

THE UK'S BEST SELLING MAGAZINE FOR AMATEUR RADIO ENTHUSIASTS

MARCH 1995 £1.90

# practical Wireless

## FREE

### 70cm DATACARD

**70cm Repeaters**

Call sign	Input freq.	Output freq.
430	434.000	435.000
431	434.020	435.020
432	434.040	435.040
433	434.060	435.060
434	434.080	435.080
435	434.100	435.100
436	434.120	435.120
437	434.140	435.140
438	434.160	435.160
439	434.180	435.180
440	434.200	435.200
441	434.220	435.220
442	434.240	435.240
443	434.260	435.260
444	434.280	435.280
445	434.300	435.300
446	434.320	435.320
447	434.340	435.340
448	434.360	435.360
449	434.380	435.380
450	434.400	435.400

**PRACTICAL WIRELESS 70cm Repeaters DATACARD**

This PW Datacard is brought to you by **YAESU UK LTD.** - Number 1 in Amateur Radio

**YAESU** Performance without compromise

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## MOBILE SPECIAL

### Amateur Radio On The Move

#### Features

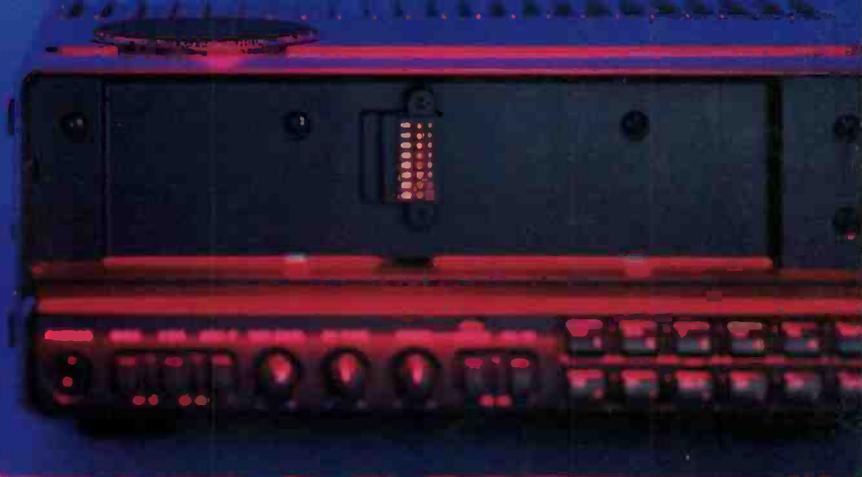
**PUSH START** Getting Going On Mobile

**EMC** The Mobile Menace

#### Reviewed

## YAESU'S FT-900AT TRANSCEIVER

### More Than A Mobile



## SPECIAL OFFERS

Hurry To Catch Our Special Deals On Mobile Antennas And A Booster Amplifier

### Build

The PW Martlet  
70MHz Transceiver  
And A 'Ten To Top  
Band' Transverter



### pull Out

## LONDON SHOW GUIDE



**NEW**  
Dual Band HT

# Dual Band Handheld FT-51R

Only one Dial/Volume knob required for easier use.

## The First Dual Band HT with **WINDOWS!**

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.

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

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

"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!"

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!

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.

### 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

Specifications subject to change without notice. Specifications guaranteed only within amateur bands.

Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.

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Make sure you don't get left behind - last chance to book your place on the amateur radio holiday of a lifetime.

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We apologise that due to Editorial space limitations this month, 'Valve & Vintage' has been held over.

## COMING NEXT MONTH

In the April issue of PW we take a look at low power operating with a QRP Special, plus bring you Part 2 of the PW Martlet 70MHz f.m. Transceiver project, all your regular features and much more.

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# SMC, A.R.E. & REG

We believe in offering our customers the best deal possible, by *the middle man*". Most of the following products we import *previous*

## THIS MONTHS SPECIALS

**YAESU FT-736R** Manufacturers list price **£1789**

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+ FREE  
2M/7CM base  
antenna. TSB-3301  
6.5/9dB gain  
worth £68

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TH-28	Our Price £259 Save £40
TH-78	Our Price £399 Save £40
TH79E	Our Price £399 Save £50
TH-42	Our Price £239 Save £30

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FT-530	Our Price £375	Save £124
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FT-690R2	Our Price £459	Save £80
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## HF EQUIPMENT

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FT-990	Our Price £1999	Save £300
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FT-890	Our Price £1079	Save £220
FT-890AT	Our Price £1279	Save £220
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TS-450S	Our Price £1249	Save £150
TS-450SAT	Our Price £1379	Save £170
TS-690S	Our Price £1379	Save £170
TS-50S	SEE THIS MONTHS SPECIAL OFFER	
TS-140S	Our Price £799	Save £100

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IC-2700H	Our Price £739	Save £90
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TM-733E	Our Price £659	Save £70
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TM-455E	Our Price £899	Save £100
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STAND 'M' IN THE RED HALL

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## FT 51R

The First Dual Band Handi with Windows

- Features
- \* Dual band 2m/70cm
  - \* Full duplex operation
  - \* Spectrum Scope
  - \* User help menu
  - \* Message paging with CW playback
  - \* Auto sub Rx muting
  - \* Built in CTCSS
  - \* Automatic Repeater Shift
  - \* 120 Memory Channels
  - \* Dual in-band receive U&V, V&V or U&U



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**G400** with meter controller  
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G800SDX 450° DeLuxe	£399	D
G1000 SDX H/D version of G800	£459	D
G2700SDX H/D rotator	£859	D
G500A Elevation rotator	£265	D
G5400 AZI/ELE rotator	£499	D
G5600 H/D AZI/EE rotator	£569	D
RC5-1 medium duty create	£299	D

Model	Price	Carr
RC5-3 medium duty + preset	£399.00	D
RC5A-3 H/D + preset	£599.00	D
RC5B-3 Very H/D + preset	£599.00	D
GC-038B Lower clamp G, 400, 800, 1000	£23.00	C
GC-038 Lower clamp G-600	£23.00	C
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B2516G 2m, 25W input, 160W output preamp	269.00	C
B5016G 2m, 50W input, 160W output preamp	269.00	C
D1010N 70cm, 10W input, 100W output	349.00	C
D3010N 70cm, 25W input, 100W output	329.00	C
RC1 Remote switching unit for Mirage amps c/w 18ft cable run	38.00	B

Model	Price	Carr
KP2/2M 2m GaAs fet 0.6dB NF 20-25dB gain or 10-15dB adjustable 165W through power	149.95	B
KP2/440 70cm GaAs fet 0.6dB NF 20-25dB gain or 10-15dB adjustable 165W through power	149.95	B

Model	Price	Carr
MP2 50-200MHz, 50-500-1500W average and PEP reading + SWR 9-13.6VDC internal battery	189.00	B
MP4 1260-1300MHz, 1-10-100W average and PEP reading + SWR9-13.6VDC internal battery	229.00	B



TNC's and Data Modems

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CA-21HR 21MHZ Mobile Whip	£38.00
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CH600MX 2/70/23CM Whip BNC	£25.00
CA-50HR 6M MOBILE Whip	£38.00
CA2X4KG 2M/70CM Mobile Whip	£45.00
Z4 2m/70cm M. whip w/locking collar	£33.00
B-10 2M/70CM Mobile Whip	£18.50
CHL21J 2M/70CM Mobile Whip	£15.00
CA-350dB 6M/10M Base Colinear	£140.00
ABC23 3 x 1/2 Base Colinear	£55.00
GP9N 2M/70CM Base Colinear	£123.00
GP15 6M/2M/70CM Base Colinear	£85.00
CX-902 2M/70CM/23CM Base Colinear	£84.50

CF-520 2M/6M Duplexer	£24.50
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CK-3MB Mini Cable Assembly	£19.50
WS-1M Window Mount & Cable	£36.50

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CF-50MR 6M Low Pass Filter 1KW PEP	£35.00
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CF-50S 6M Low Pass Filter 150W PEP	£19.50
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A103	30m Extension A3WS	£115.00
204CD	4 ele 20m Yagi	£439.00
154CD	4 ele 15m Yagi	£249.00
D4	Dipole 10/15/20/40m	£229.00
D3W	Dipole 12/17/30m	£169.00

A4S	3-4 ele Yagi 10/15/20m	£425.00
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## VHF Antennas

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AR2	2m Vertical 1.2m long	£35.00
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A148-10S	2m 10-ele Yagi 13.2 dBd	£59.00
A144-20T	2m 10-ele Cross Yagi 12.2 dBd	£99.00
13B2	13-ele 2m Yagi	£99.95
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HL100B/10	10M Linear, 10W in 100W out PEP Suitable for 21/24/28MHz	210 C
HL100B/20	20M Linear, 10W in 100W out PEP	210 C
HL100B/80	80M Linear, 10W in 100W out PEP	210 C
HL66V	6M Linear, 10W in 50-60W out Rx Preamp	169 C
HL156V	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
HL180V	2M Linear, 3/10/25W up auto select 170W out Rx Preamp	389 C

Tokyo Hy-Power. One can only describe their products as "Japanese design and build quality at its very best"

HL130U	70cms Llinear, 3/10/25W up auto select 120W out Rx Preamp	485 C
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### TRANSVERTORS

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HX640	6M to HF Specs as above	299 B
HX650	10M to 6M transverter high performance, MGF1302 Preamp dB/12dB selectable 10/50W selectable output input selectable, 100m V/1V RMS	369 B



## REXON VHF/UHF HANDI'S

RL102	VHF handi, 138-174MHz, 5 watt, complete with cell case	£189.00 B
RL402	UHF handi, 410-470MHz, 5 watt, complete with cell case	£199.00 B
RNB111	7.2V 600mAh nicad for RL102	£21.50 A
RNB112	12V 500mAh nicad for RL102	£39.95 A
NC28/REXON	Charger for RNB111	£18.00 A
SMC18/REXON	Charger for RNB112	£18.00 A
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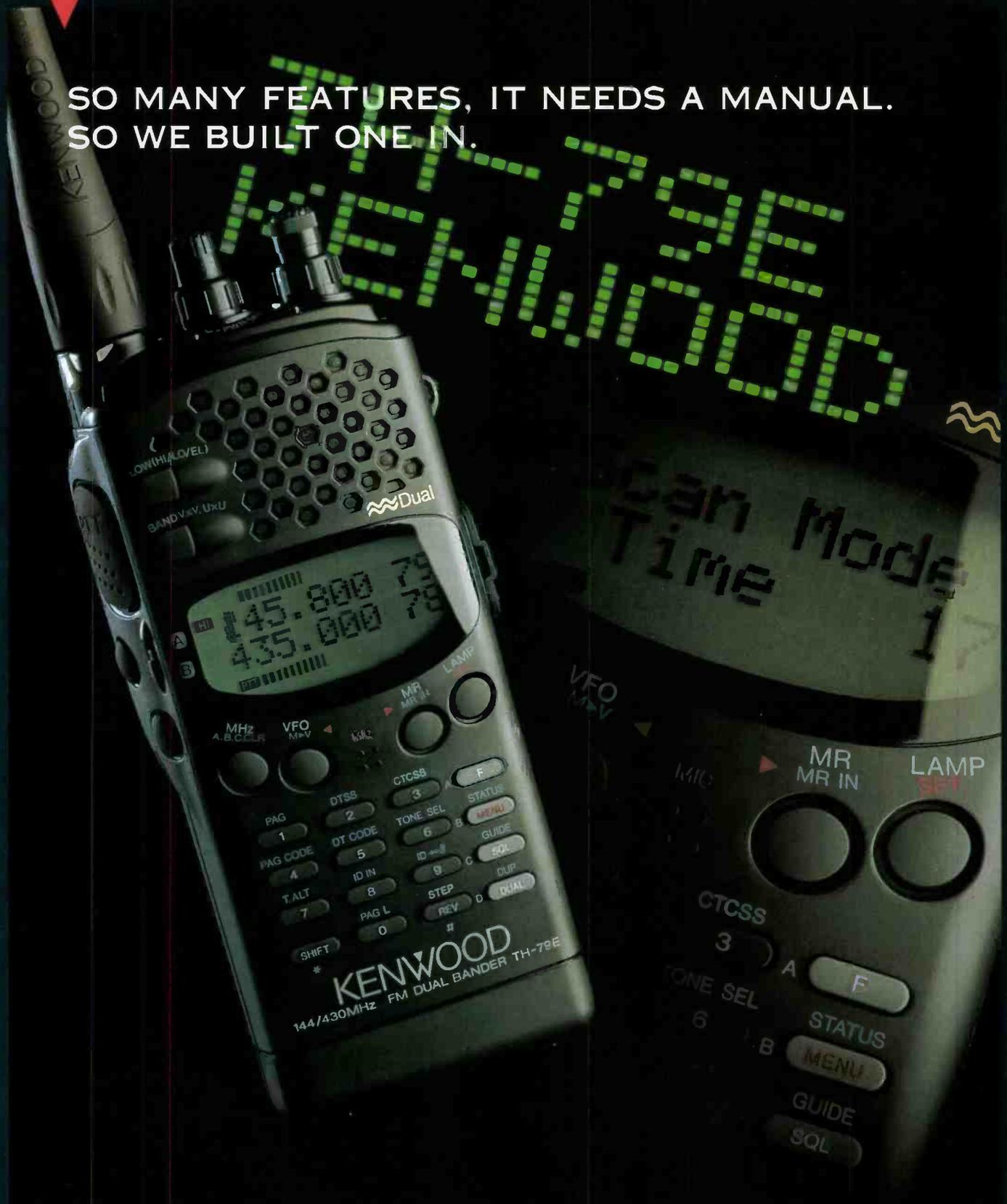
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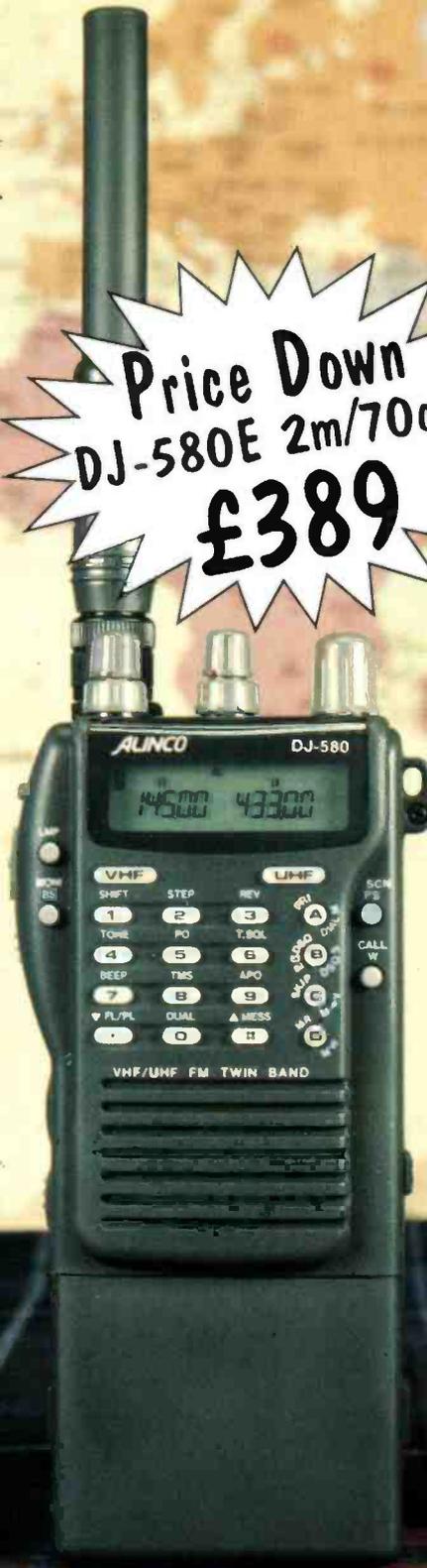


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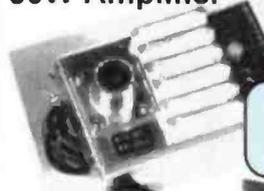
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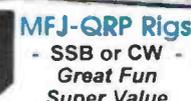


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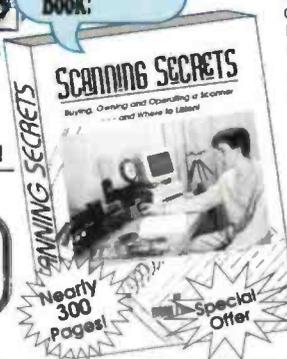
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# GUEST Keylines

**A**fter writing the first line of my guest 'Keylines', I stopped and stared at the blank sheet of paper with an equally blank mind. So, I went and had a cup of coffee, came back, and still I could not understand how, or why, I had achieved the highest accolade that could be awarded to a British Radio Amateur.

Clive Trotman, who is he, where has he come from and what's his achievements in the world of Radio or Electronics? The simple answer is, not a lot! My general background has been in Management within the manufacturing industries, so my working life has been quite mundane. It's even more apparent to me when I look at the very eminent names that have achieved the position I now occupy and that have been very prominent within the field of radio and/or electronics.

My only claim to fame in this field has been the Radio Amateur Examination Courses that I have conducted since 1981 both here in Bridgend and at the Highfields Amateur Radio Club in Cardiff. During that period I was very fortunate to have helped 437 students successfully through the examination, many of whom are now involved in Novice Training.

I have a thing about training and education. I honestly believe that if we have a skill or special knowledge we should have a moral obligation to pass that skill or knowledge on. If any young person asks what, why or how, we should find the time to give them the answer.

I know that sometimes the timing of the questions can be difficult, but we should all make the effort. I speak from experience, as I have a very inquisitive 10 year old grandson and his questions come at me like a machine gun burst. But I've found that helping young people is extremely satisfying and is certainly good for the ego!

When Rob Mannion G3XFD first invited me to write the 'Keylines' editorial I was thrilled to bits, because I first had sight of *PW* in the late 1930s when my father used to buy it. I did not understand *PW*, and to be truthful I do not think my father understood it too much either, but he did enjoy listening to broadcast stations from all over the world and he would become quite excited if he

heard a new one. At that time I could never understand why!

As a boy I used to love climbing trees and my father took full advantage of this. I can remember climbing the apple trees to pull up weird and wonderful pieces of wire. Many of these antenna ideas I believe were dreamt up by Fred Camm but whether they worked or not was another matter!

In those days we lived in the country in Herefordshire on a small holding of some 10 acres. What I would give to be living there now!

My father would spend hours turning the dial trying to catch another elusive signal from his battery powered receiver. It was powered by a 90V h.t. battery, 4.5V grid bias battery and the inevitable lead acid accumulator, and I think he must have been a frustrated DXCC hunter.



**Clive Trotman GW4YKL**  
President of the Radio Society of  
Great Britain 1995.

Over the years I have continued to read *PW* (and dare I say, *Everyday Electronics*) and build some of the small projects. Many of these had no real use and others didn't work, but it was great fun finding all the bits and pieces and putting it all together. Unfortunately, I did not have the skill or knowledge at that time to figure out why the projects didn't work.

I also played with radio controlled models for many years and I became quite skilled with the technique. But more to the point, I was still doing something, but in a different form, that I had been doing in my boyhood and teens.

During 1978/9 a friend called to see me and very furtively called me to his car, there he removed a blanket and revealed a shiny new CB transceiver. I must admit, I was intrigued, we went up to the local mountain top, some 1000ft a.s.l., and he gave me a demonstration.

The first CB station he worked was from San Paulo, and I was hooked! Here was a little box some 10 x 8in in size running at low power which allowed you the ability to converse with someone halfway round the world for **FREE!** During this time I learnt a lot about propagation and all that goes with it and had lots of fun.

So, I took stock and realised that retirement was not 10 million miles away. And, apart from playing golf, I had no hobby to occupy my time or exercise my mind (by this time I had given up radio controlled modelling). It was then that I made some enquiries about Amateur Radio, took the RAE and started life as GW6LDX.

That basically is the story so far although I still don't know how I've become President. I'm just a typical talkative Welshman who enjoys meeting people and helping whenever I can. I have been working for the RSGB since 1984/5 in various capacities and I hope that I have returned something to Amateur Radio to repay the enormous enjoyment that I have got from it.

Some time ago Rob started the *PW* 'Elmer' theme and I think we should all become 'Elmers'. How else will Amateur Radio survive? In this way I can ensure everyone that to learn something about any subject try teaching it, for sure it focuses the mind.

I have made thousands of friends over the years through Amateur Radio. And through advice and encouragement, I've also helped those 437 RAE candidates. That must be why I'm President for 1995, and it was a great pleasure to help them on their way into our great hobby.

**Clive Trotman**  
**GW4YKL**

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# RECEIVING *You*

## In Different Ways

### Dear Sir

While I accept that we are all different and enjoy amateur radio in different ways, I cannot bring myself to compete. To say 'Thank you, 5/9, QRZ' is not my cup of tea.

To me, amateur radio is about breaking down barriers and getting to know people of different countries and different ways of life.

How much does 'GO—, 5/9, QRZ' tell you about the two people in contact? What I propose is a 'Getting to know you', DXCC. To win this award, you would need 100 countries, of these, at least five minute QSOs must have taken place, details of each contact must contain callsign, QTH, name, occupation, other interest (either in radio or another hobby). And 25% must be accompanied by a photo of contact, or spouse, cat, dog, etc., or coin, postage stamp or some other thing from the country. Of course, it would take a little longer, but it would be great fun.

I remember one of my country hunting friends from when I was in the USA. I would be mobile on 28MHz and break in to tell him I was going through another country.

I did not mind this type of collecting, he knew me and had made a long QSO with one. When I said I was returning to the UK, they sent me newspapers, etc and offered help.

This is what radio is about, when I hear 5/9 QRZ, I move on, when I hear someone exchanging details and getting to know each other, I stay awhile and may even break in if the QSO permits.

So, how about it folks? Not a 'rag chewers' DXCC, but a genuine 'get to know you DXCC'!

**Dennis H. Barber  
GOUFS/KB8GCF  
Swinton**

## Bureaucratic Nightmare

### Dear Sir

I read your 'Keylines' page (January) with keen interest. As you have bought up the subject of radio amateurs and the local planning authority, I recount my own experience of this bureaucratic nightmare for the benefit of other readers who venture into the planning minefield.

At the end of last summer, I was approached by one of the local schools who had read of my activities with the space shuttle in the local paper. They had seen me on Sky TV News demonstrating amateur communications, and asked if it would be possible for me to arrange a school contact with the spacecraft and allowing them to participate in the SAREX (Shuttle Amateur Radio Experiment) mission.

A few consultations and relevant paper work completed, we sent it all off to the Education Activities Director of ARRL. The next stage was to sort out the equipment needed, and here the local amateur community came to the rescue. They were offering not only equipment, but also that very precious commodity - time in the form of operators to man the station on a 24 hour rota. So far, all well and good. Then came the antennas, and the problems!

I have a WX01 on my roof as my only antenna. So, for the purpose of the SAREX enterprise, I dug out a 144MHz 10-element X-Y beam with the intention of testing it with a view of using it for the SAREX mission, mounted on a temporary mast in the garden.

The antenna was seen by a neighbour and I was duly reported to the local authority. I then had a visit from the chief planning officer, who advised me by letter that I had to either apply for planning permission or remove the offending antenna within 28 days of receiving

the notices.

I made the mistake of applying for temporary planning permission to cover the duration of the tests. This resulted in a deluge of letters and visits from, **1:** The chairman of the local Parish Council, **2:** The Chief Planning Officer, again, and **3:** A local town council official.

The cause of the interest was that the neighbour who had complained originally, had found out that I was seeking temporary planning permission. The neighbour had fabricated a complaint that my previous antennas had blown down and damaged her garden, all untrue, I may add.

As I mentioned earlier, I only have a WX-1 antenna on the roof, but the local authority had taken her word without any mention of the nature of this complaint being made to me. Well, letters were passed back and fourth to county hall and numerous telephone calls were made.

I was then informed by the bureaucrats that the existing scaffold pole was 'A blot on the landscape' (the objectors words) and temporary permission would not be granted for the existing mast. At this point, I was wondering if trying to help the school and pupils was worth all the hassle!

So, I revised my planning application after consultation with the Chief Planning Officer, and applied for a permanent mast to be sited in the garden. Now, here is a bureaucratic logic. My existing scaffold pole is approximately seven metres in height. And it's considered a blot of the landscape, although only intended to stay up for three or four weeks.

The permanent mast that I've been told to apply for, even though I have no use for one can, when erected, be anything up to 100ft in height. (Well, what the hell, let's go the whole hog!).

So, amended plans were put forward to the planning committee. They were duly passed with enough restrictions imposed on them to make you wonder why you bothered in the first place.

The restrictions include the paragraphs **1:** That permission is only granted for a period of two years, after which, if no complaints are received, it will become permanent, **2:** The support mast can only be fully erected two or three times a month, **3:** When not in use that mast must be wound down and tilted over to reduce the possibility of damage to neighbouring residential properties and in the interest of visual amenities, **4:** Any mast erected at the above dwelling must have plans submitted to the Planning Department, who will then pass said plans to the Building Department for assessment to the possibility of structure collapsing under adverse weather conditioning in the interest of visual amenities and safety of neighbouring residential properties. **5:** The proposed structure must not be more than 4 metres from the dwelling.

With regards to condition **1:** the neighbour who complained has informed me that no matter what I put up, she will complain and oppose it. So, where do we go from here? I feel that had the local authority contacted me and said 'Look, we have received this objection, do you have any comment to make?' The whole thing could have been resolved.

If any reader is considering helping local schools or thinking of ways to benefit the community via amateur radio, forget it. You will have nothing but bureaucratic hassle for your trouble. I for one will never offer the services of this station again to anybody!  
**Colin Grellis G1YIL  
Dorset**

★ ★ ★ ★ **STAR LETTER** ★ ★ ★ ★

## Planning Permission

**Dear Sir**

With reference to Editor's 'Keylines', January *PW* and, planning permission. I noted all your comments about the unfairness of Planning Authorities and I would like to emphasise one point which arose from your comments.

Everything higher than 10 feet needs planning permission. Therefore, when applying for planning permission, you apply to erect a mast of **X** feet to hold an antenna. The authority shouldn't need to know what antenna, because they know a sight less about radio and antennas than you do!

I think you should only state what antenna you intend to erect if the planning authority ask you for the information, and inform them in the nicest possible way that they are only required to decide upon the erection of the mast.

I recommend that you **only** send in a site plan, with **X** marking the spot where you are going to put the mast. Don't give any more information than you absolutely need to give.

Remember, most of the people sitting on the planning committee, are in effect, ordinary members of the public, guided by a planning officer. If you give them too much information, you will only confuse the issue.

You may think that I am talking through my hat, and so you are entitled to. However, as a radio amateur, I have applied for planning permission in three different areas, Bournemouth 50ft, Wimborne 30ft and Powys 40ft, and using the above information, I have been successful in each case.

Thank you for an interesting magazine.

**Arthur Bagley GW4EKE  
Powys**

**Editor's reply:** Thank you Arthur for some interesting advice! Let's hope others can be as successful as you, using the simple procedure outlined.

## Trying Morse

**Dear Sir**

As a Class B Amateur (G7MPQ) for over two years and trying to learn Morse code in order to gain my A class licence, I thought I would never master the code. Although I bought the RSGB tapes and also a computer, with c.w. programs, the going seemed hard.

On discussing c.w. with a very experienced war time operator, he offered to teach me one-to-one. After a few weeks I learned the code, then I had a contact with another amateur who offered to send me c.w. over the air.

He sent me c.w. for several weeks, he kept me at it. At my third attempt, I am pleased to say I have now passed the c.w. test and acquired the callsign G0VIJ.

Without the help and mainly the encouragement of Vic G0CWD who taught me the code and Jim G0FVS who according to my log sent over 50 hours of c.w., I think I would have given up. They assured me my 60 years plus would not let me down, and they reminded me of amateurs who make it at much older ages than mine.

It makes one feel proud being a radio amateur knowing we have colleagues who will give so much of their time to help others. I would like to say a sincere thank you to Vic G0CWD and Jim G0FVS, without their help I would still be hoping.

**Joe Johnson G0VIJ  
Norfolk**

**Editor's reply:** Looks as though you have two possible *PW* 'Elmer' award nominees there John! Congratulations to you and well done to your friends who helped out in the true spirit of amateur radio.

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.

## Support For CBers

**Dear Sir**

I read with dismay the letter from G3BEC concerning ex CBers. I myself started with CB and consider myself, and many of my friends, sensible operators. You will always find someone with bad behaviour in anything that is ruled by self discipline.

The attitude of G3BEC is not typical, thank goodness, and most of the G2s, 3s and 4s, etc. on h.f. are most helpful to newcomers without the finesse gained by practice. What G3BEC forgets is that without the influx of CBers, the hobby was dying and some of the funny terms sometimes used is for amusing banter only.

Perhaps G3BEC wants people to use BBC 1946 style of language, one only has to see an old film to see how ludicrous this would be. But please do not be offended by this reply, as everyone has the right to speak his mind.

Remember, most ex CBers used CB as a 'Novice Band' before the now official scheme. On the other points about security, G3BEC has some valid points, but as I am a figurehead of a club, I must be accessible to the public via the call-book.

**Glen Loake G0GBI  
Chairman of Bedford DARC  
Bedford**

## GB2SM Saved(?)

**Dear Sir**

I am not too sure whether there should be a question mark (as above) on the front cover (and Keylines article) of your December issue 'GB2SM Saved'. It's fairly obvious from the packet 'bulletins' I've enclosed (from those that operated the station until its closure on the 7th November), that there are very differing ideas on this subject.

There are obviously 'internal' memos which they have seen that '*PW*' (understandably) does not of course have access to. Perhaps the time has come for '*PW*' to get the facts to us with a somewhat more 'in depth' article in a future issue?

**Neville Cooper G3LMO  
Cornwall**

**Editor's reply:** I have to agree with you Neville, as there appears to be much confusion over the future of GB2SM. The only thing that seems certain with the Science Museum amateur radio station is that a final decision has yet to be taken (contrary to the information we had been given). When contacted, the Science Museum were unable to provide any comment or information. However, Peter Kirby G0TWW, the RSGB General Manager, informs me that there is a meeting scheduled (it was originally planned for December 14 1994) soon to discuss the future of GB2SM and the RSGB's proposals for the station. You can be assured that *PW* will provide an up-date on the situation as soon as information is available.

## QuartSLab Crystals

The Kent based company QuartSLab Marketing Ltd., who have been supplying crystals for more than 20 years have just announced a new addition to their range. The DIL14 (TTL or CMOS) and DIL8 (CMOS) are crystal clock oscillators which are available in frequencies between 2.5 to 80MHz. Both crystal types have a standard adjustment tolerance of  $\pm 50$ ppm but alternatives are available on request.

