long as possible and the length of the stub (CD) should be adjusted for minimum s.w.r. A good starting point is to make the total length of the wire in the antenna somewhat more than half a wave-length.

The diagram of Fig. 3, shows the use of loading coils (shown at



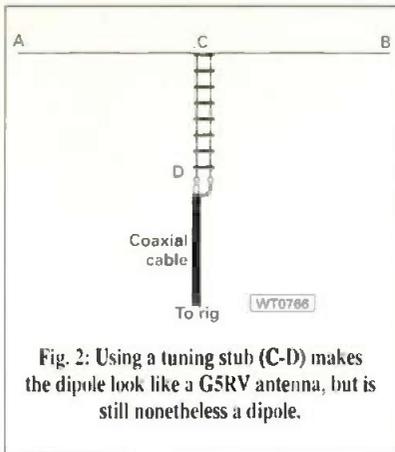


Fig. 2: Using a tuning stub (C-D) makes the dipole look like a G5RV antenna, but is still nonetheless a dipole.

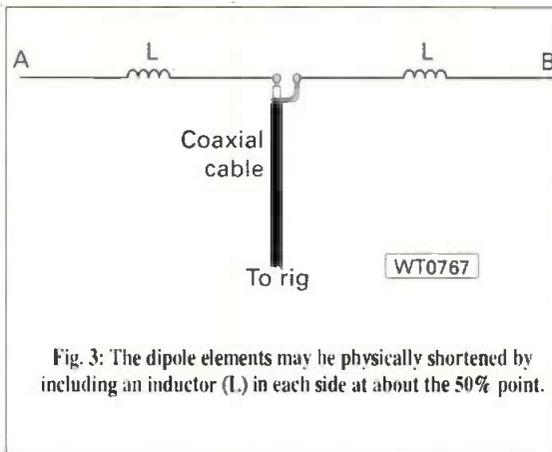


Fig. 3: The dipole elements may be physically shortened by including an inductor (L) in each side at about the 50% point.

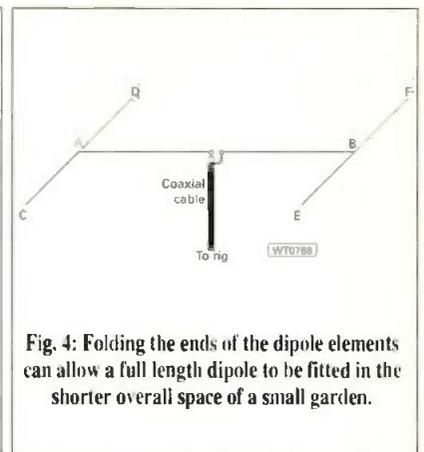


Fig. 4: Folding the ends of the dipole elements can allow a full length dipole to be fitted in the shorter overall space of a small garden.

points L in the drawing) to achieve the same effect. The optimum point for the coils is about 50-70% away from the centre point.

A dipole such as the one shown here should be adjusted for minimum s.w.r. by trimming the end sections at A and B. For guidance, if the top is  $\lambda/4$  long and the coils are in the middle of each leg then the reactance of each coil should be about  $900\Omega$  at the desired frequency.

The efficiency the antenna shows depends on the quality of the loading coils. A good design should incorporate air spaced coils made from thick wire. (When it rains or snows you may find that the antenna will not load: on such days you may be reduced to tidying the shack out).

A short dipole can be capacitively end-loaded to make it resonate as shown in Fig. 4. However, in practice a symmetrical layout is not usually necessary and just bending the ends (C-A or B-E) achieves the same effect.

The lighter lines A-D and B-F, shown in the illustration, are

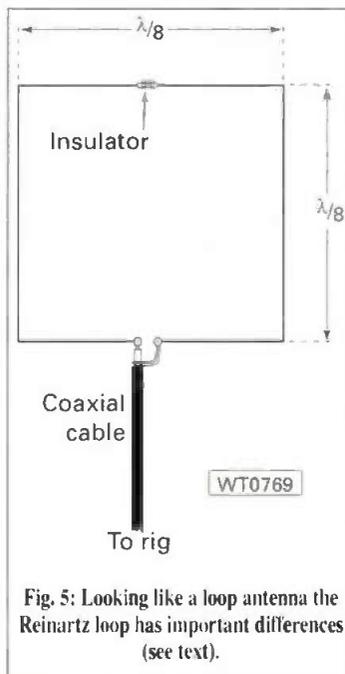


Fig. 5: Looking like a loop antenna the Reinartz loop has important differences (see text).

alternative directions. But if they are additional then they add greater end loading capacitance, allowing a shorter distance between points A and B for resonance on any frequency.

Bend the wires where it's convenient. The ends do not have to be bent in the same direction or plane. But try to keep the straight centre section (A to B in the diagram) as long as possible.

### Bent Dipoles

Now it's time to move from loading dipoles with coils or capacitors, to bending the whole dipole. Of the 'bent' dipoles, probably the most well known variant is the inverted-V dipole. (This antenna variation can be erected with only one support at the mid-point).

Using one of the variants of the 'bent' dipole, can have a big advantage as a (socially accepted) dummy TV antenna on the roof of your house can fulfil the role of support. As the centre support carries the weight of the feeder and centre insulator, the dipole itself can be made virtually invisible by using very thin wire and mono-filament nylon at the ends without end-insulators.

Finally in the bent dipoles department, Fig. 5 shows the Reinartz loop which is a highly bent dipole. In fact, this is so bent it resembles a loop antenna - but note that the ends of the dipole do not touch at the top.

Any insulator used at this point must be of good quality as very high r.f. voltages can be generated, even at QRP power levels.

Now I'll turn to hybrid and asymmetric dipoles. And it is perfectly

feasible to combine any of the above methods if circumstances so dictate, as Fig. 6 shows an inductively loaded bent inverted-V dipole.

In this case it's probably desirable to place the loading coils at the point where the antenna is bent. The bent ends can, as before, go in any direction, even perpendicular to the plane of the paper.

Another feasible configuration is when a dipole can be erected with one leg straight and the other leg bent to fit into the available space. In fact, the possible variations are only limited by your imagination.

### All Work

All the above antennas work! Which variant of the dipole is best for you, will be driven by your circumstances as all antennas interact with their environment in unpredictable ways.

It will probably be necessary to experiment to get any of them to work. If the first configuration you try doesn't work very well, then try another. This is what amateur radio is about, experimenting and trying to get good results from impossible sites.

Good luck with your trials!

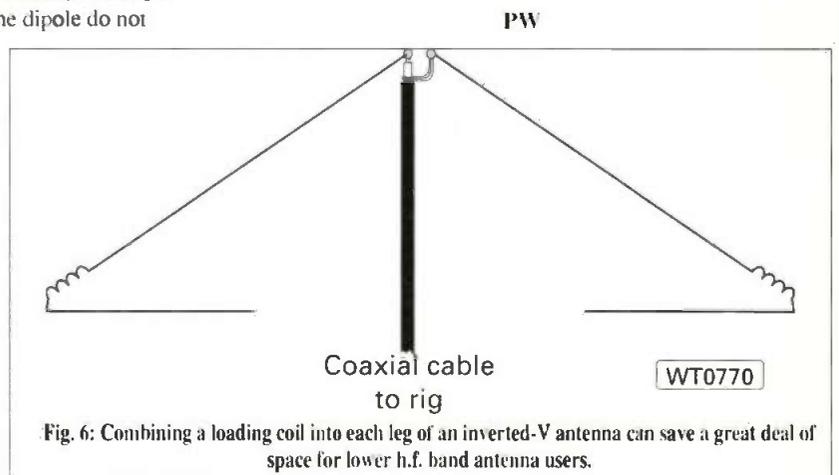


Fig. 6: Combining a loading coil into each leg of an inverted-V antenna can save a great deal of space for lower h.f. band antenna users.

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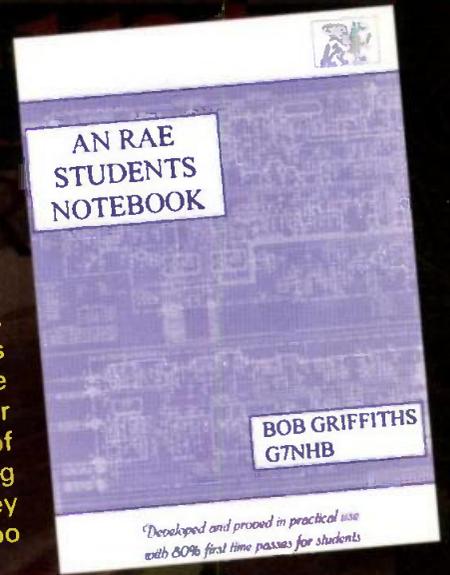
# CHRISTMAS IS COMING-AN

Well, not quite! And although the *PW* Editorial team realise that the majority of readers do already have a good 'library' - we also know you are always on the look-out for new titles to add to the 'home collection'. So, to help you order that Christmas or New Year gift...we've got some ideas for you. And by the way...everyone here at *PW* hope the book you want ends up in your stocking or New Year's gift parcel.

## An RAE Student's Notebook By Bob Griffiths G7NHB

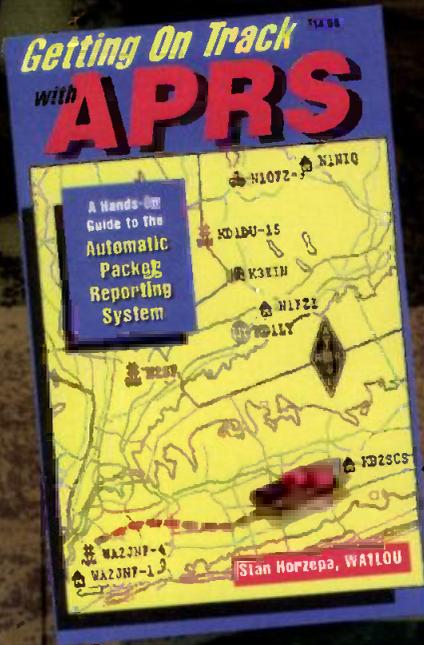
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Thinking about tackling the Novice Radio Amateur's examination? **Bob Griffiths'** book takes the reader through the syllabus and in its easy style explains the necessary technicalities in neat text 'blocks'. Although useful for the individual, this book will come into its own for group study and there's a good chance of anyone receiving this for a present being tempted to take up a Novice Course when they see the technical side of the hobby is not too daunting. **A Helpful Textbook.**



## Getting On Track With APRS By Stan Horzeppa WA1LOU

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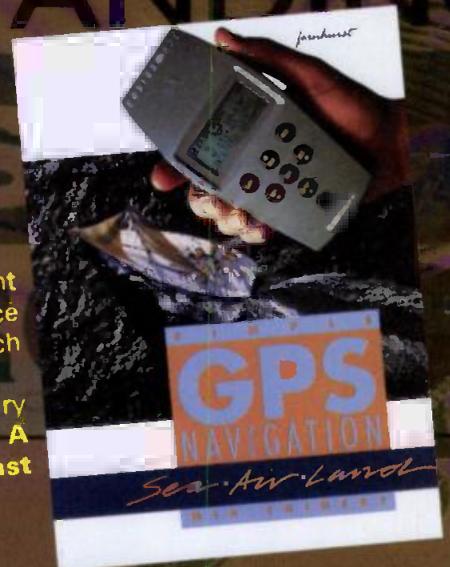


Are you into Packet radio? If you, are you may like to find out about the 'Automatic Packet Reporting System'. The American-based author explains all about 'the hottest packet application since the DX cluster'. Using mapping systems, graphics, versatile software, etc., and the power of the Global Positioning System the APRS software helps you track vehicles (including bikes!) during bicycling 'Marathons' and emergency communication units and weather fronts. And although obviously aimed at the American reader - this author who is well known as an authority on Packet Radio - will keep you up-to-date on what's going on. **Useful Introductory Guide.**

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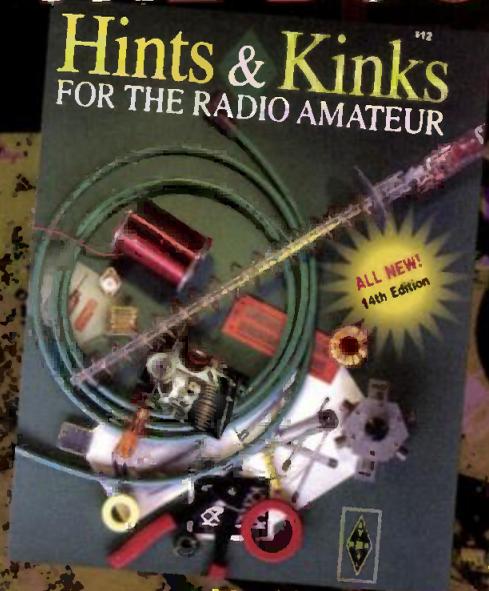
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# AND THE BOOK SHELF'S BARE!



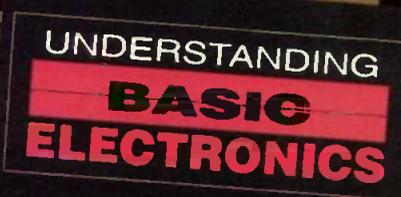
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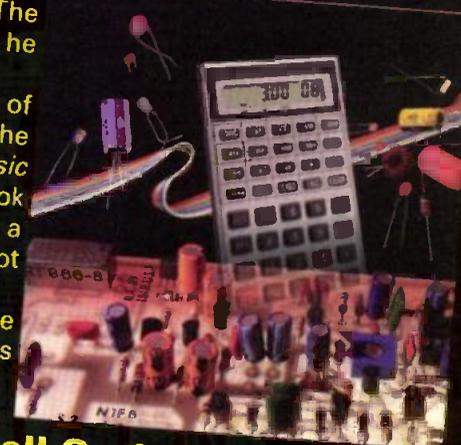
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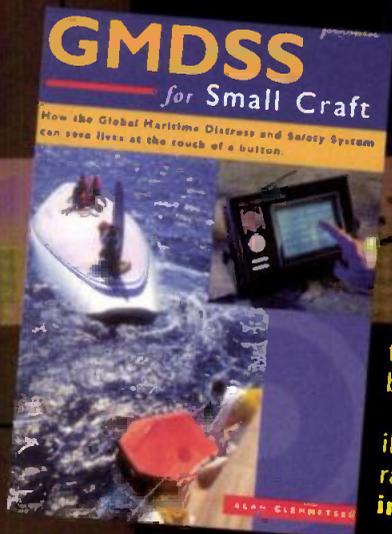
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# Amateur Radio in Germany

By Angelika Voss G0CCI/DF2XV

*Angelika Voss G0CCI/DF2XV explains how Amateur Radio operates in her home country of Germany, as well as offering advice on what you need to do to operate from Germany, if you're visiting from abroad.*

As radio amateurs we are used to communicating with people from all over the world and having long chats with people we may never see in countries we may never have the privilege to visit. But do you ever stop to wonder what it's like to be a radio amateur in another country? How easy or otherwise it is to get a licence, how the national society operates and what the local clubs are like?

When travelling abroad do you make a point of taking radio equipment, or of establishing contact with local amateurs either before going, or whilst you are there? And would you know how to find out about rallies and other events?

Being one of the UK's near neighbours, the Federal Republic of Germany is one of the more accessible places, and one which most people are likely to have visited or passed through at some time in their lives. Germany has one of the largest radio amateur populations in Europe, and with just under 60,000 members, its National Society is one of the largest amateur radio societies in the world.

## National Society

The national society in Germany is called the **Deutscher Amateur Radio Club (DARC)**. Like most of the larger National Societies it is run as a business employing full-time staff.

The DARC Headquarters is located in Baunatal on the outskirts of Kassel. A total of 30 people look after the day-to-day running of the Society, with a further five working on the monthly magazine *CQ-DL*. Book publishing and distribution are looked after by a subsidiary company called **DARC Verlag**, which employs a staff of six.

The organisational structure of DARC is somewhat different from that of the **Radio Society of Great Britain (RSGB)** in that it's based on a four-tier system. This consists of Local Group, District Council, National Council and Executive Committee.

Unlike in the UK, local radio clubs are part of the national society and are funded out of national society subscriptions (which means that it's



Angelika Voss G0CCI/DF2XV

impossible to be a member of a local club without being a member of the National Society, and vice versa). The membership of DARC is divided into geographical districts (similar to RSGB zones, but covering smaller areas).

There are 24 DARC districts made up of a total of over 1,000 local clubs. Each district has a district assembly which consists of the chairmen of the local clubs. The district assemblies each elect a representative to represent them on the National Council.

The National Council of the DARC (known as **Amateurrat**) is made up of the elected representatives of the 24 districts. Unlike in the UK, individual members have no direct say in who serves on their National Council, but have to trust their club chairmen to make the right choice.

The **Amateurrat** elects an Executive Committee consisting of the president and two vice-presidents, these are elected either from within their own ranks, or from the ranks of committee chairmen or other officers of the Society. The Executive Committee is elected for a term of two years, but its members may stand for re-election as often as they like.

The philosophy in Germany is that 'continuity is a good thing', and providing they did a good job in their initial term of office presidents and vice-presidents are generally encouraged to stay in office almost indefinitely. The current president is **Karl Vögele DK9HU** who was elected in May 1997 after having served as vice-president for two years. The vice-chairmen are **Walter Schlink DL3OAP** (on his second term of office) and **Jochen Hindrichs DL9KCX** (newly elected in May).

Like the RSGB, the DARC has a number of specialist committees (including h.f., v.h.f., Contests, Education, etc.), and these work

along similar lines to the committees of the RSGB. The main difference being that the DARC do most of their business by telephone or FAX and only meet once or twice a year. (The same goes for the National Council which only holds two formal meetings each year).

## Local Clubs

To all intents and purposes DARC local groups are the same as local clubs in the UK. They meet once or twice a month, arrange talks and slide shows, run club stations, operate in contests, enter ARDF events, run RAE classes and put on barbecues and Christmas parties. Local clubs do not charge their own subscriptions but receive a 'per capita' grant from the National Society.

However, one additional function of DARC local groups is that they serve as QSL sub-bureaus. This simplifies the process of QSLing for the German amateur.

There is no need to post QSLs to headquarters, or to leave s.a.e.s with a sub-manager. All you need to do is take your cards to the local club meeting and collect any cards that have arrived.

The local club will forward the cards to the DARC Headquarters where they are sorted with the help of bar coding equipment and an electronic sorting machine (similar to those used at Royal Mail sorting offices). To simplify QSL sorting, clubs have been issued with individual codes (known as DOK numbers).

Award hunters will be quite familiar with DOK numbers, as they form the basis for a number of awards including the German equivalent to the Worked All Britain Awards. The DOK numbers are made up of a combination of one letter (representing the DARC district) and

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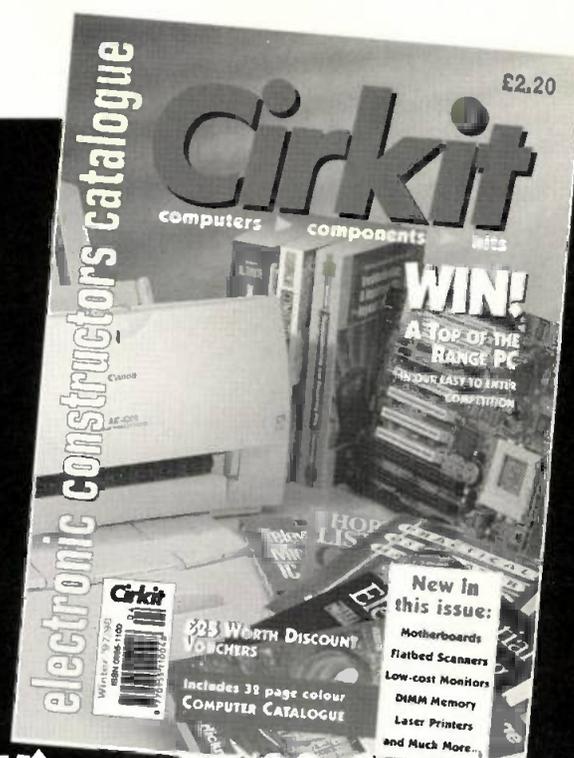
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a two-figure number. The lists of DOK numbers are published annually by the DARC.

## Operating In Germany

While Germany is not exactly 'DXpedition Country' it's well worth taking some radio equipment if you are visiting the country on holiday or business, especially if you are travelling by car. Getting on the air in Germany is straightforward for UK amateurs.

The introduction of the CEPT Common Licence in the mid-1980s means that holders of UK Class A and B licences can now operate in most European countries on a UK licence providing they do not stay for more than three months. (However, the CEPT agreement does not extend to Novice Licences). When operating in Germany you must use your own callsign prefixed by **DL/(UK Class A callsign)** or **DC/(UK Class B callsign)**.

