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*Reviewed*

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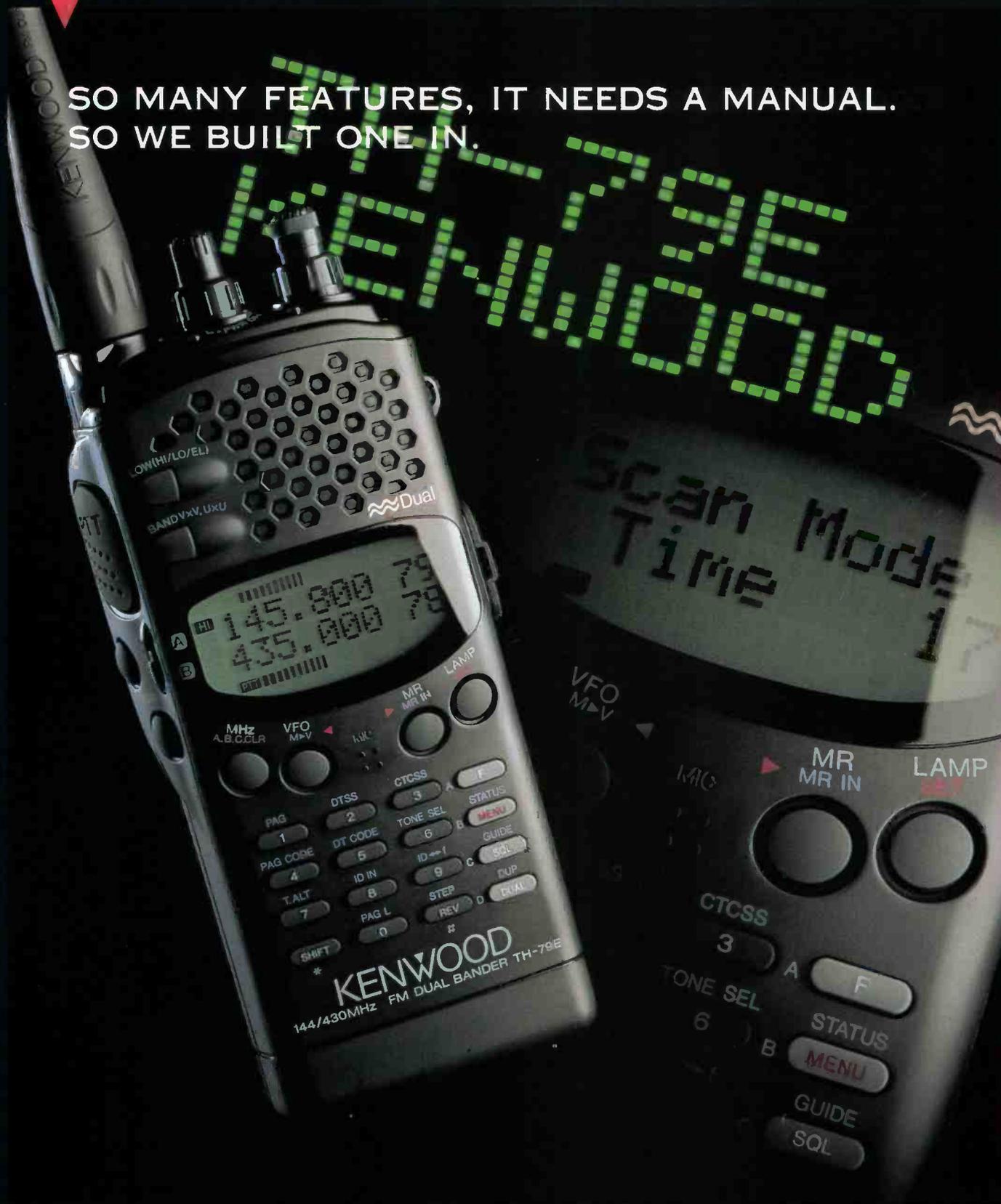


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# EDITOR'S *Keylines*

**E**very now and then it's my sad duty to announce the passing of radio amateurs who are well known to *Practical Wireless* readers. Last month I wrote about Frank Hall GM8BZX in this vein, but this time I'm recalling someone who although not well known to you, nevertheless contributed a very great deal to *PW* and to the hobby.

Rob Mackie, who until three years ago was a Director of *PW* Publishing, our Technical Draughtsman and staff Photographer was tragically killed in a road accident in the early hours of April 29. He was 43 and leaves his wife Kath, daughter Emma and son Justin.

A mercurial character, Rob Mackie was an excellent photographer and technical draughtsman who was responsible for producing our high standard of circuit diagrams. And although he couldn't stand fools gladly (including Editors at times!) he was one of those people who made friends everywhere and I'm pleased to have been a friend.

Unfortunately, I didn't hear of his death until I arrived home from the Dayton HamVention. What makes it even more of a tragic event was that he had recently started a new job, creating a publishing department for the world famous Flight Refuelling Company, based at Hurn near Bournemouth.

As a 'backroom worker' you would not have seen Rob Mackie featured very much editorially, but his photographic and technical illustration work was spread throughout *PW* and our sister publication *Short Wave Magazine*. But, when it came to paying tribute to Rob I had no hesitation...we just had to feature the front cover of our well known re-print *Are The Voltages Correct?* which featured a rare self-portrait of Rob.

So, in a way, Rob Mackie's face would

have been very familiar to readers who have a copy of *Are The Voltages Correct?* Because of this it seemed such an appropriate tribute to feature this photograph in 'Keylines' this month. And together with the tribute paid by the 200 plus people (and one Golden Labrador...as he loved animals so much) who attended his funeral on Friday May 5, I would like to remember him in this special way.

To Rob's widow Kath, daughter Emma and son Justin we send our sympathies while we can remember Rob's work in *PW* which goes back to 1980. This work provides its own memorial. **Thank you Rob.**

## New Columns

This month see the first edition of two new columns. The first is a quarterly column reporting on the amateur radio scene in America. Appropriately enough it's called 'Scene USA' and is written by Ed Taylor WT3U, who also still holds his British call-sign G3SQX.

Ed Taylor is already well known to *PW* readers through his reviews and writing on DX-hunting. He has returned to the USA with his American wife Victoria (he lived in the same village as me...I hope I didn't drive them away!) to continue his work there.

In a way, you could consider our new 'Scene USA' as being our version of the famous (and very long running) BBC Radio 4 radio programme 'Letter From America' by Alastair Cooke. In a similar vein Ed will report on what's happening in the world of amateur radio in the USA. He also intends to keep us informed of new developments, ideas and equipment.

Speaking for myself I have found his first column to be fascinating (everyone in the Editorial team was impressed). In particular I would be delighted to see the RAE here in the UK to be run by Radio Amateurs as they do it over there. (However, I'm not so keen on the various classes of licence. There's enough prejudice here with the A and B system!

If you wish to contact Ed Taylor direct to ask him to report on a particular aspect of the American scene, please do so via the address published. But if

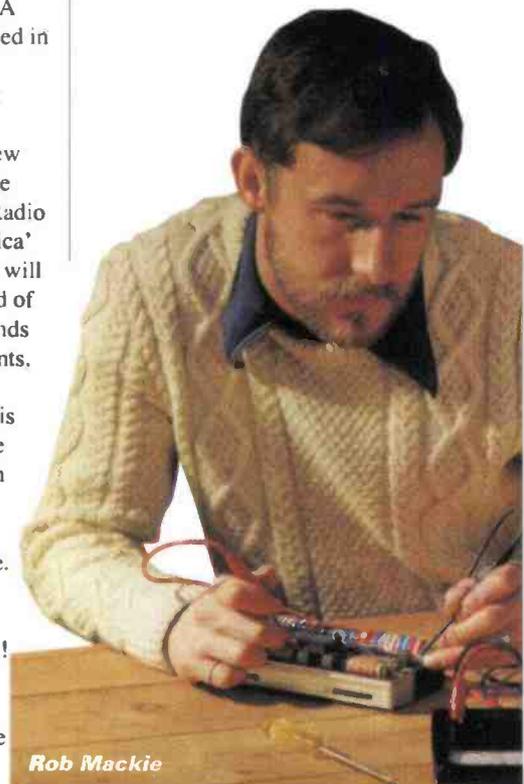
you wish, I can include brief comments and queries to him, which you include in your letters to me. They'll be passed on during my regular 'sked' on the FAX machine!

## Second Column

Our second new column this month is Leighton Smart GWOLBI's 'HF Far & Wide' page. But firstly, on behalf of Leighton and the *PW* team, I must thank readers for the marvellous response to our request in a recent 'Keylines' for help to set up the new h.f. bands initiative.

We've had offers from many s.w.l.s and transmitting amateurs wishing to help us breathe new life into h.f. operating. However, Leighton Smart GWOLBI still needs s.w.l.s and transmitting amateurs outside Europe to participate. Can you help? If so contact Leighton direct, or write or FAX the *PW* office and we'll pass it on.

*Rob Mannion G3XFD*



Rob Mackie



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

# RECEIVING You

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.

## Product Reviews

Dear Sir

Oh dearie me! I've just read another virtually meaningless product review in *PW*. As a relatively recently qualified radio amateur I am in the process of acquiring a kit, which will enable me to get on the air. Consequently, I'm trying to compare equipment and reach some sort of intelligent decision as to what my wife, bank balance, technical ability, etc. will allow me to buy, install and operate!

However, it seems to be almost impossible to get an honest, down to earth comparison of one item against another. Suppliers and indeed other amateurs, seem to be very loyal to manufacturers from whom they have previously bought equipment, often to the point of blatant and blind impartiality.

While the present product reviews are excellent at describing a piece of equipment, they only rarely go further and into how easy it is to use, its foibles or how it compares with other competitors in the market place.

Now, I can already hear you saying 'Oh, but they're all so different'. Well, yes, I can understand that point in part, but other magazines doing similar jobs in other fields, e.g. motoring, photography, video, etc. seem to have little problem when the range of products concerned is both highly technical and disparate.

I can also see that both you and your sister journal *Short Wave Magazine* (which is equally guilty), must be extremely careful not to upset your major advertisers, given that you cater for a niche market, and to do so could mean a major loss in revenue. However, why not try some sort of grid/checklist system, which both describes the equipment and perhaps gives a star rating for some of the other qualities, e.g. value for money, useability, etc.?

Perhaps this could be published twice a year or so in addition to the existing reviews? It won't be easy, but I am sure you could rise to the challenge....and it would certainly improve your useability rating to people like me!

Derrick Warner GM7PXL  
Scotland

**Editor's comment: Although I cannot agree that we are influenced by our advertisers when preparing reviews, we are always interested in making them as helpful as possible. Reader's suggestions are welcomed and we look forward to receiving suggestions on how you think we can improve product reviews. But remember - although suppliers obviously have a say in what we can have and when we can actually review it, they are all well aware they cannot tell us what to say! (However a manufacturer/supplier has the opportunity to comment through our 'reply panel' published with reviews, and they often take the opportunity to do so). I feel very strongly that *PW's* reputation for integrity is of immense value, and I'm pleased to say that nobody has ever tried to 'interfere' and influence a review in anyway whatsoever.**

## ★ ★ ★ ★ STAR LETTER ★ ★ ★ ★

### Bargain Basement

Dear Sir

This morning, Wednesday April 12, along with my morning paper, I collected the May issue of *Practical Wireless*, in which I had an advert in the Bargain Basement section. No more than five minutes after returning home, at 0830hrs, there was a 'phone call regarding my advert, which, to my surprise, was from Italy!

I've always had a good response from adverts in *PW* or *SWM*, but I think the latest response will take some beating! Still, I guess it proves that advertising does pay - in *Practical Wireless* of course!

Keith Anderson  
Isle of Wight

### Hand-Held Equipment Prices

Dear Sir

May I first congratulate your editorial team for producing an excellent magazine, which I always look forward to. It is a pleasure to read. There is only one complaint I have and this is not your fault at all, but mainly with some of your advertisers regarding hand-held equipment, information and pricing.

Recently I was looking through some of the adverts to price up particular hand-helds. I found some of the companies clearly stated what each rig was and what bands it transmitted on. But as there are now so many different hand-helds available with many different manufacturer's codes, it can be difficult to distinguish whether it transmits on 144/430MHz or is dual band from some adverts.

The situation could be made better if (as some companies already do) by including the few extra letters such as 2m, 70cm or 'Dual Band'. This will make it a lot clearer and may help their customers out with identifying each different rig.

Stuart Wersby G7TAE  
Isle of Wight

### Use 70MHz

Dear Sir

I wish to discuss the use or the actual lack of use of 70MHz. I feel that 70MHz is such a small segment from 70 to 70.5MHz and if it is not used, we, the Amateur Fraternity will lose it, to the ever expanding p.m.r. market.

So, I put to the readers/RSGB and RA to open up a discussion to let Novices use the whole of 70MHz, with normal restrictions, e.g. 5W input power and 3W output power. This way the band will be saved and be in regular use.

As regular readers of 'Receiving You' may remember, I got into radio through the Air Training Corps where my interests grew. I sat the NRAE and after I passed in March 1993 but was not on the air for another year and a half, as I could not afford a cheap hand-held for around £120. But if 70MHz was available to Novices, I would have been on the air within a week. As I would have bought a Pye Cambridge or Westminster for around £10 with a few crystals from Garex Electronics who supply surplus p.m.r. equipment to amateur and cadet forces alike. So I ask amateurs to write in or E-mail me directly with your views on 70MHz. My E-mail address is: [M.U.Islam-Choudhury@herts.ac.uk](mailto:M.U.Islam-Choudhury@herts.ac.uk)

Mubdi Choudhury 2E1BXW  
Manchester

## Very Low Dipoles

Dear Sir

I was very impressed by G3BDQ's 'Very Low Dipole' antennas in *PW* Antenna Workshop, May 1995. Three winters ago, a S7 hash came up on the h.f. bands with peaks on 1.8 and 7MHz up to S9 for 24 hours a day.

I came to the conclusion that it was associated with a central heating system somewhere nearby, but was unable to locate it. The antenna was and still is a Hy-Gain DX88 multi-band vertical.

One evening, after abandoning the shack in disgust at not being able to hear anything below S7 and there being no DX amongst what was left, I switched on a Sony portable I have in the lounge and found the bands clear of hash. There was some increase in noise however, if I took it upstairs. I have read of quiet low antennas before and wondered if this might be the answer.

The result was a quarter wave length of wire for 1.8MHz one and a half metres high, which is very quiet on all of the h.f. bands. I use it mainly for receiving, but also for transmitting around the UK and near Europe.

My antenna is fed at ground level with 50Ω coaxial cable, the braid of which is connected to a 5ft deep spike and the antenna wire itself rising from there. So, if local hash is a problem, it really is worth a try.

**Barry C. Sowter G3NAP**  
West Midlands

## Barnsley College RAE

Dear Sir

I am writing to praise the services of Barnsley College. I took my RAE at this college in December 1994, and fortunately passed. I previously contacted several colleges in Leeds and surrounding areas to take the exam externally, but was disappointed. This was due to the fact that they were either not running the course or that it was college policy not to allow students to sit exams externally.

Barnsley College not only gave me details of how to get there, but provided an adjudicator since I was the only person sitting the exam. Obviously I had to pay for this personal service, but I think that it was a pity that the fees could not go to support colleges in my own city.

Well done Barnsley College! Perhaps other colleges could take a leaf out of your book and provide this kind of service to students wishing to take exams externally, due to work commitments or previous experience.

**Paul Winfield**  
Leeds

## Good Manners

Dear Sir

I was delighted to see G4LFM's good advice to new licencees in 'First Steps' (*PW* May). It's so easy to press the key nowadays, that many new operators seem to forget even the most basic of manners.

Take the operator who simply mutters 'break' between overs. This never fails to raise my hackles, and I now respond with "surely that's break **please** over". Did their parents teach them no manners? One or two individuals have fallen out with me when challenged in this way, but most respond postively.

To those of us who came into Amateur Radio via the traditional route of home-brew short wave sets etc., radio was (and still is) sufficiently magical to command respect and decent manners on the air. Those who have grown up with 'push-button' access to the airwaves seem not to share this view.

So, let's straighten up, speak clearly and say 'Break please, from G7???' . It'll do you good!

**Andrew Howlett G1HBE**  
Cheshire

## Interesting And Disturbing

Dear Sir

Reference 'Cruising On The Air' - May Issue. I found this article very interesting, but in some ways disturbing. The purpose of amateur radio is not to provide cheap h.f. communications for yachtsmen, or to provide dedicated frequencies for Nets catering to special interest groups, yet the whole tone of this article suggests that is the sole reason for the author having obtained an amateur licence.

His comments on the German stations having a QSO on 14.303MHz ten minutes before Net time suggests a total misunderstanding of amateur radio. No frequencies are dedicated to anybody, other than on a 'first come, first served' basis in accordance with the band plans.

When emergency communications are discussed, it should be remembered that strictly speaking, this is a misuse of our bands. There are dedicated h.f. Maritime Mobile channels, which should have been used. The amateur frequencies should only be a fallback in accordance with the Radio Regulations.

Encouraging the misuse of the amateur bands for such matters could well lead to their loss. Suppose the licence were to be changed to remove frequencies above 14.3MHz so that yachtsmen could have cheap radio? Would this be acceptable to the majority of amateurs? I suspect not - we have already seen the results of the misuse of 14.313MHz in the US!

There have already been rumblings at 'official' level about the misuse of the amateur service in these ways: the passing of the third party traffic instanced in this article, together with the expressed attitude that Maritime Mobile stations have a prior right to frequencies suggest a worrying development that could lead to the total loss of either frequencies available to the 'non /MM' majority, or alternatively, the /MM privilege.

**Peter Chadwick G3RZP**  
Wiltshire

**Editor's comment: I've no doubt that other readers will wish to express their opinions on this subject. Does it mean that I can't discuss my interest in railways on the air? If the "rumblings at official level" G3RZP mentions continue and action is taken, I could foresee many 'spin off' Nets disappearing. Personally speaking, I don't look forward to a hobby where I can't talk about things of mutual interest (including railways!) with the other station. What do you think readers?**

## Cruising On The Air

Dear Sir

I was very interested to read John Hines's article about his cruise on *Pushpa*. I am about to do a similar sort of thing, but intend staying out their longer. I retired early in 1990 and sailed my little sloop down to the Canaries calling at about 50 ports on the way and thoroughly enjoyed myself.

While away on that trip I discovered many amateurs chatting to each other and calling home. I made up my mind to get involved and have passed the RAE and now have the callsign G7UJP. At present I am struggling with the Morse and hope to be fully qualified by the time I depart in August.

I am buying a classic Nantucket Clipper Yawl ready for the trip, she is 31ft, two masted yacht, so I am trying out some long wire aerial rigs in the garden, which I hope to fit on board when the time comes. I hope to install an h.f. set with 50MHz as well.

During the past six months, my practising time has been spent building my own set - a Yeovil transceiver operating on the 14 and 3.5MHz bands. I have had a lot of help from a local expert who has checked the rig out and it is working very well. Unfortunately, I cannot transmit on it at the moment.