For more details on the DIL14 and DIL8 and the full range of available crystals you are invited to contact **QuartSLab Marketing Ltd. at PO Box 19, Erith, Kent DA8 1LH. Tel: (01322) 330830, Fax: (01322) 334904.**

## Yaesu's Smallest

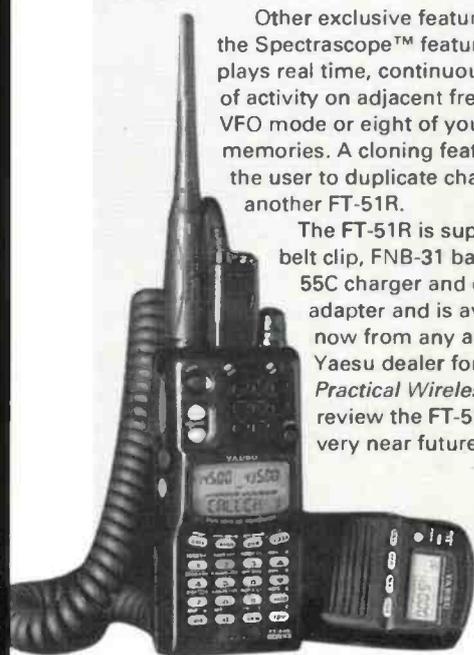
As reported in the February issue of *PW* the latest offering from the Yaesu stables is the FT-51R, a new hand-held, which is described as a state-of-the art dual-band HT. The FT-51R is a dual-band f.m. hand-held paging transceiver, is smaller than the FT-740 and FT-530 and is described as the world's smallest dual-bander.

The compactly designed FT-51R utilises dual-microprocessor control giving easier operation and boasts more features than ever before in the palm of your hand. The manufacturers say that using the FT-51R is so easy that you won't need an operating manual.

Features of the FT-51R include a scrolling instruction menu located in the large backlit display window. The menu is designed to guide you through the total operation while simultaneously viewing the main display window.

Other exclusive features include the Spectroscope™ feature. This displays real time, continuous scanning of activity on adjacent frequencies in VFO mode or eight of your favourite memories. A cloning feature enables the user to duplicate channels onto another FT-51R.

The FT-51R is supplied with belt clip, FNB-31 battery, NC-55C charger and charger adapter and is available now from any authorised Yaesu dealer for £499. *Practical Wireless* hopes to review the FT-51R in the very near future.



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

## Ham Holidays

German amateur Ulrich Kolbe DL3HUM is currently running 'Ham' holidays in central Germany. The holidays are designed to appeal to people interested in Germany, the way of life, the language, sightseeing and of course amateur radio. For more information you are invited to contact **Ulrich Kolbe, Bergstr. 10, D-06502, Weddersleben, Germany. Tel/FAX: 01049 3946 705442. PR: DL3HUM @ DB0ERF.THR.DL.EU**

# NEWS '95

## Buy Books & Win £50!

Don't forget that if you order books from the wide selection offered in the *PW* Book Service you will automatically be entered into the £50 Prize Draw for that month. The lucky winner from the January 1995 issue of *PW* was **Colin Dynes** of **County Armagh, Northern Ireland.**

## Nevada - Twenty Five Years On

**Nevada Communications of Portsmouth are this year, about to enter their 26th year of trading. Mike Devereux G3SED sent us this photo showing him in 1969 standing in the doorway of his very first shop.**

Mike told *PW* that he has been fascinated by radio since the age of 12 and got his callsign G3SED when he was 15. After he graduated Mike decided to make a career out of his hobby and opened a small shop called Telecomms.

In the early days Mike sold mainly ex-government equipment and remembers that Kenwood were only just coming into radio and that their equipment was distributed by B. H. Morris, a Hi-Fi supplier. Other memories from Mike include those of radio enthusiasts spending hours in his shop carefully looking through the piles of components searching for parts that they could use in their 'Top Band' transmitters.

Today Nevada Communications enjoy a multi-million pound turnover, are well known throughout the amateur world and offer a wide range of amateur and short wave equipment. Mike is still very active as an amateur and has travelled to many parts of the world, operating from remote locations. He believes in treating his customers in the way he would like to be treated - Mike thinks this philosophy is the reason behind Nevada's continued success.

**Mike Devereux G3SED as he is today as Managing Director of Nevada Communications.**



## Bureau Change

The Radio Society of Great Britain have informed the 'Newsdesk' that there has been a change of address and telephone number for the UK Novice QSL Bureau. All correspondence should now be sent to **Mr Michael Shread GM6TAN, RSGB Novice QSL Bureau Sub-Manager, 15 Hardie Court, Aberchirder, Huntly, Aberdeenshire AB54 5T. Tel: (01466) 780739.**

## Conway Repairs

Peter Conway G3UFI, who is based in Sussex, has recently set-up an Amateur Radio repairs service. Peter will be specialising in Kenwood, Icom and Yaesu equipment and looks forward to welcoming customers from Sussex and further afield. To find out more about Peter's repair service why not give him a call on **(01424) 753949.**

## Club Call Operational

The Club Callsign of the International Short Wave League (ISWL), **GX4BJC** will be operational throughout 1995 using a variety of modes and bands. The call will be activated by a different member of the ISWL each month (see table below) with each operator signing GX4BJC/P, except for Dick G2BRR who will sign G4BJC.

Anyone hearing or working GX4BJC is eligible to receive a special ISWL Club Callsign QSL card. Cards will be sent out on receipt of an incoming QSL or reception report and QSLs should be sent either via the bureau or direct to the ISWL Club Callsign Manager, **David Beale G0DBX/G-10618, 'Kenwood', London Road, Louth, Lincolnshire LN11 8QH.** An s.a.e. would be appreciated from anyone wishing to receive a QSL direct.

Month	Operator	Name
February	G4GQH	Alan
March	G4EQQ	Paul
April	G4KJV	John
May	G0DBX	David
June	G3JFD	Bernard
July	G4CPA	Geoff
August	G4ICC	Mike
September	G4DMS	Philip
October	G0IYZ	Chris
November	G2BRR	Dick
December	To Be Announced	



## Eddystone News

The Eddystone User Group (EUG) have recently sent the *PW* Newsdesk a copy of a new publication they have put together. The A4 sized publication entitled a *Compilation of Faults Found on the Older Valve Models* has been made possible with the help of many of the EUG members.

The Eddystone User Group is very active, with members all over the world. The group prides itself in being able to provide its members with unlimited technical help, together with copies of all manuals and circuits for Eddystone models from the 1920s onwards.

The *Eddystone User Group Newsletter* is sent out six times a year and starts with the May/June issue, as May is the annual subscription date. Subscriptions are £10 for a year (UK), £11 (Europe). Back copies of the Newsletter are also available for £2 each.

If you wish to become a member of the EUG send a sterling cheque made payable to the Eddystone User Group to the **EUG, c/o Eddystone Radio Ltd., Alvechurch Road, Birmingham B31 3PP.** **Chris Pettit G0EYO** the Managing Director of Eddystone Radio is himself a member of the Eddystone User Group. Chris will be attending the National Vintage Communications Fair in May to help promote the EUG.

## Savoy Hill Leaflets

Savoy Hill Publications who are based in North Devon can supply vintage circuits, manuals and historical information on all things electrical.

For the enthusiast they currently have the following pamphlets available: *Military service manuals & data catalogue listing, Hi-fi, & audio service manuals, Valve manual copies availability list, Wholesaler catalogues listings, Radios & components 1992 onwards, Test equipment listings - Valve testers, oscilloscopes etc., Radio Receivers 1914 onwards to early transistor, Styli listing for record players 1950/60s.* If you would like copies of any of the pamphlets you should send a large s.a.e. to **Savoy Hill Publications, Seven Ash Cottage, Combe Martin, North Devon EX34 0PA.**

## Lowe's Test Equipment

Lowe Electronics are now stocking the Trio-Kenwood range of general purpose test equipment and measuring equipment in its chain of shops. Lowe Electronics, whose Head Office is in Matlock also have retail outlets in Bristol, Cambridge, Cumbernauld, Leeds, Maidstone, Newbury, Newcastle-upon-Tyne and Plymouth. Each branch will stock and provide technical help for a range of test instruments and will also be able provide instore demonstrations of the equipment.

The Trio-Kenwood range of test equipment includes oscilloscopes, power supplies, multimeters, frequency counters and function generators. For more information on the range of test equipment available from **Lowe Electronics** you can contact Lowe's direct at **Chesterfield Road, Matlock, Derbyshire DE4 5LE. Tel: (01629) 580800.**



## Successful Launch

Southern Scanning & Shortwave (SS&S) held their official opening launch on January 15 1995 at the Southern Electric Museum, Christchurch, Dorset. The event was well supported with nearly 500 people attending throughout the day.

The SS&S team for the launch was made up of **John G1HOK, Bob G6DUN, John G0SKR, Colin G3AXS, Martin s.w.l., Debbie 2E1CFQ, Jessica 2E1DHK and Carla 2E1CCB** (pictured L-R). Also attending were **Mike Devereux G3SED** and **Phil Jeffery** of Nevada and **David Wilkins G5HY** of Kenwood UK Limited.

Southern Scanning & Shortwave can supply a wide range of amateur, s.w.l., airband and scanning equipment and are the authorised Kenwood dealer for the south of England. They are also agents for Yaesu and Icom and can supply equipment from most leading manufacturers such as AOR, ADI, AKD, Alinco, Create, Diamond, Lowe, MFJ, Microset, Revex, Taiwan Serene, Tonna and Yupiteru. In addition to this SS&S can put you in touch with their recommended antenna contractor, Eclipse, who will erect antennas bought from SS&S at a very reasonable price.

You can contact **SS&S** at **PO Box 2126, Bournemouth BH11 9YH. Tel: (01202) 590779 or (0836) 246955/246847.**



## Jack Hum G5UM

**Jack Hum G5UM**, one of the pioneer v.h.f. amateur radio operators passed away at his Leicester home in early January. Jack 'Uncle Mike' was a very popular and familiar voice to many on v.h.f. He will be greatly missed.

*Practical Wireless* and *Short Wave Magazine* were represented at the funeral on January 17 by **Dick Ganderton G8VFH**, Editor of *SWM*. (A full appreciation of Jack G5UM will appear in the April issue of *PW*. Editor).

# IN TOUCH WITH

## If you're coming to Pickett's Lock - visit the Kantronics Packet Village on the Lowe Stand

Kantronics' experts will be on hand to offer expert advice on the Lowe stand as well as providing interesting talks as part of the lecture stream.

Your chance to make sure your views are fed back to the manufacturers.



They'll be demonstrating all the latest products and we'll have the whole lot on working demonstration showing you just what you can achieve with Packet. We'll also be demonstrating the new GTOR mode and you'll find out just what is making GTOR the real mode for h.f. data communications in the 90's, so make sure you come along.

Lowe Electronics is THE place to buy your datacoms gear. We can supply you with everything you'll need from the antenna to the rig to the TNC and everything in between, including all the leads you'll need. Whether you want a simple v.h.f. only Packet station or a full blown h.f. multimode capability, Lowe are the right people. No one else combines our expertise in datacoms products and transceivers.



*P.S. - There's a new type of 'Packet' on the air. Tune to 131.725MHz a.m. and just listen to the data bursts. Wonder what it is? Well, its called ACARS, and means Aircraft Communications and Reporting System. This is a system that allows airliners and controllers to keep in touch with aircraft in flight and automatically report engineering and flight information, together with the ability to send messages in plain text. Basically, it's Packet radio for planes and you can decode it with AIRMASTER - the cheapest way to monitor ACARS. See it in action on the Lowe stand.*

## Check Out Our Other Pickett's Lock Goodies!

Lowe Electronics probably has the biggest range of Ham radio equipment and accessories available on the shelf in the whole of the UK, many of which we are the factory appointed distributor - (and we could do AEA too if we wanted!). Here's just a few of the goodies you'll be able to see at the show...

Manson power supplies... We're really famous for these. Who else gives you a variable voltage supply with separate voltage and current meters rated at 25A continuous for just £99.95. Have you got your's yet?

At Pickett's Lock you'll be able to see and hear just why JPS digital audio filters are the best in the world. We'll have the full range on working demonstration so you'll be able to try them out for yourself.

With spring approaching, you'll need to think about upgrading, improving or just maintaining your antenna system. Talk to Lowe about Butternut, Hygain, Maldol, Vargarda, Tonna and don't forget our rotator range.

If you are just looking for small accessories, make Lowe your number one call at Pickett's Lock. We stock more accessories than any other dealer you will find anywhere, from crystal filters, CCTSS units to voice synthesisers, a.t.u.s to d.c. leads, cases, battery packs, headphones, speakers - just about everything you will ever need!

We've got everything the mobile operator needs from Maldol mobile antennas and a super range of antenna mounts to suit all types of vehicle. We've also got some special d.c. leads ideal for using your hand-held transceiver or scanner in your car and a perfect mobile mount to hold it in place, and if you need a bit more sound, check out our range of extension speakers.

You'll really be able to put Lowe to the test as we are now stocking Kenwood's superb range of test gear, including 'scopes, signal generators and digital meters. This really increases our usual test gear range and makes Lowe Electronics your number one choice for great test gear at affordable prices.

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Northbrook Street  
Newbury  
Tel: (01635) 522122

### NORTH EAST

Mitford House  
Newcastle Int. Airport  
Newcastle Upon Tyne  
Tel: (01661) 860418

### SCOTLAND

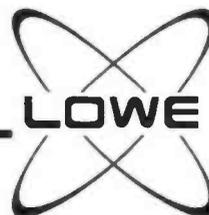
Cumbernauld Airport  
Cumbernauld  
Strathclyde  
Tel: (01236) 721004

### WALES & WEST

79/81 Gloucester Rd  
Patchway  
Bristol  
Tel: 0117-931 5263



Lowe Electronics have been appointed  
'Master Dealer' by YAESU UK



Low  
Chesterfield Road

# THE WORLD



We'll have the usual range of products from leading manufactures like Yaesu and Kenwood and you'll see everyone else advertising, but we'll have our own super deals and special offers, including some that our competitors wouldn't DARE to offer! We'll have super clearance lines too so make sure you visit the Lowe stand first for a real bargain. If we haven't got it, it's probably not worth having.

And if you can't make it to Pickett's Lock, all our show rooms around the country are still open on the Friday and Saturday - unlike some of our friends in the business, we don't need to close up just because there's a show on somewhere!

## 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

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

Plus

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

Lowe also stock a wide range of books covering all aspects of antenna design and construction. A full range can be seen in all of our branches. We also stock a superb range of quality test equipment that anyone building antennas really needs to have, including Diamond power and s.w.r. metres, MFJ antenna, s.w.r. analysers and AEA analysers.

Just send us four first class stamps for our complete Antenna Fact Pack which includes Chelcom's MultiSystem components and verticals, Hygain, Butternut, Vargarda and the full range of rotators from Hygain, Yaesu and Emotator.

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Tel: 0113-245 2657

**SOUTH WEST**  
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# NOVICE Natter

*This month Elaine Richards G4LFM has some advice on safety, takes a humorous look at the hobby and traces the life of a QSL card in 'First Steps'.*

*For Radio Beginners of all Ages.*

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

## Hobby Humour

Something that appeared in Central Scotland FM Group's newsletter, *FM News* back in 1991 caught one reader's eye. Here are some quotes from Shakespeare that could be spoken by or be about amateur radio types:

*"She shall watch all night:*

*And if she chance to nod I'll rail and brawl, And with the clamour keep her awake". - A Contester*

*"My father named me Autolycus; who being as I am, littered under Mercury, was likewise a snapper-up of unconsidered trifles". - A Bring & Buy Addict*

*"If the first heir of my invention prove deformed. I shall be sorry it had so noble a godfather". - A Home-brewer*

*"That affable familiar ghost which nightly gulls him with intelligence". - A Top Band Man*

*"Marry, Sir, sometimes he is a kind of puritan". - A Compulsive Morse Diehard*

*"Farewell! thou art too dear for my possessing". - All of us as some time, in a radio shop!*

Newsletters, like the *FM News* issue that supplied the above quotes, are a brilliant source of humour.

If you've got any good quotes send them in. After all, it is a hobby we're involved in and it does us good not to take it too seriously once in a while.

## Safety

During the dark winter evenings, many radio enthusiasts get around to either building the projects they've always been meaning to. Or they might have a go at building that antenna ready for the summer, or perhaps repairing that piece of kit that's been giving trouble for a while.

The problems that this can bring are many - not least the chance of hurting yourself if you don't pay attention to safety. Newcomers to the hobby may not be aware of the dangers and sometimes even old hands can become complacent!

So, you've got all your tools out on the kitchen/dining room table. Then you just happen to drop a screwdriver or leave the soldering iron lying down and either chip or burn the table.

Ooops! I expect that would go down like a lead balloon. **Please** use a board to protect the table or other important work surface.

When working with the soldering iron, be careful as it can give you a very nasty burn if you touch the wrong end! Soldering irons can also start fires if carelessly left around. They are usually mains devices too, so care should be taken when either connecting the plug or taking it in and out of the socket.

I know it sounds over cautious, but you should wear old clothes and probably goggles too. Don't sneer. I ruined a very good (and new) pair of jeans after dropping hot solder from the end of the iron onto them many years ago, it's a lesson I've not forgotten.

If you've decided to build an antenna, take care when you get around to putting it up in the air. Ladders are accidents looking for somewhere to happen.

On a personal note, if you wear a wedding ring please take it off before doing any jobs like erecting antennas. My husband, Mike, fell from a ladder last year and severed the tendons and nerves in his ring finger.

Mike was lucky to keep the finger on the hand. According to the nurses in hospital, many people aren't so lucky!

If you're letting someone else climb the ladder and you are 'footing' it, perhaps it might not be a bad idea to consider a hard hat. Antennas can be large, heavy items and if they are dropped could have some very unpleasant effects.

I'm sure you can think of other calamities that can befall you, these are only a few suggestions as to what to protect yourself from. Think about it, you could be glad you did,

## Digital Multimeters

Roger Doyle's article in the December '94 *PW* inspired **Mr Hartland** of Worcester to write asking for more practical information on how to use a digital multimeter. In a later column I'll give a few tips on using a digital multimeter, but I'll start by pointing out a few of the limitations of these meters.

If you've used a digital meter before you will no doubt have discovered that they are almost useless for measuring a changing value. If you were to try and measure the audio output from your receiver whilst tuned to a typical broadcast station you would just be faced with an assortment of flickering digits. This is caused by the meter continually sampling the measurement point and having to display a totally different value every time.

Some meters try to overcome the flickering digit problem by providing a thermometer-like bar display at the bottom of the main display. This then runs from left to right in-line with the selected measurement scale. Although rather crude, it can at least help to give an indication of what's going on.

The other alternative is to use a meter with a peak hold facility. This is where the meter automatically monitors the measured value, but only displays the highest value noted. This generally gives a fairly steady display that's a very accurate representation of the maximum value at the measurement point.

One other point to note is the effect of the leads between the item being measured and the meter. Most meters come with a set of simple wire leads with probes and crocodile clips.

Probes and clips are fine for most d.c. and low frequency measurements. But it's not so good when trying to take measurements in sensitive radio or audio equipment. In these cases the leads themselves can dramatically effect the item being measured and give misleading results.

The solution is to use a special measurement probe. These are usually available as an optional extra with the more sophisticated meters. However, as space is limited I'll come back to the subject of using digital multimeters next month.

## First Steps

### Proof Of Contact - QSL Cards

This month I thought I'd look at QSL cards and how they travel around the world. But I'm not going to talk about what QSL cards are as I'm sure you've worked that out by now.

The QSL cards come in very useful if you are applying for one of the many awards on offer, as some awards require them as proof of the contacts. They are also a good collectors item and proof of your achievement.

If you're just starting out, getting your QSL cards is the first hurdle. Do you want a unique card, or a standard card overprinted with your callsign, or perhaps a 'rubber stamp' you can place on the back of a suitable postcard?

The possibilities are immense. Now, obviously the individual card is the most expensive, although with computer clip art these days, getting the artwork done is much easier.

Use the *Yellow Pages* and 'phone a few local printers to get the costs of having the cards made. Beg, borrow or steal a friend's card to get the size and details correct.

If you want an overprinted card then there are lots of advertisers in the amateur radio magazines who will be able to help. If you are a member of a specialist organisation - the International Short Wave League, G-QRP Club or Royal Naval Amateur Radio Society for example - then that group will often have their own design of card that you can use or have their own printers who will overprint the cards.

It's worth finding out about as some of the cards can be very eye-catching. They are also usually very good value for money.

Finally, if you can get suitable postcards - say of a famous local landmark - at a good price you may want to stamp your own. It's up to you.

Right, so you've had the cards printed, you've worked a few stations and filled in their cards, now what happens. And in answer you have a few choices!

The Radio Society of Great Britain (RSGB) runs a QSL bureau for its members, which is a marvel of organisational logistics. To use it, you send your cards, sorted alphabetically, to one address in the UK.

The RSGB then arrange for the cards to be sent to the appropriate organisation in the correct country. Here, the cards are sorted and then sent on to the amateur concerned.

To receive cards, members (and non members too, which is generous) simply give stamped, self-addressed envelopes of a suitable size with the correct QSL manager for their callsign. Then, when your envelope has a reasonable content, it is posted to you!

The whole operation world-wide is amazing, I wonder just how many cards are exchanged this way in a year - I'm sure there is someone out there who has the answer too!

Personally, if you are going to be sending a lot of cards each year then I think this justifies the membership fee to the RSGB alone. And you get all the other benefits for nothing.

There are alternatives, again if you belong to a Society or specialist group, they usually run an inter-club bureau for sending cards to and from members. They are often enclosed with copies of the newsletter when it arrives.

Or, you can send the cards direct, but this can be expensive. You should then send either an s.a.e. or IRC to cover the return costs.

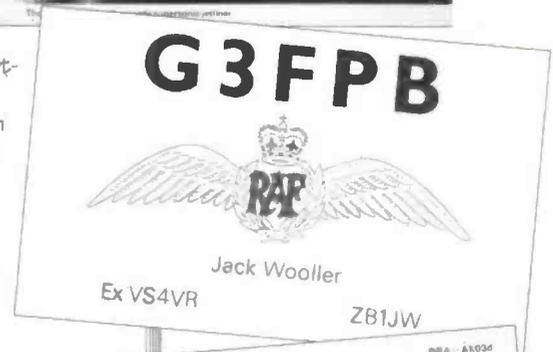
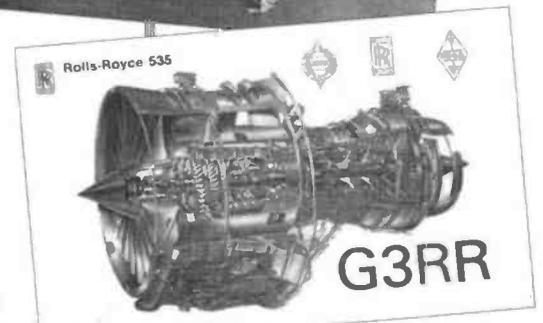
The direct method is fine if you are chasing the last card needed for an award or if it's a particularly special card. But to do this for all your QSLs, you need a lot of stamps!

Another problem is finding out the addresses of the amateurs. Using the bureau you only need the callsign, using the direct postal system you need the full address.

Not many amateurs are willing to read their address out on air, so you have to use the various national and international callbooks. These are very expensive, and the international ones are not always very up-to-date, but hopefully if you live near to a large lending library they will have them.

I hope this has explained the life of a QSL card a little. They really are amazing pieces of paper/card!

Here is a selection of possible QSL card designs.



Space has caught up with me again, so until next time cheerio and don't forget to keep sending me your novice 'natterings'.

Elaine G4LFM

## Apologies To Poldhu

The Club Spotlight team would like to apologise to the **Poldhu Amateur Radio Club** for any embarrassment caused by the publication of the incorrect contact telephone number in the January issue of *PW*. The correct contact number for the Poldhu ARC is that of the Secretary, **Carolyn Rule G1ZPC** and is **(01326) 240144**.

The members of Poldhu ARC had a busy time in December when they ran a special event station on December 12 to commemorate the anniversary of the first 'S' sent from the club's site on 12/12/1901. The special station resulted in several hundred contacts being made with amateurs from all over the world.

The club has recently been experiencing an increased demand for membership and things within the club are going very well. However, one problem area that has been discovered is that there was a shortage in the number of envelopes sent to the QSL Bureau. Unfortunately, by the time this was realised a lot of cards had already been destroyed. The Poldhu Club would therefore like to apologise to anyone who hasn't received a reply QSL.

**John G0JUR** has been appointed as the new QSL Manager for the club. Together with a team of volunteers, John will strive to ensure that the QSL system runs smoothly from now on.

## Denby's Details

**The Denby Dale Amateur Radio Society** provides RAE, Morse and Novice RAE courses and is a registered City & Guilds examinations centre for both the RAE and Novice RAE. For more information on the courses mentioned, you can ring the club secretary **Brenda G4OTE** on **(01484) 424776**.

The club meets each Wednesday at 8.30pm in the Pie Hall, Wakefield Road, Denby Dale, West Yorkshire. A few up and coming events are a talk on radio controlled aeromodelling by David Brian on Feb 15 and on March 1 there is a talk by David G0EVA on the aspects of sky wave propagation.

Further details can be obtained from the secretary, **Kevin G1FYS** on **(01484) 547553**.

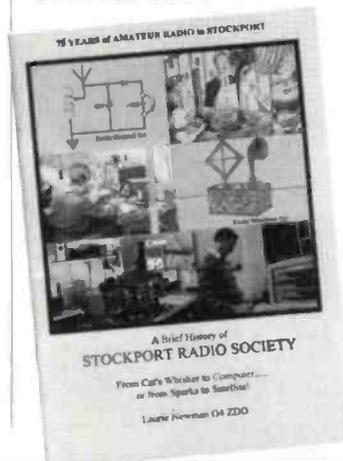
## Stockport's 75th

This year, 1995, sees the 75th anniversary of the **Stockport Radio Society** who were formed and inaugurated on June 4 1920. To mark the occasion Laurie Newman G4ZDO has researched and compiled a definitive history of the Society.

The finished publication entitled *A Brief History of Stockport Radio Society* is not intended as a technical book, but as more of a souvenir record to celebrate the 75 years of amateur radio in and around Stockport - the story so far. Laurie has written and produced the book entirely by himself and it's hoped that all the printing costs will be covered by the sales to members and friends. Stockport's local Borough Council have even requested a few copies to place in their Reference and Heritage libraries (The Editor says he thoroughly enjoyed

reading his copy).

The Stockport Radio Society meet on the 2nd and 4th Wednesdays of the month at Room 14, Dialstone Centre, Lisburne Lane, Offerton, Stockport, Cheshire. If you 'd like to be part of the next 75 year chapter of the club's history why not go along and join in with the activities? More details can be obtained from **Jim France G3KAF** on **0161-439 4952**.



## Southgate Amateur Radio Club

Since its original inception in 1936 as the Southgate and Finchley Group of the RSGB, the aim of the **Southgate Amateur Radio Club** has been to hold meetings, bringing together persons interested in amateur radio or electronics generally. The club also aims to foster the spirit of amateur radio.

The Southgate Amateur Radio Club provide a meeting

place and forum where those with similar interests can share their experiences, discuss any problems and enthuse about their achievements. Some of the club's activities include talks on technical topics, equipment sales, DF hunts and demonstration stations.

Membership is open to all who are interested in any of the many facets of amateur radio. Members range in age from

youngsters to senior citizens and visitors and new members are always welcome.

Subscription rates for full membership for 1995 is £15 with a 50% reduction for under 18s and senior citizens. Family membership, which covers two persons living at the same address, costs £22.50.

Contact **Mary Craine G0UMF**, the club's Meetings Secretary on **0181-889 1448**.

## Manchester & District Amateur Radio Society

**The Manchester and District Amateur Radio Society** would like to remind all *PW* readers that they meet every Tuesday from 7-10pm (except Bank Holidays) at the Simpson Memorial

Community Centre, Moston Lane, Moston, Manchester.

Novice RAE and RAE courses are run on a continuous basis and Morse tuition is arranged on demand, all are free to members. Lectures are

normally arranged for the third Tuesday of the month. For further information you can speak to **Anthony B. Langfield G3IOA** on **0161-681 5406**.

## Liberation Of Guernsey

On Tuesday May 9 1995 the **Guernsey Amateur Radio Society** will run a special event station in connection with the 50th anniversary of the Liberation of Guernsey at the end of the Second World War. The special event station is to run from Castle Corney in St Peter Port, Guernsey. The station begins operating from Sunday May 7 until Saturday May 13, with a full 24 hour operation on Liberation day, Tuesday May 9.

The Guernsey Amateur Radio Society is hoping to run on all h.f. bands, 1.8 to 28MHz with s.s.b., c.w. and RTTY. A QRP station will also run for periods during the week, to give QRPers the chance to make contact. The society will also be running packet on 144MHz and, if conditions allow, they will run 144 and 430MHz f.m. and s.s.b. Satellite working is also a strong possibility!

For readers interested in 'Castles on the Air', the Guernsey Amateur Radio Society are running a station from a 13th century castle, built on a rock that was originally a mile from St. Peter Port. The gap has since been bridged by a causeway.

For square hunters, the locator is IN89RK, and the Worked All Britain is WV37, St. Peter Port. To find out more, you can contact **Phil Cooper GU0SUP**.



# RADIO Diary

**February 12:** The Cambridge & District Amateur Radio Club are holding their annual rally and car boot sale at the Ambulance Station, New Addenbrookes Hospital, Cambridge at 10.30am (traders from 8am). Further info from **George Benton G00EL** - Rally Secretary - on (01954) 719273/200072.

**February 12:** The 4th Northern Cross Rally is being held at Rodillian School on the A61 between Leeds and Wakefield (near Jn. M1/M62). Doors open at 11am (10.30am for disabled visitors and Bring & Buy). £1 entry. There will be the usual dealers and groups, bar and refreshments available plus a Morse test on demand with two passport photos. Talk-in on 144 and 430MHz. **Dave Gray** on 0113-282 7883.

**February 19:** The RSGB VHF Convention is being held at Sandown Park Exhibition Centre. Further details can be obtained from **G3MNV** on (01277) 225563.

**February 25:** The 10th Rainham Radio Rally is to be held at the Rainham School for Girls, Derwent Way, Rainham, Gillingham, Kent ME8 0BX. It is very easy to find from Jn. 4 of the M2 motorway the A278 or from the A2 from Rainham. Doors open at 10am, 9.30am for disabled visitors. There will be the usual trade stands, plus a few new ones selling computers. Many special interest groups will be represented, ie. RAYNET, RNARS, Packet, KRGroup and Kent TV Group. There is also a talk-in on S22 by GB4RRR, a Bring & Buy, licensed bar, and snacks and refreshments also available with somewhere to sit and eat. Admission is £1, children under 14 free. Further information from **Martin G7JBO** on (01634) 365980 any reasonable time.

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

The Editorial staff of *PW* cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers.

If you have any queries about a particular event, please contact the organisers direct. - Editor

**March 4:** The Aberystwyth & DARS are holding their West Wales Amateur Radio & Computer Rally at The Aberaeron Comprehensive School, Aberaeron. Doors open at 10.30am to 4pm, with entrance fee being only 50p! There will be trade stands, special interest groups, a Bring & Buy, repeater group, computers, W/FAX demo, h.f. and v.h.f. station on the air, packet radio and lots more for the amateur radio and computer hobbyist. There is a free raffle for a Venus DataPack, worth, £50. For more details contact **Katy GWOFFO** on (01545) 580675.

