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Reviewed

The Yaesu FT-51R

Build

Part 3 of the PW Martlet 70MHz Transceiver project

- COMPETITION
- CLUB SPOTLIGHT
- NOVICE NATTER
- ANTENNA WORKSHOP

05
9 770141 085020

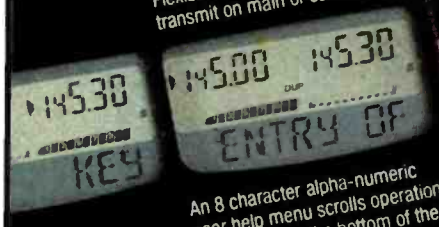
NEW
Dual Band HT

Dual Band Handheld FT-51R

The First Dual Band HT with WINDOWS!

Only one Dial/Volume knob required for easier use.

Three dual receive configurations VHF/VHF, UHF/UHF, or VHF/UHF with main band frequency on right or left side. Flexible programming allows transmit on main or sub band.



An 8 character alpha-numeric user help menu scrolls operation instructions in the bottom of the large, backlit display.

Digital battery voltage readout displays condition of battery in use. Scan skip function allows individual memory channel lock-out during scanning mode.

Spectrascope™ displays active adjacent frequencies in real time with relative signal strength.

MH-29A2B
LCD Display Mic with Remote Functions. (Optional)

FT-51R
2¼"W x 4¾"H x 1⅛"D
(2 Watt version shown.)

The new FT-51R Dual Band HT is state-of-the-art, and easy to use! So easy, you won't need an operating manual. Its exclusive, scrolling instruction menu located in the large, backlit display "window", guides you through total operation while simultaneously viewing the main display window.

You'll like some of the other new, exclusive features, too. Like Spectrascope!™ This unique feature displays real time, continuous scanning of activity on adjacent frequencies in VFO mode or 8 of your favourite memories. A cloning feature duplicates favourite channels to another FT-51R.

A digital battery voltage display, five power output levels, the largest backlit dual band HT keypad made, Smart Mute,™ two VFOs on both VHF and UHF, as well as available 2 Watt and 5 Watt versions, round out the exciting FT-51R. Plus, the optional MH-29A2B Display Microphone allows you to control volume and also access Memory, VFO, Call Channel, Band Selection and scanning functions. All of this in world's smallest dual band HT radio!

See the FT-51R with "windows" at your Yaesu dealer today!

"I can see two frequencies and alpha-numeric all at the same time."

"Scrolling instructions tell me what to do next!"

"I use the Spectrascope to find new contacts faster."

"Yaesu did it again!"

Specifications

- Frequency Coverage
  VHF RX: 110-180 MHz
  TX: 144-146 MHz
  UHF RX: 420-470 MHz
  TX: 430-440 MHz
- Spectrascope™ Display
- Scrolling User Help Menu
- Alpha-Numeric 8 Character Display
- Up/Down Volume/Squelch Controls & Display
- Selectable Sub-Band TX Mute
- Automatic Tone Search (ATS)
- Digital Battery Voltage Display
- AM Aircraft Receive
- Scanning Light System (SLS)
- 120 Memory Channels (80 w/Alpha-Numeric)
- Large Backlit Keypad & Display
- Automatic Repeater Shift (ARS)
- Multiple Scanning Modes
- 3 Selectable Scan Stop Modes with Scan Skip
- User selectable lock function w/15 combinations
- Automatic Power Off (APO)
- TX/RX Battery Savers Built-in
- Handy Cloning Feature
- 5 Selectable Power Output Levels
- Message system with CW ID
- Selectable RX Smart Mute™
- Cross-Band & One-Way Repeat Functions
- DTMF Paging/Coded Squelch Built-in

Accessories
Consult your local dealer.

YAESU
Performance without compromise.™

YAESU UK LTD. Unit 2, Maple Grove Business Centre, Lawrence Rd., Hounslow, Middlesex, TW4 6DR

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PW's Internet address is:
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Editor
Rob Mannion G3XFD
Technical Projects Sub-Editor
NG ("Tex") Swann G1TEX
Production/News
Donna Vincent G7TZB
Editorial Assistant
Zoë Shortland
Art Editor
Steve Hunt
Layouts Richard Gale

Advertisement Manager
Roger Hall G4TNT
PO Box 948
London SW6 2DS
☎ 0171-731 6222
Mobile (0585) 851385
FAX 0171-384 1031

Advert Sales and Production (Broadstone Office)
Lynn Smith (Sales),
Ailsa Turbett G7TJC (Production)
☎ (01202) 659920
FAX (01202) 659950

CREDIT CARD ORDERS
☎ (01202) 659930
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Other Regular Features

COMING NEXT MONTH

Practical Wireless gets busy 'on the key' with a look at the fascinating world of Morse Code - so brush off those keys and get practising.

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G400 only **£169** inc

G400RC only **£199** inc

SAVE £30

SAVE £40

Lower mast clamp GC038B **£23** *Rotators carr extra*

FT 8500 DUAL BAND MOBILE

The FT-8500 VHF/UHF dual band mobile transceiver has been designed utilising new concepts to lead the next generation of top-grade dual band mobile transceivers. All functions may be controlled from the new multi-purpose Smart Controller. The main unit provides a large, removable backlit Omni-glow LCD which is used to show the spectrum of the bands.

NEW

SPECIAL INTRODUCTORY PRICE

£725.00

Features:

· Control from the new Smart Controller • Remote mountable with YSK 8500 · 112 memory channels · Built-in CTCSS encoder · Built-in DTMF message pager and DTMF code squelch · Generates CW Morse code according to the incoming messages · Switchable 9600/1200 baud PACKET operation · Frequency coverage: Rx 110-174/410-500 800MHz. 800-996MHz expandable. Tx: 144-146/430-440MHz.

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		£	Carr
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HL66V	6M Linear, 10W in 50-60W out Rx Preamp	169	C
HL166V	6M Linear, 3/10W In Auto select 80/160W out Rx Preamp	299	C
HL37VSX	2M Linear, 0.5-5W In 20-35W out variable gain preamp	109	B
HL62VSX	2M Linear, 5/10/25W in 50W out preamp	235	C
HL36U	70cm Linear, 6/10W in 25/30W GaAs FET Preamp	155	B
HL63U	70cms Linear, 10/25W in 50W out GaAs FET Preamp	259	C
HL160V	2M Linear, 3/10/25W i/p auto select 170W out Rx Preamp	389	C
HL130U	70cms Linear, 3/10/25W i/p auto select 120W out Rx Preamp	485	C

TRANSVERTORS

HX240	2M to HF 80,40,20,15,10M 2.5/10W Drive 30-40W o/p	299	B
HX640	6M to HF Specs as above	299	B
HX650	10M to 6M transvertor high performance, MGF1302 Preamp dB/12dB selectable 10/50W selectable output input selectable, 100m V/1V RMS	369	B

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RNB112	12V 500mAh nicad for RL102	£39.95	A
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RTS102	DTMF unit	£19.95	A
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RBX100	AA cell case for RL102/402	£8.00	A
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AP8A	3.5-28MHz 8 band vertical	£199	D
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204CD	4 ele 20m beam	£439	D
154CD	4 ele 15m beam	£249	D
A3S	14-21-28MHz 3 ele yagi 8dbd	£349	D
A4S	14-21-28MHz 4 ele yagi 3 per band	£429	D
A3WS	18-24MHz 3 ele yagi 8dbd	£275	D
A103	10MHz extention kit for A3WS	£115	C
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D3W	24/18/10MHz rotary dipole	£169	C

CUSHCRAFT VHF ANTENNAS

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AR6	6m vertical, 3.1m long	£48	C
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A144-20T	2m, 10 ele crossed yagi, 12.2dbd	£99	C
13B2	2m, 13 ele boomer, 15.8dbd	£99.95	C
17B2	2m, 17 ele boomer, 18dbd	£169	C
A50-3S	6m, 3 ele yagi, 8dbd	£75.95	C
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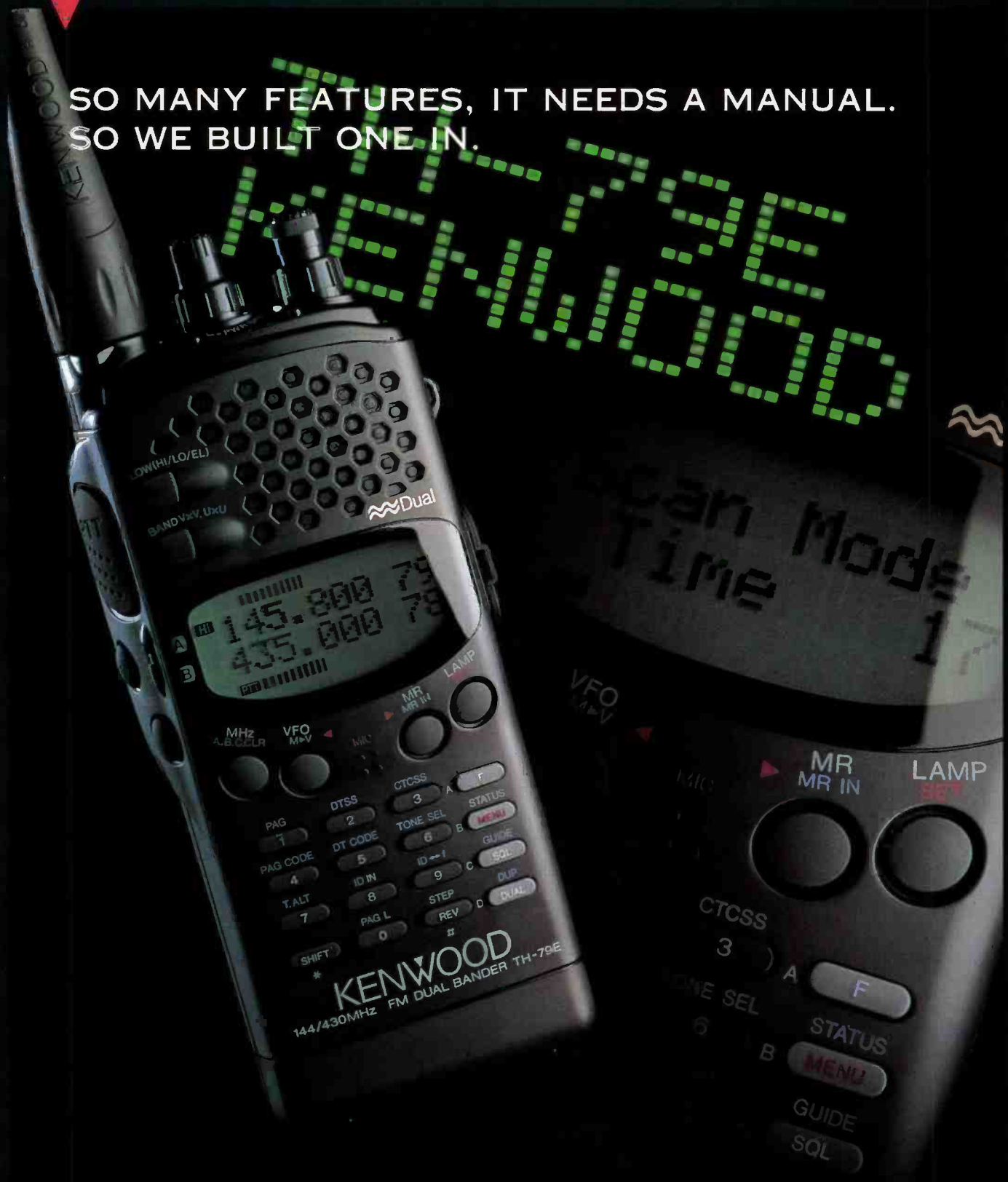

Kenwood's TH-79E marks a new high in user-friendly handheld tranceivers. This slim-line FM dual-bander features a dot matrix LCD menu, which helps you to access the many class-leading features of this stylish unit.

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New!

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BNOS VHF and UHF linears - for the serious Dxer

What's the difference between a power amplifier and a linear? Try a BNOS and compare it with some of the other products that call themselves linear and you'll soon find out! If you are going to work that DX you need to be loud and clear and BNOS linears will give you both. Models available with or without pre-amps and all can be RF switched or hard switched depending on how you like to work. Full specs available on request.

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CLP144350	2m Linear with pre-amp; 3W drive; 50W output	£289.00
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CLP4321050	70cm Linear with pre-amp; 10W drive; 50W output	£255.00
CLP432150	70cm Linear with pre-amp; 1W drive; 50W output	£289.00
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CLP5010100	6m Linear with pre-amp; 10W drive; 100W output	£289.00
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CLP50350	6m Linear with pre-amp; 3W drive; 50W output	£169.95
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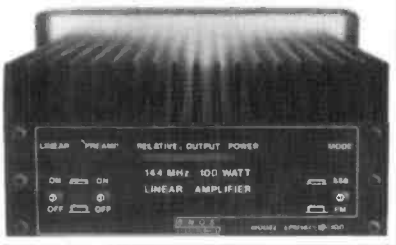
CLX432150	70cm Linear; 1W drive; 50W output	£255.00
CLX43225100	70cm Linear; 25W drive; 100W output	£345.00

If you'd like all the secrets of the top Dxers, we've a great book written by the experts themselves. It's called the VHF UHF DX Book and contains chapters on propagation, antennas, transceivers, transverters, linears, pre-amps, accessories and most importantly, the techniques you should use to get the most out of VHF and UHF operating.
Its bang up to date.



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Great New Wire Antenna Systems From

CHELCOM Aerials

Chelcom's CAHFV1 h.f. vertical antenna (see last month's ad) has become the fastest selling h.f. vertical in the UK, with over 250 happy users. Hot on the heels of this wonderful antenna, Chelcom have now produced a superb range of new wire aerial systems and components. Once again they've chosen to use only the highest quality components, from specially designed balun cases and dipole centres to the wonderful new FlexWeave™ antenna wire. Just wait 'till you see FlexWeave™ - a multi standard wire so flexible you can tie knots in it and undo it time and time again. It is used in all their ready to hang antennas and also available on its own for those who like to roll their own!

Chelcom Windoms - Ready To Hang!

Two Windom antennas, one covering 80 to 10m and 133 feet long and a shorter version just 66 feet long covering 40 to 10m for those with smaller gardens! Both made from the same high quality components including FlexWeave™ antenna wire and a 4:1 balun. Supplied ready to hang. Both antennas will let you loose with a whole 1000W p.e.p.!
CA80W for 80m is just £65.00 and the CA40W for 40m is just **£55.00**.

Chelcom G5RV's

These G5RV's really need to be seen to be appreciated. You really need to check out the quality compared to other cheaper varieties - there is no comparison! Again the components used are of the highest quality, specially designed for heavy duty use and built to last. For most people, erecting antennas is a major problem - better to do it just once! Chelcom offer the largest range of G5RV's catering for most installation requirements.

CAG5RVH Quality half size G5RV using FlexWeave™ and 300 Ohm slotted ribbon feeder. Supplied ready to hang at just **£35.00**.
CAG5RVF Quality full size G5RV FlexWeave™ and 300 Ohm slotted ribbon feeder. Supplied ready to hang at just **£45.00**.
CAG5RVHP Quality half size G5RV with FlexWeave™ balun and 450 twin feeder. Supplied ready to hang at just **£65.00**.
CAG5RVFP Quality full size G5RV with FlexWeave™ balun and 450 twin feeder. Supplied ready to hang at just **£75.00**.

End-Fed Antenna. For those that like the simple life or don't like feeders hanging about, the Chelcom end-fed design offers a simple, unobtrusive solution. Just 66 feet long, the CA66EF will fit nicely into many smaller gardens and costs just **£55.00**, ready to hang.

Chelcom MultiSystem Aerial Components For DIY Aerial Systems

CABALUN11 1 to 1 balun **£30.00**
CABALUN41 4 to 1 balun **£30.00**
CAINS Insulator (pair).....**£1.50**
CABALUN51 5 to 1 balun **£30.00**
CADIPOLE Dipole centre.....**£3.95**
CAFLEX FlexWeave multistranded antenna wire 20m pack..**£16.00**

Plus
CAHFV1 HF vertical antenna resonant on 80m.....**£119.00**

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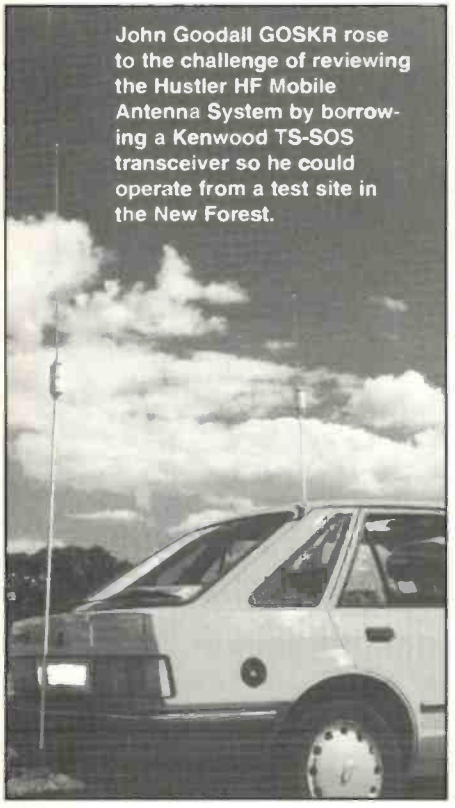
The Hustler 6-BTV, ground mounted

The Hustler 6-BTV in my opinion is very well made, it looks like it should certainly stand up to a few high winds when other aerials wouldn't (as I've found in the past, despite wind survivability claims!). I've used several commercial trapped verticals over the years, and the 6-BTV worked just as well, if not better, than others. When ground mounted, it gave good performance over unobstructed paths.

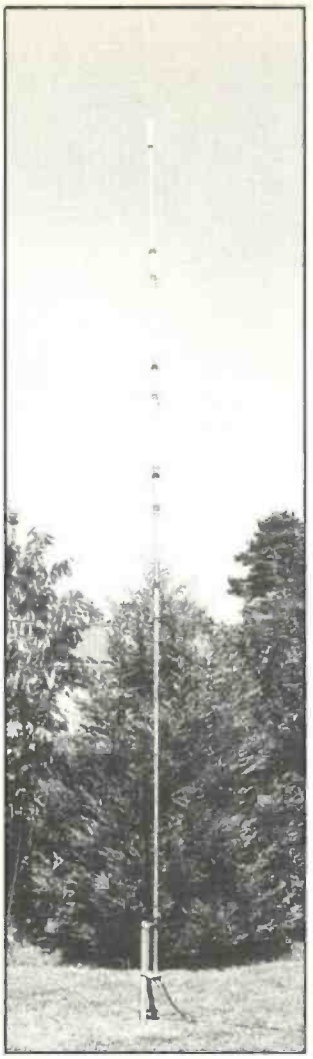
The supplied instructions were extremely clear and concise, following these I had the aerial assembled in less than half an hour.

What did suprise me was the relatively low price, for the quality of construction I found this to be very reasonable indeed. If you're in the market for a compact ground-mounted HF multi-band vertical, I wouldn't hesitate in recommending the 6-BTV.

Chris Lorek G4HCL



John Goodall GOSKR rose to the challenge of reviewing the Hustler HF Mobile Antenna System by borrowing a Kenwood TS-SOS transceiver so he could operate from a test site in the New Forest.



Before long, I had the RM-20S resonant on 14.160MHz, with the s.w.r. reading just above 1.1:1. This was with 360mm of tip protruding from the adjuster.

At 14.058MHz, the FISTS frequency, I found the s.w.r. was acceptable at 1.6:1. The dial reached on 2:1. This proved an even greater bandwith than that published by the manufacturers.

I worked RA3REM and RK3VWF, both with reports at 5 and 6; YU70GW and 9A1CAH 5 at 9, all on 50W.

I found that using the Hustler HF Mobile Antenna System was indeed a pleasure.I think that the cost of the 'Standard Resonators', which I feel are adequate for this country, is quite reasonable for the excellent quality of the equipment.

Picture and Quote from John Goodhall review in Practical Wireless

HUSTLER Inc. has been producing HF vertical antennas of unusual electrical performance and mechanical integrity since 1959. Many of those original verticals are still in service after over 30 years of reliable operations.

Our exclusive trap design offers the lowest loss possible. A special extrusion process allows us to produce trap covers to an otherwise unattainable close tolerance, assuring accurate and permanent resonances. Our highly accurate traps provide top signal reports and consistent contacts.

Accurate tuning is made possible by the wide range of tuning flexibility designed into our verticals. Not only can you use the normal adjustable tubing to change resonance, but the traps themselves can be field tuned for an additional 2 MHz. shift. This flexibility will enable you to acheive a good S.W.R. even if your installation is not ideal.

All Hustler verticals will easily handle the full legal limit of power and will cover 10/40 meters with a S.W.R. of 1.6:1 at band edges. 75 or 80 metre band width on the 5BTV and 6BTV is 80 Khz. under 2 to 1.

We believe that a fixed station antenna is only as good as its ability to stay up. We further believe that the mechanical design of our verticals is superior to any. Large diameter 1¼ inch tubing is used from top to bottom. Our base assembly utilizes a centre tube. With a .315 inch wall thickness, unequaled in the industry. The trap coils are wound around solid one inch diameter fibreglass cores. Our rugged construction is so obvious that we invite you to look at our verticals and compare them to other brands. One glance will convince you.

Solid signals, solid construction and solid value - three solid reasons to purchase a Hustler vertical, from coastal.

"The best antenna there is for HF!"

I have tested the Huster HF Mobile with the rated power and have measured the Q factor and it is the nearest to 300 in any antenna I have seen! I have also fed it with inductive and capacitor matching including both to obtain 50 ohms input on 40/80 mtr and and have a band width of between 50 and 75 kcs compared with other mobiles which had only 10 to 15kc band width. The best antenna there is for HF! Since using the Hustler I have contacted stations in "India VU2TTC", "Sri Lanka 457RO", "Trinidad 9Y4TD", Africa 9X5GC'. "KA1V/TS, 3DAAOBM, Australia VK7OH, Barbados 3P9EM and the Falklands VP8CGH with signal reports ranging between 5/5 to 5/9, as for 9Y4TO who was surprised when I told him I was mobile due to my signal strength. A station in Johannesburg called me "ZS8BEW" as he thought I was in one of the Johannesburg suburbs, this was when I was in contact with KC9B1 we then had a three way contact, not bad from a car don't you think

As for the antenna, I have tried inductive coupling and capacity matching as per ARRL handbook mobile section and this was not needed.

The resonators are very well constructed as so the most which can be used as a 1/4 wave on 6mtr, the band width is as advertised for each band, "as the instructions state 2.1 swr or better", I obtain 1.5 to 1 and less on 10, 15, 20 mHz but what did suprise me was the band width on 80 mtr as with other antennas. I could only move frequency of about 10 kcs either but with this resonator I can move 30 kcs either side of the tuned frequency. Now when i go camping all I take is the required camping equipment and the Hustler antenna which I use with a TM-band adaptor, so I can operate any three frequencies without having to change resonators. The mast is hinged so it can be folded to fit the trunk and apart from that I also use the quick disconnect attachment which I also obtained from Coastal Communications.

To end this letter which sounds like an advert, all I wil say to past, present or future mobile operators is, try this antenna and I can tell you that they will not be disappointed with the results and also excellent service from Coastal Communications.

73 David Hudson, G4WOE E. Sussex

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RM-20S 20m Mobile resonator 100-150Khz bandwidth 1.5KW	£29.95
RM-40S 40m Mobile resonator 50-80Khz bandwidth 1,5KW	£34.95
RM-80S 80m Mobile resonator 50-60Khz bandwidth 1.5KW	£45.95
MO-1 Mobile mast 54 inches long. tilts at 15 inches	£27.95
MO-2 Mobile mast 54 inches long. tilts at 27 inches	£27.95
MO-3 Mobile mast 54 inches long, solid rubbercoated	£22.95
MO-4 Mobile mast 22 inches long, solid rubbercoated	£19.95

(All masts end in a 3/8 thread, for mounting. Ideal for any strong CB style mount and cable.)
NB Postage/delivery extra as required

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EDITOR'S Keylines

Short wave listeners are usually very dedicated radio enthusiasts. And in fact, if we're honest, most of us (and I include myself) spend more time listening on the bands than we actually spend transmitting.

Quite honestly, I've felt that listeners have been neglected in *PW* for a long time...but that's going to change, and we need your help! Anyone can be a s.w.l. (including transmitting amateurs of course) and I think there's a job waiting for keen s.w.l.s who read *PW*.

So, are you a keen s.w.l. who listens on the amateur bands? Do you listen regularly for s.s.b. or c.w.? If so, you'll be able to help *PW* with a new initiative which we're planning to launch in the summer.

With the new idea, I'm hoping that the many frustrated hours on the bands won't be wasted in future. You'll be able to help other *PW* readers if you're able to spare some time to listen, and to write in to the magazine.

Anyone will be able to join in the new venture, and the Editorial team would particularly like to hear from our readers abroad. If you are (for example) living in Europe, North or South America, Australia or New Zealand...we could do with your help!

The new idea will work in reverse too, and I'm hoping that readers in the UK, Eire and 'near Europe' will be able to help readers who are on the air from DX locations. So, if you can spare some time to listen on the bands, are prepared to write in to the magazine...we'd like to hear from you as soon as possible.

Address your letters to me at the Editorial offices in Broadstone and I'll provide full details by return of post. By working together we'll be able to get even more out of our hobby!

Planning Permission

My 'Keylines' in the January issue of *PW* certainly generated a lot of feedback from readers. In fact, I've been showered with letters from people who've had some rather unfortunate dealings with the planning authorities.

The only thing which now seems certain about planning permission (in regards to amateur radio antennas, towers and masts) in the UK, is that there's a great deal of confusion! And to make matters worse, it also seems from the letters I've seen, that planning applications often turn into personality clashes and squabbles!

So, unless you're a member of the RSGB (they've got a comprehensive planning permission support system for their members) what do you do when it comes to planning permission? Apart from joining the National Society and saving yourself a great deal of trouble and possible legal fees (from what I've read in some of the sad stories in letters received, the RSGB membership fee could save you money and trouble in the long run!) what can you do to help yourself?

To help, I'm hoping to get a planning permission guidelines statement on towers/masts and antennas for radio amateurs from Central Government. I also hope we can get a central body representing local and district councils to comment.

In the meantime, I would be most interested to hear more from you on your planning problems. In particular (as this appears to be the main problem in the letters I've read) where it seems that it's one individual causing difficulties and the planning application has become a personality clash.

To round off this month, I'd like to invite any of our readers based in Eire, or in mainland Europe to pass on their comments. How does the planning permission system work in your country? Perhaps you can help us to help ourselves!

Rob Mannion G3XFD

COMPETITION CORNER

G	W	E	D	S	P	E	Q	L	U	B	I	A	U	R
R	W	X	N	R	R	S	K	A	T	P	N	C	T	Z
O	E	G	Q	O	M	G	S	R	O	T	R	E	A	O
Y	S	W	Y	V	Y	F	F	I	E	Y	A	Z	Z	K
G	C	F	O	P	P	M	N	N	S	T	S	T	R	T
H	N	P	P	P	O	T	N	T	S	E	S	Y	E	S
Z	S	I	I	L	H	A	A	B	N	S	J	L	T	Y
B	X	X	T	E	O	L	A	I	K	R	T	T	H	S
I	H	S	F	A	N	W	L	D	F	R	A	Q	U	K
K	Q	B	K	F	R	Y	B	R	A	W	J	D	L	Q
T	V	A	H	O	E	E	W	M	I	L	W	G	C	Q
I	Y	D	K	K	O	U	P	L	P	V	A	P	A	K
X	Z	X	M	R	F	B	L	O	U	D	M	C	V	C
S	Y	I	L	X	S	I	U	I	I	L	D	G	O	V
A	Y	T	Y	E	M	H	N	D	A	N	U	Z	W	F

Wordsearch rules:
Twelve different words have been hidden in the letter grid. They have been printed across (forwards or backwards), up and down, diagonally, but they are always in a straight line without odd letters between. You can use the letters in the grid more than once for different words. Once you have found all 12 words, mark them on the grid and send it, along with your name and address (photocopies accepted with the corner flash) to our editorial address, marked 'Competition Corner' Wordsearch May 1995.

Words To Find

Martlet
Low
Power
Crystal
Antenna
QRP
Focal
Point
Milliwatts
Operating
Books
Keylines

Name .....

Address.....

.....

.....

.....

Send your entry (photocopies acceptable with corner flash) to: Competition Corner, Wordsearch Competition, May 1995, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Editor's decision on the winner is final and no correspondence will be entered into.

FIRST PRIZE: A year's subscription to *Practical Wireless* or a £20 book voucher.
SECOND PRIZE: A six month subscription to Practical Wireless or a £10 book voucher.

❒ SUBSCRIPTION ❒ VOUCHER

Entries to reach us by Friday 26 May 1995.

COMPETITION CORNER MAY 1995

RECEIVING You

Please send your letters to the Editorial offices in Broadstone. Reader's letters intended for publication in 'Receiving You' must be original and not be duplicated. Letters are accepted on the understanding that they have only been submitted to *Practical Wireless*. Please ensure that your letter is clearly marked 'for publication in Receiving You' and that it has not been submitted to other magazines. We reserve the right to edit or shorten any letter. The views expressed in letters are not necessarily those of *Practical Wireless*.

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.

Planning Problems

Dear Sir

With reference to the two interesting letters about planning problems in the March issue. I have been trying for the last 15 years to get a 45ft tower at the bottom of my garden. My last planning application was for a tower 33ft up, 13ft down, behind trees that are 22ft high, and would be some 170ft away from the rear elevation of my house.

This has all been to no avail, if only someone from planning will come and see me and tell me what I can do, not keep writing and telling me what I cannot do. Early on in this charade, I asked this question, only to be told, 'it doesn't matter what aerial you want to put up, we are going to stop you'. I made the planning officer repeat this at a public appeal.

This same planning officer three weeks before my first application, gave permission for a 3-element tribander on top of a four storey block of flats on a very high point close to this location, just at the top of my road that can be seen for miles around. This was done without an official planning application, but was just confirmed by letter 'that all was OK'. This the council deny, but I have two copies of letters showing this fact dated 1982 and 1984.

About three years ago they put a link road from our new Brighton Bypass and a Sainsbury's superstore at the bottom of my garden, about 200ft away. This was the local golf course. I do not live in a conservation area, so my problems are not due to this, and my paperwork is now five inches high!

I did win one appeal, but this was over-turned by the Secretary of State a few days later. So, the RSGB and myself took it to the high court for being denied natural justice. We won the court action with the council and the DOE requesting an appeal, but the judge said, "No, I do not consider that you gave this man a fair crack of the whip". I then put in a planning application for the mobile mast and the council turned it down again.

It is my opinion that Hove Borough Council are being vindictive, malicious and unnecessary. At the moment they are in the process of serving an enforcement notice on me to take down the 20ft pole behind 22ft trees. As I am heavily involved in RAYNET, I do not know how I am supposed to work in an emergency and they do not seem concerned as again I cannot get them to see me after requests by letters.

Maybe through your magazine we can determine what is a maximum mast height before we have to apply for planning permission, let's say 30ft. If we can produce a letter that you and the RSGB can put together, a copy of which can be published in your magazine, signed by any interested parties and sent to our MPs. This will perhaps bring pressure to bear.

Doing it this way makes it easier for all amateurs to get involved. Perhaps if we show our numbers, then 'they' may at last listen to a louder voice. The protest needs to be done in such a way that everyone will get involved just because they are radio amateurs.

D. Browne G4XKF
East Sussex

★★★★ STAR LETTER ★★★★

Wonderful Surprise

Dear Sir

I am writing to say thank you to *Practical Wireless* for the wonderful surprise I received on my return from Cyprus last week. It was my prize in the shape of the Yeovil 3.5/14MHz Transceiver, which I won in the November 1994 *PW* Competition.

Last year my prize for winning a competition was a year's subscription to *Practical Wireless*. I have not put pen to paper to 'Receiving You' before, but am writing now to say thankyou for an interesting magazine. Thanks for the regular features, and the help given to readers like me who have tried to pass the RAE, failed and tried again, failing once more. I then gave up, until I read the reprint of *Practical Wireless*, the *Passport To Amateur Radio*.

To any reader I would say, finding it hard, get the reprint and get your B licence! At 67 years old, I'm trying my Morse to get my A licence and put my Yeovil transceiver prize to good use.

Thanks again for the prize and thankyou for a good amateur radio magazine.

V. G. Saundercock G7PHJ
Cornwall

More Planning Problems

Dear Sir

As a Local Authority planning administrator, I was rather concerned over what I consider misleading advice given by Arthur Bagley GW4EKE in his letter which was published in the March issue. This relates to the suggestion that an amateur wishing to apply for planning permission for a mast should give the Local Planning Authority the minimum of information, other than a location plan, with no details of the antenna likely to be affixed.

If Mr Bagley was granted permission in the past after supplying such scant information, I feel it was either a long time ago, or he was very lucky. Planning officers and/or a planning committee, when determining such an application for an amateur mast and antenna will need to establish whether the visual amenity of the neighbourhood is likely to be detrimentally affected by the proposal.

A number of factors, such as the antenna's height, its size and location are crucial in this process, and no professional planning officer or committee member worth his/her salt will attempt to make a judgement without all the relevant data. If the applicant has not supplied this data, the Local Planning Authority will request further information it needs.

Should this essential information be withheld, the application will almost certainly be refused. With the fee for submitting a planning application currently costing £80, there seems little point in getting a refusal through failure to give the planners adequate information.

My advice therefore, is to give as much information about the mast **and** the affixed antenna. Certainly, if permission is granted for the mast alone, the erection of a large antenna system on top would be considered a material change in the development and would require a further planning permission. If this second permission is refused, the mast is next to useless, so, best to supply all the information in one go.

Agreed, if an application is refused, there is a right of appeal to the Secretary of State for the Environment, but national statistics show the success rate to be around 30%. In any event, a planning appeal should not be attempted without professional help.

Incidentally, failure

Illegal Use Of Amateur Bands

Dear Sir
I'm writing about the possible unauthorised use of 144MHz and further illegal airborne use of the amateur bands.

While reading *Skywings*, the journal for hang glider/paraglider enthusiasts, I came across an advertisement involving amateur radio equipment. It is not the only advert I have seen in the same January 1995 copy. The other advertisement (which I have sent to the RSGB for action), openly advertises 144MHz transceivers for aviation communication. I hope that this will come to the notice of the regulating authorities.
John Wood G3EAY, Essex

Morse Code

Dear Sir
I was very interested in the star letter which appeared in the March issue of *Practical Wireless*. Because I too have had a very similar experience as Joe Johnson in learning the Morse code and passing the test.

For over two years I have been religiously practising and found it very hard going at times. I too had tapes and listened to Morse QSOs a lot when the format was changed as I realised there were some parts of the Morse code that wasn't too easy to copy.

I did have some assistance for a short period from a local amateur, but unfortunately, it wasn't possible to carry it on. However, I decided to have a go when I visited Lincoln Hamfest last September as I thought I might pass. But my result was poor, failing badly in both receiving and sending.

However, it gave me some idea of what to expect and decided next time I'd be more efficient. It was after my first attempt that another local amateur offered to give me tuition three times a week, and it is all thanks to him that I was successful the second time I sat the Morse exam.

His name is **Michael G0SMG**. I am extremely grateful to him for persevering when at times I had doubts myself as to whether or not I'd pass. I am a little older than Joe, being 77 and I do suffer from very bad memory, plus I'm rather deaf. Hence the long time it took me to master the Morse code, because I've had to really imprint it in my thick skull!

However, I don't expect you to print this letter. But I would be pleased if you can use it, to encourage other amateurs of my age and physical disability not to give up and be determined to master the Morse code.

I'm not perfect by a long chalk, but I've got over the main hurdle, by passing the test. I hope to get a callsign of my initials G0WMS as I shall be very proud of my achievement.
Maurice Williams G1NVB

Vowed To Return

Dear Sir
A few years ago I lost my job through redundancy. This followed by a planned house swap, put an enormous strain on the bank balance. I found myself having to sell gear, in order to raise some ready cash.

To see my beloved transceivers and associated gear disappearing down the road was a terrible wrench. I vowed there and then, to return to the air waves one day

Eventually, I got another job on a much lower salary, only to be made redundant again, two years later. This imposed further strain on my resources. Now, three years on and I am still QRT.