If you are travelling around Germany on holiday, the bands you are most likely to use are 144 or 430MHz. All in all you should find operating quite simple and not really that different from operating in the UK (apart from the language, of course), but there are a few things you need to be aware of.

One thing to bear in mind when operating on 430MHz is that Continental repeater channels are different from those in the UK. When operating on the 144MHz band in Germany, it should be noted that very few people monitor 145.500MHz.

Local clubs normally have their own (unofficial) meeting frequencies. And most amateurs will listen out either on their club frequency or on a local repeater.

People take a fairly relaxed attitude to repeater use in Germany, no one objects to repeaters being used for QSOs between fixed stations or even for local Nets. Also, it's not uncommon for QSL cards to be exchanged for repeater QSOs.

While a few words of German are certainly helpful when using 'local' frequencies in Germany don't worry too much if you don't know the language. English is widely spoken in the Western states (where it has been a compulsory subject at school since the end of the Second World War), and even in the Eastern states (where school children were learning Russian until 1989) the ability to speak English is now becoming more widespread.

## Holiday Events

If you'd like to combine your holiday to Germany with a radio event, then

there are a number of rallies and conventions worth going to.

Most people will have heard about Germany's main annual event, the 'Ham Radio' Convention held in Friedrichshafen on the shores of Lake Constance. This event takes place over three days in late June or early July and features a large trade show, gigantic flea market and a programme of talks, lectures and discussion groups.

The Weinheim VHF Convention, held every year in September, now attracts a growing international clientele. This German-Dutch Convention takes in the town of Bad Bentheim in late August and offers a two-day programme of activities and attractions for the whole family.

There are also numerous regional events ranging from half-day local flea markets to two-day meetings held over weekends. The two-day events usually include various social activities such as children's entertainment and a party or dinner dance on the Saturday night.

## Obtaining A Licence

While the CEPT licence covers short-term visits, those wishing to stay in Germany for more than three months will need to apply for a German Amateur Radio Licence. Holders of UK Class A and B licences may obtain a German licence on the strength of their UK licence without having to take the German RAE.

If you do exchange your licence don't be surprised if your British Class A licence comes back as a German Klasse B, or your British Class B has been turned into a German Klasse C. The designation of German licence classes is somewhat illogical (for historical reasons).

There are three licence classes in Germany. These are Klasse B which is roughly equivalent to UK Class A, Klasse C which is equivalent to UK Class B while Klasse A is an intermediate licence allowing limited access to the h.f. spectrum in addition to v.h.f./u.h.f. privileges.

The written exams are the same for all three licence classes but there are different pass marks for the technical paper. These pass marks are 50% for Klasse C, 65% for Klasse A and 75% for Klasse B.

There is no Morse code requirement for Klasse C, Klasse A requires a pass at 30 characters per minute (c.p.m., approx 6w.p.m.) while a speed of 60c.p.m. (12w.p.m.) is required for Klasse B. There is no Novice Licence in Germany at present, but some discussions have been held between the DARC and the Licensing Authority about the possible introduction of a new licence



The Headquarters of the Deutscher Amateur Radio Club (DARC) is situated in Baunatal on the outskirts of Kassel.

class for beginners.

The callsign prefixes for Germany are: DF, DJ, DK and DL for Klasse B, DB, DC and DG for Klasse C and DH for Klasse A. Callsigns starting with DE are not real callsigns but 'honorary' ones awarded by the DARC to short wave listeners who have passed the voluntary s.w.l. exam. The DA prefix was reserved for members of Western Allied Forces stationed in Germany but has now been allocated as a prefix for club callsigns.

## Quite A Difference

When it comes to licensing exams and Morse tests quite a few differences exist between Germany and the UK. The German RAE is a written exam (not multiple choice), and it comes in three parts which consist of a technical paper, a paper on rules and regulations, and a paper covering operating procedures. The Morse test also comes in three parts consisting of random five-letter groups, a passage of clear language, and a passage of typical QSO text.

Unlike the UK, there are no fixed dates for the RAE, as exam dates are set by local centres according to demand. The exam and Morse test are administered by the licensing authority (although this is expected to change in the near future as part of the privatisation process).

As the exams are also marked locally it is often possible to take the exam in the morning and pick up your licence before the close of business on the same day. Some people have even been known to take the RAE in the morning, sit the Morse test after lunch and appear on the air a few hours later with a brand new Klasse A or Klasse B callsign!

Until very recently the minimum age for obtaining a licence in Germany was 14, and amateurs under 16 were only able to operate under supervision. Both restrictions have now been lifted.

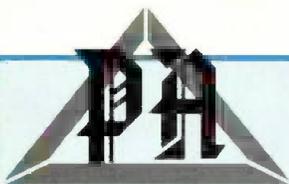
And finally I would like to thank DARC Head Quarters, and Hans Berg DJ6TJ (Chairman of the International Liaison Committee), for the assistance they have given me in compiling this article.

PW

## More Information

If you want to find out more about operating in Germany the DARC maintain a large database of information at their headquarters in Baunatal, and their staff will always be more than happy to assist visiting amateurs from abroad. They can provide you with repeater lists, put you in touch with local clubs, and answer any specific questions you may have.

For those who need to apply for a short-term reciprocal licence (i.e., from countries which are not covered by the CEPT agreement) the DARC will handle the paperwork on behalf of the Licensing Authority. You can contact the DARC (in German or English) at Postfach 1155, 34216 Baunatal, Germany or by FAX on 0049 561 9498850.



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# Carrying on the Practical Way



*"At Christmas play and  
make good cheer"*  
**(From The farmer's daily  
diet by Thomas Tusser)**

By George Dobbs G3RJV

*The Rev. George Dobbs G3RJV says he's got a few 'Tips & Twinkles' for Christmas this time. And along with providing some useful ideas and experience with light-emitting diodes George says...it's 'fun project' time!*

All that time off (for some of you...I'm very busy of course!) - all those old films on television - all those relatives to smile at - all those toys which haven't any batteries - all that food. Is it surprising that the constructor's idea of a good Christmas is to be locked away in the workshop with a full glass and a hot soldering iron.

Some of my best construction projects began on the evening of a Christmas Day. After work of course!

Escaped the family? Closed the door? Switched on the soldering iron? Well here are a few tips and a circuit.

The circuit is by way of a 'peace maker' for the season of good spirit and peace. And when your hear the prompt: "Where have you been?" or "What have you be doing all this time?" the answer can be "I have

been making this for you"!

But first some handy workshop tips to begin a new year at the bench. After you've tidied it up!

### Sealing Wax & String

Many years ago I used to keep a supply of waxed string for cable harnessing. Making an harness for loose cable in a project can improve its appearance and help to gain access to the parts on the board.

Why make a neat circuit board and then cover it with a rat's nest of connecting wires? I used to rub wax into normal string and then carefully bind the loose cables, followed by a quick stroke of a hot soldering iron tip across the string melted the wax to keep the cables in place.

I said "used to" because I don't make up wiring harnesses any more. It's far too tedious even for the most tidy-minded builder!

My direct replacement is the use of mini cable ties. Just slip them over

the bundles of cables and pull them tight to have a neat line of cable.

No cable ties? Then try the kitchen for freezer bags grips. The small ones do the job very well. Dustbin bag ties work well for larger bundles of cables.

I have rarely used sealing wax in the workshop itself but a block of beeswax is always on the side of the bench. This is invaluable stuff which I first came to value through the wisdom of Ian Keyser G3ROO.

The dielectric properties of beeswax are good and it's easy to use. I use spots of it to hold items on to circuit boards, especially where stability is important, like in a v.f.o. project.

The wax melts very easily with the tip of a soldering iron and can be dripped on to the required place. The solder iron comes out of it well - the surplus wax just burns off without any problems.

My favourite use of beeswax is securing the windings in home-made

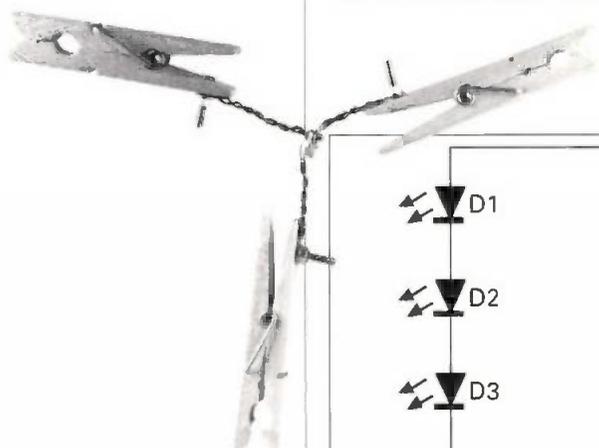


Fig. 1: George Dobbs G3RJV's 'Manx Clothes Peg' idea for producing a useful 'third hand' (see text).

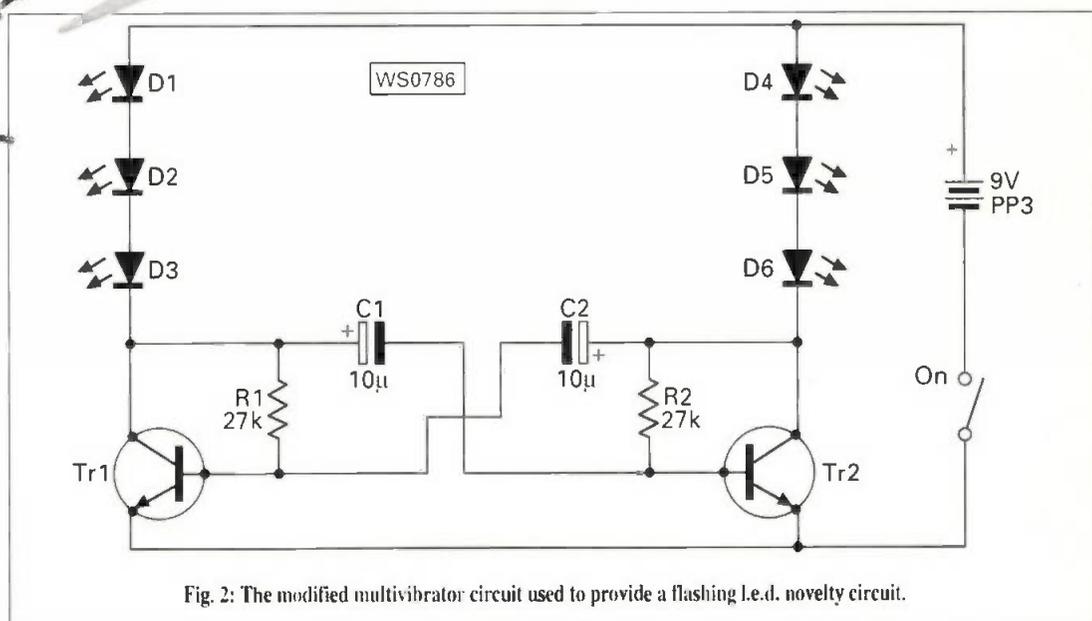


Fig. 2: The modified multivibrator circuit used to provide a flashing l.e.d. novelty circuit.

coils. When the coil is wound, drip a little of the melted wax on the windings.

Then you should gently run the iron along the winding and as the wax melts it runs into the wires to hold them in place. Remember to let the inductor cool before expecting it to be frequency stable.

I have also lightly coated coil formers and toroids with beeswax before making a winding. This helps to hold the wire in place as the coil is wound.

### **Friendly Hand**

One of the more useful small items on an electronics workbench is a 'third hand'. They're really useful because so many of the 'fiddle' jobs associated with the making of electronic circuit boards require manipulation not far short of juggling!

Holding the board, the soldering iron and the solder all at the same time and getting a good joint is not easy. A third hand is very useful!

I have a commercially made 'Third Hand' which consists of a couple of crocodile clips on universal joints, mounted on a heavy base. The work can be held in one, or both of the clip and the operator is free to perform the task.

Before I was bought the useful aid as a Christmas gift (too late to ask for one now?) I had a home-made version. This was a single 'Bulldog' stationery clip (the type you often see attached to 'clipboards' bolted to some stiff wire which was screwed to a heavy wooden block. It worked very well.

### **'Manx' Clothes Peg**

My more recent home-made third hand has been even more useful because it's light and I can carry it around in my tool bag. I call it the 'Manx Clothes

Peg'. In reality it's made up from three clothes pegs mounted on flexible wire in a 'triform' shape similar to the 'Three legged' Isle of Man symbol...hence the name! (The photograph in Fig. 1, shows how my version was made).

Choose three household wooden clothes pegs. It's an advantage if one of the three has a stronger than average grip. Loop over and twist some stiff copper wire - say about 16-18s.w.g.

Next, the looped end is screwed, or bolted, to the clothes peg. The other end, say about 40mm away, is opened up and soldered to the other three peg wires.

Your finished result will be a very useful little tool. The strongest gripping peg can be the anchor - to any convenient place. The other two pegs are the grips for the work.

The stiff wire should be firm enough to hold the job in place for soldering or other tasks. It only takes five minutes to make and can be put with the other tools ready for use.

### **Circuit To Please**

Finally, here's a little circuit to please the family! And isn't it amazing how they misunderstand our intentions?

So often the family, think we are wasting our time, or merely escaping their company. And this belief is amazing because there are so many electronic items about that people love to buy. Yet they do not see any advantage in what we beaver away at in our workshops!

Perhaps if the results did something more interesting in their eyes, they would understand a little more? So, to help overcome the misunderstandings this little circuit, while not exactly a 'cyber pet', might just interest some members of the family!

The circuit is shown in Fig. 2.

There's not much to it - and you'll probably recognise the circuit. And of course it's a multivibrator circuit driving I.e.d.s. (in this case six). But what can it do you may ask?

In answering your likely question the circuit does the following: when one transistor is switched 'on', the other is switched 'off'. The 'switched on' transistor will illuminate the I.e.d.s in the respective collector circuit. The end result? - the circuit flashes the I.e.d.s on and off.

But why use six I.e.d.s? Answer: quite simply, it's more interesting and appears to be doing more than it really is doing!

### **Optical Trickery**

The best optical trickery is produced by not having the two pairs of three I.e.d.s together. Mounting them so that they alternate between I.e.d.s from each side produces a good effect.

Your project will be quite 'twinkley' - ideal for a Christmas star, or mini bedroom disco effect. Having different coloured I.e.d.s is even better.

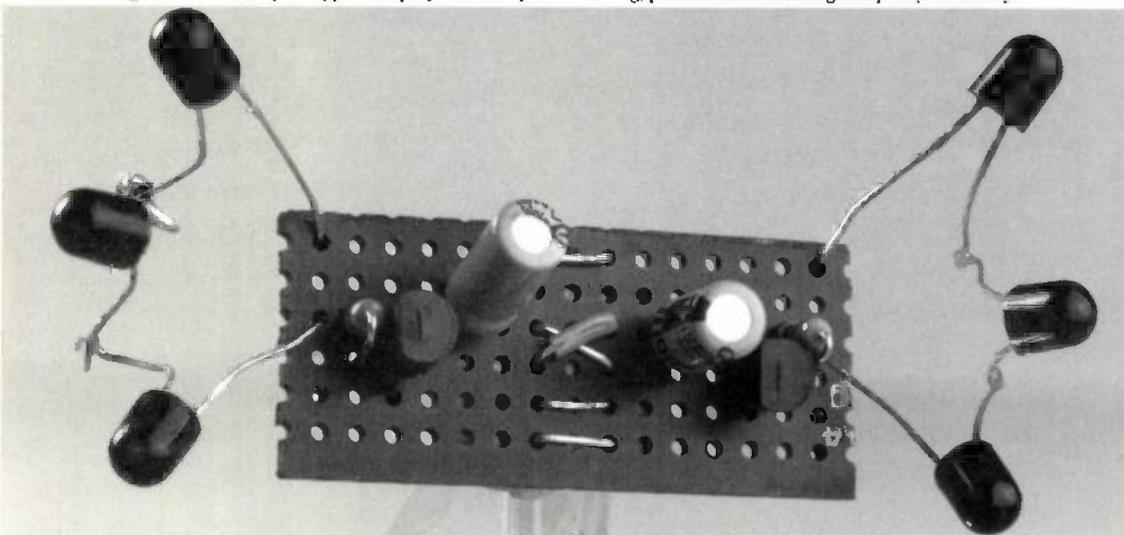
My version used all red I.e.d.s in the first model, as shown in Fig. 3, but changing these to one red, one green and one yellow per side produced a very pleasing effect. The effect goes far beyond what you might expect for a few I.e.d.s flashing alternately!

Try experimenting with the values for C1 and C2, this will vary the flash rate. Some combinations produce more pleasing effects.

Build it - package it nicely and go and show it to them before they come looking for you. The secret of a Happy Christmas and then you can get busy building more projects for yourself and your gift might encourage more of the family to join us in the hobby!

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Fig. 3: The G3RJY prototype I.e.d. project. It can prove amusing, provide useful training and pacify the family!



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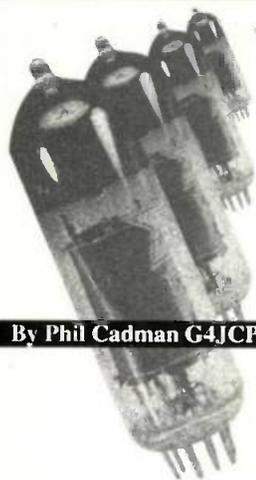
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# Valve & Vintage

By Phil Cadman G4JCP

*It's Phil Cadman G4JCP's turn to look after the vintage 'wireless shop'. This month he looks back at recent history as it was received by radio, ideas for Christmas, 'transmissions' from Bulgaria and Sri Lanka and finding the right knobs!*

Over the years, radio and TV receivers have carried news and images of momentous events. Such it was in the early hours of Sunday, 31 August 1997, with news of the death of Diana, Princess of Wales. How many of you, like me, will now forever associate the news of that tragic event with one particular radio?

We tend to cherish our vintage radios as simply items of electronic equipment. Too often we forget why the sets were built, the news they carried, and the tears and laughter they generated in their audiences.

So, next time you see a forlorn old radio set, think of the events it may have told of and the people who might have listened so intently. You're looking at a bit of history that helped spread news which became history!

## Christmas Is Coming!

On a brighter note, you may have noticed that Christmas is coming...and will soon be here! So, to help anyone who is having trouble I thought I'd mention a few books which might make ideal Christmas presents for the 'thermionically' inclined.

To begin, there are two really excellent books I haven't mentioned

before that are now available from the *PW Book Store*. Both are American volumes that have recently been reprinted by Lindsay Publications Inc. of Illinois.

The first is *The 1934 Official Short Wave Radio Manual* edited by Hugo Gernsback. The first half is mainly made up of constructional articles about short wave receivers. There are also a few articles of a more general nature, including one entitled 'Can We Radio the Planets?' (Yes, 'moonbounce' was being seriously talked about way back in 1934!).

The remainder of the book is a directory of (supposedly) all the commercial short wave receivers available in the USA at the time. There's also a 'sort-of' radio servicing guide, and each receiver has at least its circuit diagram reproduced and most have servicing information included too. This section is extremely useful for anyone interested in early commercial receivers.

The second book - *Henley's 222 Radio Circuit Designs* - was originally published in 1923. It has chapters on tuning, antennas, crystal sets, regenerative detectors, audio amplifiers and transmitters.

What interested me were two circuits of very early superheterodyne receivers. Because only triode valves were available the intermediate frequency had to be very low. One circuit even uses resistance-capacitance, as opposed to transformer, interstage coupling.

Still very much available and ideal stocking-fillers are the *RCA and General Electric Valve Manual* reprints. And don't forget the set of five

*Radio Valve Guide Books*, nor *The Handbook of Radio, TV, Industrial & Transmitting Tube & Valve Equivalents*. This last reprint is particularly useful to anyone with an interest in Military equipment, as it gives the commercial equivalents of both the British and American Services valve types and the CV series.

I recently got a copy of *Shortwave Receivers Past & Present* (second edition) by Fred Osterman. This is published by Universal Radio Research of Ohio (also available from the *PW Book Store*). *Shortwave Receivers Past & Present* is an extensive guide to over 500 amateur and commercial shortwave receivers that were manufactured between 1945 to 1996. Most of the receivers are from the USA although there are also some from Japan and the UK.

Each set featured has a photograph together with brief details about its specification, variants, reviews, cost and the period during which the receiver was available new. Most receivers have a second-hand (American) guide-price included. I'd recommend this book to any serious collector of short wave receivers, particularly to those whose primary interest lies with American receivers.