**\*March 11/12:** The London Amateur Radio & Computer Show will be held at Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London N9. Doors open at 10am to 5pm each day. There will be a trade show, lectures, Bring & Buy, on-demand Morse tests, facilities for the disabled, bars, restaurants, special interest groups and ample free parking. For further information you can contact **Steve White G3ZVW** on 0181-882 5125.

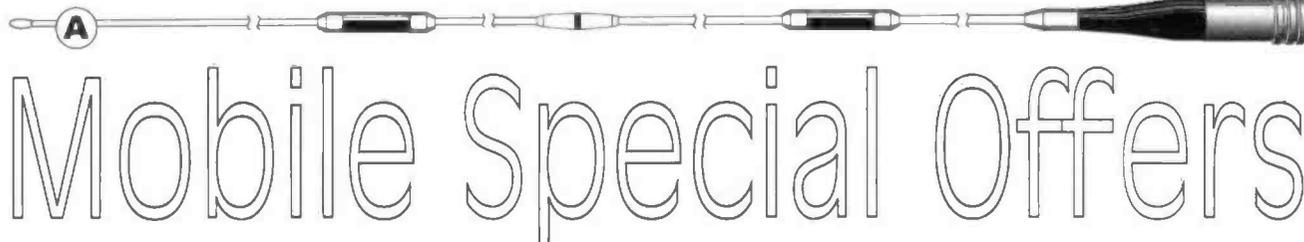
**March 12:** Wythall Radio Club will be holding their annual Radio Rally at Wythall Park, Silver Street, Wythall (near Birmingham, on the A435, just two miles from Junction 3 on the M42). Doors open at 10.30am to 4pm. There will be the usual traders in three halls, a marquee, a bar and refreshments and a Bring & Buy stall, run by the club. Talk-in on S22. Admission only £1. **Chris G0EYO** on 0121-430 7267.

**\*March 19:** The Norbreck Radio Rally, Amateur Radio, Electronics & Computing Exhibition is being held at Norbreck Castle Hotel, Exhibition Centre, Queens Promenade, North Shore, Blackpool. There will be extended free car parking and a free shuttle service. Novice Licence details and practical demonstrations, a Bring & Buy stall, talk-in on S22 and lots more. Admission is £1.50, over 65s £1 and under 14s free. Doors open at 11am to 5pm. Disabled entry through ramped entrance, 10.45am. More info from **Peter Denton G6CGF** on 0151-630 5790.

**March 19:** The Tiverton South West Radio Club are holding their 1995 Mid Devon Rally at the Pannier Market, Tiverton. Easy access, only minutes from junction 27 on the M5. Excellent free parking, two halls of trade stands, Bring & Buy stall and mobile snack bar. Further displays and full refreshments facilities in the club room bar, which is open throughout the day. Talk-in on S22. Doors open at 10am. Further details from **G4TSW**, Mid Devon Rally, PO Box 3, Tiverton, Devon.

**March 26:** Bournemouth Radio Society's 8th annual sale will be held at Kinross Community Centre, Pelhams Park, Millhams Road, Kinross, Bournemouth. Doors open at 10am and close at 4.30pm. There will be a 144MHz talk-in from G1BRS on S22, amateur radio and computer traders, clubs and specialised groups, along with excellent refreshments. Admission is £1 which includes a free raffle. **Malcolm G0UCX**, QTHR or (01202) 747745.

**March 26:** The Pontefract & District Amateur Radio Society are holding their 15th annual Components Fair and Spring Rally at the Carleton Community Centre, Carleton, Nr, Pontefract. Doors open at 11am to 4pm (10.30am for disabled visitors). There will be trade stands, a book-stall, Bring & Buy, a licensed bar and restaurant, all at ground level. Morse tests on demand (usual two passport sized photos required). Admission by prize programme, three prizes, plus ladies prize draw. **Colin G0NQE** on (01977) 677006.



## Mobile Special Offers

**You'll have to hurry to catch these three mobile special offers!**

### Offer No. 1. The DB-7900 dual-band antenna (Antenna A)

Get a **FREE** Magmount or trunk mounting kit worth **£24.95**. Only with this dual-band 144/430MHz antenna constructed of high quality materials to withstand the weather.

The offer price is **£49.95** for antenna and the mount of your choice. Fully insured courier delivery is included in the £6.50 P&P cost (UK and Irish Republic only). Charges for overseas P&P are available on application.

We've arranged not one, not two, but three special offers this month. There are two antennas on offer plus a power boosting amplifier to give 30W of power at 144MHz to help your hand-held get out better.

### Offer No. 2. The DB-1101 Budget price dual-band antenna (Antenna B)

This dual-band 144/430MHz budget priced antenna is also available with a **FREE** Magmount or trunk mounting kit worth **£24.95**.

The offer price is **£26.95** for antenna and the mount of your choice. Fully insured courier delivery is included in the £6.50 P&P cost (UK and Irish Republic only). Charges for overseas P&P are available on application.

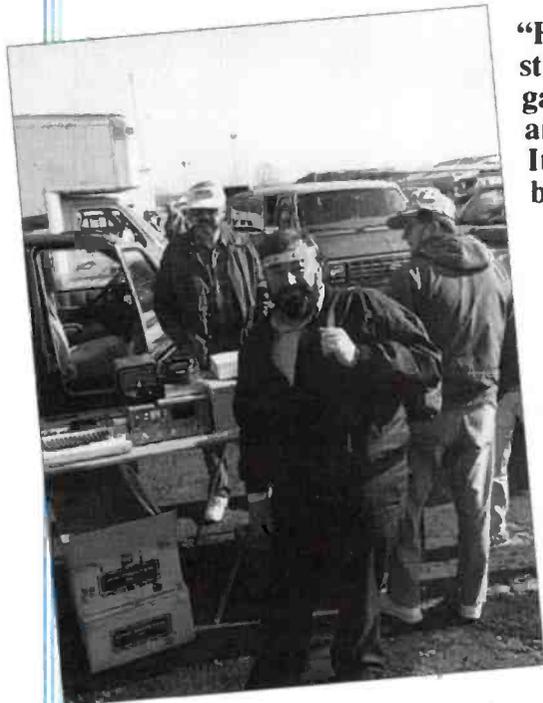
### Offer No. 3. NB-30W 144MHz power amplifier

Got a 144MHz hand-held that, from the car, struggles to make the local repeater? Don't struggle any more, boost its output to 30W. And you can get it cheaper than you thought possible.

You have a chance, if you're quick, to get this booster for **£5** less than normal. Usual price for this amplifier is **£44.95** plus P&P, the offer price is **£39.95**. A delivery charge of £3 P&P must be added for UK and Irish Republic only. Charges for overseas P&P are available on application.

All these items are featured in John Goodall G0SKR's article on **Page 45** of this issue. To take advantage of any of these offers please use the order form on **Page 68**.

# DAYTON



**"Five miles of flea market stalls and two days of bargain hunting. Then it's another day to see the show. It's marvellous and even bigger than Rob Mannion!"**  
 - *Michael Stott GONEE.*

**"It's an up, up and away holiday with fun all day and a great trip with the PW Dayton HamVention friends....that's why I come back for more".**  
 - *Les Ashworth GOKSF.*



## Don't Delay - Last Chance To Book For The Amateur Radio Holiday of 1995!

**You've read the comments from Michael Stott GONEE and Les Ashworth GOKSF following their experience of the PW holiday...so why don't you try the Dayton HamVention experience yourself? You can join the Dayton '95 HamVention Holiday for just £650 per person!**

Although many couples join us, your partner doesn't have to enjoy the hobby to appreciate the PW HamVention trip. There's so much to see, so much shopping and great company to be had on the holiday of a lifetime.

You can join Rob Mannion G3XFD and the PW party when our 1995 holiday starts on Tuesday April 25 at Gatwick when we fly out on a Delta Airlines scheduled flight to Cincinnati. After transfer by coach to Dayton we'll be staying for six nights at the Englewood Holiday Inn. There's a good choice of eating places nearby, the Hotel has a good swimming pool and is very close to the HamVention itself.

We've arranged a visit to the world famous United States Air Force Museum and there's also an optional shopping trip to see Cincinnati and its famous 'Skywalks'.

The £650 (£100 deposit) includes return flight, meals on the flights, transfers to and from Cincinnati Airport, six nights at the Holiday Inn, HamVention ticket, Air Force Museum excursion, all local taxes and the new UK Airport Tax of £10. We leave for the return journey home on the evening of Monday May 1, arriving at Gatwick on Tuesday morning.

Travelling alone? Don't miss out on the HamVention holiday just because you've not got a travelling companion. We will be delighted to arrange for you to share a twin-bedded room - so remember - 'Singles Save' on this holiday because although single rooms are available for a supplement, you can save and share if you wish. Just let us know and we'll be pleased to arrange shared accommodation on your behalf.

For further details on the PW HamVention Holiday (don't delay...we don't want to leave you behind!) please contact our professional tour organiser Andy Garside of Gulliver's Groups & Incentives at Fiddington Manor, Tewksbury, Gloucestershire GL20 7BJ. Tel: (01684) 293175, FAX: (01684) 290093.

Alternatively, you can call Rob Mannion G3XFD at the PW Editorial offices (between 1 and 2pm only please) to discuss the holiday.

To: **Andy Garside**  
**Gulliver's Groups & Incentives**  
**Fiddington Manor**  
**Tewksbury**  
**Glos GL20 7BJ**

Please reserve me  place(s) on the 1995 PW HamVention Holiday.

I enclose a cheque to the value of  as my deposit (£100 per person).

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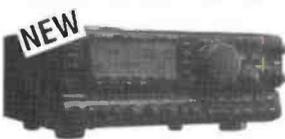
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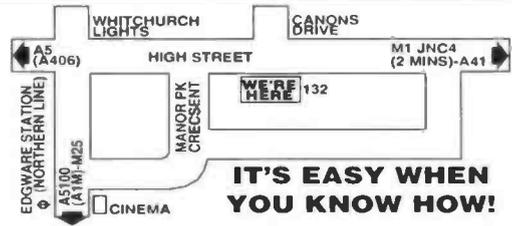
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*Rob Mannion G3XFD has tried out the recently introduced mobile transceiver from Yaesu - and found that it's the most versatile transceiver he's ever used.*

# YAESU FT-900AT Transceiver



# REVIEWED

**B**efore starting this review, it's got to be admitted that I've had a rather 'soft spot' for Yaesu h.f. equipment. This particularly applies to their mobile gear.

I developed my liking for Yaesu h.f. mobile equipment when I bought my original FT-75...almost 25 years ago. My little s.s.b. transceiver went everywhere with me, worked well (it still does!) and provided me with a great deal of enjoyment.

However, 25 years later, the Yaesu designers have learned a great deal and we've all grown a little older! And, perhaps the most dramatic changes are the spectacular improvement to equipment specifications.

Gone are the limitations of the variable crystal oscillator (VXO) of the FT-75. Also gone forever are the relatively large valve and semiconductor hybrid circuitry. In their place Yaesu have introduced what must be the most versatile transceiver I've ever come across - the FT-900AT.

In their own promotional literature Yaesu describe the FT-900AT as a "mobile transceiver for occasional fixed station use". However, it's not often that I can say that a manufacturer has understated their product capability - and this is one of those (rare) occasions!

Quite frankly I can say that following my experience with the FT-900AT, that the transceiver is much more than a mobile. In fact, I described it to someone on the air as being "a radio and a half".

So, what impressed me so much over the Christmas holidays? What's so special about the FT-900AT? To answer, I'll describe my findings, which were gained 'on air', both mobile and from home.

## The Concept

In practice, the designer's concept behind the Yaesu FT-900 is to provide a multiple purpose, versatile amateur bands only transceiver, combined with a general coverage receiver.

And, in conjunction with the small physical size, Yaesu decided to offer the transceiver with a detachable front control panel with 'remote' control facilities.

The concept behind transceivers with detachable, remote control facilities available isn't new. In fact, it's quite 'old hat' nowadays.

However, Yaesu have combined the idea along with an excellent transceiver, general coverage receiver - producing what I think is the ideal rig. In fact, I've never seen or worked with a better all purpose amateur radio station and it's an absolute winner.

## Transceiver Design

So, now I've set the scene, let's take a look at the transceiver design. And, although there are one or two points I would liked to have seen incorporated, it again scores well.

The transmitter is rated at 100W output on c.w. or s.s.b. on all the h.f. bands. It also provides 25W of carrier for a.m. operation.

A v.h.f. intermediate frequency is becoming standard practice nowadays, and the double-conversion superhet on the FT-900AT uses 70.455MHz.

A general coverage receiver is provided within the package, while the amateur bands have their own coverage. Tuning is provided by either using the main tuning knob (driving a magnetic encoder to operate the synthesisers) or via a direct entry keypad on the front panel.

Automatic antenna tuning is provided as an option, and this was fitted on the review model. Another option, the YSK-900 Separation Kit, the remote control extension cable (with quick release clamp) was also supplied.

## Receiver Facilities

Receiver facilities on the FT-900AT include: tuning steps of 2.5, 5 or 10Hz on c.w. or s.s.b. and 100Hz on a.m. and f.m. The coverage range on the receiving side is quoted as being from 100kHz to 30MHz.

However, I found that the l.f. coverage on the review model went far below the specified range...providing some interesting signals! Tuning on the general coverage receiver was continuous, and it re-awakened the broadcast bands listener in G3XFD (more about this later).

The receiver front-end on the transceiver employs parallel f.e.t.s in a constant-gain, grounded gate configuration r.f. amplifier.

# It's Mo

The r.f. amplifier can be by-passed for direct feed to the mixing circuit, and there is a 12dB attenuation filter which can be selected as either switched in or out. (There's no r.f. gain control fitted to the FT-900AT).

Yaesu employ an interference rejection process on the FT-900AT which they claim is unique. It uses an 'up-down' conversion scheme and includes an i.f. shift and notch circuit. (The optional XF-110S crystal filter unit - for improved s.s.b. and a.m. narrow skirt selectivity - wasn't fitted on the model I had on loan).

Modern transceivers come with a host of very complex 'extra' features. This rig is no exception!

What the manufacturers refer to as 'flexible scanning' features are provided on the FT-900AT. The operator can (for example) scan all 100 memories or only those selected to be tuned and scanned. And, to be honest (although I had the transceiver for a month!) apart from trying them out...I didn't use them much.

Additionally, the scanning facilities provided on the transceiver include 10 'special' memories which allow the operator to limit the tuning/scanning range between their stored frequencies. Scan resume mode is selectable between timed or carrier delay, and scanning speed is also adjustable.

## On The Air

Enough of the basic details...it's time to describe how I found the transceiver performed on the air. I'm not just a 'list' man...repeating the specification parrot-fashion, so I want to share my experience with you.

One of the very great problems that the amateur radio operator is faced with in the mid-1990s, is the ever growing complexity of professionally built transceivers. But, even though the number of 'unpack it and switch it on immediately' transceivers is dropping every year, the FT-900AT is an exception!

Despite the amazingly complex transceiver, fitted with a host of facilities...I unpacked it, connected up and switched on within minutes. I was on the air within a minute or so - thanks to the design and layout of the rig.

Incidentally, Donna Vincent our News & Production Editor particularly wanted me to mention the packaging. Even this feature is very special - coming with clear, concise instructions so that you can use the packaging time and again!

Very impressive indeed...and that was just the packaging! However, you've got to remember nowadays that equipment is expensive, and the packaging which the equipment arrived in, is often retained for transportation. It also helps to retain the re-sale value of the rig itself!



**The Yaesu FT-900 h.f. transceiver with the demountable front panel detached. The model reviewed by Rob Mannion G3XFD was supplied with the optional automatic a.t.u. unit (transceiver designation FT-900AT) and the optional 'quick release' mounting unit for the control, with associated remote control cable.**

Once I had the rig switched on, I was most impressed with the l.c.d. tuning display. It was large, clear and very well thought out. Everything the operator needs is displayed.

While on the subject of the l.c.d. display for tuning, I should perhaps mention my thoughts on the mobile operations aspects. Initially, to be honest, I didn't think the display would cope with the low angle sunshine we get in the UK over the Christmas holiday period.

However, the display coped well and I used the rig mobile and was able to see the display very clearly, despite the bright sun. It's also ideal for night-time use (more about this later).

Once on the air I used the rig on 1.8, 3.5, 7, 14 and 21MHz. I didn't have much success on the WARC bands, and there didn't seem to be much activity either.

The automatic antenna tuning unit (a.a.t.u.) fitted on the FT-900AT was so quick and quiet that I forgot it was there for most of the time! It seemed to cope very well with my long wire antennas, my trapped dipole and the G-Whip mobile antennas with no bother at all.

My 'yardstick' is 7MHz, my favourite band, and the FT-900AT coped very well. Reports on the transmitted audio quality on s.s.b. were very good. Adjacent channel interference rejection was also more than adequate on this crowded and very busy band.

Personally (I've said this in many reviews) I regard the tuning knob 'feel' to be of paramount importance. Other operators may scoff at my opinion, but surely, if you're not happy with what is the main control of a receiver (bearing in mind how much you'll be using it)...something's wrong?

I felt perfectly comfortable with the tuning on the FT-900AT. It had a very good silky smooth action and I spent many hours listening. Personally, I feel that any contest operator would find the transceiver to be a great help during the long hours of contests.

Being a keen c.w. operator, I soon found

myself on the key. I had many c.w. QSOs and what a revelation the FT-900AT turned out to be! The 'break in' operation is so smooth and effortless the operator is led to believe that the transceiver is not switching from transmit to receive.

I tried the internal electronic keyer and found it to be good. However, I don't seem to work very well in conjunction with electronic keyers nowadays. So, for most of the time I was using my favourite Kent key. But having said that, I've no doubt the keyer would be a great boon to the contest operator.

The receiver coped extremely well on c.w., although I always feel that a transceiver of this type isn't complete without a selection of extra

crystal filters. However, the facilities provided by the notch adjustment and i.f. shift help tremendously. Despite that, I would fit the extra filters in any transceiver I owned.

## General Coverage

The general coverage receiving provided by the FT-900AT adds to its versatility. And, I found that the extra long (6m) extension cable, enabled me to mount the detachable front control panel on my bedside table. (I do my operating from my office/study bedroom during the winter).

Unfortunately, I'm an insomniac and when I can't sleep I spend many hours listening to the broadcast bands during the night. So, you can imagine how pleased I was to be able to have a comprehensive receiver (the front panel is only the size of a school pencil-box) right next to my bed.

With my earphone plugged in (the main speaker is mounted on the transceiver body) the rig proved its versatility. Additionally, the tuning display illumination came into its own, proving it could cope with bright sun and darkness.

On the broadcast bands the receiver proved itself to be exceptional. The received bandwidth is just about right for broadcast use and I found myself tuning over the bands much more than I would normally, thoroughly enjoying myself.

## Mobile Operations

A transceiver such as the FT-900AT just begs to be taken out on mobile operations. So, I got busy!

With the rig mounted temporarily in my estate car I transmitted on 7 and 14MHz during the day. And, although the controls had seemed rather small (the other Editorial team members thought I'd have trouble with them) I had no difficulty whatsoever.

Personally, I found the audio output on the

# More Than A Mobile!

transceiver to be a little low in a mobile environment. But, as I prefer to use a headset/microphone unit in any case, this wasn't a problem. (The main transceiver unit was located between the front passenger and driver's seat in my car for the tests).

The controls were clear, and well laid out. Operating was also helped by the fact that the detachable front panel is so neat, it can go virtually anywhere in the cramped confines on modern cars.

## My Next Rig

Well, I've got to be honest and say that my next rig is going to be a Yaesu FT-900AT. I've never been so impressed with a single item of equipment before now. Full marks to the designers!

Having said how much I like the transceiver, there are several points I'd like to comment on. Firstly, although Yaesu provide the operator with the facility to bypass the r.f. amplifier - there's no r.f. gain control.

Personally I think it's essential to be able to control the r.f. gain manually. I've criticised other manufacturers for omitting an r.f. gain control in the past, and I hope Yaesu incorporate a variable control before I buy my FT-900AT.

Secondly, I have doubts that the telephone-type plug and sockets for the microphone (unusually there are plugs and sockets at both end of the microphone cable) will stand up to frequent use. But I may be wrong, and it may just be my old fashioned hankering to heavy duty plugs and sockets.

Hopefully however, Yaesu may consider fitting heavier duty plug and sockets for the microphone leads. If they do, I've no doubt that many FT-900AT transceivers will still be providing good service in 25 years time, in the same way my old FT-75 is doing.

So, if you want an extremely effectively 'all-in-one' package transceiver (mobile, portable or fixed)...I think the FT-900AT will fit the bill. In the days when most of us can only ever afford one commercial transceiver for h.f., this must surely be the approach to adopt. Well done Yaesu, another classic design.

**My thanks go to Yaesu UK Ltd. for the loan of the review FT900AT, which is available for £1549 r.r.p. from Yaesu dealers in the United Kingdom.**

PW

## Manufacturer's Specifications

### General

Receiving frequency range	100kHz - 30MHz
Transmitting frequency ranges	1.8 to 30MHz amateur bands
Frequency stability	±10ppm (s.s.b., c.w., a.m.) from -10° - +50°C or ±2ppm from 0° - 50° C (s.s.b., c.w., a.m. w/TCXO-3 option
Modes	u.s.b., l.s.b. (J3E), c.w. (A1A), a.m.(A3E), f.m. (F3E)
Frequency tuning steps	2.5Hz/5.0Hz/10Hz (c.w., s.s.b.) 100Hz (a.m., f.m.)
Antenna impedance	50Ω nominal (16.7 - 150Ω with optional automatic a.t.u.)
Operating temperature range	-10°C - +50°C
Supply voltage	13.5V d.c. ±10%, negative ground
Power consumption (approx)	1.5A receive (no signal) 20A transmit (100W)
Dimensions	238 x 93 x 253mm
Weight (approx)	5.3kg

### Transmitter

Power output	Adjustable up to 100W (25W a.m. carrier)
Modulation types	s.s.b., balanced, and filtered carrier, a.m. low-level (early stage) , f.m. variable reactance
Maximum f.m. deviation	±2.5kHz
Harmonic radiation	50dB below peak output 40dB (10MHz, 18MHz) Spurious radiation 40dB below peak output
Carrier suppression (s.s.b.)	40dB
Undesired sideband suppression	At least 50dB below peak output at 1.5kHz modulation
Audio response (s.s.b.)	<6dB from 400 - 2600Hz
Third order IMD	-31dB (typical) @ 100W p.e.p., 14.2MHz
Microphone impedance	500 - 600Ω

### Receiver

Circuit type	Double conversion superhet
Intermediate frequencies	1st: 70.455MHz, 2nd: 455kHz
Sensitivity	(for 10dB S/N, 0dBμ = 1μV IPO off)
Selectivity	(-6/-60dB)
Squelch sensitivity (IPO off)	1.8-30MHz (c.w., s.s.b., a.m.) <2.0μV 28-30MHz (f.m.) <0.32μV (1.8-30MHz) 70dB or better (1.8-30MHz) 70dB or better
Rejection (i.f.)	±1.2kHz
Image rejection	30dB or better
Shift range (i.f.)	±9.99kHz/2.5Hz, 5Hz or 10Hz
Notch rejection (i.f.)	at least 1.5W into 4Ω with <10% t.h.d.
Clarifier tuning range/steps	4 to 8Ω
Maximum audio power output	
Audio output impedance	

After seeing a copy of the G3XFD review Barry Cooper of Yaesu UK Ltd., sent us the following comments:

It is always pleasing to be given the chance to comment on a review before it is published. I am obviously delighted that Rob Mannion enjoyed using the equipment and found it so versatile - good to know that Yaesu achieved one of its fundamental design parameters for the FT-900.

Although the FT-900 achieves a unique first in h.f. equipment in providing a demountable front panel as the review points out, this belies the suitability of the equipment being used as a base station. Perhaps Yaesu's future advertisement copy should read 'A base station for occasional use as a mobile?'

Rob mentions low audio output for mobile use. It is envisaged

that mobile users would plug a headset or speaker microphone into the additional socket provided on the demountable head which should certainly improve matters in a noisy, mobile environment. Rob also queries the use of RJ-45 telephone plug sockets on the microphone and their long term durability. Yaesu along with other major manufacturers are moving to this new standard in its amateur equipment range, where it has been common practice for commercial products to use these connectors because of their durability and moisture resistance.

**Barry Cooper**



# The Mobile Menace

**T**he automobile has undergone a very rapid evolution in recent years. It's almost kept pace with developments in the field of the microprocessor-based electronics.

Microprocessors in vehicles control almost everything these days; braking, engine management and even suspension.

The introduction of all this technology has meant that car manufacturers are now far more concerned about owners fitting and using their own telecommunications equipment.

The prospect of litigation, such as that seen in the USA has caused concern. The resultant awards, which in some cases runs into millions of dollars for injuries sustained from runaway vehicles upset by stray r.f. fields, has put manufacturers safety policies in the spotlight. As a result they have EMC high on their list of priorities.

Existing EMC vehicle specifications are fast becoming out of touch with technology and developments in telecommunications. So, in order to counter this, new specifications are currently being submitted to the EEC for approval.

## The Definition

Firstly, let's take a look at the definition of Electromagnetic Compatibility or EMC. In layman's terms and for the scope of this article, the definition of EMC means that fitting and using a transceiver in a vehicle should not cause any malfunction or degradation in the overall operation of the vehicle and any of its subsystems.

For just one example of EMC, pressing the transceiver's p.t.t. switch should not suddenly cause the engine to overrun or stop. The prospect of either happening on a busy stretch of motorway doesn't bear thinking about!

On the other side of the coin, you don't really want to be straining to hear the other station on a mobile contact through a shower of electrically generated noise. Mobile operating is dangerous enough without throwing another problem into the arena.

## Interference Generated

Electrical interference is generated by the rapid change or interruption of an electrical current. This process (unfortunately!) is found in the operation of almost all the electronic and electrical equipment fitted to the vehicle.

Electrical systems in vehicles can normally be divided into three easily identified categories; ignition (including engine management and other essential systems), power generation and accessories.

Each system and its associated wiring are capable of generating and distributing electrical noise. It's fair to say that unless you own a diesel vehicle, most of the trouble is likely to come from the ignition system, with the close runner-up being power generation.

## Noise Propagated

Electrical noise is propagated throughout the vehicle to the affected radio equipment by one or more of the following routes:



*Richard Ayley G6AKG is a professional Engineer in the ever-expanding industry that's grown in parallel with the needs of Electromagnetic Compatibility. And, as EMC (or the lack of it!) can be a great problem for the mobile operator... in part one of his article Richard passes on some useful advice to help minimise the 'menace'.*

(a) Radiated emissions from the noise source being directly received via the antenna, (b) Conducted emissions on the vehicle supply wiring entering the receiver via its power leads and (c) Conducted emissions on the vehicle wiring being radiated and received via the antenna Radiated and conducted emissions being coupled into the mechanical structure of the vehicle and then being re-radiated and received via the antenna.

## Transceiver Installation

Transceiver installation is one of the most important factors in beating EMC problems. You can help yourself by following some straightforward guidelines.

Start the process by running a low impedance (fused) supply to the rig, directly from the -Ve and +Ve of the battery. Where practical, keep the power cable, antenna feeder and antenna as far away as possible from any possible noise sources, ie the ignition system.

Also make sure that the antenna is well matched to the transmitter. Remember that most mobile antennas need their bases earthed to the vehicle chassis to provide a ground plane.

Bonding the antenna base to the vehicle chassis has a twofold effect. It increases antenna efficiency which reduces radiated fields off the feeder during Transmissions and decreases the chance of noise pick-up on the feeder during receive.

A good ground plane connection can always be achieved by running a short length of braid from the antenna mount to one of the tailgate or boot lid fixing points. Here the braid can be trapped under a bolt, making sure that at least one surface is clean and free from paint.

It's also important to stop the ingress of moisture. Water entering will lead to corrosion, and the cable joint should be smeared with petroleum jelly before assembly.

Table 1 Test Condition	Noise Received	Interference Source
Ignition off	Open squelch with possible tick	Clock
Ignition on	Intermittent tick or whine	Fuel pump
Engine ticking over	Loud cracking proportional to engine rpm	Ignition system
Increase Engine rpm	Whine varies in pitch with engine rpm	Alternator
Wash wipe operating	Whine in unison with wiper action	Wiper motor or wiper water pump
Heater on	Whine varies in pitch with fan setting	Heater motor
Increase engine rpm for extended period	Whine appears when engine temp climbs to above normal	Electric cooling fan on radiator

## Noise Identification

In order to tackle any noise problem, you must first successfully identify the source. And to do this you'll have to choose a good site for the tests.

Park the vehicle well away from any likely sources of external noise ie, over head power lines, industrial processes and buildings with networked computer systems.

Then, with the transceiver squelch lightly set, monitor the band while putting the vehicle through each of the test conditions shown in **Table 1**.

Even the most severe ignition interference may not open the squelch on an f.m. receiver. If this happens, it can only be monitored by lifting the transceiver squelch with an external unmodulated carrier.

Squelch lifting may be achieved with a 'Dip Meter' oscillator tuned to the band required. It can be placed next to the transceiver, and used in the absence of a local signal.

## Monitoring Noise

While monitoring the identified noise, I suggest you try removing the antenna plug. If the noise is still present, then this almost certainly shows the interference is entering the effected equipment via its power supply leads.

Circuit cross-coupling is often the cause of supply line noise. It's best tackled by trying to separate rig supply wiring from other cable looms, and/or suppressing the noise at the source.

If noise suppression at source is not possible, try running the power supply to the equipment in screened cable. In this case the cable screen should be bonded directly to the vehicle chassis near the battery.

Unfortunately, high current screened cable is difficult to find. However, it may be fabricated using suitably rated twin or single conductors run down the centre of a screen taken from a length of UR67 coaxial cable.

## Toughest Nut

Perhaps I should start with the toughest nut to crack, the ignition system! And in almost every case it's best to stem the interference at source, to stop it propagating throughout the vehicle.

But before you start to add extra suppression components, be sure to check that the ignition system is in good order. Perished or damaged h.t. leads should be replaced with a good quality resistive type.

The distributor assembly should also be checked for worn or broken parts which need replacing. Another important factor is that the spark plug clearances should be checked for the correct setting.

Firstly, I suggest you try fitting a 1µF (100V d.c. working) capacitor between the SW, '+' or No. 15 terminal of the coil and the chassis of the vehicle. Make sure that there's a good earth connection for the capacitor.

On vehicles fitted with electronic ignition you should check with the manufacturer if the fitting of the 1µF capacitor is permissible. Some electronic ignition units already have a much higher voltage working capacitor installed.

If the addition of the capacitor fails to reduce the noise level try following the remedial actions shown in the fault flow chart in **Fig. 1**.