If this sounds like a sob story, I apologise. It's not intended to be one, because the experience brought with it some enlightenment. You see, what I was trying to do was replace my 'Black Boxes'.

But all the time what I really was looking for was a return to the sense of achievement, and immense pleasure, which I first experienced in 1958 when I put my first home-brew station on the air. It was a wonderful feeling and one which all the commercial gear I have owned since has failed to duplicate. With this in mind, I have come to the conclusion that the way forward for me is via QRP and home-brew. It's cheap, puts the sense of achievement back and is well suited to my favourite mode of c.w.

Over the next few months I hope to begin a building programme, and hope to be back on the air during 1995. I shall look forward to QRPing and I am sure that for me, it's the way back and will restore the challenge and fun of amateur radio.
Peter Nicholson G3MYZ
East Yorkshire

Editor's reply: Welcome back Peter! I hope you'll provide an up-date on your progress once you're back on the air.

to apply for planning permission, where it is needed, can result in the Local Planning Authority taking enforcement action. And the powers available to the Authority in this area are quite far-reaching. At worst, the offending structure will have to be taken down, and there might be a fine imposed as well. With the cost of the antenna hardware these days, its just not worth taking the risk.

The RSGB's booklet *Planning Permission...Advice To Members* is well worth reading before applying for planning permission. Although after thoroughly digesting it, the reader may feel so shell shocked as to decide to give up radio and take up growing roses instead! The staff at Council Planning Offices, however, will be pleased to give you all the advice you need and I would fervently recommend this advice is sought before submitting an application.

Finally, there have been some rumours floating around recently that the planning regulations relating to amateur antennas and masts might be relaxed in the near future. However, it must be pointed out that with the proliferation of commercial antennas recently for the various mobile 'phone networks, Local Planning Authorities are becoming increasingly concerned over the adverse effect these are having on our visual environment, so much so that the Local Planning Authority Associations are lobbying Government to make the regulations affecting such commercial antennas far more stringent. There seems little hope therefore for the humble radio amateur!
Michael Bone G3VOO
Dorset

Editor's comment: After reading the (many!) letters received on this subject following the 'Keylines' comment, I'm inclined to agree with Michael G3VOO. However, although I'm not going to give up and grow roses - I'll know in future that the only thing that we can be sure of with the planning permission 'mess' is that there's no single standard approach in the process. It seems to me that confusion and perhaps some prejudice towards amateur radio may rule in some Council Chambers!

Virtues Of QRP

Dear Sir
I know you welcome letters, views and opinions from the entire spectrum of radio amateurs, so I thought I would drop you a line extolling the virtues of QRP. As a recently licensed amateur, my choice of equipment and antenna were restricted by budget and space.

I obtained a Yaesu FT-7 (10W p.e.p.) and a half size G5RV antenna, much to the friendly derision of certain compatriots! I have not got enough space to extend the half size G5RV in a straight line, so it is strung in a 'V' formation from a tree to the house at a height of 5m up with its ends 4m apart. Hardly ideal you would think!

I have just finished an s.s.b. QSO on 21MHz with VE3VHB in Ontario (4 400 miles away) who gave me 5/3 report. I answered his CQ call, but as is often advised, added QRP after my call. He came straight back telling me that I was the quietest station that had answered his call. The QRP had obviously interested him.

I know my experiences are far from unique and that greater things are done with less power, however, the thrill of crossing the pond on s.s.b. with low power, when the other station may be using 1kW has to be experienced to be appreciated!

Thank you for a first class publication. I particularly enjoy QRP constructional articles and intend to build the simple one valve transmitter for 3.5MHz which you recently published.
John Constance G0VGD
Kent

NEWS '95

Jackson's Dial

The Norfolk based company Isoplethics, who have recently begun a distributor service for Jackson Bros variable capacitors, drive components and related hardware, have announced the renewed availability of the 6/36 slow motion drive and dial assembly (Cat No: 4103/A). The drive and dial assembly, measuring 123 x 95mm, comprises a dual ratio 6:1 and 36:1 ball drive, black plastics coated escutcheon printed card scale, hairline pointer and clear plastics window.

At a cost of only £19.50 including VAT & P&P (UK and EEC), the Jackson Bros dial and drive assembly is described as being ideal for home-brew projects, such as direct conversion receivers, grid dip oscillators and wavemeters. For more information on the drive and dial assembly contact **Isoplethics, 13 Greenway Close, North Walsham, Norfolk NR28 0DE. Tel: (01692) 403230**.

Prize Draw

The lucky winner of the £50 Prize Draw as featured in the Book Service pages of the March issue of *PW* was **Mr S. V. Jeffrey** of **New Jersey, USA**.

Don't forget that the names of all customers who order books from this issue will be entered into the £50 Prize Draw for

Take Five From Lynch

At the 1995 London Amateur Radio & Computer Show Martin Lynch G4HKS launched his unique, five year fully transferable equipment warranty. Martin's five year warranty covers all repair, replacement parts, servicing labour, collection and redelivery costs on all new equipment brought from the 'Lynch Mob'.

The G4HKS five year warranty, which is available for a nominal sum, is unique in that it is fully transferable. This means that the piece of equipment it covers can be sold or exchanged any number of times within the five years without losing the warranty cover.

Martin says "Total confidence and absolute piece of mind for everyone of my customers is what I intend. Yes, the modern designs are very reliable but the same technology can and does occasionally fail and when it does, it can mean a considerable bill for imported parts and for several hours of highly skilled labour".

Brian Greenaway G3THQ, Martin's Customer Service Manager adds "The new five year warranty is sure to set a 'benchmark' for user protection in the UK and will also give the operator the chance to upgrade their gear every five years and say goodbye to those repair bills forever!"

In addition to the new five year warranty scheme there is also a programme available to allow up to 15 months warranty on used equipment, up to eight years old. For more details you are invited to contact **Martin Lynch direct on 0181-566 1120 or leave a message on the Lynchline BBS on 0181-566 0000.**

Visit Jaycee In July

In recent issues of *PW*, on the Dealer Panel page the Jaycee Electronics Ltd. advert has stated that they are closed for holidays from July 16 to August 2. This was actually an error and is not the case. The *PW* team would like to apologise to Jaycee Electronics and their customers for any inconvenience or confusion caused by the error.

So, if you'd like to visit Jaycee in July or indeed at any other time why not go along to **20 Woodside Way, Glenrothes, Fife KY7 5DF** and have a look at their range of new and second-hand equipment. Alternatively give them a call on **(01592) 756962.**

Send in your news, photographs and product information to Donna Vincent G7TZB at the editorial offices in Broadstone.

Short Wave League Rallying

The International Short Wave League (ISWL) have informed the 'Newsdesk' that they will be attending the following rallies during 1995:

Date	Venue
28/05/95	Plymouth Amateur Radio Rally
11/06/95	Elvaston Castle Mobile Radio Rally, Derby
25/06/95	Longleat Amateur Radio Rally, Longleat
08/07/95	Cornish Amateur Radio Rally
19/08/95	Staffordshire Hamfest
20/08/95	Staffordshire Hamfest
03/09/95	T.A.R.R.G. Telford

Members of the ISWL will be on hand at the rally stands to answer questions and to enrol new members. All the ISWL guides and publications will also be available.

There has recently been a change to the ISWL Awards Manager. To obtain details or to apply for any of the ISWL Awards you should now contact **Mr Herbert Yeldham G6XOU/G-20006, ISWL Awards and Contests Manager, Belle Fleurs, Wade Reach, Walton-on-the Naze, Essex CO14 8RG**.

Nevada News

This year's London Amateur Radio & Computer Show saw Nevada Communications launch a range of new products under the DRAE banner. Included in the range were three 'classic' power supplies and a magnetic loop antenna.

The new DRAE power supplies are British made. Nevada have told us that the three power supplies are built to the highest specification and include protection for over-voltage, over-current, short circuit and over-temperature. The power supplies are available for 24, 12 and 4 amps and are priced at £139.95, £109.95 and £29.95 respectively.

The new magnetic loop marketed under the DRAE name reportedly attracted a lot of attention at the London Show. The loop uses semi-rigid 13mm coaxial cable for the radiating element, making it flexible and therefore ideal for loft mounting or for use as a low profile antenna.

There are currently two versions of the DRAE loop available, the ML80 and ML170. The ML80 covers the 7 - 30MHz band, is just 80mm in diameter, 1.12m high and comes complete with remote control tuning. The retail price for the ML80 is £179.95.

The ML170 provides continuous coverage from 3 to 10.3MHz, measures 1.7m in diameter and is mounted on a 1.5in diameter fibreglass pole. The ML170 costs

£199.95 and as with the ML80 is available without the tune control box should you wish to extend the antenna system for full frequency coverage.

For more information on the DRAE range of products currently stocked by **Nevada** you can contact them at **189 London Road, North End, Portsmouth, Hants PO2 9AE. Tel: (01705) 662145, FAX: (01705) 690626.**

Thank You Ma'am - de G3AAJ

February 14 was the day when AMSAT UK's well known joker, Ron Broadbent G3AAJ, had to be on his best behaviour! He was to be presented his MBE from The Queen. The day was clear and bright as some 25 people stood outside Buckingham palace gates to congratulate Ron and Beryl (his better half) as they floated out of the Palace entrance.

Later at a reception attended by more than 40 family and friends from AMSAT, the RSGB and amateur radio, Ron gave a light hearted account of the occasion. His next appointment may be at Newgate jail!

In his speech at the reception, Ron said the award was for Amateur Radio in general and that he was only the holder. However, on behalf of amateur radio*PW* would like to say congratulations Ron. See you in 12 months for the next 'gong' up?

Beryl and Ron Broadbent cutting the cake to celebrate receiving his MBE, at the reception afterwards attended by more that 40 family and friends.

Switches, Microphones And Power Supplies

South Midlands Communications (SMC) have recently informed the 'Newsdesk' of some new products, which are currently available from their retail outlets throughout the UK.

First on the 'new' list are series of two and four-way coaxial switches. The two-way switches comprise of the CX201 and CX201N each with a manufacturer's specification of d.c. to 1GHz frequency coverage, 2.5kW p.e.p. rating and an insertion loss of 0.5dB.

The CX201 has standard SO239 sockets whereas the CX201N features 'N' type sockets. Retail prices are £18.50 and £19.95 respectively.

The CX401 and CX401N are the four-way versions with a manufacturer's specification of 0-500MHz, 2.5kW p.e.p. rating and 1kW c.w. The CX401 has the SO239 sockets with built-in lightning protection and costs £37.50. The CX401N has 'N' type sockets and is available for £39.95 (all prices include VAT).

Secondly there are two new speaker microphones available in the shape of the MS107 and the MS102. The MS107 is a mini speaker microphone which matches the Rexon RL102/402, is suitable for use with Yeasu and Icom transceivers and costs just £12.95. The MS102 is very similar in appearance to the Yaesu MH12A2B and retails for £19.95.

The final new product from SMC is the EP-920 power supply unit which offers a maximum current output of 20A and has an adjustable output of 3 - 15V d.c. It also features a built-in ammeter and voltmeter, a thermostatically controlled cooling fan and measures 150 x 145 x 300mm. The price of the EP-20 is £79.95.

For more information on any of the products mentioned here contact **South Midlands Communications, S. M. House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hants SO5 3BY. Tel: (01703) 251549/255111.**

Alinco Additions

Waters & Stanton Electronics, in addition to their normal stand at the London Amateur Radio & Computer Show, had a stand devoted entirely to the Alinco range of radio products.

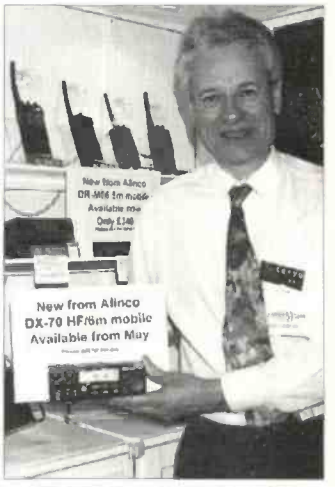
Alinco have recently added a new 144MHz f.m. transceiver to their range in the shape of the DR-150E. The DR-150E is a 50W transceiver featuring a 7-channel panoramic display to allow the operator to monitor adjacent frequencies. There is also extended receive coverage of the 430MHz band and a separate connection for packet radio with its built-in interface which offers 1200 and 9600bps.

With a retail price of £349, the DR-150E is described as a low cost mobile transceiver offering one of the most comprehensive package sever presented to the radio amateur.

Also on show was the first sample of the new Alinco DX-70 50MHz h.f. mobile transceiver. The DX-70 is claimed by the manufacturers to be the smallest all-band amateur radio h.f. transceiver, even though it's only a few millimetres smaller than the Kenwood TS-50.

The Alinco DX-70 features a detachable front panel, covers u.s.b., l.s.b., c.w., f.m. and a.m. modes. It also offers wide receive coverage from 150kHz to 30MHz plus 50 - 54MHz.

The price for the DX-70 has not yet been fixed and Waters & Stanton tell us that they expect the first shipment sometime in May. So, watch this space for more details!



Jeff Stanton G6XYU pictured with the DX-70 in front of the stand devoted entirely to the Alinco range of products at the recent London Amateur Radio & Computer Show.

Independent Group

The QL Independent User Group or QUANTA are currently the largest computer club in Europe with an international membership. The group has been running for 11 years, is run by amateurs and is solely for amateurs with no commercial spin off.

Members of QUANTA receive a monthly newsletter and have access to a free library of 70 disks. There are workshops and sub-groups throughout the UK, Europe and America.

If you'd like more information or details of membership you're invited to contact Bill Newell on (01268) 754407.

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TS-450S	~~£1399~~	£PHONE
TS-690S	HF with 6m ~~£1549~~	£PHONE
TS-50S	Mobile ~~£999~~	£PHONE
AT-50	ATU for TS-50 ~~£299~~	£PHONE

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UK's best selling HF transceiver.

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DJ-480	70cm HANDY ~~£239~~	£219
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DR-130	2m MOBILE ~~£369~~	£279
DR-M06SX	6m MOBILE ~~£299~~	£269
DR-599	DUAL BAND ~~£599~~	£549

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IC-2340H	2/70 Mobile ~~£689~~	£589
IC-2700H	2/70 Mobile ~~£829~~	£725
R-7100DC	25-2GHz ~~£1365~~	£1249
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FT-102	AS NEW	£549
FT-101ZD	VGC	£429
FC-107	ATU (250w)	£199
FC-757 AT	AS NEW	£279
PK-232MBX	VGC	£259

KENWOOD TH-78E

AS NEW **£349**

TH-215E	VGC	£199
DJ-500	WITH MICROPHONE & CASE	£249
IC-25RE	AS NEW	£299
TH-79E	AS NEW	£369
TH-28E	AS NEW	£239
ALINCO DR-112E	AS NEW	£229
FT-290R	ALL MODE	£299
TM-742E	EX DEMO	£629

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TSB-3001	AL	144MHz, 3.4dB (1.4m)	~~£39.95~~	£29.95
V-2000	GF	6m/2m/70cms, 2.1/6.2/8.4dB (2.5m)	~~£129.95~~	£114.95
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DB-1209	144MHz, 5.2dB (1.6m)	£39.95
DB-EL2E	144MHz, 7/8ths, 4.5dB (1.8m)	£29.95
DB-285	144MHz, 5/8ths, 3.4dB (1.3m)	£15.95

P&P on above £3.00

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Don't pay through the nose for "named branded antennas". All our antennas are direct from manufacturers and represent a saving of up to 50% on the branded versions. We know they're the best there is – but if you are in doubt check it out on 'packet radio' or your local repeater and ask one of the many hundreds of customers who already have one in use

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QS-300	Desk mount H/helds	£19.99
NE-1023	Scanner ant (rubber)	£8.99
NE-1012	Scanner ant (black telescopic)	£9.99
TSC-2602	Scanner ant (rubber)	£22.95
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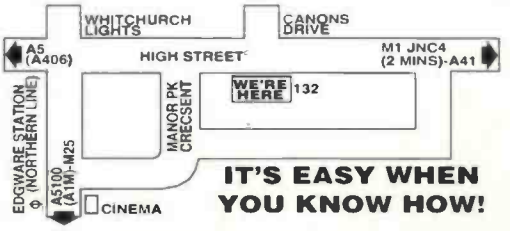

IT'S EASY WHEN YOU KNOW HOW!

Elaine Richards G4LFM looks at your letters, has news of International Marconi Day and has a Maplin clock/timer for you to win in an easier to enter competition.

NOVICE Natter

For Radio Beginners of all Ages.

Elaine Richards G4LFM, PO Box 1863, Ringwood, Hants BH24 3XD.

Readers' Letters

Ken Mallett G2AXU has written with another soldering tip following the piece about safety in May. He keeps a small aerosol of Burneze next to the soldering iron. Apparently, it doesn't stop the swearing, but it does ease the pain! Also Acriflex cream is quite good, but not so convenient to use.

If you've got any tips you have picked up over the years how about passing them on to the newcomers? Drop me a line.

Tony Mansfield 2E0AIR has been a Novice licensee since August 1994. Since then he has made some 667 contacts on 3.5MHz using c.w., 72 of these were with G3 callsigns and 62 with G4 callsigns, even 6 with G2 callsigns. He has received kindness, help and encouragement from all those he's contacted.

Many have even taken the trouble to write a letter to send with their QSL card. This is encouraging to hear, as this is what amateur radio is supposed to be about, everyone helping and supporting one another.

It's good to hear this sort of story for a change. Thanks Tony for the information.

Another Elmer Nominee

Bill Cross G0ELZ has been nominated for the Elmer Award by W. G. Andrews G3DVW. On five evenings a week, Bill sends out Morse practice from his home station with speeds from first learning to test speed. All this is despite being permanently disabled following a motor cycle accident.

Four new callsigns have burst onto the air following Bill's help: G0TPJ, G0UGQ, G0VLL and G0ULP (and they passed first time). There are now four new potential Class A licensee in the wings practising hard with Bill - G7LPJ, GW7PDC, G1HSC and G7PED.

Thanks for the nomination. If anyone else has someone they think should be nominated for their help in starting amateurs on the road to their hobby, drop me a line with the details. Prizes will be awarded around October.

Citizens' Band

I've had a couple of good letters about CB and CB rigs, but space has run out on me (again). I'll make sure these get included next month as the first item. Keep writing!

Time Check

When you are first starting out in radio, time can be a tricky problem. I don't mean trying to find enough time to do all the things we want to - although that is difficult. I mean deciding what time to put in your log and on the QSL card.

In radio, everyone uses Universal Co-ordinated Time (UTC), which is basically the same as Grenwich Mean Time (GMT). That's all well and good, but when we're in the summer months, the UK changes to British Summer Time (BST). So, looking at your watch isn't any good, you have to convert to UTC.

Obviously, the easiest way is to have a dedicated clock set to UTC and leave it by your radio and here is what prompted this. I've recently seen a press release from **Maplin Electronics** of **274-288, London Road, Hadleigh, Benfleet, Essex SS7 2DE** with details of their Multipurpose l.c.d. clock and timer, costing around £12.99.

The Maplin clock timer has a dual time-zone facility so you can set it to UTC and put BST in the second zone for when you need it. It also has several timing functions that you may find useful.

Now, I've four of the clock timers to give away as prizes. They'll go to the first four correct answers, to the questions below, pulled out of my coffee jar.

Q1: When did UTC replace GMT as the official designation of time measurement? Was it 1900, 1928 or 1955?

Q2: How many hours in front of UTC is Wellington in New Zealand? Is it +12, +10 or +13?

Send your answers to the address at the head of this column and if you are one of the winners, your prize will be sent to you. The closing date for entries is May 19. You can, of course, enclose a letter telling me what you've achieved recently or anything else too!

International Marconi Day

The International Marconi Day is held every year on the third Saturday in April to commemorate Guglielmo Marconi, who was born on 25 April 1874. So, this year the date to make a note of is April 22. Keep a listen out on the air for any of the 25 special stations that are set up from places that were of special importance in Marconi's career.

One of the Marconi Day stations is going to be **OE1M** and it will be on the air for 24 hours on April 22 using s.s.b., c.w. and amateur radio satellites. It will be run by Radio Austria International (ORF).

The ORF station will also broadcast special programmes devoted to the International Marconi Day. Each QSO or accurate reception report of OE1M and a Radio Austria International broadcast will be confirmed by a special QSL card.

Frequencies to try are: **OE1M** (s.s.b.): 3.77, 7.07, 14.17, 21.17 and 28.47MHz. Via OSCAR 13 (approximately 0500-1220) and OSCAR 10 (1300-1500): 145.89MHz. **Radio Austria International** 5.945, 6.015 (0500-0700 via Sackville, Canada), 6.155 (0400-2300), 9.655, 9.87, 9.88, 11.78, 13.73 (0000-2400), 15.41, 15.45 and 17.87MHz.

The QSL address is: **Radio Austria International, A-1136, Vienna, Austria.**

Special event stations like OE1M are a good way for beginners, whether a Novice or not, to get their QSL collection off to a flying start. Fortunately, special event stations run by large organisations usually send their cards quickly and it's very encouraging to get a few cards to look at.

It also gives you something to show the family why you spend hours glued to the radio! Happy listening.

Different Opinion

Someone has disagreed with my view, published in the Feb '95 *PW*, on the *Seek You* CD (I was fairly sure someone would!).

A FAX got sent to the *PW* offices with details of a review that appeared in *QST* (an American amateur Radio publication). It was written by a part-time brass musician **Al Brogdon K3KMO** who plays Dixieland jazz.

Al says" ...the lyrics, the tunes, the arrangements and the musicianship knocked my socks off! The album has the authentic Nashville sound, with top-notch studio musicians....This album will bring a tear to you eye on those lonely drink-alone evenings, and it will make you laugh at your ham-radio self during happier times....."

So, probably the best advice is if you're interested in *Seek You*, try and get to one of the larger radio rallies, as that's where I've heard it played. Have a listen for yourself and decide whether you like it or not.

First Steps

A Licence, A Callsign, A Rig - Now What?

So, the postman has delivered the all-important piece of paper and you now have a licence and callsign. You've even got yourself a rig but now what?

Well, you just switch the rig on and start talking to the world don't you? For most of us it's not as easy as that. It's quite a long time now since I first went on the air but I can remember it still quite clearly.

I was very nervous and didn't want to make a mistake. I didn't want to make a fool of myself either. I also felt a right idiot sat in my bedsit chatting to myself - well that's what it felt like.

I was used to not hearing a great deal of chatting once I got home (same as most who live on their own) and it felt very odd holding a conversation with something the size of a house brick! Still, I was very lucky and met some very nice people on the air in the first few weeks of getting my licence and they made it very easy for me to get into the hobby quickly.

So, what's the best way of getting your first contact? Well, the easiest way is to make arrangements with a friend and so you do at least speak to someone you know on a pre-arranged frequency. This at least gets you the first entry in your log book.

Another gentle way in is to find another conversation that sounds interesting, wait until the people involved are winding up the chat and then call one of them to see if they can spare a little time to talk to you. This can often work well as you can pick people who have spoken previously about something that interests you.

But what about the first CQ (general) call? Use a band plan or repeater card to make sure you are transmitting on the correct frequency or portion of the band. Locate the calling channel and listen - in fact, I would suggest you listen for a little while just to see who is about at that time.

If all is quiet then put out your first CQ call, everyone has their own favourite way of phrasing it, but something like, 'CQ, CQ, CQ this is G4LFM Golf Four Lima Foxtrot Mike G4LFM listening for any call' would suffice. Then sit and listen for any replies.

Do tell people that this is your first, second or one of your first calls, then usually they will become very understanding and will guide you through your first few days as a transmitting amateur.

Now for a few don'ts. Personally I wouldn't recommend an audience for the first few calls. If you make a mistake that only makes it worse and can get you flustered.

Don't just switch on your rig, select a frequency and start talking. No-one likes being rudely interrupted.

Don't join another conversation without being invited. It's just bad manners. In a pause between 'overs', announce your presence and then wait to be asked to join in. If those talking won't let you in, then their conversation isn't interesting enough to want to join!

Finally, above all, stay calm. It is a hobby and your whole life won't crumble if you make a few mistakes in the early days. Don't let you mistakes become bad habits and you'll soon get to know the regulars, perhaps on the local repeater. Before you know it you'll be the old hand talking to the 'new boys' with their brand new callsigns.

Until next time, keep 'Nattering' and don't forget I'm always interested in your suggestions and ideas for this column.

Elaine G4LFM

RADIO Diary

***PRACTICAL WIRELESS & SHORT WAVE MAGAZINE 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.

April 15: The Spring All Micro Show, Radio Rally & Electronics Fair is being held at Bingley Hall, Staffordshire Showground, Weston Road, Stafford (A518 Stafford-Uttoxeter Road), signposted from Junction 14 on M6. Admission for adults £2.50, children under 14, 50p, concessions - OAPs, RSGB members, student card, UB40, £1.50. The organisers are as usual supporting local charity stalls, and there's free parking and a licensed bar from 11am. There will also be refreshments, meals and a cafeteria. For further details contact **Sharward Promotions, Upland Centre, 2 Upland Road, Ipswich IP4 5BT. Tel: (01473) 272002** or **FAX: (01473) 272008.**

April 16: The Cambridgeshire Repeater Group Amateur Radio Rally is being held at Philips Telecom - Catering Centre, St. Andrews Road, Chesterton, Cambridge. Doors open at 10.30am. There will be trade stalls, Bring & Buy and much more. Further information can be obtained from **Darren Slater G1ERM** on **(01223) 60601** evenings.

April 22: International Marconi Day special exhibition station at the Puckpool Park Wireless Museum, Seaview, Isle of Wight. Further information from **Douglas G3KPO. (01983) 567665.**

April 23: The Bury Radio Society will be holding their annual rally at the Castle Leisure Centre, Bolton St, Bury. Doors open at 11am (10.30am for disabled visitors). There will be a Bring & Buy, a bar and refreshments. Talk-in on S22. Further details are available from **G4KLT** on **0161-762 9308.**

April 23: Lough Erne Amateur Radio Club are holding their 14th mobile rally in the Killyhelvin Hotel, Enniskillen. All radio amateurs and those interested in Electronics and Computing are cordially invited to the rally. The usual traders will be attending and there's also a Bring & Buy. Door tickets will be included in the raffle for worthwhile prizes. For more details contact **Fred GI4PCY** on **(01365) 324993.**

April 23: Swansea Amateur Radio Society are holding their Amateur Radio & Computer Show in the Swansea Leisure Centre, which is located on the A4067 Swansea-Mumbles coast road. Doors open at 10.30am. There will be trade stands, a Bring & Buy, operational h.f. and v.h.f. stations, S22 talk-in using GB2SWR plus full catering. **Roger GW4HSH** on **(01792) 404422.**

May 6: The Dartmoor Radio Rally is being held at Yelverton Memorial Village Hall, Meavy Lane, Yelverton, Devon. Doors open at 10.30am. There is enough parking for 600 cars with access for disabled visitors. There is also a playground for children, trade stands, a Bring & Buy and refreshments, etc. Talk-in on S22. For further details contact **Ron** on **(01822) 852586.**

May 14: The Dunstable Downs Radio Club are holding their 12th Annual National Amateur Radio Car Boot Sale at Stockwood Country Park, Luton, Nr. Jn. 10 M1. Doors open 10am until 5pm. Talk-in on 144MHz. Attractions include open day, environmental exhibits, side stalls, and free entry to the Mossman collection of horse drawn vehicles, craft museum, train and carriage rides plus much, much more. **Ken Brewer** on **(01582) 451057.**

May 14: The Drayton Manor Radio and Computer Rally is to be held at Drayon Manor Park Zoo, Pazbly, Tamworth, Staffs on the A4091. The main traders will be in four marquees. There will be an outside flea market, large Bring & Buy stall, local clubs and special interest stands. Doors open at 10.30am. Make it a day out for all the family. **Norman G8BHE 0121-422 9787** or **Peter G6DRN 0121-443 1189** evenings please.

May 20: The Ipswich Computer Show is being held at Willis Corroon Sports & Social Club, The Street, Rushmere St Andrew, Ipswich. Entry fee for adults is £1.50 on the day. Children under 14, OAPs, UB40 and wheelchair users only 50p. Doors open 10am to 4pm. Free parking. **Sharward Promotions** on **(01473) 272002** or **FAX: (01473) 272008.**

May 21: The 11th Yeovil QRP & Construction Convention is being held at the Preston School/Centre, Monks Dale, Yeovil, Somerset. Doors open at 9am. Admission is £1.75. There is a free car park and refreshments all day. The convention will be preceded by a Morse Fun-run on each evening from Tuesday 9 to Friday 12 May. Further details can be obtained from **G3CQR, QTHR. (01935) 813054.**

CLUB Spotlight

Send your information to the 'Club Spotlight' newshounds Donna Vincent G7TZB and Zoë Shortland at the PW Offices.

Your page - your story! The local Amateur Radio Club is seen by many as being the 'backbone' of our hobby. There are some interesting stories to be told. So, let's hear about your Club history, share the information and you'll probably recruit new members at the same time! Editor.

President Visits

The Hoddesdon Radio Club are very much looking forward to the visit of the RSGB President, Clive Trotman GW4YKL, on April 13. Meetings are held at the Conservative Club, Rye Road, Hoddesdon, Herts from 8pm.

Now in its third year, the Hoddesdon Radio Club continues to increase its membership and caters for all aspects of radio. The club especially encourages wives, girlfriends, etc., hence the talk this month is 'Orchids of the World' by Frank G0KUQ.

Yeovil VE Day

The Yeovil Amateur Radio Club will be staging a display of Vintage and Second World War radio equipment and operating a Special Event Station to celebrate the 50th anniversary of Victory Europe (VE) Day on Monday May 8 1995.

The event will be in collaboration with Yeovil District Council, who plan to stage a whole day of celebration and thanksgiving. The day will start with religious services in the morning, through to firework displays and dancing to Glen Miller style music in the evening.

The Yeovil ARC will be holding the usual annual series of classes, in preparation for the December Radio Amateurs Examination. Enrolment night for the courses will be on Thursday May 11 at 7.30pm or any time up until 10pm. The 11th Annual QRP Convention will take place on Sunday May 21. Doors open at 9.30am at the usual venue which is at The Preston Centre, Preston Road, Yeovil.

Later on in the year on July 30, there is a BBQ and Fun Day For All at the QTH of Tim Walford G3PCJ (Upton Bridge Farm, Long Sutton, Langport, Somerset). Tim G3PCJ hosted a similar event last year, when a good time was had by all, despite the weather! All radio clubs within easy reach are cordially invited. Bring your rigs or just come and meet up with friends.

Further details of the above activities can be obtained from **Cedric White, QTHR** or by telephoning **(01258) 473845**.

Members Unite

The members of the **North Ferriby United ARS** (NFUARS) recently competed for the G3YCC Award, which on this occasion, was for having QSOs on 144 and 430MHz. **Ken G4VKK** won the award, for the second time, in the most recent competition.

Michael 2EOAHY was presented with a special certificate, signed by the committee, commemorating being the first Novice licensed member of NFUARS. Michael, aged nine, passed his Morse test at seven and enjoys c.w. contacts on the bands, encouraged by his father, **Mike G4VHM**.

If you would like to get involved with the North Ferriby United ARS, you can contact the club's Chairman, **Mr F. W. Lee G3YCC**.

Members of the NFUARS (L to R): Malcom G4XWA (Club Vice Chairman), Frank G3YCC (Chairman), Ken G4VKK and at the front, Michael 2EOAHY.

Established Warrington

The Warrington Amateur Radio Club is a long established club with about 50 members. Meetings at the Grappenhall Community Centre, Bellhouse Lane, Grappenhall, Warrington are held on Tuesday evenings at 8pm. Radio Amateurs Examination (RAE) courses and Morse practice sessions are also available at this location.

Talks are often arranged, covering subjects such as technical topics, operational issues and general interest. The Warrington ARC also take part in outside events including an annual Fox Hunt.

Throughout the year there are a number of social occasions, and at all times, the Warrington ARC aim to promote a friendly and co-operative atmosphere for members to meet and exchange information and discuss any problems.

Further details can be obtained from the Secretary **John Riley G0RPG** on **(01925) 762722**.

Braintree On The Ball

The Braintree & District Amateur Radio Society meet on the 1st and 3rd Mondays of the month at The Clubhouse, Braintree Hockey Club, Church Street, Bocking. Doors open from 7.30pm for an 8pm start to the meeting.

Prior to 8pm, and during the refreshment break, members have the opportunity to sell or exchange equipment, etc. Meetings normally end at around 10pm.

The Club Membership fee is £12.50 annually. Senior (retirement age) and Junior (under 18) members pay a reduced club subscription of £6.25. Door fees are payable per meeting. Rates are 60p for members, 30p for juniors and senior members, and 80p for visitors. However, the fees for visitors under 18 and in full-time education is only 40p.

A Club Net is operated on 144MHz on the 2nd and 4th Mondays (excluding Bank Holidays) under the callsigns G6BRH and G4JXG. The net commences at 2000 clocktime on S15 - 145.375MHz, unless QRM.

The Braintree & DARS also produce a magazine *BARSCOM* which is issued free to members, usually at the first meeting of the month.

To find out more you can get in touch with the club's Secretary **John Button G1WQQ** on **(01787) 460947**.

Official Opening

The Pontefract & District Amateur Radio Society opened their new shack back in December 1994. The Rev. George Dobbs, accompanied by his wife, performed the official opening. Also in attendance were Mr & Mrs Peter Sheppard the RSGB zonal council member for the North of England. About 30 club members and friends attended, and enjoyed plenty of good food and a friendly atmosphere.

The other highlight of the day was a presentation ceremony to honour long serving members: **Brian Booth G3SYC**, **Niall Whittingham G4ISU** and **Walter Farrar G3ESP**. They each received a long service certificate presented to them by the Rev. George Dobbs.

The new shack was built entirely by club members, and was paid for with the money raised by them. For more information on The Pontefract & DARS you can contact **Colin B. Wilkinson** on **(01977) 677006**.

Top: Grand opening of the new shack. (L to R) Colin Wilkinson G0NQE and Rev. George Dobbs G3RJC.

Bottom: Recipients of the long service award (L to R) Walter Farrar G3ESP, Brian Booth G3SYC and Niall Whittingham G4ISU.

Callsign Allocated

Do you remember reading in the March Issue of *PW* the story on the Liberation of Guernsey? Well, 'Club Spotlight' has recently received good news that the **Guernsey Amateur Radio Society** have now been allocated a callsign, which is **GB50LIB**.

Want to know more about the special event station in connection with the 50th anniversary of the Liberation of Guernsey? Then why not contact **Phil Cooper GU0SUP** on **(01481) 700700**.

International Marconi Day - April 22 1995

The first **International Marconi Day** event run by the **Cornish Radio Amateur Club** took place in April 1988 and since then has made great strides, going from strength to strength. The 6th International Marconi Day event in 1993 had some 25 participating stations from all around the world.

In 1994, the number increased to 36 and some 260 awards were claimed. If all groups expected to take part in 1995 confirm, the total will rise to 46 stations.

Originally, the Cornish Radio Amateur Club decided to limit the total number of International Marconi Day stations to a maximum of 30, but with numerous approaches from other groups wishing to join, they have relented. Although the organisational workload will increase somewhat, the club feel they will be able to cope (Good luck to them! *PW*).

To date, the Cornish Radio Amateur Club have issued in excess of 800 of their special award certificates, which are of high quality and well worth anyone's efforts to earn. The required standard for the April 22 event is to work 12 of the participating stations. Alternatively an award is offered to the short wave listener (s.w.l.) for logging 12 of the International Marconi Day stations.

Operation will take part for the 24hr period from 000/2359UTC on Saturday April 22 1995. The main mode of operation will be on s.s.b. on all h.f. bands with periods of c.w. or digital modes of communicating being actively encouraged.

For the transmitting station claimant, the cost for the award is £3.50 (UK), $10 (US) or 12 IRCs. For this you require contacts with a minimum of 12 of the participating stations working two-way on any mode employed. Only one contact with each participant will count towards the award, so a contact on two bands or on two different modes will count only as one contact.

For the s.w.l., the award costs are £3.50 (UK), $10 (US) or 12 IRCs. For this award you are required to have logged 12 two-way QSOs and provide a full extract from your listeners log.

Mixed modes and bands are allowed, but each callsign will be counted just once towards the minimum of the 12 required.