Finally, don't forget *Radio! Radio!* by Jonathan Hill. This popular book is now into its third edition and has been substantially expanded over the previous edition. The only problem is the price - (have a large brandy at the ready now!) - at around £35. I know this is regarded as one of the very best vintage radio books but it does alarm me when prices reach this level.

Those of you with deep pockets can

## PAST & PRESENT

### Communications Receivers 1945-1996



Second Edition

By Fred Osterman

## Collective Noun?

Is there a collective noun for valve and vintage radio enthusiasts? And if there isn't, who's got any ideas? *Editor's suggestion: How about a 'Pounce' of vintage collectors Phil, especially as I've seen some in 'action'?*

And while on the subject of vintage radio devotees, there are, apparently, television enthusiasts who still hark back to the good-old 405-line days. Still reeling from the shock of finding that 405-line transmissions are no longer broadcast, they can now be found reminiscing within the pages of the magazine *405 Alive*.

Seriously though, for anyone with an interest in vintage television sets, subscribing to *405 Alive* could be a very sensible, even therapeutic, thing to do. Details can be obtained by sending an s.a.s.e. to: Admin. Office, *The Radiophile*, 'Larkhill', Newport Road, Woodseaves, Stafford ST20 0NP. Alternatively, a cheque or postal order for £4 made out to *The Radiophile* will get you a sample copy of the magazine.



so you'll probably be stuck with either a 4 or 8Ω unit. (A 4Ω loudspeaker will be okay but even these are now getting scarce other than those intended for in-car use).

Please don't be tempted to use an 8Ω loudspeaker 'as-is'. This is because an 8Ω unit will load the output stage too lightly and so lead to higher a.c. voltages being developed in the anode circuit of the output valve.

At high volumes the excess voltage may cause any capacitor across the primary of the output transformer to break down. Worse still, the insulation on the primary winding of the output transformer could also break down necessitating its replacement as well.

If you do have to use an 8Ω loudspeaker then either use a matching auto-transformer (if you can find one) or else connect a 10Ω, 2W (minimum) resistor across the loudspeaker terminals. This additional load should prevent any damage should the volume control be accidentally turned-up too high. **Note: Adding this resistor is particularly important if you're forced to use a relatively insensitive hi-fi loudspeaker.**

**Field coil:** When replacing a field-coil type loudspeaker with a permanent magnet type do remember to substitute a choke with approximately the same resistance to replace the field coil. The inductance isn't critical but try for 5H (Five Henries) as a minimum. The choke should, of course, be rated to take the full h.t. current. If you don't have a choke then use a high-wattage resistor instead.

### Restoration Knobs

My second restoration topic has knobs on. Or rather, doesn't! Here I'm echoing comments made by Tudor Gwilliam-Rees in issue 159 of *The Antique Wireless Newsheet*. (This is published by Savoy Hill Publications - see the classified advertisements at the back of *PW* for the address.)

When a control knob belonging to an otherwise perfectly restorable radio has been either lost or broken it often proves impossible to replace. It's easy enough to pop on any old knob that'll fit but that's hardly playing the game.

What we need is a 'Control Knob Bank'. Don't laugh, apparently there is a real need for

### Vintage In Bulgaria

I'm pleased to announce that this column has interested another vintage radio enthusiast, and it's someone who lives in Bulgaria. Back in March, Stiliyan Stankov from Sofia sent me an E-mail telling of how he was growing tired of computers and now intended to collect old radios.

After only six months Stiliyan has already collected eight sets (stop press news: as of September 24 he's amassed 13 sets and still within the six months of starting!) and is beginning to suffer from that bane of vintage radio collectors - where to keep the things! Well Stiliyan...you've really caught this vintage collecting 'bug' badly haven't you?

Here in the UK (and, of course, in the USA) there are specialist suppliers, groups and magazines that cater for vintage radio enthusiasts. However, enthusiasts in many other countries are far less fortunate than we. Even if sets are available getting information and spares may be difficult. Also, if the country has no appropriate indigenous magazine through which enthusiasts can readily communicate then the situation is made even worse.

An unlikely country in which to find a supplier of vintage bits and pieces would seem to be Sri Lanka. Yet 'Shackway', located at 67 Church Road, Kandana, Sri Lanka, does supply valves and vintage components as well as public address equipment, radio components and hardware. Their valve catalogue lists many vintage (and not so vintage) British and American valve types.

More than once I've been asked by overseas readers of *Practical Wireless* about where they can obtain components and information. Clearly, if I can indicate a source geographically close to them then that's usually a help. Also, some countries have restrictions when it comes to international currency movements and the import of goods.

With foreign based readers in mind, I'd be pleased to hear from any supplier of valves, vintage radio components and information from outside the UK and USA that I can mention in this column. And in a similar vein, I'd like to hear from readers who are resident outside the UK and USA!

What problems do you have in the pursuit of your hobby? And do you have difficulty finding others within your own country who share your interests?

I also want to hear from UK and USA readers. Tell me what valve and vintage topics interest you. Significantly, I haven't, as yet, received a letter from a lady vintage radio collector. Is this a male-only pursuit, I wonder?

something like this!

So, I ask you that for now, please keep all your 'orphaned' control knobs safe and, most important, labelled with their manufacturer, model number and function. The same applies to those irreplaceable old dial scales.

I would also like to include aerial and oscillator coils, intermediate frequency transformers and power and output transformers in any such spares bank. In fact the list could be endless!

### The Epilogue

Ah, I see it's almost time for the Epilogue so, until it's my turn 'in the shop' again, I'll say cheerio and wish you all a very Merry Christmas and a happy and prosperous New Year.

Remember to send your comments and letters to me either via the *PW* offices, via E-mail to [phil@oldpark.demon.co.uk](mailto:phil@oldpark.demon.co.uk) or direct to: Phil Cadman G4JCP, 21 Scotts Green Close, Scotts Green, Dudley, West Midlands DY1 2DX.



Cheerio from Phil, see you in March.

### Restoration Topics

A couple of subjects relating to the restoration of old radios have arisen since I wrote my last column. The first concerns loudspeakers and that's my next topic.

In some cases, particularly if a radio has been kept in damp conditions, the loudspeaker cone and its support may have badly deteriorated. Alternatively, the voice-coil may be open-circuit or jammed solid due to the pole-pieces having rusted.

When the original loudspeaker is not easily repairable the question arises as to what to do. And although it is possible to re-cone the original loudspeaker the cost involved is hardly justified in the majority of cases.

The only realistic option is to replace the original loudspeaker with another. This is one reason why you ought never to simply throw away a perfectly good loudspeaker. You - or someone else - might well need it one day!

When replacing a loudspeaker please bear in mind the following points: Firstly there's physical size. If you have to obtain a new unit, double-check not only the diameter and location of any fixing holes but also the depth.

**Impedance:** The original loudspeaker will almost certainly have an impedance of 3Ω. Unfortunately new 3Ω units are next to impossible to get hold of,

Due to the fast turn around of popular secondhand items, readers should check on availability of advertised stock. In other words...if you spot something you fancy...don't delay or you could miss it!

# Traders

## YOUR GUIDE TO SECOND-HAND EQUIPMENT

### WATERS & STANTON 01702 206835

PLEASE NOTE SECONDHAND ITEMS COME WITH FULL 3 MONTH PARTS & LABOUR GUARANTEE. FOR MORE INFORMATION PHONE ANDY TIETJEN 01702-206835 OR FAX 01702-206843.

**HF TRANSCEIVERS**  
KENWOOD TS-930S HF base station transceiver £750  
KENWOOD TS-430S HF base station transceiver £379  
TENETEC SCOUT 555 HF mobile transceiver with 80m & 40m modules £379  
TRIO TS-940SAT HF base station inc built in ATU £199  
YAESU FT-767GX HF base station £729

**VHF/UHF TRANSCEIVERS MOBILE / BASE STATION**  
ICOM IC-260E 2m all mode transceiver £199  
KENWOOD TS-711E 2m all mode transceiver £595  
KENWOOD TM-241E 2m mobile transceiver £225  
YAESU FT-290R(x) 2m all mode portable transceiver £199  
YAESU FT-8500 2m/70cms mobile transceiver £499

**VHF/UHF TRANSCEIVERS HANDHELDS**  
ALINCO DJ-500E 2m/70cms handheld transceiver £179  
ICOM IC-T42E 70cms handheld transceiver £189  
ICOM IC-W21E(x) 2m/70cms handheld with dry cell cases £199  
ICOM IC-M11 VHF Marine handheld transceiver £219  
KENWOOD TH-28E 2m handheld transceiver £199  
YAESU FT-411 2m handheld transceiver £109

**SHORTWAVE RECEIVERS**  
AKD HF8M Base station receiver inc weather fax £139  
DRAKE R8E Base station receiver (PSALE) £695  
DRAKE R8E Base station receiver £695  
GRUNDIG YB-206 Portable shortwave receiver £79  
LOWE HF-150 High specification HF receiver £279  
PANASONIC RFB-65 Portable shortwave receiver with SSB £109  
SANGEAN ATS-803A Portable shortwave receiver with ATU (PSALE) £80  
SONY ICF-SW100EX2 Portable shortwave receiver inc SSB & FM stereo £149  
YAESU FRG-7700 Base station HF receiver with memory unit £329

**SCANNERS MOBILE / BASE**  
AOR AR-2002 25-55MHz, 800-1300MHz Base scanner (P.Sale) £189  
REALISTIC PRO-3039 66-88, 108-174, 380-512, 806-960MHz £129  
REALISTIC PRO-3032 Base scanner 68-960MHz with gaps £129  
YAESU FRG-9600 60-903MHz all mode base receiver £269

**SCANNERS HANDHELD**  
AOR AR-100b(x) 8-600MHz, 805-1300MHz AM/FM/FM £99  
COMTEL COM204 68-999MHz with gaps £129  
FAIRMATE HP-2000E 0.5 - 1300MHz AM/FM/WFM £139  
REALISTIC PRO-31 66-512MHz with gaps £59  
SONY PRO-80 x3 HF receiver £139  
SIGNAL R-537S Airband receiver £35  
WIN 108 Dedicated airband receiver £109  
YUPITERU MVT-5000(x) 25-550, 805-1300MHz FM/AM £99

### LOWE ELECTRONICS 01629 580800

**HF TRANSCEIVERS**  
Icom IC 706 Mk1 HF transceiver with 2m and 6m £650  
Icom IC 728 HF transceiver £550  
JST135 HF Transceiver £975  
Kenwood TS50 Mobile HF Transceiver £550  
Kenwood TS530S HF Transceiver £495  
Kenwood TS820 HF Transceiver £395  
Yaesu FT747GX HF Transceiver £400

**DATACOMMS**  
Kantronics KAM Multimode TNC £185

**VHF/UHF TRANSCEIVERS**  
Alinco DJ500E Dual Band Handheld £249  
Alinco DJ560 Dual Band Handheld £199.00  
Alinco DR599 Dual Band Mobile £425.00  
Icom IC24ET Dual Band Handheld £269  
Icom ICW2E Dual Band Handheld £249  
Kenwood TH205E 2m Handheld £159  
Kenwood TH78E Dual Band Handheld £290  
Kenwood TM732E Dual Band Mobile / detachable front panel £380  
Kenwood TR2500 2m Handheld £140

Yaesu FT290R 2m Multimode £250.00  
Yaesu FT470R Dual Band Handheld £259  
Yaesu FT2200 2m FM Mobile £289  
Yaesu FT4700RH Dual Band Mobile with detachable front £375

**HF RECEIVERS**  
Lowe HF225 HF Receiver with all accessories £345  
Lowe HF225 Europa HF Receiver £450  
Sony ICF5W55 World band Portable £229  
Lowe HF150 Portable HF Receiver £295  
Grundig YB217 Portable receiver £95

**SCANNERS**  
AOR AR1000 Handheld £169  
AOR AR2001 Base Scanner without PSU £159  
AOR AR2700 Handheld Scanner £160  
AOR AR2800 Base Scanner with SSB £195  
Icom ICR1 Handheld Scanner £199  
Yupiteru MVT7000 Handheld Scanner £200  
Yupiteru MVT7100 Handheld Scanner £225  
Yupiteru VT225 Airband Scanner £180  
Yupiteru VT125 Airband Scanner £150  
Yupiteru MVT5000 Handheld Scanner £180

Items are held at various branches, please contact our Mallock branch for further details on 01629 580 800

### SOUTH EAST COMMUNICATIONS (REP OF IRELAND) 00353 51 871278

**HF TRANSCEIVERS:**  
Kenwood TS850sat with extra filters ..... £1195  
Kenwood TS5570D latest DSP, ATU ..... £1095  
Yaesu FT1000MP/DC demo ..... £1899  
Icom IC735 with matching PSU ..... £699  
Icom IC737A auto ATU etc ..... £899  
Alinco DX70, HF mobile+6m, mint ..... £575  
FT990DC boxed mint, auto ATU ..... £1099  
Yaesu FT840 with FC-10 auto ATU ..... £749

**VHF/UHF TRANSCEIVERS:**  
Kenwood TM702E 2m/70cms 25 watt mobile ..... £299  
Alinco DR590E 2m/70cms mobile, 45/35 watts ..... £249  
Yaesu FT3000M 70 watt 2m ..... £299  
Yaesu FT51R Top spec handheld £299  
Yaesu FT50R 2m/70cms mil spec handi ..... £199  
ADI 146 50watt 2m demo ..... £219  
Kenwood TH78E 2m/70cms handi ..... £249

**SHORTWAVE RECEIVERS:**  
Yaesu PRG8800 0-30mhz, mint ..... £349  
Yaesu FRG7700 0-30mhz, mint £289  
Lowe HF225 plus FM, and keypad boxed ..... £349  
Lowe HF150 inc keypad boxed ..... £299  
Realistic DX394 boxed as new ..... £169  
Sony SW55 as new, bargain ..... £199  
Sony PRO80 0-225mhz ssb ..... £199  
Sangean ATS 818 portable receiver ..... £129

**SCANNERS BASE/MOBILE:**  
AOR 5000 500khz-2.6GHZ boxed mint ..... £1099  
AOR 3000 0-2036mhz £400 memories ..... £499  
Icom ICR7000 25-2000mhz ..... £699  
AOR 3000A demo ..... £699  
Realistic PRO 2035, £1000 memories ..... £299  
AOR 8000 0-1900mhz boxed etc ..... £269  
Yupiteru MVT 7100 0-1650mhz £199  
Bearcat 3000XLT 25-1300mhz ..... £169  
AOR 2000 0-1300mhz ..... £179  
Icom ICR10 latest hand held ..... £249

**STATION ACCESSORIES**  
Diamond DL 1000 dummy load £109  
Diamond SX 100 3kw SWR/PWR ..... £79  
Yaesu MD-1 desk mic ..... £69  
Yaesu MB 100AX desk mic ..... £89  
Vectronics VC300DLP 300watt tuner ..... £99  
MFJ 948E 300watt tuner mint ..... £89  
Timewave DSP-59plus ..... £149  
Icom PS-55 20amp PSU ..... £129  
OPTO 3300 freq finder ..... £89  
MFJ 259 antenna analyzer ..... £189

### NEVADA 01705 662145

AMP UK HUNTER 600W ..... £925  
ALINCO DJ-S41C - 70cms ..... £89  
ALINCO G-5 Handie ..... £235  
AOR 3000 ..... £495  
AOR 3000A ..... £575  
AOR 7030 ..... £599  
BNOS 160W 2m Amp ..... £199  
DAIWA PS304 II - PSU ..... £99  
DRAE 24A PSU ..... £79  
DRAKE R8A ..... £825  
DRAKE R8E ..... £750  
ICOM IC-725 ..... £595  
ICOM IC-W2E ..... £199  
ICOM IC-706 ..... £675  
ICOM IC-728 ..... £629  
ICOM R-71 + HF ..... £575  
ICOM R-72 ..... £675  
ICOM IC-2400 TWINBAND ..... £335  
ICOM IC-7000 ..... £595  
JIL 400 BASE ..... £185  
JST 100 COMPLETE ..... £499  
KENWOOD TH-215E ..... £145  
KENWOOD TM-241E ..... £225  
KENWOOD TM-451E ..... £299  
KENWOOD TR-751E ..... £425  
KENWOOD TS-440 ..... £625  
KENWOOD TS-680s HF+6m ..... £625  
KENWOOD TS-930 BASE ..... £599  
KENWOOD TS-940S ..... £899  
KENWOOD TS-850 SAT ..... £1299  
LOWE AP 150 ..... £155  
LOWE HF 225 + Extras ..... £425  
MIRAGE B3016 2M AMP ..... £245  
PALSTAR KH6 + Extras ..... £139  
PHILLIPS D2999PI, RX ..... £135  
RACAL RA17 ..... £139  
REALISTIC 2036 ..... £179  
REALISTIC PRO-50 ..... £69  
SANGEAN ATS-803A ..... £85  
SATCOM P40 (PAIR) ..... £149  
SENTEC 20M HANDIE ..... £195  
SONY SW77 RX ..... £249  
STANDARD C500 ..... £185  
STANDARD C800 ..... £189  
TARGET HF3 RX ..... £130  
TENETEC OMNI VI S.O.B ..... £1999  
TIMEWAVE DSPs ..... from £99  
TOKYO HC-200 ATU ..... £99  
TOKYO HL-1KGX AMP ..... £799  
TRIO AT-200 ATU ..... £175  
TRIO AT-230 ATU ..... £189  
TRIO 120V 10W HF ..... £259  
TRIO 120S 100W HF ..... £325  
W9-GR DSP II ..... £185  
YAESU FL-110 HF Amp 100W ..... £169  
YAESU FP-707 20A PSU ..... £139  
YAESU FRG 9600 ..... £379  
YAESU FT-11R ..... £169  
YAESU FT-107M 100W ..... £425  
YAESU FT-208 + EXTRAS ..... £179  
YAESU FT-221R 2m BASE ..... £299  
YAESU FT-290 I ..... £245  
YAESU FT-290 II ..... £325  
YAESU FT-411 + EXTRAS ..... £189  
YAESU FT-470 + ACCS ..... £225  
YAESU FT-650 24-54MHZ ..... £699  
YAESU FT-707 ..... £349  
YAESU FT-727 ..... £169  
YAESU FT-747 FM ..... £475  
YAESU FT-757 AT ..... £225  
YAESU FT-900 AT ..... £825  
YAESU FT-990 DC as new ..... £1249  
YUPITERU MVT 7100 ..... £215  
6M Transceiver 20W ..... £75

### MULTICOMM 2000 01480 406770

**HF TRANSCEIVERS**  
ICOM IC-706 MK-1 HF / VHF TRANSCEIVER £675  
ICOM IC-765 DELUXE HF TRANSCEIVER £1,100  
ICOM IC-775DSP (8-MONTHS OLD) "THE BEST" £2,225  
KENWOOD TS-440SAT GOOD CONDITION £649  
KENWOOD TS-690SAT HF TRANSCEIVER + 6M £925  
KENWOOD TS850SAT GOOD CONDITION £875  
KENWOOD TS850SAT AS NEW CW FILTERS £950  
KENWOOD TS-940 SAT WITH LOWE MODS (MINT) £1,050  
KENWOOD TS-950D THE ULTIMATE TRANSCEIVER £1,499  
TENETEC OMNI 6 (COMPLETE) MINT CONDITION £995  
YAESU FR-300B/FL-300B (PAIR) £125  
YAESU FT-1000 MP AC (EX-DEMO) £1,875  
YAESU FT-101B HF (GOOD CONDITION) £160  
YAESU FT-101E (MINT CONDITION) CLASSIC £950  
YAESU FT-101ZD (MINT) £269  
YAESU FT-747GX "AS NEW" + FM £410  
YAESU FT-747GX MINT CONDITION + FM £399  
YAESU FT-840 GENERAL COVERAGE TRANSCEIVER £599  
YAESU FT-840 GENERAL COVERAGE TRANSCEIVER £625  
YAESU FT-900SAT (EX-DEMO) £875  
**VHF/UHF TRANSCEIVERS**  
AKD 6001 + REPEATER MODULE £149  
FT-51 DUAL BAND HANDIE £265  
ICOM IC-207H (EX-DEMO) £340  
ICOM IC-290E 2-METER MULTI-MODE 25W £249  
ICOM IC7-7E DUAL BAND HAND HELD (MINT) £205  
ICOM ICV-200T 2-METER MOBILE £129  
KENWOOD TH-79E HAND HELD £299  
KENWOOD TM-741E 62/70 (EX-DEMO) £625  
KENWOOD TM-751E 62/70 (EX-DEMO) £399  
KENWOOD TR-751E 2-METER MULTIMODE £375  
STANDARD C-156 2-METER HAND HELD (EX-DEMO) £125  
STANDARD C-7800 70CMS MOBILE £120  
YAESU FT-211 2-METER MOBILE £185  
YAESU FT-221R 2-MTR BASE MULTIMODE £259  
YAESU FT-290R NK-1 "GREAT" 2-MTR PORTABLE £210  
YAESU FT-290R NK-2 2-MTR MULTIMODE £289  
YAESU FT-290R NK-2 2-MTR MULTIMODE £289  
YAESU FT-3000M (3-WEEKS OLD) £335  
YAESU FT-726 2m/70CM BASE (MINT) £629  
**SHORT-WAVE RECEIVERS**  
AKD HF-3 (4 WEEKS OLD) £129  
AOR AR-3030 BOXED (AS NEW) £399  
ICOM IC7-7E FULLY LOADED £569  
ICOM ICR-72E SHORT-WAVE RECEIVER £550  
KENWOOD R-5000 DELUXE SHORT-WAVE RECEIVER £689  
KENWOOD R-5000 DELUXE SHORT-WAVE RECEIVER £599  
KENWOOD R-5000 DELUXE SHORT-WAVE RECEIVER £579  
LOWE HF-225 GENERAL COVERAGE RECEIVER £319  
PANASONIC RFB-10 £49  
RACAL 1792 EX-GHQ RECEIVER £679  
REALISTIC DX-394 (AS NEW) £195  
TRIO R-600 (GREAT CONDITION) £215

PLEASE MENTION TRADERS' TABLE WHEN ENQUIRING ABOUT ANY ITEMS ON THESE PAGES!