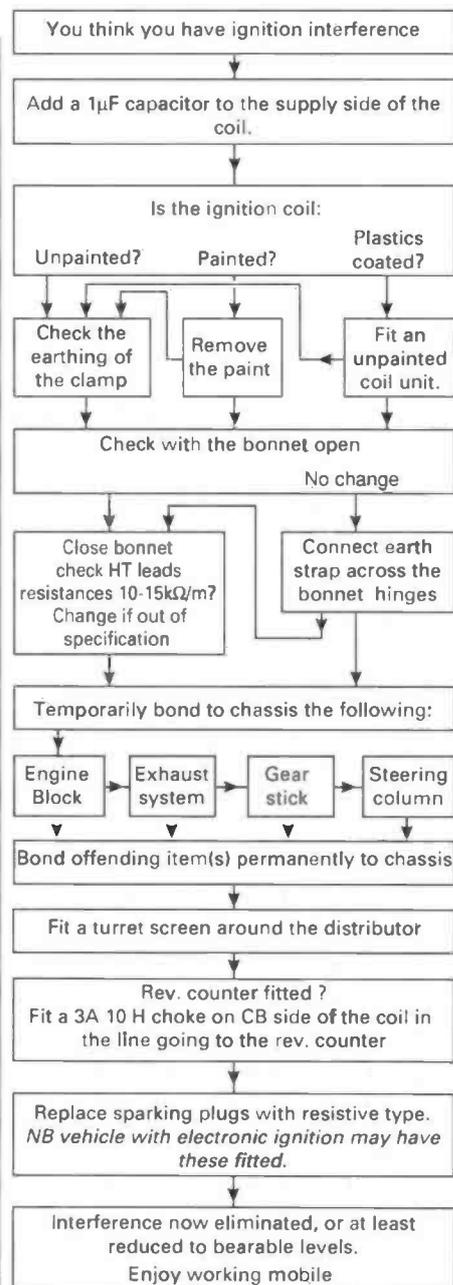
## Tackling The Problems

In the second part of this article I'll be tackling the EMC problems associated with h.t. distribution. And I plan to discuss the many types of electric motors found on vehicles and their associated EMC difficulties.

The troubles associated with alternators and brake lights won't escape either! And the second part will also look into problems associated with transducers, clocks, static electricity problems and particular difficulties associated with older vehicles.

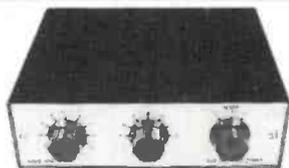
So, until next month...don't give up! We can work together to crack your particular EMC problem 'nut'!

PW



**Fig. 1: Interference fault 'flow chart' (see text).**

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By James Glanville G3TZG



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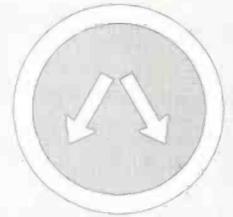
VK STATIONS PROHIBITED



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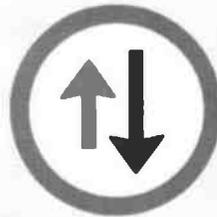
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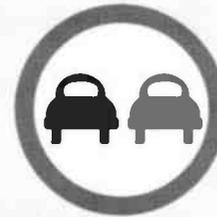
HOME-BREW INDUCTORS  
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TURNS



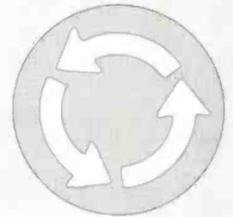
SLIGHT POSITIVE LEAKAGE  
CURRENT



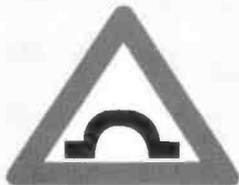
FREQUENCY MUST BE  
STATED IN CYCLES. HERTZ  
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VEHICLES WITH BOTH  
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EARTHING SYSTEMS MAY  
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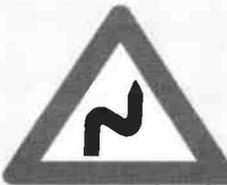
OHM METERS IN USE



BALLOON OPERATORS  
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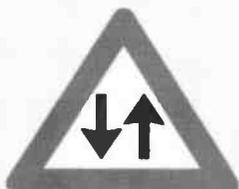
AUDIO TESTS USING TUNING  
FORKS IN OPERATION



ANTENNA MAST GUYS  
OVERTIGHTENED



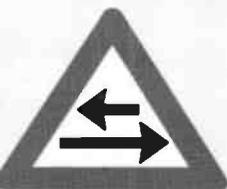
MOBILE OPERATOR USING  
HAND MIC



IONOSPHERIC CRITICAL  
FREQUENCY TESTS UNDER  
WAY



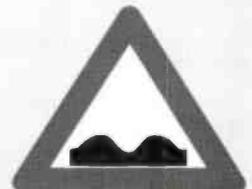
MOBILE 5/8 WHIPS MAY  
BEND AT SPEEDS ABOVE  
110 MPH



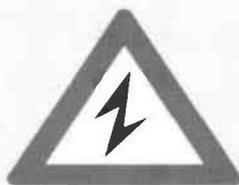
CONVENTIONAL FLOW AND  
ELECTRON FLOW THEORIES  
BOTH IN USE



OPERATORS USING  
AMPLITUDE MODULATION  
ON TOP BAND



DC WITH SLIGHT AC  
RIPPLE



HEAVY QRN AHEAD



CAUTION G3S OPERATING



NOVICE BAND



10 GIGAHERTZ DISHS  
MUST BE HORN FED



MARITIME MOBILE  
OPERATION FROM  
VEHICLES NOT ADVISED  
BEYOND THIS POINT



CAUTION. HERDS  
OF WILD PACKET  
OPERATORS MAY  
APPEAR  
SUDDENLY

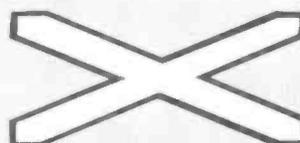


CALCULATIONS  
INVOLVING ROOT 2  
TAKING PLACE

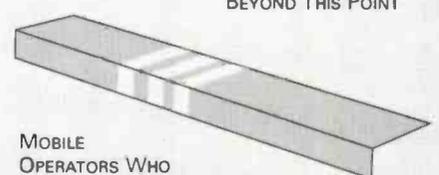


Meter  
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MUST BE USED



CROSSED DIPOLES ALLOWED



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Mike Rowe G8JVE is already well known as designer of the PW Robin frequency counter and other successful projects. This time, Mike describes his latest project, a versatile synthesiser tuned f.m. transceiver for 70MHz.

# LET FLY ON FOUR



## Build The PW Martlet 70MHz FM Transceiver Part 1

I designed the PW Martlet as an alternative to the usual 'Throw a couple of rocks into it' which is the usual (crystal controlled) p.m.r. approach to getting on 70MHz. The transceiver is a fully synthesised unit, with separate voltage controlled oscillators (v.c.o.s) for transmit and receive, with the receive v.c.o. running above the signal frequency.

The Martlet transmitter is capable of running approximately 10W, with the power output level adjustable. And, when I tested the prototype, I found the receiver quite capable of better than 0.2µv for 12dB SINAD.

Frequency selection is by means of a diode matrix with six channels available on the prototype. You can of course extend the frequency coverage if necessary.

The case I used on the Martlet is a standard type. So there's a minimum amount of 'metal bashing' required to produce a respectable

looking rig, which also performs very well on air.

### Circuit Description

I'll start off by providing a circuit description of the Martlet project. I've also provided a block diagram, Fig. 1.1, to show the complete project.

I constructed my prototype on six p.c.b.s, one each for the synthesiser/receiver, transmitter driver, p.a., diode matrix, the d.c. input and front panel l.e.d.s.

The first four p.c.b.s use double-sided boards. And in the case of the first three boards, the top is a low impedance groundplane.

The synthesiser comprises separate voltage controlled oscillators v.c.o.s for transmit and

receive, Fig. 1.2. These are virtually identical in design apart from the tuning capacitors.

Both v.c.o.s use dual gate m.o.s.f.e.t.s in a Colpitts configuration. They are tuned by varicap diodes D5 and 6, and each is followed by a buffer stage.

Taking the receiver section first, the output from the buffer stage Tr5 is split into two. One half feeds the pre-scaler amplifier, the other being amplified by Tr9 with a tuned circuit in its collector to the receive mixer Tr2, see Fig. 1.3, for the receiver circuit diagram..

The transmit section of the v.c.o., Fig. 1.2, is slightly different from the receive half. It has an additional varicap diode, D7, which directly modulates the oscillator to provide direct frequency modulation.

The output is again split to provide an output to the pre-scaler amplifier. It also goes to the transmit strip via R63 which gives a rudimentary but effective power output control.

Transmit audio is processed by the audio processing integrated circuit (i.c.), IC5, Fig. 1.4. The overall deviation is set by R63 and microphone gain by R28.

The synthesiser used in the Martlet is the Motorola MC145152 dual modulus type, Fig. 1.2, used in conjunction with a Plessey SP8793 prescaler. This is a 200MHz divide by 40/41 type. Signals to feed this are amplified by Tr16.

The MC145152 has an 'on chip' reference oscillator of 12.8MHz. This provides an accurate 12.5kHz channel spacing of the final frequency.

The frequency divide ratios are split between the 'N' and 'A' counters. And to help, later on I'll provide an easy reference table for all of the 70MHz f.m. channels. Diodes provide the necessary 'pull down' function to program the device, Fig. 1.2a.

The outputs of the phase detector remain essentially high when the reference frequency and the divided input frequency are in phase. These are then tied to the low pass filter

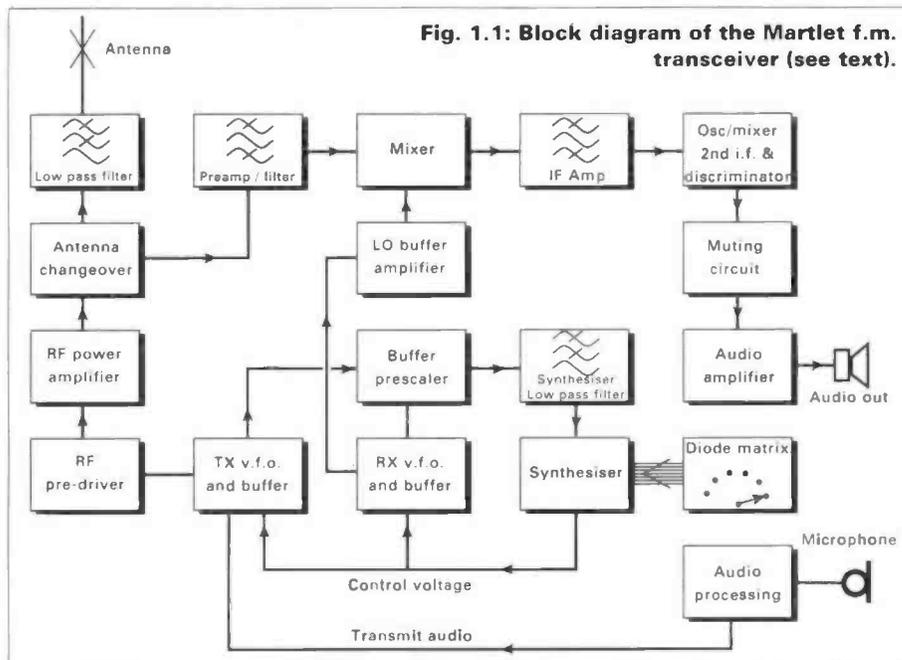
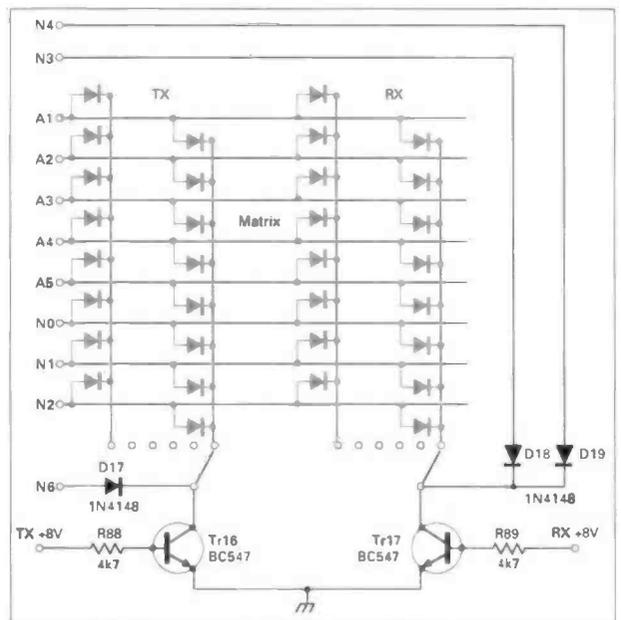
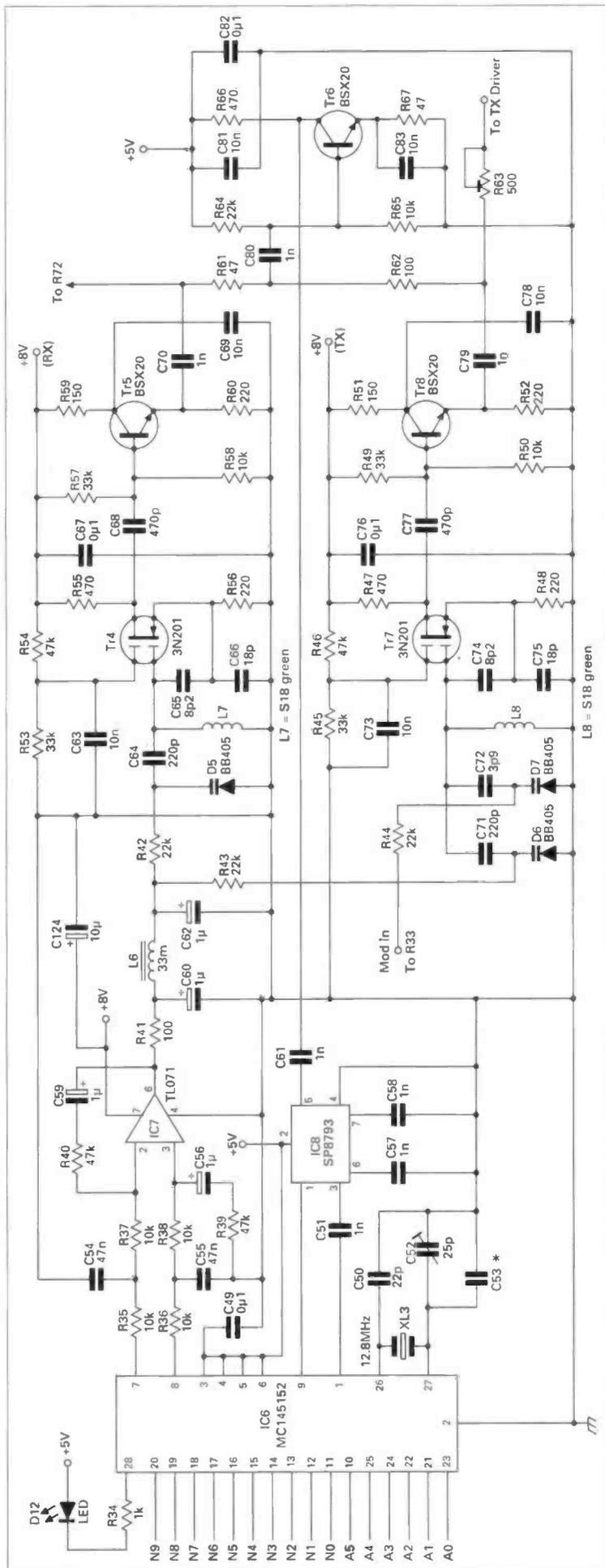


Fig. 1.1: Block diagram of the Martlet f.m. transceiver (see text).



**Fig. 1.2: (Left) Circuit diagram of the synthesiser and voltage controlled oscillators (v.c.o.s) used in the PW Martlet.**

**Fig. 1.2a: (Above) Diode matrix network used to provide channel selection in conjunction with the synthesiser (see text).**

circuitry around IC7, the output of which is fed to both the transmit and receive v.c.o.s.

Should the Martlet synthesiser be out of lock, D12 lights to give a visual warning. Further information on the general design of synthesisers may be obtained from the Motorola technical guide ref: MC145151-2/D.

Power supplies for the synthesiser are as follows: 5V for the synthesiser and prescaler regulated from 13.8V, see Fig. 1.7, continuous 8V for the low pass filter regulated from 13.8V. And there's 8V provided for the receive v.c.o. from the RX+8V line, with 8V for the transmit v.c.o. from the +8V(TX) line.

### Double Superhet

The Martlet receiver, Fig. 1.3, follows a conventional double superhet design with i.f.s of 10.7MHz and 455kHz. Input signals ( $F_{in}$ ) are coupled by a low impedance link L1 and amplified by Tr1 (R3 suppresses any tendency to spurious oscillations).

Bandpass coupling comprising of L3/L4, to the mixer reduces any possibility of all but the very strongest of out of band signals being passed to the mixer Tr2.

The oscillator injection at signal frequency ( $F_{in} + 10.7\text{MHz}$ ) into the source produces the 10.7MHz i.f. This is filtered by a two-pole crystal filter with a bandwidth of 15kHz, and amplified by Tr3 before being processed by the i.f. chip, IC1 an MC3357.

The MC3357 is the heart of the Martlet receiver. It provides the second oscillator, mixer, limiting i.f. amplifier (with an external 455kHz ceramic filter), discriminator and squelch.

The discriminator I've used with the project is a little unusual. To save a little work, I incorporated a ceramic resonator as the tuned element instead of the usual coil, giving one less adjustment.

Output from the squelch, which is high when a signal is received, drives Tr10. This causes the busy light to come on and also enable the audio power amplifier.

Should a weak signal fade, the squelch may be overridden by the mute defeat switch. This has the same effect as Tr10 conducting.

After filtering, the recovered audio from pin 9 of the MC3357 is fed to the volume control. It then subsequently proceeds to the power amplifier IC3 and loudspeaker.

Continued on page 35

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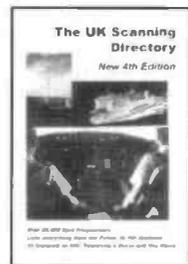
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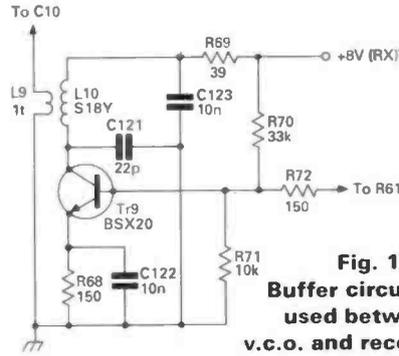
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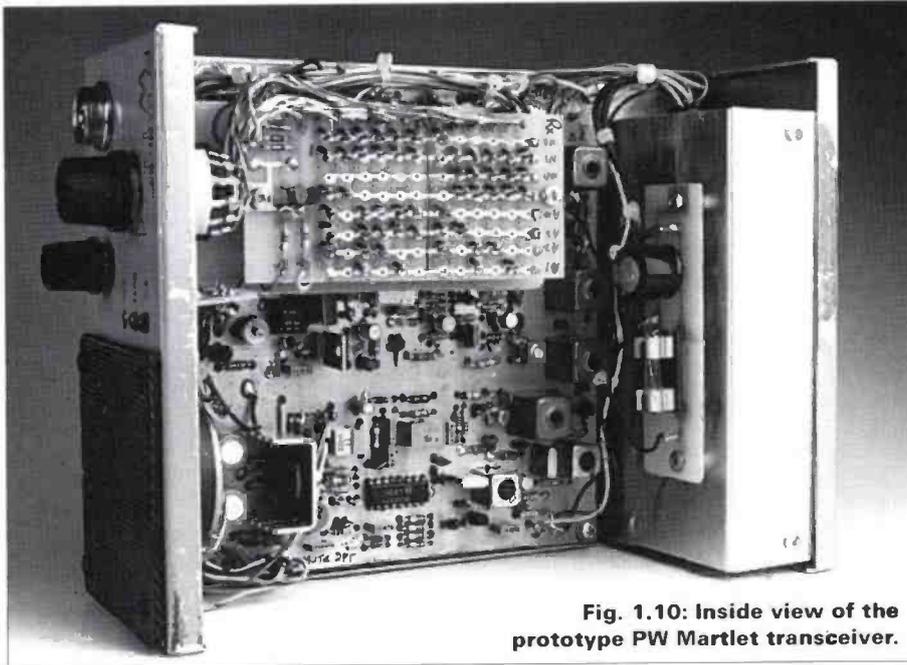
The transmitter side of the Martlet is conventional. In the circuit I've used, the f.m. signals from the v.c.o. are amplified in the transmitter driver stage, Fig. 1.5, which is constructed on a separate board from the p.a.

Both the transistors in the driver stage operate in class A with an output of about 500mW. This stage is supplied with 13.8v on transmit.

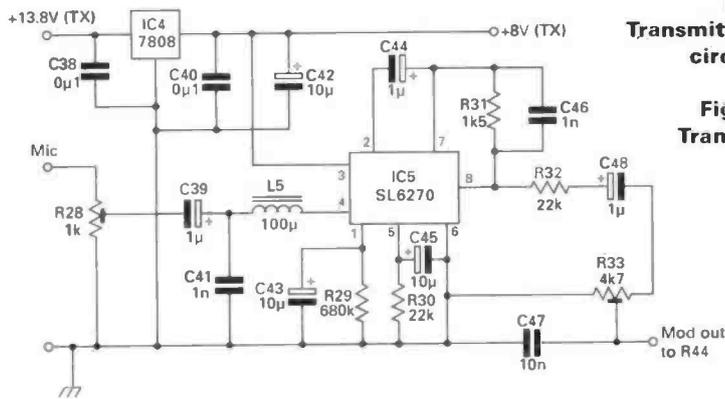
The p.a. stage itself, Fig. 1.6, uses a single transistor, Tr13, working in Class C, with a low pass filter on the output. The p.a. transistor is



**Fig. 1.3a:**  
Buffer circuitry  
used between  
v.c.o. and receive  
(see text).

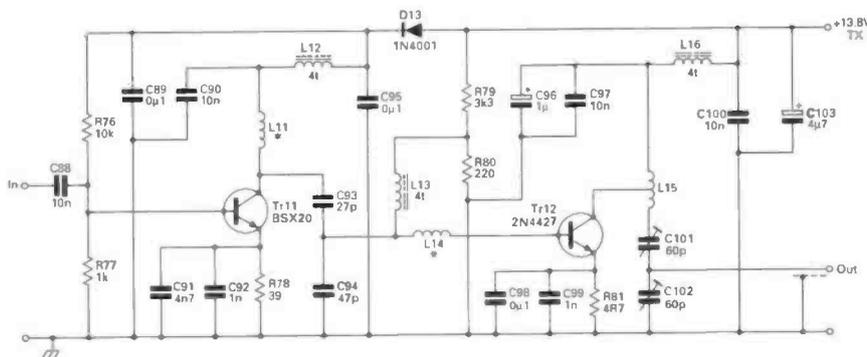


**Fig. 1.10:** Inside view of the prototype PW Martlet transceiver.

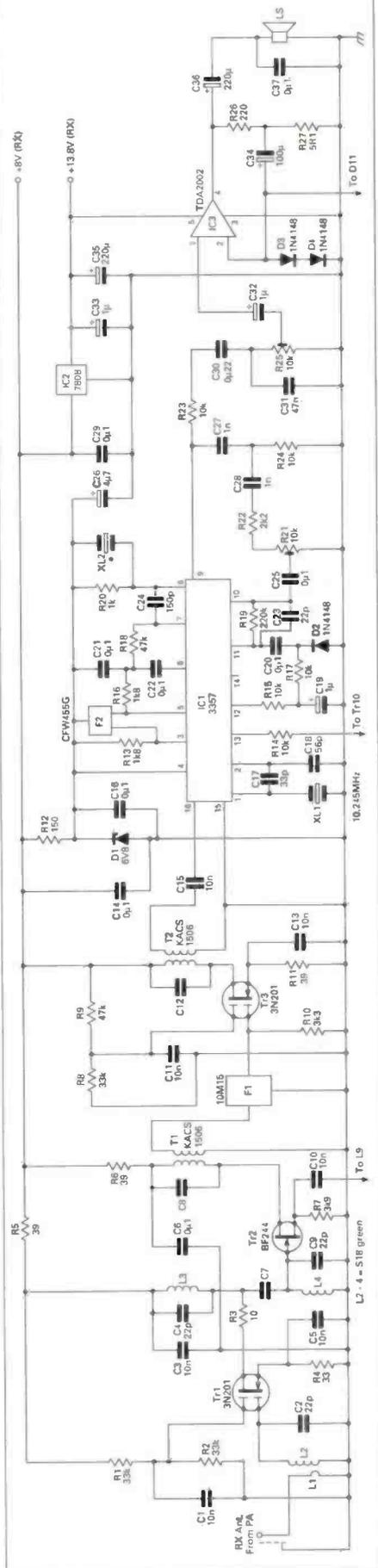


**Fig. 1.4: (Left)**  
Transmitter modulator  
circuit (see text).

**Fig. 1.5: (Below)**  
Transmitter driver  
stage circuit  
(see text).



**Fig. 1.3: The Martlet receiver circuit.**



# Let Fly On Four (continued)

Fig. 1.6: Power amplifier stage circuit (see text).

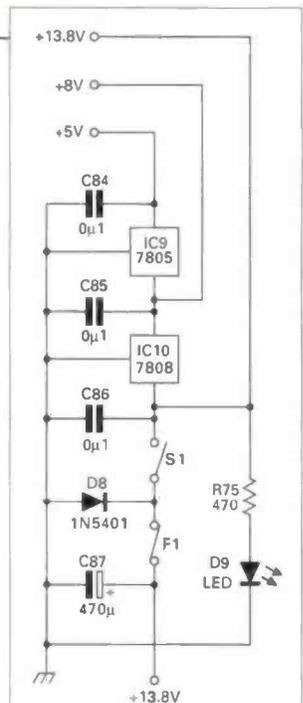
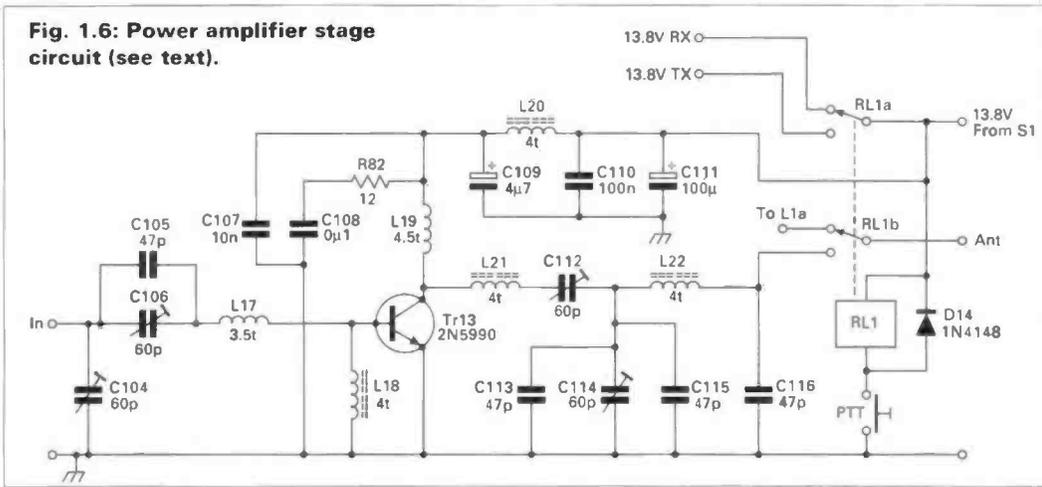


Fig. 1.7: Stabilised power supply circuitry (see text).

Fig. 1.9: (Left) Signal strength meter circuitry (to be described in Part 2).

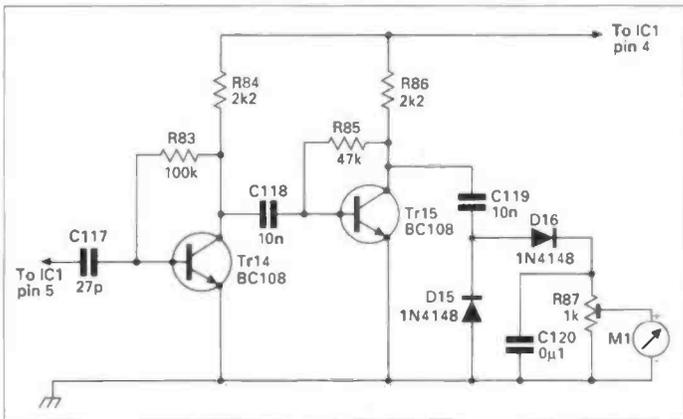
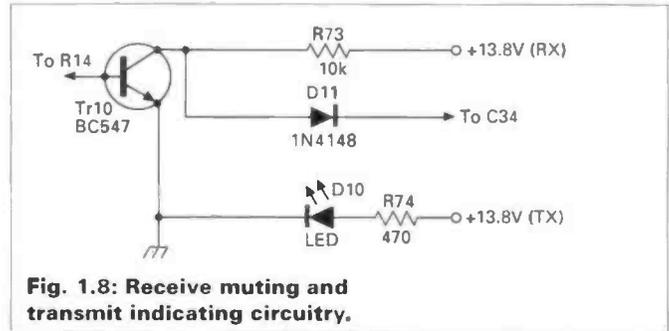


Fig. 1.8: Receive muting and transmit indicating circuitry.



supplied with d.c., directly from the on/off switch to avoid having to switch high currents through the relay.

As the p.a. stage is in class C, there's no current drawn until drive is applied. Tuning capacitors are provided on both the driver and p.a. boards.

The output from the p.a. stage passes to the antenna via a relay. This relay doubles up as a d.c. transmit/receive changeover, 13.8V from the on/off switch being applied to one half. I've also provided protection against reverse polarity and short circuits on the d.c. input.

That concludes the initial description of the

Martlet project. In Part 2 I'll describe the construction stage of the transceiver. I will also be providing a comprehensive shopping list, and of course, the PW PCB Service intends to have the p.c.b.s available. We'll soon have you 'up and running' on 70MHz!

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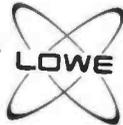
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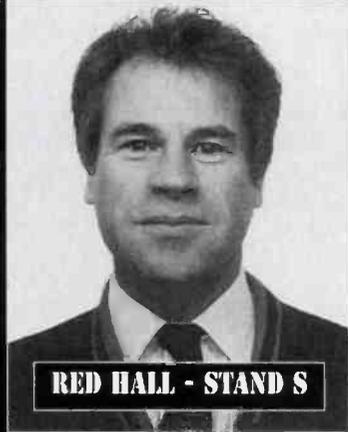
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# London Amateur Radio

## London Show Lectures

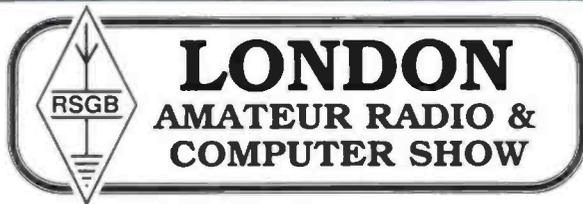
Saturday March 11th

Lecture Instant Morse      Lecturer Steve White G3ZVW

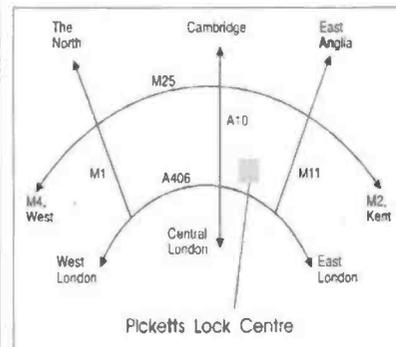
Sunday March 12th

Packet Radio      Ruth Hull N0ULD.  
Ken Baker KO0W  
(a series of 4 lectures)

Both lectures start at 12 noon.