All award claims should be made in writing giving a full extract of log entries to: **Sue Thomas G0PGX, Cornish Radio Amateur Club, IMD Awards Manager, PO Box 100, Truro, Cornwall TR1 1RX.**

The listeners award is open to all, so if you only manage to have a QSO with 10 International Marconi Day stations, but hear QSOs for at least two more, then you will be eligible to claim the award as a listener.

The Radio Society of Great Britain will be running an official International Marconi Day Station (callsign to be confirmed) in tandem with the Annual Open Day at Lambda House, the RSGB HQ.

The stations to listen out for on April 22nd 1995 are as shown in the table below.

The entries marked * have not yet confirmed their participation to the Cornish Radio Amateur Club, although they are expected to be on the air on International Marconi Day on April 22nd 1995, the eighth event - so don't forget it!

CT1TGM	Coimbra, Portugal	DA0IMD	Borkum Island
EI2IMD	Crookhaven, Eire*	EI3MFT	Letterfrack, Co. Galway, Eire
EI4IMD	Clifden, Galway, Eire	EI4JAM	Whiskey Corner, Dublin*
EI5IMD	Cork, Eire	ED7IMD	Cadiz, S. Spain
GB0IMD	Alum Bay, Isle of Wight	GB0MAR	Puckpool Pk, Isle of Wight
GB0MWT	Chelmsford	GB1IMD	Leicester (Satellites)*
GB2GM	Poldhu Cove, Cornwall	GB2IMD	Rathlin Is*
GB2MDI	Pepperbox Hill, Sallsbury	GB2MID	Sandbanks, Poole, Dorset
GB2SFL	South Foreland Lighthouse	GB4IMD	Truro (the CRAC Station)
GB4JAM	Isle of Wight	GB4MD	Old Carnarfon Stn., Waunfawr*
GB4MDI	Lavernock Point, S. Glamorgan	GB???	RSGB, Lambda House, Potters Bar
IY0GA	Sardinia Island*	I????	Caselecchio Di Reno*
IY0ORP	Rocca Di Pappa, Rome*	IY0TCI	Civitavecchia
IY1TTM	Sestri Levante, Genova	IY4FGM	Villa Grifone, Pontecchio
IY1MR	Rapallo, Genova	K1VV/IMD	Cape Cod, Mass
KK6H/IMD	Marshall, California*	OE1M	Radio Austria Int., Vienna
PQ1MD	Rio De Janeiro, Brazil*	PR1MD	Rio De Janeiro, Brazil*
PS1MD	Rio De Janeiro, Brazil*	PT1MD	Rio De Janeiro, Brazil*
PU1MD	Rio De Janeiro, Brazil*	PV1MD	Rio De Janeiro, Brazil*
PW1MD	Rio De Janeiro, Brazil*	PX1MD	Rio De Janeiro, Brazil*
ZW1TTO	Rio De Janeiro, Brazil*	ZW1USK	Rio De Janeiro, Brazil*
VE1IMD	Glace Bay, Nova Scotia	VK2IMD	Wahroonga, New S. Wales
VO1IMD	St Johns, Newfoundland	ZS6IMD	Johannesburg, S. Africa*

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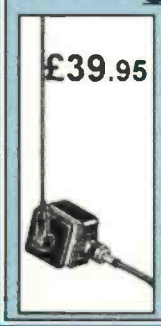

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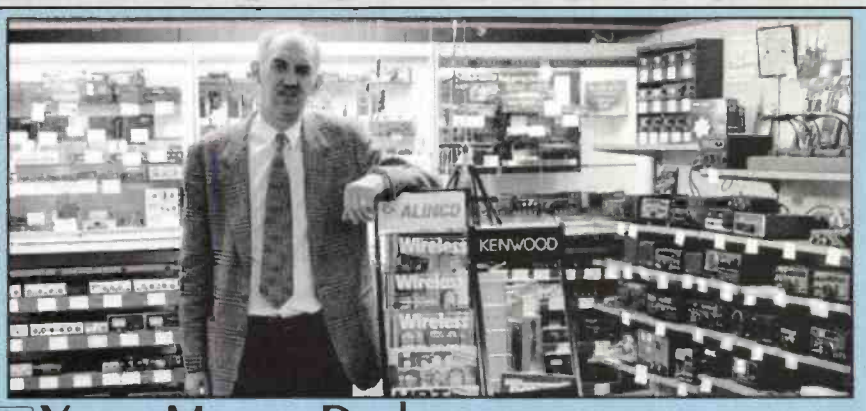

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INSPECT SPECTR

Richard Newton G0RSN has tried the newly-introduced FT-51R transceiver from Yaesu and finds there's a large number of interesting facilities built-in to a small package.

The Yaesu FT-51R is a dual band transceiver covering 110-180MHz and 420-470MHz on receive and 144-148MHz and 430-450MHz on transmit. It creates an excellent first impression. The radio is supplied with a helical antenna, belt clip, and drop-in charger unit. This all goes to make up a very professional looking package.

The Yaesu FT-51R comes with an extensive handbook and a quick reference guide. The handbook I found to be confusing, poorly written and far too complicated. This is in stark contrast to the radio, which proved itself to be very pleasant and easy to use.

Smartly Finished

The Yaesu FT-51R is smartly finished in high impact plastics and metal. It's very small but maintains a good solid feel to it.

The display is large and the main function indicators are easy to read. However, the indicators for less used functions are not so easy to see.

On the top panel of the Yaesu FT-51R are the speaker/microphone sockets. The top panel is also home to the BNC antenna connector and a large rubber covered rotary knob.

The rotary knob is used to move through the v.f.o. range and memories. It's also used to toggle through various functions such as the set-up menu and CTCSS tones.

On the left side panel (as the unit faces the operator) the **p.t.t.** button can be found. This is a rubber covered push-to-make switch, and incorporated in this is a second switch that when operated transmits a constant 1750Hz tone burst.

My fear was that this would be easily pressed when not required. However, it is so positioned that this did not occur. Even with my large clumsy fingers!

The **Sub Band** button momentarily switches control from the current operating band to the other band. For example, enabling you to lower the volume on the sub band while still transmitting on the operating band.

The power **On/Off** button is covered in vivid orange hard rubber (this is in contrast to the other controls which are all black). The power **On/Off** is also flush with the body of the radio to ensure it cannot be accidentally pushed.

All the controls on the side panel are designed so that they need gentle but positive pressure on them to switch. And in fact, I feel it unlikely they could be accidentally operated.

The front panel of the Yaesu FT-51R is home to remainder of the controls. The **Volume** and **Squelch** are controlled by the same two buttons, in a rather unusual way. They are in the form of two press buttons, one up and one down.

I also found that the **Lamp** button is well recessed. This turns on a very effective green back light that lights up the large display and all primary function and DTMF number keys.

Splendid Ergonomic Design

The splendid ergonomic design of the Yaesu FT-51R is only one of its attractions. The Yaesu FT-51R also has an advanced use of DTMF tones whereby it can send and decode short messages using the tones!

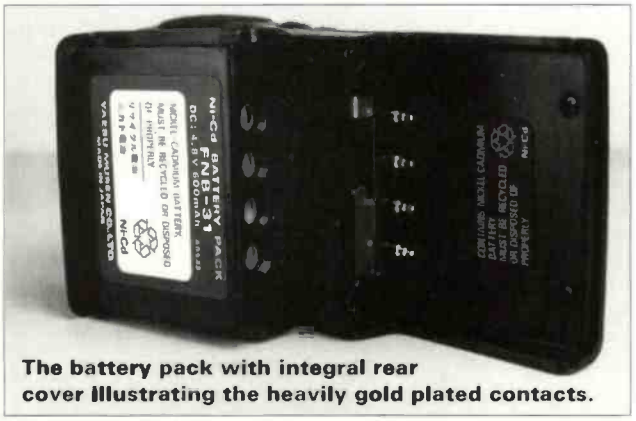
The transceiver displays the messages one at a time on the large l.c.d. display. Messages such as 'Ring me' or 'At home' can be received and held in memory. The user can then toggle through them to get a complete message such as: 'Richard - Ring-Me-At-Home-Tonight-Cheers-Clive'.

The Yaesu FT-51R also uses DTMF for the familiar paging facility. This is where you can page individuals or groups of people with equipment with the same facility.

Message And Paging

I have owned a hand-held with DTMF message and paging facilities for three years now, and as yet I have not used either in anger. However, I can see that in some circumstances both would be very useful, perhaps at a rally for bargain hunting or on a RAYNET exercise.

Nowadays CTCSS squelch control is becoming very popular due to the increased activity in some areas. Because of this, I think it's wonderful to see a hand-held that offers CTCSS encode and decode as standard, instead of selling the latter as an optional extra. Well done Yaesu!



The battery pack with integral rear cover illustrating the heavily gold plated contacts.

Spectrascope Feature

The Yaesu FT-51R also incorporates a 'Spectrascope' feature. This allows you to view activity on the channels above or below the current operating v.f.o. frequency.

With the 'Spectrascope' facility (if it's in memory mode) the transceiver will display the activity on the adjacent ascending and descending memories. This could be useful if you're monitoring local repeaters.

Another facet of the Yaesu FT-51R design that really caught my eye was the fact it will receive in amplitude modulation (a.m.) mode anywhere in its v.f.o. range. And although it's not unusual for a modern hand-held to receive the 'Air Band' in a.m., that's normally as far as a.m. coverage extends.

The Yaesu FT-51R can be toggled to a.m. reception on any frequency. I liked this because down my way there's an increasing number of people going back to a.m. on 144MHz due to the cheaply available second-hand equipment. It's terrific to be able to receive them, and if they have receive on 433MHz it's great fun to have a cross band, cross mode QSO!

The Yaesu FT-51R also has a full or semi duplex facility. When in full duplex, the radio automatically adjusts the received audio level.

The microphone is also well situated for hand portable and duplex operation in mind. It's right at the bottom of the radio, thus cutting down on feedback and making the transceiver easier to operate, as it can be held like a telephone.

On Board Help

One thing that is worth a mention is the Yaesu FT-51R on board help facility. When you select a function the radio automatically starts scrolling a user help message across the screen telling you what you should be doing. This can be disabled when you have mastered the radio or if you just like giving yourself a hard time!

Many of the functions on the Yaesu FT-51R can be customised by the user. For example, these include transmit offset, channel spacing, key bleeps, bell alerts and scan modes to name but a few.

Transmit Output

The transmit output power is also very versatile on the Yaesu FT-51R. With the supplied battery pack it can be switched between the high power

ASCOPE with the Yaesu FT-51R

Manufacturer's Specifications

General

Frequency range (RX)	110-180MHz 420-470 MHz
Frequency range (TX)	144-146 and 430-450 MHz
Channel steps	5, 10, 12.5, 15, 20, 25, and 50kHz
Supply voltage:	4.0-12V d.c.
Current Consumption:	
	v.h.f u.h.f.
Auto Power Off:	200uA 200uA
Stby (Saver on):	25mA 23mA (34mA dual-rx)
Stby (Saver off):	52mA 49mA (85ma dual-rx)
Tx (5w@9.6VDC):	<1.6A <1.9A
Antenna (BNC):	50Ω - YHA-55 helical supplied
Case size (WHD):	57 x 123 x 26.5 mm
Weight (approx.):	330 grams with battery pack FNB-31 and antenna

Receiver

Circuit type:	Double-conversion superheterodyne
Intermediate Frequency:	45.05MHz and 455kHz (v.h.f) 58.525MHz and 455kHz (u.h.f)
12-dB SINAD Sensitivity:	< 0.158 uV (v.h.f) and < 0.180 uV (u.h.f)
Adjacent channel selectivity	> 65 dB (v.h.f) and > 60 dB (u.h.f)
Intermodulation	> 65 dB (v.h.f) and > 60dB (u.h.f)
AF output:	0.2 W @ 8 Ohms for 10% THD

Transmitter

RF output:	With supplied battery pack.
EL:	20mW
L1:	0.5W
L2:	1.5W
L3:	2.0W (1.5W on u.h.f.)
HI:	2.0W (1.5W on u.h.f.)
Frequency Stability:	Better than ± 5 ppm
Modulation system:	Variable reactance
Maximum deviation:	±5kHz
FM noise (@ 1 kHz):	better than -40dB @ 1 kHz
Spurious emissions:	> 60 dB below carrier
Microphone type:	2kΩ condenser

setting of 2W (1.5W on u.h.f.) through 1.5W, 500mW and down to an extra low of 20mW.

It would seem that there's no provision for the Yaesu FT-51R to be operated from an external power supply. This surprised me.

You can however purchase a mobile charger that doubles as a d.c. supply and mounting cradle. Using this will give 5W out on high power. There are also different battery packs available, one of which will allow 5W output.

Liked The Transceiver

I must say that I liked the Yaesu FT-51R transceiver! I must confess however, the big selling points did not impress me that much, but the small attentions to detail did.

The small attention to details which impressed me included: The facility that can be set to enable the display light to automatically come on when a station is found in scanning mode. I also liked the neat and tidy way the cover for the speaker/microphone folds over and the large well labelled and thoughtfully situated controls. They are all features that endear this little radio to me.

I must also congratulate Yaesu on designing a radio with a 'wide' front-end that seems to reject interference well! The supplied helical antenna also gets my vote. Although it may well be one and half times the length of the radio, it's certainly not like the 'dummy load' you often get with some radios!

The Yaesu FT-51R is a small, well built and despite its handbook, an easy to use hand-held. Its advanced features can be used or ignored depending on what your needs are.

Whatever you use the Yaesu FT-51R for, I'm sure you will not be disappointed. **My thanks for the loan of the transceiver go to Barry Cooper of Yaesu UK Ltd., Unit 2, Maple Grove Business Centre, Lawrence Road, Hounslow, Middlesex TW4 6DR. The FT-51R is available from approved Yaesu dealers for £499.**

PW

After seeing a copy of the G0RSN review Barry Cooper of Yaesu UK Ltd., sent us the following comments:

When given the chance to comment on a review, it is difficult not to become over protective of your 'new baby'. Any parent will know how quickly the hackles rise should anybody **dare** to criticise an offspring, whether or not criticism is justified! I guess this is what makes equipment reviews so popular. I digress ...

I am pleased that Richard G0RSN found so much to like about Yaesu's new dual-band paging transceiver. He states that he found the handbook confusing, poorly written and too complicated. Whilst I respect the reviewer's opinion, I must take issue with it.

The handbook is comprehensive, well illustrated and detailed. It is **well** written in concise English, pleasingly devoid of American spellings and transliterations from the Japanese prevalent not so many years ago. The FT-51R has myriad of features and to do these the injustice of less than a full explanation would be a disservice to a very complex product.

Richard comments that the major features did not impress him but the small attentions to detail did. This is surely how it should be - something in the product for everybody.

Barry Cooper G4RKO

Bits & Bytes Special

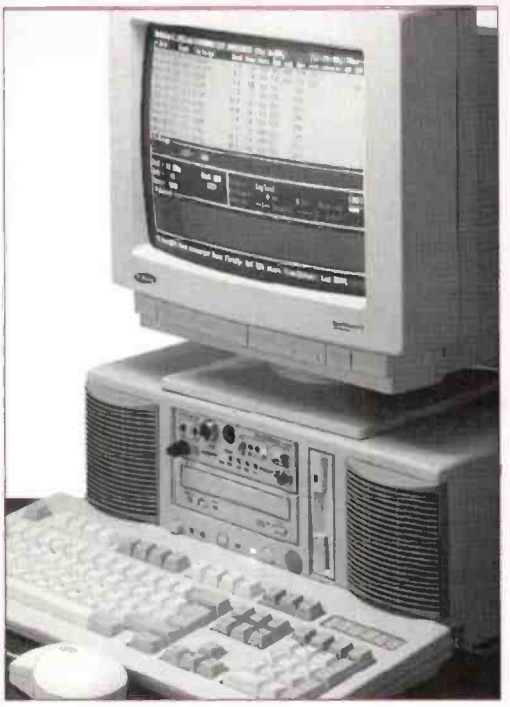
As this is our 'Computing In Radio' special, Mike Richards G4WNC has devoted his column to a review of a specialised amateur radio computer from Future Business Systems Ltd. And Mike says "If you're thinking of getting a computer for radio work but not sure where to start, read this first"!

If you've ever looked through the numerous computer magazines trying to find a computer for radio work you could be forgiven for being confused. The IBM PC clone market is still thriving and results in a mass of glossy adverts all claiming their machines are the best.

Even if you read the reviews to find the best machine, will it be any good for the specialised applications used by radio amateurs? Once you've got past this stage and bought the ideal computer you still have a lot of work to do before you can use it on air.

Is this story sounding familiar or perhaps daunting? Well, **Martin Rhodes G3XZO** Managing Director of **Future Business Systems** decided to do something about the problem.

As a keen DX enthusiast Martin is well placed to understand the needs of a radio amateur. Put this together with the fact that his company have been building IBM clones since 1988 and you have a potentially winning combination. The computer I've reviewed here is one of a range of custom units available from his company.



Review Model

The review model was basically a 486DX2/66 multi-media PC with CD-ROM, 4Mb RAM and sound board with internal speakers. Whilst that's fine if you're into computers it doesn't help the newcomer - so what does it all mean?

The 486DX2/66 means that the PC uses an Intel 486 processor device which runs at double the normal (33MHz) clock rate, e.g. 66MHz. The 486 processor used represents one of the fastest processors available, so the computer is very up-to-date.

The 4Mb of RAM (Random Access Memory) is about the lowest you should run with this type of processor and you may be well advised to buy an 8Mb version if funds allow. The inclusion of a CD-ROM drive lets you take advantage of all the new CD-ROM based software that's available, while the sound board lets you use the computer to both record and playback high quality audio.

The built-in sound board also has the benefit of giving you great sound with any games you might use. So, you can see, this basic computer set-up is up-to-date and is likely to serve you well for non-radio uses as well.

Special Hardware

In addition to the basic features I've mentioned so far, the computer is fitted with some special hardware and software to customise it for amateur radio use. At the heart of this is the ShackMaster unit which is built into one of the disk drive bays on the computer front panel.

The custom made unit provided control of a wide range of radio related functions. One of the objectives of creating the specialised radio computer was to try and get rid of the 'rat's nest' of wires and boxes that you often find at the back of many radio set-ups.

The front panel of the Shackmaster unit is quite busy and packed with a host of features. The main elements are a 1200baud v.h.f. Packet TNC, audio switching between two rigs, Serial port level converter, c.w. rig keying, band data import plus a voice keying system.

All the connections to the ShackMaster were handled via the appropriate interface cards at the rear of the computer. The only exception to this was the microphone in and out sockets that were mounted on the front panel.

While the 'mic in' was fine I

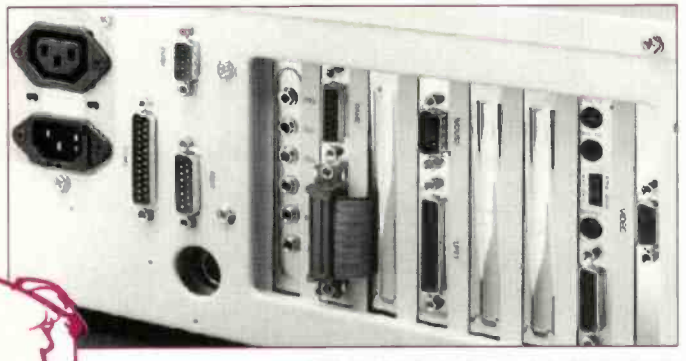
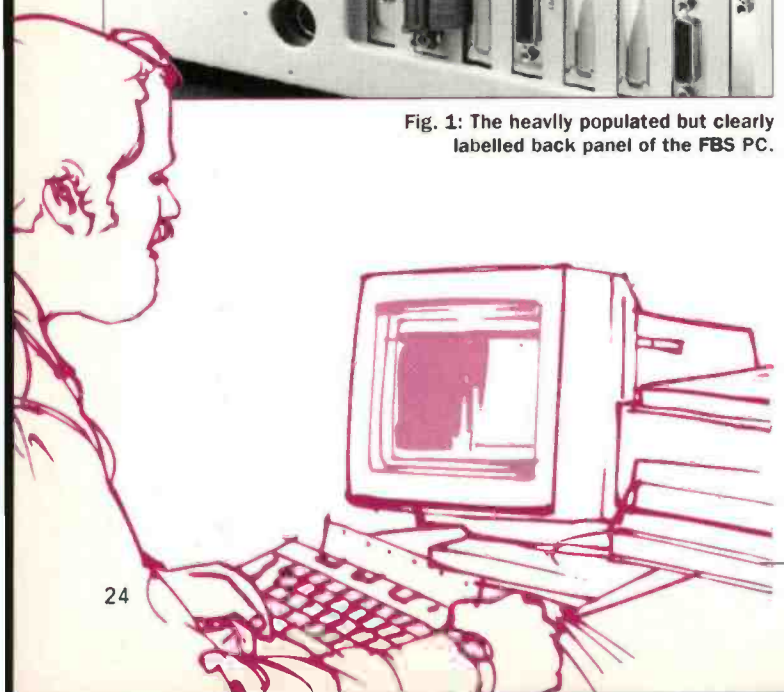


Fig. 1: The heavily populated but clearly labelled back panel of the FBS PC.



Manufacturer's Specifications

Hardware	
Processor	80486DX2/66 cpu with 256kb cache RAM Memory 4Mb RAM expandable to 48Mb
Disk drives	Hard Disk 420Mb Floppy 1.44Mb 3.5in Dual speed CD-ROM drive
Extensions	1Mb SVGA video board SoundBlaster stereo sound card 2 x parallel ports 4 x serial ports
Video	14in SVGA low radiation colour monitor
Shackmaster	1200 baud TNC-2 type Packet controller with mailbox Voice keyer for digital recording playback RS-232 - TTL level convertor for rig control Audio monitoring/analyser switching for two transceivers c.w. rig keying via LPT port Band data import
Software	DOS and Windows installed Voicekeyer control software

Fig. 2 (above): Screen grab from the TurboLog system (see text).

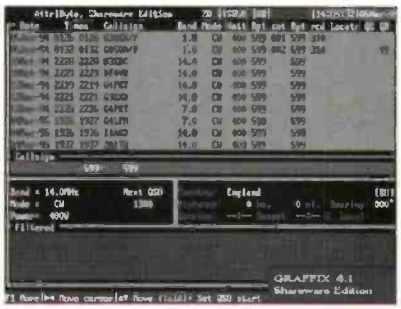


Fig. 3 (top right): A Packet DX cluster screen grab (see text).

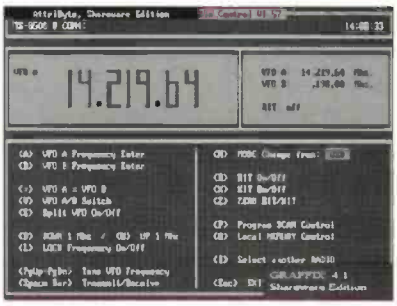


Fig. 4 (right): The Rig-EQF program gave G4WNC comprehensive control of the Kenwood TS-850 (see text).

felt the 'mic out' socket would be better placed somewhere on the rear panel. However, I suspect the decision to place both sockets on the front panel was done in the interests of keeping computer noise well away from the sensitive microphone signals.

The Connections

Before I go on to cover the various features in detail, let's just run through the connections that need to be made to get the system running. In this section I'm assuming you have an h.f. rig that includes remote control features and a v.h.f. rig for packet operation.

On the front panel the only connections are the microphone input and output as I described earlier. The remaining connections were all neatly labelled on the rear panel.

Anyone with experience in computers will appreciate this as all too often you have to make an educated guess as to the purpose of the various sockets! The main remote control link to the h.f. transceiver is the only special lead required and this is ordered to suit the transceiver.

In my case I was using a Kenwood TS-850S h.f. transceiver. The lead I used comprised a 15-way D connector at the computer and a DIN and standard jack plug for the CAT and keying connection to the transceiver.

A standard lead with a 3.5mm jack at each end is also needed to provide a receive audio feed to the computer. Connecting the v.h.f. transceiver was also very straightforward and used just three single leads for receive audio, transmit audio and the p.t.t. line respectively.

With the essential connections completed, the end result was certainly very much neater than the usual 'rats nest' associated with an advanced station set-up. In addition to the radio connections on the rear panel, there were the usual input and output ports for printer and serial data.

The serial output could be set to COM3: or 4 with COM3: being the preferred option. One of the great advantages of a comprehensive set-up such as this is the ease of installation. Anyone who's tried to get all four COM: ports working to different applications will know what I mean!

One final optional connection was a power feed to the Packet TNC. This was useful for those that want to keep the TNC running when the PC is turned off.

The TNC required just 6 to 12V d.c. connected via a 3.5mm jack on the rear of the PC. Just a word of warning here - there are six of these jacks in a neat line on the rear panel so be very careful to make sure you pick the right one! They are all sign written so there's no excuses!

Audio Monitoring

The routing of all the audio signals through the computer enables simple monitoring of the transmit and receive signals from both transceivers. This monitoring was controlled by two toggle switches on the ShackMaster unit.

The first switch was used to select either rig 1 or 2, whilst the second selected between transmit or receive monitoring. In later versions this set-up will be changed to include a centre off position to facilitate non-radio use of the internal sound board.

Depending on the setting of the Sound/CD switch on the front panel the audio is passed through the internal amplifier direct or via the sound board. Although not yet implemented, the routing of the signal via the sound board gives an opportunity to add some sophisticated signal processing as the sound board contains digital signal processing circuitry.

In addition to providing a substitute for an external speaker, diverting the audio via the computer gives a much higher output power which could be great for special event stations.

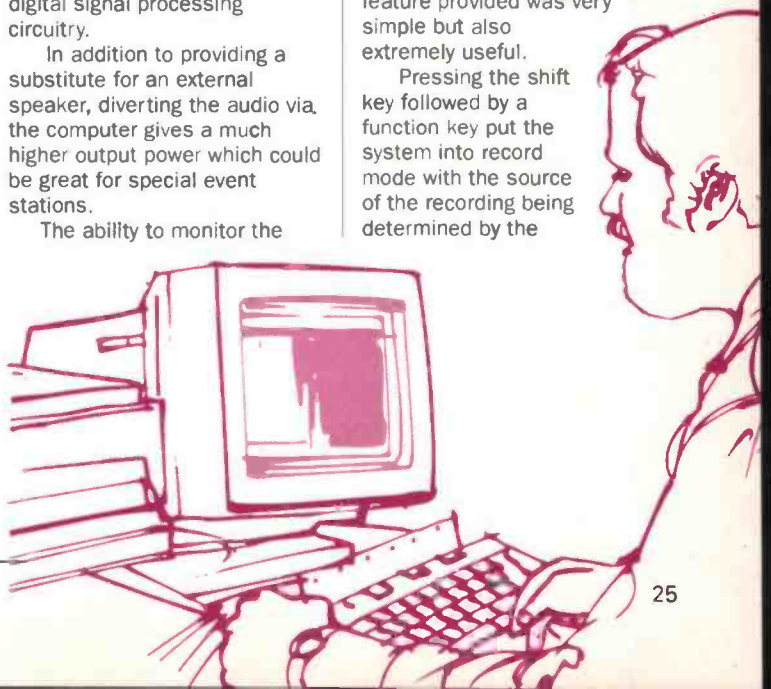
The ability to monitor the transmit signal, whilst not really relevant for microphone operation, was very useful for data work. At the flick of a switch you could quickly check the quality of the audio feed to the transceiver.

Recording And Playback

By combining the audio monitoring, sound board and the computer's large memory ShackMaster includes a digital recording and playback system. The software for this in the review model was called VoiceBlaster, but Future Business Systems are currently developing their own system to provide similar facilities.

The supplied VoiceBlaster system operated in the background and was activated using the F1 - F7 keys. The basic record and playback feature provided was very simple but also extremely useful.

Pressing the shift key followed by a function key put the system into record mode with the source of the recording being determined by the



Bits & Bytes Special

setting of the audio monitor controls described earlier. The recording was started with a press of the **Enter** key and there was a handy on-screen bargraph showing the progress of the recording. The recording was finished by pressing the **ESC** key.

The flexibility of the monitoring controls meant that you could record your own messages for later transmission or even record transmissions off-air. Once a recording had been made playback could be started by just pressing the appropriate function key. This very simple to use system was extremely useful in practice.

The most obvious use is to pre-record your CQ call so you can call at the press of a key! It also effectively replaced the shack tape recorder for short duration recordings. In my tests the basic memory configuration provided enough room for around two minutes of recording.

Rig Control

Next in the armoury of control features was the built-in rig control circuitry. The circuitry was directly associated with communications port COM4: and included TTL level conversion for some of the control lines.

The conversion is required to change the higher RS-232 voltages down to the 5V limits required by the CAT inputs of most transceivers. The modified output from the level converter was wired to a D-type miscellaneous connector on the rear panel. To link this connector to your transceiver you could either wire your own or purchase a ready made lead from Future Business Systems.

To make use of the control link you will also need some special software designed for your transceiver. The review computer was supplied with a copy of the shareware program Rig-EQF **(Fig. 4)** for controlling Kenwood transceivers.

The straight forward DOS program provided comprehensive control of the TS-850S from the computer keyboard. In addition to offering full control it also polled the transceiver every second or so to check for any changes. This meant that you could operate the rig either from the keyboard or directly and the computer would keep in step.

Just to complete the rig control facilities the computer also included a level converter for c.w. keying. There are also connections for downloading band data from many transceivers.

Packet Terminal

Just to complete the picture, the ShackMaster included a full featured Packet TNC.The TNC was permanently connected to communications port COM2: with the audio being wired to the Radio 2 connections on the rear panel.

The TNC was a TNC-2 compatible unit featuring PacComm firmware with a built-in mailbox. There is little really to add, except that it worked fine and was a very neat way to build a TNC into your set-up.

Radio Software

You've probably gathered by now that the computer comes with very little in the way of radio software. This is no accident as the choice of software package is very much down to personal preference.

There are so many good packages around that you need to carefully consider which is the right one for you. One example of a well thought out system is TurboLog **(Fig. 2)** that was supplied loaded onto the review computer. This is particularly suited to the DX enthusiast and could drive the TNC while connected to a DX cluster and be used to provide a very effective logging system **(Fig. 3)**.

Well Designed

The FBS computer system was certainly well designed and is a much easier option than trying to make all the connections yourself. As it's supplied with only the basic software which gives the buyer the freedom to choose the best system, I suspect those that go for this type of presentation may also need help with the selection of software.

It may therefore be helpful if the manual included a section on recommended software. The documentation supplied with the review model was only in draft form, so I've not been able to comment on it's quality.

However, a machine designed for those unfamiliar with computing deserves good quality documentation. Overall the computer worked very well and provides the basis of a very comprehensive radio station.

The configuration described here is available at the special launch price of £1095 excluding VAT from Future Business Systems Ltd., 21 Halford Road, Ettington, Warwickshire CV37 7TH. Tel: (01789) 740073. My thanks to Martin Rhodes G3XZO for the loan of the review model. Also thanks go to Trio-Kenwood UK Ltd., Kenwood House, Dwight Road, Watford, Herts WD1 8EB for the loan of the Kenwood TS-850S used in this review.

After seeing a copy of the G4WNC review Martin Rhodes G3XZO sent us the following comments:

In response to Mike G4WNC's comment about the position of the 'mic out' socket, I share his view that this would be better placed at the rear of the PC. If this can be achieved without introducing computer noise into the mic circuitry (and if we can find somewhere to put it on an already heavily populated back-panel) then this will be implemented.

The ShackMaster unit is available separately - subject to model and specification of the existing computer. We will also be including free with the PC (subject to normal registration/update charges) the following software:

Super-Duper h.f Contest Logging Programme; Super-Duper IOTA Contest Logging Programme; Super-Duper IOTA for Listeners by kind permission of EI5DI. RigMaster for Windows - combined TNC and rig control for DXCluster monitoring by both operators and listeners by kind permission of G0CDO.

Finally a full-function combined station and contest logging programme for Windows is currently under further development which will fully exploit the features of the PC and ShackMaster - watch this space!

Martin Rhodes G3XZO

Choosing & Using Your Computer

For many radio amateurs, deciding what computer to buy is one the hardest decisions of all. Wherever you look you'll find advertisers claiming that their computer is best. With this in mind, the Editorial team pass on a few tips to help you make your choice.

Even if you ask other radio amateurs for advice, you'll soon find that people tend to fall into camps with equally compelling (and conflicting!) arguments regarding the best computer. So where do you start?

While it's very easy to get carried away with the hardware features of the various computers, the only thing that really counts **is the software that's available**. There's little point in buying a super-fast computer if there are no programs available that do what you want!

Over the years there have been many computers that have found favour with amateurs. All of these machines therefore tend to have good software support, often with a plentiful supply of shareware programs.

Examples of those falling into good software support category are: Commodore C64, Atari and the BBCB. So, if you're looking for a second-hand computer, these older machines can be a very good buy, providing you check out the software first.

Good places to look for the software are J & P Electronics and Grosvenor Software, etc.

Moving more up-to-date, the number of different computers available has diminished. The focus is now around the Amiga, Archimedes, Apple Macintosh (Mac) and IBM PC or compatible.

Desktop Publishing

Although the Mac is an excellent computer, here in the UK it's only really taken-off in the desktop publishing world (*PW* is produced using Macintosh machines). As a result, there's not much amateur radio software around.

In the United States, the situation is different as the Macintosh has a much greater following there. So, if you decide on a Macintosh, you will need to check-out American suppliers to find the best amateur radio software.

The Archimedes, rather like the Mac, has had limited market success and is largely limited to educational establishments. If your interest lies with weather satellites, contact Spacetech, who offer a range of very good products.

The Amiga is another computer that's received only limited acceptance in the amateur radio market although it is technically a very competent computer. And, by now you've probably gathered that we're homing in on the IBM PC and its clones as the best choice for amateur radio use!

Although many would argue that there are other computers that are both cheaper and more powerful, none of these can match the PC for software and hardware support. For that reason we have covered the choice of PC in a little more extra detail.

What's A Clone?

One of the first questions facing someone new to computers is what's an IBM PC clone? The answer is it's simply a computer that's built with all the essential features of an IBM PC so that it can use the same software and accept the same plug-in expansion cards.

Although the original IBM PC started with the market lead in the desk-top PC, this has changed over the years. And nowadays there are a number of different manufacturers sharing the PC market.

Another important point about most PCs is that they are simply a collection of parts from an assortment of third party manufacturers. This mix and match approach makes it very difficult to make comparisons between different manufacturers.

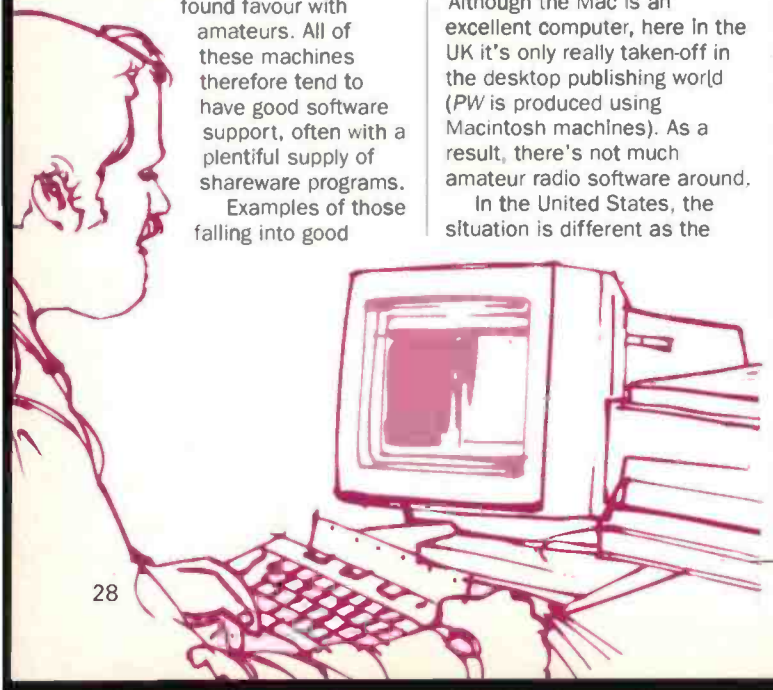
When you come to choosing your first PC there are many points you need to appreciate. The first is to note that PCs have been built with a number of different central processor units.

As the name implies, the central processor is the main chip or device that controls the operation of the computer. And incidentally, the very first IBM PC computers used an Intel 8088 chip.

The 8088s were superseded by the 80286, 80386, 80486 and currently the Pentium processors. There are similarities between all these devices, but the later versions are both faster and more powerful.