# Traders' Table

## YOUR GUIDE TO SECOND-HAND EQUIPMENT

### ARC EARLESTOWN 01925 229881

HF TRANSCEIVERS	
Yaesu FT-900AT - boxed	£950
2 x Icom IC-765 plus speaker	from £1500
2 x Yaesu FT-757GX1 + boxed	£TEL
Yaesu FT-980	£799
Yaesu FT-102 + FC-102	£475
Yaesu FT-101ZD MkIII + FC-902/FCV-901R incl 2m/6m	£799
Icom IC-735 boxed	£525
Yaesu FT-902DM + SP-901/SPC-300 ATU	£499
Yaesu FT-747 + FC-700 boxed	£TEL
Kenwood TS-830M1 +	£375
Yaesu FT-102	£375
Yaesu FT-101Z	£299
Yaesu FT-902	£250

MOBILE/BASE VHF/UHF TRANSCEIVERS	
Kenwood TS-700S	£450
Kenwood TM-742 + 10m module as new	£625
Icom IC-229 - boxed	£225
Icom IC-290D	£300
Kenwood TM-255E boxed VGC	£TEL
Yaesu FT-230	£175
Kenwood TW-4000 boxed	£225
Icom IC-271H +100W internal PSU	£550
Icom IC-2410H1 boxed	£TEL
Yaesu FT-790R + linear	£TEL
2 x FT-290R1	from £200

RECEIVERS/SCANNERS	
Icom IC-R7000	£700
ICOM IC-R71E1 boxed	£599
2 x Kenwood R-1000 boxed	£250
Regency MX-7000	£TEL
AR-2500	£275
Drake R-8E	£699
2 x Lowe HF-225	from £275
Sony PRO-80	£150
Yaesu FRG-9600 - HF converter	£350
Yaesu FRG-7	£140
Icom IC-R7100 boxed	£TEL
2 x AOR AR-3000A	from £550
Sony SW-55 mint condition	£TEL
AOR AR-2800 boxed	£199
Grundig Satellite 500 + IC-FAX 1/Datong AD-270	£175

HANDHELDS	
Kenpro KT-22	£80
Alinco DJ-160	£150
Kenwood TH-21	£99
Icom IC-4E	£115
Standard C-528 boxed	£199
Standard C-558 boxed	£225

MISC.	
SDU-5000 Spectrum Display Unit - as new	£599
AT-230 - box	£175
MJF-1278 Packet Unit + Software	£225
Datong ASP (wired for Kenwood)	£50
MML-344 - 100-3 + boxed	£TEL
Tokyo HL-160W linear	£175
Icom SP-20 speaker	£75

### SHORTWAVE SHOP 01202 490099

HF TRANSCEIVERS	
Icom IC751 - 100W HF	£545
Icom IC725 inc AT150 - VGC	£645
Icom IC706 HF 6m and 2m Mobile	£625
Kenwood TS-850S inc ATU - Mint	£895
Kenwood TS-880S - HF & 6m	£695
Kenwood TS-570D - Latest HF with DSP	£1,050
Kenwood TS-140S - 100W HF	£525
Kenwood TS-120S - 100W HF	£295
Racal Synical - 10W HF with Handset	
Trio TS-530SP - 100W HF	£375
Trio TS530SP - 100W HF Narrow CW Filter	£395
Trio TS120V - 10W HF - Ideal Novice Set	£275
Yaesu FT990 - AC PSU & ATU	£1,150

VHF/UHF	
Alinco DR510 - 2m/70cm Mobile LED Display	£275
Icom IC215 - 2m Channelised FM	£85
Icom IC2E 2m Thumbwheel H/Held	£75
Icom IC02A - No 1750Hz	£85
Kenwood TH22E - 2m H/Held c/w Keypad	£185
Kenwood TS711E 2m Multimode Base	£525
Kenwood TM733 - 2m/7cm Mobile	£399
Trio TR9130 2m Multimode Boxed	£350
Yaesu FT290R11 2m M/mode Mobile	£325

RECEIVERS	
AOR 7030 Acclaimed HF RX - Ex Demo	£645
Eddystone EC10 - General Coverage RX	£85
Icom R71E - General Coverage Receiver - Mint	£495
Icom ICR72 - General Coverage RX	£595
JIL SX400 - Base Scanner - Mint	£165
JRC NRD525 with VHF and UHF	£595
Lowe ?125 - ? Gen Cov RX	£225
Lowe HF-150 - HF Gen Cov RX - Mint	£325
Realistic PRO-2036 - 400Ch Scanner (Choice of Two)	From £165
Signal R532 - Airband Receiver	£135
Sony Air? Air and Marine Rec (Choice of Two)	From £145
Sony ICF PRO80 - SW and FM Broadcast	£135
Yaesu FRG8800 with VHF (Choice of Two)	£495
Yaesu FRG7700 - General Coverage RX	£295

MISCELLANEOUS	
Capco 1KW ATU	£125
Diawa CNA1001 - Auto ATU	£145
Diawa AP-606K Active Filter Unit	£85
Diawa PS30411 - 30A PSU	£95
Emotator 105TS - Heavy Duty Rotator - VGC	£185
Global AT2000 - RX ATU - New - No Box	£85
Icom PS15 - Matching PSU (IC745, IC751, etc)	£125
Kantronics KAM - Multimode TNC	£165
Kenwood SP950 - Deluxe Matching Speaker	£85
Kenwood PS31 - Matching PSU (850, etc)	£125
MJF 407B - Keyer	£49
MJF 259 Twin Meter Aerial Analyser with case	£195
Microter R432-90 - 90W 70cm Amplifier	£349
Optoelectronics 3300 - Frequency Counter	£100
Optoelectronics 3000A - Frequency Counter	£120
Tokyo Hy-power HC400L Deluxe ATU	£145
Tokyo Hy-Power HX240 - 2m HF Transverter	£145
Yaesu G500A Elevation Unit - VGC	£165
Yaesu G250 Rotator	£85

Please call for our latest used equipment list and details of our Sell-On-Behalf Scheme.

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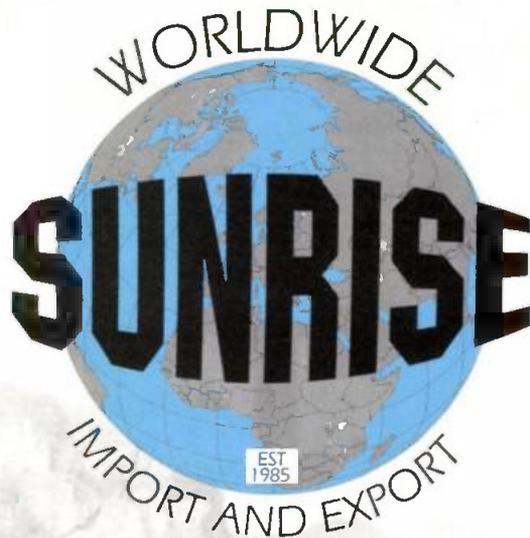
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# HF FAR & WIDE

*Leighton Smart GWOLBI reports on YOUR activity on the h.f. bands, and as Leighton says....band conditions really do seem to be improving!*

The good news this month is that our reporters have noticed a definite improvement in propagation conditions on the h.f. bands. Most notably improved is the 14MHz allocation, with strong signals from Australia and New Zealand coming in on the long path at around 0600UTC.

By the time you read this, the dark autumn/winter nights should be upon us, and we'll be working some nice DX with simple dipoles held up with string, perhaps!

Firstly, I have an up-date on the ZB2 callsign 'pirating' reported this year. It started several months ago when I mentioned that the callsign ZB2FUM had been pirated on the h.f. bands by a station reportedly operating from Gibraltar, following information given by Mr W. Guerrero ZB2IB, Secretary of the Gibraltar Amateur Radio Society.

However, this month I've received a couple of telephone calls from readers who have worked the similarly-titled ZB2FU/M, who has apparently been mistaken on a number of occasions for the ZB2FUM illegal operator!

It seems that ZB2FU, who works /Mobile quite often has told our readers that he's a little 'cheesed off' about being told that he's a pirate, and would like to set the record straight. No problem! So...let's get it straight: ZB2FUM is a callsign that has not been issued in Gibraltar, and is thus illegal. On the other hand ZB2FU, (including ZB2FU/M), is legitimate! Okay?

## Your Reports

I'll start your reports this month with the 1.8 and 3.5MHz bands for a change, and the log from Sean Gilbert G4UCJ in Milton Keynes, who says he's been experimenting with a m.w. loop antenna on 1.8MHz, (or 'Top Band' as it's affectionately known).

Using the loop Sean made contacts with the well known VE1ZZ (Canada), and UA9ADD (Asiatic Russia) on s.s.b., while c.w. operation brought in 9A1HCD (Croatia), OK1DX/MM (off the Faroe Islands), EU1AI (Belarus), and LA5M/P (Norway), all between 2000 and midnight. On 3.5MHz he lists c.w.

contacts with VY2JG (Prince Edward Island), J69B (St. Lucia Island), BV5BG (Taiwan), and 9K2MU (Kuwait), all between 2130 and 2240UTC.

It's a big 'Welcome Back' to Derek Blunden BRS171057 of Swindon, who has been tied up for quite a while with his studies. Hope everything goes well with the 'A' Levels, Derek! His long s.w.l. list this month shows 3.5MHz reception of N2BNA (USA) working G0LJT at 0007, LU2NI (Argentina) working E18HZ in Eire at 2242, CY1FG (Canada) working G40BB at 2215, as well as WA2WVL (USA) in contact with M0ARU at midnight, and KD1WQ working GM3UHT at 2314UTC.

## The 7MHz Band

Up to 'Forty' and now straight into the 7MHz band log from newly-licensed reporter Dave Nolan EI5IN from Mulingarr in Co. Westmeath, Ireland, who has been QRPing on the band. With powers of between 1 and 5W of c.w. the log includes contacts with RW4FE (Russia) at 2053, YU1WN (Serbia) at 2236, HB9CM (Switzerland) at 2100, YO3RX (Romania) at 0616, and HG5RVT (Hungary) at 2045. A warm welcome goes out to EI5IN.

Next comes Ted Trowell G2HKU on the Isle of Sheppey in Kent, and of course 'Our Ted' is an all-c.w. man. Ted has been 'invited' to the hospital again of late (hope you are fine now, Ted, keep that 'spark transmitter going'!

For 7MHz, Ted lists contacts with FG/F2HE (Guadeloupe Island), CP6IV (Bolivia), VP2EXM (Anguilla Island), ZL1BM (New Zealand), CL8VP (Cuba) at around 0500. Later operation at 1700 brought Ted a contact with VK8AV (Alice Springs, Australia), and at 2000UTC saw 9K2RR come in with good signal strengths.

## The G3NOF Report

The monthly propagation report from Don McLean G3NOF in Yeovil indicates that conditions on 14MHz and the other bands in August have improved somewhat (his report is a summary of conditions on 14MHz and all the DX bands). Don says "The



**Fig. 1: The man himself - 'HF Far & Wide's 7MHz Correspondent' Charlie Blake M0AIJ operating /P while on holiday in Poole, Dorset.**

long path to New Zealand has been opening lately between 0600 and 1000UTC, although the best conditions have seemed to be on the short path to Asia around 1500 to 1800, with some very strong signals indeed. During this time a few Australians were also heard".

Don continues: "Around the same time, west coast Americans came in, and African stations were heard mostly between 1500 and 1900. There were a few Africans heard around 2200, and north and south America were good signals around 2000UTC onwards".

Ted G2HKU's 14MHz band log includes s.s.b. contacts with A61AJ (United Arab Emirates) at 1800, BV5GO (Taiwan) at 1745, D44AB (Cape Verde Island) at 1754. He also worked DU1SAN (Philippines) at 1800, 4S7FS (Sri Lanka) at 1700, J38AI (Grenada) at 2242, Y11RS (Iraq) at 1745 (QSL to Adel, Box 55072, Baghdad, Iraq). Finally, Ted worked 8P9HA (Barbados) at 2314, 9M20M (Malaysia) at 1533, and 9V1ZB (Singapore) at 1700UTC.

Now I give a warm welcome to new reporter Richard Lewis GWOWRI of Ammanford in Carmarthen. Richard has sent in a short log, which shows his contacts with VK2CP (Australia) at 1450, CQ2AL (Cuba) at 1645, 4S7FS (Sri Lanka) at 1920, HB9VIO/AM at 37,000 feet over Morocco, ET3BA (Ethiopia) at 1852, and 4F4IX in the Philippines at 1800UTC (Don't forget to include equipment, antenna and power input details everyone).

Next comes Carl Mason GWOVSW from Skewen in West Glamorgan, who has been 'bashing the key' yet again. His log for August shows his contacts with PY4PZ (Brazil) and WP4S (Puerto Rico) at around 1900, along with EP2MKP in Tehran at 1548, SV9/DJ4TR (Crete) at

0728, and CN18DKH (Morocco) on s.s.b. at 0750 (QSL via CN8SS, Box 299, Rabat).

Also on the 14MHz band was Charlie Blake M0AIJ who recently took a holiday down in Poole, (see Fig. 1) where he met up with Rob G3XFD for a bit of a 'ragchew'. A DXpedition in Poole eh, Charlie!

Charlie's log shows his /Portable contacts with Z32FD (Macedonia) at 1040, K9WR (USA) at 1315, ED5HQ (Columbretes Island) at 0838. Also worked were J41WCA at the World Championships Athletics in Athens at 1045, and CQ1I on Berlanga Island at 1245UTC.

And now back to Ted G2HKU to tie up the ribbons for this month. Ted's log shows that at 1500 he contacted TF/DJ7RU (Iceland), SV5/SM0CMH (Island of Rhodes), and JA7SSB (Japan), while operating at 1700 gave him a contact with EA5ND/EA9 (Ceuta & Mellila, north Africa).

## Signing-Off

Well that just about wraps it up for this month, folks and it's signing-off time! I hope I managed to squeeze you all in, although it does become difficult sometimes to give all reporters a 'fair crack at the whip' so to speak.

Thanks again, and as usual, reports and information (don't forget to include full details of your equipment, antennas, power inputs and photos!) by the 15th of each month to: Leighton Smart GWOLBI, 33 Nant Gwyn, Trelewis, Mid-Glamorgan CF46 6DB, Wales. Tel: (01443) 411459 or (01443) 710749 (9am - 6pm), FAX: (01443) 710789.

**END**

## VHF REPORT

*David Butler G4ASR has reports of some excellent autumnal tropospheric propagation which enabled contacts to be made with stations in Scandinavia and Eastern Europe.*

Some very good tropospheric propagation occurred on the v.h.f. and u.h.f. bands during September. Contacts from the UK were made with stations as far away as Scandinavia and eastern Europe.

There were also a number of weak auroral openings, predominantly on the 50MHz band, enabling contacts to be made with stations in northern England, Scotland and Scandinavia. Sporadic-E (Sp-E) propagation was still present on the 50MHz band during September although the openings were very much reduced compared to the frenetic activity of previous months. For the very observant, there was also a brief trans-equatorial propagation (t.e.p.) opening to southern Africa on the 50MHz band.

### Tropospheric Enhancement

What was probably one of the best periods of tropospheric enhancement for some considerable time occurred in a multitude of openings throughout much of September. At the beginning of the month, September 2, the 144MHz band was reported open from eastern England into Scandinavia. This tropo opening fortunately coincided with one of the regular monthly Scandinavian activity periods (held on a Tuesday).

At the QTH of **Andy Cook G4PIQ** (J001) stations worked on s.s.b. included OZ5V and OZ5W (both in JD55) and OZ1ALS/A (J045). A little further to the north the station of **John Regnault G4SWX** (J002) found DD0VF (J061), OZ1KLU (J046), OZ6ABA (J057), OZ7UHF (J065) and SM7ALC (JD65).

The IARU Region 1 144MHz contest on September 6-7 generated much activity but as usual 'Murphy' decided that propagation would not be spectacular. Nevertheless there was still some good DX being worked on the 144MHz band.

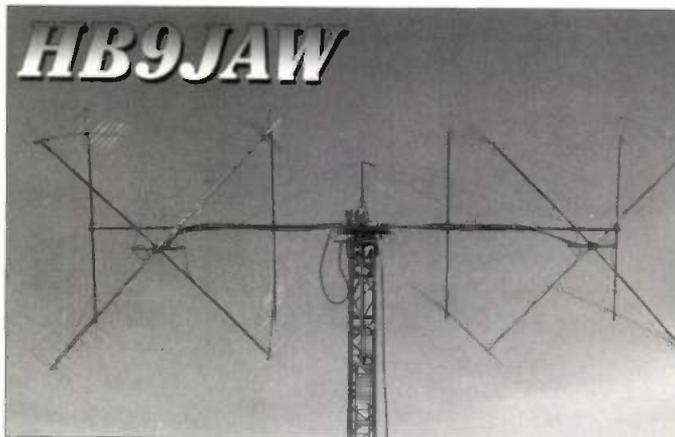
In southern Scotland the station of **Ray James GM4CXM** (I075) heard EA2LU/P (IN93) over something like a 1400km path. Ray also reported F5KAR/P, TM2K (JN09), TM2DX (all in JN09) and ON4ASL/A (J010).

At the QTH of **Alec Trusler G0FIG** (I090) located on the south coast of England s.s.b. contacts

were made with EA2LU/P, EA3TI/P (JN12) and HB9S/P (JN36). Of course as soon as the contest had finished the conditions improved considerably!

In the period September 8-10 propagation on the v.h.f., u.h.f. and microwave bands were very good in an arc stretching from southern France, through Switzerland, Austria and south-east Germany. Among the DX reported on the 144MHz band were the stations of F5BUU (JN03) and F5SOH (IN93), both located near the Spanish border, F6KEX near the Italian border in JN35, OE9NHI (JN47) and DF1CF (JN57), DF9NP (JN58) and DK00G (JN68) all located near the Austrian border.

Activity from Switzerland seemed very high especially on the 144MHz band. Among those reported were the stations of HB9AOF, HB9IAM, HB9SLO, HB9SNR and HB9STY (all in JN36), HB9AMH/P, HB9BLF, HB9BQU, HB9DFG and HB9RDE (in JN37), HB9FAP/P (JN46)



**Fig. 1: The 448-element antenna array for the 144MHz band at the QTH of Michel Winiger HB9JAW.**

and HB9QQ (JN47).

Also active was the station of **Michel Winiger HB9JAW** (JN47). He uses an antenna system consisting of 8 x 28-element crossed Yagis (a total of 448-elements!) as shown in the photograph, Fig. 1. All the HB9 stations mentioned were making s.s.b. contacts with stations located throughout much of southern and central England, GW, GD, G1 and EI.

**John F5IQA** (JN36) sent a report mentioning that his 144MHz station consists of an FT-736R transceiver,

an 80W solid-state amplifier and two stacked 12-element DJ9BV Yagis. In the period September 9-10 he made s.s.b. contacts with G0FIG (I090), G3KEQ (J001), G3NAQ (I091), G4DOL (I080), G4RRA (I091) and G16ATZ (I074) for his best DX at 1242km.