**Paul Lucas G7UJP**  
Basingstoke

## Clocking Up 100 Years

# NEWS

# '95

Eastern Communications of Norfolk have produced a special edition clock to commemorate 100 years of communication by radio. The 230mm diameter quartz wall clock is printed in four colours on a parchment paper and shows a sepia print of the young Marconi.

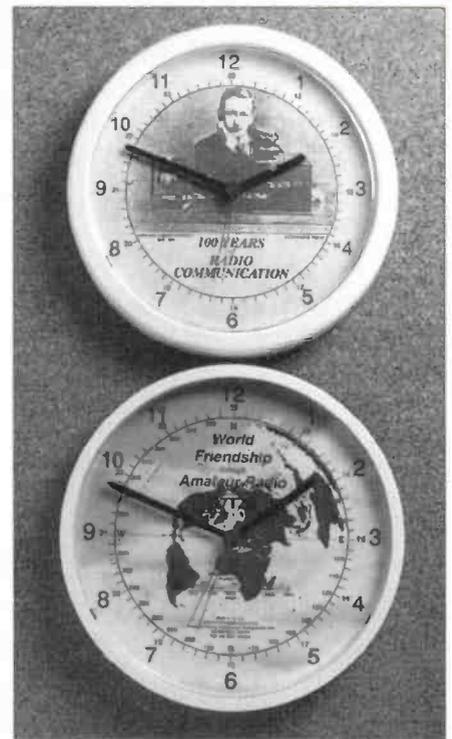
The time on the Marconi clock is given in 12 and 24 hour format printed on the 230mm diameter face, giving excellent visibility across the radio 'shack'. This clock is available world-wide for £24.95 including delivery.

Following the success of the UK version of their Radio Amateur World Clock, Eastern Communications have launched additional models for use by radio amateurs in other parts of the world. The central area of the clock is printed in three colours with a global map showing countries and their true bearings in degrees. You can also have your callsign printed on the clock face.

This clock also measures 230mm with models now available showing maps centered on: Australia, East Africa, Eastern Europe, Far East, Near East, North America - Central, North America - East, North America - West, South Africa, South Asia, South America - East, South America - South, United Kingdom, West Africa and Western Europe.

Eastern Communications say that not only is the clock an attractive and useful addition to any 'shack' but it could also prove to be an invaluable aid to h.f. operators. At £39.95 including delivery the Radio Amateur World Clock could make the ideal gift for a radio amateur.

To order either of the clocks mentioned here contact **Eastern Communications at Cavendish House, Happisburgh, Norfolk NR12 0RU. Tel: (01692) 650077, FAX: (01692) 650925.**



## Digital Signals & Slim Hand-Helds

The latest offerings for the radio amateur from Icom UK take the shape of the IC-775DSP and the IC-W31A.

The IC-775DSP is an h.f. all-band transceiver which uses Digital Signal Processing (d.s.p.) technology on both transmit and receive. The d.s.p. system separates desired signal components from noise before they enter the audio amplifier. The manufacturers' say that using this feature results in an outstanding signal-to-noise ratio being achieved.

A 90° phase shifter and digital Phase Shift Network (PSN) help the IC-775 to reproduce clear transmit on s.s.b. and give a higher quality receive of s.s.b. signals through superior carrier suppression and unwanted sideband rejection. An automatic digital a.f. notch attenuates single tone signals such as beat signals and interference from broadcast stations.

Other features include twin passband tuning, ultra-narrow c.w. filter, an audio peak filter, built-in a.t.u. and adjustable c.w. pitch. The IC-775 provides 200W output with power MOSFET used in all stages of the p.a. to giving excellent signal quality and low IMD characteristics.

The price of the IC-775DSP is expected to be around £3700 and the first shipments should have arrived in the UK by now. More details can be obtained from Icom (UK) Ltd., or from any Icom approved dealer.

The newly available u.h.f./v.h.f. IC-W31E is described as an ultra slim, compact dual band hand-held transceiver. It has been designed, Icom say, to fit comfortably in your hand. With dimensions of only 57(W) x 125(H) x 31(D)mm and weighing in at 340g its design allows you to carry it easily in your pocket.

A total of 104 memories are available on the IC-W31E. Each band has 50 memory channels and the superior memory management system allows the easy transfer of memory contents to either v.f.o. or other memories. An EEPROM is built-in to prevent memory loss if the battery runs low.

The IC-W31E features include dual tuning dials allowing independent tuning of the v.h.f. and u.h.f. bands, full crossband duplex operation, three power levels, backlit keys and power saver functions. There is also a battery voltage read-out, allowing the user to monitor battery condition and the option of using an external power supply of 4.5 - 16V.

For more information on the IC-W31E which costs £469 you should contact **Icom (UK) Ltd., Sea Street, Herne Bay, Kent CT6 8LD. Tel: (01227) 741741** or any Icom approved dealer.

## Can You Help?

**Mr M. B. Glasman** has a 30 year old **Armstrong 44 Radiogram** chassis which is coupled to a Collaro Conquest four speed turntable and is fitted into a veneered cabinet. The unit has a 'tape record' socket with an output of 150/200mV at 1M $\Omega$  impedance on each channel.

Mr Glasman has tried to find a tape recorder to accept the output but unfortunately to date has not had any success. If any *PW* readers can offer suggestions on where Mr Glasman can find a tape recorder to suit or can point him in the direction of where he may be able to find a unit that will play at three speeds and record direct onto tape, he would be very grateful.

Mr Glasman can be contacted at **2 Ashmead, Chase Road, Southgate, London N14 4QX. Tel: 0181-886 3841.**

## Backpackers & QRPers Unite

The second 144MHz Backpackers Contest run by the Radio Society of Great Britain (RSGB) is taking place from 1100 to 1500UTC on June 18, the same day as the *PW* 144MHz QRP Contest, which runs from 0900 to 1700UTC (full rules appeared in the June *PW*).

If any back-packing contestants were wondering if they could use their logs to enter both events, you can! This is now possible as the RSGB have said that they will accept logs in which the serial number doesn't start at 001, but at whatever number you've reached by 1100UTC. The rules for the Backpackers Contest were published in the April 1995 issue of *Radcom*.

The *PW* team and Neill Taylor G4HLX (organiser of the *PW* Contest) are grateful for the co-operation received from the RSGB VHF Contests Committee on this matter.

## Power Talks

The American SGC Company have added the SG-2000 PowerTalk control head to their range of products. The PowerTalk has been designed for use with the SG-2000 or SG-2000SP transceivers and features adaptive digital signal processing (ADSP) and spectral noise subtraction (SNS).

The ADSP feature reduces unwanted noise while the SNS feature subtracts noise in the spectrum where voice modulation is not present and therefore enhancing the signal further. The PowerTalk also allows the operator to adjust the frequency range by using the Upper and Lower Corner frequency controls and then adjusting the center frequency up or down via the 'spinner' control.

A built-in notch filter allows up to five tones to be suppressed simultaneously. The user memory (eight pre-set and seven user programmable) allows configuration of frequency and mode for ease of operation.

Other features of the PowerTalk include SITOR/AMTOR and PAKTOR telex channels, permanently etched into the memory, 100 user programmable frequencies, Weatherfax connections and 150W of power. The introductory price for the SG-2000 PowerTalk is \$2495. For more information or to receive a brochure contact **SGC Inc., PO Box 3526, Bellevue, WA 98009 USA. Tel: 1-800 259 7331 or FAX: 1-206 746 6384.**



## Prize Draw Winner

The winner of the £50 Prize Draw as featured in the Book Service pages of the May issue of *PW* was **A. M. Harper of Yorkshire.**

If you order books from this month's *PW* and your order totals over £20 excluding P&P you'll receive a **free copy of *Antennas For VHF and UHF***. Full details can be found in our 'new look' Book Service on page 71 of this issue.

## From Stroud To Steepholm

The Stroud Radio Society are mounting a mini-DXpedition to Steepholm Island over the weekend of June 17 - 19th.

Steepholm Island which is situated in the Bristol Channel is about 1000m long by 400m wide, 78m a.s.l. and is owned by The Kenneth Allsop Trust. The island is uninhabited and it's thought that amateur radio operation has only ever taken place twice from the Island, both times by the Stroud Club. It's also part of the EU120 group of islands, qualifies for the IOTA awards and is located in 'wet square' ST26 for the WAB awards.

The Stroud Radio Society hope to operate continuously during their stay on Steepholm Island on all h.f. bands, 50 and 144MHz on c.w. and s.s.b. Operations are expected to start at midday on Saturday June 17 and run through until the morning of the 19th. The main purpose of the DXpedition is to take part in the *PW* 144MHz QRP Contest on Sunday June 18.

The following call signs will be used during the DXpedition: **GB0SRS** on h.f., **GB2SRS** on 144MHz, **GB6SRS** on 50MHz and **G4SRS/P** during the *PW* contest. The QSL cards for this event will be via the bureau or if preferred via **GOATX**, the club's QSL Manager, who is QTHR.

## Innovative Inverter

If you enjoy getting 'out and about' with your hobby then the latest offering from South Midlands Communications could be just the thing for you.

The Manson Inverter provides 120W of power, plugs direct into a vehicle cigar lighter socket and is fitted with a flush mounted 13A square pin socket for 230V 550mA mains supply output from 10 - 15V d.c. input. The Inverter is capable of running anything from a portable TV or computer to lights when camping and charging batteries - so it could be ideal for when you go on holiday with your hobby.

**South Midlands Communications of S. M. House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hampshire SO5 3BY** are the selling the Manson Inverter for £69 inc. VAT.



## An Extra-Five Watts

Alan Lake G4DVW of Lake Electronics has informed the 'Newsdesk' of his newly introduced DTR3-5 transceiver. Alan says this is an enhanced version of his already popular DTR3.

The DTR3-5 covers 3.5 - 3.6MHz, features the new Jackson tuning control, stable v.f.o., 7-pole filter at the p.a. output and gives five watts output. Lake Electronics can supply the DTR3-5 fully built and air tested for £162 including carriage or in kit form for £101.80. The kit version includes everything you need to complete the job - down to the last nut!

Further information on the DTR3-5 can be obtained on receipt of an s.s.a.e. to **Lake Electronics, 7 Middleton Close, Nuthall, Nottingham NG16 1BX or by telephoning Alan on 0115-938 2509.**

Elaine Richards G4LFM has more hints and tips for you from the 'natterings' she's received this month.

# NOVICE Natter

For Radio Beginners of all Ages.

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

## Wide Spread Citizens Band

To make sure I deal with all the letters on CB that I've received, I'll look at this subject first this month. The use of CB must be wider spread amongst readers than I thought, judging by your letters.

The opinion I get from just about all the correspondents is that they found CB to be the first step on the radio ladder. Many have gone onto take their amateur licence whilst still using CB to chat to those not yet licensed.

Trevor John GOUWZ has

### Miss

DNT (good rig, but the p.l.l. i.c. is obsolete)

Realistic

Moonraker

Midland (new models, physical size very good)

Amstrad 900 Series

Nato 'FM'

All those marked \* are virtually identical.

### Hit

Maxcom 7E handset (not bad)

Uniden/Uniace 100, 200, 300

\*Rotel RVC 240/220

\*Harrier CBX

\*York 861, 863

\*Cybernet, any model

\*Fidelity 3001

carried out quite a few repairs on different CB sets and so has prepared his own 'hit or miss' table (left).

Trevor thinks the performance from the 'Hit' sets is superior compared to the 'Miss' sets. If you start with a Rotel RVC 240/220 then when you pass the RAE you can convert the rig to the 28MHz band (10m) f.m. to give you a cheap way onto the h.f. bands.

Another tip from Trevor is to get to the car boot sales early. He picked up five non-working rigs for £5 but he soon had them up and running!

Colin DT480 (hopefully G77?? by now) has been an s.w.l. for some 33 years (on and off). Last year he decided to try CB after listening to all sorts of conversations on the 11m band.

Once Colin had bought his licence, he purchased a pair of 3-channel hand-helds and a mobile rig for the car. He was fortunate and found some very helpful and accommodating 'breakers' who helped him through his first few weeks.

He also discovered several with a very low IQ, but learned to ignore them or switch off. Sounds a bit like me and my reaction to Soap Operas!

Colin then progressed from hill-top operation to indoor operation. Next came CEPT operation and a whole new world - polite, sensible, chatty people interested in radio; properly run nets and DX work just using 4W f.m.

Now he says that he wouldn't be without CB for both the help he received during the January snowfalls and the friendships he has made.

Now for a CB problem. Mr D. Pritchard has a problem when he tries to transmit using his CB. He doesn't interfere with any television sets but as soon as he keys up he causes a loud hum on a video recorder across the street.

## Simple Morse Sounder

If the 'First Steps' on Morse a couple of month's ago got you thinking, then this idea for a simple Morse sounder (Fig. 1) from Walter Farrar G3ESP might be worth a go. He says it is an old idea for practising without causing QRM!

All you need is a carbon microphone insert, a miniature speaker and a battery (1.5 to 3V should do). Just wire all three items so that they are connected in series, with your Morse key completing the circuit.

Now you need to mount the microphone and speaker so that they are facing each other to encourage feedback between the two items. In case you haven't already twigged, you are trying to create the 'howl round' you get from a p.a. system.

In order to get the best tone you will have to experiment with the gap between the speaker and microphone and possibly the battery voltage. Once you've found the best position you can use Blu-Tack or similar to maintain the gap.

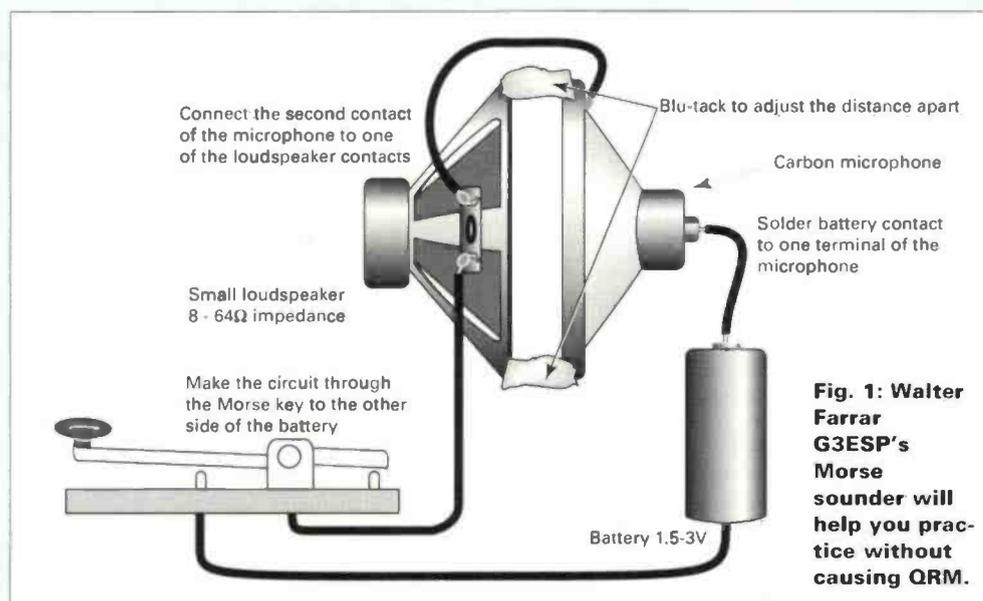


Fig. 1: Walter Farrar G3ESP's Morse sounder will help you practice without causing QRM.

## First Steps

### I'm Married to a Novice Instructor

Michael Stott GONEE has been a contributor to this column from time to time and I've been fortunate enough to meet him at several rallies. He's a successful Novice Instructor and Pat 2E1BUJ, his wife, has dropped me a line telling her side of the story. The next few paragraphs should be passed on to any 'better halves' who feel they are the only one who comes second to the hobby (in the nicest possible way of course.).

This is the other side of the coin, the bit that they don't tell the partner of any prospective amateur radio operator. I'm really lucky as my husband is also interested in radio, in fact that's how we met. Not every one is that lucky.

"I had been going out with Michael for several weeks when a colleague at work said to me, 'He's one of those you know, just like my husband'. It took a little encouragement for me to find out what she meant, they had always seemed perfectly normal to me.

Our courtship continued, much of it being spent in his shack, a posh word for the attic in his parents house where he had his 'ham' station. There was no music in the car, all I listened to was QRM and monotonous talk of new gear, antennas and traffic jams.

I must admit it, amateur radio did have its good side, we met some lovely people over the air, particularly after we got married and started going abroad. Yes, readers I married him (don't tell Michael, but I couldn't afford to give his mother the dowry back!).

Anyway, back to the advantages of radio, we were given free meals and hospitality in Norway, when you're camping at the end of the season and money is running short, both are welcome. We listened enthralled to stories of the Second World War, it was clearly still very fresh in their minds.

We reciprocated by offering hospitality to a couple from San Francisco who we heard on the air asking for directions through Newcastle. A year later on our first trip Stateside, we stayed with them, and also made other new friends through amateur radio. Fifteen years on they are still good friends and have been over to visit us, as have their friends.

And then there was Enrico, from Rome. He landed on our doorstep unannounced at 6am one morning after Michael's vague invitation over the air to call and see us if he was in England. He stayed a week and now asks when we are going to visit him! So much for the 'advantages'.

Our first house was small, but guess who slept in the largest bedroom - the radio equipment! Not nice and tidy

like shacks you see in photos in PW, but more like Steptoe's back yard.

Still, I was young and in love, and I always knew where he was because I could hear him on the 'phone, the radio and the TV. When the time came to move to a bigger house it was easy, we swapped homes with my widowed father-in-law, and Michael moved back into his shack.

Who's law is it that states that work expands to fit the time available? Substitute junk and space into that saying and you've got it right. Michael began to teach the RAE, the first class was under subscribed so, I enlisted with another student's wife to make up the numbers.

I never had to do that again. Michael was a born teacher, over the years very few people failed to get a pass - unfortunately I was one. I did pass Part 1, reading the manual on the train for a few weeks before the exam I memorised enough to get through.

Part 2 of the RAE has always eluded me, my brain can't get round the formulas, the squiggles and the maths. In 1990, the Novice Licence arrived. Michael prepared for this like an evangelist. He passed the American test at a local rally and got the call KB5MPO, to get a flavour of what it was all about.

Books and papers arrived and he organised his first class, in his capacity as Senior Instructor. Our dining room was turned into a classroom, for what was to be a 3-day intensive course.

I provided meals and coffee for 10 people, it was exhausting but fun. 1993 saw our silver wedding anniversary and I decided to mark it by getting my Novice licence. There were no concessions, I had to do my projects and homework every week, but it was worth it when I passed, and gained the callsign 2E1BUJ. I wasn't as electronically illiterate as I thought, and it looks very impressive on a CV or quiz application forms.

And it is great fun, I am hoping that when Michael has the time to spare from running courses I'll get my own set in my car so that I can listen to the QRM, the talk of antennas, equipment and traffic jams!"



Pat 2E1BUJ tells her story of what it's like being the 'better half' of an enthusiastic radio amateur.