Along with the processor developments, the rest of the computer has undergone considerable change. For example, the video systems have gone from the old Colour Graphics Adapter (CGA) through the Versatile Graphics Array (VGA) to super VGA (SVGA). In each case the change has brought about higher definition.

One of the problems with the faster processor is the need to move data around within the computer at higher speeds. The most important development on this front is the VESA Local Bus. This provides a connection system that lets peripheral



systems like the video and hard disk systems talk to the processor at around 33MHz as opposed to the 8MHz used by older systems.

Finally, to help you choose your first PC, here are a few pointers. Although you may be tempted to go for a cheap PC like early Amstrad 1640 series, you are advised against it as these offer very limited performance.

You need to start with the fastest processor you can afford. If you want to operate with modern Windows based software you will need at least a 386 processor and a minimum of 4Mb of RAM.

If you can afford a 486 based machine then make sure you buy the 486DX rather than the slower 486SX. While the Pentium chip is the fastest currently available, the difference between a 486 and the Pentium only really shows if your software is specially written to take advantage of the Pentium.

As there is little or no amateur software specially written for the 486 or the Pentium 586, it's probably not worth spending the extra money demanded by a Pentium based system. But, if you're really uncertain about choosing a PC for radio use, you would be well advised to go for a radio-ready PC such as those supplied by Martin Lynch or Future Business Systems.

Contact Addresses

Badger Boards,
80 Clarence Road,
Erdington,
Birmingham B23 6AR.
Tel: 0121-384 2473

Future Business Systems Ltd.,
21 Halford Road,
Ettington,
Warwickshire CV37 7TH.
Tel: (01789) 740073.

Grosvenor Software (G4BMK),
2 Beacon Close,
Seaford Close,
East Sussex BN25 2JZ.
Tel: (01323) 893378.

J & P Electronics Ltd.,
Unit 45 Meadowmill Estate,
Dixon Street,
Kidderminster,
Worcestershire DY10 1HH.
Tel: (01562) 753893.

Martin Lynch G4HKS
The Amateur Radio Exchange Centre,
140 -142 Northfield Avenue,
Ealing, London, W13 9SB.
Tel: 0181-566 1120.

Pervisell Ltd., 8 Temple End,
High Wycombe,
Buckinghamshire HP13 5DR.
Tel: (01494) 443033,
FAX: (01494) 448236.

Spacetech,
21 West Wools,
Portland, Dorset DT5 2EA.
Tel: (01305) 822753

Venus Electronics,
26 Pevensey Way,
Frimley Green,
Camberley,
Surrey GU16 5YD.
Tel: (01252) 837860.

Data Modes

Without Breaking The Bank!

Mike Richards G4WNC provides some advice to help you to start using data modes, without spending all your pocket money!

With so many amateurs now using computers in the shack, there's an opportunity to utilise the expensive and powerful equipment for more than just keeping the log book. To find out how...just read on!

In this feature I'll attempt to show you how you can try out the data modes without first needing an overdraft! The secret lies in the use of the software distribution system known as Shareware.

Shareware is a system where by a version of the software is made freely available to everyone at no charge. However, although some suppliers provide the full package (but with a time limit), others supply a limited or earlier version of the software.

With both Shareware systems you are expected to make a voluntary contribution to the author after the trial period. In return, you'll either receive the full package or you become entitled to a free upgrade.

The Shareware system has become well established in the computer world. And I think it's particularly appropriate for the author who wants to make a small profit on a system that's essentially been produced for his or her own use.

In this example, I've concentrated on software that's available for the IBM PC and compatible computers. This has been because not only is the PC more widespread than any other system, but the software support is also very comprehensive.

For those with other systems I know this can be very frustrating. However, if you have developed your own software for a non-PC system why not use the shareware system to make it available to others. If you need help with this, contact me via my 'Bits & Bytes' column.

Package To Start

Personally, I think by far the best software package to start with is HAMCOMM 3.0 by Wilhelm Schroeder DL5YEC. Wilhelm released the first version of this program back in 1990, but since then it's gone from strength to strength.

The latest version of HAMCOMM 3.0 features many sophisticated extras and can send and receive c.w., RTTY and AMTOR. Another good point about this particular system is its modest demands on the computer hardware.

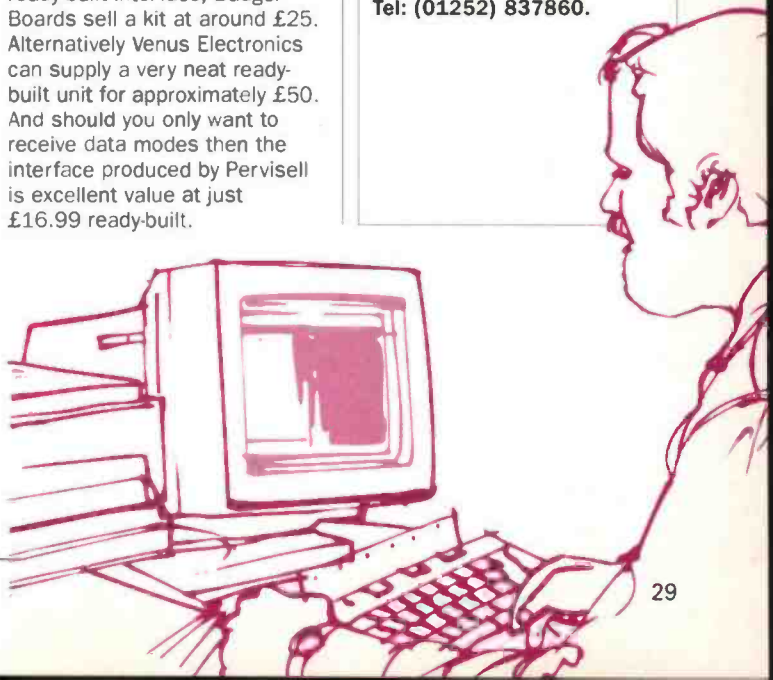
Although Wilhelm's program certainly works best with a modern 486 machine, it will still work quite comfortably on an old 8086 based system. You just lose some of the fancy tuning aids!

In addition to the software and a suitable computer, you'll also need a simple interface to link the computer to your transceiver. The full circuit details are given in the disk-based manual, but it comprises a simple Op-Amp limiter to process the audio from the receiver and a low pass filter for the transmit tones.

The filter is very necessary! It's used to convert the very coarse square wave output from the computer into a low level sine wave that can be fed into the microphone socket of your transceiver.

The only other electronics required is a simple transistor buffer. This connects between the computer serial port and the p.t.t. line of your transceiver.

If you would rather buy a ready-built interface, Badger Boards sell a kit at around £25. Alternatively Venus Electronics can supply a very neat ready-built unit for approximately £50. And should you only want to receive data modes then the interface produced by Pervisell is excellent value at just £16.99 ready-built.



Data Modes

Without Breaking The Bank!

Software Installed

Once the software has been installed into a suitable sub-directory on your hard disk (C:\hamcomm) the program and supporting files occupy just over 1Mb of disk space. But before you start using the program seriously it's as well to print-out the manual using the disk file hc.doc.

The best way to print out is to set your printer font for 12 characters per inch and from the Hamcomm sub-directory type COPY HC.DOC LPT1.

Once you have the program running and you've taken time to explore some of its features, take a look at the HC.CFG file with a simple text editor. The sample file is very well documented and it's an excellent way to set the program up to suit your own personal preferences

As the HAMCOMM 3.0 program is so well developed and easy to use it makes a very good starting point for anyone thinking about experimenting with the data modes. However, because it's unfamiliar ground for many people, some have trouble mastering the tuning technique.

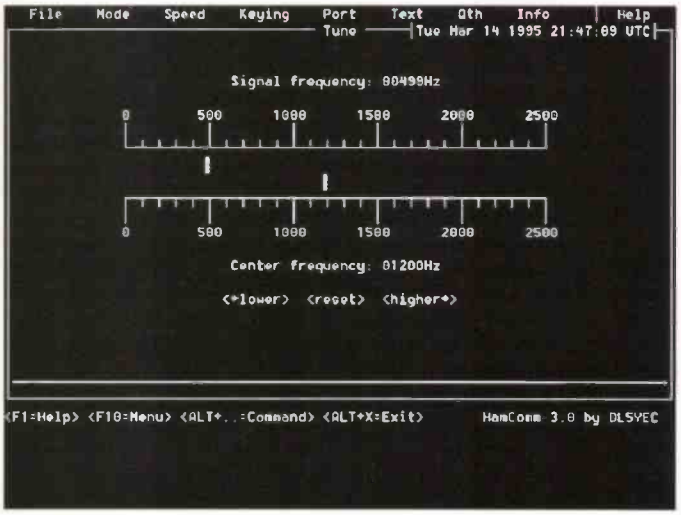
The best way to learn the tuning technique is with a good reliable commercial station. A good example of this is the Bracknell Meteorological RTTY transmission that's to be found on 4.489MHz.

To receive the Bracknell transmission, set the mode to Baudot (F3), speed to 75 baud (C) and keying to 425Hz. Next set the mode to tune and adjust your transceiver's tuning until the flashing white squares straddle the centre point of the display.

If you now press ALT M - Baudot, you should find groups of five figure numbers being displayed on the screen. If you want to turn this into something more interesting you can activate HAMCOMM's SYNOP decoder.

All you do is select the text menu and select FORCE SHIP or FORCE SYNOP. You'll then be presented with plain text translations of the coded weather data.

Having completed some receive practice you only need to set your transmit power level and you're ready to start transmitting. However, before you do **Please** spend some time listening to familiarise yourself with the operating practice.



HAMCOMM tuning indicator.

FAX And SSTV

If you're now 'hooked' by the fascinating aspects of computing in amateur radio, you're probably ready to move into the more complex modes of FAX and SSTV. Fortunately, this is actually very easy, thanks to the hard work and dedication of the shareware authors.

In this particular case I'll concentrate on the JVFAX 7.0 program written by Eberhard Backeshoff. This very comprehensive program uses the same interface as I described earlier for HAMCOMM and provides facilities for the sending and reception of both FAX and SSTV signals.

As you might expect from these highly graphical modes, JVFAX makes much higher demands on the computer hardware. Especially so if you're using the simple interface.

For best performance you'll need at least an IBM PC or compatible computer with a 386 or better processor, 4Mb RAM and a SVGA display. The program has been designed to support most modern video systems and includes drivers for VESA based systems.

If you want to use the program with a slower machine you will have to compromise the performance by reducing the horizontal resolution.

An alternative is to obtain one of the complex interfaces such as that produced by Martelec. These units have their own processor built-in that relieves the processing load on the main computer.

Installation of JVFAX is very simple. This is because the set-up program (INSJV70) automatically unpacks all the program and support files and creates the appropriate sub-directories.

In addition to providing support for the amateur FAX modes, JVFAX includes facilities for all common types of l.f., h.f. and satellite FAX systems. Included in this armoury is fully automatic reception of APT weather images.

Now it's time to look at TV - slowly! Slow Scan Television (SSTV) remains a popular transmission system for many amateurs and can usually be found on the 14MHz band at around 14.215MHz.

The JVFAX program is equipped with just about every SSTV mode including the modern colour systems. The program is extremely easy to use and includes facilities for superimposing your callsign on the transmitted image.

Packet Radio

Packet radio is one of the liveliest of the data modes and as such attracts a lot of interest. There are various ways to get started, but if you're using a PC you might like to try a receive only system just to see what goes on.

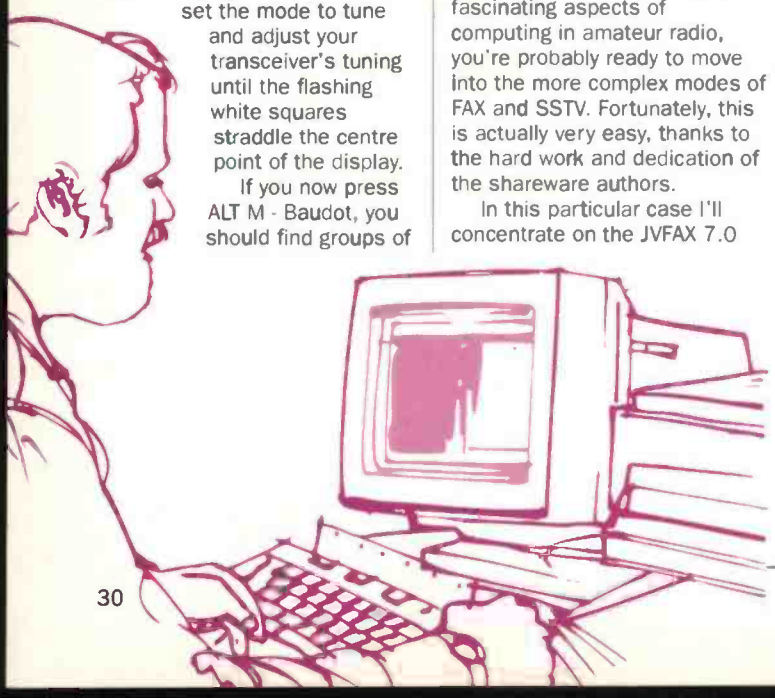
Like the other programs in this section, PKTMON12 is shareware and is readily available from most good shareware suppliers. Although the program is very compact and basic, it demands a lot of processor time, so you'll need a 386 or better processor in your PC.

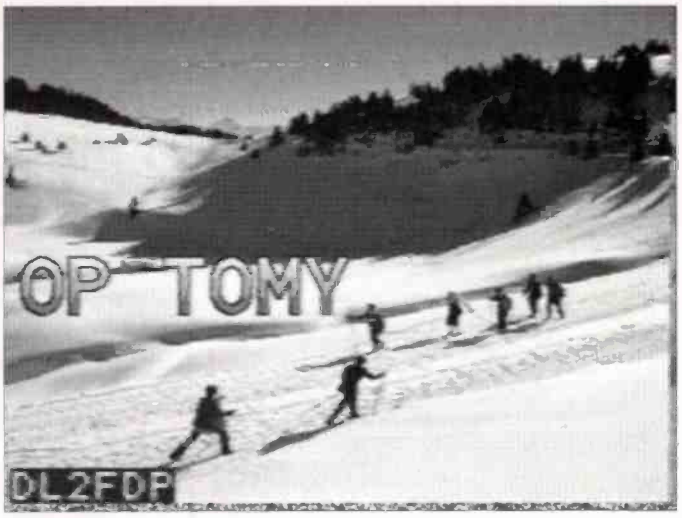
The user interface to PKTMON12 is rather crude and can confuse new users so I'll quickly run through it here. When you start the program you will be asked to select a COM port which can be either COM 1 or 2.

Next, you need to choose to receive h.f. or v.h.f. packet, the difference is 300 baud 200Hz shift on h.f. and 1200baud 1000Hz on v.h.f. You also need to provide a file name for the received data.

Instead of displaying all the received data just to the screen, PKTMON logs all the data to a separate file for each connection it identifies. Once you've started the program, you just leave it to gather all the current QSOs on that frequency.

At the end of the monitoring period you just press enter to finish the session. You then use a simple text editor such as MSDOS EDIT to look through the received files. Clearly, this system is only really suitable for





An SSTV picture received by G4WNC while using JVFAX.

those that want to take a look at the mode with minimum cash outlay.

Another less obvious benefit of PKTMON is that is has been written in Turbo Pascal with all the source code supplied. This is very useful for those who would like to write their own software as all the basic routines for converting audio to digital are ready-built.

Terminal Node Controller

If you're more seriously interested in Packet radio then you need to get yourself a Terminal Node Controller (TNC). A TNC is a processor controlled interface that handles the conversion of simple text to and from the computer into audio signals to link with your transceiver.

As you would expect, it also provides all the control facilities to link with the Packet network. Fortunately, one of the advantages to come from the popularity of packet radio is a plentiful supply of second-hand TNCs.

The TNC can be used with the simplest of communications programs. Despite this, a dedicated packet driver makes the system much easier to use.

If you're a PC user running Windows 3.1, one of the best programs around at the moment is UltraPak 2.0 by Tim Kearsley G4WFT. A demo version of this impressive software is currently being distributed as shareware so it's a great way to start on Packet.

The only difference between the shareware and full version is a 30 minute continuous usage limit. You can, of course, start the program again for another 30 minute session.

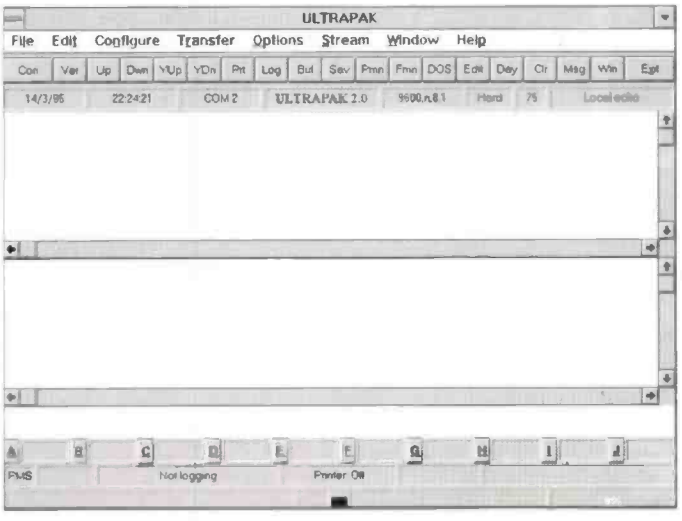
The program is supplied on a 1.44Mb floppy disk and includes a complete installation routine. This moves all the files to their correct directories on your hard drive and creates the usual program group and associated icons.

The Windows screen layout is really good. It has been arranged to give the operator rapid access to all the program's facilities.

One aspect that was handled particularly well was the facility to shell out to other applications. Included here were three push buttons set up so that a single press took you straight to print manager, program manager or a basic DOS shell.

UltraPak version 2 also includes full support for multiple connects with the data for each connect confined to its own window. You can even select a split screen display so you can view two connections at the same time.

At present, UltraPak is configured to work with TNC-2 type TNCs but Tim has reported that he's currently working to extend the compatibility to work with other systems. He's also working on a script language and PMS facility.



The UltraPak main logging screen.

Shareware Reminder

Now for a Shareware reminder! For many people the cost of modern commercial software can be a deterrent to even starting down the road of home computing.

The solution for most is to take advantage of the wide range of 'free' programs that are readily available. For the radio amateur this is a particularly good option as there's plenty of very good quality software available for most radio related applications.

The software is usually distributed in one of two basic formats shareware or freeware. Shareware is by far the most common, but sadly often abused.

The whole principle of shareware operates on the basis of trust. The program author releases the program onto the market place, but asks the user to pay a nominal sum to the author if you find the program useful. While some authors give the program a mild handicap such as a delayed start-up with a shareware prompt, others release the software with no operational restrictions.

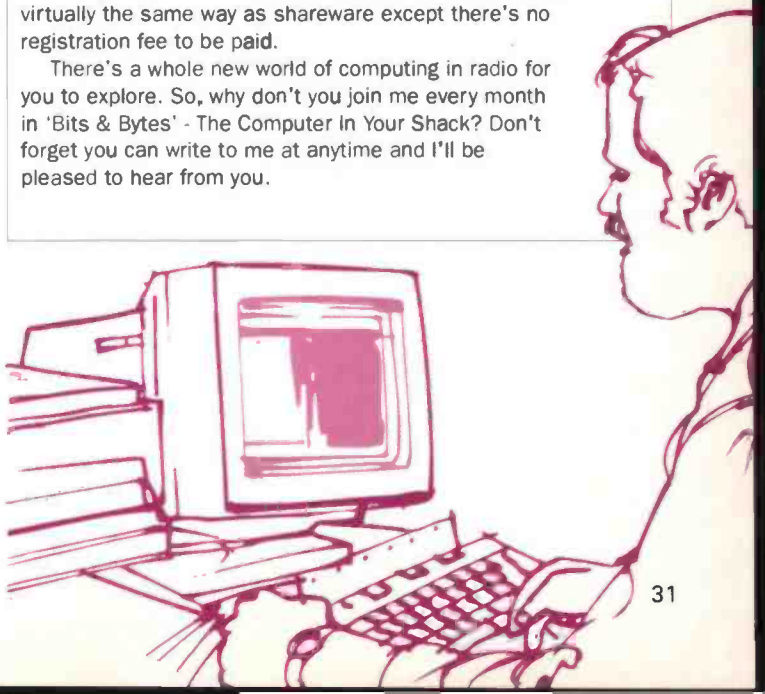
The typical registration fee requested by most authors is around £20 to £30. In exchange for this payment you will normally receive a full version of the program and some form of support.

Another important condition about shareware programs is that all the files must be distributed without alteration. If you want to copy the program to friends this is usually acceptable practice, but check the conditions before you do.

The sad fact about shareware is that very few people actually bother to register with the author. Not only does registration give you access to support but it gives the author some encouragement to develop the program further. **So please register your shareware**.

Finally, a quick word about Freeware. This operates in virtually the same way as shareware except there's no registration fee to be paid.

There's a whole new world of computing in radio for you to explore. So, why don't you join me every month in 'Bits & Bytes' - The Computer In Your Shack? Don't forget you can write to me at anytime and I'll be pleased to hear from you.



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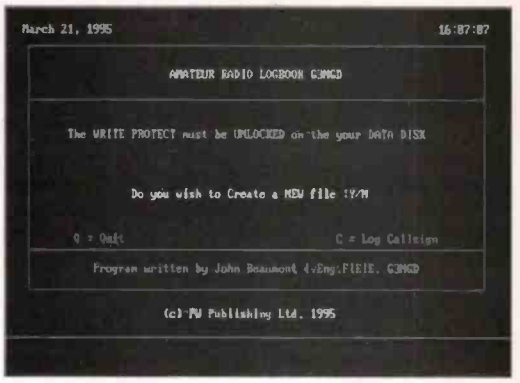
Basic Computer Logbook

John Beaumont G3NGD has written a basic computer logbook program especially for readers of *PW*, which he describes here.



On purchasing a new computer, I decided to write a simple database program to be my logbook. The object of the exercise was to enable me to speedily identify if I'd previously worked the station. The *Amateur Radio Licence Terms, Provisions and Limitations Booklet* BR68 states that a log should be written in a book or may be kept on a computer disk or tape.

All records shall be kept for inspection by a person authorised by the Secretary of State for at least six months from the date of the last entry. Furthermore, the tape or disk must **only** be used to keep the log on.

For speed of operation, both the program and data files are kept on a hard disk. But you must remember to copy the data file(s) to floppy disk at the end of the session.

Design Ideas

When operating on repeaters, many operators don't want signal reports, so I omitted these columns. You can always include signal reports in the comments column anyway.

You can print out a logbook, or sections of a logbook onto paper. There is also a means of correcting data errors saved on the disk. But to meet the regulations, it's not possible to insert entries at a later date.

The time and date must be set correctly before you start, (don't forget to set the computer clock to GMT/UTC).

A clock with date is displayed, in real time, on the screen. This will enable you to enter the correct time.

A complete entry is only 80 characters (one screen line), so many entries can be stored on even a low density disk.

In Action

Let's look at the program in action. When the opening title appears on the screen, you may open a new file. This will always be the case when the program is initially used.

In normal use, the file of data is updated only, so care must be taken to ensure that the new file option is not selected.

To ensure that an original file is not erased when creating a new data file, a warning is given. Then before possible destruction of data, a final reminder is given. You should make a backup copy of the logbook data/disk after each session, in case of data corruption at a later time.

Logbook Update

From the main menu, the logbook can be updated. The frequency band entry must not contain more than three numbers.

The remarks column may contain any information, but is limited to a maximum of 35 characters.

Each contact is given a unique record number, and this record number is used to identify the section of data to be edited. The data is amended like the original entry method.

A search can be made for any data contained in the remarks column. Callsign searches can be made even requesting, for example, /P, or /MM stations.

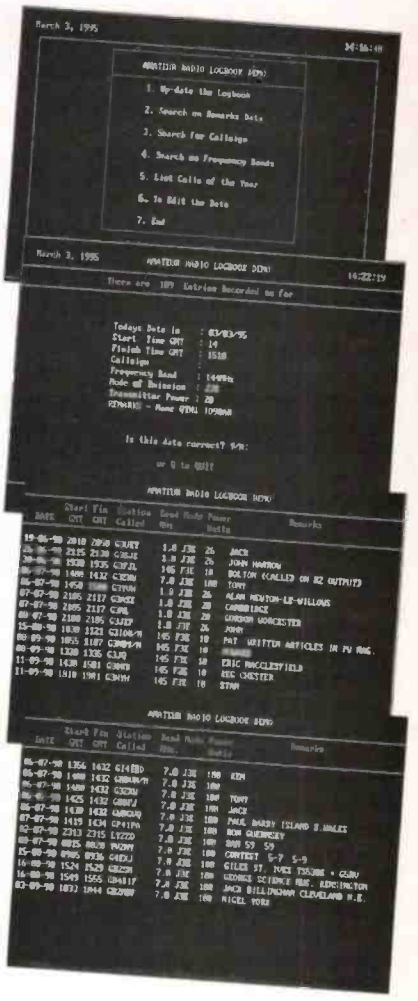
You can make frequency band searches for contacts. The program lists all contacts recorded on a particular band, e.g. 1.8, 3.5, 144MHz. **Note**: That if 14MHz is requested, it should be entered as 14 <space> RETURN, or 144MHz will be printed. (The search can be made on any particular single number).

You can list all the contacts made in any particular year. For instance, enter '94' for 1994 ('92' for 1992, etc.). **Note**: Pressing the pause key will stop the screen scrolling. This can be cancelled by pressing the ENTER key.

If a printer is available, then the lists may be sent to the printer. To initiate this facility press the letter 'P' when viewing the main menu (pressing 'S' stops this action). Should your printer not be connected or isn't 'on line' then the programme will automatically indicate this on screen.

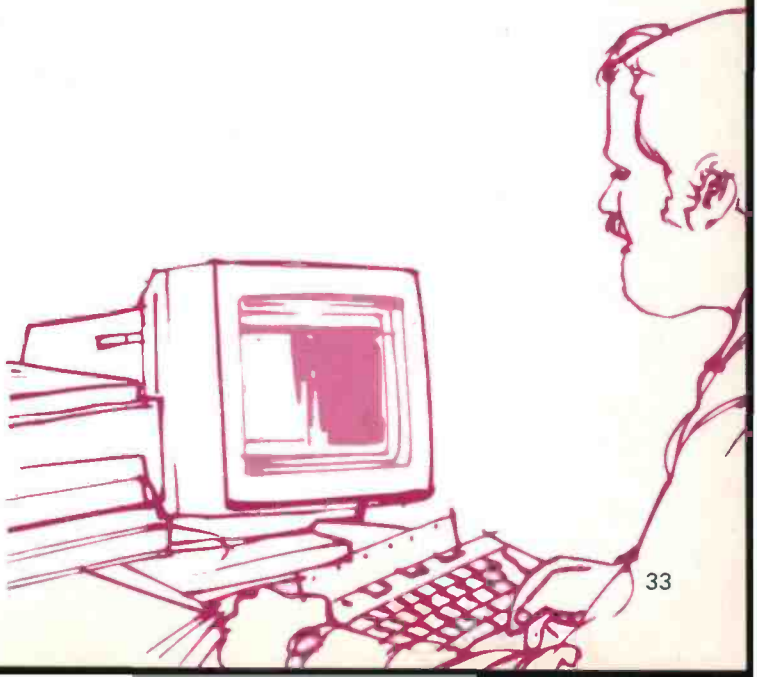
Using A Hard Disk

The program can be copied onto the computer's 'Hard Disk' (Drive 'C'). At the end of the 'Transmitting Period', the data must be transferred to a floppy disk. **It should be remembered that the floppy disk used must only contain the logbook data.**

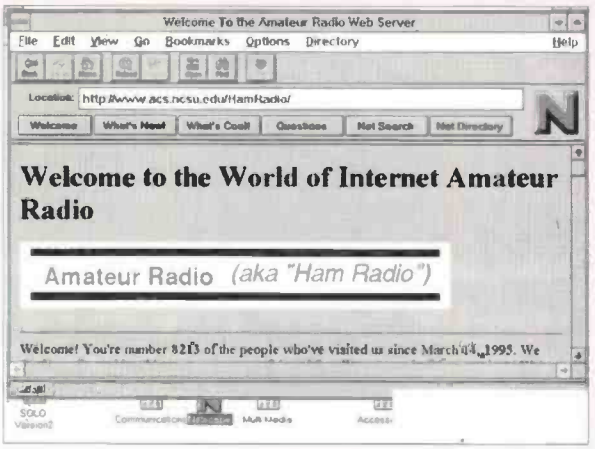


Editorial Note: If you would like a copy of the *PW* Logbook-95, write direct to **John Beaumont** at **28 Barton Road, Davyhulme, Urmston, Manchester M41 7WA** enclosing payment of £6 with your request. And don't forget your address of course!

PW



Amateur Radio And The Internet



Mike Richards G4WNC casts his experienced eye far and wide to gather all the up-to-date information on the latest computer associated event to attract attention - the Internet - from the amateur radio viewpoint. Mike then rounds off with a look at CompuServe.

Anyone with even a passing interest in communications or computing can hardly have missed the enormous hype associated with the media's discovery of the Internet!

I say discovery because you could be forgiven for mistakenly thinking the Internet is a new product that's just been launched. If so you'd be wrong on two counts as it's neither new or a product that you can buy! So just what is it?

In reality, the Internet is just a collection of computer systems and networks that have been connected together. The most significant point is that no single body either owns or controls the Internet.

The interconnections between the computer systems are provided on an individual basis. This is done without any consideration for the overall network.

I shan't bore you with lots of history, but one of the main driving forces behind the creation of the Internet has always been the educational and research establishments. They have a need to communicate with other academics around the world and have developed the Internet to provide that service.

The provision of links between these establishments formed the start of the Internet as we know it. This process of gradually interconnecting computer networks has continued over many years and the present Internet provides access to thousands of networks with an estimated 30 million users.

Because nobody owns or controls the Internet, it's impossible to be precise about its real size. That's enough history so, let's now see how you get connected and what's in it for the radio amateur.

Needs And Budget

Not surprisingly there are lots of ways to get connected to the Internet...depending on your needs and budget. If you're a university student you may well be able to get connected simply by using the university's own campus network.

With the popularity of Packet radio you may be wondering if there's a packet gateway you can use. And unfortunately, there are a couple of problems that currently make this impractical.

The first is the regulatory issue regarding the handling of information from unlicensed sources. Although it would be comparatively easy to provide a link between the packet network and the Internet, there's no easy way to ensure that only messages and traffic from licensed amateurs escape from the Internet into the packet network.

The other limitation is that of data throughput. Whilst most amateur links operate at 1200baud, many Internet facilities require 9600baud as an absolute minimum with 14400baud being the accepted standard. If you think about the baud rate in terms of downloading, some simple mathematics soon puts the data throughput problem into perspective.

Most of the software archives on the Internet store their data in compressed format (usually 'zip' format for PCs). Even with this compression, files are often 300k bytes plus in size. This means that some (300,000 x 8) 2,400,000 data bits need to be sent to complete the transaction.

At a constant 1200 bits/s this would give a transfer time of 33 minutes. However, this figure makes no allowance for the error correction process which divides the information into packets with acknowledgements sent after each packet to confirm reception. This would reduce the throughput by around 25% so increasing the transfer time to about 41 minutes.

However, you would only see this level of performance if you had exclusive use of the link from your computer through to the distant host and you suffered no interference hits. As this rarely happens you can expect further slowing of the transfer due to wait periods and repeated packets.

The end result would probably give a transfer time closer to an hour for the 300k program. If very many people were doing this you can see that the system would quickly grind to a halt!

For most people then the only practical way to join the Internet is via a modem and dial-up line. This will connect you to what's become a growth industry - the service provider.

Service Provider

There are a host of companies across the land that offer the service provider function. They can be divided into two main categories - bulletin board access (BBS) or full Internet Protocol (IP) connection.

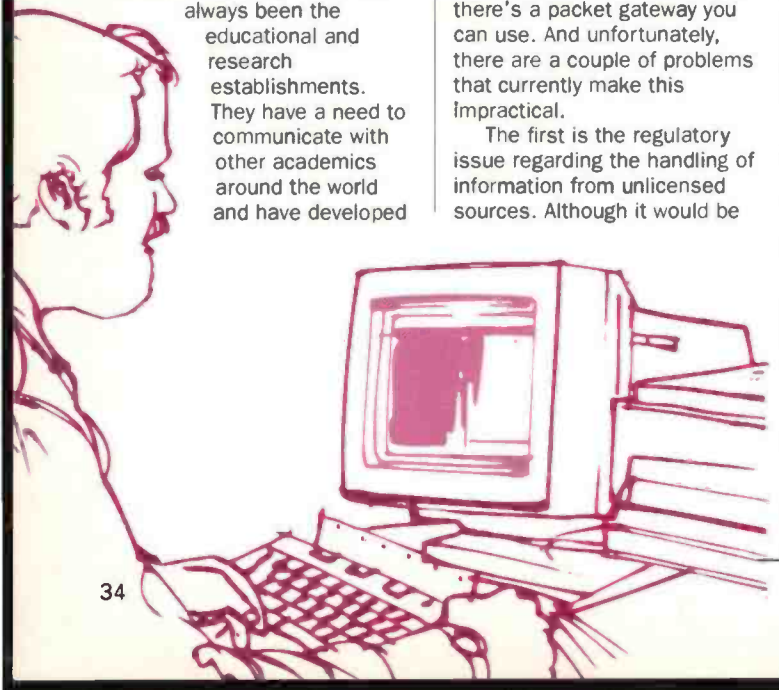
While the BBS connection is usually the cheapest option, the down side is limited access to the Internet's range of facilities. But before I go into some detail on how to choose a service provider, let's take a look at some of the available services and how they can be used by the amateur.

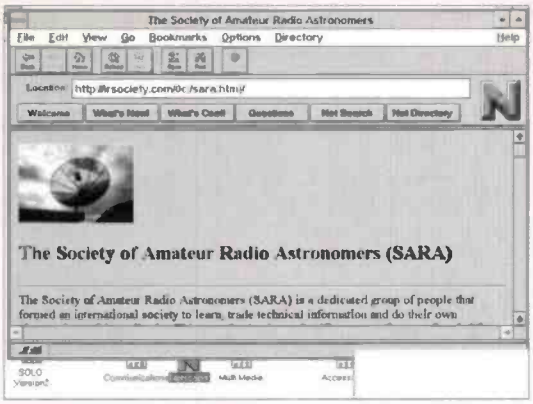
Universally Used

Probably the most universally used Internet feature is that of Electronic mail or E-mail This is a very fast and effective way of communicating globally.

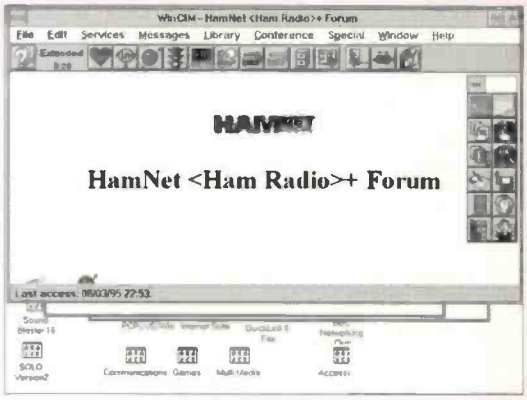
If you join a service provider with just BBS access you will often find that E-mail is the only access you have to the Internet. When you connect to the Internet, your service provider will allocate you an E-mail address which is exclusive to you.

There are a number of different formats for the address for E-mail. So, I'll use mine as an example: **mike.richards@bbcnc.org.uk** Obviously the first part is





All aspects of Amateur Radio are available on the Internet.



Screen grab showing CompuServe's HamNet forum.

exclusive to me whilst the @ points to the domain I'm using which in this case is the BBC Networking Club (bbcnc).

The next part shows that the service is provided by an Organisation (org). The final section the country of origin (uk).

An alternative example would be my CompuServe address which is **100411,3444@compuserve.com** The breakdown here is the same as before except that the com suffix indicates that the service provider or domain is a company.

You'll also note that there is no country identifier. This is because CompuServe is a US based company and, as they invented the Internet, they claim the right not to use a country suffix!

In addition to providing the facility for sending simple messages, most E-mail applications allow data files to be attached to messages. There are a number of ways of doing this but one of the most popular is called UUENCODING.

In the UUENCODING system the file to be sent is converted into ASCII characters. This is so it can be transported in the same way as message text. At the distant end a decoding program reverses the process.