On the 430MHz band the station of **Nick Peckett G4KUX** (I094) reported working F8DKW (J018), F6BSJ (JN26) at 1000km and F5FEN (JN25) for his best DX in the period at 1162km. Conditions were also very good on the 1.3GHz band with the station of **Eric Gedvilas G8XVJ** (I083) spotting F5FEN (JN25), F5HRY and F6DKW (in JN18) and HB9AMH/P (JN37). This latter station also managed to work GD4XTT (I074) over a path of some 1140km.

The prevailing high pressure weather system slipped away in the following days but slowly returned to provide yet another period of excellent tropo conditions between September 16-18. This opening was different from the previous event in

evening of September 17. **Ulrich OH0GHU** (JN38) reports that during the evening he worked the stations of G0FIG (I090), G3KEQ (J001) and G60DA (I091) on the 144MHz band. Ulrich was running 100W into an 11-element DL6WU long Yagi.

On the 430MHz band, running 20W into an 18-element Yagi Ulrich contacted G0FIG again for a new locator square. Meanwhile G0FIG, now operating on the 430MHz band, made s.s.b. contacts with DL6LP (JN48), DL6WU and DG7SFL in JN49 and LX1JX (J030).

Possibly some of the longest distance contacts were made in the period September 21-23. All bands from 144MHz and up were open via tropo ducting predominantly to areas of southern Scandinavia, northern Germany and Poland.

At the beginning of the opening, on September 21, stations in GD, G1, GM and GW were heard making c.v. and s.s.b. DX contacts on the 144MHz band with stations located throughout Germany. For example GW8JLY/P (I081) worked DL2ABO (J051) as did MD1BYG (I074).

Also on the Isle of Man GD3TNS/P worked DG7EAI (J031) and over in Northern Ireland the station of G16ATZ (I074) contacted DB8KJ (J030) and on the 430MHz band made it with PA0RDY (J022). Ray GM4CXM, who incidentally runs 400W into two stacked 16-element F9FT Yagis, managed to work a small number of DL stations late in the evening but mentions that the Scottish Amateur Radio Convention was held on September 21 so there was very little activity from Scotland at the beginning of the opening.

Some German stations found conditions particularly good across the North Sea with DD3DX (J031) amongst others reporting a 1500km QSO with OY9JD (IP62) located on the Faeroe Islands. Another German station, **Uwe DL8UD** (J044), situated near the Danish border, also contacted OY9JO (best DX at 1286km) along with the stations of GM3JIJ (I068) at 1070km, EI2FIB (I063) at 1067km and EI3GE (I063) 1042km.

Uwe used an FT-736R transceiver driving a 200W amplifier into a 17-element F9FT Yagi to make his contacts. He also contacted GU3EJL (IN89), GW4ZQV and GW8JLY (I081) and numerous G

that propagation was generally restricted to the east of the UK extending into eastern Germany, Austria and the Czech Republic.

**Lee Adams G4RKY** (J001) reports working strings of German stations on the 144MHz band in locator squares JN58, JN59, JN68 and JN69. He also contacted OK1JKT/P (J060), OK2MWR/P (JN99) and OK2PQR/P (JN89).

Alec G0FIG was pleased to find two Austrian stations OE2JG/2 (JN67) and OE3LFA (JN88) during the

stations in I080, I081, I082, I083, I091, I092, I093 and I094.

Conditions in the following days, September 22-23, were excellent as a pronounced area of ducting formed between the UK and northern Europe. **John G1ZCW** was pleased to catch this opening as it was his first big event since coming onto the 144MHz band. His QTH is situated in locator square J003 which contains very few v.h.f. DXers and he was therefore in much demand during the tropo event. John uses a Yaesu FT-726R transceiver driving into a Nag 144XL amplifier producing about 200W output into a 19-element Yagi.

Numerous s.s.b. contacts were made during the evening of September 22 with operators located in DL, DZ, PA, SM and SP. Among John's best contacts were the stations of SP1E0I (J073), SP2IQW (J094), SP2SGZ (J082), SP3SFN (J082) and SQ3VAA (J072).

All of John's contacts were well in excess of 1000km but the star turn of the evening were contacts with SP4MPB (K003) at 1351km and SP4CHY in the same locator square at 1417km. Not a bad start at v.h.f. DXing!

## Unusual Characteristics

Located near Glasgow the station of Ray GM4CXM mentions the unusual characteristics of the tropo opening. Ray noticed that the duct went a long way inland, overhead of the stations immediately to the east of his QTH. This meant that he didn't have to fight through the normal barrage of coastal stations who often get to the DX before Ray does.

Ray reports that propagation during the evening of September 22 was very good although signals from Polish stations (which had been worked for most of the day in G and GW) only appeared at his QTH for some 20 minutes just before midnight. However, he did manage to contact SP1E0I, SP2FAX (J083), SP20FW (J093) for his best DX of the evening at 1478km and SP3SFN (J082).

Ray also worked a number of stations in F, DL, DZ, PA and SM at distances ranging between 800-1200 km. Propagation on the following day declined somewhat at the QTH of GM4CXM and although there were still some very big signals around it was difficult to find any real DX. There was still a path into DL, ON and PA but by the evening it had all disappeared.

The tropo duct fortunately extended to my QTH (I081) on the Welsh border and I was able to make many contacts on both c.w. and s.s.b. with stations in DL, OZ, SM and SP. Just as experienced by GM4CXM the duct went over the top of stations to the east and south-east of my QTH. The result was that there was far less competition for the DX stations.

A total of nine Polish stations were worked in locators J072, J073,

J082, J083, J084, J092, J093, J094 and K003 and if you look at a locator map you'll see how tightly grouped all these contacts were. Only two contacts were less than 1400km, the best DX being SP4MPB at a shade under 1600km.

Other contacts included OZ1DNN (J055), OZ5AGJ (J056), SH7ABV (J065) the SH-prefix indicating a novice licensee and SM7WT. For the record I was using a Yaesu FT-221R with a replacement MuTek front-end, 400W and a single 17-element F9FT Yagi.

Irec SP3SUX (J072) sent a message via Packet radio about his contacts made on the 144MHz band on September 22. He uses a Yaesu FT-290R transceiver and an 80W amplifier into a 14-element DJ9BV Yagi and made contact with EI2FIB, EI3GE, GD4XTT, GI6ATZ and GM4YX1.

Irec also made three contacts into England working G0EWN, G4PBP and G8XVJ. On the following morning he worked G8GXP and G4CYA/M (I093) who was using an arrangement of 2 x two-element beams on his car.

Jim Smith G00FE (I090) sent in a report covering the whole of September. On the 144MHz band he uses an Icom IC-820H transceiver, a solid-state 170W amplifier and a 12-element ZL Special beam at 15m a.g.l.

In the period September 7-9 Jim found that the best propagation was towards Switzerland working HB9S (JN36) during the contest on September 7, HB9QQ (JN47) on September 8, the first time he had heard Pierre via tropo and HB9DFG (JN37) plus an assortment of French stations in JN16, JN26 and JN27. The station of DL2ARD/P (J060) was worked on September 17 and a contact was made the next morning, at 0555UTC with OK1JKT/P (J060).

Jim reports that he was located too far south (near Bournemouth) to hear any of the Polish stations being worked on September 22 but he did make s.s.b. QSD's with OZ1PIF (J065), OZ5KM (J045), SK6HD (J068) and SM6VQW (J067) during the evening. However, by early morning of September 23 the necessary propagation had swung Jim's way and he was pleased to contact SP4MPB at 1558km for his furthest ever tropo contact. Jim mentions that he has now worked SP4MPB via aurora, Sporadic-E and tropo.

On the 430MHz band the station of G1HWY (I090) reported contacts on September 22 with SM7ECM, SM7FMX, SM7JUQ and SM7TUG. He also heard the low power beacons SK7MHH (J086) and OZ7IGY (J055).

Alec G0FIG also heard the Swiss beacons HB9F (432.984MHz) and HB9G (432.880MHz) and GD4GNH (Isle of Man) contacted a number of stations including DL8QS (J043). On the east coast of England John Quarmby G3XDY (J002) worked SP2FAX on the 430MHz band and OZ2LD on the 1.3GHz band.

Propagation still remained good in the following week, building up to

a peak on September 27-28. Yet again the 144MHz band was open into DL, HB9, LA, OE, OK and OZ. Among some of the stations being worked in this period were LA2PHA (J038), OE2JG/2 (JN67) and OK1A0V/P (J080). In Suffolk G4SWX even managed to copy traces of a weak signal from 9A1CAL (JN86) located in Croatia.

## Auroral Openings

Weak openings via auroral backscatter were reported on September 3, 10, 17, 18 and 27. All openings were noted on the 50MHz band and nothing was reported at higher frequencies. There are probably two reasons for this.

Firstly the openings were quite weak on the 50MHz band and therefore any opening on a higher frequency band, such as 144MHz, would have been considerably weaker or non-existent. Secondly these auroral openings all occurred when excellent tropo conditions were occurring on the v.h.f. and u.h.f. bands. It's therefore very easy to miss the weak auroral DX when the band is full of very strong tropo signals.

## Sporadic-E

During September there were some brief Sp-E openings on the 50MHz band but these were very much few and far between. Evening openings between 1900-2100UTC were observed at the beginning of the month, September 1 and 2, to I, SP, YU and 9A.

The only other significant period of activity occurred on Sunday September 7 when a number of openings were observed throughout the day between 0830-1600UTC. Surprisingly the propagation appeared to cover a very large area with stations such as EH6ADW (JM19) in the south, YU1QC (KN04) and 9A1CAL (JN86) to the south-east and UA1WJ (K047) to the north-east being worked from the UK.

Catch of the day though was an Austrian DXpedition to Libya using the special call sign 5A28 (commemorating 28 years of the Libyan Revolution). The group were active on the 50MHz band between August 30 to September 7, so it was fortunate that a Sp-E opening occurred on the very last day of their operation.

Using an Icom IC-706 and a 5-element F9FT Yagi a total of 23 UK stations were worked by 5A28 in an hour long opening commencing around 0930UTC. Contacts were made with stations in GJ, GW and G stations predominantly in southern England. (At my QTH in I081 they only peaked S2 for about 15 seconds!). This was the first time that Libya had been worked from the UK and it will be interesting to see if that country can be activated again next year, hopefully during the main summer Sp-E season.

## Trans-Equatorial

Exactly one year ago I gave details of the timings of t.e.p. openings and mentioned that you should pay particular attention to the 50MHz band during the September/October period for these special type of propagation events. (Last year there were very brief openings on September 28/29 to Namibia and Malawi). Although very weak there have indeed been a few openings this year during the autumn equinox period.

What was probably the first event appears to have occurred on September 12 around 1845UTC when 7Q7RM in Malawi was heard by stations in Israel (4X). A few days later on September 16 the stations of G4HBA and G4IGO (both in I080) heard 7Q7RM between 1740-1750UTC.

The next t.e.p. event was on September 22 at 1710UTC when IK00KY (JN61) heard the V51VHF beacon (50.018MHz) peaking 579. On the following day at 1815UTC the Maltese station 9H5EE (JM75) heard 7Q7RM at 59 on s.s.b. As you read this the autumn t.e.p. peak will have disappeared but it may be worthwhile noting that similar conditions could occur next March during the spring equinox.

## Satellite News

On October 4 1957 the Soviet Union launched the first artificial satellite, Sputnik-1, into Earth orbit. To commemorate its 40th anniversary a one-third scale model of Sputnik was scheduled to be hand-launched from the Mir Space Station on October 4 1997.

If all went to plan you should be able to hear the beep-beep sound of the beacon on-board the miniature working model. Running on dry batteries it is expected to have a lifetime of up to two months duration.

The transmitter power of between 100 and 200mW should deliver a readable signal to all but the smallest of receiving stations. At the time of writing the beacon frequency has not been finalised but was expected to lie between 145.810MHz and 145.850MHz. If you heard it please let me know.

## Deadlines

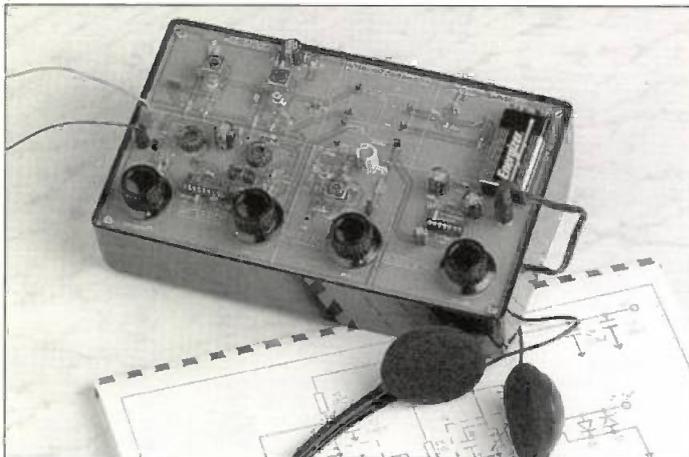
That's it again for another month. Please forward any news, views, comments or photographs to reach me no later than **Saturday November 29**. Send them to me at **Yew Tree Cottage, Lower Maescoed, Herefordshire HR2 0HP**. You can also contact me via Packet radio @ **GB7MAD**, the UK DX Cluster @ **GB7DXC** or E-mail via **davebu@mdlhr1.agw.bt.co.uk** Alternatively you can telephone me on (01873) 860679.

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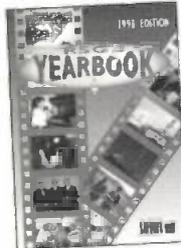
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# BITS & BYTES

*This month Mike Richards G4WNC looks at the basics of digital mode operations such as ASCII and RTTY, but first starts off with a further update on DSP Blaster.*

The DSP Blaster program from Brian Beezley really does seem to be causing quite a stir judging by the number of complimentary comments I've been receiving from readers. I've also just heard from Mike Le Ves Conte (UK distributor of registered copies) that the program is now up to version 2.07, so I'd better fill you in with the changes from the version 2.04 that I originally reviewed.

The first change is the elimination of the Noise Reduction 'pop' on start-up. This is supplemented with a new squelch facility which includes ten dither settings, digital/analogue deadband all featuring full control from within the a.g.c. box.

The configuration memory selector now highlights on selection and changes colour if the settings are altered. You can also label the selectors with their settings - this looks to be a particularly helpful change.

There has also been a general clean-up of the code and the main Fast Fourier Transform (FFT) is quicker. As a final add-on, all the hot-key functions except the volume are ignored when the bypass is activated.

## Digital Modes

For many amateurs one of the main reasons for introducing a computer into the shack is to start getting into the digital modes that abound all over the spectrum. Whilst you can do this with very little knowledge by using commercial kits, this rather negates the whole point of amateur radio, which is self education.

If you're just going to buy commercial equipment for everything and not even attempt to understand the technicalities you might as well sign-up for Internet access and save the Amateur Radio licence fee! But enough of the controversial stuff.

If you do want to learn more you may have some difficulty in finding publications that approach the subject in a friendly manner. In an attempt to overcome this, I'm going to spend most of this month's column going through some of the basics.

If you really think about the

purpose of the data modes you will soon realise that the common factor with all the systems is that they have been designed for the movement of information. The most common forms being text messages, programs and pictures.

The systems which are used to transmit pictures are slightly different, so this time I'll concentrate on the transmission of messages and computer programs. In both text and computer programs it's easy to see that even the largest program or message is made-up from lots of smaller elements i.e. letters and program bytes.

I can't imagine how you could send a large message or program in one operation, so it's clear that you need to break them up into much more manageable chunks and reassemble them at the far end. But, let's take a closer look at how letters

Fig. 1: The ASCII Look-up Table.

Letter	Decimal Number	128	64	32	16	8	4	2	1
a	65	0	1	0	0	0	0	0	1
b	66	0	1	0	0	0	0	1	0
c	67	0	1	0	0	0	0	1	1
d	68	0	1	0	0	0	1	0	0
e	69	0	1	0	0	0	1	0	1
f	70	0	1	0	0	0	1	1	0
g	71	0	1	0	0	0	1	1	1

are represented inside a computer.

You probably already know that computers can only think in numbers and binary ones at that. So how on earth can they handle text characters?

The answer is to convert all the letters into binary numbers. Computers do this by using a simple

programming technique called a 'look-up' table.

Everytime you press a key the computer checks against the table to see which number it should use. Whilst this system is pretty simple, what happens when you send this numerical representation of your message to another computer? Fairly obviously the other computer needs to use the same look-up table or your message will turn into gibberish!

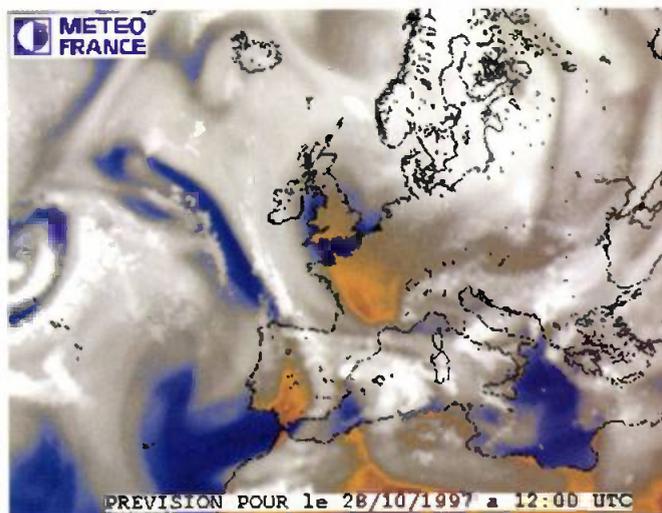
Fortunately, the requirement of look-up tables is well documented and there are a number of standards around to make sure all is well. For use within the PC the common standard is known as ASCII, which is an acronym for American Standard Code for Information Interchange.

The ASCII code uses a separate seven digit binary number to represent each letter, figure and a range of punctuation marks. Within the computer this number is usually made-up to an eight bit number to align with the computer's standard number length.

It just so happens that computer programs are also built-up from similar eight bit numbers. So, you can now see that the common factor between a computer program and a text message is that they're handled within the computer using identical formats.

Now you need to consider how these eight digit binary numbers can be transmitted over a radio link. To work this out you first need to remind yourself what a typical single side band (s.s.b.) transceiver is designed to do best.

The answer is that the s.s.b. transceiver is designed to convey the important parts of the spoken word.



### Special Offers

If you'd like a copy of Hamcomm/JVFX, etc. I've arranged a very special offer with the Public Domain and Shareware Library (PDSL). They have put together a library set of all five disks for just £12, all inclusive.

Using PDSL also makes ordering simpler as they accept all the usual credit cards so you can order by phone - you don't even have to write a letter. Please direct all orders and enquiries about this disk set to PDSL, Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel: (01892) 663298 and request library volume: H008739abcde.

The software is only available as a set of five disks as follows: IBM PC Software (1.44Mb disks): Disk A - JVFX 7.1, HAMCOMM 3.1 and WXFAX 3.2; Disk B - DSP Starter plus Texas device selection software; Disk C - NuMorse 1.3; Disk D - UltraPak 4.0 and Disk E - Mscan 1.3 and 2.0.

In technical terms this means that it needs to be able to transmit the band of frequencies between around 300Hz and 3kHz, as these contain the important parts of the human voice.

In order to send our computer data using a standard s.s.b. transceiver you need to somehow make it fit in this range of frequencies. The solution comes from taking a closer look at an individual binary digit.

This can only ever be in one of two states which are ON or OFF. In electrical terms this means 5 or 0V for many computer systems.

If you were to arrange for the binary information to be sent out of the computer over a single wire you would get a varying voltage that would swing between 0 and 5V depending on the value of each bit as it emerged. This highly useful task is carried out by the part of your computer known as a serial port controller. The actual electrical signal appearing on one of the pins of the serial port.

The next step is to connect the signal from the serial port to a special voltage controlled oscillator that can switch between two frequencies in synchronisation with the 5 and 0V signal. If the frequencies were selected so that they fell within the 300Hz to 3kHz band they could be comfortably handled by an ordinary s.s.b. transceiver. This is precisely what happens in a real data transmission system.

As with the selection of an appropriate look-up table for each letter, there needs to be a few standards in place for the system to be really effective. The first thing that needs to be agreed is the rate at which the binary digits are sent from the computer.

The 'rate' factor is called the baud rate and in radio based systems can range from 45.5 baud through to 9600 and higher. Rather than using a completely variable figure, there are a number of pre-set rates, a typical sequence being 45, 50, 75, 100, 110, 300, 600, 1200, 2400, 4800, 9600, etc. Next, there needs to be some standardisation of the tones used to carry the information.