As you can imagine, Mr Pritchard's problem is not popular even though he's offered the owners all kinds of filters. There were no complaints until he put up an antenna, but there's still interference no matter the size of antenna.

If you've got any suggestions, then Mr Pritchard would be pleased to have them, as he's only able to

listen at the moment. Send your letters to me and I'll pass them on.

Finally on CB, Mr N. McGeechan uses an FRG-8800 for his usual listening, but following the purchase of a Midland 40 channel CB rig has found a different world of radio. He's been interested in radio for many years now and has found CB to be reminiscent of the old

days of radio when he was young in Glasgow.

If anyone else has hints and tips on CB, drop me a line and I'll include it in the column. Next time, I will try and deal with the letters quicker!

*That's all for this month so, until next time cheerio and don't forget keep those letters and ideas coming.*

*Elaine G4LFM*

# HAYDON COMMUNICATIONS

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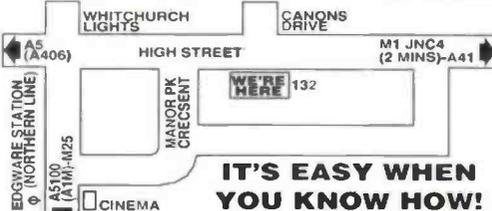
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## Club Of Friendship

Howard Ketley G1JGY is trying to revive the **Club of Friendship** (COF), which was founded in 1987 by Ken Norvall G3IFN, to develop and further the friendship between the UK and Russian radio amateurs. The club has its own callsign **G4BAS**, and Howard is appealing for help to re-establish the club.

The aim of the COF is to develop the friendship between the UK and Russia over the air, with regular Nets, etc. It is also a good way of learning another language if you so desire. In the past, some members have even been on exchange visits to see their 'friends'.

If you have even a slight interest in becoming a member, please drop Howard a line (address below), together with an s.a.e. Should sufficient people show a positive response to becoming a member, then Howard will act as co-ordinator among the UK amateurs and liaise with the Russian section of the club, so that it can continue.

The address to contact Howard is **1 Tewkesbury Avenue, Mansfield Woodhouse, Notts NG19 8LA** or you can telephone/FAX him on **(01623) 423697**.

## Temporary QTH

The **Douglas Valley Amateur Radio Society** would like to tell all *PW* readers that they now have a new (temporary) QTH as they have been experiencing some problems with their previous premises. Although the Standish Conservative Club was a good venue for h.f. and v.h.f. activities due to its height above sea level, it was not so good for lectures, since the room they were using was shared.

So, the (Wigan) Douglas Valley Amateur Radio Society is alive and well. And it is still meeting on the first and third Thursday in the month but now at The Hesketh Arms, Shevington Moor, Shevington, Wigan. The contact is still **D. Snape G4GWG, QTHR** on **(01942) 211397**.

# CLUB Spotlight

Send your information to the 'Club Spotlight' newshound **Zoë Shortland** at the **PW Offices**.

## Wandering in the Wilderness

The **Barry Amateur Radio Society** was founded in 1966 by the present Secretary **Dan Adams GW3VBP** together with the present Treasurer **Brian Vodden GW3WBU** and a small band of dedicated enthusiasts. At that time, the club venue was inside the Barry College and the shack was one of the classrooms, which had to be restored to its proper status at the end of each meeting.

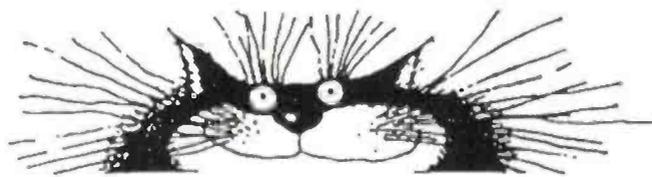
Largely due to disputes with the caretakers, who no doubt regarded the club as a nuisance, other venues were sought and tried, eventually ending up back with the college, but this time on an outlying site.

The Barry Amateur Radio Society were fortunate enough to have masts and a shack, but in the early 1980s, the college, like others, was obliged to start charging for facilities provided. From this point, things got to the stage where the Society could no longer afford it.

From that time, until fairly recently, the club has been 'wandering in the wilderness'. In October 1994, **Glyn Jones GW0ANA** was elected as chairman, ably abetted by a small band of willing helpers in the form of officers and committee.

Since then, things have moved apace and the Society now represent a section of the Sully Sports and Social Club situated in extensive grounds in a beautiful location with the grounds gently sloping down to Sully beach. The Society has succeeded in attracting old and new members, and they now can look forward with confidence to keeping up the momentum and becoming once again a 'Real Radio Club'.

To find out more, you can reach the Secretary, **Dan Adams GW3VBP** on **(01222) 484922**.



## New Member

The **Coulsdon Amateur Transmitting Society (CATS)** are pleased to announce that they have a new member, **Garry Gibbs G7UOC**. Garry joined the Society at the March meeting. Garry passed his RAE in December and is hoping to be on the air soon.

Regular society meetings are held on the second Monday in each month at St. Swithun's Church Hall, Grovelands Road, Purley at 7.45 for 8, until 10pm. Current membership of CATS stands at 34. For more details, you can contact **Alan Bartle G6HC** (Secretary) on **0181-684 0610**.

## Up & Coming Events

The **Leicester Radio Society** meet on Mondays at 7.30pm at Gilroes Cottage, off the Groby Road, Leicester, A50. The Society also runs an h.f., v.h.f. and u.h.f. shack, along with RAE and Novice classes.

A few up and coming events to watch out for are: June 12 - h.f./v.h.f. night on the air and general matter night, 19th - Progress meeting, 26th - Ascension, 'The Radio Active Island' by Richard G3VGW, July 3 - h.f./v.h.f. night on the air and general matter night, 10th - Committee meeting and h.f./v.h.f. night on the air.

For more information, you can contact the Society's secretary, **Mr A. T. Wann GOTNI** on **0116-291 7250**.

Members of the **Winchester Amateur Radio Club** meet on the third Friday of every month at the Red Cross Centre, Durngate House, North Walls, Winchester at 7.30pm. On June 16, Jim Chick G4NWJ is giving a talk on Radio Control within Falconry. **P. Simpkins G3MCL** is the club's Honorary Secretary and Mr Simpkins can be contacted on **(01962) 865814**.

## Attention All Club Secretaries

The *PW* Book Service Department has put together a special deal offering discounts on book orders received from radio clubs. If your club places an order for books from our comprehensive selection of titles that totals over £50 we will give you a **10% discount** and **free post and packing!**

To take advantage of this offer please use the order form towards the back of this issue, making sure that it is the club secretary who places the order and that the name of your club is stated.

So, don't delay take your copy of *PW* along to your next club meeting and get your members to start making a list of all those books they've been meaning to buy but never quite got round to.

## Bedford Net

'Club Spotlight' has recently received a letter from John Percival G7DDU who has nominated **Charles Austin G4MEW** for the Novice Natter PW Elmer Award. Charles turned 80 in May and has been the anchor man for the 'Bedford Net' for many years.

Before Charles was licensed, some 25 years ago, many people starting their working day would 'log in' to the 'Bedford Net' whilst on route to work. People from all over the country called in on 3.5MHz and with the growing popularity of 144MHz, eventually the Net gravitated to h.f.

The activity coincided with Charles retiring from his news agency business and, being an early riser, found himself as Controller. His friendly nature has won him many friends over the years and his meticulous log of contacts, which he started immediately when he took to helm, has reached astronomical proportions.

The morning Net, which is usually in full swing at 7am, goes on for about two hours with some 15 to 20 calls entered in the log book, each

one being given a number. At a glance, Charles can tell you his score to date, which is currently nearing 25000 entries with some 220 different call signs included in this score.

Charles Austin G4MEW has made considerable contribution to amateur radio. He is a first class c.w. operator and teaches aspiring v.h.f. licensees Samuel Morse's legacy. He is also a QRP exponent and holder of the QRP Masters Award.

At the age of eight, Charles could hear his father teaching older children Morse code using a buzzer, which Charles could hear in his bedroom, where he would be writing down what his father was sending! When his mother discovered this she informed her husband, who said, 'it's time for him to learn properly'.

For two whole years, Charles was not allowed to use a buzzer, 'until he can spell correctly' said his father. At the age of 18, Charles joined the Metropolitan Police and eventually after he had pounded the beat, in 1934 he found himself in patrol cars.

Back in those days, Charles

and three others in the Metropolitan Police operated c.w. at 30 words per minute. Sometimes the transmissions were on v.h.f., which were rather difficult to read, particularly when they were amongst high rise buildings.

There were no relay stations then as the transmissions were done from one centre. Charles said he did lots of courses, 'to save his feet'. One of these was shorthand, where he attained the speed of 200 words per minute. Again, the introduction to shorthand was by his father, when Charles was quite young.

Next came the 1939/1945 war when Charles joined the RAF and eventually became a pilot instructor. Later, he transferred to the army and his 30w.p.m. Morse and 200w.p.m. shorthand were put to good use.

After being demobbed, Charles became manager of a large agricultural implement sales firm, an accountant, a large scale bee keeper, a shop owner and a news agent and so it goes on.

Most amateurs like to play

around with antennas and Charles certainly comes into this category. When he was living in a high rise flat, it was a challenge to get the most out of a piece of wire, as no external antennas were allowed.

Now living in a smaller bungalow, with an equally small garden, Charles has done wonders working the world on QRP with G4MEW antennas that utilise roof spaces, under carpets, garden fences and whatever in his quest to get the very last bit of power out of his rig and into the front-end of the other station.

Recently Charles founded a meeting of local amateurs for an 8am Saturday morning breakfast at one of the local supermarkets. The next meeting will coincide with, and is to celebrate, Charles's ten years as Controller of the Bedford morning Net, which incidentally has stretched to other parts of the day now!

So, if you're a mobile traveller and in the Bedford region, tune into 145.275MHz and see if you can raise Charles's friendly voice, you'll always be made welcome.

### \*PRACTICAL WIRELESS & SHORT WAVE MAGAZINE IN ATTENDANCE

**June 10:** The second annual Crane Hamfest presented by Ham & Coffee at the City Park, Crane Missouri, USA. Doors open 10am to 3pm. No admission fee, no alcohol but lunch is available. Crane is only 40 miles from all the Branson Shows. A percentage of the 1995 Crane Hamfest proceeds will be donated to Handi-Hams of America. For more information, contact Lonnie Allen N0TBO at 417-723 5671 (24hr answermachine), 701 Agnes RT1 Box 390, Crane, Missouri. 65633 USA.

**June 11:** The annual Royal Navy Amateur Radio Society Rally will take place between 10am and 5pm on the Sports Field, HMS Collingwood, Fareham, Hants. Clive G3YTK on (01329) 234143.

**\*June 11:** The Elvaston Castle National Radio Rally is being held at the usual venue, which is the Showground of the Elvaston Castle Country Park, five miles south east of Derby. This is the 26th radio rally and should be the most spectacular event to date. Keith Ellis G1ZLQ on (01332) 662896.

**June 17/18:** The Bletchley Park Amateur Radio & Computer Rally is being held at Bletchley Park, Bletchley, Milton Keynes, Bucks. Doors open at 10am to 5pm, both days. This is a new rally in the grounds of the former Second World War top-secret code-breaking, cipher and intelligence centre. There will be special interest groups, Morse tests, numerous interesting displays, talk-in and a Bring & Buy. One price admission to rally and museum. For further details you can ring (01923) 893929.

**\*June 23-25:** Ham Radio '95 Friedrichshafen, Germany. The largest amateur radio show in Europe, and well worth a visit. The Flea Market alone is worth the journey and Friedrichshafen, situated on the Bodensee - Lake Constance to the English - and within easy reach of Austria and Switzerland, is a fantastic area for a holiday.

**\*June 25:** The 38th Longleat Amateur Radio Rally. Trade stands, club stands, free parking, catering and bar on site. Large Bring & Buy. £2.50 entrance fee for adults, £2 for DAPs and 50p for children. Further details from Gordon Lindsay G0KGL on 0117-940 2950.

# RADIO Diary

**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.**

**July 2:** The 6th York Radio Rally will be held in the Tattersall Building, York Racecourse, York. Doors open at 10.30am. Admission is £1.50. Children accompanied with adult FREE. Ample free parking. Amateur radio, electronics and computers, Morse tests and Repeater Groups. Refreshments and licensed bar. Talk-in on S22. Dave Moreland G7FGA (01904) 790079.

**\*July 8:** Cornish Radio Rally & Computer Fair. For further information contact Ken G0FC on (01209) 821073.

**July 9:** The 1995 Sussex Amateur Radio and Computer Fair will be held at Brighton Racecourse, Sussex. Doors open at 10.30am to 4pm. This event brings together the best in amateur radio and computer technology. Admission is £1.50. There will be a free car park, a giant Bring & Buy, a bar and a talk-in on S22. Further details from Ron Bray G8VEH, QTHR on (01903) 763978 or (01273) 417756 office hours.

**July 9:** The Horncastle Amateur Radio and Computer Fair will be holding their Rally at the Grammar School Sports Hall. Horncastle is half way between Lincoln and Skegness on the A158 trunk road. For more information, you can ring Tony Nightingale on (01507) 522482.

**July 16:** The Norfolk RAYNET Barford Rally will be held at the Village Hall, Barford, on B1108, Norwich to Watton Road. Doors open 10.30am to 3.30pm. There will be trade stands, a raffle and refreshments. Free car parking and talk-in on S22. Further details on (01603) 625833 daytime or (01362) 820820 evenings.

**July 16:** The 12th McMichael Rally and Car Boot Sale will take place at the Haymill Youth and Community Centre, Burnham Lane, Slough, near Burnham Railway Station. Talk-in on S22. Doors open at 10.30am. Admission is £1.50. For more details contact Dave G3SET on (01628) 486554.

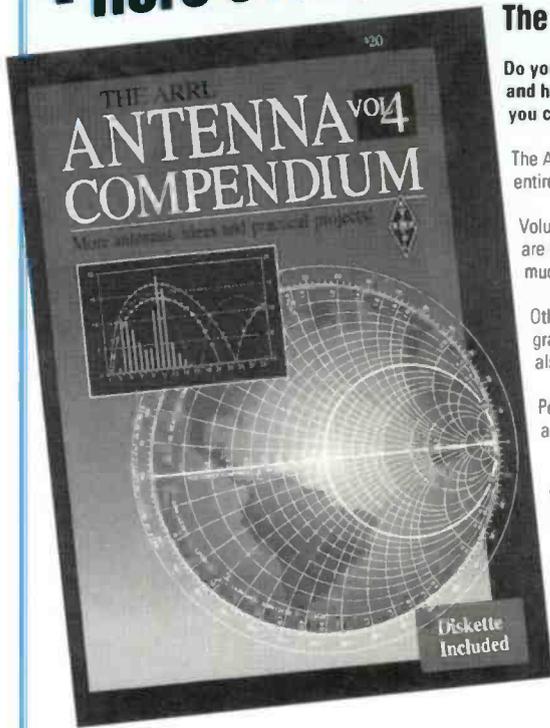
**July 23:** Britain's biggest Outdoor and Leisure Show is due to take place at Powderham Castle, Nr. Exeter, Devon between 10am and 6pm. The show is situated in the grounds of the magnificent Powderham Castle on the edge of the River Exe. The show has a variety of different sections to cater for all, new and used sailing and power boats, used boat jumble, new equipment and lots more. There is to be an amateur radio section (new and used equipment) and a special event station is planned. Any enquiries to: **The Outdoor Boat and Leisure Show Ltd., c/o The Estate Office, Powderham Castle, Exeter, Devon EX6 8JQ** or you can ring (01626) 890243.

**\*July 30:** Scarborough Amateur Radio Society will be holding their Radio Electronics and Computer Rally at the Spa, South Foreshore, Scarborough. Doors open at 11am. There will be many traders a Bring & Buy, refreshments and a bar. Ross Neilson G4ZNE on (01377) 257074.

**July 30:** The Rugby ATS are holding their 7th annual Amateur Radio Rally at the BP Truckstop on the A5, three miles east of Rugby and just 2.5 miles north west from junction 18 on the M1 motorway. Doors open from 10am and admission is £1 per car. Facilities include a good cafeteria and toilets. Talk-in on S22 by GB7RRR. Peter (01455) 552449.

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Other areas covered are: multi-band antennas, portable/temporary antennas, propagation (with a computer program), receiving antennas, rotators and measurements (an interesting combination...but it makes sense!). There's also an interesting v.h.f. section which covers the construction of 50 and 144MHz antennas.

Personally, I think this book is well worth having, if only for the h.f. mobile chapter, which is excellent. Hopefully a copy will find its way on to my bookshelf!

Rob Mannion G3XFD.

You can get your copy of the *ARRL Antenna Compendium Volume 4* for **£12.50 plus £1 P&P (UK), £1.75 P&P (Overseas)**, (Normal price £14.50 plus £1 P&P (UK), £1.75 P&P overseas) and get *PW* delivered right to your door every month too!

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# COMPETITION

## Corner

### Wordsearch rules:

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

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### Words To Find:

Alinco; Antenna; DXpedition; Hobby;  
 Holiday; MFJ; Packet; Portable; Rally;  
 Reciprocal; Scene; USA

M	G	S	R	E	A	O	Y	S	Y	V	Y	F	F	A
Z	Z	K	A	C	F	P	P	M	T	H	T	P	R	H
P	P	O	N	S	S	Y	Z	S	O	E	A	I	N	H
B	S	J	T	E	Y	B	X	B	L	C	X	O	E	A
K	R	H	E	N	S	I	B	B	K	H	I	F	N	Y
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T	V	A	A	S	R	H	W	D	W	G	I	C	C	Q
I	Y	D	U	O	K	U	E	P	V	L	O	P	A	K
X	Z	S	P	X	A	P	J	M	O	R	R	F	U	D
M	A	V	C	L	X	F	S	H	P	Y	Y	I	L	X
S	U	I	I	D	M	I	T	I	D	G	L	V	A	Y
T	Y	N	E	H	N	D	C	A	N	U	Z	L	W	J
K	C	L	A	C	R	E	Y	L	V	K	T	F	A	Z
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COMPETITION CORNER  
 JULY 1995

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

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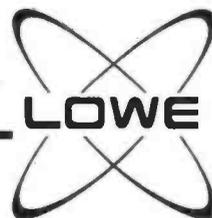
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## Chelcom G5RV's

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.