In addition, E-mail can also be used to subscribe to mailing lists. Mailing lists are available for a very wide range of subjects and one good particularly good service for amateurs is that provided by the American Radio Relay League (ARRL).

To subscribe to the ARRL list all you do is send an E-mail message to info@arrl.org with the word help in the main text of the message. Once joined, you will automatically be sent copies of all the information passing through the mailing list.

It's also possible to use E-mail to retrieve files from remote computers. But the process tends to be rather cumbersome and slow.

Usenet Group

If you have a full IP connection a better way of receiving information from special interest groups is to join the appropriate Usenet group. There are literally thousands of these around covering just about every subject you can imagine.

In order to access these groups you will also need a special newsreader program for your computer. However, this shouldn't be a problem as most service providers include a range of suitable software when you join-up.

If you have the choice you should use what's known as an off-line reader. This will automatically download all the unread news items and store them on your hard disk so you can read them after you've hung-up the phone connection.

Amateur interests are served by the following popular Usenet groups:

rec.radio.amateur.antenna
rec.radio.amateur.digital.misc
rec.radio.amateur.equipment
rec.radio.amateur.homebrew
rec.radio.amateur.misc
rec.radio.amateur.packet
rec.radio.amateur.policy
rec.radio.amateur.space
uk.radio.amateur

Abundance Of Shareware

One of the great things about the Internet is the abundance of good quality shareware or free software for a wide range of computer systems.

You'll find excellent support for IBM PCs, Macintosh, UNIX, Archimedes and Amiga machines. The most common way to acquire the software is to use the Internet's File Transfer Protocol or ftp.

By far the best method to use the ftp is via what's known as a client program. This is a software package that provides an easy to use interface to, what can be, a clumsy command line method of transferring files.

With most client programs you can select the destination site and transfer the files simply by using the mouse pointer.

Favourite ftp sites for amateurs are:

ftp.ucsd.edu
ftp.cs.buffalo.edu/pub/ham-radio
ftp.wustl.edu/pub/hamradio

Search System

The vast size and rapidly changing nature of the Internet means that you will inevitably have to use some form of search system to find what you want. Fortunately, most of the ftp sites use a standard system for arranging their sub-directories so you can find most things using a simple manual search.

By way of an example, Windows software will normally be found in the directory path pub/ibm/windows. If you do need to use an automated search one of the most popular and easiest to use is called Archie and is available at a number of key sites across the Internet.

The principle of Archie operation is very simple. It relies on the Archie servers holding a database of the files available across a wide range of sites.

By using Archie client software you can search the database to find the file you want and then automatically transfer the file to your computer. Although a long way from being perfect, it does seem to be an effective way to find files.

World Wide Web

Now if you really want to impress your friends, the World Wide Web is the service for you! The WWW is the user friendly face of the Internet and I'm sure it represents the way forward.

The WWW system uses hypertext links and extensive graphics to create a simple to use yet very powerful way to navigate the Internet. There are a number of client programs available, but for PC users the best by far is Netscape v1.0 (available from most ftp sites in the www section).

The Netscape has been designed specifically to operate with dial-up links and is optimised for use with 14.4k modems. Not only can the program display all the graphics and make best use of the system but it will handle Usenet news, mail and file transfers.

One of the best starting points for UK amateurs is http://www.mcc.ac.uk/OtherPages/AmateurRadio.html. If you want to just 'surf' the Net, another good starter is http:/akebono.stanford.edu/yahoo/

Get Connected

Having whetted your appetite I'll try to give you some guidance on how best to get connected. If you're happy with just E-mail access your best bet is to use one of the many service providers that give just BBS access as this is by far the cheapest.

It's as well to make sure that the provider you choose is as close as possible to your home and preferable with the local call charge area. This will keep your telephone bill under control!

If you need to buy a new modem I would strongly recommend getting the fastest you can afford. The best value at the moment lies with 14.4kb modems, though no doubt 28.8kb units will be dropping in price soon.

Amateur Radio *And The Internet*

If you're going for full IP access you again need to pick someone close to home and use the fastest modem you can. If you want to use WWW or transfer a lot of files, a 14.4kb modem should be considered the absolute minimum.

When you start looking at service providers you will see that they operate Points of Presence or PoPs located around the country. The PoPs are just dial-up nodes that are spread around the country to help minimise telephone charges.

Ideally you should choose a supplier with a PoP within your local call area. This is because (as you'll find!) that of all the costs of getting on the Internet, telephone charges take the lions share.

Of the suppliers I have used, I found Demon to be the cheapest (£10 a month), but with some network congestion due to their fast growth rate.

The Pipex Solo network (£15 a month) has by far the best interface software and offers excellent data transfer rates and reliable access.

After sampling several full IP suppliers, my final choice has been to go for the BBC Networking Club which at £12 per month offers reasonable costs plus excellent access and transfer rates through their use of the Pipex network.

As an added bonus, the £25 start-up fee includes a full set of software. There's also printed manual and access to the BBC's Auntie Bulletin Board system.

CompuServe for Amateurs

Whilst you can hardly open a magazine without some reference to the Internet there are alternative networks around that can offer the amateur a lot of support. One of the best established of these is the American CompuServe network.

Although CompuServe's origins lay firmly in the USA, they have extensive links to Europe and in particular the UK. The system is basically a very large bulletin board network.

CompuServe's attraction lies in its acceptance by industry as an effective electronic communications supplier. Just to take the E-mail facilities as an example, CompuServe have interfaces to a number of external communications systems and you can use the E-mail system to send a FAX to any FAX machine world-wide.

All you have to do is insert FAX: followed by the telephone number in place of the E-mail address. For the amateur one of the main reasons for considering joining CompuServe is the extensive product support that's available.

All the major hardware and software houses have their own forums on CompuServe. You can join these for technical support or maybe to get the latest software drivers or fix files.

For dedicated amateur support there is a specialist HamNet forum. This special area of CompuServe is packed with software and advice for all aspects of our hobby. It's in this section that you will find all the satellite orbital data plus all the latest news and views.

You can also join on-line chats with other amateurs. For those of you already involved with data modes there's even a dedicated section for AEA products such as the PK-232.

Having used this system for some time, I think there's no doubt it's one of the most effective and reliable ways to get up-to-date information. However, if you can't decide between CompuServe and the Internet you'll be pleased to hear that CompuServe have an Internet gateway that enables you to send e-mail, join Usenet groups and download software.

The other important point is that the CompuServe network is extremely easy to use. This is thanks to their excellent Information Manager software that's supplied as part of the start- up kit.

With this software you can navigate your way around all the facilities at the stroke of a key (or mouse). In addition to the software all you need is a suitable modem that can be from 2400 baud to 14.4kb.

CompuServe's pricing structure has recently been simplified and you can expect to pay around £6.50 per month subscription plus up to £3.14 per hour for downloads. For more information on CompuServe just contact their Sales line on **(0800) 289378.**

PW

Pot Ratios By Computer

Jim Butler GM3ZMA shows you how to get a computer to do all the hard work, calculating potentiometer ratios.

Given the input voltage and the required output voltage, it is well known how to calculate the values of resistors to use in a simple voltage divider network, such as the one shown in **Fig. 1**. First, select a value for R2 and then calculate the value of R1 using the equation:

$$R_1 = \left(\frac{V_{in}}{V_{out}} - 1\right) \cdot R_2$$

It's quite straightforward so far, but what value do you select for R2? It would be very nice if you could select a preferred value for R2, do the calculations and end up with a preferred value for R1.

But in practice, you usually find that R1 turns out to be a very odd value indeed. Yes, you can always make it up from two or more preferred values, however, it would be much nicer if you could use preferred value resistors for R1 and R2. The following computer programme helps you to do just that.

The Program

The program was written in Basic to run on a BBC 'B' microcomputer. I've kept the program to a bare minimum, avoiding the use of features such as screen formatting which would be particular to BBC Basic. This means that the programme may be easily modified to other dialects of Basic used by any of the other popular home computers.

The program operates as follows: Lines 30 and 40 prompt for the input and output voltages. Lines 70 to 110 form a loop which reads the value for resistor R2 from the data statement in line 180, calculates the corresponding value for R1 (held in the Data statements in line 90) and then displays on screen the values of R1 and R2 (line 100).

The loop is run 12 times for the step values of the E12 series of resistors. The program then prompts and waits for a key to be pressed (lines 130 and 140), before repeating the calculation using the 12 extra values of the E24 series of resistors, (line 190). Lines 20, 120 and 150 ensure that the programme ends after the E24 series calculation.

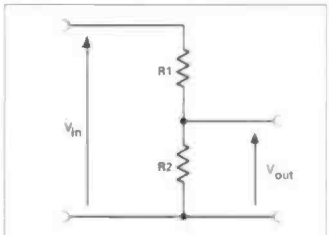


Fig. 1: Such a simple circuit, but that doesn't mean finding the correct values of R1 and R2 is easy!

Input Voltage

On running the program you will be asked for the input voltage to the divider, and the desired output voltage. After these have been entered, the computer will print the two columns of values, R2 on the left and R1 on the right.

You must now visually inspect the right hand column for a value which is suitably close to a preferred value for the desired application. If no preferred values are seen, press any key and a new set of values will be displayed, again, visually inspect for a preferred value in the right hand column.

If none are found, then one must revert to using two resistors to make up the required value. All that remains to be done now is to scale the resistor values to an appropriate decade.

An Example

As always an example is worth a thousand words. So let's suppose you have a 12V supply and require 7.5V. After running the programme you see that suitable values are 3.36 for R1 and 5.6 for R2.

If the current drain from the divider output is low, say 1mA, the real values would be 330Ω for R1 and 560Ω for R2. This would give a standing current in the divider resistors of approximately 13mA, which is sufficiently large to swamp any voltage pulling effects due to changes in the output current.

Preferred Values

Like most analogue things, resistors are rarely of the exact preferred values with which they're marked. How close a resistor will be to its nominal value will depend on the tolerance of how much error was allowed in the selection of the resistor during manufacture. Also, resistor values will vary with temperature and age. It also depends on the material from which the resistor is made.

So, when you buy say a 100Ω resistor with a tolerance on 10%, the actual value may be anywhere between 90 and 110Ω. Similarly, a 100Ω resistor with a 5% tolerance may be between 95 and 105Ω.

To save producing an infinite number of resistor values with very close tolerance which would make them very expensive, manufacturers produce resistors in series of predefined values. Thus for 10% tolerance resistors, the 'E12' series is used, and each value in the series is 1.2 times (approx) the value of its predecessor. The 12 in E12 comes from the fact that there are 12 values in each decade.

So, the step values for the E12 series are: 1.0, 1.2, 1.5, 1.8, 2.2, 2.7, 3.3, 3.9, 4.7, 5.6, 6.8 and 8.2. These steps hold true for all decade ranges, i.e. 10 to 82Ω, 100 to 820Ω, 1000 to 8200Ω, etc.

When closer tolerance values (5%) are required, the gaps in the series are filled in by additional values in the so-called the E24 series. In this range each larger value is 1.1. times the value of its predecessor.

In addition to the all the step values of the E12 range, the E24 series also includes the following values: 1.1, 1.3, 1.6, 2.0, 2.4, 3.0, 3.6, 4.3, 5.1, 6.2, 7.5 and 9.1.

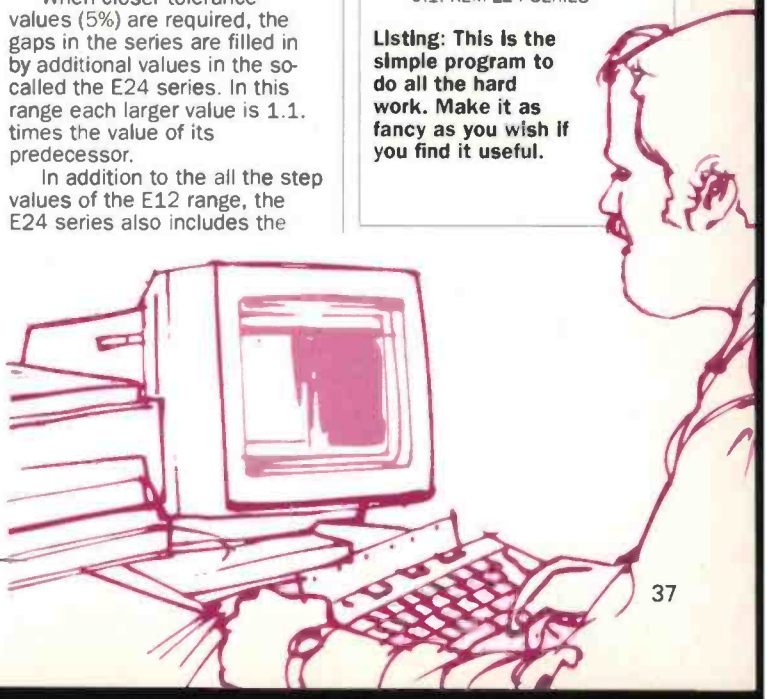
The Computer

I realise that not everyone will be using the same computer as I use. So, for those of you not using BBC Basic, and I suppose that means most PC users, the variables (VIN, VOUT and FLAG) can be reduced to only the first two characters.

So now you know how to get the computer to take the strain, there's no reason not to get calculating those potentiometer values. **PW**

```
10 CLS
20 FLAG = 0
30 INPUT 'Divider input volts', VIN
40 INPUT 'Divider output volts',
   VOUT
50 PRINT 'E12 SERIES'
60 PRINT 'R2, R1'
70 FOR N = 1 -12
80 READ R2
90 R1=(VIN/VOUT - 1) *R2
100 PRINT R2, R1
110 NEXT
120 IF FLAG>0 THEN END
130 PRINT 'PRESS ANY KEY FOR
    E24 SERIES'
140 DELAY = GET
150 FLAG = 1
160 PRINT 'E24 SERIES'
170 GOTO 60
180 DATA 1.0, 1.2, 1.5, 1.8, 2.2,
    2.7, 3.3, 3.9, 4.6, 5.6, 6.8,
    8.2: REM E12 SERIES
190 DATA 1.1, 1.3, 1.6, 2.0, 2.4,
    3.0, 3.6, 4.3, 5.1, 6.2, 7.5,
    9.1: REM E24 SERIES
```

Listing: This is the simple program to do all the hard work. Make it as fancy as you wish if you find it useful.



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Around The Loop

Richard Q. Marris G2BZQ discusses variants of the loop antenna

Loop antennas are with us in many forms and variations of those forms. They produce a certain amount of confusion!

The fact is that a loop antenna is one, or more, turns of wire (or tubing) which resonates, or is resonated, to a required frequency in the v.l.f., l.f., m.f., v.h.f. and u.h.f. bands. Furthermore, with correct design, the loop, irrespective of type, can be matched into the modern communications receiver and loaded, in many cases with a transmitter. Loop antennas are bi-directional.

Loops also appear in several basic types, and each type incorporates many variations. This therefore adds to the apparent confusion.

Basic Full Wave

The basic full wave, or quad, loop has a circumference equal to one wavelength (or a multiple) at one frequency. Because on h.f. there may be large dimensions involved, this loop is more usually considered ideal for u.h.f., v.h.f. and the higher h.f. bands. Those lucky amateurs with a large area of real estate, can use them on 7 and 3.5MHz or even 1.8MHz.

The basic configuration of a quad loop is shown in **Fig. 1**. Here you will see that if the loop is split, and fed with a transmission line (not just coaxial feed). In this way it can be used for both transmission and reception at the resonant frequency.

Although **Fig. 1** shows the square full-wave loop, it may be built in rectangular, triangular (then called a delta loop), diamond and other shapes. The loop can be mounted vertically, horizontally or even sloping, because of its versatility. The quad loop is well documented in the many antenna books.

Half-Wave Loop

The next smaller version I'll consider is the half-wave loop antenna. This antenna has a circumference equal to a half-wavelength. It can also be mounted horizontally or vertically.

The loop may be fed, as shown in **Fig. 2**, with a coaxial feedline, although a balanced feed would be better. An insulator placed diametrically opposite, holds the loop in tension.

The operation of the half wave loop is similar to a dipole. And there are those who contend that it's not a loop, but a dipole folded back until the ends nearly meet.

Whatever the action of the half wave antenna - it looks like a loop! As with the full-wave loop antenna, half-wave loops may be circular, square, rectangular and diamond in shape, as long as they are symmetrical.

Good results have been achieved with the half wave loop antenna on 144MHz, using tubing for the conductor. An excellent 144MHz design has been described by F. C. Judd G2BCX†.

Small HF Loop

The small h.f. loop antenna is often used for reception on the lower h.f. bands, e.g. 3.5 and 1.8MHz. It may be built in both the screened and unscreened style. With care, and ingenuity, it's possible to load a transmitter into it, giving a compact table-top antenna.

The diagram **Fig. 3** shows the basic small h.f. loop. The circumference of the outer, tuned loop can be between 0.1 and 0.3% of a wavelength. It can be made with one, or more turns and brought to resonance with a variable capacitor.

The physical signal null on this type of loop antenna is quite sharply defined, and this helps in QRM reduction. It also makes a convenient form of a small size indoor receiving antenna.

Look now at the drawing of **Fig. 4**, which shows a screened loop antenna. This type of antenna is often used on the low frequency amateur bands. It's made of a circle of coaxial feedline (or tubing), resonated with a variable capacitor, with the outer braid screening split at the top, as shown.

The outer braiding acts an electrostatic screen. It can be between 0.1 and 0.3% wavelength long in circumference. It is highly directional with excellent nulling to reduce QRM and the shielding reduces/eliminates QRN.

Various coupling methods can be used - the simplest being shown in here. This type of loop is only really suitable for receiver use.

Medium Wave

Physically small loops are often used by medium wave DXers because of their excellent anti-QRM nulling capability. These small loop antennas normally consist of a number of turns of wire, wound on a frame, or box, about a metre square (40in x 40in). This winding is normally resonated to the receive frequency with a variable capacitor.

A single low impedance coupling turn is added to enable attachment to the receiver's input. Many articles have been written about m.w. loops, but one of the best, and clearest, is by Charles Molloy G8BUS.

The G8BUS m.w. loops were described in his article in *PW* back in November 1979. There have been designs without the coupling coil. The coil is replaced by directly coupling the loop to an f.e.t. or transistor pre-amplifier. Some articles have appeared in our sister publication *Short Wave Magazine* over the past few years.

Long Wave

It's possible to use loop antennas on long wave, and these antennas are ideal for those interested in long wave DX reception. Few designs have appeared in print. But one method often suggested is to take a m.w. loop, as above, and insert a 3 or 4mH r.f. choke in series with the winding.

Insertion of a choke does work, but it's not efficient enough for real l.w. DX reception. I've designed and made several l.w. loops. It's a formidable task, involving winding three to four times as much wire, as for a m.w. loop.

Tests I've carried out, have indicated that a spiral loop gives better nulling and sensitivity than a box type loop. My best design achieved has been written up under the title 'The Long Waver'.

I hope this article has given you a thirst to get out and try a loop antenna on your band of interest, whatever it is. So get looping! **PW**

Fig. 1: The basic full wave loop antenna. Note the complete connection.

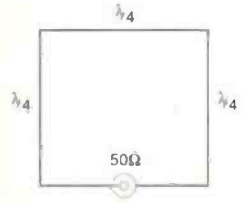


Fig. 2: A smaller half-wave loop antenna. Is this really a folded l/2 dipole?

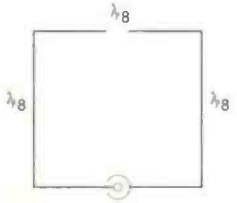
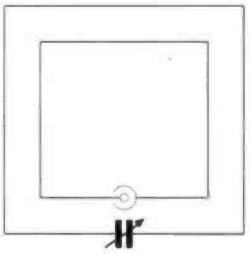


Fig. 3: A physically small loop with an inductively coupled tuning loop.



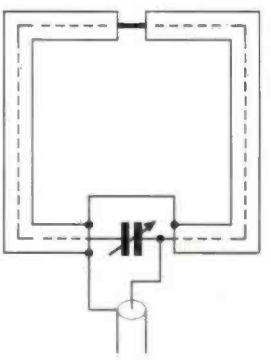


Fig. 4: A shielded small tuned loop antenna.

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Let Fly On Four

The PW Martlet 70MHz FM Transceiver Part 3

In part three of his 70MHz QRP f.m. transceiver project Mike Rowe G8JVE describes the diode matrix programming system used, and provides the main p.c.b. designs and associated component overlays.

As I've already mentioned, I designed the *PW* Martlet with a synthesiser to get away from the normal 'rock bound' crystal controlled approach normally adopted for simple (usually surplus p.m.r.) rigs. And I chose the diode matrix system because it's a cheaper and simpler approach to programming a synthesiser than an EPROM.

To help, I'll describe what goes on in the synthesiser, starting off with the division techniques used. The programmable divider in the MC145152 has internal pull-up resistors built in to all the programming lines, i.e. if no action is taken, all the lines will be at logic 1.

Divide Ratio

So, to start off, I'll explain how I set about working out the divide ratio. The select lines on the 145152 i.c. are arranged to give the following frequency steps:

A0	6.25kHz	N0	250kHz
A1	12.5kHz	N1	500kHz
A2	25kHz	N2	1MHz
A3	50kHz	N3	2MHz
A4	100kHz	N4	4MHz
A5	200kHz	N5	8MHz
		N6	16MHz
		N7	32MHz
		N8	64MHz
		N9	128MHz

And, as one example is worth a thousand words, let's now work out the two synthesiser numerical codes for the transmit and receive frequencies for operation on 70.25MHz. For this you need two codes because there are two frequencies to create - the direct transmit frequency at 70.250MHz, and the local oscillator (10.7MHz above) at 80.95MHz.

In the table I've provided you will see we have N values, i.e. N0 - N9, as well as A values A0 - A5. Coupled to these values are various frequencies associated with each value. So N3 has 2MHz associated with it. The A2 value has 25kHz alongside it and so on.

Technique Used

The technique used is to start at the biggest step end of the table of frequency codes. You then successively subtract an 'N' frequency (then 'A' frequencies) to leave a remainder of 0 (zero) or a positive value at each step.

To begin, you take the actual frequency you are to create (say 70.25MHz) and carry out an easy series of steps. These steps are logically the same each time, but just using different numbers.

Beginning from N9, you compare an N frequency with the desired frequency. And, if the N frequency is greater than the desired frequency, you write down a logical 0 against the N value. You then take the next lower N value's frequency and continue with the desired frequency.

If however, the N frequency is smaller, or the same as the desired frequency then subtract the N frequency from the desired one and write down a logic 1 against the N value. The resulting frequency difference between the desired and the N frequency becomes the new desired frequency.

It may seem pretty complicated but in the following description I'll call the frequency to be compared - F1. So, at the start F1 is the full frequency of 70.25MHz.

Step one is to take the biggest N frequency from the table, that's smaller than F1. So, N9's associated frequency of 128MHz is too big. But N8's frequency, at 64MHz is smaller than F1. This means N9 is a logical 0, N8 is active or a logic 1.

You now subtract N8's frequency (64MHz) from this stage's F1, and the result, 6.25MHz, becomes the new F1 for the next stage. Taking the new value of F1 (6.25MHz) we compare that with the next lower N value's frequency.

The frequency associated with N7 is 32MHz, which is bigger than the new F1, so N7 is not needed and becomes a logic 0. The present value of F1 passes on unchanged to the following stage, using the frequency associated with N6. The frequency for N6 (16MHz), is also bigger than F1 so N6 is also 0, and F1 passes on again unchanged.

So, I'll start with the transmit frequency of 70.25MHz.
The N9 frequency (128MHz) is too great so **N9 is 0**
70.25 - 64MHz = 6.25MHz so **N8=1**
N7, 6 and 5 are all bigger so **N7, N6 and N5 are 0**
6.25 - 4MHz = 2.25MHz so **N4 = 1**
2.25 - 2MHz = 0.25MHz so **N3 =1**
N2 frequency, 1MHz, is too big so **N2=0**
N1 frequency , 500kHz, is too big so **N1=0**
250kHz - 250kHz leaves no remainder so **N0 = 1 and lines A5 to A0 are all 0.**

Synthesised Frequency

To obtain a synthesised frequency of 70.250MHz we need to leave N8, N4, N3 and N1 floating (at logic 1 remember) and put in diodes to pull all other lines down to logic 0. Now let's go onto finding the values for the local oscillator frequency at 80.95MHz.

Again **N9 is 0**
80.95- 64MHz = 16.95MHz so **N8 is = 1**
Again N7 frequency is too big so **N7 = 0**
16.95 - 16MHz = 0.95MHz so **N6 = 1**
N5, 4, 3 and 2 frequencies are to big, so **N5, N4, N3, and N2 are 0**
950 - 500kHz = 450kHz so **N1 = 1**
450 - 250kHz = 200kHz so **N0 = 1**
200 - 200kHz leaves no remainder, so **A5 = 1**
As there was no remainder to process, **A4, A3, A2, A1 and A0 are all 0.**

So, lines N9, N7, N5, N4, N3, N2, A4, A3, A2, and A1 all require diodes to pull them to logic 0. Lines N8, N6, N1, N0 and A5 are all left floating at logic 1.

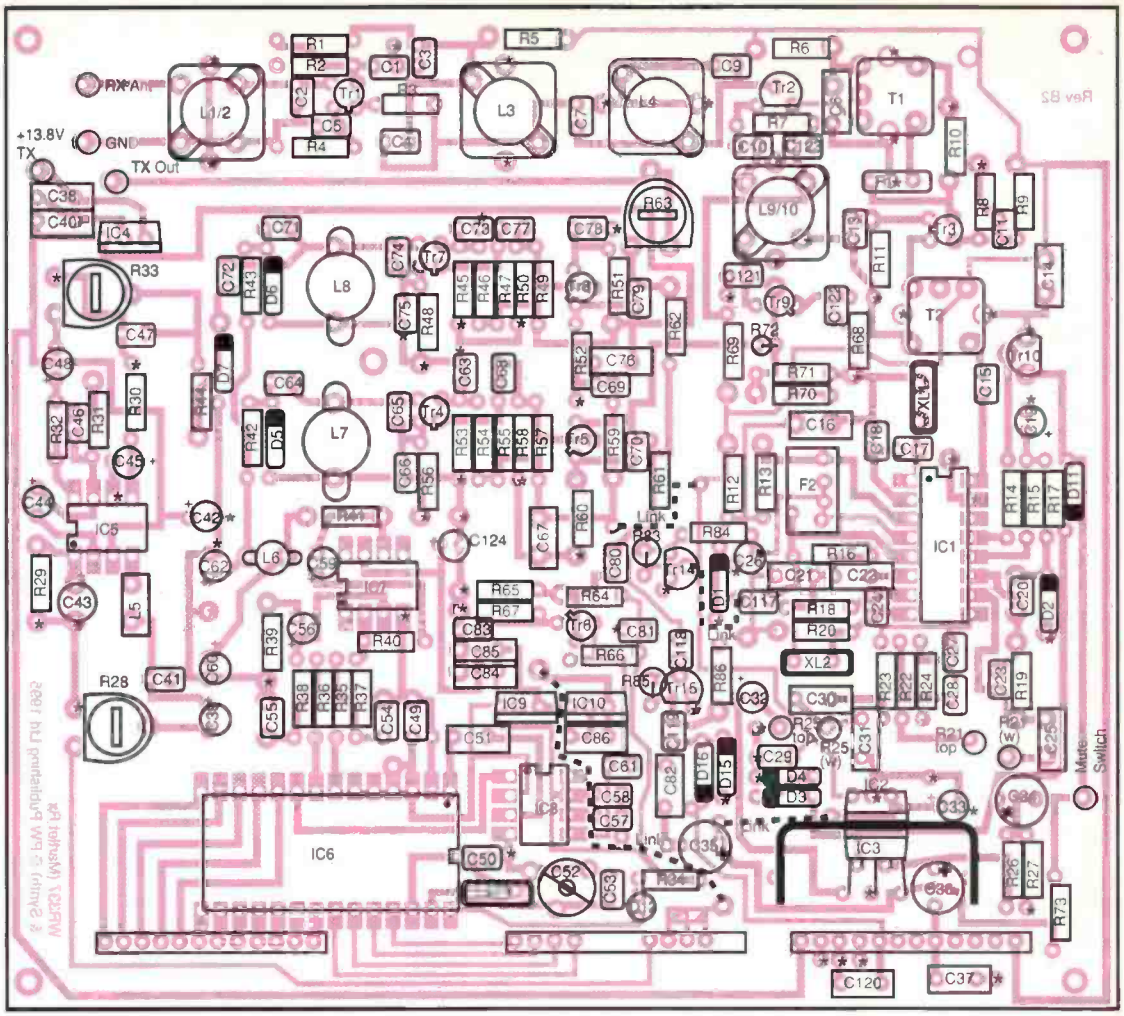
It's not difficult is it? And now that you know the method you can go ahead and calculate the other frequencies needed for the particular channels you require on 70MHz. As an aid, I've reproduced the diode requirements for the popular f.m. channels in the chart.

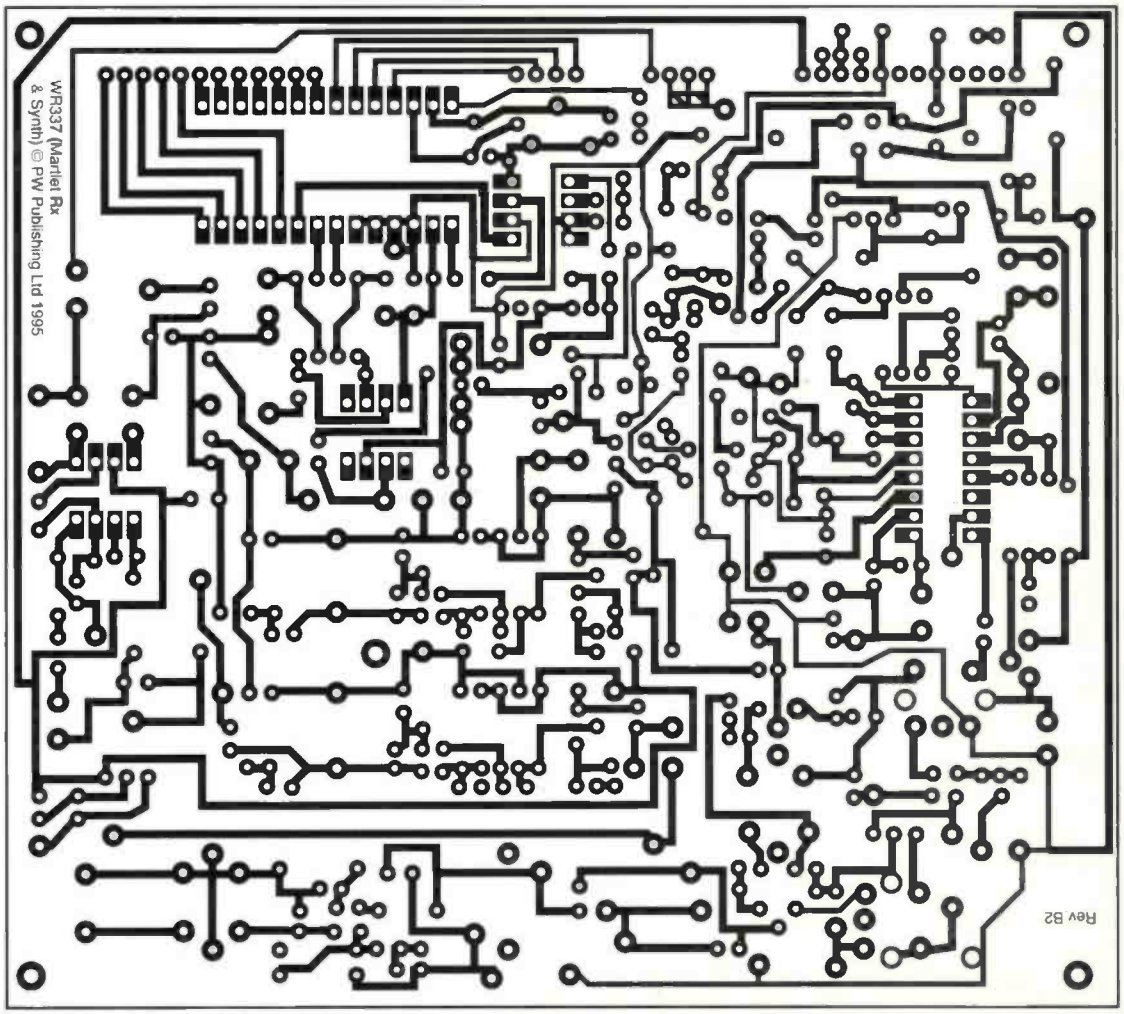
Enjoy Four Metres

I hope you enjoy building the Martlet and using 'four metres'. It's a great band and often neglected.

So, get busy and show everyone that there's more to 70MHz than packet radio! Let fly on four!

Fig. 1: The main p.c.b. and associated component overlay (note that the capacitors C8 and C12 shown in the circuit diagram, are in fact integral to T1 and T2 respectively). The method used for preparing the main and front panel p.c.b.s plug and socket arrangement is described in the 'Errors & Update and Shopping List Extra' panel on page 44.





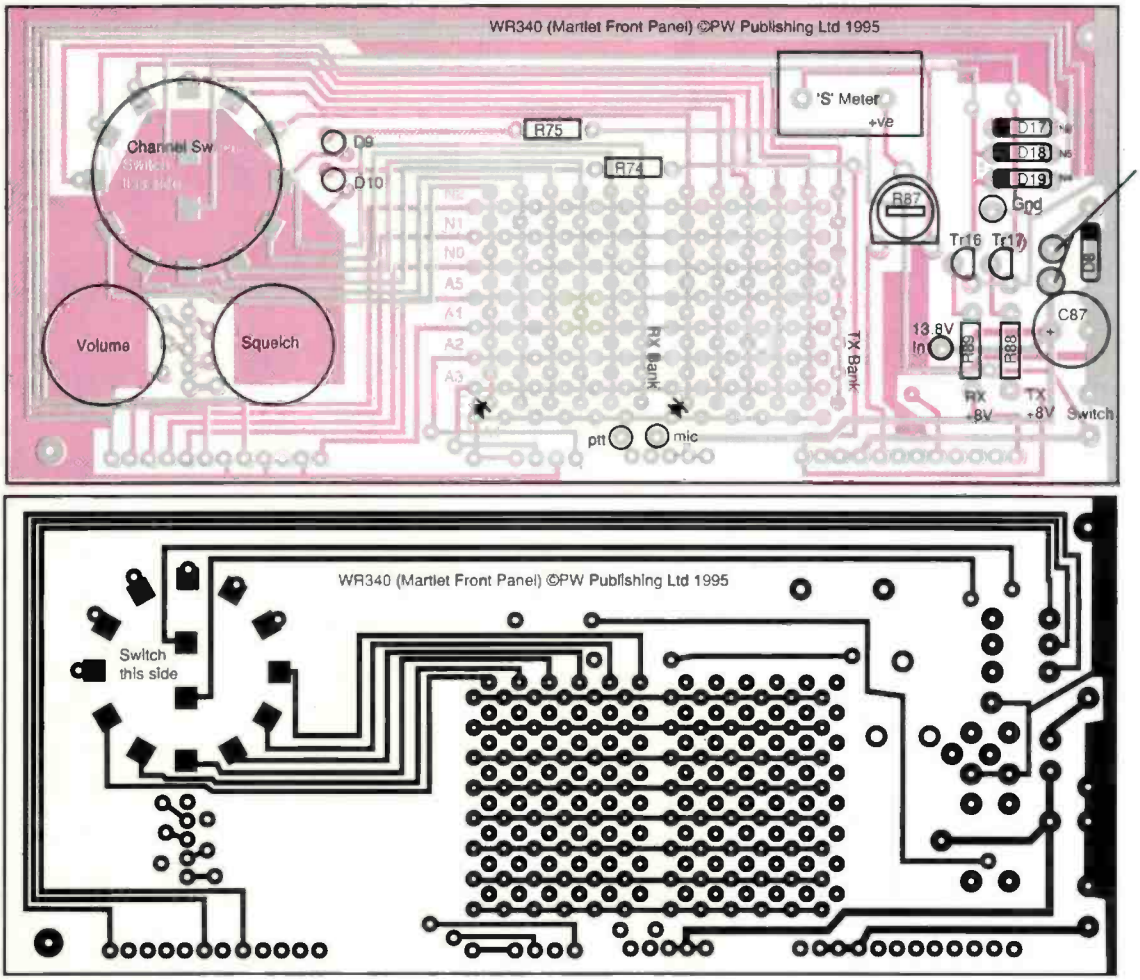


Fig. 2: The PW Martlet front panel p.c.b. and associated component overlay. The special technique needed for installation of the channel selector switch is described in the 'Errors & Updates and Shopping List Extra' panel.