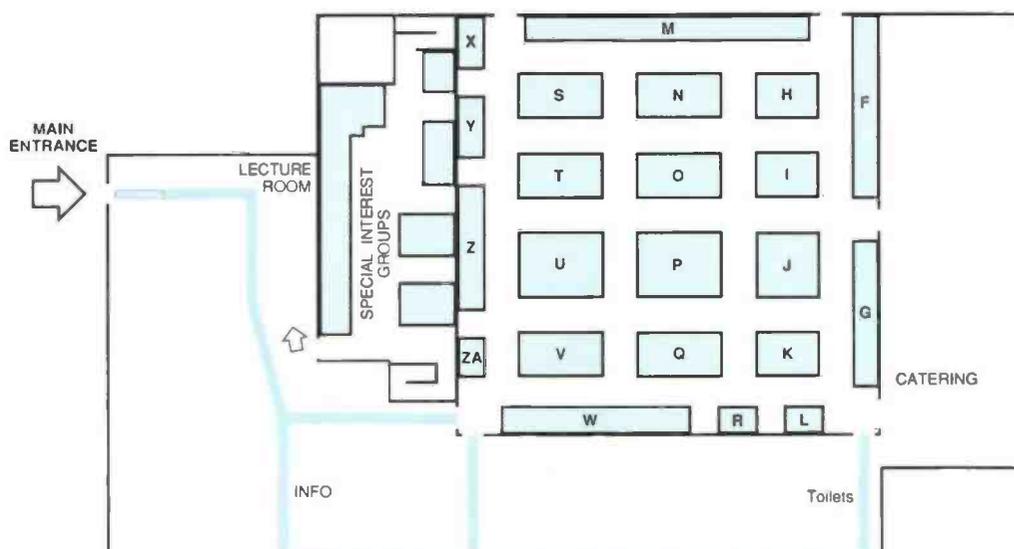


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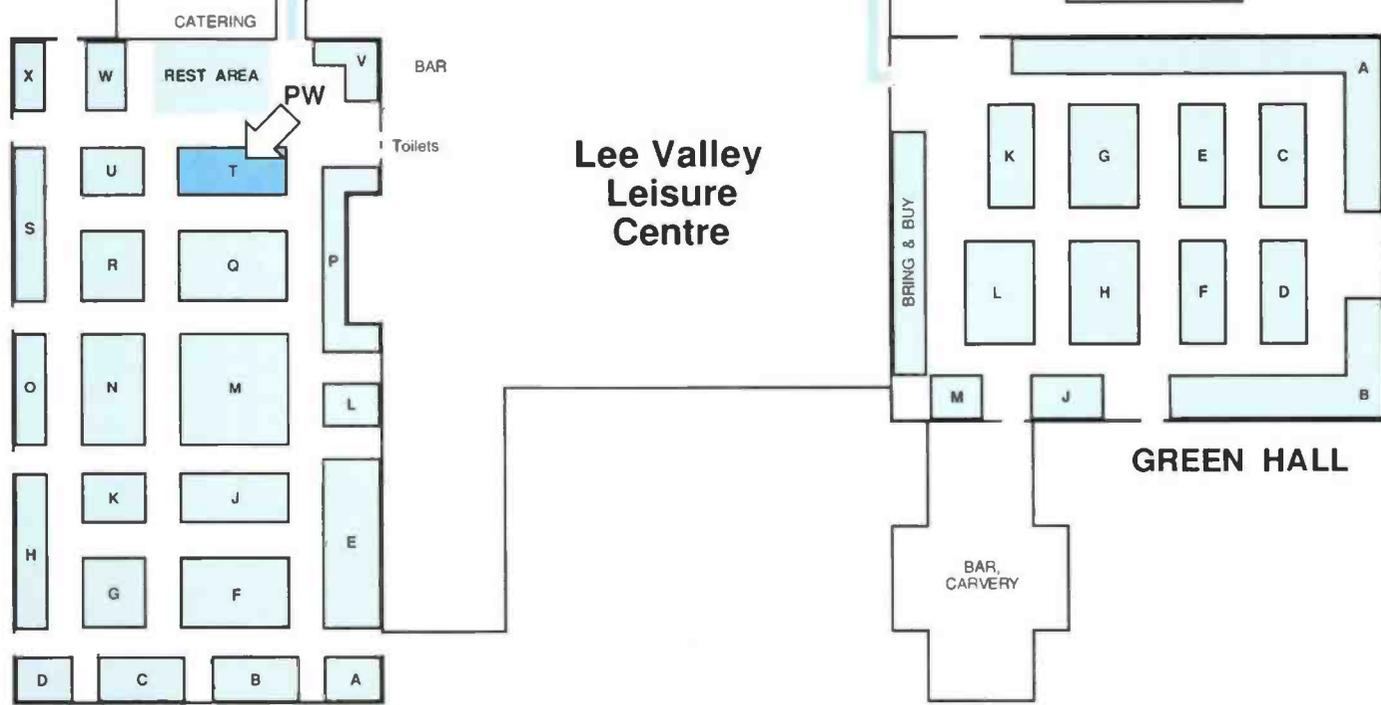


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# Be Careful Using Your Whip

Having acquired a 144MHz hand-held mainly to use inside the house (the 'shack' being in the garage, and not too good for ageing bones), I thought that it would be a good idea to obtain a mobile magnetic mount. This was so I could use the 144MHz rig for occasional mobile use.

Rummaging through the inevitable old bits and pieces that all radio amateurs acquire, I found something suitable. It was an old CB magnetic mount plus a small base loading coil and a nice bit of flexible whip. If I remember correctly, this was acquired at a car boot sale for 20p!

The mechanical stability of the whole assembly was centred around the coil and base assembly. So, I decided in the first instance to short out the coil and use a piece of metal coat hanger to extend the length up to 483mm to make a 1/4 wave whip.

After carrying out the work to short out the coil, it was off for an upstairs search to find a coat hanger. Once I had found a suitable hanger I cut it to the right length before placing the new 'element' into the top of the coil. And of course I was expecting a very good s.w.r.

## Ground Plane

The car was in the garage so, I didn't do the old trick of trying to resonate a mobile 1/4 wave without a proper ground plane. Well, if 5:1 is a good s.w.r. (it's not), then there you have it!

I then took off the shorted coil and substituted it with just a 19in length of coat hanger, (who cares if all the clothes are now on the floor!). I put the hanger in the base part, and was expecting a very reasonable s.w.r. and I didn't believe it when I got 5:1 again.

At this point I thought I'd found the answer and that the coaxial and/or PL259 was shorting. However, on checking with my meter,

discovered no shorts, so it was back to scratching the head and this time think for a bit longer.

## Hidden Secret

The coil was not very big and was meant to resonate the whip on 27MHz and it had a hidden secret. I carefully took the whole thing to bits and found nothing there. However, when I looked more closely I did find it, very neatly hidden beneath the coaxial, a little black beast.

The hidden component was cleverly concealed. It was nicely sleeved in heat shrink sleeving, so that elderly short sighted radio amateurs, who are too mean to go out and buy a proper antenna, can't see it!

The source of the problem was a tubular capacitor, Fig. 1. I clipped it out, shorted out the coil with aluminium foil and managed a successful s.w.r. of 1:1.

The 1/4 wave whip certainly works as is to be expected. When using it, I find it's quite possible to work around the area and into my local repeater GB3PO 14 miles away using less than 500mW.

PW

# RADIO ON THE MOVE

Jeff Harris G3LWM gets down to 'basic' construction and whips up a budget mobile antenna.

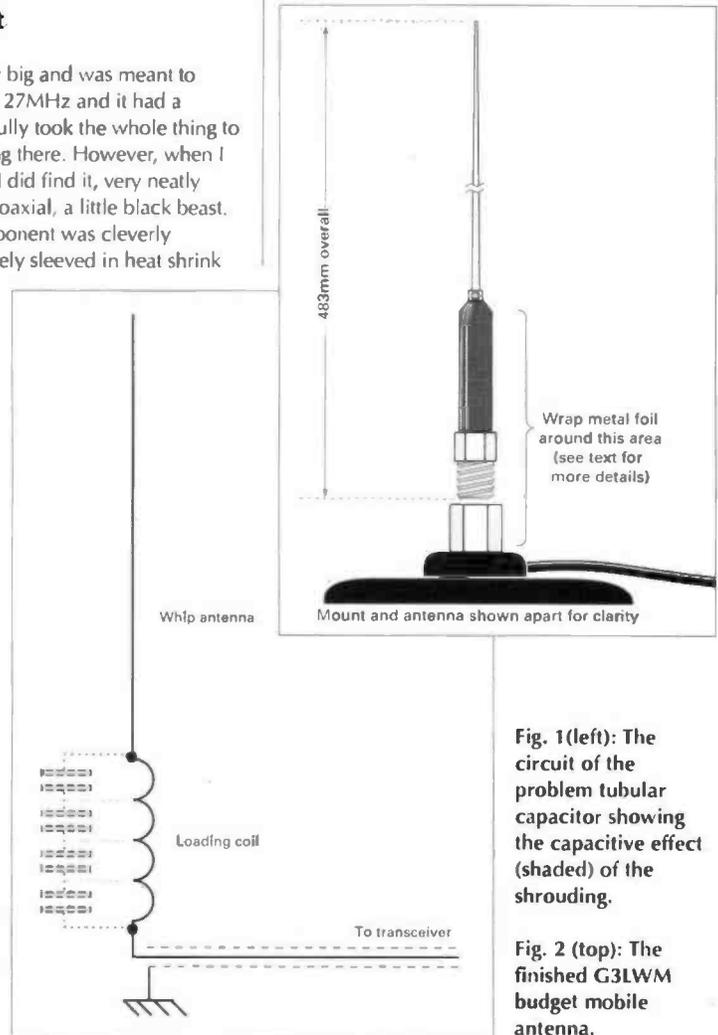


Fig. 1 (left): The circuit of the problem tubular capacitor showing the capacitive effect (shaded) of the shrouding.

Fig. 2 (top): The finished G3LWM budget mobile antenna.

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# Three Canes In A Mounting

**RADIO**  
ON THE MOVE

Brian Shersby G0ISL, shows you how to make an antenna for 1.8MHz, using three canes and a short whip section. It could bring you luck in the form of DX!

There has been a resurgence of interest in 1.8MHz a.m. operation in recent years, particularly with the PW Chatterbox a few years ago, and now with the PW Top Band Tourer in July 1994's issue of PW.

And since I obtained my 'A' licence eight years ago, I have also had great fun with 'Top Band' a.m.

You can join the fun on 1.8MHz a.m. if you can string up some 30m or so of wire, end-fed antenna. With a simple antenna matching unit you shouldn't have much difficulty in putting out a good signal.

Even if you haven't got a good receiver, almost any Japanese medium wave portable can be pressed into service by carefully unscrewing the core of the local oscillator coil, so that top band is covered.

However, the difficulty with this band, is in going mobile or portable. This is because you need to have a fair amount of metal in the air to get anywhere.

For quite a few years, my wife and I and our two children have been enjoying motor cruising holidays on the Norfolk Broads and I like to have some radio gear with me, especially for the 1.8MHz band.

The difficulties I've faced have always been with the antenna. But this antenna idea helped me get over the problems and on the air.

## Bamboo Canes

In the past I have had moderate success using a number of bamboo garden canes. These were tied, in unlikely places, to support about 10m of 24 gauge enamelled wire about four metres above the deck. However, this causes problems when negotiating low bridges.

So, after a little lateral thought I have now a more elegant solution, using a vertical helically wound antenna. This can quickly and easily be lowered for negotiating those low bridges found on canals and rivers.

The antenna consists of three six foot bamboo canes, wound with a total of approximately 26m of 24 gauge enamelled copper wire. The length is not too critical - I used a winding pitch of about 12mm. The exact length of wire depends on the thickness of the bamboo poles used.

The poles were joined together, fishing rod style, using ferrules made from lengths (about 150mm) of suitable copper, or aluminium tube.

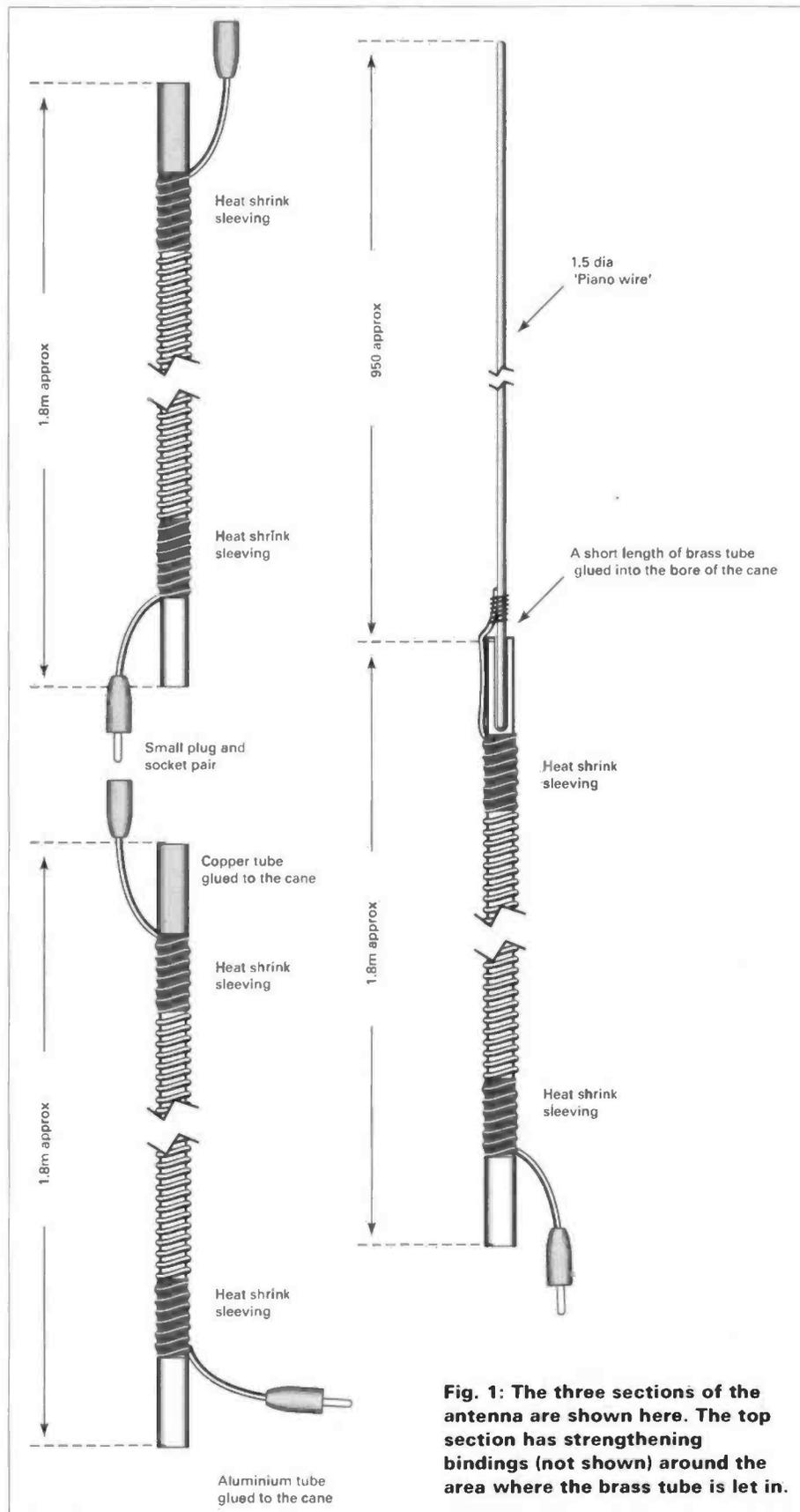


Fig. 1: The three sections of the antenna are shown here. The top section has strengthening bindings (not shown) around the area where the brass tube is let in.

I also fixed a one metre length of 16 gauge piano wire on the top section, both to add to the height of the antenna and to act as a capacity hat.

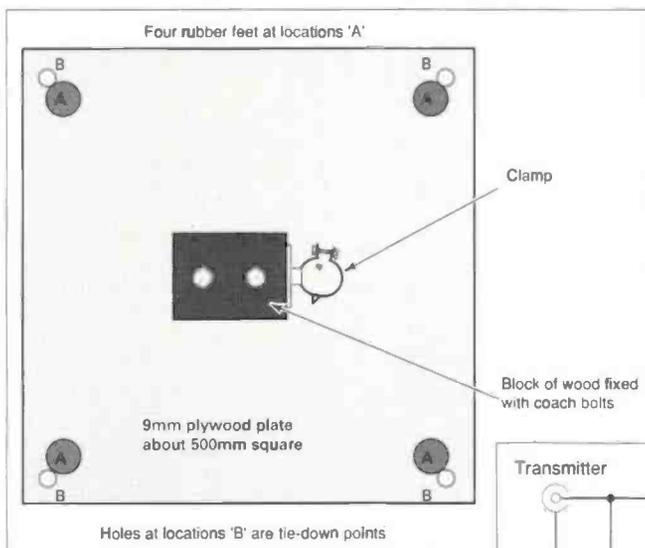
For simplicity, I used flexible wire with small plugs and sockets to connect the wire between the bamboo sections. See Fig. 1 for more details. I used a standard aluminium clamp to mount the antenna, that was screwed to a small block of wood.

The block of wood was in turn, fixed, using coach bolts, to a 500mm square of plywood. This plywood plate with rubber cushion feet, can be attached to the roof of the boat using elasticated hooks to the grab rail on each side of the roof. The plate is shown in Fig. 2.

The clamp section I made easily separable from the plywood base, since when we pack to go away on holiday, space is at a premium in our car. A large sheet of plywood takes up virtually no space when the clamp is not attached.

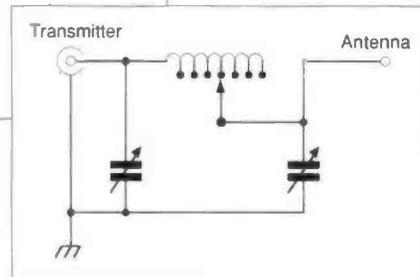
## Marine Mobile

As I write this, I haven't had the opportunity to try out the antenna on a boat (marine mobile), but I have tried it on my car in the driveway, with some very pleasing results. Using a home-brew 3W transmitter, I received a 5 and 9 report from G4RGN in Ashford, only about 15



**Fig. 2: The layout of the baseboard follows this general form. Compare this with the photograph of Fig. 5.**

**Fig. 5: Suggested antenna tuner unit.**



miles as the crow flies, but with a lot of hills between.

For the sake of appearance as well as ease of winding the antenna sections, I filed down the knobs on the bamboo, using a coarse file. If the bamboo is not perfectly straight, it can be heated and corrected when hot.

When it comes to winding the wire onto the cane, anchor one end about 100mm from the end of the cane with insulating tape, and wind the wire as tightly as possible. I find the best way is to rotate the cane.

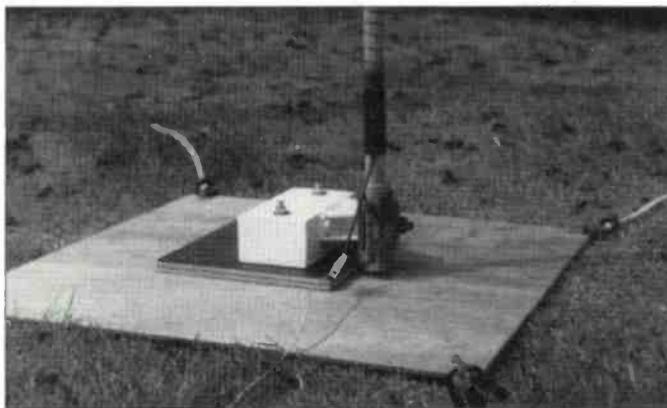
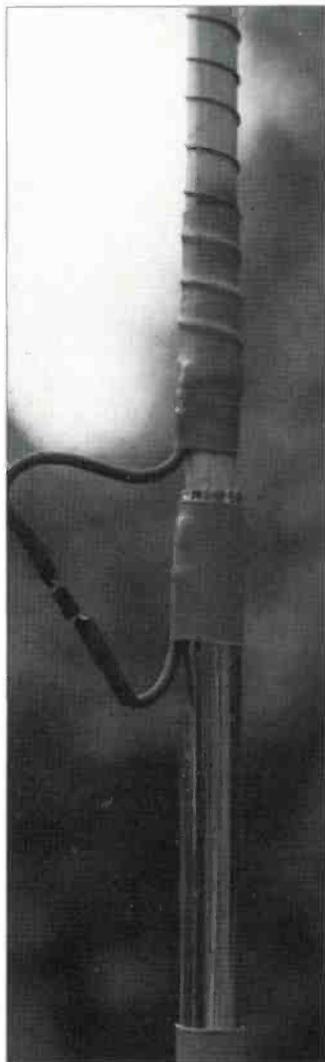
But have a piece of insulating tape at the ready to anchor the wire if you have to stop winding for any reason. My experience is that everyone waits until I begin this kind of operation before they ring my doorbell or telephone.

Should you be disturbed, if you let the wire go without anchoring it, it will just spring loose and then you will have to begin all over again.

**Fig. 3: (Far Left) The centre joints of the antenna.**

**Fig. 4: (Left) The top joint of the antenna.**

**Fig. 5: (Below) The base of the author's antenna.**



## Soldered Tails

Next I soldered tails of flexible wire to the windings at each end of the cane and anchored them securely using heat shrink sleeving. I also coated the cane and the wire with polyurethane varnish to stop the wire moving as well as give some protection from the elements.

Then I fixed 150mm lengths of 5/8in copper tubing to the top of two of the canes using tape and epoxy glue. The next stage meant carefully sanding the bottom of each cane to fit into the pipe.

Fortunately I found I could get a reasonable push fit after varnishing. I used a piece of thin brass tube glued, with epoxy resin glue into the bore of the bamboo, to take the 16 gauge wire on the top of the section. This section of the bamboo should have wire wrapped around it and soldered. This will give it more strength.

On air I feed the antenna from my transmitter using a small Pi-match tuning unit. This is fitted with a tapped coil and small receiving type polycon variable capacitors. I found that anything from 200-500pF should work satisfactorily.

The circuit of my a.t.u. is shown in Fig. 5. I use a field strength meter, and tune for maximum radiated signal.

The necessary earth connection won't

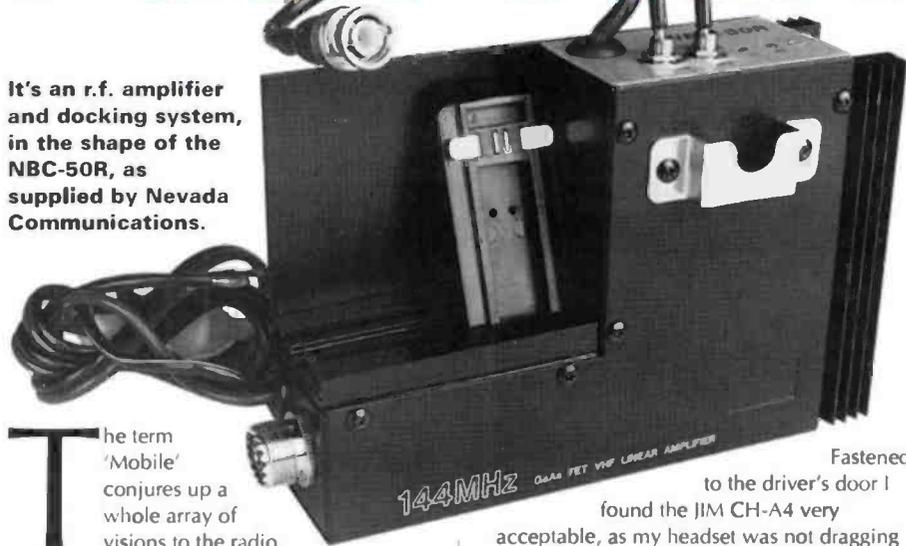
actually be earth of course. On the boat I use the negative connection of the electrical system, which will be bonded to the majority of the large metal objects, such as the engine, in the boat anyway. And on the car, the earth connection goes to the bodywork.

The method of mounting the antenna seems surprisingly stable, I put it up on the car in quite a high wind without any problems. But don't try driving the car with this six-and-a-bit metre antenna attached!

PW

# Push Start

It's an r.f. amplifier and docking system, in the shape of the NBC-50R, as supplied by Nevada Communications.



The term 'Mobile' conjures up a whole array of visions to the radio amateur. Nowadays it can be anything from a bicycle to vehicles looking like porcupines with antennas sprouting from numerous brackets and ill-fitting holes!

I've also no doubt you've seen some 'mobiles' holding some form of microphone, the spiral cable of which is wound several times around the steering column. Or perhaps what appears to be a driverless car, where the driver is actually ferreting around the floor to retrieve the wandering hand-held transceiver!

Most radio amateurs at one time or another venture into mobile operating. This can be h.f. or v.h.f./u.h.f. But, for this article I'm concentrating on v.h.f./u.h.f. mobile operation.

## Many Suppliers

There are many amateur radio suppliers. They can provide the amateur with a wide range of accessories, mounts and antennas.

Looking at the glossy catalogues and publicity on mobile equipment can be confusing. So, to help you get mobile, I've had chance to test a reasonable selection of goodies for mobile use.

Mounting equipment within the vehicle can often be a very involved job task. So, I'll look at installing the standard mobile rig in another article. This time I shall concentrate on the hand-held transceiver and other equipment in the car and suggest some ideas for better safety.

## Versatile Mount

To keep the small rig safe in your car, the JIM CH-A4 manufactured by Solid State Electronics of Southampton, is a versatile mount. It's useful for either a hand-held or scanner and can be slotted down the inside of the driver's window.

Placed inside the car window, you can hang your hand-held or scanner on the Jim CH-A4 against the driver's door and within easy reach. Or, with the aid of the separate plate supplied, fasten it to the dashboard or fascia.

Fastened to the driver's door I found the JIM CH-A4 very acceptable, as my headset was not dragging all over the place. The mount is very neat, well made and reasonably priced at £7.95, and is available from Nevada Communications.

Next, I tried another mount - the Multi Flex Handie Holder, from Southern Scanning and Shortwave. I used it with the removable rig cradle which is supplied as an optional extra.

The Multi Flex Handie Holder is a very heavy duty stand-off mount, made in plastics material. It has knuckle, elbow and swivel joints, making it a really useful piece of equipment.

The mount can be fixed to any position, it's handy not just in the car, but could also be useful in the shack. By utilising the various joints to the best advantage, your hand-held is secured firmly exactly where it's needed.

If, like myself, you wish to leave the belt clip in place, then the Spring Loaded Rig Cradle can be purchased as an extra. This in turn is mounted on the back plate with the aid of four screws supplied.

Your hand-held or scanner can then simply be held in position by the cradle and the rig is firmly held by the rubber lined side grips. Removal couldn't be simpler - press a button and the rubber-lined side grips instantly release from holding the rig in place.

The Multi Flex Handie Holder itself is priced at £13.95 and the Spring Loaded Rig Cradle also at £13.95. Both units are available from Southern Scanning and Shortwave.

## Mounting And Boosting

One method of mounting a hand-held and boosting the r.f. output power can be obtained with the aid of the NBC-50R. It's an r.f. amplifier and docking system, manufactured by Nietzsche Enterprise Company Ltd., and supplied by Nevada Communications.

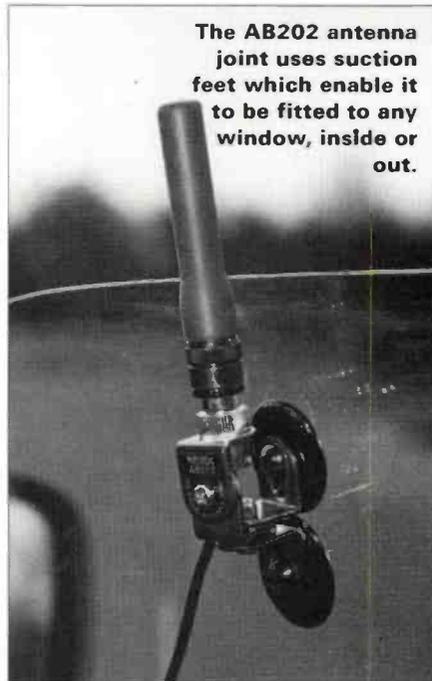
The NBC-50R allows a variety of hand-held transceivers to be mounted directly onto the unit. Your vehicle's 12V d.c. power is then taken through the base of the hand-held. This is done via a set of interchangeable base plates, each having different battery contacts, to match the make of hand-held being used.

# RADIO

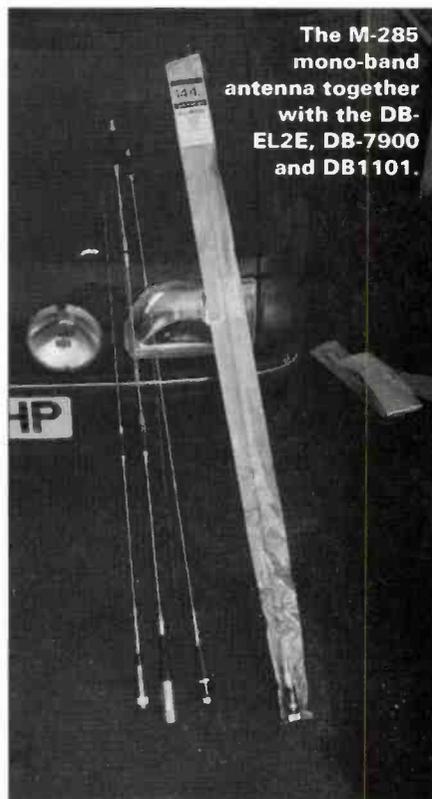
## ON The move

John Goodall GOSKR is a keen mobile operator and he's provided a series of mini reviews to give you a helpful 'push start' to get you going with mobile amateur radio.