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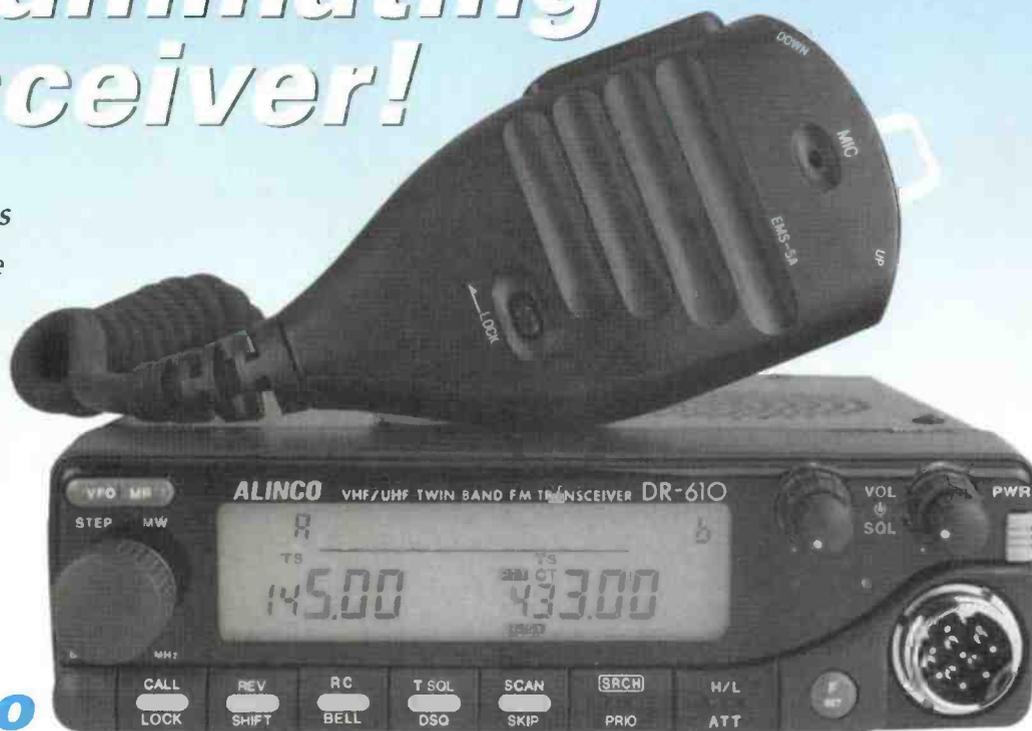
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# An Illuminating Transceiver!

Kevin Nice G7TZC, takes a break from Short Wave Magazine to try out the Alinco DR-610E dual-band v.h.f./u.h.f. transceiver and finds the display facilities rather illuminating!



## The Alinco DR-610 144/430MHz Dual-Band Mobile

Last time I reviewed a transceiver I said that you just have to remember to read the manual. So, this month I took my own advice, and the statement on the cover of the manual!

However, due to the extremely exclusive nature of the DR-610, the manual was in the form of printer's proofs. Because of this it contained one or two 'funnies'. (Nothing serious though, and I doubt that they will permeate through to the final version. You can't get a much newer product than that!).

I was on my guard for typical new product bugs (not the multi-legged variety either!). More the kind of things that are missed in the rush to get the product to the market place.

### Dual-Band

In the past I have never been able to make up my mind about dual-band mobile transceivers - until now that is. And I've spent quite some time with the DR-610, travelling many thousands of miles the length and breadth of the country with it looking me in the eye.

Mind you it can get very confusing when the squelch breaks and a call is heard. Just which of the two bands was it? Even in the high position on my Citroën's dashboard it's not always easy to catch the display in time to see which band the call was on.

Identifying which band the call is on is important because if you're not on the correct band pressing the p.t.t. doesn't help in returning to the call - you transmit on the wrong band. This is of course operator error, but it's easy to do.

I know. I lost count of the number of times I returned to a station calling on the other band!

Of course it's not a real problem identifying the band if you're not driving. It's also not difficult if you have a good differential between the volume levels on each of the bands.

The differential in volume was my ultimate solution to the problem. I decided to set the volume of the band I was concentrating on, to half setting.

The other band was set to a quarter, this enabled me to hear activity on either and to be able to identify whether it was 144MHz or 430MHz. It's not totally foolproof though!

What tends to happen, is that you hear a call on the band with the lowest volume setting with low deviation. As it's not loud enough there is a need to advance the volume to a higher level.

The difficult bit is remembering to reduce the volume again, because if you don't then the next time the squelch breaks you're back to not knowing which band it is. Oh, the trials of mobile operating!

### Mobile Operating

Whilst on the problems of mobile operating, you may recall that when I was enjoying my time with the Alinco DR-150 in the June issue of *PW* I had transferred from a 'lash-up' to a permanent installation.

For this rig I happened to change cars, and so had to revisit the installation trauma again. Since I changed, to a similar model both transceiver and car, the exercise wasn't as painful as it could have been. But it did mean extra work which I could have done without.

Apart from the additional complication, the change over from the DR-150 to the DR-610 was very easy. This is because both rigs share the same mounting bracket, power lead, and antenna socket (though a PL259 and SO239 arrangement is not ideal at 430MHz).

There's only one antenna connection. Both the v.h.f. and u.h.f. portions of the transceiver are connected to the antenna via a built-in duplexer.

### Antenna Problems

My antenna problems did return, with the fitting of the DR-610 into the car, since I had been using a Sirio  $\lambda/2$  over  $\lambda/2$  collinear for the 144MHz transceiver. Help was again on hand in the shape of locally-based **Southern Short Wave and Scanning**.

This time I was loaned a 144/430MHz dual-band whip, again the Sirio brand, type HP2070R. This effective antenna is a  $5\lambda/8$  on 144MHz and collinear on 430MHz. It's a well constructed design with tilt-over capability.

### Remote Panel

Even though this transceiver is compact, Alinco have designed it to be optionally operated with a remote front panel. It's possible to mount the body of the unit almost anywhere in the vehicle and have only the detached front panel in an ergonomically sound location.

These days though, it can be quite difficult routing cable runs discreetly though the interior of your vehicle. To help you there are two ways

to install the DR-610 for remote operation, either with the microphone still connected to the front panel or by using the 'relay box' EDS-1.

By using the EDS-1 option both the external speaker and the microphone, are connected to this 'break-out' adapter. This allows a more convenient mounting position for the microphone and can avoid the microphone cable hanging across vital vehicle controls.

Another option is the DTMF microphone that further enhances the remote control possibilities of the DR-610. With the EMS-12 microphone - which is standard with the USA version of the rig, most of the transceiver's functions can be controlled from the microphone keypad. (Not really recommended whilst on the move though!).

The options were not supplied with the review rig. So, unfortunately I can't comment on how easy they were to install or, for that matter what improvements in useability are to be enjoyed.

## Competent Transceiver

The DR-610 is a very competent transceiver indeed, so what can it do? Perhaps I should mention what it can't do, as the list would be much shorter! Mind you for the price of £729 it ought to be!

The transceiver is a dual-band, double conversion, synthesised affair. It features dual v.f.o.s on each band.

As you would expect, the transceiver is based around microprocessor control. The front panel controls are therefore all multi-function. The display is large and clear allowing simultaneous indication of two operating frequencies.

There's one extremely useful and well thought-out feature, which greatly enhances night-time operation on the DR-610. The button illumination both changes from green to orange and highlights their shifted functions on depressing the F (Function) button. A brilliant idea!

Like most other offerings in the market sector, the DR-610 has extensive memory capability - 120 channels. It's also possible to extend this capacity with the addition of the memory expansion unit, which adds an additional 120 locations.

Considering its diminutive size, only slightly deeper than the DR-150, the DR-610 is very compact and it does represent pretty good value for the money. Or perhaps I should say its price-to-performance ratio is good.

## Power Levels

The DR-610 has three power levels on both bands, these are 50, 10 and 5W on 144MHz. On 430MHz high power is at the lower value of 35W, as on 144MHz, medium and low powers are at 10 and 5W respectively.

Just as with the DR-150 I found myself using the medium setting most of the time. This was in spite of the lower level and the lower gain antenna.

Performance was superb. I received many



**Inside view of the v.h.f. side of the Alinco DR-610. The sloping-sided casing either side of the d.c. power input and the single antenna connection, houses the cooling fan. The u.h.f. unit is on a similar board mounted on the other side of DR-610.**

complimentary reports of excellent audio quality from stations all over the country from the south coast, to Snowdonia, the Lake District and Lincolnshire and everywhere inbetween.

## Easy To Use

I found the DR-610 very easy to use. I did my utmost to exercise all the possibilities, I almost made it although I didn't get around to any packet operation.

The radio is organised so that the left-hand section is the v.h.f. side and the right-hand side is for u.h.f. This is the default condition, but the user can easily change it for themselves.

For some totally inexplicable reason I found myself having changed them over for the duration of the review. To accomplish this, or for that matter to change the band at any time, all that's required is the depression of the volume control for the side to be changed (the bands cycle on each depression).

It's entirely possible to have both left and right sections on the same band. This can be v.h.f. or u.h.f. It's also possible (for example) to have v.h.f. running on v.f.o. A on one side, and v.h.f. scanning through memory locations on the other. This is very flexible indeed!

If you prefer, you may have only one side of the radio operating alone. To achieve this the band select button (the volume control button) for the side you wish to use is depressed and held while the radio is powered on.

Then, if you wish the other side can be enabled at any time by depressing its band button, this then reactivates dual band operation. However, return to 'single side' operation can only be achieved at 'power on'.

## Spectrum Display

Those of you who read my review of the DR-150, may recall my wish that the spectrum display was capable of showing more channels at a time. The DR-610 did not disappoint me in this respect.

Not only are there two sets of panoramic indicators on the DR-610, there's one for each of the two sections. It's actually possible to view the whole display indicating adjacent channels for one side of the transceiver only. This gives 11 simultaneous channels to view.

I believe that the panoramic feature will become standard on all rigs in future. So, I only had to wait to get my wish, well for the review period at any rate!

The way the search function is activated differs on the rig for some reason and resulted in me being caught out - just like last time. Mind you, this time I wasn't driving and hence I was able to quickly consult the manual to discover that you need to press the **Band** button to cancel the function.

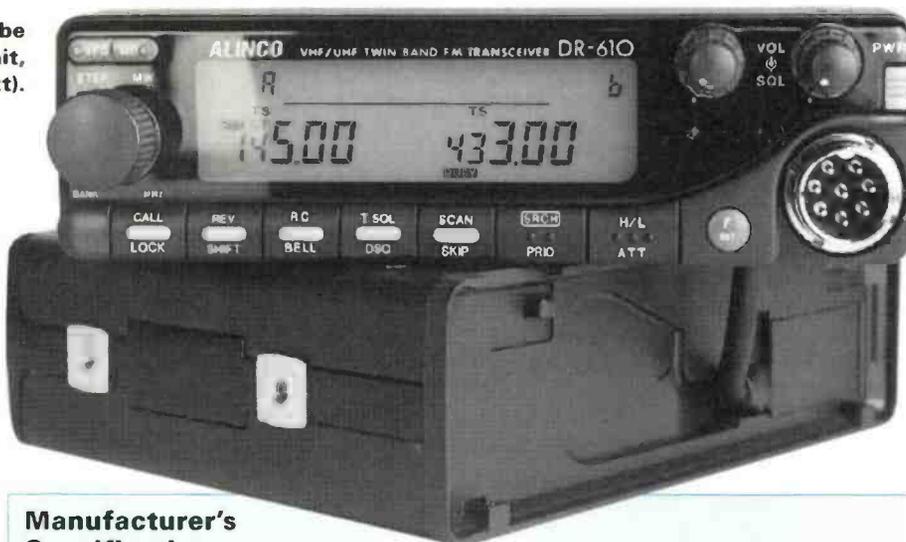
## Selective Calling

The DR-610 is supplied with two options for selective calling. The first is in-line with the growing trend in repeater access, though I am unaware of any repeaters which utilise this method of access exclusively.

I'm referring of course to CTCSS (Continuous Tone-Coded Squelch System). The second is DTMF (Dual Tone Multiple Frequency).

The advantage of CTCSS is that it is discrete, in so far as the tones, between 67.1 and

The DR-610's front panel can be detached from the main unit, permitting remote operation (see text).



118.8Hz, are outside of the transceiver's audio passband. They are therefore rendered inaudible.

I find that the CTCSS method of repeater access is preferable to simple tone burst access. (which incidentally is easier with this rig as the tone burst activation is achieved by depressing the 'UP' button on the microphone with the p.t.t.). But it does require the use of the correct tone every time you use a different repeater.

Certainly, CTCSS is not a problem if you only use one repeater. But I use several on a regular basis, so it means that I have to sacrifice memory space to store the CTCSS tone appropriate to the repeater.

## Different Tones

Since the point of CTCSS is to avoid co-channel interference in times of good propagation, the repeaters that I use, which share the same channel, have different tones. This results in having the same frequency programmed in several memory locations.

Now we need 'alpha tagging' to show which channel is used by which repeater! I suppose I could commit them all to memory - mine that is, or write them down, but that some what defeats the object of memory-driven rigs.

All that said, I was pleased with the way in which CTCSS worked with the DR-610.

The second selective calling option, DTMF is rather less useful unless you plan a trip to the USA. But there are several ways that the scheme could be used, especially since the DR-610 can decode DTMF in addition to generating it.

I would recommend that if you're considering the use of DTMF, you obtain the optional microphone including the appropriate keypad. Operation without the keypad is cumbersome, as you might expect (Optional EMS-12 DTMF microphone is now available, price to be arranged).

## Reason Logical

For some reason, perhaps quite a logical one, Alinco ship the DR-610 with a set-up that has to be changed to be of any use. As supplied, the repeater shifts are wrong as are the calling channels.

Less important are the default scan edges, both band upper and lower limits are set to the same value, which happens to be the lower edge of each band. Surely it makes sense to have these values set for the UK market? Having been involved in the automatic testing of similar radio equipment in the past I believe it would only mean a slight change to the end of line testing programme.

As with the DR-150, the DR-610 can have its factory programmed defaults for band edges

## Manufacturer's Specifications

<b>Frequency range (as shipped)</b>		
<b>Transmitter</b>	v.h.f.	144-145.995MHz
	u.h.f.	430-439.995MHz
<b>Modulation:</b>		F2, F3
<b>Antenna impedance:</b>		50Ω
<b>Stability:</b>		±10 p.p.m.
<b>Receiver type:</b>		Double conversion superhet
<b>Intermediate frequencies:</b>	v.h.f.	45.1MHz and 455kHz
	u.h.f.	58.3MHz and 455kHz
<b>Sensitivity: (12dB SINAD)</b>	144-145.995MHz	>-16dBu
	430-439.995MHz	>-10dBu
<b>Selectivity:</b>		-6dB@12kHz
		-60dB@28kHz
		>-20dBu
<b>Squelch sensitivity:</b>		>2W@5% distortion
<b>Audio output:</b>		8Ω
<b>Speaker impedance:</b>		
<b>Transmitter</b>		
<b>Power output:</b>	v.h.f.	High 50W
		Low 5W(approx)
<b>Medium 10W</b>	u.h.f.	High 35W
		Low 5W(approx)
<b>Medium 10W</b>		Reactance modulation
<b>Modulation type:</b>		<-60dB
<b>Spurious emission:</b>		±5kHz
<b>Maximum deviation:</b>		>3%@60% modulation
<b>Distortion:</b>		2kΩ
<b>Microphone impedance:</b>		EMS-5A
<b>Microphone type:</b>		13.8V d.c.
<b>Supply voltage:</b>		11.5A v.h.f. (50W)
<b>Current consumption:</b>	Transmit	10.0A u.h.f. (35W)
	Receive	1.2A
<b>Operating temperature:</b>		-10° to +60°C
<b>Dimensions:</b>		140(W) x 40(H) x 162mm(D)
<b>Weight:</b>		1.1kg (Transceiver only)

opened up, by the user. It's also capable of resolving a.m. signals once this procedure has been carried out. The importers Waters and Stanton Electronics will perform this for you if you require.

My thanks go to **Waters & Stanton Electronics** for the loan of the DR-610 which costs £729. They can be contacted at, **Spa House, 22 Main Road, Hockley, Essex S55 4QS. Tel: (01702) 206835, Fax: (01702) 205843.**

PW

After seeing a copy of the G7TZC review, Jeff Stanton G6XYU of Waters & Stanton Electronics sent us the following comments:

Kevin Nice G7TZC had the very first DR-610 in the country and therefore had to struggle with a temporary handbook. However, an excellent 76 page illustrated handbook is now provided. Although not used for packet by the reviewer, this is well catered for with separate rear panel connections for both 1200 and 9600bps speeds. Also extended wide band receive coverage is available between 108-174MHz and 430-510MHz with a.m. mode available on v.h.f. frequencies to monitor airband activity for instance. Even if the user does not remotely mount the front panel, they can detach it when parked for security.

Jeff Stanton G6XYU

# Mississippi Mystery

## - The MFJ Secret

After her recent trip to the Dayton HamVention, PW's Kathy Moore took the opportunity to visit the MFJ factories in Mississippi and learn more about the company and Martin Jue K5FLU - the man behind the name.

In the late summer of 1972, Martin F. Jue K5FLU, an electronics engineering Professor at Mississippi State University in Southern USA, designed and built his first amateur radio project for commercial sale. It was an add-on c.w. filter for universal use, which sold for \$9. He called it the CW-2 and he sold hundreds.

As was to happen many times since, demand for the c.w. filter outstripped supply. Obviously producing them individually on the kitchen table was just not good enough!

So, Martin persuaded his students to make-up units in school and at home, paying them to supplement their grants. In the meantime he was busy developing new products, just as he does today, 23 years on.

Martin set up a company called MFJ Enterprises Inc. and turned over \$30 000 in the first year. Of Chinese descent, his great-great-grandparents had come from the Hong Kong area to the Mississippi Delta in the USA to help build the Union Pacific Railroad in the 1860s.

### Middle Name Secret

Martin F. Jue keeps his middle name a secret. Just as he does his current sales, which now run into millions of dollars each year!

In the mid-1970s, Martin rented a room in a run-down hotel in downtown Starkville, Mississippi for 50 cents a day as a workshop,



while still keeping up his University job. Shortly after he made his first antenna tuner.

Sales of the antenna tuner really took off. And in 1977 he quit his University post to work in the business full-time.

Busier than ever Martin moved production across town to larger premises, which is now a busy bistro restaurant! Amongst others, he took on Steve Pan KF5C, 'Kentucky Fried Chicken'. Steve, one of his students was also from China, had no work permit and needed a job.

Martin and Steve shared the job of sorting problems in silk screen printing the antenna tuner front panels. Steve got it right, staying on to become today's Vice President in charge of all production.

Like Martin, Steve Pan is also a 'workaholic'. His staff say that the only way to talk with him is to 'phone him!

Morse keyers, power meters, antennas, switches and just about every type of amateur radio-related accessory were designed by Martin and added to their range of products. Today, their catalogue contains over 300 items with linear amplifiers included following their take-over of Ameritron Products of Cleveland, Ohio.

### Mirage Range

The MFJ company's latest acquisition is the Mirage range of v.h.f. and u.h.f. amplifiers. And Martin is hoping that the production will soon be moved from the West Coast area to Starkville.

The packet radio boom of the mid-1980s in the USA gave a huge boost to sales. This was

**Left: Ready for assembly, MFJ loop antennas in production.**

**Bottom: The p.c.b. assembly line for linear amplifiers, with a thoughtful Martin watching the procedure.**



**Martin F. Jue K5FLU, the man behind the successful MFJ name.**

helped by MFJ setting a new low price level when they were the first to source data controllers, like the famous 1278 model from China.