Clive Hardy G4SLU reports on the PW Martlet project: At the time of writing, I've built the main board of the PW Martlet using a pre-production version of the p.c.b. As can be seen in the photographs (page 35 March, page 36 April *PW* issues), there is a lot of inter-board wiring on the original pre-publication design. However, from the experience I gained from building the prototypes, changes have now been made to the Martlet design so that the matrix and main boards now plug directly together. This greatly reduces the amount of wiring, which has to be good news! The 'S' meter has also been added since the original design.

I obtained all the components by mail order, although not from a single source. Construction of the main board was quite straightforward. However, I did make one change. Instead of the twisted wires in the receiver front end I used a 3.3pF capacitor. Initial checks on the board are done before the i.c.s are fitted. Without making any adjustments, the test results were extremely close to the values required. To complete the testing, the board was connected to the original p.a. and matrix boards. With the i.c.s fitted both v.c.o.s locked up straight away. As soon as an antenna was connected packet signals were heard on 70MHz. The adjustment needed to optimise the receiver tuning was almost nil. On transmit, 10W was easily obtained. The transmitted audio was reported to be a little quiet, which could have been the microphone. However, more than enough audio was obtained by changing R32 from 22kΩ to 2.2kΩ. So far, the Martlet has proved a delight to build. **G4SLU**

Errors & Updates And Shopping List Extras

Coils L7, 8 in the original circuit diagram (page 33 March issue) should be **S18 Blue**, not S18 Green as shown.

Pin headers on main p.c.b. These are made up from one 36-way single row p.c.b. plug (Cirkit stock No. 10-70173). Break it up into two 12-way and three 4-way sections. Also needed- p.c.b. sockets. (Cirkit stock 10-70123 (6-way) x 4, and Cirkit stock No. 10-70121 (4-way) x 2.

For the audio and squelch: you will need two cable shells - Cirkit stock No. 10-0495 (5-way) x two. Also needed are crimp terminals Cirkit No. 10-04077 (10 off).

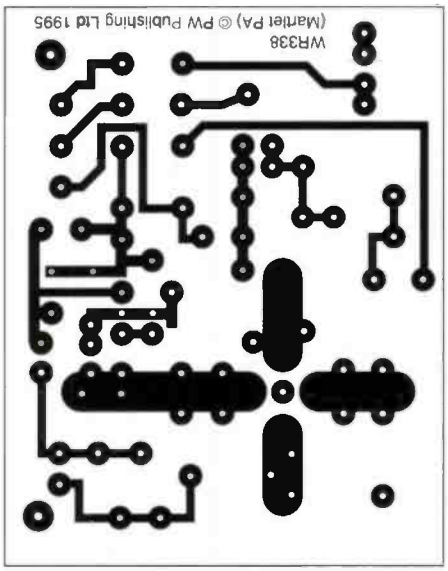
There is a special technique for mounting the channel change switch on the matrix p.c.b. The switch has the two common contacts inside a ring of made of the other contacts.

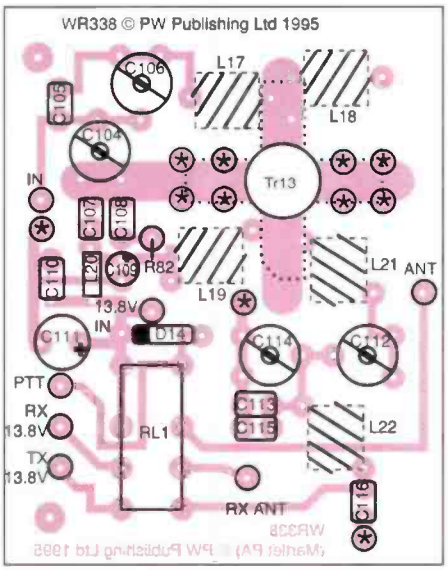
This outer ring makes it difficult to get a soldering iron in to solder the common contacts to the p.c.b. So cut the common contacts short and solder a 50mm length of insulated wire onto each contact.

Then solder the other ends of the leads onto the correct pads on the p.c.b. Gently bend out the ends of the connections on the switch and place the switch, correctly orientated of course, against the p.c.b. and solder each contact in place.

The switch should now be firmly held against the p.c.b. For the inter-p.c.b. connections for the volume and squelch controls a short 5-way lead has to be made up with the two 5-way cable shells and contacts. Use five lengths of insulated wire (but preferably short lengths of miniature audio coaxial cable) about 60-70mm long. Although the terminals are really 'crimp' types you can solder them quite easily instead.

Fig. 4: The p.a. stage p.c.b. and associated component overlay.





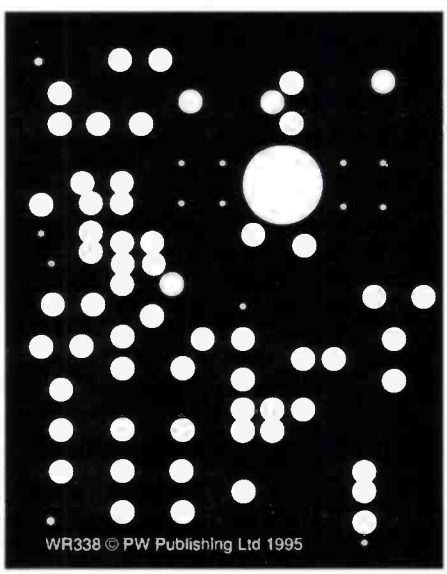
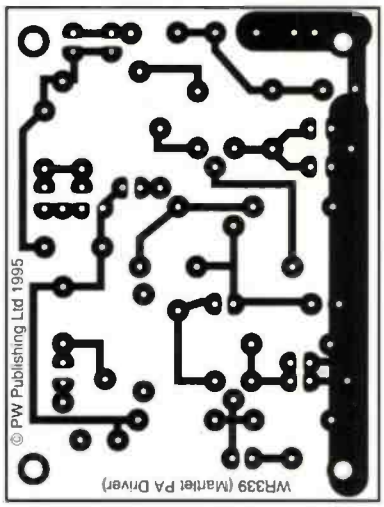
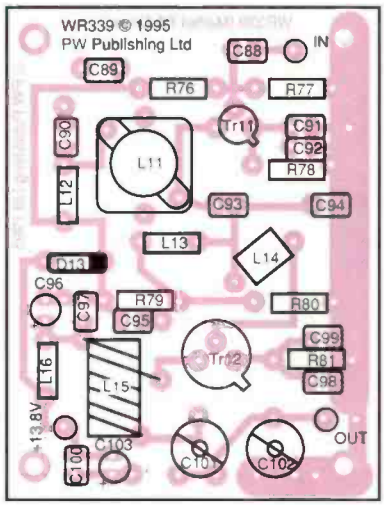
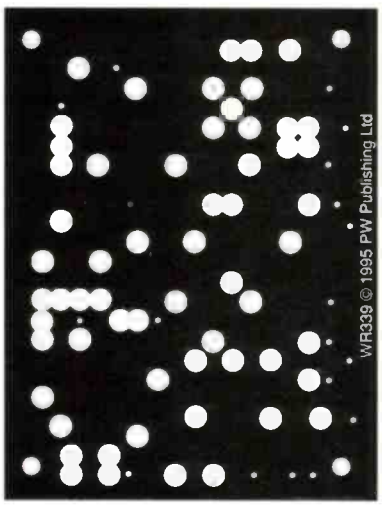


Fig. 3: The p.a. driver stage p.c.b. and associated component overlay.







Diode Matrix Programming Chart

Frequency MHz	Receiver								Transmitter							
	N 2	N 1	N 0	A 5	A 4	A 3	A 2	A 1	N 2	N 1	N 0	A 5	A 4	A 3	A 2	A 1
70.2500	*				*	*	*	*	*	*		*	*	*	*	*
70.2625	*				*	*	*		*	*		*	*	*	*	
70.2750	*				*	*		*	*	*		*	*	*		*
70.2825	*				*	*			*	*		*	*	*		
70.3000		*	*	*	*	*	*	*	*	*		*	*		*	*
70.3125		*	*	*	*	*	*		*	*		*	*		*	
70.3250		*	*	*	*	*		*	*	*		*	*			*
70.3375		*	*	*	*	*			*	*		*	*			
70.3550		*	*	*	*		*	*	*	*		*		*	*	*
70.3625		*	*	*	*		*		*	*		*		*	*	
70.3750		*	*	*	*			*	*	*		*		*		*
70.3875		*	*	*	*				*	*		*		*		
70.4000		*	*	*		*	*	*	*	*		*			*	*
70.4125		*	*	*		*	*		*	*		*			*	
70.4250		*	*	*		*		*	*	*		*				*
70.4375		*	*	*		*			*	*		*				
70.4500		*	*	*			*	*	*	*			*	*	*	*
70.4625		*	*	*			*		*	*			*	*	*	
70.4750		*	*	*				*	*	*		*	*			*
70.4875		*	*	*					*	*			*	*		
70.5000		*	*		*	*	*	*	*	*			*		*	*

* = fit diode, i.e set to logic "0"

Examining An Image Problem

Murray Ward G3KZB opens his RAE notebook again and, looks further into the problems of image interference.

In the first part of this article that appeared in the February 1995 issue of *PW*, I explained what second channel interference is. I showed that it happens in the mixer stage of a superhet receiver. I also showed that the image (or second channel) frequency is always separated from the wanted frequency (the one we are trying to listen to) by twice the i.f.

This time, I'll show how designers reduce (hopefully they prevent) the problem from happening. To avoid second channel interference, we must stop the image frequency getting into the mixer. The diagram, **Fig. 1**, shows how designers try to achieve this.

Some methods used include a band-pass filter (called a preselector on some older receivers) at the antenna input. This filtering may involve a stage of r.f. amplification. They also add good screening so that the image frequency does not 'leak' in via the wiring.

The diagram of **Fig. 1** shows the layout of a 'typical' receiver, with only a single, unspecified, i.f. Many designs use a high i.f. because the wider apart, in frequency, the wanted and image frequencies are, the easier it is to separate them.

A modern communications receiver is likely to be a double superhet. But it could be a triple conversion, but let's not get too complicated.

A double superhet has two i.f.s. and in this case, selectivity (the ability of the circuit to respond to the frequency we want and reject all others) is provided by the second i.f. which is usually low in frequency compared with the first i.f.

In fact, using a high first i.f. has two advantages: it minimises the risk of second channel interference; and the designer can provide continuous coverage over a wide frequency range more easily. Amateur bands only receivers are a dying breed.

PW

Questions

The following multiple choice questions are similar to those that you will find in the RAE.
Answers at Bottom of the page.
But... no cheating!

Q1 When a superhet is tuned to 3.5MHz, its local oscillator is running at 4.0MHz.
The second channel frequency is:

(a) 500kHz
(b) 1.0MHz
(c) 3.0MHz
(d) 4.5MHz

Q2 Image interference in a superhet can be minimised with:

(a) a narrow i.f. bandwidth
(b) a stable local oscillator
(c) a high i.f.
(d) a wide dynamic range

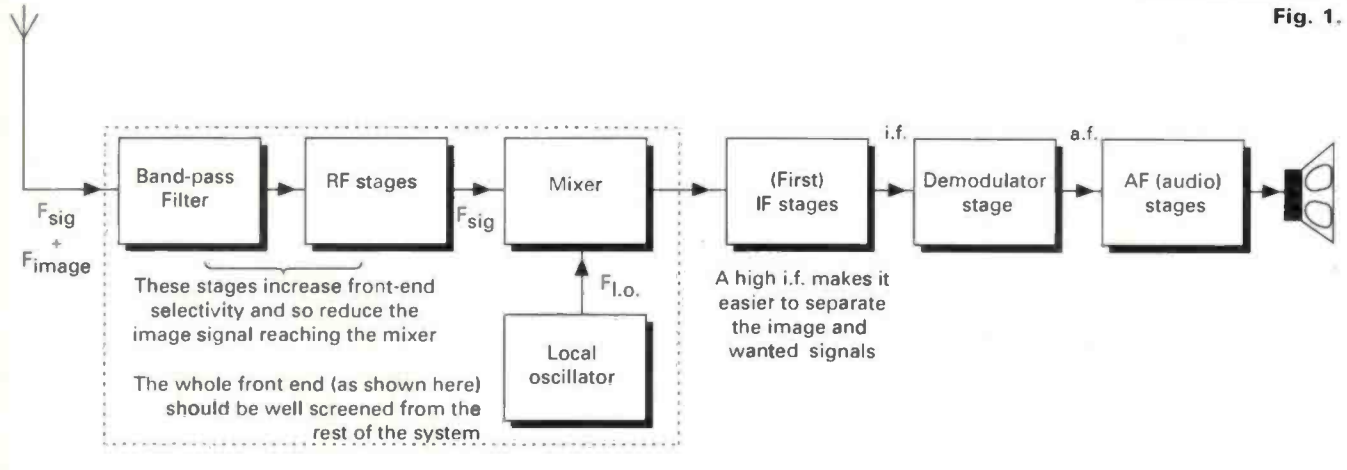
Q3 A superhet has an i.f. of 10.0MHz. When receiving a signal on 29.0MHz, the frequency of the local oscillator is 39.0MHz.
The image or second channel frequency is:

(a) 49.0MHz
(b) 58.0MHz
(c) 68.0MHz
(d) 87.0MHz

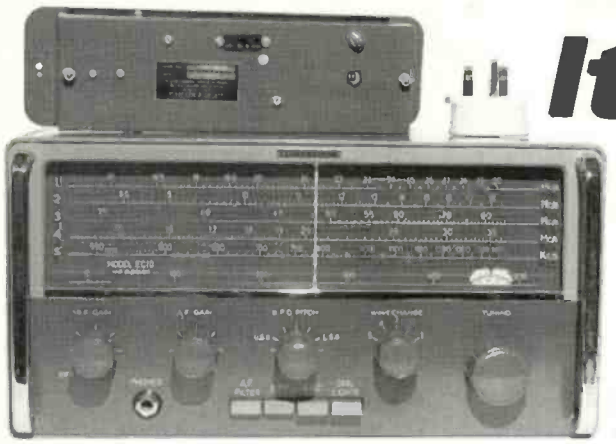
Q4 Second channel (image) interference is caused by:

(a) abnormal propagation conditions
(b) overdriving the transmitter power amplifier
(c) deficiencies in the receiver
(d) strong transmissions on adjacent frequencies

Fig. 1.



Again no cheating please, here are the answers. (c) Q4 (a) Q3 (c) Q2 (d) Q1



It's a Classic... The Eddystone EC10 Receiver

Ben Nock G4BXD looks at another 'classic'. This time it's the Eddystone EC10, a transistorised receiver, a pioneer in its day which is still in use in many shacks, including the PW offices where you'll find no less than five EC10 owners!

The Eddystone EC10 and associated mains power supply unit.

The EC10 communication receiver was produced by the Eddystone company from the early 1960s onwards. It's a 10 transistor, five band receiver covering 550kHz to 30MHz.

Capable of a.m., c.w. and s.s.b. reception, the EC10 can be powered from either internal batteries or an external supply. The batteries are six size D (the old U2) 1.5V cells, held in a carrier at the rear of the set or via the mains adapter that replaces the battery carrier.

Lightweight Receiver

The EC10 is lightweight and quite modern in its styling. With its blue-grey all metal case and chassis along with a cast front panel and chromium plated 'grab handles' mean the set has excellent rigidity and a solid feel to it. That's something often lacking in many modern plastics cased receivers!

Weighing in some 6.3kg (14lb) with batteries, with dimensions a fraction over 152 x 304 x 203mm (6 x 12 x 8in). The scale provides 228mm (9in) of tuning span which, combined with the slow motion drive arrangement, gives a very easy tuning rate on all but the highest range.

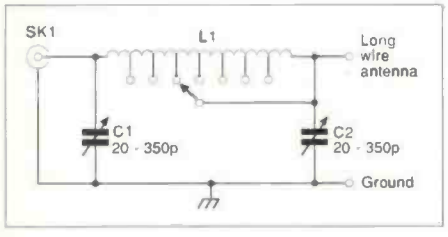
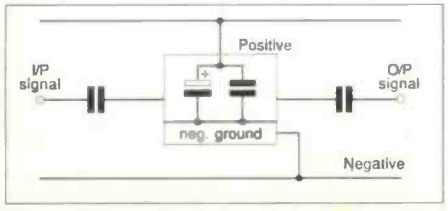


Fig. 1: Circuit of simple antenna tuning unit (a.t.u.) suitable for EC10 (see text).

Fig. 2: Method used to allow negative earthed equipment to be used with EC10 receiver (see text).



The tuning coverage on the EC10 is broken into the following ranges: **Band 1** covers 18 to 30MHz. **Band 2** covers 8.5 to 18MHz. **Band 3** covers 3.5 to 8.5MHz. **Band 4** covers 1.5 to 3.5MHz. **Band 5** covers 550kHz to 1.5MHz.

Circuit Design

The circuit used in the EC10 receiver is a single conversion design. Working with an intermediate frequency (i.f.) of 465kHz, it employs six OC171, an OC71, three OC83 transistors and three diodes.

The r.f. amplifier, an OC171, operates in grounded base configuration. The design allows automatic gain control (a.g.c.) to be applied to the r.f. amplifier and the first i.f. amplifier. The r.f. gain is adjusted from the front panel mounted control, which also varies the a.g.c. characteristics.

The EC10's local oscillator, an OC171, operates on the high side of the signal frequency on all bands. The l.o. signal is fed to the emitter of the mixer transistor, an OC171, with the r.f. signal being applied to the base of that device.

Two stages of i.f. amplification are employed in the EC10. The i.f. stage uses OC171 transistors with the a.g.c. and r.f. gain control affecting only the first stage. A diode (OA70) is used in the primary of the first i.f. transformer to help the receiver under strong signal conditions.

The output of the beat frequency oscillator (b.f.o.) when it's in use, is fed to the output transformer of the first i.f. stage. Because of this, the b.f.o. signal is amplified by the second stage along with the signal being received.

A diode detector, an OA90, is used with the recovered audio passing to the audio frequency (a.f.) gain control. The a.f. signal is then fed to the audio stages.

In the audio stage an OC71 preamplifier is used to feed a driver transistor. This drives two OC83s in a push-pull configuration.

An audio filter is capable of being switched in circuit on the receiver. This has a peak at around 1kHz and is useful for c.w. reception in noisy band conditions.

The EC10's audio output is quoted as exceeding 1W and a small loudspeaker is enclosed in the case and there's a jack socket for low impedance headphones. Using headphones automatically mutes the loudspeaker when the jack plug is inserted.

A further diode, an OAZ203, provides a regulated supply from the main supply line. This feeds the r.f., mixer, oscillator and b.f.o. circuits with 6.5V. The remaining circuits in the EC10 are supplied with the 9V from the battery pack or mains unit.

As it's an older receiver, the EC10 has a 'positive' earth. But, when it's powered by either the internal batteries or the mains unit, the positive earth won't cause problems if the set is used with other equipment as the supply is self-contained.

However, if you intend to use the EC10 mobile, it's a different matter. The receiver will then need to be powered from a separate supply and not from the car battery (as modern vehicles are of course negative ground).

Antenna And Earth

Antenna and earth sockets are provided on the EC10's rear panel. They're marked **A1, A2, AE,** and **Earth**, for either balanced or unbalanced antennas.

Short or long wires can be connected to the EC10, along with a balanced fed antenna. If you intend using a single long wire end fed antenna, then this should be connected to **A1** with a shorting link between **AE** and **Earth**.

A coaxial cable feed from a suitable antenna also uses the combination of sockets I've just described. In this case the braid goes to **Earth**, with the inner core going to **A1**.

However, if you decide to use a balanced feeder, then it should be connected to **A1** and **AE**. And in this case the shorting link must be removed.

The popular type of short rod antenna can be used with the EC10. You should connect them to the **A2** terminal and again the **AE** socket is shorted to the **Earth** socket. Incidentally, some useful reduction in the local noise received may be gained if you can provide a good earth connection for the EC10.

Finally, as with all random length long wire antennas, some form of antenna tuning unit (a.t.u.) is advisable. I've suggested a suitable simple circuit in **Fig. 1**.

Servicing The Receiver

The EC10's circuitry is a very straightforward design. So there should be very little problem in servicing the receiver should it be required.

The front end, r.f., oscillator and mixer together with the coils are contained on one board. The remainder of the EC10's circuitry is on a second p.c.b.

I've provided some typical voltage readings, which are given in **Table 1**. They should be taken with a meter of at least 20kΩ/volt sensitivity, measured negative with respect to the set case and ground. Controls are set to: Range 1, 20MHz, r.f. and a.f. controls at maximum, the a.g.c. off and b.f.o. on.

Receiver Alignment

If your receiver requires alignment, **Table 2** will help. It provides the location references for the core/trimmer associated with each alignment frequency.

Alignment is carried out by selecting the correct high frequency tuning point and then injecting a modulated signal from an accurate signal generator. You then adjust the appropriate **trimmer**, select the associated low frequency point, then adjust the appropriate **inductor**.

The procedure is repeated, reducing the output of the signal generator to prevent overloading. You should continue until the EC10 is correctly aligned and no further improvement can be gained.

A good enough 'tool' for measuring the receiver is the old human ear! But, if higher accuracy is required then some form of voltage measurement of the audio output can be used. (One method uses a resistor across the speaker terminals and a voltmeter connected across it, with a modulated signal being supplied from the generator).

After alignment, set the generator to 465kHz, with the receiver to 560kHz and increase generator output until a signal is heard. Then Adjust L1 for minimum output, re-checking L6 at 560kHz afterwards.

Possible Modifications

Although there are several possible modifications for the EC10, I haven't tried any on my set. However, one modification that might be considered is the addition of a product detector to improve s.s.b. reception.

There are a few product detector kits around. But you must remember though that any new devices fitted are going to be of the wrong polarity.

Don't forget that a negative ground unit cannot be connected directly to a positive grounded set. In other words you could not connect the 'grounded' section of the new p.c.b. to the chassis of the EC10.

The EC10's earthing problem can be overcome though if the unit is isolated from the set ground. With the method I suggest, **Fig. 1**, the supply adequately decoupled with capacitors between both negative and positive of the unit and set. It permits the a.c. signals involved to pass through, while preventing short circuiting of the d.s. supply.

If you do modify your EC10, the feed from the b.f.o. to the first i.f. transformer would need removing and taking to the new product detector. The received signal could then be taken either from the transformer side of the detector diode or the collector of the second i.f. amplifier via a blocking capacitor.

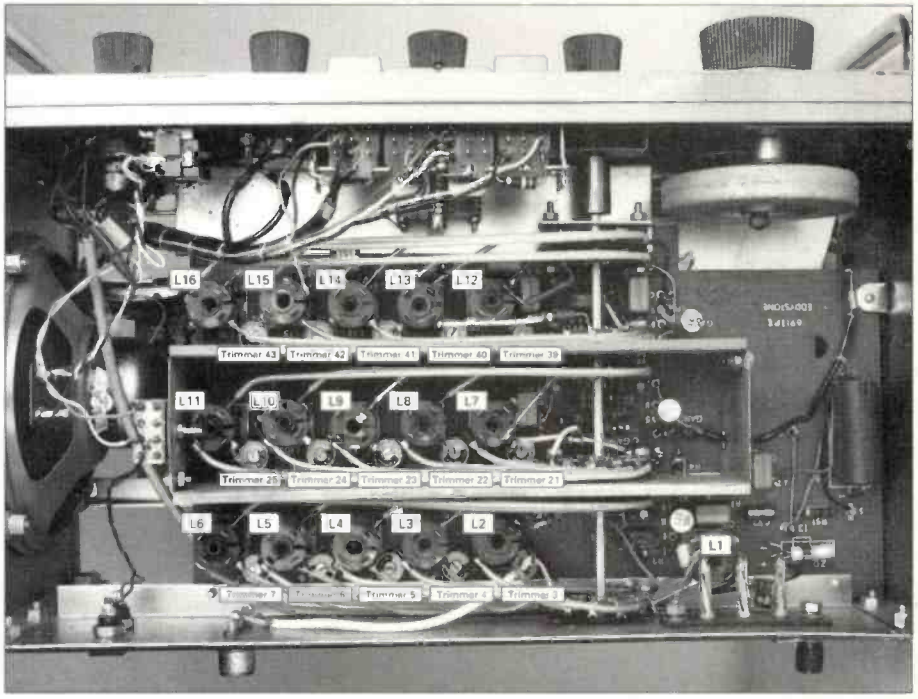


Fig. 3: Annotated photograph showing location of inductors and trimmers for alignment purposes (see text and Table 1).

The a.f. gain potentiometer could be switched between the output of the diode detector or the product detector. But a 5kΩ resistor would need switching in place of the a.f. gain potentiometer when you're receiving s.s.b., to maintain the a.g.c. load.

Fortunately, the EC10's original b.f.o. push-to-make switch has spare contacts. These could be used to re-route the audio from either the diode detector or the new product detector.

Useful Receiver

All things considered I think that the EC10 is a useful receiver. However, it does have slight drawbacks for the shortwave listener.

For example, the receiver has a cramped bandscale on the highest range. Additionally, there's no antenna 'peaking' control and fixed selectivity.

Despite my reservations, considering its size and weight the EC10 proves a very useful receiver for those with either a limited budget or limited space in which to pursue the hobby. Many enthusiasts would be well advised to seek out one of these sets at the next rally and have a good old play with it, I'm sure it will be most rewarding. **PW**

Table 1: Voltage measurements

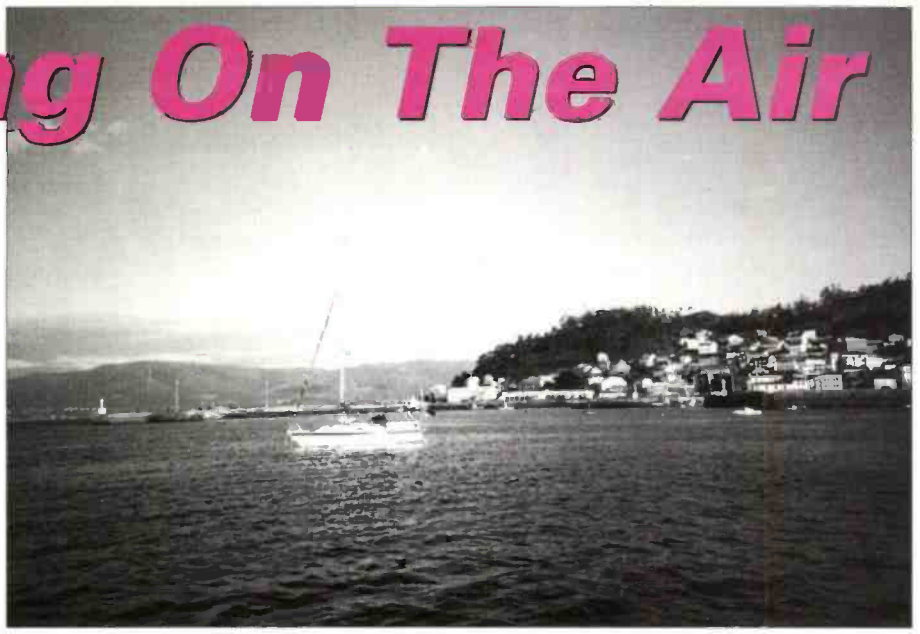
	Device	Collector	Base	Emitter
r.f. amp.	Tr1	6.35	1.0	0.68
mixer	Tr2	6.5	1.2	1.1
local osc.	Tr3	6.3	1.35	1.2
1st i.f.	Tr4	5.6	1.15	0.87
2nd. i.f.	Tr5	7.5	0.7	0.4
b.f.o.	Tr6	6.3	0.75	0.6
a.f. amp.	Tr7	4.0	0.97	0.9
driver	Tr8	8.9	1.5	1.5
a.f. output	Tr9	9.1	0.15	0.07
a.f. output	Tr10	9.1	0.15	0.07

Table 2: Alignment

Range	Freq.	Trimmer			Freq.	Core	
Mixer		Osc.	Antenna	Mixer		Osc.	Antenna
1	29.0	C39	C3	C21	18.0	L12	L2 L7
2	18.0	C40	C4	C22	8.5	L13	L3 L8
3	7.5	C41	C5	C23	3.5	L14	L4 L9
4	3.5	C42	C6	C24	1.5	L15	L5 L10
5	1400	C43	C7	C25	560	L16	L6 L11

Cruising On The Air

John Hines G0PNX shares his sailor's story of how he put his newly acquired radio skills to the test on a cruise around Spain and Portugal.



Yacht *Pushpa* at anchor in Munros, north-west Spain.

As my callsign G0PNX shows, I am fairly new to amateur radio. However, I have discovered that although there are plenty of licensees who are also yachtsmen, the combination is still comparitively rare. So, I'm going to share with you some of the joys and problems of operating Maritime Mobile (MM), or Mickey Mouse as some people say.

It was sailing that got me involved with radio in the first place. In 1990, my wife Margaret and I were at anchor in our yacht, *Pushpa*, in Finisterre in Spain. We got talking to the people in the only other boat in the anchorage.

There was a licensee aboard the other boat and he passed a weather forecast to us, including a gale warning. This was a help because we had been unable to receive Radio 4 in Northern Spain for some weeks.

The anchorage was less than ideal for letting a gale pass through, so both yachts moved up to Corcubion. The gale duly arrived, and I learned enough about the value of amateur radio to yachtsmen from the amateur **Trevor Liberson G0MKO** to convince me that I should learn more.

Within a month, I was wishing that I had already learnt about radio. I thought this way because I fell between two pontoons in Corunna, broke a leg and had to fly home while Margaret brought *Pushpa* home.

The complications of arranging things with friends in Britain would have been reduced if we could have talked from the boat rather than from coin box 'phones, especially as many of the calls were to **Ian Brotherton G2BDV**, a sailing friend.

Joined Class

That winter I joined an RAE class, wrote a computer program to teach myself Morse and received help and encouragement from several licensees that I already knew. By the end of July 1991, I had an Icom IC-720A, a manual a.t.u., a third battery in the boat and my own licence.

I had a month to practice at home, shoved a bag of plugs and wire into a bilge locker before it was off to Lymington to cross to the Bay of Biscay. We intended to spend the winter somewhere in the sun!

My yacht *Pushpa* is only 32ft long. Fitting an antenna into such a limited space is not easy.

Sure, we have a mast 43ft high and lots of sea water all round to provide a good earth. But the mast is used to support sails and I was inclined to give these priority, after all, I have been sailing for over 40 years and had not had my licence for 40 days!

I made two dipoles for the 14MHz band, one ordinary and one using the CFR design called a 'Cobra' from the Orr-Cowan book on wire antennas. I hoped that the second would evade the impossibility of providing a route to take the feeder away at right angles to the antenna itself.

I'd fitted a second burgee halyard but had been warned to keep the antenna away from the mast and rigging, (not easy while sailing). A G-whip mobile antenna had been part of the deal with IC-720A so I'd bought a bracket for it and fitted that to the self steering gear which is out of the way at the stern, intending to keep the dipole for when at anchor.

I had already been told about the UK Maritime Mobile Net. I'd been listening to it during the preparation stages, had identified one of the Net controllers and written to him to feed basic information on the boat and crew to him so that my arrival on the net would not come as a surprise. And, as you will see, I still had a lot to learn.

Corunna Contact

A week later, we were in Corunna. I soon hauled up an antenna and made contact with the morning controller of the UK MM Net **Bill Hall G4FRN**.

I must acknowledge the amount I learned by listening to him and to **Bruce G4YZH**, the evening controller. Both were so efficient, organised and calm that I shall always think of them as admirable examples to try to follow.

I'd arranged a morning schedule with the Lymington members. Frequent contacts were made on 14MHz as we moved along the Spanish coast. When looking for a collective term to call them, it became natural to refer to them as 'The Friends of *Pushpa*'.

One Lymington member spends several months a year near Bordeaux. While there, he has regular contacts with Lymington on 7MHz and I found myself included. These contacts were made using the Cobra (although it had not been cut for this band), usually while not under way, because it tended to get very close either to the sails or the wire rigging.

I was keen to get the G-whip working because it was easy to have in place while moving. I also regarded it as my emergency system. Then, in our first Portuguese port, Viana do Castelo, I met **Geoff G0OHE**.

Geoff dismissed all my attempts to have a tuned antenna strung around the rigging, "just use your a.t.u. to match the rigging" was his advice. So, I connected a bit of coaxial cable to the backstay with a hose clip, ran a connection from the outer to the lifelines and tried the idea.

Bingo! I could get an s.w.r. below 1.2 across the 14 and 21MHz bands and below 1.5 on 7MHz. This lash-up became the routine system and the tuned wires went into the bilge. Contacts with the Lymington group and the MM Net continued as we worked our way South.

I had taken several radio books, which became regular reading, even on some of the longer and uneventful passages. We had a portable multi-standard TV on board and had kidded ourselves that it was for weather forecasts, but found that the MM Net, plus Navtex, met those needs so effectively that the TV was used more to watch entertainment programmes.

The antenna studies produced an unexpected benefit because we were sometimes in places where TV coverage was pretty poor, such as a deep dock alongside a steel fishing boat. In any case, the cabin table is barely above sea level, so putting the set there meant that the TV antenna was having a struggle to find a signal.

I bought a length of fencing wire, salvaged a bit of wood from a skip and made a Yagi for

the TV. This could be propped on the boom and sometimes made a worthwhile difference.

The TV antenna experiments really paid off when we reached Gibraltar. The owner of a nearby yacht found that he couldn't get a picture although he had just paid a boatyard £200 to install an omni-directional antenna at the masthead. I fetched my fencing wire, folded it into a quad and attached it to his feed line with insulating tape, not even soldering it.

The picture was perfect and he got his money back! It was also in Gibraltar that we met George, a Slovenian radio amateur who was just beginning a world cruise in a tiny boat.

George was having problems on transmission but I found that I knew enough to diagnose them and provide a solution. Maybe even the RAE is a bit tougher than the former Yugoslavian equivalent examination?

Winter Quarters

By late November we had settled in Puerto de la Duquesa, 20 miles north east of Gibraltar, which was to provide our winter quarters. A routine developed, whereby we would listen to the evening MM Net while having supper, not often joining in.

We usually just learned how things were done, by listening. But we also got a lot of entertainment for hearing what people used the Net for.

The Net provided a record of where boats at sea were so that the controllers were ready to cope with any emergencies. The variety of other topics was interesting and we heard people asking about resources of various ports around the Mediterranean, including FAX numbers, the availability of shot blasting and also making arrangements to return the ship's papers where they had been left behind.

We heard reports of a yacht which had been stolen, and of the yacht and thief being found. One of the most dramatic items was when we heard a man whose mast had fallen down when he was two days out from the Canaries, injuring his wife.

Within 20 minutes there was a doctor on the frequency, giving advice. A few days later, the casualty was in the Cap Verdes, where people were ready to repair both wife and boat.

A couple of weeks later, we heard him restart his trans-Atlantic passage. We could almost hear the sigh of relief from several hundred members of the Net when he eventually arrived in the West Indies.

I then decided to re-build the connections to the backstay, to tidy up the lash-up that had been built in Viana. The test on the re-build was interesting.

I broke into a contact, just requesting a check-on signal, to ensure that the system was working. "Good signal" said one man in Edinburgh, "but let's see what the man I'm talking to says". "No problem here in Tasmania", said the other.

There were several other live-abroads in the Port who were also licensees. There was an American lady who had crossed the Atlantic with only her dog for crew had a regular c.w. schedule with her father in Indiana.

We also had **Bob G4VUF** who was a great help and who introduced us to Bruce G4YZH, the evening Net controller, who had become such a part of our lives. Bruce's wife, **Sue G0OEP** also provided advice on places which we ought to visit.

Resumed Travels

When the spring came and we resumed our travels, we sailed right along the Spanish Mediterranean coast. We avoided long passages, in fact, doing no overnight passages because one of the objects was to see the country.

One evening, I was just setting up the set for the evening Net, without paying much attention to what was being said, but Margaret heard a magic phrase from Bruce. I checked in and was told that daughter Jan had passed some exams.

If there had been any doubt before, Margaret was now convinced about the merits of amateur radio. So, that night I began a preparatory course in radio theory with a class of one.