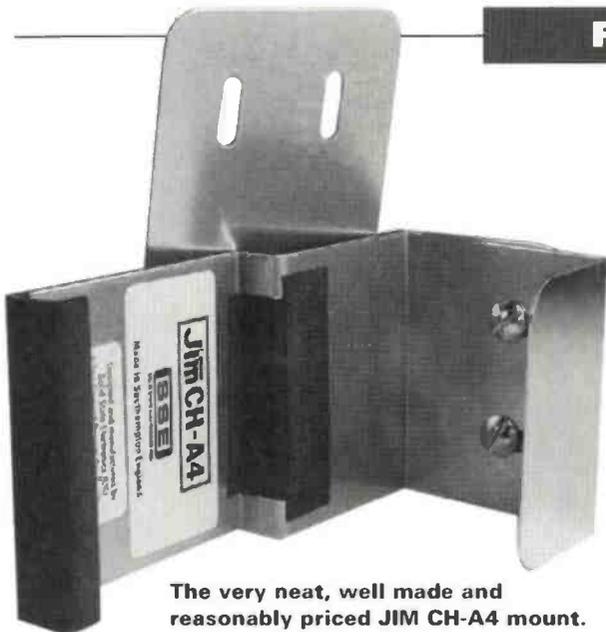
The AB202 antenna joint uses suction feet which enable it to be fitted to any window, inside or out.



The M-285 mono-band antenna together with the DB-EL2E, DB-7900 and DB1101.



## FEATURE



The very neat, well made and reasonably priced JIM CH-A4 mount.

The NBC-50R Docking System, depending upon individual hand-held output power, will deliver up to 50W to the antenna. However, the power supply, from the vehicle or shack p.s.u., must be disconnected before attaching the hand-held to the unit. This prevents any possible short circuits and possible damage to the unit or hand-held, or both.

The NBC-50R is available for £99.95. I'm certain that it's very good value for money for both base and mobile use.

Also aimed at mobile use (but it could be equally used in the shack) from the same manufacturers is the **NB-30W**. This model was supplied by **Haydon Communications**.

The NB-30W is a linear amplifier giving up to 35W output to the antenna. This is dependent on the input power from the hand-held or mobile rig. It's small, measuring 125 x 60 x 45mm in depth, but packs a tidy punch from the output of a hand-held. The NB-30W is available for £44.95.

### Hands Free

While still looking at equipment for mobile operation inside the car, I've taken a rather close look at a selection of 'Hands free' equipment. This is a change from the all-too-common 'Hands-off-the-wheel' approach!

We all know it's not safe to operate the hand-held microphone of a transceiver while driving. So, let's show everyone radio amateurs are a responsible breed when operating a transceiver when mobile.

The following items designed to aid 'Hands Free' operating are all from Revex and were supplied by **Nevada Communications**. They're compact but versatile, and are ideal accessories for operating the modern hand-held while driving.

Top of the range is the **Revex FM50** for £49.95. This is a complete headset with boom microphone and locking push to talk (p.t.t.) switch.

The FM50 unit is extremely light in weight and the connecting cables are made from miniature microphone screened lead. It can be firmly fixed to a separate clamp which in turn can be clamped around the gear lever or any other convenient place. (If you have a

Kenwood hand-held you should order the Revex FM 50K).

Next, again priced at £49.95, is the Revex FM80. This is a 'Hands Free' microphone with a lockable p.t.t. The boom microphone is attached to a spring clip, which, for easy use, can be attached to the sun visor. Kenwood users should ask for the Revex FM80K.

The Revex EM700-H at £39.95 is the next little item. This is an earpiece/microphone, again with lockable p.t.t. and has a small earpiece, similar to those on many personal stereos. It fits neatly inside the ear, and has a tiny (but sensitive) electret microphone on the end of a very neat 40mm long fixed boom.

Audio reproduction from the microphone is extremely good and I found this unit to be ideal. Again, for Kenwood users Revex have a separate model, the Revex EM700-KH also at £39.95.

Whilst still with the Revex range from Nevada, I must mention the EP300. This is a very sensible earpiece and fits snugly over the whole ear with the earpiece itself close inside the ear. It's supplied with a 3.5mm mono jack plug, suitable for most makes. The EP300 is priced at £13.95 and I have owned and used one for several years.

### Antennas And Mounts

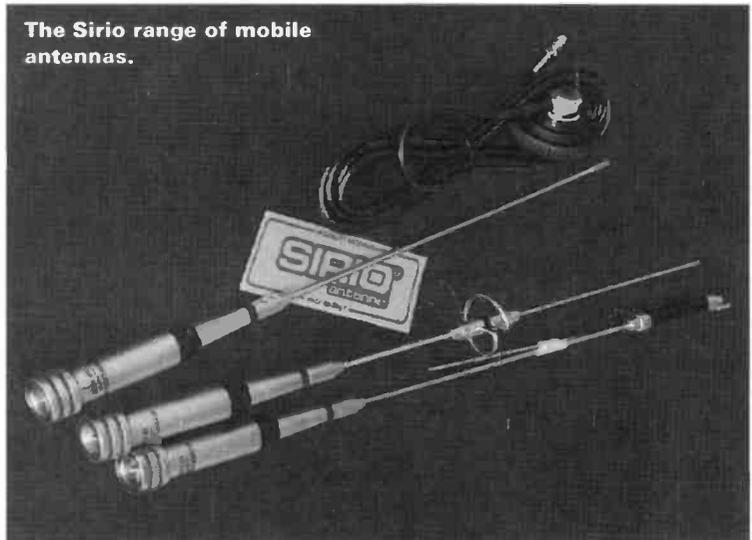
Now I'd like to look at antennas and antenna mounts. Firstly though, I've a couple of items within this category, which can be used inside the vehicle. Both have been manufactured for the hand-held user, and can be obtained from **Southern Scanning and Shortwave**.

The first unit is from the American company Pro-Am, and it's a window mount kit. This consists of almost two metres of RG58U coaxial cable terminated in a BNC plug.

There's also a clip-over bracket with a BNC socket attached. The bracket clips over any wind-up window, with the BNC socket on the outside for attaching the hand-held's rubber antenna or similar. It's available at £13.95 and I think it's very useful for the Novice Operator.

The second item is a more sophisticated antenna mount and cable harness. The AB202 Suctorial Antenna Joint (that's what it says on the packing!), is a compact mount with 2.5

### The Sirio range of mobile antennas.



metres of RG188A thin coaxial cable attached, terminating in a BNC plug.

The mount has two swivels and two black plastics suckers for attaching to any window, inside or out, mobile or in the home. It features a slot into which the flexible rubber antenna of the hand-held can be firmly kept in place. For those of us with limited funds it's priced at a sensible £11.95.

On to mounts now and at the very top of the price range of the mounts I tested, is the Diamond K400M, what I think could be the 'Rolls Royce' of antenna mounts/cable harness. I found it to be very versatile for mounting safely in many positions on my five door Ford Escort.

Directly fastened to the SO239 of the Diamond K400M was 370mm of RG188A (thin 50Ω coaxial cable). This in turn was (very professionally) connected to five metres of high quality low loss .5DSFA coaxial cable, terminated in a standard PL259 with gold plated centre pin.

The mount itself can be fixed to any hatch, boot or even a gutter if your vehicle has one. The K400M was certainly an impressive and quality mount/harness, easy to fit and costs £69.95.

From the same manufacturer I then tried the K10M at £49.95. This was again a mount/cable harness, but with the mount being solely gutter fitting. Finally from Diamond, there's also the DP-SPM magnetic mount/cable harness.

### Safety Tests

As safety is of the utmost importance I carried out some tests on a disused airfield in the Midlands. I first mounted the Diamond NR-770S then the Diamond M285, on the DP-SPM magnetic mount/cable harness.

I tested each mount in turn at speeds up to (and well in excess of) the legal speed limit. I was very impressed to say the least with the results. Even with a strong cross wind the mount remained firmly centrally placed on the roof of the vehicle.

The Diamond NR-770S, is a dual-band, 144/430MHz antenna, 430mm in length. The price for this antenna is £32.95.

The Diamond M285 is a 144MHz monoband antenna. It's 1340mm in length

giving 5/8 wave and priced at £19.95. Incidentally, all the Diamond equipment was kindly loaned by **Waters and Stanton Electronics**.

Next, from the Taiwan Serene Company's (supplied by **Southern Scanning and Shortwave**) range, I tested several items. These included a budget priced universal hatch/boot mount, the TSA-5005, and separate cable harness, the TSA-5311, along with a couple of antennas.

The TSA-5005 at £16.95 is excellent value for money, as is the TSA-5311 also at £16.95. Incidentally, the TSA-5005 is made entirely of stainless steel and is almost identical to the Diamond K400M.

The TSA-5311 cable harness, is again similar to that of the Diamond K400M. It has 370mm of RG188A cable into four metres of 3.5D - FV low loss cable. This terminates in a standard PL259 plug which also has a gold plated centre pin.

I also tried two antennas from Taiwan Serene, and both were dual band models. The first was the TSM-1316 model, which is a 144/430MHz antenna, 445mm in length, a 1/4 wave on 144MHz and 5/8 wave on 430MHz.

The other model was the TSM-1309, 144/430MHz antenna, 930mm in length and providing 1/2 wave on 144 and 2 x 1/2 waves on 430MHz. The TSM-1316 costs £21.95 and the TSM 1309 is available for £29.95. Both antennas are in matt black making a welcome change from the usual shiny stainless steel.

I also had three mobile antennas to try out from **Haydon Communications**. They supplied the DB-EL2E, a mono-band 144MHz antenna, a 1700mm long 1/2 wave x 2 collinear.

The DB-EL2E is a very impressive antenna but is extremely heavy and needs a firmly fixed mount. I used it on the Taiwan Serene TSA-5-5 mount without any trouble.

The DB-7900 antenna is a dual-band version, 144/430 MHz antenna, which is a 1/2 wave x 2 at 144 and 5/8 wave x 2 at 430MHz. I found it to be an excellent antenna, giving very good performance. And despite its very heavy base, it's a very neat antenna at 1580mm in length.

The DB-1101 is a budget priced dual-band antenna, 144/430MHz. It's 900mm in length, giving 1/2 wave on 144 and 5/8 wave x 2 on 430MHz. The DB-EL2E is priced at £28.95, the DB-7900 at £49.95 and the DB-1101 at £24.95.

## New Range

I also had the opportunity to try out a completely new range (to me anyway) of amateur mobile antennas, from the Sirio stables of Italy. These were supplied by **Nevada Communications**.

Although they're new to me, Sirio have been around for many years. Their experience shows by the extremely professional appearance, design and performance of this whole range of antennas.

The Sirio range consists of two mono-banders for 144MHz, two mono-banders for 430MHz and three dual-band 144/430MHz antennas.

The base of each antenna being identical throughout the range, and having a gold plated centre pin of the u.h.f. male connector. Also on

the base is a silicone rubber sealing gasket and 'O' ring for perfect weatherproofing. The whips of all seven antennas are from high quality, heavy duty stainless steel.

Starting with the mono-banders; the HP 2000 is priced £24.95, the HP 2000C is priced at £29.95. The HP 7000 covers 430MHz and is priced at £21.95. The last mono-bander is the HP 7000C, 730mm in length giving 1/2 wave x 2 collinear at 430 - 440MHz.

Giving excellent dual-band performance, firstly there's the HP 2070, 445mm in length giving 1/4 wave at 144 and 5/8 wave at 430MHz priced at £22.95.

At £31.95 the HP 2070H is the top of the range. It's 1050mm in length giving 1/2 wave x 2 at 144 and 5/8 wave x 2 collinear at 430MHz.

Finally there's the HP 2070R at £29.95, 980mm in length and giving 1/2 wave at 144 and 5/8 wave x 2 at 430MHz. Sirio also supply a connector and cable harness, the HP AC-U which is suitable for any mount.

## Stand Out

During my tests, several items seemed to stand out from the crowd. Firstly, there was the Multi Flex Handie Holder supplied by **Southern Scanning and Shortwave**. I thought it was ideal for the keen mobile operator.

Next, there's the docking system r.f. amplifier and hand-held holder, the NBC 50R from **Nevada Communications**. I thought it was a very neat and versatile accessory.

Finally, there was the 'Rolls Royce' of mobile antenna mounts, the Diamond K400M from **Waters and Stanton Electronics**. It was used in conjunction with the DB-7900 dual band heavy duty antenna from **Haydon Communications**.

## Final Advice

My final advice is...don't become a statistic! Wouldn't it be marvellous if all the mobile users of hand-held transceivers, had their rigs firmly fixed in a suitable, easy to reach position. It's food for thought isn't it?

To round off, I wish you all safe mobile working. I would also like to express my sincere thanks to everyone (listed below) who kindly loaned the review equipment. PW

**The NB-30W supplied by Haydon Communications is a linear amplifier that provides up to 35W output to an antenna.**



**The Diamond DP-770S mounted on the DP-SPM magnetic mount.**



**A selection of items from the Revex range designed to make hands-free operation safer and easier.**

## Contact Addresses For Equipment Supplied In This Article

Haydon Communications, 132 High Street, Edgware, Middlesex HA8 7EL. Tel: 0181-951 5781/2.

Nevada Communications, 189 London Road, North End, Portsmouth, Hampshire PO2 9AE. Tel: (01705) 662145.

Southern Scanning and Shortwave, PO Box 2126, Bournemouth BH11 9YH. Tel: (01202) 570779.

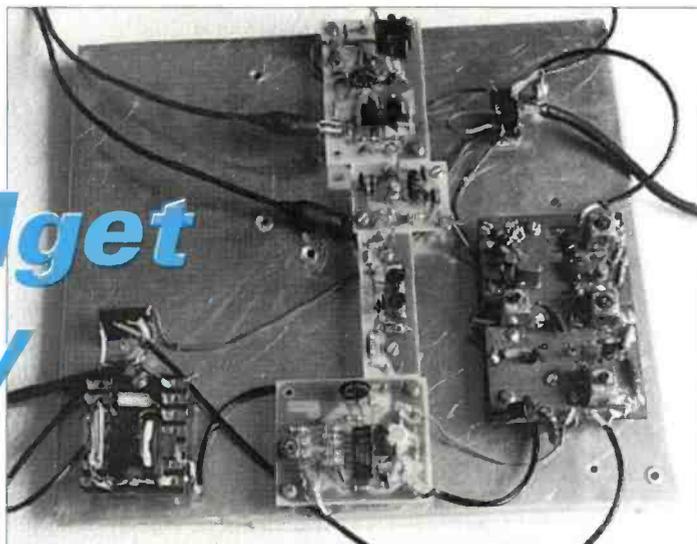
Waters & Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835.

# THE ROAD TO TOP BAND -



Ben Nock G4BXD describes his neat idea 'Top Band' operation using a simple 28 to 1.8MHz transverter. Ben's project could be your 'limited budget' route to getting going on 1.8MHz.

## The Budget Way Part 1



**A**s I had a spare 28MHz mobile rig, and I wanted to operate mobile on 1.8MHz, I thought the easiest solution would be to build a transverter. In this way I'd be able to fully utilise the existing transceiver.

The design that follows allows a 28MHz drive source (any 28MHz transceiver) to operate on 1.8MHz. This of course can be either from your home station or when operating mobile.

My project could in fact be used with some of the older amateur transceivers which don't cover 1.8MHz. It's also a very inexpensive way of getting onto 'Top Band'.

### Initial Considerations

My initial considerations for the project were that it should cost as little as possible. I also intended that it would be easy to construct. I looked at the methods used with single units, such as the 'PW Meon' and the like, and decided that for ease of building this method was too complex.

With this in mind I looked through my amateur radio library to see if anything was already on offer, either ready-built or as a kit. I didn't find anything ready-made, but several firms offered kits. The kits found could either be modified or put together to do the job required.

In particular, the kits produced by Derek Pearson G3ZOM of Jandek, in the West Midlands were investigated. The kits on offer included separate units such as mixers, filters and amplifiers which go together in various combinations. (See note regarding Jandek Kits at end of article. Editor).

Various experiments showed that kits could be used to make a QRP 1.8MHz station suitable for base or mobile operation.

The results made me think that this could be a whole new area of interest to many amateurs.

### Receive Converter

This time I'll show you how to build a receive converter. The circuit diagram of this unit is shown in Fig. 1. The transmit converter I'll deal with in a later article.

In the overall block diagram, Fig. 2, the box in the lower right hand side is the receiving section of the project. This converter uses a 3SK88 m.o.s.f.e.t. (though in my prototype I used a 40673 type) as an r.f. amplifier, a 2N3819 f.e.t. as the mixer and a BC109 as the oscillator.

I didn't have any reason for choosing the transistors I used... other than that they were in the junk box at the time of building! Any similar, or indeed better devices could be used depending on what you want to spend!

And, to save the bother of coil winding, I used Toko 10K series inductors. These coils made construction a little easier. In the circuit I've used two KANK3333R coils for the 1.8MHz tuned circuits, and two KANK3335R coils for the higher frequencies.

The incoming signal at 1.8-2MHz comes, via the changeover switching, from the antenna. Tuned circuits T1/C1 and T2/C5 form a filter centred on 1.9MHz (or any other area of interest).

The r.f. amp feeds its signal into the gate of Tr2, an 'ordinary' j.f.e.t. mixer. The other signal needed for the mixer is of course from Tr3, the crystal controlled local oscillator. Although this is shown with a 27MHz crystal (XL1) a suitable substitute is a 26.995MHz model control transmitter crystal.

Continued on Page 51

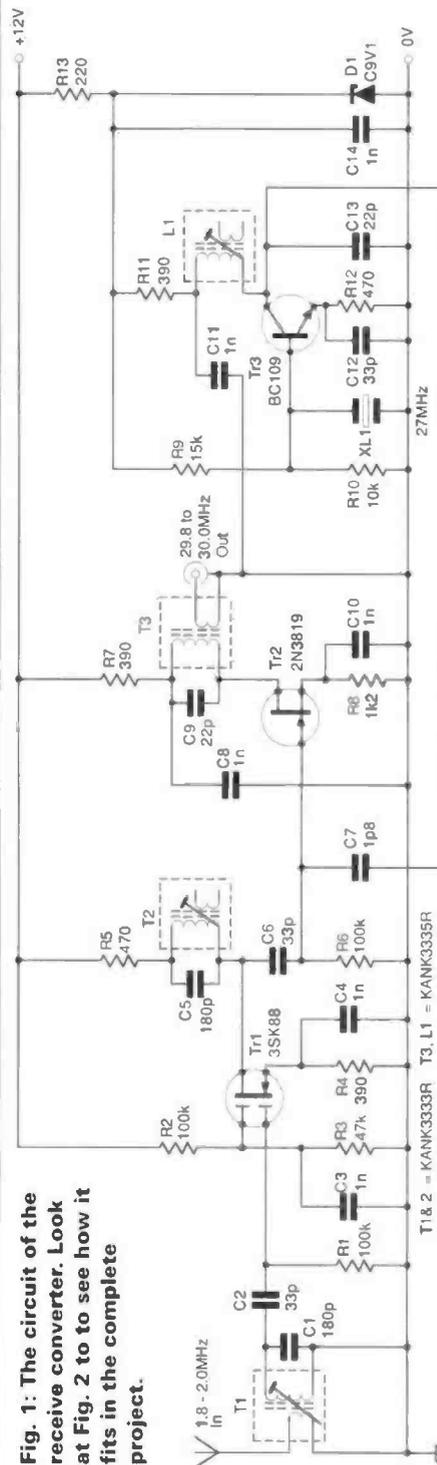


Fig. 1: The circuit of the receive converter. Look at Fig. 2 to see how it fits in the complete project.

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### MULTI-BAND SSB/CW RECEIVER

The new **DXR20** covers 20, 40 & 80M bands plus any other HF frequency with optional plug-in modules. The photo shows the receiver built with **DXR20** and **DCS2** ("S meter") kits and **HA20R** hardware pack (case etc.). It has some great technical features hidden inside! **DXR20** electronics kit: **£39.90** HA20R hardware pack: **£28.90**

### IS YOUR WINTER PROJECT HERE?

Please send an SAE for a catalogue/data sheet or give us a ring to discuss the details of the kits and optional hardware packs. Kits are also available as assembled and tested modules at extra cost. Not all kits are listed!

#### ACTIVE ANTENNA KITS

AA2	150kHz to 30MHz	£8.90
AA4	25 to 1300MHz Compact	£19.90
AB118	High Performance VHF Airband	£18.80
SPA4	Scanner Pre-amp. 4 to 1300MHz	£15.90

#### RECEIVER KITS

MW1	Medium Wave + 160M inc. H/W	£29.90
DXR10	10, 12 & 15M SSB/CW	£27.50
TRF3	5.7 to 17MHz TRF	£15.50

#### TRANSMITTER KITS

CTX40	40M QRP CW inc. crystal	£15.50
CTX80	80M QRP CW inc. crystal	£15.50
AT160	80 & 160M AM/DSB/CW	£39.90
MTX20	20M 10W CW inc. crystal	£29.90
HTX10	10 & 15M SSB Exciter 50mW	£49.90
HPA10	10 & 15M 10W Power Amp	£39.90

#### TX TYPE ATU KITS

CTU30	30W HF & 6M with balun	£39.90
CTU150	150W 1.8 to 30MHz	£49.90

#### ACCESSORY KITS

AP3	Auto Speech Processor	£16.80
MA4	Mic Amp with active filter	£6.20
CM2	Electret Mic with VOGAD	£13.50
CSL4	SSB & CW Filter for DCR etc.	£10.50
CV100	HF Converter for VHF scanner	£27.50
DCS2	"S Meter" for DC receivers	£10.90
DFD4	Add-on Digital Readout	£49.90
DFD5	Digital Frequency Counter	£54.90
ST2	Side-tone/Practice Oscillator	£9.80
SWB30	SWR/Power Indicator/Load	£13.90
XM1	Crystal Calibrator LF to UHF	£16.90

#### HARDWARE PACKS

CA4M	Houses DFD4 and PMB4	£24.90
CA5M	Houses DFD5 and CBA2	£28.90
CA10M	10 & 15M Transceiver H/W	£34.90
CA30M	Houses CTU30/SWB30/ST2	£34.90
CAB0M	Houses CW Transceiver	£34.90
HA10R	Houses DXR10 Receiver	£25.90
HA11R	Houses XM1 Crystal Calibrator	£11.90
HA12R	Houses ST2 Side-tone	£10.10
HA30R	Houses CTU30 ATU	£17.90
HA33R	Houses TRF3 SW Receiver	£25.90
HA150R	Houses CTU150 ATU	£16.90

### GREAT VALUE ATU!



The new **HOWES CTU8** SWL ATU covers medium and shortwave bands (500kHz to 30MHz). Increases wanted signals by providing impedance matching, and at the same time reduces spurious signals and interference with "front end" selectivity for the receiver. Kit contains case and all parts. Top value general coverage receiving Antenna Tuning Unit.

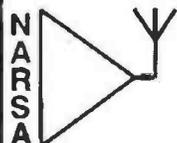
**Kit: £29.90 Fully assembled, ready to use: £49.90**

PLEASE ADD £4.00 P&P, or £1.50 P&P for electronics only kits.

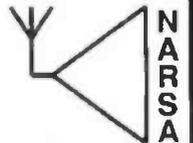
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73 from Dave G4KQH, Technical Manager.

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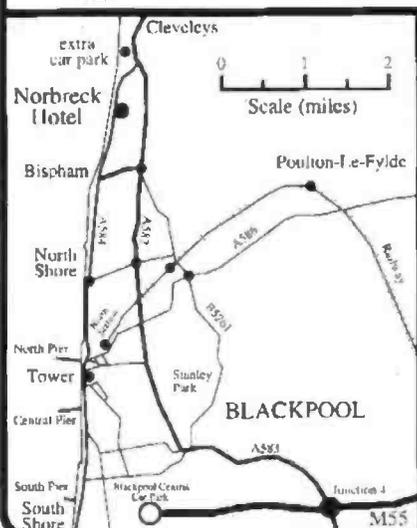
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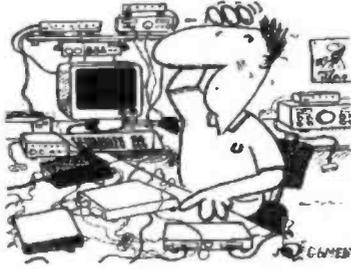
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The output of the mixer unit may be either broad-band or tuned to a particular frequency. However, as I was contemplating multi-band use at a later date, the broad-band option was chosen.

## Transmit Description

Before I get on with describing building the receive converter I'll give you a transmit conversion description. The numbers in brackets are the Jandek kit numbers for those of you lucky enough to have these available.

The raw output from the 28MHz transceiver is at far too high a level to be fed direct into the mixer board (Jandek mixer kit 023) and so I had to make a matched attenuator. The input to the mixer should be about 500mV to 1V of r.f. The local oscillator signal from Tr3 is from the (presently) unused secondary winding of coil L1.

The output of the transmit mixer unit is then passed to a filter unit (Filter, kit No 007). In this instance it's tuned to 1.9MHz but the kit was available for other frequencies. The circuit comprises a double-tuned configuration with 50Ω input and 500Ω output. The latter impedance needs altering to suit the interconnection impedance (50Ω) used throughout the transverter.

The output of the mixer is quite low in level so I used a broad-band amplifier (Amplifier kit No 028) following the filter. As this unit was designed as a broad-band unit, multi-band use would be possible without the need for other filtering.

Incidentally, the amplifier circuit has a gain of 13dB (20 times) and runs in Class A. Because it is a linear amplifier it's suitable for s.s.b. The output and the input are both designed to be 50Ω making interconnection of units easier.

## Power Amplifier

When I started the project, I had not decided what sort of p.a. would be used. In my prototype I settled for the level of 1.5W p.a. stage. Although a larger p.a. stage could be fitted in place of the low power amplifier I used.

Circuit and Hands Electronics produce h.f. p.a. kits giving about 15-20W of r.f. Both kit designs produce between 15 to 20W of output. There's enough drive from the Jandek 028 kit for this to drive either of these amplifiers.

## Prototype Board

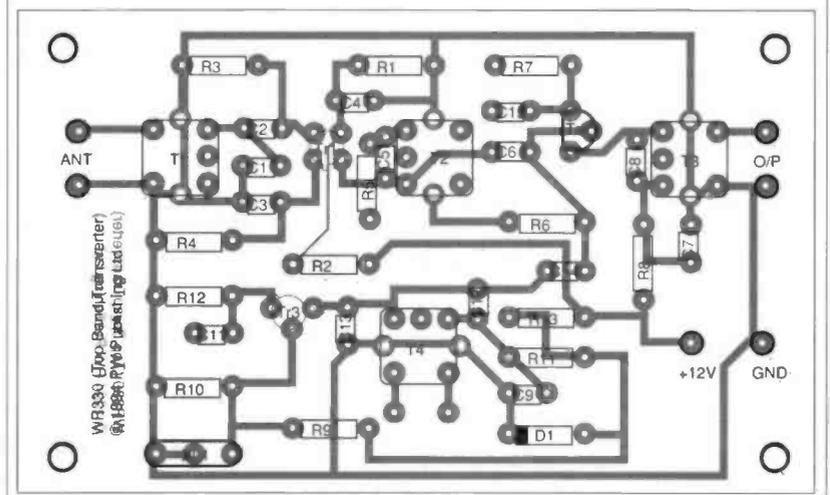
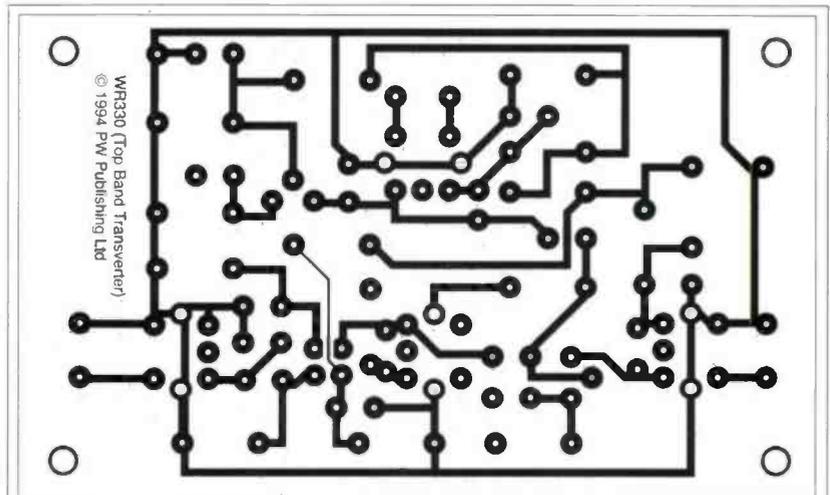
I built the prototype board using double-sided p.c.b. material with all the ground connections to the upper side. I find this approach simplifies the amount of tracks needed underneath the p.c.b.

You can of course make your own board, using a simple p.c.b. etch resist pen, and free hand drawing. Place the coils first and use them as templates to mark the pin positions. The associated component overlay, Fig. 3, will help in this respect.

## Crystal Choices

Crystal choices will depend upon whether you intend to use one that's handy, or buy what you need. All that's needed to convert 28 to 1.8MHz, is a 26.2MHz crystal. To explain, I'll assume that the transceiver you're using, is capable of 28-30MHz coverage. If this is so, then any crystal between 26.2 and 28MHz could be used.

However, it may be that your 'Ten metre' rig does



Track pattern and overlay for WR330, the receive converter section of the project. Note the earth plane has been left off for clarity.

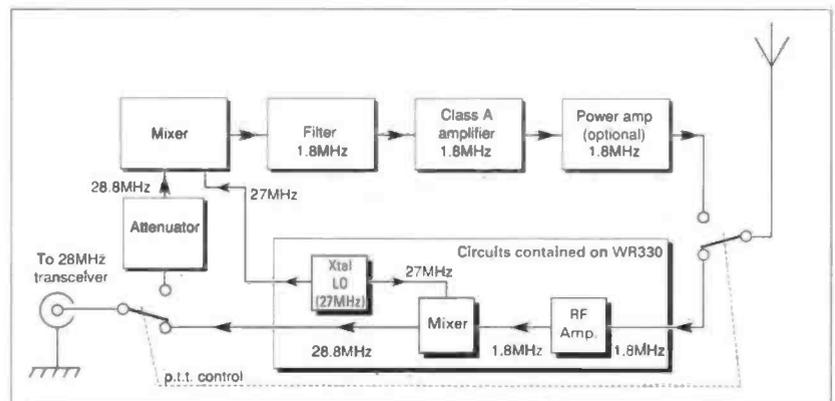


Fig. 2: Block diagram of the full project. The boxed section labelled as being on WR330 is the receive converter partly dealt in this issue.

not cover the whole of that band. But there's no real problem: the crystal frequency required is simply the 28MHz frequency you require finally minus 1.8MHz.

So, if a 27MHz crystal were used, then the kHz reading on your rig's dial would reflect the 1.8MHz frequency. In other words, 28.933MHz would be equal to 1.933MHz after transverting.

## Tuning Up

After assembly the tuning up required is quite simple. You should connect the transverter to the 28MHz equipment and an antenna to the transverter, and then adjust the core of T3 for greatest noise. Then locate a signal on 1.8MHz

Continued on page 52

and adjust the cores of T1 and T2 for maximum signal.

## On The Air

I tried my prototype on the air while it was still in the 'breadboard' state (see the heading picture). I used it in conjunction with the 2W power amplifier stage.