Three of MFJ's four factories are in Starkville, which is a low-cost labour area, keeping prices to the customer highly competitive. They also supply more than 20 overseas customers, including even some in Japan!

As much as possible is produced in-house and they have recently invested \$250 000 in a computer-controlled machine. This automatically cuts, punches, drills and folds cabinet tops, bottoms and front panels.

The company has its own print room, which produces all their sales literature and instruction books. However, they draw the line with the 200 000 print run of their 40-page catalogue, which is printed elsewhere.

More than 150 employees work a two day shift system at MFJ to keep up with demand, making virtually everything on site including final assembly and testing. One of their staff, Mr Charles, a retired engineer from the local dairy, has been tempted out of retirement because he enjoys playing with the new products!

Like many radio amateurs, Martin Jue cannot throw anything away. His factories still house the original print presses used years ago as well as the silk screen plates.

Martin even keeps a veteran Buick car, which is rusting away in the car park. He keeps it because (so he says) "the engine is still sound"!

### Expansion Plan

A factory expansion plan is underway, as customers the world over chase delivery of their orders. This expansion will help MFJ to increase production still further.

Meanwhile, Martin Jue is in his back office radio shack working on another new product. This time it's a compact, active short wave listening antenna.

No doubt in time the active antenna will be added to the catalogue and the telephone lines will continue to be jammed with orders. Perhaps the demand will mean the need for an even bigger factory...so we'll watch MFJ's space and see!

All photographs courtesy of G6XYU.

PW

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# Amateur Radio Holiday - Have You Packed Your Reciprocal Licence?



In Monaco operating from a car which is legally parked and using a mobile whip is acceptable.

*Peter Barville G3XJS looks at what's involved in applying for a reciprocal licence. He also offers some advice on things to bear in mind when operating overseas.*

I was delighted when Rob Mannion G3XFD asked if I would research and write a feature covering amateur radio on holiday, particularly overseas holidays. The thought of an expenses paid trip around Europe investigating reciprocal licences was one which had a certain appeal!

However, I soon discovered that there would be no free holiday for me. I would have to do my research from home!

It really isn't difficult these days to organise a reciprocal licence for use during a visit to most of the 'normal' holiday destinations. In fact, when operating in most of the countries which are members of The European Conference of Postal and Telecommunication Administrations (CEPT), it's not even necessary to obtain a reciprocal licence.

The CEPT group of over 40 European countries, has agreed (amongst other things) a common standard of amateur radio licence - T/R 61-01. Once a member of CEPT has implemented T/R 61-01, amateurs from that country are able to operate (on a temporary basis) in the other countries that have also implemented the agreement. At the time of writing, over 30 members of CEPT have implemented T/R 61-01, and the list is growing all the time.

## Simple Steps

As easy as it is to take advantage of the CEPT arrangements, there are some simple steps you need to take before setting off to the airport, channel tunnel or ferry terminal.

In order to operate under the CEPT T/R 61-01 agreement, you are required to carry your UK licence validation document with you, together with a copy of the UK licensing regulations and a copy of the regulations applicable in the country (or countries) you are visiting.

It's therefore necessary to obtain a copy of the foreign country's regulations before setting off, by writing to that country's licensing authority. However, no further formalities are required and operating in any of the CEPT countries will be very straightforward.

The CEPT agreement only covers temporary operation, not exceeding three months. Normally you should use your own call sign, with the addition of the country's national prefix, together with the usual portable or mobile suffix (eg F/G3XJS/M, HB9/G3XJS/P). However, in some countries, the numerical part of the prefix will vary, dependent on which call district you operate from (eg IK\*/G3XJS/P in Italy).

Other countries require a different prefix depending whether you have a class 'A' Licence, or class 'B' Licence (eg EA/G3XJS/M or EB/G6XJS/M in Spain). You will need to check carefully the information you receive from the foreign country's licensing authority to confirm exactly what call sign to use.

In addition you should look carefully at the relevant licensing conditions, which may well have sections slightly more restrictive than your UK licence. You are required to observe both the UK's and the foreign country's licence conditions, but always to adopt whichever is the most restrictive.

For example, if the overseas licence conditions appear to allow the use of higher power, you will have to observe the lower limit of the UK licence. Similarly, although your UK licence permits operation on 70MHz, you will not be able to use that band once you are overseas.

There are also countries which, although not part of CEPT, have elected to implement the T/R 61-01 agreement. These include New Zealand and Peru, which shows that the countries from which it is easy to operate are not restricted to within Europe.

## Need To Apply

Let's look at those countries where you'll need to apply for a reciprocal licence. These are countries (e.g. Australia and USA) which do not recognise CEPT T/R 61-01, but do recognise the standards set by the UK licence, and are therefore willing to allow UK amateurs to operate, once they have obtained a reciprocal licence.

There is likely to be a small fee payable for the licence, but it should prove fairly straightforward to make the necessary arrangements with the overseas authority. Be careful though, some of these countries do not recognise the UK 'B' Licence.

Whether you are applying for a reciprocal licence, or planning to operate under the CEPT arrangements, you'll need to write and obtain the necessary information well in advance of your departure date.

It's my experience that the authorities in some countries reply quite quickly, with an English language 'package' covering everything you need, but that others can be very slow, and with paper-work that needs translating. Allow months, not weeks, if you can.

## Laws & Regulations

Whilst preparing this article I wrote to quite a few of the CEPT licensing authorities asking for the necessary copy of their licence conditions. I also enquired if there might be other laws and regulations which could be relevant to the operation of amateur radio equipment.

In particular, I asked whether it is illegal (in their country) to use a hand-held microphone whilst driving a car. By and large, I found that my question was ignored (language difficulties perhaps?).

It's interesting to note though that the

reply from the Swiss authorities said, "According to a recent sentence of the High Court it is forbidden to use hand-held telephones or microphones whilst driving a car. This means that the microphone has to be fixed near the driver's seat".

I'm sure there will be other countries with similar laws - including The Netherlands and Belgium, I believe - but, if only in the interests of safety, I think the best advice (at home or abroad) is **not** to use a hand-held microphone!

The letter from the Spanish authorities (if my wife's Spanish translation was correct!) referred me to local bye-laws concerning the erection of antennas. But I don't think this should ever present too much of a problem, providing care is taken, and permission asked wherever you think it prudent to do so.

It's worth noting, however, that the erection of portable antennas in Monaco is **not** permitted. However, operating from a car which is legally parked and using a mobile whip, is acceptable.

I've put up simple wire antennas at French camp sites without any problems, but have always been careful to ensure they were not a danger to other site users. If the site owner prefers that you don't hang wire in their trees, or there are no suitable trees to use, then very good results can be obtained from an efficient mobile whip installation on the car, or caravan.

I have successfully kept many sked contacts into the UK from sites around France just using the normal h.f. mobile set-up. But beware, you will get very hot indeed, inside your car parked in the sun!

Although my amateur activity abroad has concentrated on the h.f. bands, I have always had some 144MHz equipment with me. However, it has to be said that I've not had much success on v.h.f. I have never found a great deal of activity on the band. Perhaps I haven't looked hard enough, but it would be wrong to expect the same level of v.h.f. activity as can be found in many parts of the UK.

## Sensitive Issues

With the ever increasing ease of travel around most of Europe, you are unlikely to experience any difficulty taking equipment with you when crossing borders by road. However, electronic equipment inside a suitcase can be a 'sensitive issue' when travelling by air, and it would be advisable to seek guidance from your airline, or tour operator.

Whether travelling by road or air, I recommend carrying the relevant invoices, in order that the place of purchase can be proved, as well as ownership. It's also well worth checking with your insurance company that the policy covers your amateur radio equipment whilst it is abroad with you.

If you have the opportunity to get on the bands before your trip and talk to amateurs from the area you intend visiting, it will enable you to find out about local repeaters

(frequencies, etc.), any local regulations that could affect you. It could even result in an invite to the local club!

In fact, there is no doubt that my 1992 QRP operation from Monaco would not have been successful without the help and advice I received from Claude 3A2LF. He advised me on licence and operating regulations, as well as telling me where I would be able to park the car and operate - provided I only used mobile whips.

In the same way that you will need to have done the necessary paperwork before you go, your chances of successful operating from abroad are greatly improved by careful preparatory work with the hardware. Collect the equipment together, and thoroughly test it in realistic circumstances.

Take your equipment to a suitable site (but not too far from home), set it up and have plenty of QSOs. Make a list of every piece of equipment, patch leads, antenna items and sundries (insulating tape, etc.). Imagine the frustration of arriving at your exotic holiday location, only to find you are short of one coaxial lead!

## Sun Searching

Well, you've got all the paperwork organised, the mobile rig installed, the big h.f. whip mounted on the roof of the car and now the time has come to set off in search of the sun. There is, however, one more thing to remember.

The headroom on the car deck of some ferries can be quite limited and severe damage to the whip might result unless you remove it before driving on. I know it seems obvious, but yours would not be the first 'DXpedition' forced to go QRT at this early stage!

Operating amateur radio abroad can be great fun, and a very useful way of keeping in touch with home. Your locals will probably enjoy keeping skeds with you, and following the progress of your trip.

If you are visiting one of the more unusual countries you are likely to find that you have suddenly become very popular. Then you'll be able to sample the joys of being on the other end of a 'pile-up'.

After your 'pile-up' you'll need to think about the dozens of direct QSL requests sitting on the mat when you get back home. Now, that really will mean more paper-work for you!

PW

Peter Barville has prepared a list giving details of CEPT countries, callsign to be used when visiting and details of licensing authorities. If you'd like a copy just send an A4 sized s.a.e. to the PW Offices marked 'CEPT List'.



**You should be able to put up antennas on camp sites without too many problems as long as you ensure they are not a danger to others.**

# The Weekend Special

Weekends are special times for many radio enthusiasts when hobby and holiday can be combined. So, to help make your weekend a special event, Bob Harry G3NRT describes his inexpensive h.f. antenna system.

There's been many a time, after calling DX stations on 14 or 21MHz without a reply, I've envied stations with beam antennas. If I had a beam, the DX would have poured in, and the shack wall would have become smothered in certificates!

An h.f. beam in my suburban garden has never seemed a possibility. There are three reasons for this: my wife, the neighbours, and the need for planning permission - in that order.

If I had a beam antenna my wife would object to the 'eye-sore'. Neighbours would immediately complain (probably wrongly) of QRM, and the local authority would possibly reject my application to erect a tower with beam!

## Answer Dawned

After much thought, and unworked DX, the answer dawned - I needed a temporary beam. An antenna put up for a short time - say a weekend - and then put away. Then (surely) 'her indoors' could not object?

So, that was how the design of the 'Weekend Special' was born. Then the search for a suitable design started.

I eventually chose a two-element beam design for 21MHz.

The advantage of a two element beam over a dipole is mainly due to the rejection of signals from the back of the beam. However, there is some forward gain relative to a dipole.

The amount of gain and front-to-back ratio depends upon the length and spacing between the two elements of the beam. These elements are, of course the driven dipole, and the reflector.

An interesting reference source is *The ARRL Antenna Handbook* (Ref. 1). This provides a description of two element beams and their characteristics.

Summarised, a two element beam can provide a forward gain of just over 5dB compared to a dipole. They can also provide a front-to-back ratio of 18dB (but not necessarily at the same time!).

The actual spacing between elements in the 'Weekend Special' is 1.8m (1.828m). This is just about the optimum spacing for maximum forward gain for three

bands, 21, 24 and 28MHz.

Front-to-back ratio on the two-element design appears to depend on the length of the reflector. But there's no information in *The ARRL Handbook*, on the proper length for the reflector. Fortunately *The Beam Antenna Handbook* (Ref. 2) provided the data on which the element lengths are based.

The final design of the 'Weekend Special' allows for easy adjustment of element length. And as a consequence this also allows the beam to operate on 21, or 24 and on 28MHz with some compromise in performance.

## Principles Followed

When thinking about how to construct the 'Weekend Special' I decided that two principles should be followed: 1: I would only use readily available materials and 2: The construction would not require any special skills.

The antenna is made from four lengths of plastic covered steel tube found in most large DIY stores.

The steel tubes are described (misleadingly) as 'plastic tube'. They are 2.44m (2.438m) long, 19mm in diameter, and coated with a thin layer of white plastic material.

The four tubes make up the basic structure of the beam. Two tubes are used for the driven element and two for the reflector.

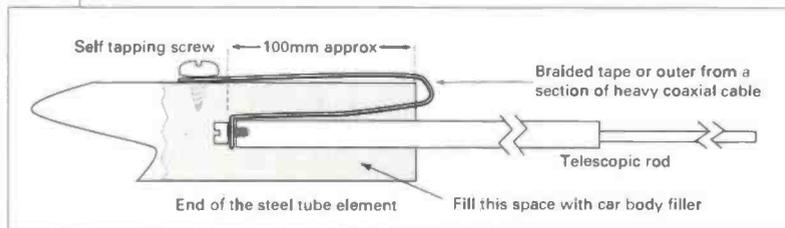
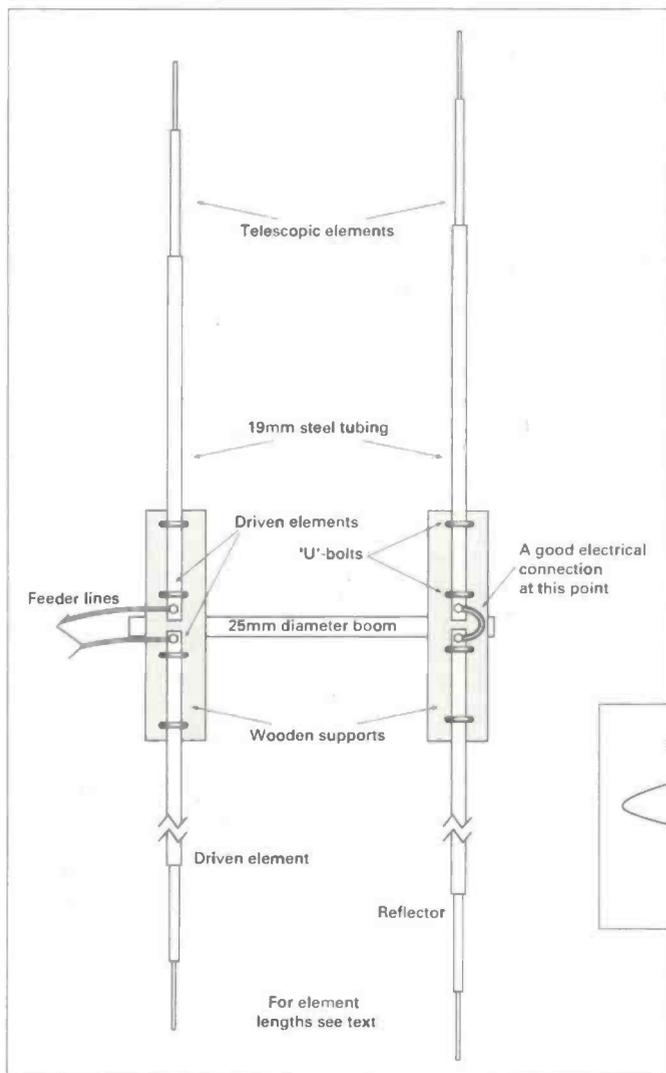
A 1.85m (1.828m) length of 25mm diameter tube of the same type provides the boom. Steel tube was chosen instead of aluminium because it is more readily available in the popular stores, and less expensive.

The use of steel might suggest that the antenna would turn out to be very heavy. But the steel tube is thin walled and the complete beam is neither heavy nor difficult to handle.

The final length is made up with telescopic whip antennas which are used as adjustable ends to the elements. Band changing is accomplished by setting the rods to the appropriate length for the frequency required.

## Construction Method

The diagrams, Fig. 1 and 2 show the construction method. You should first drill the



**Fig. 1: (Left) Diagram of G3NRT's 'Weekend Special' antenna (see text for details).**

**Fig. 2: (Right) Close up detail of method used to attach telescopic whip section into main elements (see text).**

four 19mm diameter tubes through both walls about 10-15mm from the ends that are closest to the boom.

In the case of the driven elements, the holes provide the electrical connections to the balun. The plastic should be cut away from around the hole, and solder tags secured with nuts and screws. Care should be taken to ensure that the solder tag and nut make good electrical contact with the metal.

Next, the reflector elements are drilled in the same way, except that solder tags are not fitted. The four tubes, and the boom are then fixed to the wood supports using the 'U' bolts.

The driven element should have a gap of 25mm at the centre. The reflector elements should be butted together and joined with a strap made from the outer screen from a piece of coaxial cable. A short length of tinned copper wire could be used, but a lower inductance should be obtained by using a short length of coaxial cable braid.

To obtain the braid you should prepare a length of good quality coaxial cable about one metre long. The pvc cover should be removed and the braid pushed from both ends towards the middle to loosen it.

Once removed, the copper braiding should be flattened with fingers to produce a flexible strap approximately 12mm wide. The mesh can be teased apart to make a hole and then soldered to prevent fraying.

The telescopic rods I used had an M4 threaded hole which should be used to secure the coaxial braid at one end. The rods should be pushed about 100mm into the ends of the tubes and fixed into position with car body filler. The loose end of the strap should be connected to the tube with a self-tapping screw. This is shown in Fig. 2.

**Editorial note:** Take care with the resin and hardener used in conjunction with the epoxy resin based car body fillers. The filler itself gives off dense fumes (inflammable - so do not smoke when using it!) and the hardener is harmful to the skin. Tubes of resin/hardener remover are available from chemists, DIY outlets, and marine chandlers and effectively removes the material from the skin. Perhaps it's better to buy a tube before you start!

I found that the testing stage was the most enjoyable part of the project. And I learnt a lot about antenna adjustment in the process!

Five variables have to be manipulated to get the optimum performance from this antenna! The variables are the four element lengths, and the height above ground.



Fig. 3: The antenna ready for setting up and adjustment (see text).

## Tuning Correctly

How do you know if you've set the antenna tuning correctly? Well, the easiest way is to measure the v.s.w.r., if the antenna is matched to the feeder (50Ω) then maximum power transference will take place.

Since matching will depend on the resonant frequency of the beam (mainly the driven element) v.s.w.r. will be high if the antenna is off tune.

If the beam is thought of as two tuned circuits, the driven element at resonance in-band, and the reflector as resonating outside and below the band, you should get an intuitive feel for the necessary adjustments.

I started building the beam one warm summer afternoon. It did not take long, and I was soon ready to try it out.

My test equipment consisted of an FT-747GX and a 12V battery power supply. I also had a v.s.w.r. meter and assorted pieces of coaxial cable.

To start testing the beam, it was first placed on a set of steps, and the v.s.w.r. meter connected by a 150mm length of coaxial to the feed point.

My first attempts to tune the beam failed. In my haste I had forgotten two fundamental things: the need for a balun, and the fact that a horizontal antenna close to the ground has a low feed impedance!