In France, we lowered the mast, re-installed the G-whip and entered the canal system. I had to remember that I was now **F-G0PNX**, not G0PNX/MM, which had become so much of a reflex that it was difficult to shake off the suffix even when we got home.

It was a new kind of sailing, but we found the benefits of radio continued. An antenna I saw on a French lock-keeper's house led to a query to the lock-keeper who rushed off to get a QSL card to give to me.

A earlier discussion in Duquesa with **Bob G4IHH** who keeps a boat on the Canal du Midi sent us looking for a restaurant where we had all we could eat and as much wine as we could drink, for 38 Francs each, about £4. Although near the canal, we wouldn't have found it without his advice.

We had been wondering about where to have the mast raised. The first possible place after the last low bridge was in Bordeaux, but the reference books were discouraging, more as a result of what they left unsaid than of what they said.

It would be possible in Royan, but that was about 100 miles beyond, with a fair amount of potentially rough water in between. The idea of going there with the mast on deck and unable to set sail felt risky.

In between was Pauillac, the right side of the more open water, where mast installation might be possible, but our books were vague. One of the 'Friends of *Pushpa*' was in his holiday home nearby. He had the opportunity to visit the yard, obtained the information and fed it back to us on one of our morning schedules, yet another practical benefit of radio.

However, the mast actually went up again in Bordeaux, after we had surveyed the arrangements for ourselves. We felt more like being abroad a sea-going vessel, and could revert to the back-stay antenna system.

Once Home

It was interesting that, once home, we found a long forgotten lightning protection strap, which had been making a capacitative connection from the mast base to the sea via a keel bolt. The antenna had not been working in the way I had thought, but as I said I am a 'new boy'.

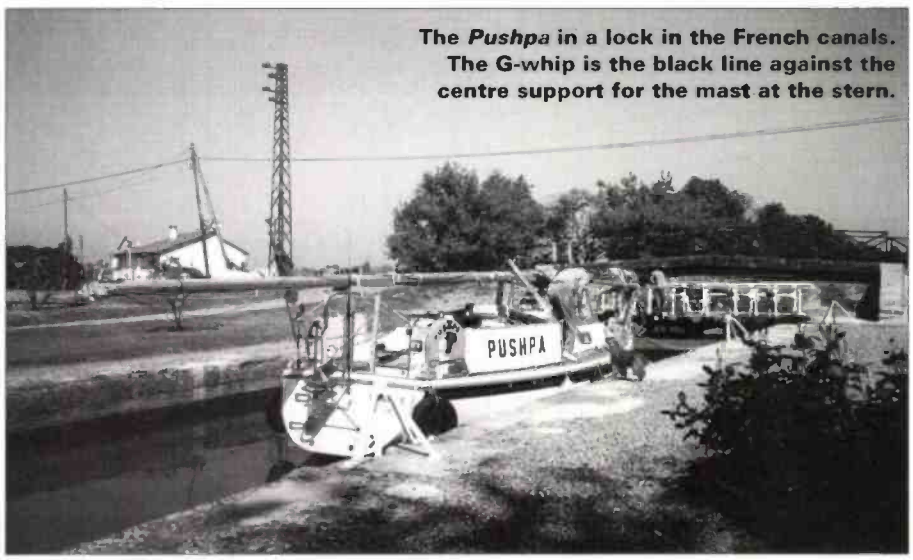
However, the length of back-stay plus mast plus earthing strap is over 100ft, around one and a half wavelengths at 14.3MHz. In any case, it had worked, the basic requirement for any antenna.

Bearing in the mind the value of amateur radio to yachtsmen, especially for emergency communications, some things we heard were a bit surprising. We noted how one (?) person would start to tune on the MM frequency, for minutes at a time, shortly after the morning Net had begun.

It was done so often that it looked like a deliberate attempt to disrupt the Net. We noted how a couple of German stations would start a contact 10 minutes before the evening Net, slap on 14.303MHz, apparently just for the sake of pushing the Net somewhere else.

And since we got home? Well, Margaret is now **G0TXN.** So she will be able to talk home and we will be better equipped with operators next time we leave the house to the 'children'.

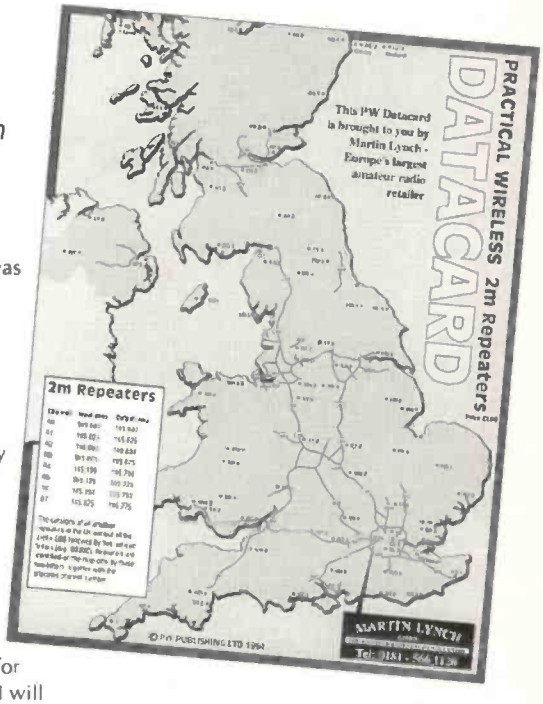
PW



The *Pushpa* in a lock in the French canals. The G-whip is the black line against the centre support for the mast at the stern.

The Practical Wireless Datacard Guide

Kevin Nice G7TZC reflects on what you can and can't do with the PW repeater Datacards for 144 and 430MHz and the painstaking process of producing them.



You can please some of the people most of the time, or most of the people some of the time, but you can't please all of the people all of the time. So the saying goes. Well, when I was assigned the task researching and compiling the latest *Repeater Datacards* for *Practical Wireless* I wanted to maintain the high standard of previous versions.

In preparing the Datacard I was keen to cheat the saying and 'please all of the people, all of the time' - or at least those who use repeaters and roam the country. It is, after all, these amateurs that the Datacards are primarily aimed at.

Some of the telephone calls that have been received at the Editorial Offices of *PW*, leads everyone on the Editorial Team to think that the purpose of the *Datacard* has been missed by a few, hence these words of explanation on the spirit of intent of these invaluable guides. And as an aside, it has led me to the conclusion that a more detailed book is required, watch this space for more news on that front.

Problem Solved

Many years ago there was a difficult problem to be solved at *Practical Wireless*, many heads were scratched, hands wrung, and brains racked.

Then out of the mists of confusion there was a clear light of reason. The answer to the interminable problem was nigh, and the PW Repeater Datacards were born.

There have been imitations and alternatives since the inception of our solution. but there have been none to match either the simplicity or functionality of the Datacard.

The way in which the Datacard functions is unique. We've copyrighted it so that it stays that way. Much care, thought and effort has gone into the production of the latest versions.

All you Repeater Keepers reading this will know what follows already. But, for the benefit of all the other repeater users, I will explain how the data was gathered to produce a most invaluable v.h.f. mobile accessory.

I was keen to ensure a highly efficient method of gathering the most up-to-date location and frequency information for the UK v.h.f./u.h.f. network. To this end at *PW* we reasoned that the only safe source for this data was the Repeater Keeper, after all, they are the station licensee and legally responsible for maintaining the station.

The most efficient way I could devise for gathering the frequency and location information from the 'Keeper, was to supply a map with the information that was already held on file to the keeper. The map was then returned with confirmation that the essential information was correct or annotated with updated details.

Once gathered, and by the way there was a very high return rate - thank you, this information was transcribed on to both master art work for the appropriate card and a listing for the use on the rear of the card.

Mobile Guide

It's worth noting several important things at this point. The Datacard is intended as a guide only, for use while operating mobile, the locations of repeater sites are **not** to scale.

While it's quite possible to produce a guide to scale, it would have no more functionality than the Datacard, which has been produced at its current size to enable easy use and storage in the mobile environment. After a recent bout of long distant travelling around our fair isles, I know I wouldn't be without mine.

I wish to take this opportunity of wishing all the users of the card maximum enjoyment from the use of your card. If you have any suggestions related to future cards then please write to me at the Editorial Offices. I also want to thank all the Repeater Keepers that were surveyed for their essential co-operation.

On a final note, judging by the favourable feed back, the Datacard has had a high level of success and we've pleased most of the people most of the time! **PW**

If you missed the issues of PW containing the Datacards back issues of the December '94 and March '95 issues are available for £2 each from our Post Sales Department. The 2m (144MHz) Repeater Datacard appeared in the December 1994 issue and the 70cm (430MHz) card in the March issue.

If you'd like to find out more repeater operation you may be interested to read the previously published articles 'Repeaters - What They Are And How To Use Them' and 'Repeaters - The UHF Side'. These articles appeared in the November 1994 and February 1995 issues of *PW* respectively, back copies are available for £2 each from our Post Sales Department.

To order your copies contact ***Ann or Michael at PW Publishing Ltd, Post Sales Department, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: (01202) 659930 FAX: (01202) 659950.***

Ron Ham invites you into the warm confines of the PW vintage wireless shop...this month he's looking at two interesting post Second World War receivers from Bush, and also comments on readers' letters.

Valve & Vintage

Welcome to the world of 'valve & vintage' equipment. And this month I'm looking back at the time long before the advent of frequency modulation (f.m.) broadcasting on v.h.f.

Before Band II (nowadays 88 to 108MHz) transmissions there was a great demand for good quality long and medium wave receivers. Particularly so after the Second World War when customers began to replace their Wartime Civilian Receivers.

To meet the demand, Bush began production of their popular DAC range of mains portable receivers. The early versions, like the DAC90, **Fig. 1**, used the Mullard Red 'E' valves and the later sets, like the DAC10, **Fig. 2**, used the smaller glass valves, which I've shown in **Fig. 4**.

The Bush sets were attractive in appearance and were well made. The large loudspeaker, inside the robust Bakelite cabinet, ensured good sound reproduction.

Domestic Use

The DAC90 range were suitable for domestic use at the bedside, kitchen and small sitting rooms. Although similar in construction and suitable for the general domestic work, the DAC10, with its push button and manual tuning, was ideal for blind people.

Blind people found the DAC10 was useful because a station could be selected by pressing a button. In fact, this Bush receiver was one of the sets chosen by the Wireless For The Blind organisation.

Frame Antenna

Both the Bush sets had a circular frame antenna fitted near the front end valve on one side of the chassis. This can be seen on the left of the DAC90 and DAC10 chassis in **Figs. 3** and **4** respectively.

The receivers illustrated can operate on a.c. and d.c. mains supplies and consequently have a **live chassis**. So, be very careful when you carry out any work. Incidentally, a warning notice to this effect can be seen on the button tuning plate of the DAC10 in the centre of **Fig. 5**. ***Editorial note:*** *As a.c./d.c. receivers are still very common, readers interested in working and restoring them are advised to invest in a mains isolating transformer. They are not particularly cheap, but provide an extra safeguard for all amateur radio workshop servicing.*

Fig. 3: Rear view of the DAC90.

Fig. 1: The Bush DAC90 (see text).

Fig. 2: The Bush DAC10 used miniature glass-based valves (see text).

Valve heaters on the Bush receivers are wired in series. The difference between their total voltage and the mains voltage is made up with a large wattage ballast resistor. This is mounted on the right of **Fig. 3** and between the output valve and rectifier on the centre right of **Fig. 4**.

The valve line up in the DAC90, **Figs. 1** and **3**, comprises one each of CCH35, EF39, EBC33, CL33 and the rectifier CY31. The DAC10 has a UCH42, UF41, UBC41 and UL41, plus the rectifier which I think is a UY41.

Great care must be taken when removing the small glass valves from their sockets. This is because they have a glass locating 'pip' on the side, just above the pins, which can snap off if forced.

Each valve-holder has a clip, see **Fig. 4**, around it to hold the valve in position. It's best to ease the pressure on this clip with a screwdriver before the valve is removed. **But don't forget to disconnect the mains supply first.**

The heater current for the Mullard 'Red Es' valves is 20mA whereas the miniature types used in the DAC10, are 100mA. The rectified h.t. voltage for the valves is supplied from the cathode of the CY31 in the DAC90 and the UY41 in the DAC10.

The electrolytic reservoir and 'smoothing' capacitors for the receivers are housed in one 'can', with a common earth point. The capacitor is mounted under the chassis, top centre of **Fig. 6**, of the DAC90 and on the top of the chassis, centre of **Fig. 4**, on the DAC10.

Fig. 4: Inside view of Bush DAC10. Note the 'live chassis' warning (see text).

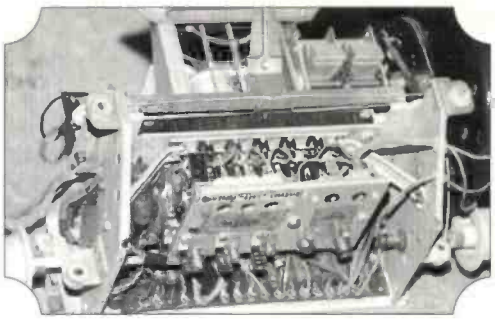


Fig. 5: The receiver manufacturers took great care to ensure that users were aware of the risks involved with 'live chassis', hence the warning under the push-button tuning plate on the DAC10.

Dismantling The Receivers

Let's now look at dismantling the Bush receivers. The loudspeaker on the DAC90 is bolted to the chassis, top centre **Fig. 6** and comes out with it. On the DAC10 it's fixed, along with the output transformer, to the cabinet.

There are two holes in the base of the DAC90's case for access to the screws that hold the front knobs to the shafts. The screw for the large tuning knob is found on the tuning capacitor's spindle just above the chassis inside on the left **of Fig. 3**.

The control knobs on each side of the DAC10 remain on the shafts, **Fig. 5**, when the chassis is removed. However, before further dismantling there are three wires to release from the frame antenna on the DAC90 and two from the output-transformer on the DAC10.

The dial and press button escutcheon on the DAC10, **Fig. 7**, is secured by a screw in each corner. This can be removed for dial cleaning, button label changing and must be taken off before the main chassis is removed. **(Don't forget to disconnect the mains!)**

However, unlike the DAC90 with its orthodox back cover, the cabinet on the DAC10 almost splits in two for access. It does this when the four recessed bolts on the rear of the cabinet are removed.

Military Radio

Last June **John Easterbrook** (Isle Of Sheppey) put his extensive collection of military radio gear on display at a D-Day show for the RAF Benevolent Fund. John's Second World War collection includes such sets as the AR88, BC348, CR100, PCR, R107 **(Fig. 8)**, R1155, and WS19, 22, 31, 38 and 52 sets.

Recently John acquired a piece of German v.h.f. gear, **Fig. 9**, and would like some information about it. The unit has the dial on the right and a cathode ray tube display on the left.

Have you any ideas readers? If so, please write to John at: **Glebe Cottage, 2 Warden Road, Eastchurch, Isle Of Sheppey, Kent ME12 4EJ**. In his letter John kindly said "If you know anybody at anytime who would like a good Second World War transmitter - receiver display, etc., please mention my collection". So, there we are folks, if you are organising an event for the VE and/or VJ-Day Remembrance this year and would like John's support drop him a line.

Good Idea!

What a good idea! **Mr K. N. Harvison** (Northwich, Cheshire) has used a number of PP9, 9V batteries to make up the high tension requirement for the 1936 Cossor 373 battery set in his collection. He also has a Philips 617A using side-contact valves and a PIX indoor antenna.

When Mr Harvison purchased the PIX the label and instructions were missing, but he found the information he needed in a 1936 copy of *Practical And Amateur Wireless*. Briefly, the PIX antenna has an aluminium strip which was often put around the room just below the picture rail to blend in with the border.

Navy Receiver

If anyone is looking for information about the ex-Navy B40 communications receiver, I suggest they write to Andy **Johnston** at: **2 Kentmere Close, Kempston, Bedfordshire MK42 8HF**. Andy is the proud owner of a B40 and has kindly offered help, so, readers please enclose an s.a.e. and be prepared to cover any of his expenses concerning your request.

Well, it's time to close up the 'shop' once again. But I look forward to sharing those 'vintage' memories with you next month. Cheerio for now.

***Editorial Note:** Our apologies for the error that crept in regarding EF50 Valves. They are loctal bases, not octal.* **PW**

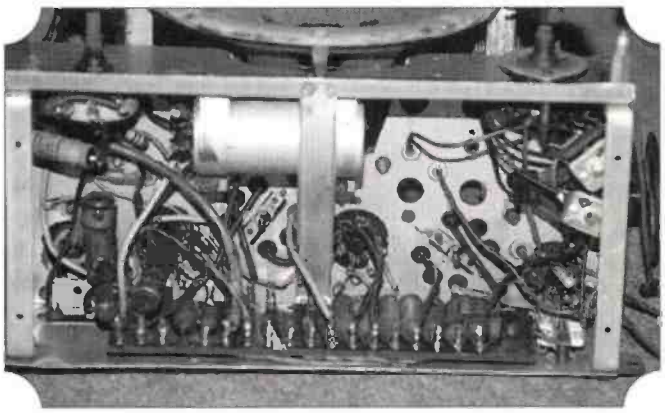


Fig. 6: Both the Bush DAC90 and DAC10 receivers employed 'common can' electrolytic capacitors for smoothing purposes. In the DAC90, this photograph, the capacitor was mounted under the chassis (see text).

Fig. 7: Because of its push-button tuning facility, the Bush DAC10 was useful for blind listeners.

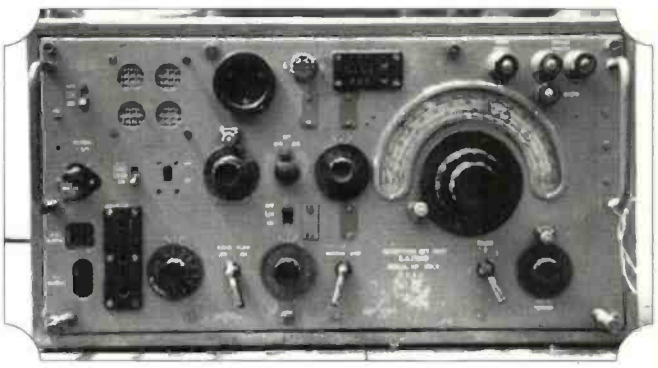


Fig. 8: An R107 receiver is featured in John Easterbrook's collection of Second World War transmitting and receiving equipment (see text).

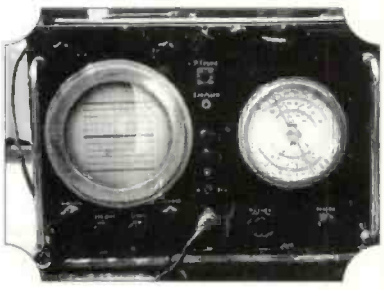


Fig. 9: Can you help solve a mystery? John Easterbrook wants to identify this interesting item of German v.h.f. equipment (see text).

Specifications
– The Mysteries Explained

This month Ian Poole G3YWX takes a look at the mysteries surrounding the dynamic range of a receiver.

Dynamic range is one of the most important receiver parameters, which is unfortunately open to a lot of interpretation. I say this because a receiver advertised with a specified dynamic range of 110dB may not be as good as another with a specified range of 90dB.

The reason for the confusion is that there are several ways of measuring dynamic range. As a result, a closer look must be taken to see exactly what is being measured.

Range Important

First it's necessary to see why the dynamic range of the receiver is important. It's obviously necessary for the receiver to be able to receive weak signals. However, this sensitivity will be of little use if any strong signals on the band degrade the performance of the set so that the weak ones can't be heard.

When the sensitivity of a receiver is measured in the laboratory only one signal is used. But when the receiver is connected to an antenna, it will be subjected to an enormous number of signals of varying strengths.

Some signals will be very weak while others will be very strong. It's because of this that the receiver has to be able to pick-up the weak signals while there are very strong ones close by. To be able to do this, the receiver must be capable of operating with a wide variety of signal strengths, i.e. it must have a good dynamic range.

Unfortunately it's not always easy for the designer to achieve a good dynamic range. Often the sensitivity can be improved at the expense of the dynamic range and vice versa. To be able to balance both requirements is the mark of a good receiver.

Dynamic Definition

Before progressing any further it's necessary to look at a definition of dynamic range. Basically the dynamic range is the difference between the weakest signal a receiver can hear, and the strongest it can tolerate without any noticeable degradation in performance.

As a receiver's performance can degrade in several different ways, the way in which the performance is degraded must also be specified.

The weakest signal that can be received is governed by the sensitivity. A term called the minimum discernible signal or m.d.s. is often used.

The m.d.s. is the weakest signal the set can receive. It's generally taken as a signal equal to the noise produced by the set.

The level of the m.d.s. signal is usually measured in dBm i.e. decibels relative to a milliwatt. Typically it might be around -135dBm for a bandwidth of 3kHz.

The bandwidth has to be included in the measuring. This is because the noise level is proportional to the bandwidth, i.e. the wider the bandwidth the more noise is picked up.

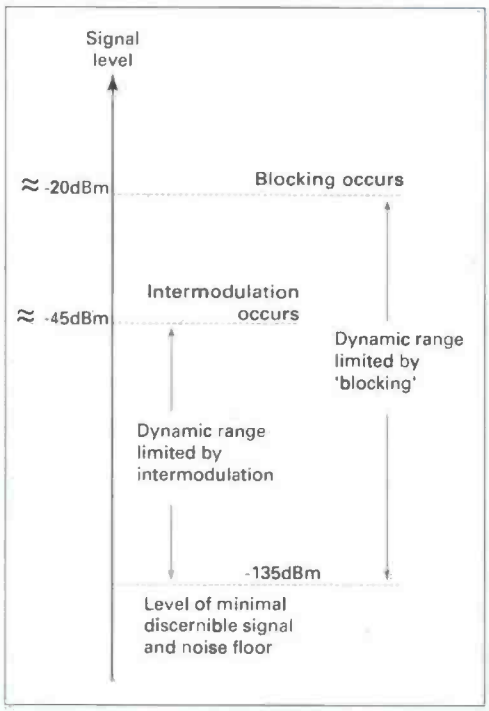
Limiting Factors

At the other end of the scale there are two main limiting factors. One is the generation of intermodulation products, and the other is blocking. As the onset of these effects occur at different levels, two figures can be obtained for the dynamic range.

Even when the specification states that blocking is the limiting factor the level must be closely viewed. Often a 1dB decrease in the sensitivity is used whereas in other cases a 3dB decrease might be specified.

The intermodulation limited dynamic range is a measure of the receiver's ability to handle strong signals without generating others that might mask out the weak wanted ones. In this case the level of the intermodulation products must not be any greater than the m.d.s., i.e. no greater than the noise floor of the set. But again care should be taken to inspect exactly how the measurements are taken.

Fig. 1: Dynamic ranges of a receiver (see text).



Modern Receivers

Most modern receivers will have an intermodulation limited dynamic range of between 80 and 90dB. If the blocking range is taken instead then its range is likely to be 115dB or possibly even more.

My comments illustrate the importance of looking at the full specification and checking exactly what the dynamic range refers to. The diagram **Fig. 1** shows a typical example but even then it's necessary to make sure that the test conditions are the same when comparing two receivers.

If comparisons are to be made between two receivers it's best to look at reviews made by the same reviewer. This is because the test methods should be the same, and direct comparisons can then be made.

That's all for this month, next time I'll be unravelling the mysteries of reciprocal mixing. Don't forget I'm always pleased to receive details of any specification mysteries you'd like explained on this page.

PAUL ESSERY GW3KFE

HF BANDS Report

This month Paul Essery GW3KFE looks to the far south to Antartica for some important news, provides an information round-up and your reports.

Down south in Antartica (VP8) seems to be where it all happens nowadays. The news is that the British research station, Faraday Base, in Graham Land is closing down. I've also heard that negotiations are in hand for the Ukrainian Antarctic Research centre to take it over.

Still in the sub-antartic region, South Georgia was the subject of a DXpedition. The expedition's callsign VP8SGP made some 15 000 contacts. And continuing noises are being made about a team to activate South Sandwich.

Top Band

Interest in Top Band is reviving. And don't forget, that while a big antenna helps radiate a decent signal on this band, for receive it's more important to have a separate low-noise receiving antenna.

Recent Top Band activity around 0400UTC has seen 9J2BO (1.825MHz c.w.) and 9J2GA (1.847MHz s.s.b.). A mite earlier A22MN was livening up 1.827MHz. On the other hand, VK6HD reports via *Top Band News* that he called G3BDQ, G3KEV and G3YRO without success.

However, there was no mention though of VK6HD in **G3BDQ**'s letter from John's QTH in Hastings. From this location John has managed 154 American stations in the reporting month. These included K0HA (Nebraska), three from Iowa, N8SS in Arizona which takes John up to 44 states.

The other G3BDQ Top Band contacts included 4U1ITU, OH0/OH1AF, SU1MT, T99W, US8ZAL, ZA1AJ. He also had a split-frequency effort with JH5FXP (the JAs only have that tiny allocation above 1.9MHz).

Still with 1.8MHz, AL7MX reports a serious reception problem. His Beverages (antennas) are being eaten by moose! (Or should that be 'drunk' by a moose!).

Back to a more usual problem now! At his first attempt on a computer with a word-processed report, **Ted G2HKU** in Minster, Isle of Sheppey in Kent, seems to be holding his own. Meanwhile on air the 1.8MHz score included W0ZV, OH0/OH1AF and some rare Europeans.

Nearer home, **Leighton Smart GW0LBI** in Trelewis keyed at low power with DL3HWF, SM6LJP, ON4AEB, plus speech with GM0FTX. Leighton's antenna is almost a half-wave mounted at 19 metres.

If you're keen on 1.8MHz, the Top Band information net on 14.339MHz is on Saturdays at 1230. You'll find that SP5INQ and UA9CBO take the chair.

Logs Missing

Mick Holtham G0EIG has written in to say his VP8CON logs went missing in the move from Mount Pleasant in the Falkland Islands. However, they have been found and are safely at home.

Immediately he gets back from his current Service duty aboard HMS *Coventry*, Mick promises that the cards will be sent out. Incidentally, he says his best contact from the Falklands was with a 2E0 using a couple of watts on a 'dead' 28MHz band!

Spratly Arguments

There have been press reports that arguments on sovereignty of the Spratly group have come to the surface. However, my personal view is that one life lost trying to activate Spratly is one too many!

The 28MHz Band

I've already mentioned VP8CON and his QSO with a British Novice on 28MHz. John G3BDQ also found a brief opening which yielded him KS4LC and KC4UXM on the afternoon of January 29.

Coming Up

Now for some news of what's coming up. In August/September KK6EK hopes to lead an expedition to Easter Island CE0 and Sala y Gomez. The latter a new one for IOTA.

In late April/early May an expedition to Navassa, KC4 is on the cards too. While the Big One will be VU2JPS's on Andaman.

If VU2JPS has a go outside 7MHz s.s.b., he could be very busy, Andaman being on most people's 'Wanted' list. If you get this on time you might catch the Conway Reef 3D2 effort; callsign not yet known.

Silent Key

Yet another silent key I'm afraid. One of the Greats of the DX world, Martin Haasen OY7ML has died after a long illness. Apart from being a great operator, Martin was a true amateur always ready to help and advise anyone thinking of a visit to Faroe.

The 3.5MHz Band

The letter from G2HKU mentions VP2EWW with the OMNI-V, while the low-power IC-721S signal found its way to several Europeans.

There have been some Stateside openings noted from GW3KFE late at night but nothing spectacular.

The 7MHz Band

It was QRP all the way for Ted G2HKU on the 3.5MHz band. The results for Ted were c.w. contacts with S50A and ZA1AJ.

John G3BDQ gave the 3.5MHz band a good pasting on the key. He worked several JA8s in the far north of Japan, VKs, KC1XX, ZS6WR, HP1AC, PY1UP/2, RA0FW (Sakhalin Island), VU2RX, and SM0CNS/DU7.

The 14MHz Band

On the other hand 14MHz wasn't G3BDQ's flavour of the month. John only went on to get a c.w. bite from VP8SGP.

By contrast, the Omni-V at G2HKU did well. Ted keyed with VP5FOC, K6NA, N7BG, YV4NX, TI2PZ, PJ9JT, EA6ZY who used to be G3ZY, 4X4NJ, VQ9TP, A71CW, a 'special' ZS95WRT, VP2EWW and 9H1BM.

The 18MHz Band

For his 18MHz band report John G3BDQ has a good one this time. John mentions sideband contacts with 5N0PYL, CF1YX, 9Q5TT, CN2GB, and GM0EKM plus c.w. to 9G1AA and J20UFT.

Ted's IC-721S at 5W was enough for G2HKU to deal with 3B8CF and S51CA. But the 'Big Box' was needed for N6AW, TU4SR, VY2SS, ST2AA. He also worked assorted W0s, ZB2EO, A71AN, HK7AAG, and OH1N0A/OD5.

The 21MHz Band

Again on 21MHz it's Ted G2HKU who has been busy. Using his Omni-V Ted worked LU4FC, 9J2BO, 4X4NJ, EA8AB. He also managed Z23JO (who is the former G2SO), TI2PZ, YV4NX and EL2NB.

So that's it for this month. Keep writing, and enjoy yourself on the h.f. bands! Send your reports to Box 4 Newtown, Powys SY16 1ZZ.

END

Antenna Wo

Low Slung Antennas

For many more years than I care to remember I, like many others, had accepted that half-wave dipoles will have a steady fall in their radiation resistance when they become closer to the ground. But on one wet afternoon last summer, when browsing through the *ARRL Antenna Book* (15th Edition), I came across a graph that showed that this was only true for dipoles above perfectly conducting ground.

Over what was described as 'real' ground, the fall in radiation resistance doesn't hold true. However, the *ARRL Handbook* definition of 'real' ground is very vague, for in the UK, at least, we have a wide range of soil types.

Perfect ground must be considered as being an excellent conductor in the same way as copper mesh or sea water. Under these circumstances the radiation resistance of a half wave dipole will fall from about 70Ω at a height of 0.2λ down to almost zero at ground.

When 'real' ground is used, there is a remarkable rise in radiation resistance when the antenna height falls below 0.05λ. This is shown in **Fig. 1**, which indicates that the radiation resistance will lie between 50 and 70Ω when the dipole is only 0.02 to 0.05λ above real ground.

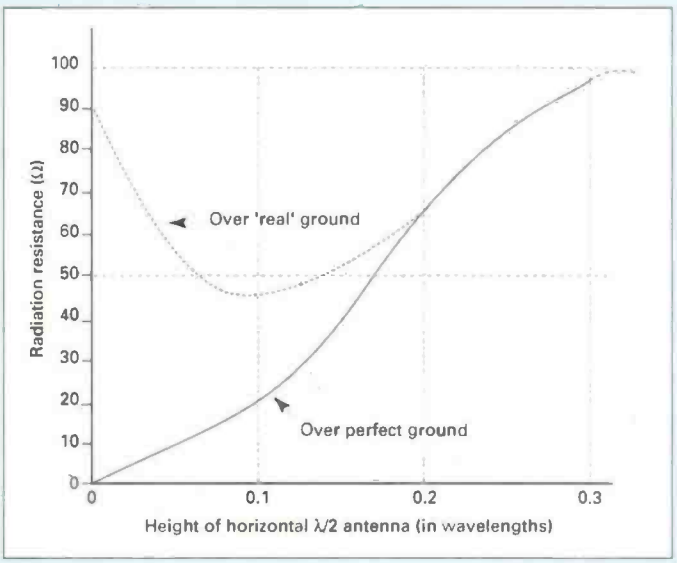


Fig. 1: Graph showing the radiation resistance of half-wave dipoles over a perfect conductor and real ground. The actual curve of the impedance over real ground will vary from location to location, as the soil type varies. The curve shown here is only as an illustration and approximation.

The rise in radiation resistance means that a very low dipole (v.l.d.) for the 14MHz band could match into 50 or 72Ω feeder at heights as low as 500-1000mm. This new information created a challenge.

So I set about making a practical v.l.d. for 7MHz. This was because I thought it might be easier to make contacts on that band.

Garden Canes

I used three one metre (three foot) garden canes as 'masts'. A centre support is needed to keep the middle of the antenna up (against the weight of coaxial cable), see **Fig. 2**. Thin insulated wire was employed to make the dipole and it was cut to resonate on 7.050MHz.

The smallest 'egg' insulators I could find were used at the wire ends and a thin rectangle of plastics material served as the centre connector block. When the coaxial cable reached the ground, it was buried at right angles to the run of the dipole for a run of about five metres.

After the right angled run, the coaxial cable was led into a boundary hedge and ran back, a distance of about 45m, to the operating position. If the feeder is not buried (just below the surface will do) a balun is needed to stop r.f. currents running back along the coaxial cable shield.

Half-wave dipoles fed with coaxial cable present a balance to unbalance situation. One solution is to slip some 30 or so large ferrite beads over the antenna end of the feeder.

The ferrite beads, in effect, form an inductive choke. Suitable ferrite beads may be obtained from Messrs

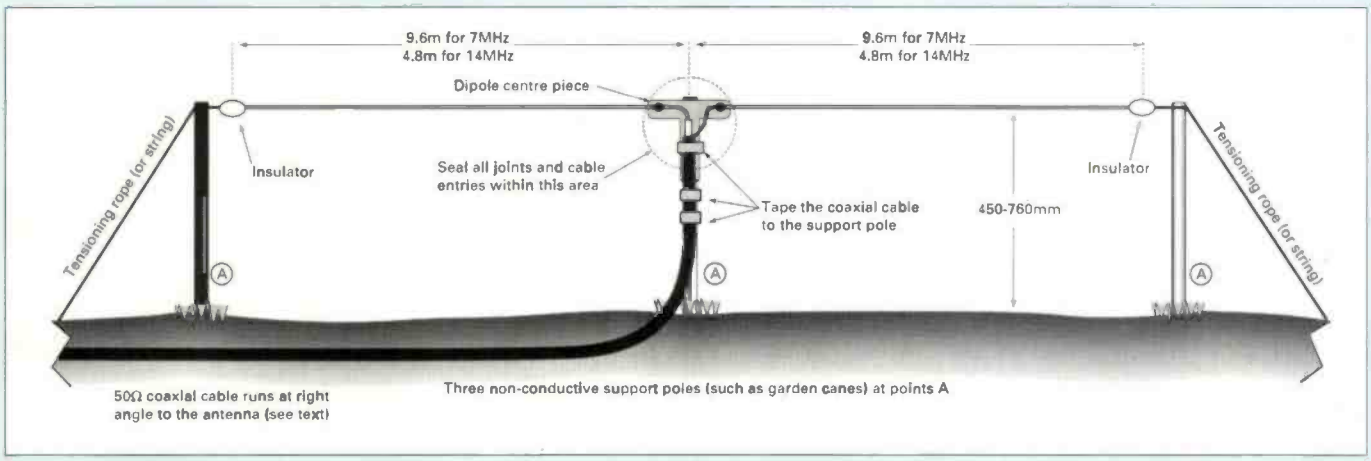


Fig. 2: Practical arrangements for very low dipoles cut for 7 or 14MHz. The three support poles can be made from almost any non-conducting material such as garden canes, length of wooden dowelling or plastics material.

rkshop

John Heys G3BDQ questions the supposed fall in radiation resistance of low slung antennas. He describes his experiments and results using very low dipoles on the 7 and 14MHz bands.

Ferromagnetics and are catalogued as type no: FB-73-2401.

Silicone rubber sealant must be spread over the connection end of the coaxial cable. This is to prevent the ingress of moisture penetration and resultant corrosion.

The prototype antenna had an s.w.r. close to unity and this was brought down to exactly 1:1 by reducing each dipole element by 5%. The v.l.d. wire lengths for 7 and 14MHz are shown in **Fig. 2**.

First Results

The first results of the radiation pattern for a very low dipole shows mainly high radiation angles. There was little of the very low angles of radiation which are sought after for DX work.

The radiation pattern may best be described as a large sphere positioned at the centre of the antenna. There will be considerable ground losses (average soil is a poor conductor and a lossy dielectric), so much of the radiation will be upwards at high angles.

An unexpected bonus I found with the v.l.d. antenna, is its very low noise level. Signals seem to jump out from a really quiet background. I did not expect much in the way of performance, but was pleasantly surprised!

I tried both c.w. and s.s.b. transmission in tests on 7MHz and I made many contacts with British and European stations. Reports from these stations were good, many reporting an S9 signal. The transceiver output for these tests was 80W and all the stations I worked in the tests lay within a 1000km radius.