My tests on 1.8MHz started with a 40m long wire antenna with a commercial a.t.u. I received a 5/7 report from the south coast and a 5/5 from Wales along with many others. This proved (to my satisfaction!) that the simple design was working well and that QRP was indeed an interesting alternative to a more powerful transmitter.

## Boxing Up

The final 'boxing up' will depend much upon what you want. As there are no user controls, then one solution could be a die cast aluminium box. You could use a box of approximately 110 x 70 x 50mm. The p.a. stage, if used, could be bolted to the outside of the lid to provide a good air flow.

Finally, I hope you will enjoy building and operating with this project. It provided me with a 'budget route' to 1.8MHz operation. Why don't you have a go and try it for yourself? I look forward to describing the next stage of the project in Part 2.

PW

This article was written before Jandek, operated by of Derek Pearson G3ZOM, ceased trading. That is why there are various references to his kits in this article. In spite of this we felt that you would like to read how Ben achieved getting on 'Top Band' cheaply.

Derek has gone back to university and has granted us permission to publish his designs (which will become PW copyright) mentioned in this article. They will be brought to you in future issues as soon as we can prepare them. So there is no need for these excellent designs to disappear.

- Ed.

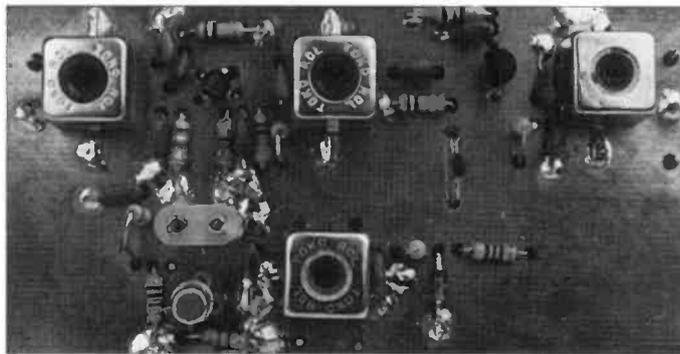


Fig. 4: The first PW Prototype, that is similar to the final design.

## Shopping List

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220Ω	1	R13
390Ω	3	R4, 7, 11
470Ω	2	R5, 12
1.2kΩ	1	R8
10kΩ	1	R10
15kΩ	1	R9
47kΩ	1	R3
100kΩ	3	R1, 2, 6

### Capacitors

#### Miniature disc ceramic

22pF	2	C9, 13
33pF	3	C2, 6, 12
180pF	2	C1, 5
1nF	6	C3, 4, 8, 10, 11, 14

C7 may be either a 1.8pF capacitor or it can be made from two short lengths of insulated copper wire twisted together.

### Semiconductors

2N3819	1	Tr2
3SK88	1	Tr3 (or a 40673 or similar dual-gate m.o.s.f.e.t.)
BC109	1	Tr3
C9V1	1	D1 (any 9.1V Zener diode of more than 400mW)

### Inductors

KANK3333R	2	T1, 2
KANK3335R	2	T3, L1

### Miscellaneous

A third overtone crystal of 27MHz (or near frequency, see text). Then depending on the installation you will need a suitable box, mounting bolts nuts and washers, interconnecting coaxial cable and wire, two coaxial sockets, relays

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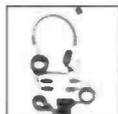
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# Antenna Wo

**M**uch has been written about antennas in amateur radio literature over the years. Arguments for, and against, the superiority of beams (both close and wide-spaced), cubical quads and loops of all sorts have appeared month after month and year after year. The quest for antenna knowledge and experimental know-how seems to be unending.

In the amateur radio press, not much appears about indoor antennas, although some of us, either by choice or by necessity, have been using them for a long time. For some 30 years I have used only indoor antennas.

And yet, I've still managed QSOs with over 180 countries. Although I admit that most of my QSOs are using c.w. they've been successful.

My successful QSOs are not intended as a bit of personal trumpet-blowing. They're simply to show that amateur radio is still possible without the aid of large outdoor antenna systems.

I must admit that in the competition of a DX pile-up it is difficult. It's only when the 'big boys' have had their contacts that it's possible to work the rare DX station (and sometimes not even then!).

Even so, using quite humble bits of wire in the attic I still get a thrill and sense of achievement. Especially when a VK station comes back to my call.

But what types of antenna can produce these results? In this occasional series of indoor antennas 'Antenna Workshop', I'll endeavour to describe a few that I have used with reasonable results.

## Attic Antenna

One simple attic antenna, the W8JK, is a two element system with both elements directly fed. However, they're fed with signals that are 180° out of phase with each other.

The W8JK antenna may be mounted with both elements at the same height, or with one element above the other. In the version to be described the

elements are mounted horizontally at the same height. In this mode the maximum radiation, like a simple dipole, is (or should be) at right angles to the elements.

Much has been said about the fact that W8JK isn't very effective unless it's erected in the clear, away from trees and buildings. The reason given for not using it as an indoor antenna is that very high voltages exist at the element ends. These high voltages result in high losses by absorption by timber, brickwork, tiles, etc.

I've also seen it stated that, as the impedance at the centre of each element is very low, when the two elements are connected in parallel, the impedance for the whole antenna is half the value of the already low element impedances. This is supposed to make it difficult to match.

In spite of the rather gloomy introduction, I've used a W8JK antenna in the attic space of my house for some 20 years. I've made frequent 14MHz DX contacts with Australia, New Zealand and the west coast of America, admittedly mostly using c.w. but some were on s.s.b.

By tuning and matching with an antenna tuning unit (a.t.u.), the 7, 21 and 28MHz bands have also been used quite successfully. The W8JK antenna was chosen because, at that time, I wasn't aware that it shouldn't work very well!

It may be that my antenna operates satisfactorily because my version has folded dipoles for both elements. Using folded elements has the effect of increasing the terminal impedance making it easier to match.

## Inspect Attic

Inspect your attic to ensure the ease of erecting any sort of antenna before you start construction! Installation in a 'typical' attic is normally fairly easy but there must be space to move around in.

Some modern attics are all joists and wooden bracers. You can put the antenna up, but you will need

the agility of an eel to move around!

If the attic timbers don't run horizontally end to end of the roof space (making fitting comparatively easy) it's still possible to fit such an antenna. This is then carried out by pinning the elements to the sloping woodwork inside the attic. These sloping beams are the support for the tiles on the outside.

The antenna and its feeders are made up from 300Ω flat twin cable. Around 25m will ensure that there is sufficient to make the antenna itself.

However, the length between the a.t.u. and antenna will depend on individual requirements. In fact, the length between the a.t.u. and antenna doesn't seem to matter, unless it's so long that the resistive losses of the cable absorb a lot of the transmitter power!

But, **here's a most important point.** An effective antenna tuner **must** be used to transform the impedance of the complete antenna and feeder system to match the transmitter output at the shack end.

Now for the complete construction programme. Steps one to seven can be done in the comfort of the shack!

### Step 1

Cut the 300Ω feeder into lengths as detailed in **Table 1**. Measure the shortest practicable run for the feeder (part 5) between the expected centre of the antenna (points X-X in **Fig. 3**) and the a.t.u. in the shack).

Remember to allow for the vertical drop recommended in Step 13 and then add another metre or so. This is just to be sure the feeder will reach the a.t.u. in the shack! (It's most frustrating to have to add an extra bit of feeder just because it's a little too short!

### Step 2

In the exact centre of both elements, cut through **one wire only** of the 300Ω feeder. Then remove polythene insulation from both wire ends and bend each bare wire at right angles as shown in **Fig. 1**.

**Table 1**

Antenna Part	Cut Length
1	9.145m
2	9.145m
3	1.65m
4	1.65m
5	*

The length of part 5 is chosen to suit each installation.

### Step 3

Strip insulation from the ends of all eight wires on both parts 1 and 2 for about 20mm as in **Fig. 2**.

### Step 4

Twist together the bare wires at the free ends of each element, and solder. There are eight instances of two wires to be soldered together (points Y in **Fig. 3**) and two instances of three wires to be connected together (points X in **Fig. 3**).

### Step 5

On parts 3 and 4 shown in **Fig. 2**, bare the wires for about 20mm at each end, similarly to step 3.

### Step 6

To form the centre joint, twist the wire ends of parts 3 and 4 together. But do not solder them together just yet.

### Step 7

Bare the wires for 20-25mm at one end of part 5.

### Step 8

Take the whole antenna system into the attic.

### Step 9

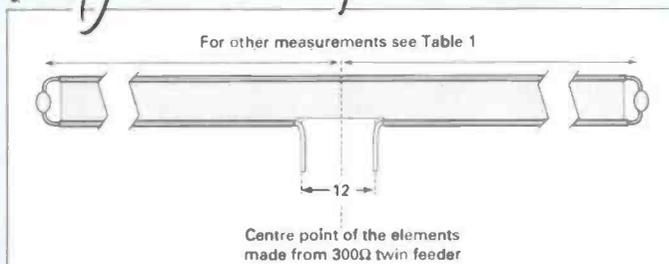
Fix the antenna elements to the attic timbers. I use very small nails, or panel pins, and nail the elements with a nail about every two metres along the centre line of the elements (shown dotted in **Fig. 3**).

The nails should pierce the centre of the polythene insulation but **not** near the wires. If the elements are too long for the attic, make certain that the centres of the elements (i.e., where they join to sections 3 and 4, see **Fig. 5**) are in the centre of the attic space available and just

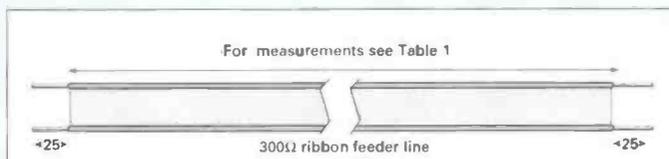
# Workshop

## Rafter Special

Ray Fautley G3ASG, operates exclusively with indoor antennas. He aims to encourage you to get up into the loft space to erect an antenna capable of operating on several bands.



**Fig. 1: Details of the centre and ends of the elements (parts 1 & 2 in Fig. 3).**



**Fig. 2: Details of the ends of the phasing lines (parts 3 & 4 in Fig. 3).**

let each free end dangle unsupported.

### Step 10

Twist the joins of parts 2 and part 4, then then solder them together. Lay the parts out ensuring that part 4 is flat and not twisted.

### Step 11

Turn the free end of the phasing section (part 3) over through 180° (half turn). Then twist together and solder the free ends of part 3 to part 1.

### Step 12

Twist prepared wire ends of part 5 to junction of parts 3 and 4. (It doesn't matter which way round part 5 is connected) Then solder both twisted wire connections (marked with an X in Fig. 3).

### Step 13

Try to get the feeder (part 5) to drop vertically from its junction with parts 3 and 4 as far as possible and then, anchor it to the floor of the attic. Lay the remainder of part 5 along the floor

of the attic and then to the shack.

One method I've used is to fit a length of about 25mm diameter PVC tubing from the attic, down inside the exterior wall cavity. This tubing reaches to just above a hole in the shack wall positioned near the a.t.u.

Using this simple piece of PVC tubing made it quite easy to get the 300Ω cable from the attic to the shack. Merely push the feeder into the tube at the top and gravity does the work! The end of the feeder is then just pulled through the lower hole.

To make the installation look neat, a metal light-switch box may be fitted into the hole and capped with a white plastics plate. You'll probably find this, domestically at least, much more acceptable!

### Step 14

Take the free end of the feeder, bare the insulation back for about 25mm, and connect it to the balanced output of the a.t.u.

### Step 15

Switch on the transmitter and tune the a.t.u. for zero reflected power. Whichever band you intend to use **always use an a.t.u.** to tune and match the antenna system to the impedance necessary (usually 50Ω) for the correct operation of the transmitter.

You could operate, by using the complete feeder/antenna system as a vertical (with capacity hat) antenna by joining the two feeder wires together at the shack end. Secure both together to one of the a.t.u. terminals and connect as good an earth connection as possible to the other.

Using the antenna in the vertical mode may produce better results on 7MHz. It may even make 3.5MHz operation possible. When used on the 14MHz band the maximum radiation should, like a dipole, be at right angles to the antenna elements.

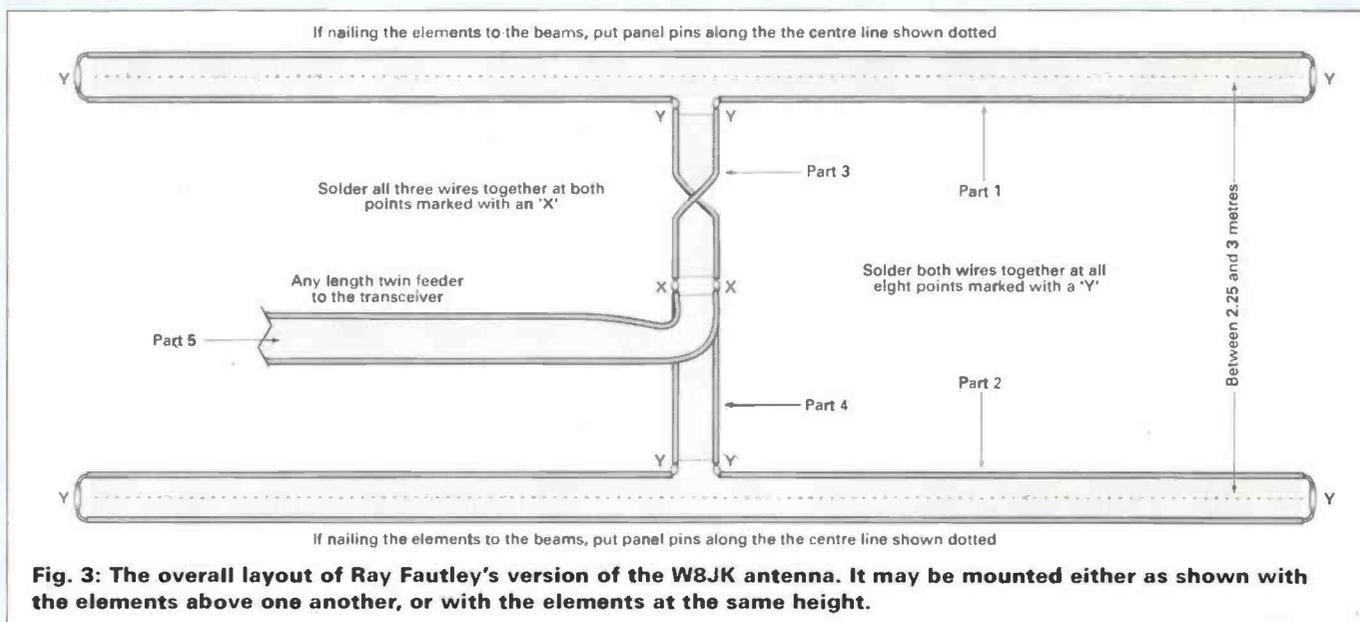
However, some distortion of the radiation pattern is to be expected because of the proximity of the bits usually to be found in attic area. These bits include house wiring, water tanks and the like.

### The New Bands

You may even find it possible to operate on the new WARC bands of 10.1, 18 and 24MHz, as long as - (I expect you've already guessed what's coming) **the antenna system is tuned and matched with a good a.t.u.**

Good indoor DX hunting!

PW



**Fig. 3: The overall layout of Ray Fautley's version of the W8JK antenna. It may be mounted either as shown with the elements above one another, or with the elements at the same height.**

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# Specifications

## - The Mysteries Explained

Ian Poole G3YWX delves into the mysteries surrounding one of the specification aspects associated with handling strong signals.

Last month I took a look at some of the problems which can arise when strong signals are present on a band. This month I am going to take a look at one of the specifications associated with strong signal handling and see how it gives an indication of the receiver's performance.

One of the problems that occurs with amplifiers and mixers is that when very strong signals are applied, unwanted spurious signals start to appear. And one of these major problems is associated with the third order products that I looked at last month.

In view of the difficulty an important specification is the third order intercept point. This gives a measure of the ability of a set to cope with close in strong signals and reject their effects.

### Third Orders

Third order effects are those which are generated when a harmonic of one signal mixes with a second signal, i.e.  $2f_1 \pm f_2$ . (Fifth order ones are those where the third harmonic of the first signal mixes with the second harmonic of the second, i.e.  $3f_1 \pm 2f_2$ ).

To give an example of how signals may affect reception, I'll take the example of when two strong signals appear on the 144MHz band, one at 145 and the other at 145.50MHz.

If any third order effects are produced, the second harmonic of the first signal will appear at 290MHz, and when it mixes with the second at 145.5MHz it will produce another signal at 144.5MHz. Again, the second harmonic of 145.5MHz will appear at 191MHz and mix with the signal at 145MHz to give a third order product at 146MHz and it's quite possible that either of these signals could mask out a weak wanted station.

In most instances, the third order signals are well below the

noise level and have no effect on reception. However, as signal levels rise, so do the third order effects.

In fact, third order effects rise at a much faster rate than the wanted signals. An increase of only 1dB in the wanted signal will give a 3dB increase in third order effects, and a 5dB increase in fifth order effects.

As the third and higher order effects are normally so far down in the noise, it's only when large signals are present that they start to appear above the noise level. When they do start to appear above the noise they quickly become a major problem.

### Unwanted Signals

In view of the fact that unwanted spurious signals rise so quickly it's very important not to overload the front-end. If this occurs then new signals will appear in many places up and down the band.

Reducing the input level to the receiver, even by a comparatively small amount in some cases, can make the spurious signals inaudible. This emphasises the importance of not having too much front-end gain.

I once had a contact with a station on 144MHz who said I was appearing at several points on the band. He also let slip that he was using two (yes two!) pre-amplifiers. Removing one of them cured the problem, and he could still hear me very well!

Alternatively, just rotating a beam antenna to reduce the level of the offending strong signal can do the trick. For h.f. operation some sets have front-end attenuators which can be used to prevent overloading.

Front-end attenuators can be very useful when amateur stations are being sought close to very strong broadcast stations. This used to be a particular problem on 7MHz where many broadcast stations occupied frequencies down to 7MHz even though their band

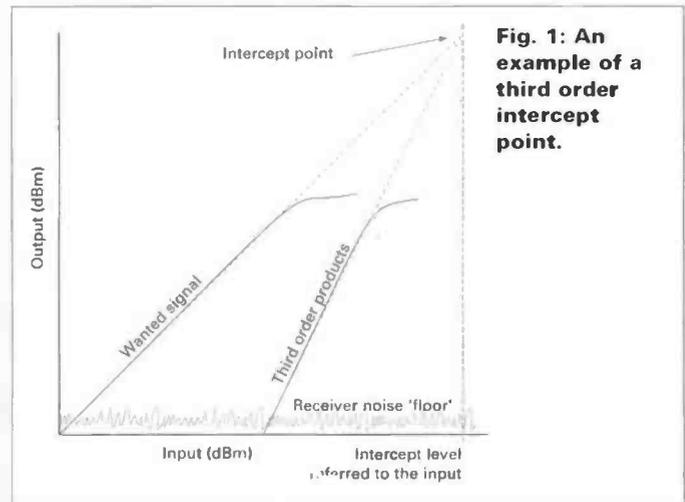


Fig. 1: An example of a third order intercept point.

allocation stopped at 7.1MHz as it does today. This meant that receivers had to be able to pick-up very weak amateur signals with enormous broadcast transmitters just a few kHz away.

### Intercept Point

The third order intercept point uses the fact that the third order signals rise much faster than the wanted ones as input levels increase. A plot can be made of the output level for varying input levels.

As the input signal level is increased the output will rise in line with it. Initially no third order products are seen as they are masked by the noise, but they soon start to appear as shown in Fig. 1. As the input to the amplifier is raised, it eventually limits when it cannot handle the output power.

If the curves for the input signals and third order products are continued they cross or intercept. This is an imaginary figure known as the third order intercept.

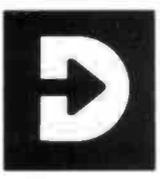
The third order intercept gives a very good indication of the strong signal handling capability of the front-end. The higher the intercept point, the better the set. As an example, a typical amateur set may have a third order intercept point of around 15dBm, i.e. 15dB above

1mW or just over 30mW.

For complete receivers this figure usually refers to the level of the signals at the input to the set. In the cases of pre-amplifiers or mixers the power level may be that at the input or output and this should be specified.

Obviously the output intercept point will be higher than the input by the gain of the devices. An amplifier with an intercept point at the input of 10dBm and a gain of 10dB will have an output intercept point of 20dBm.

That's all for this month. Don't forget if there are any specification mysteries you'd like explained drop me a line via the PW Editorial Offices and I'll try to answer your queries on this page.



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ECH81	3.00	OA2	2.70	Z759	25.00	6EA8	3.50	807	5.75
ECL80	1.50	OB2	2.70	Z803U	25.00	6EH5	1.85	811A	18.50
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EF37A	3.50	PCF85	2.50	5U4G	5.75	6H6B	4.95	872A	20.00
EF39	2.75	PCF801	2.50	5V4G	4.00	6J5	3.00	931A	25.00
EF40	5.00	PCF802	2.50	5Y3GT	2.50	6J6	3.00	2050A GE	10.00
EF41	3.50	PCL82	2.00	5Z3	4.00	6J7	4.00	5751	6.00
EF42	4.50	PCL83	3.00	5Z4GT	2.50	6J86A GE	19.00	5763	10.00
EF80	1.50	PCL84	2.00	6AN6	4.00	6J6C	20.00	5814A	5.00
EF85	1.50	PCL85	2.50	6AN5	1.50	6J6C Siemens	17.50	5842	12.80
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*The Computer in Your Shack*

*This month Mike Richards G4WNC takes a look at a selection of new programs.*

**BITS & BYTES**

**Fig.1: This clearly shows the Grey line DX opportunities for any time of the year.**

Peter Oldfield from Quebec has sent me the latest version of his DXAID program. The program contains a set of utilities designed to make life easier for the DX enthusiast and is likely to be of interest to both amateurs and short wave listeners.

The hardware requirements for DXAID are fairly basic. It needs just an IBM compatible PC with a VGA (640 x 480 16 colour) video system, 640k RAM and a hard disk. Once the files were copied from the single floppy disk, the SET-UP routine completed the installation and expanded the files to occupy a total of just over 1Mb of space on the hard disk.

The final part of the installation is to configure the program for your QTH. Once the home location had been entered, all the calculations and map projections were centred on this point.

A good example can be seen with the sunrise/sunset shown in Fig. 1. In addition to being able to show these maps based on the home location, you also have the option to select alternative points.

Although the DXAID program uses mainly Great Circle maps, you can choose to have the data displayed on a Mercator map if you prefer.

To use DXAID to produce propagation predictions, you need to set the remote target area. For this you can either enter a specific location by typing the full latitude and longitude co-ordinates or alternatively you can select the nearest site from the built-in databases.

The review copy featured one database pre-programmed with major cities, and a second one that carried short wave broadcast station information. As you use the program you can either create your own custom database or edit the ones supplied.

The basic solar data

calculation provided a range of information. This included declination latitude, sunrise and set azimuth, sunrise and set times for any specified day and location.

You can also use DXAID to provide bearing and distance information to anywhere in the world. This can either be done by entering the co-ordinates or by just clicking on the required destination using the mouse. In the latter case, the bearing and distance are shown at the top right of the screen.

As you can see, DXAID is a very useful collection of utilities for anyone interested in working DX. If you'd like a copy, it's available direct from P. Oldfield, 251 Chemin Beauvine, Piedmont, Quebec J0R 1K0 on a single 3.5in disk for £15 post paid. My thanks to Peter for supplying the review copy.

### Internet Update

Lowe Electronics are now on the Internet with a number of facilities for amateurs and listeners alike. The mailboxes available are: [info@lowe.demon.co.uk](mailto:info@lowe.demon.co.uk) and [Orders@lowe.demon.co.uk](mailto:Orders@lowe.demon.co.uk)

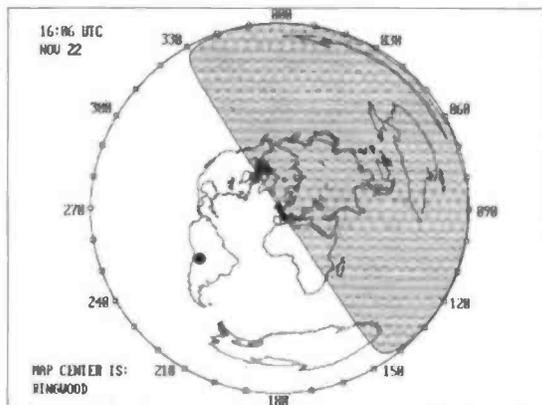
While Lowe are happy to deal with requests for information, they do need your street address as some of the material is best posted.

If you are an HF-150 user you may be interested in Lowe's user mailing list. To join, just E-mail a request to [hf150-request@batcomfs.Eng.Sun.Com](mailto:hf150-request@batcomfs.Eng.Sun.Com).

### New Interfaces

If you've developed an interest in the data modes, you may be looking for an interface that can be used for transmit as well as receive.

While the popular interface unit from Pervisell makes an excellent receive unit, it doesn't include the extra circuitry needed to



switch the transmitter and feed the tones to the microphone socket of the transceiver. I've recently tried out two units that provide all these facilities.

The first from GOLOV/G4LUE comes in kit form or ready-built whilst the other one from Venus is supplied ready-built only.

The GOLOV/G4LUE version, HAMFAX, was supplied in a plastics video box and comprised a 3.5in disk with HAMCOMM and JVFAX software, kit of parts and a five-page, A4 leaflet with assembly instructions.

The assembly instructions were well set-out and should be adequate for those with little constructional experience. The only problems I encountered was with the p.c.b. mounted 5-pin DIN socket.

The holes in the p.c.b. were too small and had to be drilled-out. Hardly a major problem, but it was nevertheless very annoying, especially if you don't have a suitably sized drill to hand.

The final assembly measured 84 x 50mm and could be mounted in box of your choice. The software supplied was HAMCOMM v2.1 and JVFAX v7.0 with a special set-up routine to transfer all the files to your hard disk. As HAMCOMM is now at version 3.0 you will need to make sure you are supplied with the latest version.

The HAMFAX is available in kit form from J. Bailey, 8 Hild Avenue, Cudworth, Barnsley, South Yorkshire S72 8RN for £19 or ready-built for £23 both plus £1.50 P&P.

The ready-built offering from Venus Electronics was neater with all the

electronics housed in the 25-way D connector. A good point about this unit was the provision of an in-line 5-pin DIN socket with connections set-out to match that used by the most of the Packet radio TNC systems. If you already have a Packet set-up all you have to do is move the plug, to changeover to the other data modes.

The Venus software comprised of three disks, the first two of which contained JVFAX 7.0 and HAMCOMM 3.0. The final disk contained 15 GIF files that could be used for SSTV. Installation of all the files was handled by custom installation routines.

The Venus DataPack costs £49 plus £3 P&P and is available from Venus Electronics, 26 Pevensey Way, Frimley Green, Camberley, Surrey GU16 5YD. Tel: (01252) 837860.

My main disappointment with both packages was the lack of acknowledgement for the software authors. Wilhelm Schroeder and Eberhard Backeshoff have put in a considerable effort to make these programs excellent performers. If you do purchase either of these packages, please make sure you register the software with the authors and send a contribution to support further development.

That's all for this month, keep those letters coming to me, Mike Richards, 'Bits & Bytes', PO Box 1863, Ringwood, Hants BH24 3XD. CompuServe 100411,344 or Internet on [Mike@decode.demon.co.uk](mailto:Mike@decode.demon.co.uk)

**E N D**

*Paul Essery GW3KFE devotes this month's column to hints, tips and advice.*

*Report*

**H F B A N D S**

This month's column is being written before the incoming mail arrives, for two very simple reasons. One, I forgot about Christmas and two some postal problems!

Now for this month's tip. Remember that if an expedition is operating from some rare spot, they'll most likely be operating round the clock. Hence, there's no reason to be calling them outside the 'best' times.

Listen to the pile-up. If you are in say G-land, and they are not working anyone in Europe, they either have no intention of working us at that time, or, more likely, they just aren't hearing us under the barrage of bigger signals they are dealing with. Thus, to call them is merely to create more QRM.

**The Grapevine**

The grapevine is something you need to be connected to. The RSGB *DX-News Sheet* comes out weekly, edited by G4DYD. Details and rates from RSGB, Tel: (01707) 659015.

Another weekly possibility is *The DX Bulletin*, at PO Box 50, Fulton CA 95439-0050, USA, and *The DX Magazine* from the same source. If you have packet gear, the Packet-Cluster network is useful if you can get in.

If you and a friend are both interested in chasing the rare ones, hunting in pairs with a landline or v.h.f. link is useful. One of you can be listening to the DX transmit frequency, while the other is 'spotting' the frequencies they're listening on. One snaps the DX station up, and the two roles are then reversed.

**Band Conditions**

Band conditions, as ever, are up-and-down. But check with your pal up the road sometimes, as 'bad conditions' have been known to arise from an antenna or equipment failure!

All the bands have shown signs of life, some obviously, more than most. Other than its true-blue addicts chasing DX most of us just cannot hear, activity here is distressingly low.

On 3.5MHz, activity seems to pick up late in the evening and go on through the night. There's sometimes a gap just before dawn which I believe to be more lack of activity than anything. During the day and evening of course, there is general activity as this is the 'natter band' par excellence.

The 7MHz band is often unjustly abused, but those who have the 'know-how' can run up massive country scores. It does however, seem to take some specialisation to get the best from 7MHz though.

It's often said that 10MHz partakes of more than a little of both 7 and 14MHz. But since it has been heavily invaded by the sidebanders, the old pleasantness has gone for ever. On the other hand, like 18 and 24MHz, the 10MHz band is a haven from contests.

**The 14MHz Band**

The 14MHz band of course is where the world's DX business is mainly transacted, whatever the mode. At the top of the sunspot cycle it has been known to open right through the night. At the present low ebb we can only expect daylight to be much use.

The 18, 21, 24 and 28MHz band should always be checked. You may just find something interesting and a CQ on a 'dead' band may scare up something quite interesting.

If no-one is operating, everyone assumes the band is dead. You have the comic vision of thousands of ears carefully listening to an open but totally unpopulated band - and one which the commercial lobbies would love to steal from us. 'Use or lose' is a good motto.

Since starting this month's report there has



**Paul Essery reminds us that DXpeditions (like this trip to scotland) often work 24 hours round the clock.**

been a passable imitation of a gale in my part of Wales. It leads to an instant proof of the proposition above - my l.f. band antenna is now mostly below one metre in height!

**Cable TV**

On a totally different tack, throughout the country we have been seeing gangs of men installing cable TV systems. Many of us who have 'had some' will have been appalled at some of the engineering techniques being used.

I know of one example for instance where the work is to be completed before Christmas. And I can guarantee TVI from the 'rusty bolt effect' within one year or less of the system going in to service - and fully expect TVI from Day One due to the leakage of signals into their unscreened electronics.

As for 'piped TV' systems I have one locally which distributes its S4C channel (the Channel 4 in Wales) in a chunk of spectrum which includes 70MHz. Luckily no-one locally watches S4C!

**Next Month**

So, in the absence of the mail, the column must go to post. All mail coming in will be taken into next month's offering of course.