So, I fitted a balun and used a pole used to increase the antenna height to about 2m above ground level. But even at this height the influence of the ground is present, and the v.s.w.r. was higher than when the antenna was raised to a more sensible level.

Since the v.s.w.r. is central to the adjustment of the beam it is worth understanding what is to be achieved. And it's important to remember the maximum v.s.w.r. should be below 3:1 because transmitters like the FT-747 do not like high readings and will automatically close down the transmitter p.a. stage.

A v.s.w.r. of 1:1 represents a perfect match. This will not be achieved while the antenna is close to the ground.

In practice, a v.s.w.r. of 2:1 is acceptable. This represents a power transfer efficiency of just under 90%.

During adjustment near the ground the best v.s.w.r. I achieved on my antenna was 1:1.4. This represents a transmission efficiency of 97%.

The object of all

adjustments is to achieve a relative low value of v.s.w.r. in the middle of the band. If the antenna is resonated correctly the v.s.w.r. will be at its lowest value (even if that value is 2:1!) in the middle of the band. (c.w. enthusiasts can peak the beam at the low end of the band).

## Gain Measurements

At this point in articles on antenna construction the author usually mutters something about the difficulties of antenna gain measurements. They then make an excuse and leave you to it!

I am not so different from the usual author I have just described. However, I found that the results of the summer afternoon fiddling with the v.s.w.r. were worthwhile.

I had just 'glued' the rods into the ends of the main elements when I heard an ODS (Lebanon) on 28MHz. So I called him and got a 53 report (remember the beam is about 2m above ground).

Then on 21MHz I worked an RA1 near Archangel, followed by a PY2 in central Brazil. As twilight came and the bats began to flutter around the house, I sat in the garden and ragchewed with a station in Springfield Massachusetts in the USA.

My 'Weekend Special' beam was easy to build, it cost about £30, and taught me something about antennas. It worked on three bands, although the performance is a compromise on 28MHz.

I enjoyed building and then using the antenna on air. And hoping you have as much fun I'm looking forward to working you on 21, 24 or even on 28MHz!

PW

## References

- 1: *The ARRL Antenna Handbook*, Published ARRL Inc., Newington USA. ISBN 0-87259-414-9 (Available from the PW Book Service).
- 2: *Beam Antenna Handbook*, by W. Orr, and S. Cowan, Radio Publications Inc., Lake Bluff USA: ISBN 0-933616-10-4 (Available from the PW Book Service).

## Table of dimensions (the lengths are tip to tip)

Frequency	Dipole	Reflector
21MHz	6.58m	7.09m
24MHz	5.59m	6.02m
28MHz*	4.85m	5.26m

\*Calculated for 28.6MHz. The 'Weekend Special' will not meet these dimensions on the without reducing the length of the steel elements.

## Shopping List

Two pieces of timber about 19mm thick, 125mm wide and 1m long, ten 'U' bolts, four 2.44m lengths of 19mm diameter steel tube. One 1.8m (1.828m) length of 25mm diameter steel tube. Four telescopic rod antennas (Maplin Part No. LB10L, Antenna mast clamp Maplin Part No. BW42V, or similar. Selection of steel M4 nuts and bolts. Balun with 1:1 impedance ratio. Tube of car body filler (see text).

# Rambling Delta

## - A Reasonably Portable Antenna For HF Working

Bryan Wells G3MND, describes a portable delta antenna for use on the 3.5 - 14MHz bands.

**T**aking a transceiver along is, for me, the making of self catering holidays and up to now I've always relied on there being convenient trees, to support a worthwhile antenna, available at the selected cottage. But I decided there might be an occasion when such a tree might not be available.

To guard against future disappointment, I acquired a 'roach pole' fishing rod in our local market in Chesterfield. The rod was a set of telescoping sections with an overall length of around eight and a half metres.

In my efforts to utilise this pole to best advantage, I've been very disappointed with the efficiency of a variety of compressed antennas for 3.5 and 7MHz. I've tried incorporating linear loading and helical windings, but after many experiments I came up with the antenna shown in the diagram of Fig. 1.

The starting point of my antenna was a full size, but lightweight doublet (for 3.5MHz) that could be supported at a height of 8m. Then, by using the inverted V configuration and folding the ends of the antenna back to the centre at the base of the fishing pole, it would provide potential for a full wave loop on 7MHz and a reasonably efficient antenna for

3.5MHz within a ground span of around 20m. I disliked the idea of having to go out to the base of the antenna to open the loop for 3.5MHz and close it for 7MHz. So I thought of trying to accomplish the open/closed switching with a resonant stub, which could be folded up and housed in the bottom section of the fishing pole.

An electrical quarter wave closed stub centred upon 3.7MHz should give a high impedance at the base connection point for 80m operation. At the same time, it should provide the equivalent of a closed switch to approximate a half wave on 7MHz.

Unfortunately, 3.7 and 7.1MHz are not harmonically related. But I guessed that the  $\lambda/4$  action on the lower band would be the most important and so it proved to be.

The lightweight, eight section 'roach pole' has a rather flimsy top section, which I removed. This left me with a pole that had a top diameter of some 12mm, and about 50mm diameter at the base. The overall length was slightly reduced to around 7.75m.

the antenna along an east west hedge in my garden, I was ready for trials.

The antenna worked well. On 3.5MHz it was perhaps a little more than one 'S' point down. But on 7MHz it was as good as an east/west mounted 3.5MHz doublet at a height of 10m.

In addition with the dimensions shown, the antenna can be used without an a.t.u. on 3.5, 7 and 14MHz. It gives an acceptable v.s.w.r. or less than 1.5 to 1 on these bands. I admit to being somewhat fortunate so far as the results on 14MHz are concerned.

The quarter wave stub was trimmed to 3.7MHz using a calibrated noise bridge after it was folded and placed inside the base section of the fishing pole. I attempted to fold the stub as non inductively as possible.

The increased self capacitance in folding the stub, lead to a reduction in operating length from the theoretical, about 16.45m, to a real value of about 13.4m. If the stub is left as a random 'heap' at the foot of the antenna, this reduction will probably be different.

### Regular Contacts

My regular radio contacts are with old friends in Shetland, Orkney and Anglesey on 7MHz in the early morning and 3.5MHz in the evening. Having erected the pole self supporting with the base strapped to a convenient fence post and spread out,

### Balun Needed

The impedance at the transceiver end of the 300 $\Omega$  ribbon feeder on 7.08MHz was measured to be approximately 190-j17 $\Omega$  (capacitive). To match into the transceiver, I decided that a balun was needed.

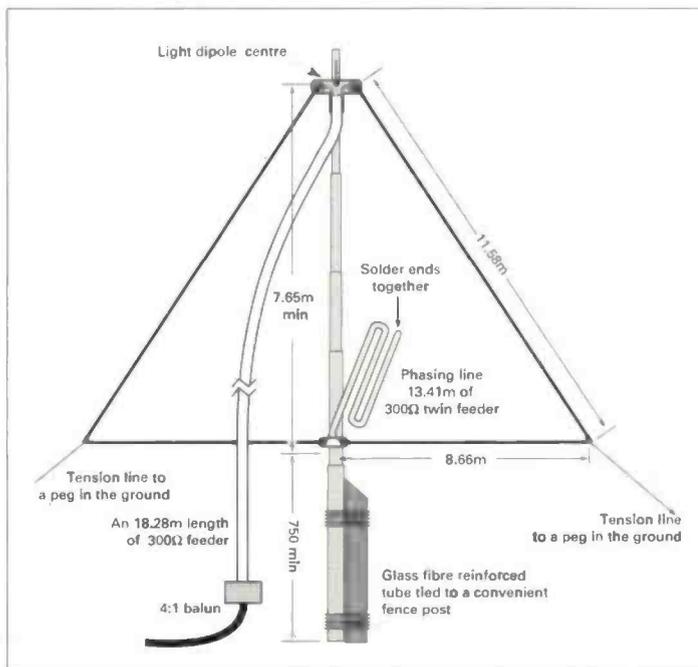
The residual inductance in the 4:1 balun just about cancels out the capacitance (-j17 $\Omega$ ) reactance. It provides a near perfect match on 7MHz.

I tried a commercial 4:1 balun and two home-made ones, and the results were similar for all three. I did this because I was concerned that my home-made baluns may have fortuitously achieved a good match that could not be reproduced with a professional product.

Using a Transmatch type tuning unit (MFJ Versatuner 801B) there was no difficulty in getting a near 1:1 s.w.r. on all the amateur bands between 3.5 and 28MHz as you would expect with a loop and fairly long twin feeder arrangement.

Going on Holiday? Take my Rambling Delta with you, and we might just meet on the bands.

PW



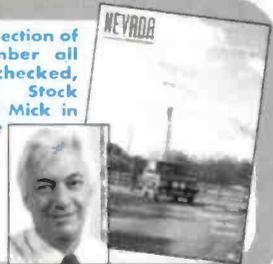
**Fig. 1: This is it. Simplicity itself, and it folds to fit in a relatively small holdall.**

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# Peak Radio Practice

Doctor Andrew Taylor G4SSC describes his adventures with the 1994 British Mount Everest Medical Expedition.

In early 1992 I read of the British Mount Everest Medical Expedition 1994 and volunteered my services. I was readily accepted, perhaps because of my Amateur Radio Licence!

The Expedition leaders were well advanced with the arrangements for the main expedition. They had a climbing plan and were working out the timetable and necessary resources for the Autumn ascent.

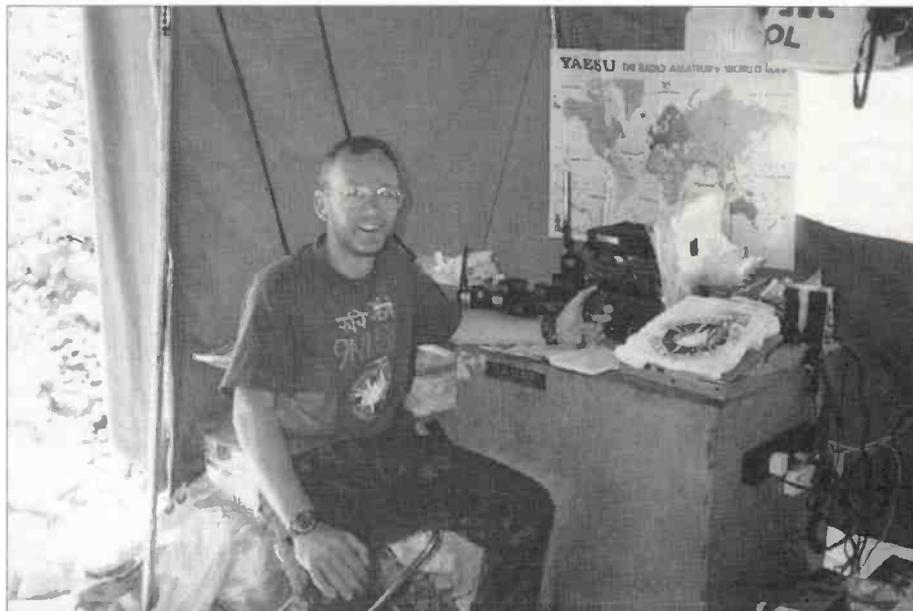
The need for radio communications had so far been shelved and I was seized upon to investigate this aspect. It was hoped at this stage to attract corporate sponsorship to the tune of £250 000 to support the Expedition and its research projects, of which it was thought £500 would cover the radio requirements!

It was obvious that I would have to strongly exercise the cadging muscle here. Especially as the Expedition slowly grew into a party of some 80 people who were going to climb some ten Himalayan peaks in eight groups over ten weeks!

I asked for more money, but as the possibility of large financial backing faded, the need for a Radio Plan increased. I rang and wrote to all my known possible sources of reasonable second-hand v.h.f. sets, especially hand-helds.

## Doubtful Reliability

It soon became obvious that second-hand sets would all be of doubtful reliability. They would also weigh more and would require new batteries which would cost more than the sets.



Dr. Andrew Taylor G4SSC up in and on the air from Mount Everest in 1994.

Power supply problems loomed larger as we realised how far groups would be wandering from Base Camp where we had two 3kVA diesel generators planned.

Prospects worsened as the Base Camp Manager had to pull out of the Expedition and the generators went with him. Could we run the hand-helds on alkaline cells? Were solar cells a viable proposition? (After much more effort the answer seemed to be a double negative).

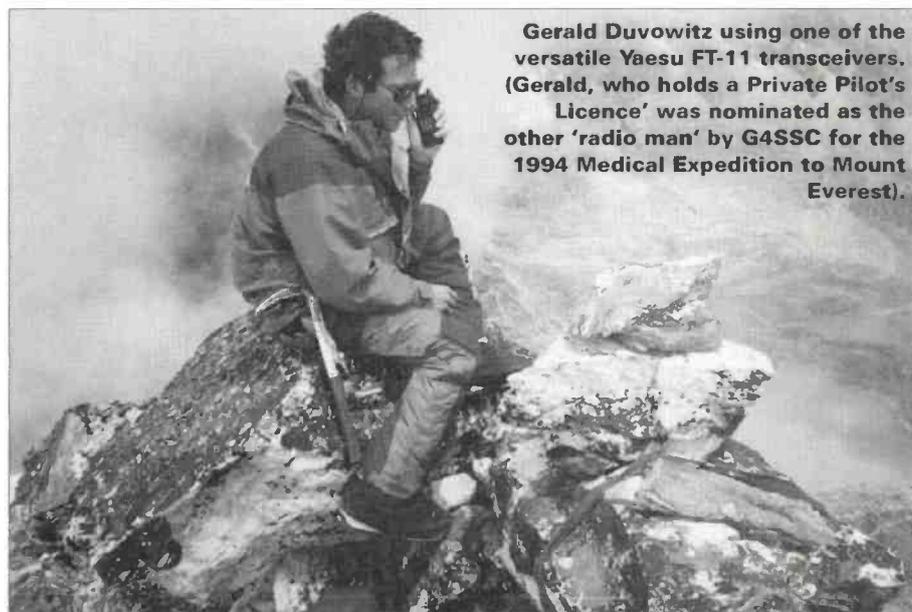
Telephone calls were made to Japan about hand-turned generators...how long ago was the Second World War? Surely technology had improved, but was it accessible? But thank heaven, the replacement Base Camp manager obtained two petrol driven Honda generators.

My enquiries of the Nepalese authorities as to

what frequencies we could use was countered by a request for details of the equipment we planned to use. But I couldn't plan to use anything until we knew the possible frequencies!

Details from other expeditions were surprisingly sketchy. But slowly the information trickled through that 140-150MHz was a safe bet.

The trekking company handling the Nepalese transport and accommodation promised to arrange the licence, and without turning a hair further agreed to arrange a reciprocal Nepalese Amateur licence. The time had come to lift my sights to the wonderful technology as seen every month in the magazines.



Gerald Duvowitz using one of the versatile Yaesu FT-11 transceivers. (Gerald, who holds a Private Pilot's Licence' was nominated as the other 'radio man' by G4SSC for the 1994 Medical Expedition to Mount Everest).

## Yaesu Help

Many 'phone calls all round finally brought me to the manufacturers and to Barry Cooper at Yaesu UK in London for help. Have you ever felt what it is like to push hard on a door just as someone opens it? Barry at Yaesu opened the door and I fell through!

By now we had established a need for eight hand-helds and a base set on v.h.f. And a chance meeting with a senior officer from Portishead Marine Radio had also resulted in the option to patch into the BT telephone system via h.f. from Nepal, at UK call costs - an offer not to be dismissed. This gave a validity to my slight hope of achieving h.f. communication with the UK from Nepal.

A mention of the BT offer to Yaesu and there was another of those funny doors. I picked myself up to face a final offer of ten hand-helds, two v.h.f. base sets for reliability's sake, and two

h.f. sets to try to achieve the UK contact. This, along with a couple of power supplies and a long wire antenna.

Oh, gosh, yes! Antennas! Time to get the old land line overheated again. One of my first calls (advertised in the mags, you know!) got me talking to **Tim Thirst** at **Eastern Communications** who fixed me up with a 10-40MHz WARC band 4-element Mosley beam, a 12-element v.h.f. beam, a 5-band trapped dipole and a ladder antenna. Yaesu complemented this with an FC-800 automatic tuner unit.

A local builder donated six 2m lengths of aluminium scaffolding pole and Eastern Communications added 100 metres of RG-213U coaxial cable. But time was pressing and I had heard nothing about the licenses.

## Nepalese Laws

Rumours of dire penalties for infringement of Nepalese licensing laws did not improve the optimism. At that point a flurry of international FAXes began, resulting in complete re-assurance that 144MHz would be fine for v.h.f. communications and the Amateur licence would be a 'breeze'.

The equipment arrived with me up here in Saddleworth in the last week before the freight flights were scheduled from Heathrow. And as I really didn't want to let it all fly out without checking it, and reluctantly opened up the boxes.

The hand-helds were the Yaesu FT-11s. The size seemed ridiculous. Even on the smallest battery they were something less than a cigarette packet, complete with antenna!

Even with the big NiCad battery the FT-11s were tiny, and provided 5W r.f. output. The range of functions was staggering, as was the amount of information I needed to soak up from the manual.

The FT-11 actually had four astoundingly useful functions for Expedition use. The power-save function seemed a good idea, as was the ability to extend beyond the amateur 144MHz band. Additionally, the capacity to use AA size alkaline cells was an unexpected plus and the ability to channelise the frequencies could render them idiot-proof.

This is because even a Mensa candidate can be a real goof when the atmospheric oxygen is 30% of what they're used to.

Each transceiver had four NiCad cells, an AA-cell holder and a charger. Two rapid chargers were enclosed.

## Base Stations

The v.h.f. base stations were FT-2500 mobile sets to military specification, effectively. They were very light and robust.

The supplied h.f. sets were FT-840s converted to general coverage transceiving. This was done so we could access the Portishead frequencies and they were equipped with the power FP757RDs.

The antennas from Eastern Communications had all been assembled, colour coded and disassembled and the more complicated coaxial terminations sorted out for us. Everything was



**The Sherpas found the Expedition's radio communications Net to be very useful for their own purposes! Battery power had to be rationed!**

checked, found to work, and 350kg of equipment was despatched by the earliest Expedition member who passed with a van!

## Remote Control

The next stage happened by remote control. However, the 'control' aspect turned out hardly to be the appropriate word!

The advance party of Everest climbers and researchers went out a month before the rest, which included me. Pakistan Airlines handled the freight immaculately, and it all arrived in Khatmandu to be opened and inspected by Customs.

Stringent import regulations, stiff import duties and enthusiastically enforced licensing regulations demanded a detailed inspection of all the technical equipment. This including 3000kg of research machines, computers and even an exercise bicycle for Base Camp!

Inspection was effected by the simple expedient of spreading it all out over the Customs hall floor and then scooping it up in categories thought up locally. Wires went in one box, plugs in another.

Large things were put together in one place, square things in another. A charge of \$165 was applied to anything perceived to be a radio. Fortunately the FT-11s were considered too small to be anything of importance and escaped the duty!