More Tests

Encouraged by the results on 7MHz, I decided to try some more tests, but this time on 14MHz. The dipole wires were shortened to two 4.8m lengths and the antenna was lowered to just half a metre above ground.

The new height of only 500mm represents about 0.025 of a wavelength. Amazingly, my first tests on 14MHz version showed an s.w.r. of unity over the whole of the band. And as with the 7MHz tests, I was using just 80W into the v.l.d.

My first call brought back **IK4MFP** who gave me a 599 report. Many more stations were worked over the next few days including many Russians.

When using s.s.b. mode and I got a 5-and-9 from **CT3EE**. In Uzbekstan, **UN8PYL** also gave me 5-and-9. (On this band just about every European country was worked and logged).

In Eastbourne, **Eric G3CPS**, became interested in my experiments and quickly made a 'chinese copy' of the 14MHz version. Eric was amazed with his results, working all over Europe. Surprisingly, he also had c.w. contacts with **VE8RAF** on Ellesmere Island and **A71CW** in Quatar.

Eric was as surprised, as I was, by the very low noise levels present. He said that he could hear exotic DX on the v.l.d. more easily than on his normal antennas.

Other Findings

Now for some of my other findings .To start I found that the v.l.d. antenna worked best when the two dipole wires ran in a straight line.

Secondly, a slight 'dog-leg' on the antenna elements had little effect. But if the angle between the wires was reduced to 120°, there was some de-tuning.

With the change of tune, I had to add a few centimetres to each end of the antenna to restore the antenna to tune. When the wires were brought to 90° apart, the performance fell right off, the number of contacts and incoming reports dropping.

My v.l.d. antennas are easily and quickly set up and should be ideal at temporary locations where outside wires are frowned upon. But I had to hang little plastics flags on my dipoles to prevent the XYL tripping over the wires!

As mentioned, the definition of 'real ground' is very vague. For example my garden has a clay loam soil whereas Eric G3CPS, is on chalk.

More experimenting is needed with the v.l.d. type of antenna. This is because the induction field of a v.l.d. antenna will be absorbed to a greater or lesser degree over lossy ground.

So **don't** position your low antenna over your earth system. If you do this of course, you will be getting closer to the 'perfect ground' of the text books.

In practice, raising or lowering the v.l.d. antennas by some tens of centimetres had little effect on their s.w.r. The dipole element lengths however, proved to be more critical.

You can never better a good antenna system that is half a wavelength or more above ground. But, if for some reason, putting up sky wires is not possible, a very low dipole can be tried. It will certainly bring you many contacts within Europe and occasionally with stations further afield.

Even if not used for transmitting, v.l.d.s are excellent for low noise reception. Man-made noise fields such as those from motors, thermostats or TV line timebases are less intense at ground level. **PW**

Further Reading

ARRL Antenna Book 17th Edition. **Over 700 pages of many antennas and related topics.**

ARRL Antenna Compendium **(Volumes one to three). Three more ARRL books to make up your library.**

HF Antenna Collection **(RSGB) edited by Erwin David G4LQI. Extracted from articles previously published in *RadCom*.**

Practical Antennas For Novices **(RSGB) by John Heys G3BDQ. Especially written for Novices (or other low power users) to get the best out of an antenna system.**

Practical Wire Antennas **(RSGB) by John Heys G3BDQ. More practical approaches to wire antennas suitable for many locations.**

All the above books are available through the *PW* Book Service (see those pages in this issue). In the section marked 'Antennas' (Aerials) you will find many more books that should interest you.

VHF Report

D A V I D B U T L E R G 4 A S R

This month David Butler G4ASR explains just how you can catch those elusive openings on the v.h.f. and u.h.f. bands. David gives advice by looking at the 'Propagation Year' and provides a special chart.

I'm going to take a look at the 'Propagation Year' this time. This is because I've recently received a letter asking for advice about how to recognise when a 'lift' is likely to occur on the v.h.f. bands.

The correspondent mentioned that the only time he had taken part in such conditions was more by luck than judgement. He now wants to change the odds!

In my view, the key to catching openings on the v.h.f. bands is based on three simple processes. These are **knowledge**, **prediction** and **fact**. And now, I'll explain just what I mean.

Picking up knowledge of when certain propagation modes occur is no different from picking up knowledge of the weather. In the winter you expect it to be cold and in the summer you hope it will be hot!

You'll also be aware of spring showers and autumn fog. And it's **exactly** the same with radio propagation.

With a little help you'll soon learn about summer **Sp-E**, autumnal tropospherics pheric and auroral propagation during the equinoxes. But, to help you remember them all, I've designed a chart, **Fig. 1**.

The Chart

The chart in **Fig. 1** shows when certain propagation modes are likely to occur during the year. The year planner shows the four propagation modes that are most common on the v.h.f. bands.

The four modes are: **tropospheric enhancement (tropo)**, **auroral**, **Sporadic-E** (Sp-E) and **meteor scatter** (m.s.). Other modes such as tropospheric scatter, ionospheric scatter and even moonbounce (e.m.e.) exist, but as these require high power and large antenna systems, I won't mention them further.

There are also modes that only affect the 50MHz band and occasionally the 70MHz band. These are **trans-equatorial propagation** (t.e.p.) and **F2-layer propagation**. I'll cover these and the other esoteric modes in a later column.

Tropospheric Opening

The most common of all propagation modes is the tropospherics pheric opening. Enhancements occur throughout the year, usually in the summer.

However, the best openings are in the autumn during the months of October and November. Openings in the summer can occur at any time of the day or night but are generally better in the early morning or evening.

The reasons for better evening and morning events are straightforward. It's because the cause of the surface duct, the temperature inversion, is destroyed to some extent by the warming rays of the sun.

Tropo enhancement can be found on all bands from 144MHz through into the microwave region. Although small lifts are experienced on the 50 and 70MHz bands, they are never extensive.

Auroral Openings

Auroral openings also occur at any time of the year, but peak around the equinoxes. So I suggest you keep a special watch during February-March and October-November.

Openings normally occur between 1400-1900UTC and around local midnight. All events are different but the peak times for DX is usually 1500-1700UTC.

Auroral propagation works best on the 50 and 70MHz bands. However, much activity can also be found on the 144MHz band because of the increased international availability. Contacts on the 430MHz band are more scarce and usually limited to the larger auroral events.

Sporadic-E

Openings via Sp-E propagation occur frequently during the summer months. On the lower frequency v.h.f. bands the season will start in early May and continue into the first week or so of August.

There's also a winter peak in activity during December-January. The 50MHz band can often be open for DX at some time between 0600-2400UTC.

More intense openings create openings on the 144MHz band, normally during June and July.

The upper frequency limit of Sp-E propagation is around 230MHz. The best times to catch openings on this band are 1000-1400 and 1600-2000UTC.

Meteor Scatter

Propagation via the ionised trails of meteors (as they burn up in the upper atmosphere) exists every single day of the year allowing contacts to be made with stations up to 2000km away. However, many m.s. enthusiasts prefer to operate during major meteor showers when the chances of making a complete QSO are greatly enhanced.

The principal showers occur virtually every month of the year. But the months of February, March and September are the exception. In the northern hemisphere most showers occur in the months May-August.

The great thing about m.s. is that unlike other propagation modes, the 'opening' can be predicted with a high degree of confidence. And contacts with low power and simple antennas are very easy to make on the 50MHz band.

You'll need about 100W and a reasonably long Yagi to make consistent contacts on the 144MHz band. But only stations with e.m.e. capability should attempt contacts on the 430MHz band!

The Knowledge

So, the **knowledge** is the first of the three essential processes. It will tell you in general terms when something is likely to happen.

To narrow the odds still further you need to have a method of predicting the opening. This is our second process and once again I'll use the analogy of weather as it draws a useful comparison.

Study of existing weather patterns and knowledge of trends enables the meteorological office to issue accurate forecasts. All **you** need do then is watch the weather report to get a good idea what will happen during the next few days. Similarly a study of various propagation events (Yes...even on the h.f. bands!) will give you clues when the next v.h.f. opening might occur.

Usual Mechanism

Interestingly, the most usual mechanism that governs day-to-day band conditions has its origins in the weather. Tropospheric propagation is linked to the fundamental properties of the atmosphere.

The properties are, incidentally, the vertical distribution of temperature and water vapour. These tropospheric lifts occur most often in anticyclonic weather systems. Watch out for an area of high pressure during the summer when your barometer is reading **Fair** or **Very Dry**.

During the autumn, some excellent tropospherics pheric DX can be worked when the weather conditions are misty. So, keep a look out for weather forecasts where fog or mist is indicated and high pressure extends from the

UK deep into Europe.

It's also a good idea to watch for co-channel interference (c.c.i.) on TV too. This can be a pointer to a 'lift' (particularly on 430MHz) on v.h.f./u.h.f. On your TV, c.c.i. shows up as either fine horizontal lines or (when the lift is pronounced) a complete foreign television picture.

Important Calendar

I've mentioned many times in this column the important need to keep a 27-day auroral calendar. This is simply a chart of the year (or longer periods) displayed in 27-day strips.

Whenever an auroral opening is observed you should note it on the chart. As the sun takes approximately 27 days to rotate it's possible that a repeat may occur a month later. And although you won't catch every repeat event it will indicate when special attention should be paid to the band.

There are also a number of reliable indicators which give a short-term indication of auroral events. For example, some 20 to 40 hours before a radio aurora, incoming high energy electrons may penetrate down into the ionospheric D, E or F layer regions.

The incoming high energy electrons can cause h.f. fade-outs. So, if your favourite h.f. band (or l.f. band for that matter) is acting strangely it's worth remembering that an aurora might occur within a day or so.

One of the most reliable short-term indicators of auroral events is disturbances caused to the earth's magnetic field. You can detect them with a magnetometer using a Hall-effect sensor, which is simple to build and gives an excellent indication of auroral openings.

Not Restricted

The use of a 27-day calendar is not just restricted to auroral prediction. The chart can also show when the active or quiet side of the sun is facing the earth.

The 'active' or 'quiet' indication is very useful as the sun has a considerable influence on other propagation modes. This is especially true of the 50MHz band when F2-layer propagation is prevalent.

Some 'experts' also claim to be able to predict when Sp-E openings are most probable. Certainly in my experience the formation of Sp-E seems to be inhibited during periods of auroral activity.

So, although many other factors need to be taken into account, periods when the geomagnetic K-index is 0 or 1 (little or no activity) is conducive to Sp-E openings. You'll need to listen to the standard WWV broadcasts or propagation beacons like DK0WCY (10.144MHz) to get this information. Alternatively the DX Cluster network can provide this data.

Regular Intervals

Earlier I mentioned that meteor showers occur at regular intervals. And of course they do!

However, it's worth noting that by keeping a record of the previous year's activity an accurate prediction of subsequent radio peaks can be made. This is because the earth intercepts the shower orbit every 365.25 days.

So, by simply adding six hours to the date and time of the previous year's radio peak, you can predict fairly accurately when the peak will be this year. For leap years, you must subtract one day for all shower dates after February 29.

For example, I noticed that conditions during the Perseids shower last year seemed to peak between 0900-1200UTC on August 12. There was also another peak in activity between 2200-0400UTC during the evening.

Therefore, the radio peak of the Perseids meteor shower this year will be between 1500-1800 on Saturday August 12 and between 0400-1000UTC on Sunday August 13. But of course, these predictions won't guarantee that any meteors will be present at the time!

Another way to make predictions of meteor shower peaks is to use appropriate software and a computer. Incidentally, a program by OH5IY gives the Perseids peak as 1130UTC on August 12, with an accuracy of ±3 hours.

Yet another prediction program, this version is by G4PMK, gives the peak as 0115UTC on August 13. However, which method **you** use is your choice but I can guarantee that there will be much DX activity that weekend!

Maintaining Records

So, the second process, that of prediction, is simply a matter of maintaining records of solar or weather driven events. Of course it's not quite as simple as that, but after a while you'll get an intuitive feel for your favourite band.

Finally I'll turn to the last of our processes. This is probably the most important and deals with what's happening right **now**.

Again I'll compare radio conditions with the weather. For example, if you stick your head out of the window and it gets wet you can say it's raining!

Next turn the radio on. You hear lots of DX. The band's open! Nothing can be a substitute for **actually** sitting in the shack and listening to the v.h.f. bands. If you did it all day long you wouldn't miss a thing.

However, as I've just described you don't actually need to monitor the bands all the time...only when it's more likely to be open. But I realise that not everyone can afford the time to sit in the shack tuning aimlessly up and down the frequency bands.

One method I use, particularly for Sp-E and auroral propagation, is to monitor activity in the 48-54MHz region. This spectrum covers not only the 50MHz amateur band but also Band I television broadcast stations.

The Band I television transmitters are especially useful 'indicators' as a sufficient number of them still exist throughout Europe. Additionally, radio auroras and Sp-E are more prevalent at these low frequencies than the 144MHz band for example.

By investing in a 50MHz converter and a simple dipole you are able to monitor Band I. You could also get a few hours warning of better things to come on higher frequencies.

Good Results

Two other real-time information methods also give good results. The first is the use of the DX Cluster network.

By logging into your local cluster you are able to monitor DX spotted by other stations. The attraction of this packet radio based system is that you can set up parameters to your particular liking. You could, for example, configure the system to alert you only when DX spots are announced for the 50 or 144MHz band.

The other method is to form a telephone 'warning chain'. This is quite easy to set up but does rely on other people telephoning you. More often than not they prefer to stay on the microphone and work the DX!

Finally, if all else fails just leave your radio tuned to 28.885, 50.110, or 144.3MHz or whatever calling frequency you prefer and turn the volume up. You can then do the washing up and monitor the band at the same time!

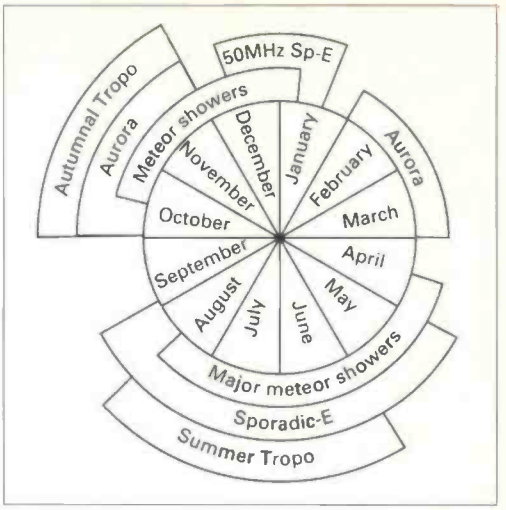


Fig. 1: Propagation modes chart by G4ASR (see text).

Deadline Time

It's deadline time again! And, by the time you read this, the first signs of the summer Sp-E season should be observed.

So, if you make any interesting contacts please let me know about it. As usual send your reports to me at: **Yew Tree Cottage, Lower Maescoed, Herefordshire HR2 0HP** or via packet radio @ GB7MAD or the DX Cluster system. Alternatively you can telephone me on **(01873) 87679**.

E N D

Recommended Reading

The VHF/UHF DX Book **by Ian White G3SEK† (ISBN 0-9520468-0-6).**
Radio Auroras **by Charlie Newton G2FKZ (ISBN 1-872309-03-8).**
Space Radio Handbook **by John Branegan GM4IHJ† (ISBN 1-872309-05-4).**
Beyond Line of Sight **by Emil Pocock W3EP (ISBN 087259-402-5).**

† Available from the *PW* Book Service.

PETER SHORE

BROADCAST Round-up

In this month's round-up, Peter Shore has news of changes to the BBC World Service, readers' reports as well as the latest radio programme schedules.

Since the beginning of April, Britain's international broadcaster, BBC World Service (WS), has been transmitting five different versions of its English language output. Regional schedules have been devised which, according to WS Managing Director, Sam Younger, "put time on the listener's side", with the same programmes being broadcast, but at more convenient times.

Apparently in some parts of the world, up until now, tuning to things like *Play of the Week* meant getting up before sunrise, or listening in the middle of the night. Now, wherever you may be in the world 'your favourite programmes are at times to suit you'. A bold claim from the world's most listened to international radio station, but what does it mean in practice?

Five separate 'streams' of programmes are now leaving Bush House on their way to transmitting stations in Britain and overseas relays. One stream broadcasts to Europe, North Africa and the Middle East, as well as most of the countries that formed the Soviet Union; another goes to Africa south of the Sahara; South Asia (India, Pakistan, Bangladesh, Nepal) receive another; Asia and the Pacific has its own service; and the Americas, from the wastes of the Canadian north to the tip of the South American continent has another.

So, if you tune in to 15.07MHz, a favourite European frequency, you should hear the World Service's European service. Try 15.40MHz from Ascension, and you'll get the African stream, complete with *Focus on Africa* and other programmes made for audiences in the continent. And so on, all around the world.

But what about strange frequencies like 6.195MHz? In the European early evening the 6.195MHz has often been subject to an off-putting echo as the frequency is broadcast from the UK and an overseas station simultaneously.

Under the new scheme, the two transmitters might carry separate programmes, and effectively the BBC would jam itself. Apparently the new schedule has ironed out such problems. Let me know if you spot any strange effects caused by the World Service's new broadcasting techniques.

Radio Metropolis

There's been quite a lot of reaction to my mention last month of new Czech short wave broadcaster, Radio Metropolis. **Robin Guppy** in Basildon, Essex, and **A. P. Oldroyd** in Ossett, West Yorkshire, were among the first to write and say they had heard the station.

Robin caught the station in February using a newly purchased Kenwood R-5000. It's connected to a 25 metre long-wire antenna.

The set owned by A. P. Oldroyd is a Sony SW-55. He uses the set's built-in whip antenna and says he also picked up Radio New Zealand International very well on it. Radio Metropolis was heard on 5.905MHz at 1140UTC on February 20.

Keep writing, and don't just limit your news to snippets about Radio Metropolis!

Columbia's Service

Reports have been carried on a number of DX shows on the short wave bands about the re-emergence of Colombia's international service. Radio Nacional has been logged between 2230 and 0000UTC on 4.955MHz, with identification in Spanish. The station's address is **Radiodifusora Nacional de Colombia, Radio Canal Internacional, PO Box 93994, Bogota.**

Latest Schedules

A new schedule has recently arrived from Radio Budapest. From the end of March, the station will be on the air with English to Europe at 2000 until 2030 on 3.975, 6.11 and 7.22MHz, and at 2200 to 2230 on 3.955, 6.11 and 7.22MHz. The North America service is on the air for 30 minutes at 0200 on 6.025, 9.0835 and 11.91MHz and at 0330 on 5.965, 9.835 and 11.91MHz.

Radio Budapest has published its 'Honours List' for 1994. The list contains details of people who participated in Budapest's programmes during the year, with letters quoted, questions answered, or suggestions for broadcast features sent in. There are 21 listeners in the UK (including one who slipped in although his address is in Normandy) who are included on the list, and 18 from the USA.

Contact the station to see if you can make it into the 1995 Honours List. The station's address is **Radio Budapest, Bródy Sándor u. 5-7, H-1800 Budapest, Hungary**, or **FAX** on **+36 1 138 8838** or **138 8517**. There is also an answering machine connected to **+36 1 138 8320.**

The Voice of Greece has English for Europe at the following times: 0740 on 11.645, 9.935 and 9.425MHz; 1335 on 17.52, 15.65MHz; 1910 on 9.38, 6.26MHz

The Voice of the Islamic Republic of Iran beams English worldwide at: 0030 on 9.67, 9.022 and 7.10MHz to North America; 1130 on 11.93, 11.79 and 11.745MHz to the Middle East and Asia; 1530 on 11.79 and 9.575MHz to Asia; 1930 on 9.022 and 7.26MHz to Europe and Africa. All programmes are one hour long.

The Iranian station has started a new Swahili service to East Africa. It has been observed on the air at 1700UTC for half-an-hour on 11.74 and 9.685MHz.

Vietnam has started to use transmitters in Russia to beam into Europe. There is an English service at 0400 for two hours on 5.94MHz, and at 0600UTC an hour long programme in Spanish is transmitted on 7.40MHz, following a Voice of Russia (formerly Radio Moscow) Spanish service programme.

Christian Science

The sale of the Scott's Corner transmitting station built by the World Service of the Christian Science Monitor has now been completed. The Christian Science Monitor has sold the fully operational site to the World Voice of Historic Adventism for US$5million.

The Monitor has concentrated its US short wave operation to the Cypress Creek site in South Carolina. From there it beams to Europe and Africa using 500kW transmitters.

China Messenger

The winter edition of China Radio International's (CRI) *The Messenger* landed on my desk just as I was finishing off this month's column. The station publishes its English language schedule as: 2000-2200 on 9.92 and 6.95MHz to Europe direct from China; 2200-2230 on 3.985MHz from Switzerland and 2200-2300 on 7.17MHz from a Russian transmitter. Can anyone explain why CRI broadcasts two distinct programmes to the same target area at the same time?

Broadcasts to North America's East Coast are at 0000 on 9.71 and 11.715MHz from Mali; 0300-0400 on 9.69 from Spain; 9.71 and 11.715MHz both from Mali; 0400-0600 on 9.73 from French Guiana.

That's all for this month. Do keep writing to me via the *PW* Editorial Offices with details of interesting things you've caught. Until next time, good listening.

E N D

PACKET Panorama

Roger Cooke G3LDI brings you news of his trip to Australia, where he made a point of meeting many amateurs interested in packet. This month Roger introduces just a few of the more active stations.

Fig. 1: (Right) Paul VK2BZC in his compact shack.

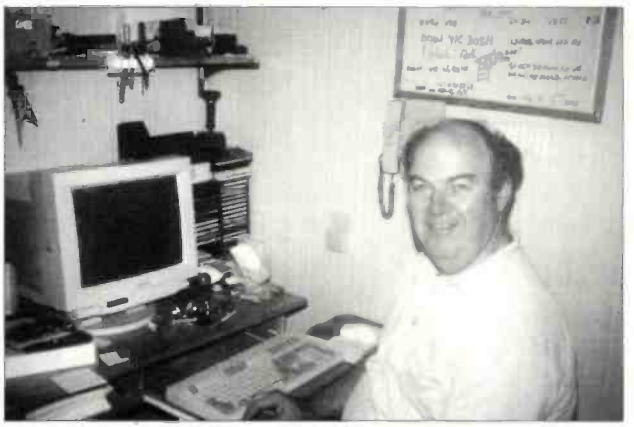


Fig. 2: (Left) Tony Lonsdale VK2DHU the author of the PAKET computer program.

Fig. 3: (Below) John VK2AWA who at 78 years young, shows you're never too old to enjoy yourself on packet radio.

During my Australian tour I stayed in Crowsnest, a suburb of Sydney with **John Bayes VK2SB** and his wife Mary. John and I had planned a trip north up the coast of Australia, as far as Cairns, in Northern Queensland.
We had the TS-50 in the car with a home-made whip on the roof and also a 144MHz f.m. rig, so we were well-equipped radio-wise. Unfortunately, propagation did not favour us too well and we spent most of our time on 144MHz or the VK travellers net on 14.116MHz.

One of the first amateurs we spoke with was **Jim VK2FJM**. Jim is a white stick operator and wanted to know if there was a method of getting onto packet. I thought I had seen a mention of this somewhere, so if anybody can enlighten me, I would be delighted to pass any information back to Jim.

Further north in Port Macquarie, John and I spoke with **Richard VK2CHC**. We were invited to visit **Peter VK2BZA**, who at 80 plus, still works DX regularly.

Further north still, we visited **Paul VK2BZC**, who has a superb location on a hill-top and is very active on packet.

Paul is a Doctor and is known locally as Dr. Paul on the air! He is featured in **Fig. 1**. Paul is only active on the v.h.f./u.h.f. bands.

One of the more well-known Port Macquarie packet people must be **Tony Lonsdale VK2DHU**, the author of PAKET, the packet terminal program. We got lost on the way to Tony, but eventually found him, and he is shown at the terminal in **Fig. 2**.

Tony very kindly gave us a copy of PAKET 6 - which at the time was the latest version of his software. We spent a very informative evening with him.

No Site Clearance

One very nice thing about VK is that there is no site clearance, no special BBS licence, so there's no need to wait. They just operate!

However, even without an official organisation, they still manage to run quite an efficient network, which must be extremely difficult considering the enormous distances involved.

The packet 'backbone' is on u.h.f. at 1200baud, although changing to 9k6baud shortly with users on 144MHz. Tony estimated that out of 50 amateurs in Port Maquarie, about 12 were active on packet.

The Australian Amateur Packet Radio Association (AAPRA) is a very active and dedicated organisation which has some 250 members. We visited **Jo Harris VK2KAA**, one of AAPRA's committee members on our return to Sydney.

More on Jo in my next column. However, Jo was kind enough to let me have a copy of the *PAKET Handbook*, produced by AAPRA.

The *PAKET Handbook* is a very nicely produced manual, telling you just about everything you need to know about the computer program PAKET. The book, written by Tony VK2DHU, is available from AAPRA for $30 seamail or $35 airmail. It is well bound, starts with an index and is separated into 11 parts or chapters.

The handbook starts with the history and description of the Australian Network, before describing starting PAKET. There are sections on REMOTE mode, SCRIPT PROCESSING and PMS system. There's a section dealing with PAKET PROTOCOL and a Technical section which gives information on handshaking and TNC settings.

Written with two columns per page, the book has a style catering for the raw beginner, but is still excellent for the more advanced user. Running to around 150 pages, it's good value and seems a must for the PAKET user. It can be obtained from:

AAPRA, 59 Westbrook Avenue, Wahroonga, NSW 2076, Australia.

By this time, all the talk about packet had inspired John. He was thinking how best to get onto the mode upon our return to Sydney, so he also took a copy of PAKET from Tony and made it his project before I left for home!

John wondered if he was getting too old at 64 to get into the digital world, so we visited **Bob VK2AWA**, who, at 78 years young (his words!) is active on packet and thoroughly enjoys it. Bob lives in Coffs Harbour and is pictured in **Fig. 3** proves you're never too old to have fun!

BBS Survival Guide

Finally, I would just like to say that the *BBS Survival Guide*, 2nd Edition, is now available. It now runs to 98 pages, but with different livery, with a light blue cover, and loads more information. The cost is £6.00 post paid from G3LDI or it is available from Siskin Electronics. Profits will go to the Amsat Phase3D fund.

Happy Packeting. Roger, G3LDI @ GB7LDI, or QTHR for 'snailmail'. Tel: (01508) 570278.

E N D

ARCADE

The *PW* Shopping Arcade

Welcome to the *Practical Wireless* 'Arcade'. In this section of the magazine, you'll be able to find all those important services 'under one roof' - just like the shopping arcades you see in the High Street.

Let your eyes 'stroll through' the Arcade every month and you'll find all departments open for business including: The Book Service, Binders and details of other *PW* Services. Make a regular habit of 'visiting' the Arcade, because in future, you'll have the chance of seeing special book offers and other bargains. And don't forget, this Arcade is open wherever you're reading *PW*!

Services

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We will always try to help readers having difficulties with *Practical Wireless* projects, but please note the following simple rules:
1: We **cannot** deal with technical queries over the telephone.
2: We **cannot** give advice on modifications either to our designs, to commercial radio, TV or electronic equipment.
3: All letters asking for advice **must** be accompanied by a stamped self-addressed envelope (or envelope plus IRCs for overseas readers).
4: Make sure you describe the problem adequately, with as much detail as you can possibly supply.
5: Only one problem per letter please.

Back Numbers

Limited stocks of many issues of *PW* for past years are available at £2.00 each including post and packing. If the issue you want is not available, we can photocopy a specific article at a cost of £1.50 per article or part of article. Over the years, *PW* has reviewed many items of radio related equipment. A list of all the available reviews and their cost can be obtained from the Editorial Offices at Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW for a large stamped self-addressed envelope.

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Components for *PW* projects are usually readily available from component suppliers. For unusual or specialised components, a source or sources will be quoted.
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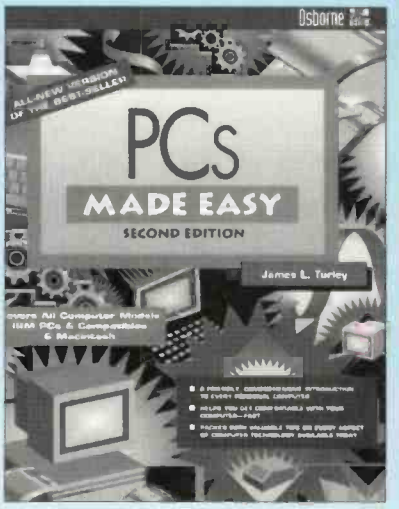
Beginner: A project that can be tackled by a beginner who is able to identify components and handle a soldering iron.
Intermediate: A fair degree of experience of building radio or electronic projects is assumed, but only basic test equipment will be needed to complete any tests and adjustments.
Advanced: A project likely to appeal to the experienced constructor. Access to workshop facilities and test equipment will often be required. Definitely not for the beginner to attempt without assistance.

Mail Order

All items from *PW* are available Mail Order, either by post or using the 24hr Mail Order Hotline (01202) 659930. Payment should be by cheque, postal order, money order or credit card (Mastercard and Visa only). All payments **must** be in sterling and overseas orders **must** be drawn on a London Clearing Bank.

SUBS CLUB

Are you frightened of computers and intimidated by all the jargon? Well, this month's *Practical Wireless* Subs Club special offer could change all that. You can learn to use and enjoy computer technology to your best advantage and get *PW* delivered to your door into the bargain!



As we've got a 'Computing in Radio' theme this month, I've looked at various books on the subject with the aim of helping readers who (like me!) are somewhat intimidated by computer technology. And without hesitation I'm again recommending *PCs Made Easy* (2nd Edition), as an effective answer to all those 'computer know alls' we're surrounded with in the office and our hobby!

Armed with *PCs Made Easy*, you, like me, can become more familiar with personal computers. Remember, a computer is just a sophisticated tool, it need not become a way of life for anyone, you just use it to your advantage. Computers are there to serve you, not the other way round and *PCs Made Easy* takes the mystique out of the subject.

With chapters entitled: Getting Started, What Can A Computer Do For Me?, What Are All These Parts?, What's A Program, How Do I Print?, What's A Network?, you'll soon realise *PCs Made Easy* is aimed at helping you. However, although the book is aimed at helping the beginner, it also provides a good reference source for established users. And personally speaking, I've found the book very helpful in setting up my younger daughter's PC requirements and questions for College. (The chapters Do's & Don'ts and Buying A Computer were especially helpful here!)

I especially recommend this book. It helped me and I think it could help you too!

G3XFD

You can get your copy of *PCs Made Easy* for **£13.95 plus £1 P&P (UK), £1.75 P&P (overseas)** (normal price £15.95 plus £1 P&P UK and £1.75 P&P overseas) and get *PW* delivered to your door every month too!

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FT-707 with c.w. filter, FP707 power supply, FC707 a.t.u., stand, mic., mint mobile mount and manuals, £550. Geoff G4ECF, Surrey. Tel: (01483) 570033.

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***Practical Wireless* magazines**, 1951-93, some complete years, also *Everyday Electronics, Practical Electronics, Radio Electronics Constructor*. T. Robinson, Rugeley. Tel: (01889) 583965.

Quantity of *QST*, *T+R*, *Bulletins* 30-70-s, *CQ*, *SWM* 1940-70s, Melody Maker cabinet, 1930s. W1117 wavemeter, Hallicrafters S20R RX. All v.g.c., delivery Midlands possible, sell or swap. Tel: (01938) 810938.

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Wireless World, Vol. 31 (July to December 1932) and Vol. 46 (1940). Terry Brown G4TZB, Manchester. Tel: 0161-643 6116.

Bargain Basement May 1995

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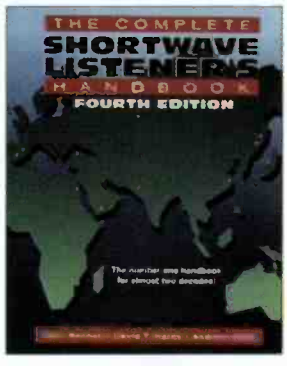

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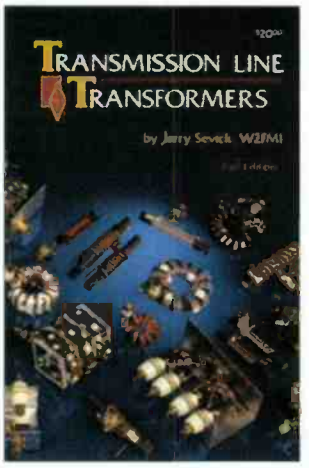

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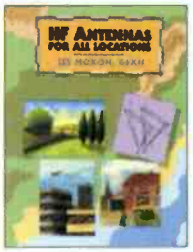

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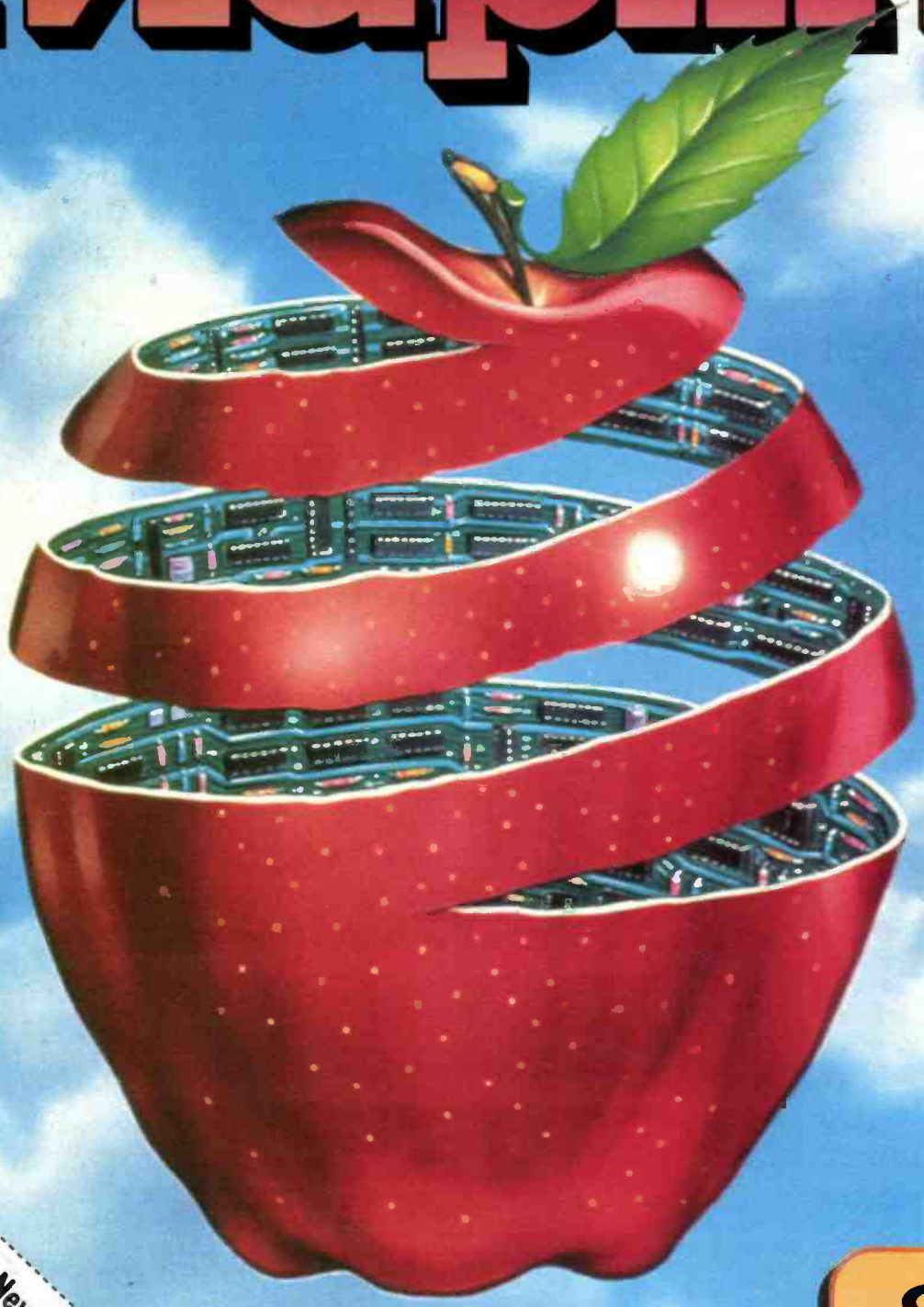

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