Meanwhile, my thanks to all of you - too many to answer individually - who so kindly sent me greetings and Christmas cards. And, until next Christmas we're back again to the old routine.

Send your letters please to **PO Box 4, Newtown, Powys SY16 1ZZ** to reach me by the middle of the month. Now - to get that antenna back up before I suffer withdrawal symptoms!

**E N D**



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*This month David Butler G4ASR has details about tropo openings on the v.h.f. and microwave bands, reports about conditions during the recent e.m.e. contest, and news about winter propagation on the 50MHz band.*

Report  
 VHF

Last month I mentioned the good tropo conditions which occur during the autumn. And it seems that the months of October and November were particularly good.

During an opening on November 28 and 29 an area of high pressure was centred over the British Isles and extended into central Europe. From my QTH (IO81) QSOs on the 144MHz band could be made with stations over a considerable area of Europe.

I contacted many stations in the eastern part of Germany in locator squares JO60, 61 and 71. These contacts, on s.s.b., were in excess of 1100km.

By moving the antennas further to the east I was able to work stations located in the Czech Republic. Contacts were made with OK1IAS at 1135km, OK1AGE at 1138km, OK1BMX at 1230km and OK2PLB at 1230km. All of these incidentally were worked between 2005 to 2015 UTC.

The tropo duct also extended into Hungary with HA/DL1MAJ (JN87) being the prize catch of the evening. He was 53 with me over a distance of 1520km.

The 144MHz band was also open to Switzerland and southern France. I completed QSOs on s.s.b. with HB9RDE, F10WV (JN25) and F6IRF (JN35).

### Good Conditions

The station of **Vince Shirley G0ORC** (IO93) was also active during the good conditions on November 28. He first noted that propagation was up at 1525UTC when he heard the HB9HB beacon on 144.865MHz.

Later in the evening, from 2230UTC, Vince contacted OK1IAS (JO60) and OK1VMS/P (JO70) on the 144MHz band. He also worked OM3CQF (JN88) who was heard calling CQ on c.w.

Vince was also one of the fortunate stations to make a QSO with HA/DL1MAJ. He had to use c.w. for this contact as signals were quite weak. Further Morse QSOs

were made with OK1XN (JO70) and OK3PNN (JN89).

### The 430MHz Band

Conditions on the 430MHz band were also very good. **Reg Wooley GW8VHI** operating from the RAF club station G6RAF (IO92) made a number of excellent contacts.

The stations worked by Reg included HB9AMH/P (JN37), OE2UKL (JN67) and OE5VRL/5 (JN78). Reg said he had to resort to c.w. to work HA/DL1MAJ for his 25th DXCC country on the band.

### On 1.2GHz

A number of operators on the 1.2GHz band reported contacts with stations located deep into Germany. The station of **G0JDL** (JO02) worked DB6NT/A (JO52) and DG9NCX (JN59) around 2300UTC on November 28. Earlier in the day, at 1625UTC, he contacted HB9AMH/P.

**John Quarmby G3XDY**, also located in JO02, made s.s.b. QSOs with DL3IAS (JN49) and OK9MN (JO58). The band was still in good shape on November 29 when John exchanged 59 reports with DJ6JJ (JO31) at 2220UTC.

The husband and wife team **Charlie G3WDG** and **Petra Suckling G4KGC** (IO92) made the grade by working DG4YFK, DG9NCX, DB6NT/A and OE5VRL/5 on the 1.2GHz band. They were only running 1W output!

Even better results were made on the 10GHz band. Both G3WDG and G4KGC worked DB6NT/A (JO52) over a distance of 872km.

The Suckling's best DX of the evening however was an s.s.b. QSO with OE5VRL/5 at a distance of 1135km. It's really amazing what can be worked on this microwave band with low power!

### United States

Interestingly it wasn't only Europe that enjoyed the enhanced conditions during November, as over in the United States propagation was equally as good. A new

tropospheric ducting continental distance record was recorded on the 144MHz band.

On November 5 **Rene Shaw WB4MJE** in Florida contacted **Serge Szpilfogel VE1KG** in Halifax, Nova Scotia over a 2715km path. The previous record was 2362km set in October 1968. The station of WB4MJE was ideally located at the southern tip of the Florida Keys.

A new USA overland distance record was also established on the 5.7GHz band during the autumn. On November 11 **Al Ward WB5LUA** contacted **Ron Stefanski W9ZIH** on the 430MHz band over a 1188km path.

Signals between WB5LUA and W9ZIH were S9 both ways. The two then attempted unsuccessfully to work each other on the 5.7GHz band. They tried that night and the following morning.

Finally at 1652UTC on November 12 the 1188km record was established. The previous overland record was held by N6CA and XE2/N6XQ over a path length of 988km.

### Enhanced Tropo Returns

Now it's back to the UK again where the enhanced tropo conditions returned on a few occasions during December. Stations in central England reported working into localised areas of France and Switzerland during the evening of December 1.

The club station G6RAF, again operated by GW8VHI, were apparently located at one end of a tropo duct. Operating on both the 144 and 430MHz band he only worked stations in locator squares JN38 and JN39.

The duct type of propagation is quite common in the autumn. Radio waves can be trapped within channels bounded by sharp changes in the refractive index of the troposphere.

In effect the duct resembles an optical fibre or a microwave waveguide. The attenuation at ranges up to

1000km or more can be comparable with the free-space value. Consequently ducted signals are often extremely strong.

The down side of ducting is that propagation is generally limited to a very small geographical area. Albeit a long way away!

Another period of enhanced tropo occurred on December 11. **Lee Adams G4RKY** (JO01) worked HB9DFG, HB9DFP, HB9HLI and HB9RLM on the 144MHz band. All stations incidentally, were located in JN37. He also contacted F5SVQ in JN38.

### Towards Switzerland

Although conditions were good towards Switzerland, there was also an opening to southern France and Spain. The station of **GW7SMV** (IO81) heard the EA1VHF beacon at 2200UTC on November 11.

On December 12 G6RAF operating on the 144MHz band contacted F1SQ (JN05), F6DJB (JN03), F6GPT (IN94) and F9HS (JN03). A QSO was also made with EA1NV located on the north coast of Spain.

Reg GW8VHI the station operator at G6RAF also worked F5FLN (JN93) on the 430MHz band. Regrettably Reg reports that due to rationalisation RAF Luffenham will close down in 1995.

Unfortunately therefore, the club station G6RAF will disappear. However, knowing Reg's enthusiasm for the v.h.f. bands, I'm sure he'll pop up from somewhere else in the not too distant future.

### Moonbounce Contest

During the ARRL moonbounce (e.m.e.) contest held in October and November 1994 it was planned that a 46m diameter parabolic dish would be activated. The Toronto VHF Society, VE3ONT, were going to use the huge 960-ton radio telescope on the 50, 144, 430MHz and 1.2GHz bands.

Unfortunately, the proposed operation by VE3ONT in October was cancelled. The dish was needed for an international supernova observation scheduled for the same period.

Fortunately, the 46m dish was available during the November leg of the moonbounce contest, but only on the 144MHz band.

According to **Michael Owen W9IP**, the e.m.e. conditions were the worst experienced in nine years of operation. There were times when they could hardly hear their own echoes, even running 1.5kW to a 46m dish!

However, a total of 299 stations in all continents except South America were contacted by VE3ONT. Many stations not in the e.m.e. database were worked suggesting that they were first-timers.

If you were one of the fortunate stations to make a QSO with VE3ONT, send your QSL card to: **Dennis Mungham VE3ASO, RR3, Mountain, Ontario, KOE 1S0, Canada**. Alternatively, stations in Europe can send the QSL to: **Rainer DF6NA** who has the VE3ONT logs for 1993 and 1994. Please include an IRC and s.a.e.

**Ralph Sachs G2CZS** (J001) reports that he listened for e.m.e. signals on the 144MHz band during the contest on October 29. He uses an FT-290 and a 13-element Cushcraft Yagi antenna.

Signals were heard by from K5GW and W5UN by G2CZS but no contact was made. Ralph mentions that fading of the signals and QRM from other local stations made copy very difficult.

Ralph is thinking that a digital signal processing (d.s.p.) filter will be a good investment. It could be used not only for e.m.e. work but for v.h.f. and h.f. in general.

## Problems On Antenna

At my QTH I ended up with problems on the antenna elevation drive during the e.m.e. contest. This meant that I could only operate during moonrise and moonset.

I used an array of 4 x 17-element Yagis, Fig. 1, an MFG1802 low noise amplifier. My transceiver was an FT-221 with filtering down to 100Hz bandwidth.

During moonrise on October 29 I heard DL8DAT, HB9CRQ, I2FAK, IK3MAC, SM5BSZ, SV1AAF and S51WV. Contacts were made on c.w. with LZ2US, PA0JMV

and SM5FRH.

Moonset, from 1230UTC, was fraught with problems because of auroral activity. Stations heard were K5GW and W6HBT with QSOs being made with K2GAL and W5UN.

Conditions during moonset on the following day, October 30, were not particularly good either. The magnetic K index was still high causing attenuation of received signals. Stations heard were I5JUX, LA8YB, KB8RQ, K9MRI and W9OEH with K5GW and K7CA being worked.

## Started Well

**John Regnault G4SWX** (J002) reports that the contest in October started well but went rapidly downhill. With signs of massive absorption, it was no surprise to note a K-index of 5 at 1200 UTC on October 29.

At times, John says it was difficult to hear the megastations like K5GW or W5UN. And when John could hear stations, the fading was so bad that letters were getting chopped up and it was very difficult to read call signs. However, on the 144MHz band G4SWX heard 27 stations, working 11 of them.

## November Contest

The November leg of the contest wasn't particularly good either. The problem being that it was 27 days after the auroral activity in October. And, as the sun takes approximately 27 days to rotate, similar geomagnetic activity was encountered!

New stations that I heard at moonset on November 26-27 were EA6VQ, WB5LBT and S57TW. The station of KL7FB in Alaska was heard peaking 549 on c.w. for 10 minutes but the pile-up was too much! Contact were made however with WA1JXN/7 and VE3ONT.

The station of **Doug Mallett G3HUL** (J002) was active on the 430MHz band during the second leg of the e.m.e. contest. Along with co-operator **Pat Gowen G3IOR** they worked 20 stations, 11 in Europe and 9 in North America.

The vast majority of the contacts worked by G3HUL and G3IOR were before dawn. They noticed that as the path became illuminated by the sun, the European stations became badly attenuated.

The station of DL9KR who is normally S7 off the moon was deep in the noise for hours at a time. Faraday rotation of received signals seemed stuck at 90° causing severe loss of signals.

Incidentally, Faraday

rotation means that horizontally polarised signals were being twisted around into vertical polarisation. But this doesn't cause a major problem if you have a dish antenna with a rotatable feed. The feed can simply be rotated to match the received polarisation.

Alternatively, some stations have a fixed vertical and horizontal driven element at the focus of the dish. It's then only a matter of selecting the one which gives the strongest receive signal.

However, if you're using a conventional linear Yagi array it's virtually impossible to mechanically rotate it into another polarisation plane. You therefore have to wait maybe for hours at a time before the correct polarisation matches up. Unfortunately though, you often run out of moon time in the process!

## Winter Propagation

Some of you may be surprised to hear that there was some winter Sp-E propagation recently on the v.h.f. bands. You probably thought that it only occurred in the summer time.

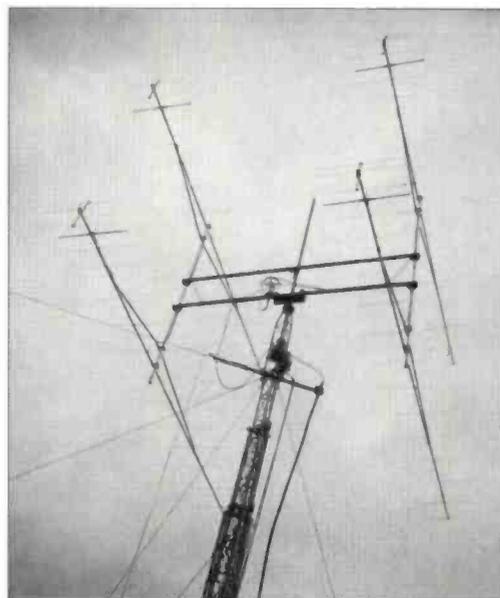
However, there is also a short period of Sp-E activity during the winter. It's not so intense as the summer season but nevertheless it can occasionally throw up some pleasant surprises.

During December and early January, the Maximum Useable Frequency (m.u.f.) sometimes reached the 70MHz band and on one afternoon even reached 90MHz. The consequence of this was that the 50MHz band was open for DX on a number of days during the period.

On Boxing Day (the day after Christmas Day for those of you who aren't sure of British Holidays!) the band opened up briefly between 1230 to 1300UTC. Contacts were made into Estonia (ES) and Denmark by stations located in northwest England.

Sp-E propagation was noted on December 28 at 1015UTC by **Dave Ackrill G0DJJA** (I093) when he heard the OH1SIX beacon. The opening then continued through to 1230UTC with stations in DL, ES, LA, OE, OH, OZ, SM and SP being worked from central and northern England.

The Sp-E conditions returned at 1500UTC and continued for approximately four hours. It allowed operators all over the UK to make contacts with stations up to 2000km away.



**Fig. 1: The four 17-element 144MHz Yagi array used by David Butler G4ASR.**

## Recently Active

**Gavin Stirling GM7LVJ** (I085) has only recently become active on the 50MHz band. Using a Kenwood TS-690S and a 14MHz dipole (?) he heard the beacon OH9SIX (KP36), at 1972km, peaking 529 during the opening on December 28.

Encouraged by the success of the 14MHz antenna on 50MHz, Gavin then quickly constructed a simple dipole. He made one out of twin-core electricity cable and heard signals from ES, OZ and SM.

Not bad for a 5-minute d.i.y. antenna! Gavin also reports that GM4IPK in Shetland noticed interference to an 87MHz link to the North Sea oil rigs at the same time.

Further Sp-E openings occurred on December 29 and January 1, both from 1800 to 1930UTC and on January 2 from 1600 to 1715UTC. On January 6 there were two events, 1230 to 1345UTC and 1545 to 1600UTC. Countries worked during these openings included DL, ES, F, I, OK, OM, OZ, SM, SP, YL, YU and S5. Not a bad start to 1995!

## Deadline Time

Well, I've run out of space and it's deadline time again, and as usual send them 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**

# PACKET

In this session Roger Cooke G3LDI welcomes Thetford, Norfolk onto the packet network.

The featured user group this month is the Thetford Data Group. The group was formed in 1989.

Thetford, in Norfolk, is almost the dead end of the world for v.h.f. communications. It is situated 28 miles from the nearest repeater, so activity was limited to local working.

However, Packet has managed to link it to the outside world, and with the increasing interest in the mode, the town now has GB7TDG as its own BBS. At least a callsign like that is easy to understand!

The East Anglian Data Group meets regularly in Thetford, and it was Ron GODVI, who was instrumental in providing the meeting place. This was at his place of work, and it was indeed a very comfortable and convenient place to meet, and quite

inexpensive.

Ron attended most of the meetings and it was this which helped kindle some of his interest in packet. Together with Steve G7LVA, they originally set up GB7LVA, but unfortunately Steve had to curtail his activities due to pressure of work, so John G4VEL joined in and they set up GB7TDG.

Forwarding paths have been set up to GB7DPC and GB7TLH and other links, including a proposed high-speed link, are in the pipeline. The co-sponsors of GB7TDG are John G4VEL and Phil GOCLT.

The group consists of approximately 14 local amateurs, meetings are held on Wednesdays evenings and a weekly newsletter is produced by John G4VEL. John also runs a node, G4VEL-8, which helps access the BBS for remote stations.

The photograph, Fig. 1, shows John G4VEL in his shack. It looks highly technical John. The photograph, Fig. 2, shows Ron GODVI, at the operating position of GB7TDG and this is more spartan.

## Rose Switch

In the March 1994 issue of *PW*, I described the Rose Switch as an 'odddity'. It was a slip of the pen for me to describe it as such. I've been taken to task by several amateurs since then, including a couple from the USA.

Dave ZR5GQ, wrote to me, and gave me more information about 'Rose'. Then I visited Australia and experienced the Rose Network for myself. The Rose network has not really been used in the UK, so I had assumed it was a rare



Fig. 1: John G4VEL seated at the command console.

Table 1

1	70.3250Mhz	Tait T500	¼ antenna
2	144.625Mhz	Pye Westminster	¾ antenna
3	432.675Mhz	Tait T500	Colinear antenna
4	WICK><LINK	Alinco ALR72E	9-el Beam antenna
5	TCP/IP	Test port only	

Breed.

I can only send my apologies to all users of **Rose**. I will try to obtain some information on the system and present it in a future issue.

## Address Wanted

I had a request from ON7SF for an address of RF Engineering Ltd., who were based in Sherborne, Gloucestershire. They are stockists of Barker and Williamson products.

Apparently RF Engineering have moved, and despite requests to directory enquiries and packet messages, nothing has been forthcoming. If you have any information, could you please pass it on to Andre ON7SF @ ON6AR.#AN.BEL.EU

## Writtle Node

The CHELM1 Node, run by Dave G60QJ, was first started, during 1986, from

Writtle near Chelmsford.

The original equipment was a Commodore 64 running 'Digicom' and a home built modem using a TCM3105 i.c.

After moving location to North Springfield, a KPC2 KA-Node and PMS was added, then a change to a Tiny-2 with the call ESSX-2:G6DQJ as the first 24hr TheNet Node in Essex.

The configuration has changed somewhat and is currently running on a PC with two serial ports, a Thor RLC-100 4-port 1200Baud modem card. There are five ports, and they're as shown in Table 1.

The main links of Chelm1 are to GB7NNA, G6DWB-4/LY4, G11BP-1/CHELM4, G6FCL/GB7DUG, and GORTD-1/WICK1.

That's just about all the space for now, so until the next time, happy packeting de Roger, G3LDI, @GB7LDI, QTHR. Tel: (01508) 570278.

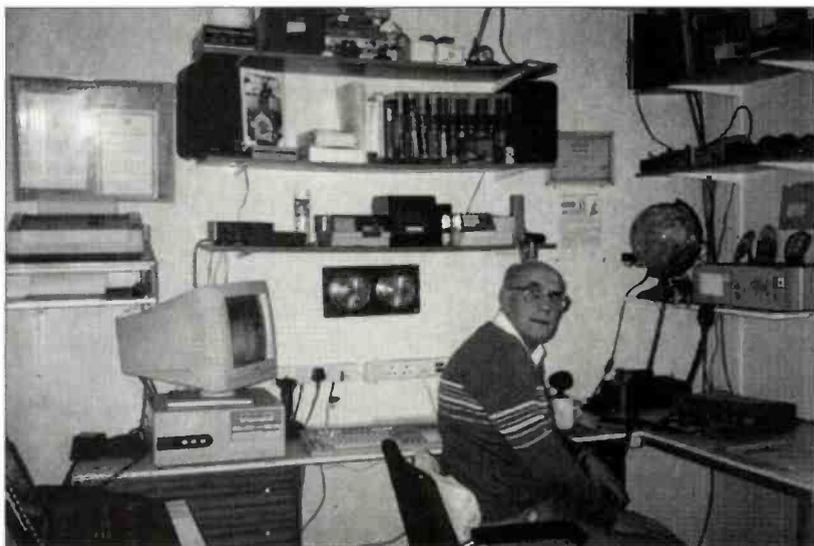


Fig. 2: Ron GODVI seated at his side of GB7TDG.

E N D

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*This month Peter Shore has news of a reactivated short wave station to listen out for as well as details on where to tune to catch your favourite stations.*

This month there could be the chance to log a short wave station that hasn't been heard since the late 1980s. This follows the installation of new transmitters at a place called Guinea Fowl. No, it's not as the name might suggest Papua New Guinea, but Zimbabwe!

Guinea Fowl is a southern African country, with one of the most highly developed f.m. transmission networks in the continent. It has been decided to reinstate short wave broadcasting across the country and into neighbouring areas.

The Zimbabwe Broadcasting Corporation's (ZBC) Radio 2 is on the air on 6.045MHz during the day, and on 7.285MHz after dark. Their Radio 4 is on 3.306MHz during daylight hours and 4.828MHz at night.

The reason for the re-emergence of short wave is the fact that despite major investment in f.m. during the time of the Smith government in the former Rhodesia (as a way of stopping people tuning to stations from abroad), only around 70% of the country was adequately covered. Despite the lesser quality of short wave, greater areas can be covered using the high frequency bands. Eventually, say ZBC, all four national networks will be available on short wave.

### Commercial Station

Closer to home, a new commercial short wave station is now operational in the Czech Republic beaming world-wide. Radio Metropolis in Prague is a private station which has broadcast on f.m. in the Czech capital, and has been granted permission to broadcast on short wave in addition to the programmes of state-run Radio Prague.

The station is currently transmitting in English, Russian, German and Czech

at these times: 0700-0755 on 9.455 to Europe; 0800-0855 on 5.905 to Europe; 0900-1055 on 9.47 to Europe (including the UK); 1100-1255 on 5.905 to Europe; 1300-1400 on 5.905 to Europe; 1600-1755 on 5.94 to Europe; 1800-1955 on 7.25 to North Africa and the Middle East; 2000-2255 on 7.305 to North America; 2300-0100 on 6.20MHz to North America.

The Czech station is seeking reception reports which can be sent to **Jeseniova 38, 13000 Prague 3, Czech Republic.** Let *PW* know if you manage to log this station.

### Rumours

Hot on the heels of the closure of the Voice of America's short wave transmitting station at Bethany in Ohio comes a rumour that Deutsche Welle plans to stop using its Julich station in north-west Germany and at the Koenigs Wusterhausen site in the former East Germany.

Apparently the German Telekom, which operates all transmitters in Germany, plans to install new equipment at another former East German site at Nauen, on the outskirts of Berlin. The new 500kW transmitters will be installed there, coupled to a new state-of-the-art rotatable antenna. More details soon in *PW*.

### Broadcast Schedules

There are short English-language news bulletins from Croatian Radio in Zagreb. These are broadcast on short wave at 0703 (not Sunday), 0803 (Sunday only) and 1003 (Sunday only) on 13.83, 9.83, 7.37 and 5.92MHz; at 1303 daily on 13.83, 13.64, 9.83 and 5.92MHz and at 2203 on 13.83, 9.83, 7.37, 5.92 and 5.895MHz.

More German language international programmes

appear on Astra audio subcarriers. Trans World Radio Europe has leased a subcarrier on Astra 1C at 11.038GHz (QVC home shopping channel) and you can hear the station on the 7.38MHz audio. Although presently in German, other language services of this religious station are expected to be added soon.

Spanish Foreign Radio has English to Europe for an hour at 2100 on 6.125MHz, to the Americas at 0000 for two hours on 9.54 and at 0500 for 60 minutes on 9.54MHz. An African service broadcasts at 1900 on 9.675MHz.

I mentioned in last month's column that the Voice of Israel's future looked uncertain, but during December came news that its future was assured at least for the whole of 1995 after additional funding was secured.

The Sri Lanka Broadcasting Corporation's External Service has discontinued transmissions to North America, preferring to concentrate its efforts on Asia and Australasia, as signals were rarely received in the US and Canada. Two frequencies can be heard at 1030 for the hour-long English service, these are: 11.835 and 17.85MHz.

English to Europe from China Radio International can be heard direct from the People's Republic at: 2000-2100 on 9.92, 8.26 and 4.13; 2100-2200 on 9.92, 8.26, 6.95 and 4.13MHz and via relays from Swiss Radio International transmitters at: 2200-2230 on 3.985MHz

Radio Ulan Bator is on the air to Europe with English at 1930 on 13.65 and 7.29MHz. There are also transmissions to Asia in English - not all daily, though - at 0910-0940 on 12.0 and 7.29; 1200-1230 on 12.0 and 7.29 and 1445-1515 on 12.0 and 7.29MHz.

There are traces of jamming in the 16 metre band around frequencies used by Radio Moldova International which

broadcasts in Romanian to Romania. Frequencies of 17.815 and 17.735MHz, on the air at around 1100UTC, suffer from apparent jamming.

You can tune to Tehran and programmes on the Voice of the Islamic Republic of Iran in English at 1930 to 2030 on 9.022MHz. That transmission is directed towards Europe, but the same channel carries the North American English service at 0030, along with parallel 7.10MHz. There are daytime English services to the Middle East at 1130 to 1230 on 11.93 and 11.79 and to Asia on 11.79 and 9.575MHz at 1530UTC.

The Quito based station, HCJB has made some frequency alterations. English is on the air to Europe at: 0700-0830 on 9.42 and 6.205; 1700-2000 on 15.49MHz. The station runs a 24-hour single sideband channel (s.s.b.) on 21.455MHz, upper side band (u.s.b.) (on which English programmes can be heard), and a second channel on 17.49MHz with other languages.

Radio Tashkent with English has been noted at 1200 for 30 minutes on new 13.785, although the station announces both 6.025 and 9.715MHz.

Radio Thailand, making use of its new high-powered transmitter at Udorn, is on the air with English to Europe at 1900 for an hour on 11.855 and at 2000-2115 on 11.835MHz with English at 2030.

Finally this month, Radio Dnestria International is on the air daily at 2130 for 30 minutes of English on 9.62MHz.

**Don't forget to let me have any interesting logs to tell fellow *PW* readers about. Until next month, good listening! Please send your letters to me via the *PW* Editorial Offices.**

**E N D**



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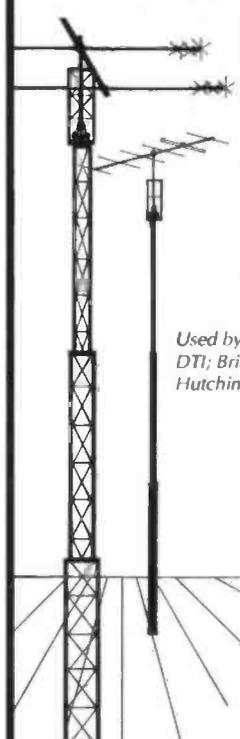


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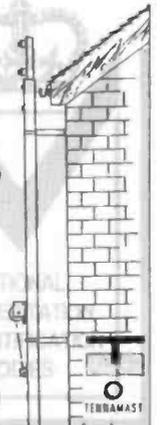
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Practical Wireless, March 1995

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There can't be many radio amateurs who have not seen or read one of the many books written by William I. Orr W6SAI and Stuart D. Cowan W2LX. They are both prolific authors, and adopt an attractive, relaxed, but informative style. I've got quite a few of their books on my bookshelves, and I can personally recommend many of them to *PW* readers.

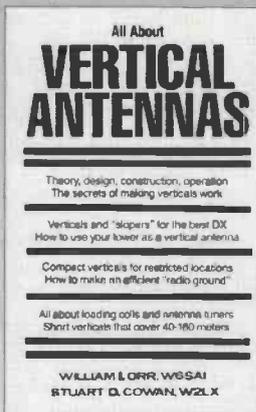
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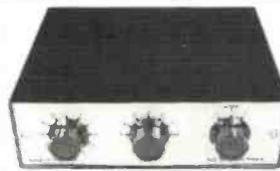
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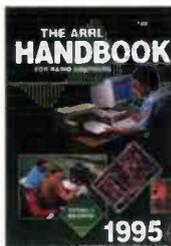
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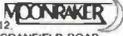
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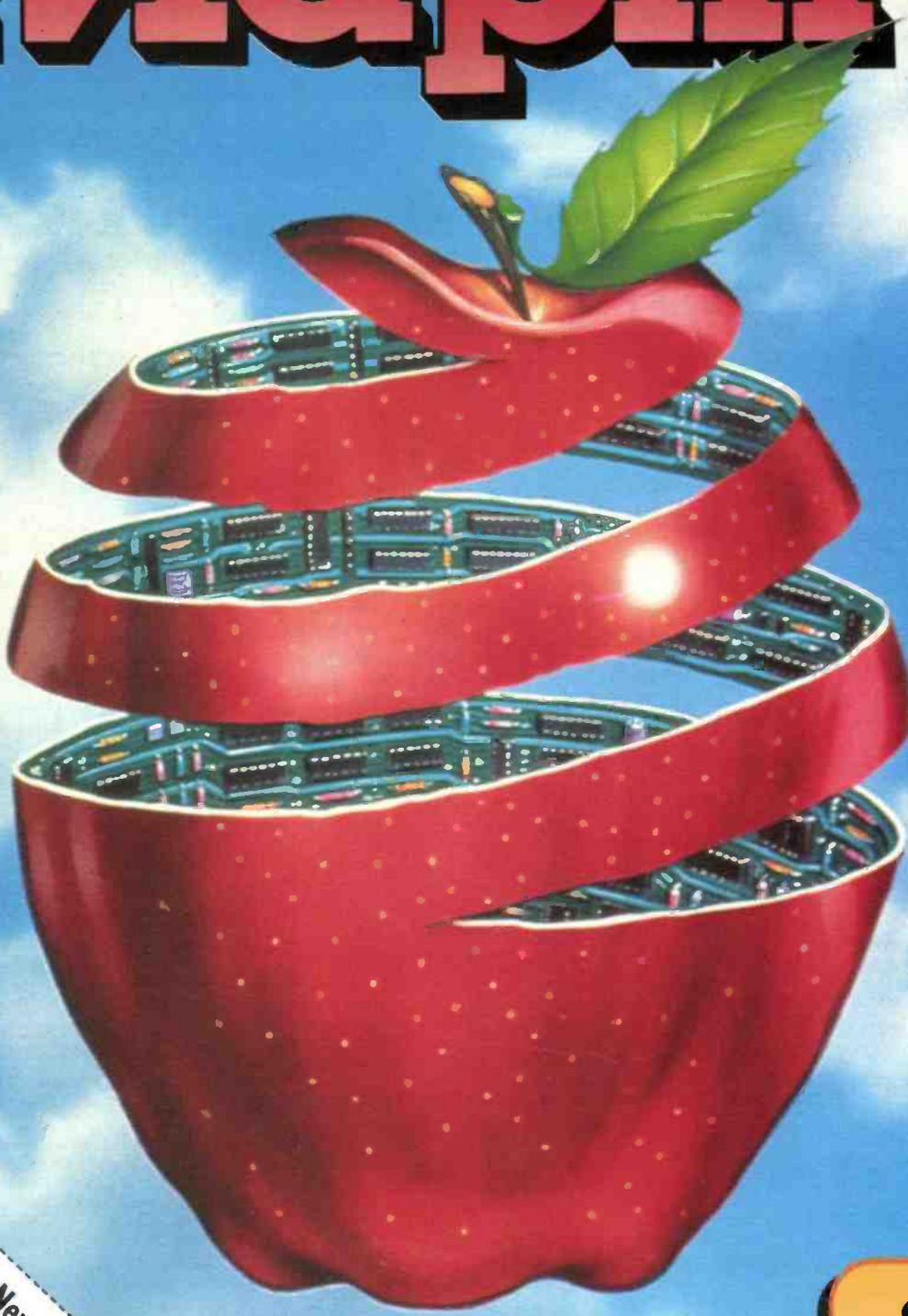
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