Two weeks later the advance party were in Namche Bazaar, wet from the monsoon with everyone suffering severe gastro-enteritis. One, who I had selected as the only person allowed to touch 'my' radios, was a qualified private pilot (he had at least had talked on v.h.f. radio!).

My 'radioman' broke out the FT-11s and one FT-2500. The latter he located in a mountain hotel which had mains electricity from 6 to 10pm from a local hydro-electric scheme.

Unfortunately, the antenna had gone on ahead. So, he was forced to use a telescopic type designed for hand-held use.

## Local Net

The group established a local Net which worked, and moved on to Base Camp, some ten days walking into the mountains, leaving the FT-2500 set up. Once there, they rigged the second FT-2500 using the Base Camp petrol generator for power.

The 14-element beam was erected and communications really began. At this point our group arrived in Namche Bazaar.

We had spent five days in Khatmandu waiting for the right weather to fly into the mountains. This was fortunate as it turned out, as it took me two days to get the amateur radio licence.

Getting the licence itself was an epic. It involved a personal interview with the Minister of Telecommunications and resulted in 9N15C - the first reciprocal Nepalese amateur licence for use at Everest Base Camp.

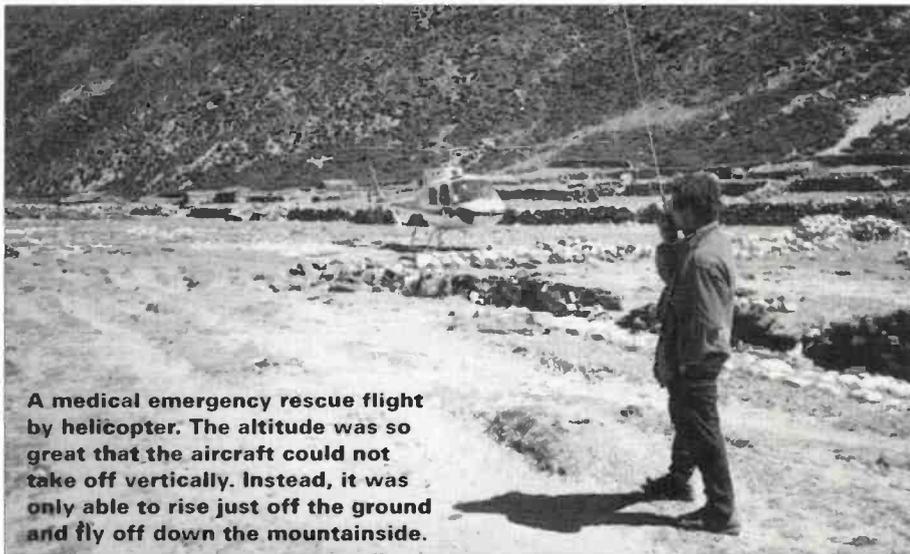
I was initially surprised to find mains power in the village of Namche. But the surprise was nothing in comparison to operating the FT-2500 there, and getting immediately through to Base Camp on the already established 6pm Net on 144MHz. (We were advised that communications were better at 6pm as the electricity "was of a better quality" at that time!).

## Radio Pathway

The radio pathway was some 27km (17 miles) in a straight line passing over peaks up to 6367m (21,011ft). Or it went round the valleys!

My knowledge of propagation was stretched in Nepal. Here in the UK I'm quite used to failing to reach 3km over a 200m pimple on 86MHz in UK mountain rescue mission. What was more surprising to me was that we managed the same pathway with the FT-11 hand-held.

Communication was so easy that Expedition members immediately came to expect instant



**A medical emergency rescue flight by helicopter. The altitude was so great that the aircraft could not take off vertically. Instead, it was only able to rise just off the ground and fly off down the mountainside.**

contact at schedule time - turn on and talk. They had no worries about choosing a 'radio location'.

As time progressed, the other groups moved into the Khumbu region, each using an FT-11. The scheduled contacts became crowded as the Everest climbers established higher camps and used the FT-11s for logistic support.

The incoming groups all had to undergo stiff medical research schedules for which little definite pre-planning had been possible. But the radios helped sort this out.

The complete v.h.f. coverage meant that arrangements could be made on a daily basis and updated hourly as groups walked in. The base camp generator was working so well that a full daylight listening watch was maintained.

All the incoming groups could hear all the Everest ascent teams and monitor progress. The insularity and loneliness of being a climber only one valley away from colleagues had vanished.

Because of the radios 80 people stumbling about the Khumbu knew exactly what the entire huge Expedition was up to. And those who had access to the NiCads charged at Base camp used these extensively.

Most parties, however, either had not yet reached Base camp or went on excursions which took them far away. In these circumstances the AA cells were used.

With the power saving circuitry it was possible to obtain up to four days of use out of one set of four AA cells. This entailed monitoring from dawn to dusk and transmitting for about ten minutes at 6pm.

Sadly, the Sherpas found the Net invaluable for their arrangements. They could exhaust a pack much quicker, if permitted!

Even so, the coverage allowed for previously impossible changes in arrangements, and the instant passing of what would otherwise be a three day message. Cleft sticks are now selling cheap over there!

## Slowly To Base

Our group progressed slowly, as you must at those altitudes, to Base camp. We 'booked' our research appointments on v.h.f. as we approached. But we arrived to find that the

communal tent had been destroyed by the air blast accompanying a recent avalanche some 3km away!

The military specification FT-2500 had joined the tent in its 500 metre flight at up to 20 metres altitude, without the slightest problem. The damaged tent was re-erected and research equipment repaired and brought into service.

The FT-2500 just needed re-connecting. The h.f. equipment was then unpacked and the 4-element Mosley beam assembled - thank heaven for colour coding!

Everest Base Camp can be +30°C in the sunshine and very pleasant. It can also be -30° in the dark and the wind, and very unpleasant!

Fortunately, our antenna erecting days were relatively balmy. By the third attempt we had a 4-element beam 10m above the glacier and well guyed.

There followed days of monitoring amateur and commercial bands and calling "CQ" from 9N1SC and repetitively calling Portishead on several of its frequencies. The effort was sadly unrewarded despite even once starting the noisy generator at 3am and -18°C on one occasion and trying every possible antenna configuration from our kit.

Although our efforts were unrewarded by a UK amateur contact, or reaching Portishead we contacted in excess of 40 South East Asian stations. Some of whom were very helpful and tried to relay to the UK for us.

We rarely heard European callsigns. Once we heard a G-callsign from Sheffield but could not get back to him!

Our h.f. problems were probably not surprising considering that the path to the UK was nearly due North. And although it passed through a very convenient low point in the 'Everest horse-shoe', we were still aiming 750m upwards over a distance of 2.5km. Small wonder we did better off the back of the beam.

## Other Peaks

When our little group left Base Camp, it was to climb other peaks. These included Lobuje East, Pokalde, Island Peak, Gokyo Ri and Parcharmo, usually returning for further research measurements.

At all times we remained in contact with the main Expedition and came to rely on the FT-11s like "Khumbu cellphones".

At every turn of each valley, I expected to lose the signal. But we maintained contact even at Island Peak Base Camp with the climbers on the face of Everest.

The impossible statistics here are that the climbers on the face of Everest were at 6000 metres and we were at 5000 metres with Lhotse at 8500 metres and Island Peak at 6189 metres between us.

I was heard at this point to be rambling about "knife-edge refraction of radio waves". My non-technical companions were barely impressed!

## Rescues Organised

Two expedition rescues were organised and effected with the assistance of the v.h.f. Net. One of the rescues involved an Everest climber who suffered a stroke on the way to Camp One, and another involved one elderly trekker succumbing to too many days at 5200m.

The co-ordination of available British Mount Everest Medical Expedition groups to effect their evacuations was impressive to say the least.

Emotively, the best use of the v.h.f. Net came after we departed Base camp clutching two of the FT-11s (and a lot of other stuff!) to climb Parcharmo. This was the most distant objective and nine days' hard trek from Everest Base Camp.

We did not expect to maintain communications on Parcharmo trek, except between ourselves. In some measure, early on, this was true - we missed the 6pm schedules on two evenings, but still had occasional chats with a group on a peak somewhere.

How we appreciated the ability to constantly monitor the frequency! Three days from our final objective we stopped in the village of Thame (Tah-may) and as the evening grew cold we went into a tea house.

## Radio Monitoring

The radio was monitoring, but 6pm passed silently, sadly it seemed to be finally out of radio range. But suddenly came the classic crackle into life!

"This is Everest Base Camp - today at 11.03am two of our expedition reached the summit of Everest". I kissed that little FT-11 and then remembered they sold rum in that tea-house!

From there on it was downhill. It was over a cold windy 6666m high mountain perhaps, but the emotional high point had already been passed.

There was a lot more that we did, and a lot that we didn't do that we could have done. But the radio equipment we took with us transformed a gangly and potentially chaotic group into an amazingly cohesive mobile community.

But that was last year, time flies, and 72 of us have just attended our first re-union dinner!

PW

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 Memories: 101, incl. 9 Alphanumeric.  
 AUTO ATU available: Yes, as option (external)  
 Removable Front Panel: Yes

PRICED UNDER £1100



Alinco DX-70

Frequency Range: 150kHz-30MHz + 50-54MHz  
 Transmit: 1.8-30MHz+50-54MHz  
 Modes: LSB/USB, CW, AM, FM  
 Power: 1.8-30MHz 100W, 50-54MHz 10W  
 Dimensions: 178(W)\*58(H)\*230(D) mm  
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 Memories: 100  
 AUTO ATU available: No, manual only (external)  
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# Buying On A Budget - A Guide To Rally Bargain Hunting

*Ben Nock G4BXD offers advice to point you in the direction of those 'gems' which can often only be found at radio rallies.*

**T**he winter is now over, the spring flowers are pushing their heads above the thawing earth. And the keen rally 'hound' is dusting off his bag and anorak and preparing to do battle once more!

Talking to my RAE class students over the terms, it has become apparent that many of those newly interested in the hobby still have difficulty in finding sensibly priced equipment with which to start. I have of course, over the long hours of the classes, tried to point them in the right direction and I offer a few words here in the hope it will help. Rally buying can be a gold mine or a mine field for those seeking to purchase gear for the first time.

In my opinion the first decision you should make is to set yourself a spending limit. Make a decision as to what you can afford or wish to spend on gear and stick to that figure.

It really doesn't matter what the stall holder's asking price for the gear is. Your main concern should be to fix the limit of your spending. At least that way you won't get home and then regret spending so much money, as you'll have expected to have spent that much in the first place.

## What To Buy

Assuming you are just starting in the world of amateur radio, what's going to be your first purchase? A receiver? A transceiver? Some h.f. gear or v.h.f. gear?

I suggest you talk first to someone in the know. Your RAE tutor for instance or perhaps someone at your local radio club could help.

Try and get an idea of what equipment there is around, what the different bands can give you. And remember that some of the h.f. bands are dead at night, or during poor sunspots, etc.

Your home location might also play a part. If you are unfortunate and live in a deep hollow, or in shade of a large hill or mountain then v.h.f. and u.h.f. might be a waste of time. Or, if you only have a small garden with not enough room to even put out 40ft of wire as



**Fig. 1: A typical selection of p.m.r. rigs that can be found at rallies.**

an end fed antenna, your h.f. prospects may well be limited.

Remember though, even small gardens can accommodate a vertical antenna of some sort. And if it's just for listening, any old bit of wire will do.

You might only be interested in listening, and eventually working, locals, or you might only be interested in trying to work long distance (DX) and foreign countries. All these factors will dictate what you might care to spend your cash on first.

## Rallies Interesting

Most rallies are an interesting affair. For me, the 1994 rally season was on the whole a good season with plenty of friends met and bargains obtained.

Getting 'bargains' is not as easy as it sounds. There are two main times when you might just get a bit of a bargain.

Firstly a good time is at the start of the rally. If you get there early you might see some good bargains that suit your purpose.

Another good time is towards the end of a rally. A lot of folk don't want the bother of carting all the 'junk' back home and are more inclined to be haggled about the price. Gear

costing £100 at the start of a rally can easily end up costing £50 or £60 at the end of it.

Once at a rally, what can you find that's cheap and suited to the newcomer? Initially the p.m.r. equipment, the old police/taxi/bus/MOD gear that abounds at rallies, seems a good buy, and indeed it is if, and its a big if, you are able to re-tune and re-align the sets accurately and correctly.

Re-alignment of a piece of p.m.r. gear onto an amateur band is usually quite feasible. However, if the re-alignment is done incorrectly it can cause out of band transmissions that might get you into trouble with other radio users.

The older, crystal controlled sets are easier to re-align than the more modern p.m.r. sets that now use an EPROM (Electrically Programmable Read Only Memory) chip to select frequencies. Unless you have access to a PROM programmer, it's often difficult to find someone who can do this for you. The older sets simply require a new crystal to be inserted and the set re-tuned. Then it can be operational on the amateur band.

The p.m.r. rigs are most suited for the 50, 70, 144 and 430MHz amateur bands. Typical power outputs are around 10 to 20W, with anything from 1 to 10 channels.

Each channel on a crystal rig requires a

separate crystal for transmit and receive. Although there are a few rigs that only need the one crystal per channel.

Fig. 1 shows a typical p.m.r. selection, the bottom rig, the Pye Europa, comes in v.h.f. and u.h.f. versions. The Europa is suitable for 144 or 430MHz at 5 or 25W.

The hand-helds shown in Fig. 1 are Phillips PF85 on the left and a Burndept B470 on the right. Again these come in v.h.f. or u.h.f. versions.

All the hand-helds are crystal rigs and therefore need a pair of crystals for each frequency. Look out for later PF85s which are frequency controlled by EPROM's, which need re-writing and replacing (Crystals work out at just under £6 each).

## Older Gear

One impression that I've got when talking to RAE students, is that any older gear, whilst being fully usable on the bands, gets ignored. This is possibly due to the barrage of advertising about new £2000 plus h.f. boxes being imported from abroad.

There seems to be a feeling held by newcomers, that they have to go out and buy a new h.f. box as there are no alternatives. And as for valved sets, well, they are positively prehistoric and cannot be repaired. This is **not** the case and hopefully I can give a few examples of what can be obtained to allay those fears.

Take for example the case of the Heathkit SB-101, Fig. 2. This is a valved h.f. transceiver capable of 100W on the 3.5 through to 28MHz bands, s.s.b. and c.w.

The SB-101 has a c.w. filter, is metered and has a mains power supply with speaker. Although not a modern rig, it does have a very nice styling and appearance.

My SB-101 rig was purchased at a rally, the seller stating that there was a fault, and I bought the set with that in mind. Obviously, if the seller says there's a fault with a piece of gear then you have the advantage of being able to offer a lower price.

Don't forget that you will have to repair a faulty set, but, as you are probably keen to learn all about radio and the insides of a set, what better to practice on than a cheap item? It's easier to change a valve than a semiconductor/cockroach!

Having the seller state that "its fully working guv", no problems with it" does not, unfortunately in this day and age, mean necessarily that. There was a time when you could fully rely upon the opinion of the seller, but due to various factors, the quick 'buck', the inexperienced type, perhaps the lack of pride, this is now not always so.

I have bought many items that were not 'working fully'. One such set was 'fully operational', as the seller put it, but when I plugged it in and tried it back home, it was found to even have the b.f.o. valve missing! This was something I couldn't check on at the time due to the complexity of the set.

How the seller had received s.s.b. signals still beats me to this day! So, even the



Fig. 2: The Heathkit SB-101 h.f. transceiver, with matching speaker/p.s.u., on the bottom with the KW 201 h.f. receiver on top.

experienced buyer can get caught out.

The KW range of receivers and transmitters can be a good buy. There are many versions, but the KW 2000 is probably the most well known.

Other sets include the KW Vespa, the KW 201 and the 2000 and its descendants, the 2000A, B, and E for example. Just look for the KW Electronics logo.

Things to look for when considering KW sets include looking inside them. Most of the sets have lift-up lids so, a quick inspection inside can tell a lot about the set. If it's clean, free from layers of dust for example then its probably been well looked after

Look out for inept modifications, those

that look like they are connected with chewing gum and sealing wax. Modifications in themselves are not bad, as long as they look like they have been done in a confident manner, and do not distract from the overall look of the set.

## Four Receivers

The four receivers shown in Fig. 3, show the type of thing that can be found at rallies. The bottom set, an Eddystone 730/4, is perhaps the best of the bunch with good frequency coverage, 480kHz to 31MHz and a superb tuning scale.

The rig second from bottom in Fig. 3 is a dual conversion Star SR-550. It offers 1.8 to 28MHz and 50 to 54MHz.

The SR-550 was rescued from a rally at an acceptable price. After cleaning and re-alignment it proved to be a very interesting receiver.

The top two receivers are both Eddystones, an EC-10 Mk1 and an 870A. The EC-10 is better suited to shortwave listening as it has a good dial and coverage, and even comes with an a.f. filter for c.w. reception.

The 870A, while being a super little short wave set, has no b.f.o. and so is unable to resolve s.s.b. However, injecting a 465kHz signal from a generator into the i.f. is not too difficult.

When viewing a prospective receiver purchase it should be possible to see what bands the set covers. If you can't tell from the dial scale, then the band switch should give you a clue.



Fig. 3: These four receivers give you a good idea of the type of radio that can be found at rallies (see text).

Some of the older sets, like the Star SR-550, only cover the 'old' amateur bands, 1.8, 3.5, 7, 14, 21 and 28MHz and miss out the new WARC bands. This is not too much of an inconvenience though as you could always build a receive converter.

Check receiver controls for things like b.f.o. Filters, or an adjustable selectivity, are also an advantage on a receiver.

Again, the Star SR-550 has an adjustable i.f. selectivity, from 4 to 0.5kHz which is ideal for a.m. through to c.w. reception.

The three sets in Fig. 4 are Eddystones in the shape of an S750 and an S504. Also pictured is a commercial marine receiver used in direction finding.

The Eddystones have the usual 500kHz to 30MHz coverage. The S504 is in need of a little restoration though, whilst the marine set covers 200kHz to 13.5MHz and can resolve a.m. or s.s.b./c.w.

Again all the sets in Fig. 4 were good rally buys. They are no nonsense, solidly built and looked clean in the first place.

If you want to 'have a go' at getting a set functional again then the initial purchase condition might not be too important. But if you want to buy a set which is working straight away, some time spent inspecting it beforehand is a good idea.