When using an s.s.b. transceiver it's not so much the actual audio frequencies that matter rather than the difference between them. This difference is called the shift and you

will find this mentioned in the specifications for many systems.

If, for example, you used 1800 and 2000Hz for the binary digits, the shift would be quoted as (2000 - 1800) = 200Hz. Now, that you have your basic data signal winging its way across the air waves - how on earth are you going to reverse the process and re-construct the original message or computer program? It's actually quite easy as I will now explain.

At the receiving end of the link you will hear the data signal as a warbling tone that changes in synchronisation with the data signals. All you now have to do is systematically unravel all the work that was done at the transmitter.

## Convert Tones

So, the first thing is to convert the varying tones into an electrical signal that varies between 0 and 5V. This can be done in many ways, but is traditionally done with a device called a terminal unit.

A terminal unit uses either a filter or phase locked loop system to carry out the required decoding. With the original 0 and 5V signal re-created you just have to apply it to the serial port and you're back to square one!

There are a few points I need to clear-up though. First, the system I've described here using the ASCII look-up table is not generally used on its own in amateur radio.

For simple point-to-point communications Radio TeleType (RTTY) is one of these most common standards. The subtle difference with this system is that the International Telegraph Alphabet number 2 (known as ITA2) is used to provide the look-up between the alpha-numeric character and a binary digit.

A significant aspect of this code is that it only uses five binary numbers for each letter. This creates a few complications, as five elements are not enough to cover all the letters, numbers and basic punctuation.

As a result, two special shift characters are used to give each five digit number two possible interpretations. Although the system is fairly crude and prone to errors it has survived well and is still in regular use today both by amateurs

and commercial stations.

A second very important point to consider is the synchronisation between the transmitted signal and the receiver. Whilst it's relatively simple to get the decoding system to produce the 0 and 5V signal, how can the receiver know where each letter starts and finishes?

In order to achieve this the RTTY system adds some extra bits around the basic 5 bit number used to represent each letter. The first is a single bit known as a start bit. When this drops from 5 to 0V the receiver knows a new letter is on the way.

At the other end of each letter a further 1.5 bits are added to show the end of the letter. From this you can see that each letter or number in a RTTY signal comprises of a start bit followed by five data bits and a 1.5 bit stop bit. It's this distinctive pattern that the receiver looks out for to help it find its place when tuning into a new signal.

A number of decoding systems also use this distinctive 'fingerprint' to provide fully automated identification of both the transmission mode and speed. To work out the speed of the signal all the program has to do is measure the duration of the shortest element of the signal. This will normally be measured in milliseconds (ms).

The figure can then be used to directly calculate the transmission speed or baud rate. All you have to do is divide the duration in ms into 1000 to give the baud rate.

The mode analysis is simply a question of spotting that the signal uses five data bits, one start bit plus 1.5 stop bits. As no other mode uses this format the signal must therefore be RTTY.

In order to make all this happen on your PC you will need to run a special computer program that will convert your typed messages from ASCII to the RTTY code and arrange for them to be transmitted from the serial port at the appropriate speed with the various start and stop bits added. If I've sparked an interest in this part of the hobby and you're starting from scratch, the *Hamcomm* program is really very good and is available through many sources including my readers offers on this page. The current version of *Hamcomm* contains all the software necessary to send and receive RTTY plus some other modes that I'll describe another time.

In addition to the software and a PC you will also need an interface lead to make the connection between the serial port on your PC and your receiver. This is more than just a simple lead because it has to convert the audio signal from the receiver into a format that the computer can process.

The electronics are very simple and you will find plenty of interface kits around if you want to build your own. If you're rather impatient like me you can buy excellent quality ready made interface units from

Pervisell Ltd., 8 Temple End, High Wycombe, Bucks HP13 5DR. Tel: (01494) 443033, FAX: (01494) 448236 or E-Mail: ham@pervisell.com

Pervisell can also supply fully registered version of many of the popular programs. Once you've put together your station try tuning around 14.08MHz and you will soon come across some amateur RTTY.

## Weather Update

If you're seriously into v.h.f. DXing then you will no doubt have learned the significant impact that the prevailing weather has on propagation conditions. As result many amateurs develop a very keen interest in the weather and use this knowledge to try and get ahead of the 'pile-ups' when an opening occurs.

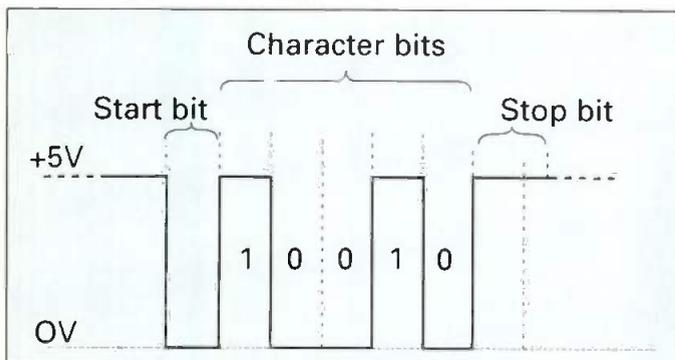
With all the modern satellite and computer enhanced imagery available, the capture of weather information becomes an art form in itself. However, now many amateurs have access to the Internet there's even more information available.

However it can all get rather overwhelming so, I thought it might be helpful if I just run through a few of the sites that I've found to be particularly good. If you want to impress your friends as well as get useful data, the computer generated cloud cover forecast supplied by France Met is really good.

The site is best accessed via the excellent Jersey Met site at <http://user.super.net.uk/~jnet> If you want satellite pics to check what's going-on in and around Europe then the best ones are to be found at the Met Office site at <http://www.meto.govt.uk>

All the Meteosat images are regularly updated and the image quality is really excellent. If you know of some more sites that offer good data for Radio Amateurs please write or E-mail me with the details.

Fig. 2: A Typical RTTY Character.



That's all I have room for this time so until next month, cheerio and please keep your news and views coming to me Mike Richards G4WNC at PO Box 1863, Ringwood, Hants BH24 2ZD or via E-mail to: [mike.richards@dial.pipex.com](mailto:mike.richards@dial.pipex.com) My Web site address is <http://dialspace.dial.pipex.com/mike.richards/>

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# BROADCAST ROUND-UP

*Peter Shore has news of winter schedules, along with a final broadcast, a station to close and a new name for Voice of Free China.*

Since the introduction of the new winter schedules at the end of October, cash-stricken **Radio Vlaanderen Internationaal** has been co-operating with **Radio Netherlands** for the transmission of each other's programmes. Radio Netherlands, which has been renting the hugely expensive high-powered medium wave transmitter of RTL in Luxembourg, is now heard daily in English to Europe at 2130UTC until 2330 on 1512kHz, the Radio Vlaanderen medium wave channel, that offers good reception to listeners in the UK.

In return, Radio Vlaanderen has access to the Bonaire relay station owned and operated by Radio Netherlands to improve reception in the Americas, and the Madagascar relay which will boost audibility across Africa.

The complete Radio Vlaanderen International English language schedule is now: 0830-0855UTC on 6.130MHz from Wavre, Belgium to South Europe and 13.795MHz, also from Wavre, to Australia; 1300-1325UTC on 13.680MHz from Wavre to North America; 1730-1755UTC on 5.910MHz from Wavre to South Europe; 9.925MHz from Wavre to East Europe and 11.680MHz from Julich in Germany to the Middle East; 1830-1855UTC on 9.925 and 13.745MHz from Wavre to Africa.

Transmissions on medium wave in English can be heard in Europe on 1512kHz at 0830-0900, 1300-1330 and 1730-1800 using 25kW and at 1830-1900 and 2100-2130 with the output uprated to 300kW.

Relays via Radio Netherlands' overseas transmitting stations, and from a Russian h.f. facility, are all in Dutch at: 0430-0500UTC on 6.120MHz for North America's West Coast via Bonaire; 1000-1025UTC on 15.145MHz for South Africa via Madagascar; 1200-1230UTC on 6.170MHz via Petropavlovsk-Kamtchatka for East Asia and Australia; 13.795MHz via Tashkent for South East Asia and 15.250MHz via Bonaire for South America; 2300-2325UTC on 9.555MHz via Bonaire for the East Coast of North America.

You can contact Radio Vlaanderen International at: **PO Box 26, B-1000 Brussels, Belgium.**

## Final Broadcast

**Radio Norway International's** Fredrikstad transmitting station made its final broadcast on Saturday 18 October. The facility, inaugurated back in 1948, currently has a 500kW Thomcast-manufactured transmitter, although it has been radiating just 350kW for most of its life (it was installed in 1976, replacing a 100kW transmitter, which had been on the



air since the station opened).

Norway's public broadcaster, NRK, had hoped to lease time on the Fredrikstad facility, but with a glut in the short wave transmission market which has considerable over-capacity in Europe, was unable to find clients. The station is now being dismantled.

A special 30 minute broadcast at 1630UTC on 11.68MHz organised in conjunction with the Nordx '97 championships staged by the DX Listeners' Club of Norway, enabled listeners around the world to tune to this much-loved Norwegian transmitting station. The **Voice of America's** Greenville transmitter also participated in the championships, with an hour-long transmission the following day at 0400UTC on 5.89MHz, and a special QSL card was issued for both broadcasts.

If you heard either of the transmissions but have not yet sent in a report, hurry up! The address is: **Nordx '97, DX-Listeners' Club, PO**

## Box 7080 Vesttheiene, N-4602 Kristiansand, Norway.

Radio Norway continues to broadcast in English and Norwegian world-wide from its transmitters at Sveio. The English winter schedule (Sundays only) is: 0700-0730 on 9.59 and 11.625MHz; 0800-0830 on 11.625MHz; 1300-1330 on 9.59, 9.905, 13.80, 13.805MHz; 1400-1430 on 13.80MHz; 1600-1630 on 13.80, 13.805MHz; 1700-1730 on 7.56MHz; 1900-1930 on 7.485, 9.59 and 9.96MHz plus 1314kHz medium wave; 2000-2030 on 7.57MHz; 2200-2230 on 7.57MHz; 0100-0130 (Monday) on 7.465 and 7.545MHz; 0200-0230 (Monday) on 7.565MHz and 0400-0430 (Monday) on 7.52 MHz

Radio Norway celebrates its 50th anniversary next year. Watch out for more news in this column!

## Winter Schedule

**Radio Prague's** winter schedule has been affected by budget cutbacks. The English service can be heard: 0830-0857 on 9.505 and 11.60MHz to Europe; 1000-1030 on 17.485 and 21.705MHz to West Africa, the Middle East and South Asia; 1130-1157 on 7.345 and 9.505MHz to Europe; 1400-1430 on 13.58 and 21.70MHz to N America, South Asia, Australia and East Africa; 1700-1727 on 5.93 and 9.43MHz to Europe and East Africa; 1800-1827 on 5.93 and 9.43MHz to Europe, South Asia and Australia; 2100-2127 on 5.93 and 7.345MHz to Europe, North America and West Africa; 2230-2257 and 0000-0027 on 5.93 and 7.345MHz to North America; 0100-0127 on 6.20 and 7.345MHz to North America and South West Asia; 0300-0327 on 5.93 and 7.345MHz to North America and 0330-0357 on 7.35 and 11.60MHz to the Middle East and South West Asia.

Radio Prague can also be heard on World Radio Network's Astra service to Europe, WRN1, daily at 1000UTC.

## New Edition

A new edition of the annual *Radio Stations in the United Kingdom* has just been published by the British DX Club. This 1997-98 edition has been completely revised and updated to

include all UK domestic a.m. and f.m. stations currently on the air. It also comes with a free supplement covering radio stations in the Republic of Ireland.

Many new stations have come on the air since the last edition was published 18 months ago, and the new edition helps listeners find their way round the increasingly crowded UK radio dial by listing stations by frequency and name, with a helpful cross referencing of stations to show parallel channels. There is also data on transmitter power and individual sites, plus comprehensive contact information for each station.

The book costs £2.50 including postage in the UK, £3.00 in the rest of the world and can be ordered from: **the British DX Club, 126 Bargery Road, Catford, London, SE6 2LR.**

## Station News

Danish-based short wave station **World Music Radio**, beamed around the world from South Africa's Meyerton transmitters, closed at the end of August. The owner, well-known DXer **Stig Hartvig Nielsen**, blamed the station's inability to sell a single commercial and the lack of listeners who supported the station through sales of its merchandise. Nielsen said that the only interest from listeners was in the form of reception reports and requests for WMR's QSL card.

This is the last month to hear **the Voice of Free China**. The Taiwan station will be renamed on 1st January 1998 as **Taipei Radio International**. English is beamed to Europe at 2200UTC for an hour on 15.60 and 17.75MHz.

## And Finally

That's all for this month - and this year. I'll be back in the January edition, reporting on more of the exciting developments in international short wave broadcasting that will keep you scanning the broadcast bands throughout the New Year. Until then, good listening and Merry Christmas!

**END**

# FOCAL POINT

*Graham Hankins G8EMX rounds off the year with some surprising information together with all your ATV news and views received over the last two months.*

In October's 'Focal Point' I hinted at some surprise news - and here it is. Birmingham may soon have its own 10GHz (3cm) and 1.3GHz (24cm) Amateur Television repeaters! The 10GHz unit will be located in Sedgley, which is to the west of Birmingham, while a site on a high point north of the city has been offered for the 1.3GHz repeater.

The **Beacons Repeater Group**, (with Alan Kendal G6WJJ as chairman,) was formed on September 10 1997 to manage the 10 and 1.3GHz ATV services. Alan, who has already built, and is developing, some of the 3cm hardware, says: "The channel that I will be applying for is RT103, which uses frequencies of 10.135 for the transmitter and 10.425GHz for the receiver. In addition to the Radio Amateurs present at the Repeater Group meeting, several others have expressed their interest".

Hardware for the 24cm ATV repeater already exists, too. Your scribe G8EMX has a transmitter, p.a. and receiver available for use in a repeater, together with a substantial quantity of very high quality professional coaxial feeder in his loft!

In my opinion, putting an ATV repeater into service is no easy task. The Radio Society of Great Britain's Repeater Management Committee (formerly 'Group') provides *A Guide to Repeater Licencing* and Version 1997 runs to 92 pages. The technical specifications for any repeater are very 'tight' and a Repeater Group's responsibilities for on-going service and close-down compliance are considerable.

Here in Birmingham I have been attempting to start a 1.3GHz ATV repeater for some time. One of the first essential requirements is an available site.

Over the past few years three likely buildings in Birmingham, although offered, failed to become realities for various reasons. Access by close-down operators, at any time, is essential, so to, I consider, is straightforward access for periodic development - especially during the initial period of service. I trust that both of the sites now offered will prove quite satisfactory in these respects.

Incidentally, the *Guide to*

*Repeater Licencing* contains an Appendix 'A', titled 'Responsibilities of a Repeater Keeper'. Appendix 'A' states that the Keeper can delegate but remains ultimately responsible for, among many other things, Communication/Liaison; for example - "To be the contact for other parties who require information about the repeater". So, why is it that some repeater keepers, and occasionally other members of a Repeater Group's committee, are 'Particulars Withheld' in the RSGB *Callbook*?

## Auckland ATV

"Hi Graham", says Michael ZL1ABS: "The **Auckland ATV Interest Group** (of the AK VHF Group inc.) attended the Hamilton Radio Club's sale day at the Claudelands showgrounds, along with a lot of amateurs from the top half of the North Island. Our table raised about \$40 NZ for ATV repeater funds from the sale of donated components magazines, cable, meters and old radios".

After the show, some of the ATVers from Auckland went on to Jerry ZL1RN's home for more conversation and to see some of his steam railway tapes. Jerry used to work on the railways and is qualified as a Fireman for steam engines.

But back to ATV in New Zealand. Michael ZL1ABS continues: "Grant ZL1WTT and Wayne ZL1UJK have just achieved P4 copy on 23cm FMTV over 15km. They achieved this contact with a home-brew transmitter and a TV Receive Only rig with in-line preamplifier.

"Thanks to the **Sevenside ATV Group** (Bristol) for ideas from their newsletter 'P5', the **British Amateur**



**Fig. 1: Anglesey 1.3GHz ATV repeater GB3TM as commonly received in Dublin by Dave Hooper EI2HR, with John Lawrence GW3JGA in vision.**

TV Club's magazine 'CQ-TV' and 'Amateur EYE' from the South East Queensland ATV Group for material that helped get things going".

The knowledge gained from Wayne and Grant's contact will help with the construction of a translator to 23cm to extend the coverage of the ZL1BQ ATV repeater in Auckland.

One of these fine months I am hoping to go to New Zealand for a few weeks, see some of their repeaters and maybe meet up with some of the ATVers in person. When I do, Michael has given me the name of his excellent local fish shop!

## Talking Television

Some Amateur Radio clubs have responded to my offer to give an ATV talk. The latest Club to request a visit is the **Moorlands and District ARC**, near Stoke-on-Trent.

Moorlands Secretary, **Warwick Hutchings**, has provided a map for me to find their meeting place and, very helpfully, an audio tape cassette of directions to use in my car as I drive there! Moorlands ARC meets in the area served by the Stoke ATV repeater **GB3UD**, so we may be able to use the repeater on the night.

My offer of an ATV talk and demonstration is still open to any Clubs with a 'speakers calendar' to fill.

## Irish News

Now some brief but fascinating news from Dublin, Eire. **Dave Hooper EI2HR** writes: "During the weekend August 9/10, the Dartmoor 1.3GHz repeater **GB3WV** was received by **Dermot EI2AK** in Monasterboice, County Louth. Some 'P5' pictures (high quality) were exchanged with **G8CEQ**, **G1YHN** and **G6URM**; this is the first time that **GB3WV** has been received in Eire".

So I spread my map out. County Louth is not marked, but the straight-line path length from Dartmoor to Dublin looks like around 400km, which is quite remarkable. Of course, whatever their frequency, r.f. signals can and sometimes do behave in quite extraordinary ways. Thanks for the news Dave!

For instance, I remember reports of mobile radio calls propagating around the world, direct from handset to handset, under extremely rare meteorological conditions. Exceptionally long v.h.f., u.h.f. and microwave path lengths can happen, but don't depend on them occurring very often!

So, that has been the ATV 'picture' for 1997. I wish all readers of 'Focal Point' a very Happy Christmas and New Year.

Keep sending those reports, and newsletters to me, Graham Hankins G8EMX, **11 Cottesbrook Road, Acocks Green, Birmingham B27 6LE**, or by Packet to **G8aEMX @ GB7SOL.#29.GBR.EU** Cheerio for now!

## Amateur Television A to Z

Here's the final instalment of my ATV alphabet.

**Up-converter:** Enables a 436MHz ATV signal to be received on a domestic TV.

**Weatherproofing:** To prevent corrosion where a feeder meets its antenna. Self-amalgamating tape is effective.

**Y:** Symbol for Luminance, or the 'brightness' part of a colour TV waveform.

**Z (Ω):** Symbol for impedance. ATV uses two impedances, 50Ω for r.f. cables, 75Ω for video feeds. Mismatching causes standing waves at r.f., picture distortion along vision channels.

**END**

Advertisements from traders or for equipment that is illegal to possess, use or which cannot be licensed in the UK, will not be accepted. No responsibility will be taken for errors.

You should state clearly in your advert whether the equipment is professionally built, home-brewed or modified.

The Publishers of *Practical Wireless* also wish to point out that it is the responsibility of the buyer to ascertain the suitability of goods offered for purchase.

# BARGAIN

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Compiled by Zoë Crabb

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**70cm (430MHz) video transmitter.** 10W linear (home-brew), plus 70cm (430MHz) Tonna antenna, (brand new), buyer collects. £50 the lot. Dave on 0121-552 7560.

**70cms (430MHz) Storno for modification.** 100 channels, includes repeater shift, comes with full instructions, new crystals (worth £15), power leads, microphones and all connectors. P&P extra or buyer collects. Norwich area. James on (01603) 737111 after 4.35pm.

**A large box of hits and pieces** from home-made television, made in the 1950s. 'phone for details. £10 o.n.o. Peter GW4GCB, N. Wales. Tel: (01745) 720756.

**Alineo DR599E dual-band 144/433MHz mic., m/bracket, boxed.** £375. Not used mobile, only little use base station, consider exchange for WXSAT receiver. G8VHG, QTHR. Tel: Hull (01482) 809274.

**Alineo DX70T h.f. + 6m (50MHz) transceiver, all-mode, mint, boxed.** £475. Yaesu FT-790R 70cm (430MHz) multi-mode, NiCads, charger, soft case, manual, v.g.c., £195. MuTek 2m to h.f. 9-band transverter, manual, cost, £400, accept £165. Dave G4JXK on (01329) 220753 after 5pm please.

**Andrew Heliac LDF5-50A coaxial cable.** approx 150 feet, also Andrew elliptical wave guide A1 CV approx 45 feet, both in single lengths and in new condition, offers. Peter on (01771) 623654.

**AOR AR1000 hand-held scanner.** 6-600MHz, 800-1300MHz, a.m., f.m., w.f.m., mint condition, all original, accessories inc. NiCads, charger, carry case. £125 boxed and manuals. Discone antenna, stainless transmit 6/4/2/70, £25. Ross G0IZP, Cirencester. Tel: (01285) 860896.

**AOR AR8000 hand-held.** 500kHz - 1900MHz, no gaps, 4XAA NiCad battery, mains charger, d.c. cigar lighter plug, belt clip, case, manual, two antennas, buyer collects. £200. Tel: Merseyside 0151-733 7860.

**ARRM00 and Opto Scout Counter,** both still under warranty. £450. Peter on (01803) 552160.

**AR88.** no case. HRO5T with coils, R1155 + p.s.u., not original. R208, no case, FT-101E + Z match a.t.u., LFVVM D-100V, R107, fair condition, no

case, silent key sale. Frances, Southampton. Tel: (mobile) (0958) 276905.

**Army receivers, valve tester, valves, two loud speaker BTH BBC BBC amps, etc.** Tel: 0113-240 3496.

**ATU.** global AT1000 RX only, v.g.c., £55 o.n.o. Also Howes CTU8 a.t.u., £22 o.n.o. Sinclair Spectrum plus c.w., RTTY and FAX software. £30 o.n.o. Wanted h.f. bands TX a.t.u. Andy on 0116-212 1557 after 8.30pm or (0802) 623308 mobile or 0116-286 2259 work.

**Auto a.t.u. - Daiwa 500W, will work with any rig.** £150. Kenwood mobile antenna, unused. AT130 a.t.u., big mag mount. £100. G3PTN, QTHR. Tel: Leeds 0113-265 4644.

**BNOS 2m (144MHz) mobile linear with 100W output and 10W input.** model no: LPM144-10-100, cost £300 new, will accept £125, may deliver 75 miles of Bradford, Yorkshire. Barry MOAPO, Yorkshire. Tel: (01274) 880895.

**Boosey & Hawkes wire recorder.** pre-war, sensible offers, plus other items, valves. Universal Avometer, Selectest Super 50, microphones, Eddystone receivers, wooden radio jigsaw, collectors items. Tel: Pontefract (01977) 678593 after 3pm.

**Box of valves.** 100 plus other wireless parts, condensers in good condition, leakage tester valve voltmeter, sine square generator, r.f. signal generator. T. R. Carless, 10 Anson Green, Royal Oak, Gwent. Tel: (01633) 279461.

**Brand new boxed and never used 1ST DFS0 telephone FAX machine** with photocopy facility, hands free dialing, auto identify, bought for business that never took off, swap or sell computer, radio, etc. Tom on (01536) 522007, any offers considered.

**Codar AT5 TX.** Tel: SW London area 0181-946 6145.

**Collection of 19 old fashioned transistor radios.** £75 the lot. Also about 80 PW, SWM and RadCom magazines, offer, £20+. Tel: Guildford (01483) 233830.

**Collins Model TC110 transmitter receiver** with matching p.s.u., spare valves, dynamotor audio amp 1943 with original handbook, used for receive but will transmit. US Navy, very heavy, room needed, £325 + carriage. Tel: W. Midlands 0121-520 9686 after 6pm or weekends.

**CR300 RX for restoration.** £40. Crystal calibrator No 5 MkII, complete in wooden case. £20. Buyer collects or pay carriage, may swap, w.h.y.? Richard G7RV1 on (01989) 769654.

**Cultural quad suitable for**

10/15m (28/21MHz) with rotator, mast support bracket, control box, cables, etc.. £200. No offers. Vectronics VC300 DLP a.t.u., £80 or offers, all in good working order. Keith on (01642) 320008 or leave message on answerphone.

**Diamond X700H 2m/70cm (144/430MHz) dual-band collinear,** 7.2m long (in 4 sections) with 9.3dB on 2m (144MHz) and 13.0dB on 70cm (430MHz), cost over £200 new, will accept, £95, no offers. Barry MOAPO, Yorkshire. Tel: (01274) 880895.

**Disposing large quantity electronic radio items.** transmitters, receivers, teleprinters WW2 - 1965. VGA SVGA monitors, printers, 50MHz oscilloscope, etc., send stamped addressed envelope for list, 'phone first on (01908) 373114 (Bucks area).

**DNT 10m (28MHz) mobile,** 2.5/25W, Tonno 5000E data rec./send RTTY, AMPTOR, PACTOR, c.w., inbuilt Morse tutor, monitor internal. Buyer inspects and collects. Jack on (01946) 810043.

**Drake R8E, 0.15-30MHz continuous coverage.** RRP £965, plus fitted v.h.f. converter, 35-55MHz, 108-174MHz, RRP, £195, mint condition, boxed, manual, cash, collect for bargain price, £750. Tel: (01502) 711880.

**DX394 receiver.** 150kHz to 30MHz, pristine condition, full service manual, boxed, £170. Eddystone EC10, solid state h.f. RX, nice condition, g.w.o., mains p.s.u., spare battery box, service manual, no mods. R. Taylor, 23 Lancaster Close, Bolton BL1 1PJ.

**Eddystone 358X.** 870, 870A, 750, EC10, scrap 770U, some others. Peter Lepino, Surrey. Tel: (01372) 454381 or (0374) 128170 anytime!

**Eddystone 840C.** nice condition, working, classic h.f. RX, c/w copy handbook, circuit, alignment info, etc., £110 or straight swap for similar nice condition f.w.o. model 770R. Howard, 9 Pembridge Court, Northgate, Newark, Notts NG24 1HE.

**Eddystone receivers,** all v.g.c., 358X p.s.u. coils in box, £110. EC10, two available, £50 and £85, 870, 870A, £75 each. Some rare spares, ask! All plus post, etc., collection recommended. Peter Lepino, Surrey. Tel: (01372) 454381 or (0374) 128170 anytime.

**Excellent condition Icom IC-T42E,** complete with wall charger, battery pack, antenna and original packaging, very good over-all transceiver for all levels of skill, £175. Barry Martin, Margate. Tel: (01843) 226561.

**Free.** approx 3000, unboxed,

some used, but mainly new, assorted radio valves. Also free, approx 43,000 new, boxed, assorted radio valves, to the buyer of approx 13,000, tubes, cathode ray, picture, monitor, radar, industrial, medical, rectifiers, transmitting, receiving, amateur, professional, klystrons, audio, r.f. laboratory, special, nuvitors, nixie, diodes, triodes, tetrodes, pentodes, multi purpose, etc., manufactured by RCA, Sylvania, Heinz and Kaufman, US, G.E. Eimac, Taylor, International, Siemens, Philips, Mullard, Amperex, Marconi, Brit G.E.C., Osram, Raytheon, Eng Elect., etc., etc., all at £3 each.

Also free expert packing in multi layer cartons for export. Also free documentation and UK customs declarations, no lists available. Please no agents or brokers. On site inspection invited and welcomed. Private seller Gerald Levien B.Sc (Eng). Electrical Engineer. Tel: 011 708 1157 Gauteng South Africa. FAX: 011 794 1938, Gauteng South Africa.

**FT-26 Yaesu 2m (144MHz) hand-held** with two NiCads, cell case, fast 1hr charger, cigar lead, case, boxed, £200 o.n.o. Icom U16T 99ch p.m.r. 70cm (430MHz) hand-held, cigar lead, Z cell, cases, boxed, £130 o.n.o., 12.5kHz. Steve G7PWH, Sussex. Tel: (01444) 441460 answerphone, please leave message if not in.

**FT-26 Yaesu hand-held,** 2m (144MHz) with two NiCads, cell case, cigar lead + 1 hour fast charger, soft case, 12.5kHz spacing, boxed, £200 o.n.o. Steve G7PWH on (01444) 441460 answerphone (Sussex) or (01444) 482034.

**FT-26R 145MHz hand-held,** NiCad and charger, soft case, speaker, mic., VOX headset, mobile mount, CTCSS fitted, excellent condition, boxed, £150 or exchange for 25/30 amp p.s.u., in excellent condition. Dave G1IDZ, Guildford. Tel: (01483) 892390.

**FT-480 2m (144MHz) multi-mode.** £230. Kenwood TH-215E hand-held, case, charger, boxed, £125. 2m (144MHz) base antenna, £30. S/steel disccone with 2m (144MHz) TX, £35. Disccone, £20. G-whip 2m (144MHz) antenna, £10. Barrie, N. Wales. Tel: (01745) 591704.

**IRO receiver plus 9 coils,** power unit and manual, also R1475 receiver with power unit and new copy of manual, £50 each plus carriage. Peter on (01771) 623654.

**IC-706, £630. IC-721S special QRP model of IC-725.** £450. KW107 a.t.u., £125. KW Match, £15. LP filter, £15. Heathkit IO18U scope, £20 (collect). Various KW Ten Tec manuals, £5 each. Class 'D' w/meter, £10. Tel: Sheerness (01795) 873100.

**IC-P2E, £110.** 2m (144MHz) hand-held, TR-7730 2m

(144MHz) mobile, £120. FT-780 70cm (430MHz) all-mode mobile, £250. All v.g.c., all o.v.n.o. John G6UVU on (01902) 681961.

**Icom 735.** Icom HM-12, AH2, AT120, service manual, 735 instruction manual and service manual, all in mint condition, £550 o.n.o. Elvis G0MWM, QTHR. Tel: (01253) 852116.

**Icom IC-451E 430MHz multi-mode transceiver.** 10W output, mains or 12V, good condition, £275 o.n.o. Collect or carriage extra. 10GHz WG16 to SMA transition, £25. Bob G8VOI, Waterlooove. Tel: (01705) 250830 after 6pm please.

**Icom IC-725 h.f. transceiver,** general coverage RX, f.m. unit fitted, £495 o.v.n.o. AEA PK900 multi-mode terminal unit with PC Packratt v.2 and AEA FAXIII, £275 o.v.n.o. Both boxed and superb condition. G0FRQ, QTHR. Tel: (01757) 638551 or E-mail Peter\_Charlesworth@email.msn.com

**Icom IC-725 h.f. transceiver.** Icom SM-8 desk mic., Welz s.w.r. power meter, mod SP225, £450. Tel: 0117-964 0809

**Icom IC-735 with EX243** electronic keyer unit and 250Hz filter, AT150 auto a.t.u., £800 o.n.o. Yupiteru MVT2200 multi-band scanner, charger, etc., £250. Sony ICF SW7600, £100 as new, manuals, boxed, Colin GM0AVR, Shetland Islands. Tel: (01806) 242836.

**Icom IC-745 h.f. TX** general coverage RX, mint condition with box and manual, £375 o.n.o. Tel: Co. Down (012477) 29689.

**Icom R70 GC/RX,** new condition, manual, etc., Icom fitted c.w. and f.m., original carton packing, also KW Vespa 2 + mic., and KV p.s.u., manual, excellent condition, no mods, moving to smaller room. Raymond 2E1CQL, Northampton. Tel: (01604) 24486.

**Icom R7000** in excellent condition with remote control and manual, £475. Timewave DSP5992X, only months old, mint, £225. John, Tayside. Tel: (01356) 624039 anytime.

**Icom T7E 2m/70cm (144/430MHz) handie,** case, NiCads, charger, boxed, £195. AOR 8000 scanner, three months old, NiCads, charger, boxed, £230. Weller PS2D soldering station, boxed, £30. Would exchange some for FT-690R II, Terry G4OXD on (01462) 435248 after 6pm.

**In very good condition copies of Practical Wireless and Practical Television,** dating from 1945 to 1987, total, approx 500. To view or offer price, Tel: (01204) 592124.

Jayheam six element quad Yagi

(144MHz). £20. Sangean AT-803A with p.s.u., manual, boxed as new, £60. Dave, Glasgow, Tel: 0141-632 5408.

**Kenpro KR400 RC** horizontal rotor/controller/cable/clamps, new. BNOS L432-10-100 linear amp. new. BNOS power supply 12V/25A, new. Makdol HS-770 duplexer 2m/70cm (144/430MHz), new, sensible offers, most sell. Tel: (01953) 603470.

**Kent keyer**, speed pitch tune volumic, £20. Kenwood TS-830S, VFO230, filters, 230 a.c., 12V d.c., £575. Daiwa 9-band a.t.u., £80. Eddystone bug key. Sony ICF-2001 l.w.-30MHz with adaptor, £75. all o.v.n.o. Tony G3KID, Devon, Tel: (01752) 768298.

**Kenwood 450S h.f. transceiver**, mint with all original packing, £695. Icom 726 h.f. transceiver with 6m + p.s.u., P555, mint condition and boxed, £595. Tel: Wimborne (01202) 695350.

**Kenwood 751E**, all-mode, £300. To include 8-element Yagi, also 2m (144MHz) antenna, G400 rotor with direct box and cable, stab power unit, also useful bits and bobs. G7HPZ on (01205) 750694.

**Kenwood TM702** dual-band f.m., mobile, 25W, extended receive, excellent condition, inc. duplexer, £275, boxed and manuals. Ross G0I2P, Cirencester, Tel: (01285) 860896.

**Kenwood TM732E** dual-band mobile, boxed, with manual, mobile bracket, mic, and power lead, £280. G3FUN on (01795) 532608.

**Kenwood TR9500** 70cm (430MHz) multi, £250 o.n.o. Tri-band h.f. quad, brand new, cost £430, accept. £195 o.n.o. Vacuum capacitor, 8kV, 10pF to 1000pF, £35 new. Mike on 0181-423 0576.

**Kenwood Trio TR7800** 2m (144MHz) f.m. transceiver, £160. Yaesu FT-290R multi-mode, £190. Spectrum transverter, 2m (144MHz) to 6m (50MHz), 25W output, 2.5W input, £200 or FT-290 plus transverter, £365. G0XBO, Norfolk, Tel: (01485) 532638.

**Kenwood TS-180S h.f. TX/RX** intermittent fault on 160m (1.8MHz), mint condition, with manual, £220 o.a.o. Tel: Dereham (01362) 821102.

**Kenwood TS-430 and PS-430**, good condition, service manual, £450. G4FOY on (01420) 82855.

**Kenwood TS-440SAT**, narrow s.s.b. filter, matching speaker, hand/desk mics, mint condition, £650, boxed and manual. Ross G0I2P, Cirencester, Tel: (01285) 860896.

**Kenwood TS-530S**, extra v.f.o., c.w. filter, etc., excellent, £325. Trio TS-700G 2m (144MHz) multi, mint, £225. Icom IC-271E 2m (144MHz) multi, mains/12V pre-amp, 100%. £325. KW201 receiver, exceptional, £85. Genuine items for cash/buyers collect. Tel: West Midlands 0121-474 4856.

**Kenwood TS-670** four bander, 7, 21, 10, 50MHz, all modes, a.m., f.m., s.s.b., with extra filters, boxed, mint with GC-10 board making it RX, 500kHz to 30MHz, sell, £500 o.n.o. Swap dual mobile TX (new one), Mike 2E1FCG on (01226) 742971 after 5pm.

**Keys, RAF, 10F/7741** in original packing, £20. RCAF 10F/556, £30. Early classic US telegraph key, AT&T 1A, £30. All post paid. Colin Waters, 1 Chantry Estate, Corbridge, Northumberland NE45 5JH.

**KLM34XA 6-element beam**, £300. Butternut HF2V Top Band coil, £115. TH3 tri-band, £100. MFJ 941D a.t.u., £75. Hy-gain 7MHz 2-element beam, model 402BA, £300. Tail Twister TX rotor, £200. Tel/FAX: (01279) 503332 evenings 6pm.

**KW Vespa MkII**, mic., p.s.u., Philips PCR GD, silent key sale. Frances, Southampton, Tel: (mobile) (0958) 276905.

**KW1000**, new 572Bs, £300. KW107, immaculate, £100. Tait 2m (144MHz) 6 channels fitted, £20. S21, R-4(VA), £50. Tait 70cm (430MHz) 6 channels fitted, SU20, SU16, 433.300, £50. Both 25W, FR100B, FL200B, pair, £100. Alex G0JZE, Chipping Norton, Tel: (01608) 643585 after 6pm please.

**KW2000 CAT power supply**, as new, £25 o.n.o. Peter GW4GCB, N. Wales, Tel: (01745) 720756.

**KW2000B** with matching p.s.u., both in v.g.c., plus manual, spare valves and s.w.r. meter, £145. G3AIO, QTHR, Tel: Kent (01892) 822836.

**Low HF-150** and p.s.u., excellent condition, £250. Low IF-150 and s/ware, £30. Alinco DJ-X1 wide band hand-held receiver, £180 o.n.o. JIM p.s.u. 101A Mk5, £30. All items good order. Colin on (01475) 786831.

**Low HF-150 receiver** in excellent condition, £230. Yupiteri MYT-7100 scanner, all-mode, full coverage, £170. Kcv on (01869) 600049 weekends/answerphone.

**Marconi TF2015 signal generator**, 10 to 520MHz, a.m./f.m., good condition, £120. Icom IC-451E 430MHz multi-mode base station, 10W output, mains or 12V, £275. Robot 400 SSTV clone, £20. Carriage extra. Bob G8VOI, Waterlooville, Tel: (01705) 250830 after 6pm please.

**Motorola MC80 12 channel v.h.f. transceiver**, £20. Pye Europa three channel v.h.f. high band, £15. Pye Westminster W15 a.m., v.h.f., dash mount, £15. Motorola Maxar v.h.f. dashmount, £15. Alistair GM4UQD, Tel: (01506) 467351.

**Multi 700EX** 2m (144MHz) f.m., 1-25W, boxed, good condition, power supply regulated 13-8 Watson W-30 ant., all as new, lot for, £120 o.n.o. Tel: Chesterfield (01246) 236496.

**PA valves 4CX250 (CCS1) B & O blocks**, QQV06, QQ20 by EIMAC and STC, brand new, sealed, boxed, heat sinks for 4CX250B (conduction type), not many left, cheap, to clear stock. Ken G4ZLX on (01258) 455507 weekends only or write QTHR.

**Pair magnetic loop antennas**, 3.5-11MHz and 14-30MHz, £60 pair, 70cm (430MHz) 3 x 5/8 co-linear base antenna, £20, 2m (144MHz) 2 x 5/8 co-linear base antenna, £20. Tel: Worcester (01905) 451805.

**Pye 1.434 1.5GHz data link equipment**, complete system, dual RX/TX, 19in cabinets, ideal conver 23cm (1296MHz) packet node link, working 24V, buyer

collect (van), offers, s.a.e. for data sheet. Colin M0AFW, Sheffield, Tel: 0114-251 1098 evenings, QTHR.

**Pye M4000 mobile telephone** v.h.f. high band, on the old BT system 4, complete unit, very clean, good condition, phone for details, £25 o.n.o. Peter GW4GCB, N. Wales, Tel: (01745) 720756.

**R1155**, good working order, including power supply, £75. Plessey PR155G receiver, excellent condition, £150. Ex ministry 270 valves for sale, many new, ex-ministry, offers accepted, buyer collects. Keith on (01942) 745512.

**R210**, ex-mod h.f. receiver, 2-16MHz, good condition, includes manual, mains transformer, p.s.u. and G5RU antenna, £30. Phone for details. Tel: Cheshire (01606) 836133.

**Racal RA117C2 h.f. RX** (broadcast monitor version without crystal filter), g.w.o., manual, trade for RA17T18 or sell, £110 o.v.n.o. Also Murphy B40B, working, manual, £30. Neil G8LIU, Middlesex, Tel: (01895) 230006.

**Racal RA17** receiver, good condition, full working order, £130. Ralph, Wakefield, Tel: (01924) 366072.

**Racal RA17L receiver**, very good condition with service manual, together with RA37 low frequency converter, £165 o.n.o. Peter GW4GCB, N. Wales, Tel: (01745) 720756.

**RCA AR881F receiver** oscilloscope, type TF1330 oscillator, model D-890-A voltage stabilisers, Windsor signal generator, audio oscillator, type 440A (and many more), Geoff, Bristol, Tel: 0117-979 1477.

**Realistic HTX100 28MHz** s.s.b./c.w. mono bander, 5/25W out, as new, £120. Icom AT-160 auto a.t.u., £200. Icom PS55 p.s.u., £100. Both as new, boxed, Yaesu MD1 base mic., £60, 2m (144MHz) 9-element X tonna, £40. Rotator, £50. Tel: Watton (01953) 884305.

**Realistic PRO-34 hand-held scanner**, 200 channels, all usual frequencies, plus 806-960MHz, good condition, a.c./d.c., complete with charger, £100 inc. P&P. Dave Wilkinson on (01983) 854766.

**Realistic PRO2004** and PRO2005 scanning receiver, 25-520MHz, 760-1300MHz, 400 memories with manuals, £150 each o.n.o. John Wilson on 0181-769 0147.

**Robot 400 SSTV clone**, £30. W9GR d.s.p. filter, kit version, £75. NEC PC8201 lap top computer, £30. Marconi TF2015 signal generator, £120, carriage extra. Bob G8VOI, Waterlooville, Tel: (01705) 250830 after 6pm, please.

**Rotators: AR40**, £75. G250, as new, £75. Daiwa M750 h/duty, £150. TS-700G v.h.f. multi-mode base, £225. Bird Thru-line, three inserts, offers, X30 colinear, new, £40, v.h.f. 30W amp, £40. Capco halun, £15. Tel: (0468) 756762 anytime.

**Short Wave Magazines**, Oct 1989-April 1993, £10. Practical

**Wireless Encyclopaedia** by F. J. Camm (9th edition), July 1941, in excellent condition, offers. Assortment of components, books by Mike Tooley, Electronic projects IV, test gear projects, £5. Tandy books, getting started in electronics with eight engineers handbooks, construction techniques using breadboards, £5. Mike, Livingston, Tel: (01506) 493959.

**Shure 401 mic.**, £30. Yaesu YD844 mic., £25. Wanted Nye Viking key, Kenwood SP940 + MC85, G3XZF, QTHR, Tel: (01945) 588102.

**Silent key sale: Yaesu FT-990**, £900. FC-902, £60. FT-7, £80. FT-23R, £75. FT-290R, £140. FL-2100, £300. FT-101Z, £175. Altai dip meter, £20. Most manuals/boxes, prefer collect. Tel: (01270) 812312.

**Six metre 5-element Tonna beam**, v.g.c., nearly new, £45, plus postage. Tel: Newcastle-Upon-Tyne 0191-266 1255.

**Sony SW800 world band**, £70. Sony 7600DA 15-band, £70. Grundig Traveler MkII 7-band, Toshiba FIL 11-band, Philips AE 3405 12-band, Sony 7600D, Grundig Boy-230 16-band, Roberts R-808, Sony WA8800 radio + cassette, £70 each, FRG-7700 + FRV-770 + FRT-7700, v.g.c., £300. B40-D, £60. Trio 1000, £190. Tel: 0181-813 9193.

**Ten Tec Scout 80m (3.5MHz) module**, £20. Tel: Leics (01455) 273042.

**Three Army sets**, R107, R208, R308, two valve testers, lots of valves. Tel: 0113-240 3496.

**Timewave DSP5992X**, top of the range d.s.p. filter, hardly used, mint condition, boxed, cost £350, sell for, £225. Derek on 0191-252 8417.

**Tonno data decode/sender**, c.w., RTTY, AMPTOR, Morse tutor, internal monitor, keyboard, good condition, DNT 10m modded, 40 channel, 400mW 4W, mobile CB 29.3101-29.500, Tel: Cumbria (01946) 810043.

**TR-751E** 2m (144MHz) multi-mode, boxed, operating manual, v.g.c., £300. Alinco DR599E 2m (144MHz) + 70cm (430MHz) dual-band mobile, front demount kit, CTCSS mod, boxed, operating manual, v.g.c., £425. Allen, Romford, Tel: (01708) 764014.

**Trio Kenwood TS-120S h.f.**, c.w., s.s.b. transceiver, 100W, v.g.c., £255. Complete with all leads, manual and microphone, very good value. Stan G3XON, 14 Dagden Road, Shalford, Guildford, Surrey GU4 8DD, Tel: (01483) 536953.

**Trio R600 receiver**, good condition, in original box with manual, £100 + carriage. Tel: (01389) 873563.

**Trio TR-9130** 2m (144MHz) all-mode transceiver with system base B0-91A and SP-120 speaker, £325. G4UVT, QTHR, Tel: N. Manchester 0161-655 3128.

**Trio TS-430S, AT230, PS430S, SP430S, MC60** Morse key, multi dipole, all immaculate, £650 o.n.o. Tel: Derby (01332) 831300.

**Trio TS-520 plus v.f.o.** 520S, pair, £200 o.n.o. Also Yaesu FT-101ZD, £250. All mint condition, buyer collects. G3NSG, QTHR, Tel: (01282) 813892.

**Trio TS-520 transceiver** with s.s.b./c.w. filters, g.w.o., little used, good starter rig, £210. Howes DF-D4 digital frequency counter for use with TS-520, £40. Tony G0WEK, High Wycombe, Tel: (01494) 520104.

**Trio TS-700 multi-mode**, analogue display transceiver, built in mains p.s.u., v.g.c., £250 o.n.o. Stan, Essex, Tel: (01279) 869214.

**Trio TS700G**, mint, £225. Trio TS-530S, mint with all the extras, £325. Icom IC-271E, mains, £325. Yaesu FT-5100 under guarantee, £300. Eddystone 770R with matching speaker, refurbished, £95. Daiwa 2m (144MHz) RX, £35. Wanted transverter 6/2m i.f. RN Electronics type preferred. Tel: West Midlands 0121-474 4856.

**TS-850S**, boxed, with manuals, hardly used, £750. 30A power supply, £50. KW107 a.t.u. and manual, £50. Kantronics KAM, boxed, £200. Low pass filter, £50. 2m/70cm (144/430MHz) s.w.r. meter, £25. Wedding forces sale! Adrian, Swansea, Tel: (01792) 299687 evenings or (0374) 645623 mobile.

**TS-950**, digital, all filters, text, MC85 microphone, original packing, £1400. G3PTN, QTHR, Tel: 0113-265 4644.

**Unitron 20 computer (286)** with printer and mouse, suitable for packet, £130 or exchange for dual-bander, Tel: (01827) 58605.

**Unwanted gift**, complete CB base mobile station, antenna transv. s.w.r. meter, mic., cables, the lot for, £60 or exchange for s.w. receiver, w.h.y.? John on (01634) 233058 after 6pm.

**US Army R-174 receiver**, 1.5-18MHz, correct p.s.u., shock-mounted case, v. scarce, £170. Eddystone 504 receiver, 58-30.5MHz, manual, £110. 1/2KW h.f. c.w. TX, Gelofo v.f.o., 813 final inc. valves, £95, pair AR88S (a.l.u.), £60. Burndepi v.h.f. a.t.u., no. 6, £35. Tel: Yorkshire (01482) 869682.

**Yaesu FT-1**, good condition, solid state, 100W full coverage h.f. transceiver, boxed, built-in p.s.u., £475. Also Collins TCS10 transceiver, 1943, very heavy spare valves, etc., room needed, £250 + carriage. Tel: 0121-520 9686 evenings or weekends.

**Yaesu FT-290 MkII** multi-mode, v.g.c. with 2 sets of NiCads, £325. MML 144MHz linear, 3W in, 100W out, as new, £150. RN 2-6 transverter, 25W, as new, £150. Tel: (01292) 520459.

**Yaesu FT-290R** with battery charger, NiCads, carrying case, power meter, mobile magnetic mount antenna, £200, 2m (144MHz) cross polarised Yagi antenna plus cables, (8-element), £30. Tel: Kent (01634) 300544.

**Yaesu FT-301**, Yaesu FC-301, both with manuals, also RMS 25 amp p.s.u., all in v.g.c., £450 o.n.o. A. Brown, 3 Tyn-y-Cae, Newborough, Anglesey, Wales LL61 6SW.

**Yaesu FT-41R** 70cm (430MHz) transceiver, excellent condition, boxed as new, has been wide banded and comes with various accessories, e.g. speaker mic. and charger, etc., £350 new, will sell for, £200. Richard on (01843) 220657.

**Yaesu FT-6901I** multi-mode, FTS7A, c.t.c.s.s. board, MMB1 mobile mount, telescopic whip antenna, BNOS, 50W

amp/Gasfet pre-amp, both totally as new, manual, boxed, never used outside shack. £425, postage extra. Tel: Norfolk (01953) 884305.

**Yaesu FT-747GX f.m. board,** narrow c.w. filter, boxed, manual, good condition. £350. Tel: Aylesbury (01296) 747013.

**Yaesu FT-757GX h.f. all-mode** 100W 2X FC-757 AT auto a.t.u., FP-757 H/D p.s.u., FP-757GX light duty p.s.u. 2X Kenwood TR2600A hand-held, mint, leather case, will split, swap, w.h.y.? up or down. Tel: (0831) 660944 day or (01438) 750450 evenings/weekends.

**Yaesu FT-757GX plus FP-757HD,** g.w.o., £450. Yaesu FRG-7, classic, g.w.o., £125. Realistic receiver, 15-30 DX160, g.w.o., £45. Lafayette KT320, g.w.o., £40. 1155, complete, rust, dust, spiders, £30. Buyer collects. John on (01795) 880301.

**Yaesu FT-767 + 2m auto a.t.u.,** p.s.u., hand mic., boxed, manual, £725. Richard, Bedford. Tel: (01234) 781862.

**Yaesu FT-8500 transceiver,** mobile, boxed and very little used, in as new condition, £375. Tel: London 0181-785 7314.

**Yaesu h.f. gear, FRDX 400 RX** and FLDX 400 TX in good condition with built-in 6m (50MHz) and 2m (144MHz) RX inc. Yaesu spkr., £230 o.n.o. Can deliver approx 25 miles. John G6YDN, QTHR. Tel: (01298) 812172 or (0378) 545130.

**Yupiter MVT-7100 scanner,** 100kHz to 1650MHz with s.s.b. with NiCads, etc., 1000 channels, boxed, as new, £200. Dave, Derby. Tel: (0831) 497004 or (01332) 672112.

**Zetagi C57 7 digit frequency meter,** £45. Zycomm p.m.r., converted for use with Tiny 2 TNC with circuit diagrams, £35. Mr M Jones, N. Wales. Tel: (01407) 763988 after 6pm.

**£1 each, 200 1930s wireless magazines: Practical Wireless, Popular Wireless, Amateur Wireless, Wireless Constructor** R1475, £40. PSU and cables for above, £25. Above two items fair condition, buyer collects. B. Rampton, 7 Alderbrooke Drive, Nuneaton, Warwickshire CV11 6PL. Tel: (01203) 642116.

**Howes kits, QRP 80m (3.5MHz)** transceiver, d.c. RX, TX, S/one, filter boards made up for working R1475 with p.s.u. John G4VPU on 0191-252 2304.

**Swap for Codar AT5 and p.s.u.** for advance a.f. generator, as new, 2m (144MHz) r.f. switched pre-amp, Microwave Modules, perfect condition. Tel: (01254) 832350.

**Trio TS-830S and remote** VFO230 for Yaesu FT-726R. Tel: (01429) 234011.

**Would someone like to swap a computer,** without monitor, for brand new boxed, never used, FAX machine, BT DF50 telephone FAX, photocopy facility, hands free dialing, automatic identity, cost £229.99 Argos, Tom, Northants. Tel: (01536) 522007.

**Yaesu FT-480R** in v.g.c. for Yaesu FTV-901R transverter, must have 2m (144MHz) and 6m (50MHz) modules, Tom Burke on (01472) 602335 evenings.

### Wanted

**'Low Profile' speaker** for Sony ICF-M20W radio, 3in dia, 4W, 8Ω. David, Southampton. Tel: (01703) 693370.

**18kHz crystal for Racaal RA218** s.s.b. adapter, Racaal badges as fitted to RA17 front panel, scrap RA17/117, RA17M RX, defunct R390A, complete or sub units for spares/repair. Neil G8LIU, Middlesex. Tel: (01895) 230006.

**80m (3.5MHz) bandspread coil pack** for HRO, also matching loud speaker for HRO 'period' mic., working or not, w.h.y.? Peter G4VUN, works QTH. Tel: (01287) 634397 9-5pm.

**AEA Isoloop or MFJ1786 loop,** also Yaesu FTV250 and FTV650 transverters, Yaesu FR101 with i.e.d. digital read-out and any FR101 or FL101 spares or U/S units. Pete, Bristol. Tel: (01454) 887461.

**All early wireless gear,** crystal sets, valves, horn speakers, top prices for items made by Marconi, Burndept, Pye, BTH, Gecophone, Ericsson. Serious collector, will pay well and collect any area. Jim Taylor G4ERU, 5 Luther Road, Winton, Bournemouth BH9 1LH. Tel/FAX: (01202) 510400.

**Circuit diagram for Sinclair DM350** digital multimeter, any info, and if possible non-worker for spares, must be cheap for student. Mike Sharp, 1 Winfield Grove, Newdigate, Surrey RH5 5AZ.

**Circuit diagram or manual** for the Olympic T100 transmitter, all expenses reimbursed. John Fallon G3SGV on (01752) 660028.

**Circuit diagram/construction details** to rebuild 'HAC' 1 valve s.w. receiver, C1957 design using an LD210 triode valve, originally built on wooden baseboard and used 4-pin coils. Gordon GM3ULP, 12 Airbles Drive, Motherwell, N. Lanarkshire ML1 3AS. Tel: (01698) 253394.

**Circuit or manual for Eddystone 870A,** also address of Eddystone Users Group, Tom Kelly EI2AJ, 32 Rushbrook, Blanchardstown, Dublin 15, Ireland.

**Circuit or manual** for receiver radio No 40A, SN186 made by Edlystone for B.T. loan or purchase. Neville G8NCK, QTHR. Tel: Tamworth (01827) 59423.

**Eddystone 940 and 1830** (analogue) receiver urgently required in g.w.o. and condition please. Jim McGowan, 20 Keats Avenue, Romford, Essex RM3 7AR. Tel: (01708) 340304.

**Eddystone EC10 MkII,** also Drake SW8, cash waiting. Tel: Barnet 0181-449 3921 after 7pm.

**Filament transformer 2.5V** centre tapped @ 10A, 10kV insulation, for two 866A rectifier tubes. Duncan Cadd G0UTY on (01604) 460851.

**German WW2 radio radar,** also parts, cypher equipment of all sorts. Clandestine sets, all periods, swap or cash, w.h.y.? R. Otterstad OZ8RO, Hosterkøb, 10 DK 3460 Birkerød, Denmark.

**Good home waiting for unwanted Morse computer disc,** Apple Mac or IBM compatible, retired gent, keen to learn. Bill on (01684) 295770 anytime.

**Handbook for Bang & Olufsen stereo unit Beocenter,** 2002 photocopy would suffice. George, Daventry. Tel: (01327) 879023.

**Have you got a Kenwood p.s.u. PS430** to match TS-430S you do not want, also mic. MC60A, if so, please let me know and ring. Tel: Cardiff (01222) 512959.

**Icom IC-211E for spares,** consider working set if price reasonable, also wanted R109 RX for sentimental reasons. Keith G3TLB, Crowborough. Tel: (01892) 655527.

**Intelligent RS232 display unit** with parallel printer port and 8k memory for the ERA Microreader MkII. Bill, Lanes. Tel/FAX: (01524) 833506.

**Linear amplifier 2m (144MHz)** required, s.s.b./f.m., about 50W for 10W input, also 6m (50MHz) f.m. transceiver with about 25W plus CTCSS and repeater shift, must have freq. read-out, not 'channels'. Tel: (01222) 703429 with details and price please.

**Matching speaker for IIRO RX,** also period microphone, w.h.y.? Good prices paid + P&P. Peter, works QTH. on (01287) 634397 9-5pm.

**Military items: RXs, TXs, etc.,** also old Morse keys, Eddystone EC-10 needed and valves VR18, VR27, VR21, VR118, VT50, VT51, CV465, CV466, CV469, EF72/3, EA76, QS1202 No11, 12, 21 Set. Ben, Worcestershire. Tel: (01562) 743253.

**Morse Tutor,** complete with key and manuals, also Antron 99 CB aerial. Tel: Hants (01329) 315789.

**Original Admiralty Handbook** on B40 series of Naval receivers, not photocopy. John G3SZM, Worthing. Tel: (01903) 241810 after 8pm and at weekends.

**Racaal 1792, Redifon R500,** Edlystone 1650 or Watkins Johnson 8626A-4 receiver in not working condition, at a reasonable price to repair for disabled s.w.l. Dave Jones, 50 New Dock Street, Llanelli, Dyfed SA15 2HB, Tel: (01554) 775790 or E-mail: Daiungoed@aol.com

**Scrap WS38 MkIII,** must have Bowden cable control switch. Soviet 'bloc' radios R106, R112, R116, R130, R323, others considered, also German WWII army radios, private collector. Bob Warner, 45 Eastry Close, Ashford, Kent TN23 5RS. Tel: (01233) 636185.

**Software for CBM64** on disc, 5 1/4in floppy, to buy or copy. J. J. Sales G0AZJ, 6 Ennerdale Close, Lancaster LA1 3NB.

**Spy 'clandestine' radio sets** wanted by private collector, American, British, French, German, Polish, Russian, etc., good price paid for the right items, write with details and price wanted to: Bill MacDonald, 40 Latchett Road, London E18 1DJ.

**Standard C58 2m (144MHz)** multi-mode scrapped for spares, including any accessories. Mike G0IFN, Dorset. Tel: (01258) 456192 after 6pm.

**Trio/Kenwood power supply PS-430,** good condition, prefer boxed with instruction, output power cable for TS-430S, also SP430 external speaker, GW4XKE, Cardiff. Tel: (01222) 512959.

**Universal M8000 or Wavecom decoder,** must be as new, £750 offered with video unit and manual. Tel: Dublin 01 453 6452.

**Woden mains transformer type SRS/152/T** secondary 670/0/670V at 160mA wanted to repair old power supply. Denis G3UVR on 0151-652 7454 day or 0151-342 7880 evenings.

**Yaesu FP-707 power supply wanted,** night consider non-working one. Dave on 0141-632 5408.

**Yaesu FRG-7700 memory unit,** also YR-901 Morse code and/or RTTY monitor plus YVM1 video monitor, must be full working order, expenses repaid. Guy, Northants. Tel: (01327) 879902.

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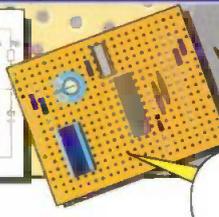
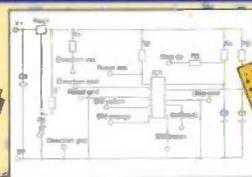
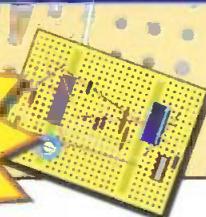
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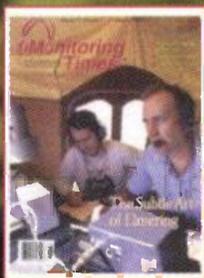
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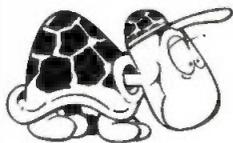
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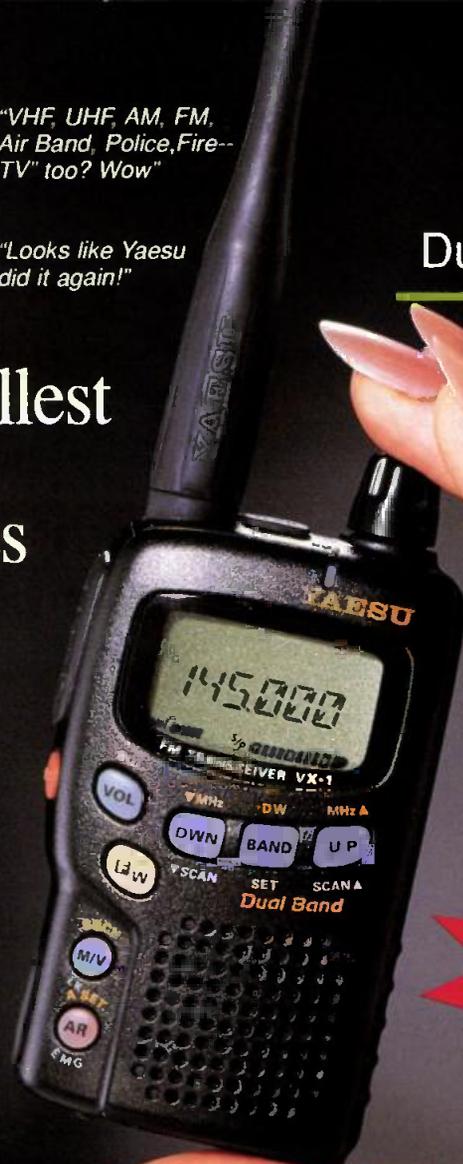


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