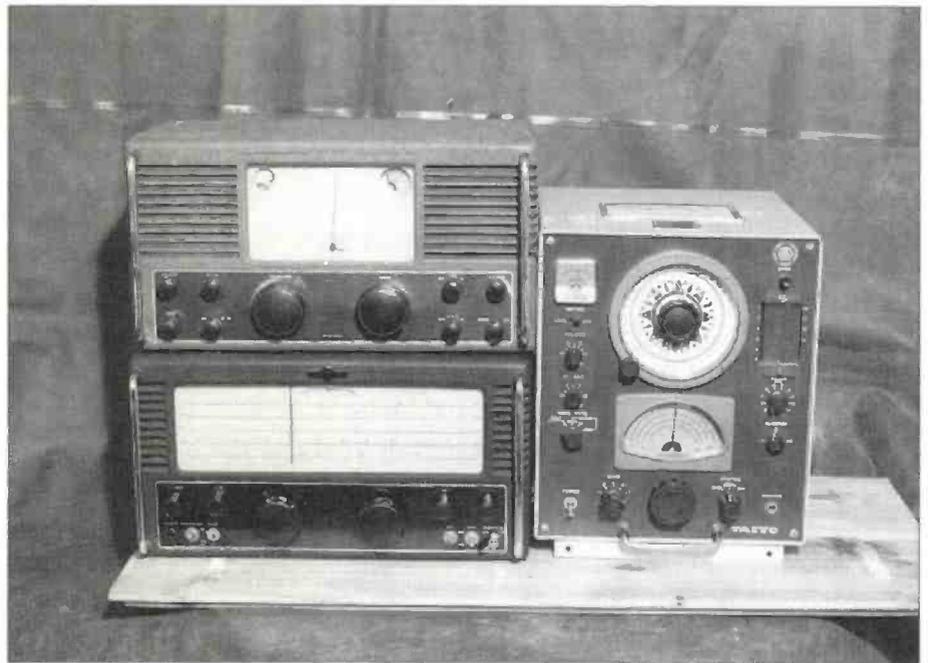
## Rally Power

Many rally organisers these days provide power. You may find one trader has a generator going.

Why not ask the seller of the set if you can take it over to the power source and try it? Even seeing it light up is a help. Any hesitation on the part of the seller might give a clue as to the 'it's fully working' statement!

It's always wise to slip a small flat and crosshead screwdriver into your pocket before attending rallies. Take the case off a receiver or transmitter have a look inside, check all the valves, and that none are broken or missing. Make sure there are no missing i.f. cans or bent bits of metal that appear to be foreign to the set.

Check the wave change switches! Trying to replace broken wafers in a bank of several situated inside a transceiver is not a job for the



**Fig. 4: The two Eddystone receivers on the left (top to bottom) are the S504 and the S750. Pictured on the right is a marine a.d.f. receiver, which will (if supplied with the correct antenna), provide a directional bearing on the signal being received.**

newcomer to crack his or her teeth on.

There is also one other thing to consider. I recently bought an old Heathkit transceiver, and also acquired the carrier crystals, the s.s.b. and c.w. filters, all the mixing crystals to get on the bands, two p.a. valves and a power supply. This all costs less than it would have cost to buy one of the p.a. valves new.

Even if the Heathkit set had not worked, I would have had enough critical components to build my own transceiver, including a suitable case. You might consider buying an old set just to obtain the heart of a future project.

## Touchy Subject

Finally, prices, this is (a touchy subject) as everyone thinks their bit of treasure is worth the earth. But look around at a rally. I've seen the same receiver for £35 on one stall and

£90 at another, guess which one sold first!

Price, is of course, dependent upon condition. However, you should be able to find a decent h.f. receiver for around £40 to £60.

A decent h.f. transmitter can be picked up for around £70 to £90, and p.m.r. rigs from £5. With p.m.r. hand-helds fetching around £30 to £50 depending upon age and channels and condition.

If prices are vastly higher than this and there has to be a very good reason. Perhaps it's a relatively modern set, or is in absolute mint condition (perhaps not so important for the beginner) or it has all the fitted extras or comes with a load of accessories.

At any rate, fix your spending limit, visit the rally, search for the bargains and haggle your way to a purchase. Happy hunting and see you on the air or at a future rally!

PW

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73 from Dave G4KQH, Technical Manager.

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# Tour To Papa Stour

Robert G. Miles GM4CAQ provides an account of the recent DXpedition to the Island of Papa Stour in the Shetland Islands. Yes, and it was much more than a tour!

Sitting in the Radio Club one Tuesday night in May, Colin GM0AVR said "Bob, do you fancy going to Papa Stour on Saturday?"

"Where?" I said. I knew that Colin liked to activate obscure islands around the Shetlands and my interest was aroused.

On the wall of the Lerwick Radio Club is a large Ordnance Survey Map of Shetland. I pulled up a chair and stood on the table to get a better look.

"Here," said Colin, "In Square HU16. It's never been activated for Worked All Britain, and I am certain it would create a fair bit of interest if we put it on."

Sure enough, I could see that the only land in HU16 was the island of Papa Stour and the Ve Skerries, a sort of reef.

"How would we get there?"

"A ferry" said Colin. And that was it. The start of the DXpedition. Well, not a trip to Turkey, or Gozo, but a DXpedition all the same.

Colin arranged the transport and antennas and I arranged the operators and the other gear.

"Problem!" said Colin on Thursday night. "There's no ferry on Saturday. Don't worry though, I've arranged a boat... and a tractor to meet us at the other end."

"A Tractor!" I thought, "What is he up to?"

## All Systems Go

On Friday night we were all systems go. The team was Colin GM0AVR, James GM0OMV,

Alan GM0FKU, myself GM4CAQ and our junior op Jonathan.

We had three stations: My Icom IC-730, MFJ a.t.u. and a Dipole for 14MHz; Colin's Icom IC-735, AT230 and a dipole for 7MHz and Alan's Trio TS-680 and a dipole for 50MHz.

Power was from four large and heavy 65Ah batteries and a 500W generator, kindly loaned by Gordon GM4ZEX, who spent his day on the Golf Course. Provided the sea was not too rough, we were all set to go.

Now all things are relative. To a Shetland fisherman it looked OK. To me, it looked pretty rough. And the sea as well!

The boat was around 10m long, sharp at both ends and had a distinctly rusty appearance. What you might call a working boat. It had a wheel house big enough for two and we were six, including the driver... sorry skipper of this fine vessel.

We were assembled on the pier near West Burrafirth at 7.45am, having risen at 6am, had a quick breakfast and driven for an hour to get there. It was June 1, blowing a stiff Force 5 and around 4/6°C.

The boatman arrived at 8am, and helped load the gear into the fish hold. As we pulled away from the pier for the hour long trip across the Sound of Papa to Papa Stour, he said, "Better stand the other side, it might splash a bit."

**GM4CAQ/P** 58, Fogralea, Lerwick, SHETLAND, U.K.

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SHETLAND ISLANDS

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UR Sigs RST.....  
Rig Icom IC730 ANT Dipole  
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*We are Here*



73's de Bob

## Sheltered From Waves

I put Jonathan into the wheel house, while the rest held onto anything we could that was solid. We sheltered from the waves, which lashed the boat's side in the wind as we headed out into the 12 knot current and six foot swells into what is shown on the map as St Magnus Bay.

As we approached the island, Colin drew my attention to the large rock near the headland which we were aiming straight at. There was no need to draw my attention to it!

Minutes later, my eyes were drawn to the small gap between the skerries, which were jutting up about 1m either side of the boat as the boatman sailed between the large rock and the headland.

On the pier, we congratulated the boatman on his skill whilst I muttered under my breath "If I'd have known then I ...." However, we were relying on him to come back for us, so we didn't want to upset him too much!

"See you at eight tonight." we called as he went off back through the skerries to lay lobster pots, the way we had come in.

## Tractor Waiting

The tractor was waiting, hooked up to a battered old wooden trailer. Colin got out his map as I looked around with my binoculars at the high ground of Papa Stour.

The island isn't very big, around 5km in diameter, so I could see a lot of it from where I stood. To the south west, in the distance, the island of Foula was visible through the faint mist, its cliffs standing out against the sky line.

Colin asked how far away the high land was. "There's a road marked on the map to Virda Field" I pointed out. "That's the highest land on the island at 85 metres."

"That's a horse track, about 2.5km long." said the young farmer smiling, "It's about an hour away."



James GM0OMV, Alan GM0FKU and Johnathan (L to R). Note: Johnathan hiding from the birds!



**Steering *Ivy Leaf* between the rock and the island - less than a few metres either side of the boat - was definitely a skill!**



**The 'ferry' - MFV *Ivy Leaf* returning to collect the DXpedition team.**

We soon found out why there is only one road on Papa Stour, it's about 2.5km long.... in the other direction, into the wrong WAB square. To be fair, we could have operated from the pier, but the pioneering spirit and the thought of 50MHz DX prevailed. High ground it had to be.

We all piled onto the trailer and quickly covered the first 1km on a tarmac road, then we turned off through the first of many gates into a field. For the next 50 minutes, we were rocked about on the trailer feeling more sick than when we were on the boat!

There was plenty of nature around us, lambs in the fields, seals in the sea, Arctic Skua's overhead..... The funny thing about Arctic Skua's is that they don't like visitors. They dive bomb them, trying to protect their nests.

The tractor driver was quite safe in his cab, but we were outside. That's where the 50MHz dipole was to be of the most use all day. Waved in the air it kept the skuas at bay!

At last, the tractor climbed the last steep moorland to the top of Virda field. The farmer unhitched the trailer and promised to return around 6.30 that evening.

## Setting Up

We got to work erecting the tent, then sat in it warming up with a cup of coffee from the flasks. The rigs were set-up in the tent on a makeshift table, made from the side of the trailer, by resting it at one end on a coolbox, and at the other end, on Colin's aluminium modified camera case.

The modification provides a very neat case into which his rig, a.t.u. and dipoles fit, well protected for these trips. The dipoles were erected using five 3m wooden poles that could be joined together. Two each supported the feed points of the h.f. dipoles, and one held up the 50MHz dipole. Some large rocks and the trailer acted as supports for the guys.

By 11.30 we were ready to go. We had earlier called into the WAB net on 7.060MHz and told them that we would be operational shortly from Papa Stour in the Shetlands.

"Oh" came a voice, "I wonder if that is HU16." I was very impressed, but kept them guessing. Colin worked them on 7MHz whilst I operated on 14.280MHz. Alan was tuning around on 50MHz with only the Inverness beacon audible.

The skip on 14MHz was very short and plenty of stations in the south of the UK were audible. We were soon working G and GW stations at a reasonable pace.

We were using our own call signs with the /P suffix, and as Shetland does not have a separate prefix, making sure that everyone knew where we were by repeatedly mentioning our location.

## Portable Stations

We were working a few portable stations, which was a surprise, until someone mentioned that it was CW Field Day. After an hour, we changed operators.

Alan was working on 14MHz, and James, newly licensed, made his first QSO, Dundee on Forty. Still nothing on 50MHz.

Colin and I went right to the top of the hill, next to the Ordnance Survey triangulation point, to look at the Ve Skerries a few miles to the Northeast, being lashed by the rough sea.

Colin said, "That's next. One of those rocks is in a completely unactivated square!" I looked at the waves breaking over it and thought, "Not today!"

We had another change of operators at around 1.30 and I worked a few more stations. The skip on twenty was very erratic with deep QSB and by now we had lost the Inverness beacon on 50MHz.

We had tried a few skeds on 50MHz with stations in the South, but nothing heard. At 3pm there was a Solar Flare.

The Solar Flare was interesting because all radio communications were lost on all bands. This was apart from the Lerwick 144MHz repeater, which could be accessed using Colin's hand-held.

It takes a bit of believing, and a lot of checking of rigs before it was accepted. With

about 70 QSOs logged, our DXpedition was effectively over.

We monitored the bands for the remainder of the afternoon but the only thing heard was a UZ1 on 29MHz f.m., who didn't come back to our calls. Still nothing on 50MHz!

## Uneventful Return

At six o'clock, we started to pack up the tent and loaded up the trailer. By the time the farmer returned promptly at 6.30, the wind had dropped to a strong breeze and the Ve Skerries were looking almost acceptable as a base. (A bit of scaffolding required? Shades of Minami Torishima). Pity there was no propagation.

The return boat trip was uneventful after the boatman once again negotiated the narrow inlet through the skerries. Even the sea was calm and the trip only lasted thirty minutes. The gear lay on the deck this time, as there was no risk of waves splashing over it.

Chatting to the skipper, he thought that he could land us on the Ve skerries on a good day. I had a mental picture of the waves breaking over them. Hence to say I didn't make an appointment!

I think everyone enjoyed the day, it certainly was one to remember. The total cost of the expedition was about £60, just under a pound a QSO, but it was well worth it. A lot less glamorous than somewhere in the Med, but we were home in time for supper.

For all those stations that need HU16, or EU12 or Shetland for WAE..... We'll be back someday....

PW

# Alasdair Makes His Match

A versatile multi-band multi-antenna matching unit is in use north of the border at Alasdair Fraser GM3AXX's location. Follow his instructions and you can have one as well!

There's nothing unconventional about the antenna system 'Chez '3AXX'. It's an inverted 'V' trapped dipole for 3.5 and 7MHz, a horizontal trapped dipole for 18 and 24MHz and a 2-element tri-band Yagi for 14, 21 and 28MHz.

In spite of remarks about 'lossy traps' by the manufacturers of non-trap antennas, I've never found this to be the case. In fact, were this so, there must be a lot of 'lossy' amateur radio equipment around, as most traps are just parallel tuned circuits.

A two band trap dipole for say 3.5 and 7MHz is simply a 3.5MHz dipole with a pair of 7MHz traps inserted approximately 10m each side of the centre feed point. At 7MHz and at 7MHz only, the traps behave as virtual open circuits, producing a 20m centre-fed 7MHz dipole.

On 3.5MHz however, the traps behave as small inductances, which is both an advantage and a disadvantage. Due to the inductive loading, the total length of the antenna has to be less than a normal 3.5MHz dipole. This shortening is good news to amateurs with small suburban gardens.

Inductive loading has another disadvantage, the bandwidth of an inductively loaded antenna is less. On the 3.5MHz, 300kHz bandwidth may not seem much, but it in fact, represents, 8.5% of the band. This high percentage contrasts with the other h.f. bands - even on 28MHz, where the 1.7MHz bandwidth represents only 6%.

In practice, I found that if the trapped antenna was trimmed carefully to be resonant at say 3.75MHz for s.s.b., then the mismatch rose to above 2:1 at 3.510MHz. This rise in mismatch causes a fall off in output power,

due mainly to protection circuitry in the transceiver.

## Problems Overcome

You may have noticed that in commercial trapped tri-bander antennas, different element lengths are quoted for the c.w. and s.s.b. sections of the h.f. bands. Happily the unit I'm about to describe overcomes this problem.

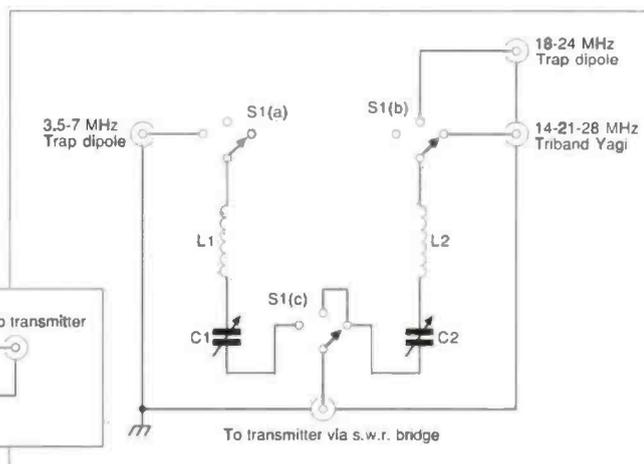
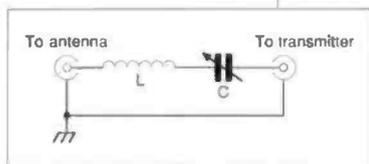
Obviously, an antenna tuning unit (a.t.u.) would have to overcome the difficulty, but this seemed an expensive and complex solution to a simple problem. After a great deal of soldering and unsoldering of various inductances and variable capacitors, I found that a simple series tuned circuit did the trick.

The circuit of Fig. 1 shows how simple the solution is. The series components should cover the frequencies in use. Another consideration is that as a low impedance device, high voltage wide-spaced variable capacitors are not needed for normal powers.

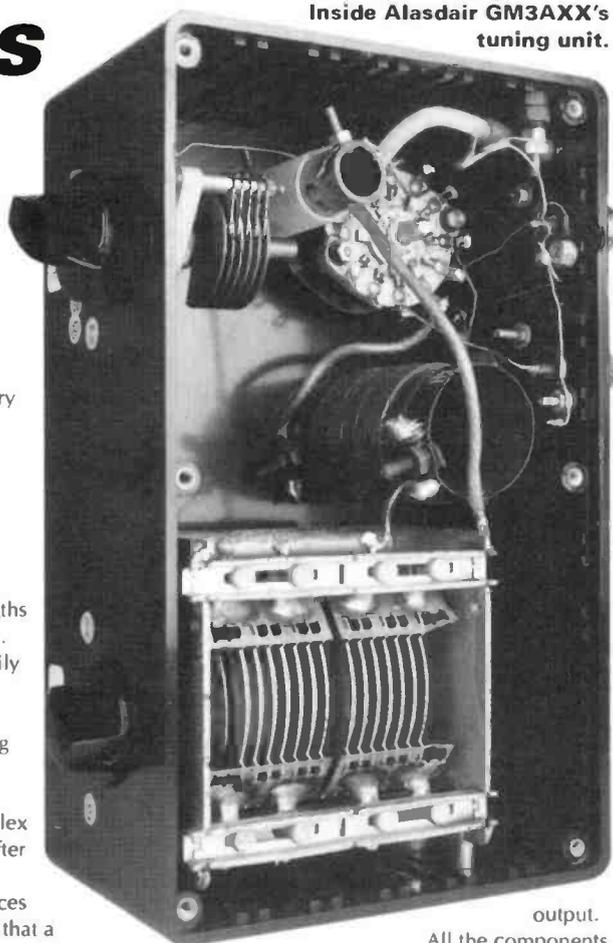
A unit was made up to cover all the bands from 3.5 to 28MHz and the three antennas in use and the full circuit is shown in Fig. 2. It should be emphasised that this is **not** an a.t.u., it will not allow a 7MHz dipole work on 3.5MHz.

The unit merely cancels out any residual reactance on a low impedance coaxial cable fed trapped dipole when used at other frequencies within band. This ensures that the transmitter is working into a purely resistive load, and therefore giving maximum power

Fig. 1: A simple L-and-C matching unit capable to tuning out small reactive impedances.



Inside Alasdair GM3AXX's tuning unit.



output.

All the components

in the unit came from the junk box.

Because of this it's impossible to give specific values for the variable capacitors and inductances, and they must be found by experiment.

As a start point though, the old 'rule of thumb' may be useful here. For a 100pF variable capacitor, use four turns for 28MHz, eight turns for 14, 17 and 7MHz and 32 turns for 3.5MHz. All windings will be of 12-15mm diameter.

Inductors for use at r.f. should not be placed in close proximity to a metal cabinets. So I constructed the unit in a plastic box, formerly used to store printed circuit boards. In the unit described, the tuned circuit L1/C1 tunes from 2.5 to 12MHz, while the circuit L2/C2 tunes from 12 to 30MHz. This gives coverage of all amateur bands from 3.5 to 28MHz.

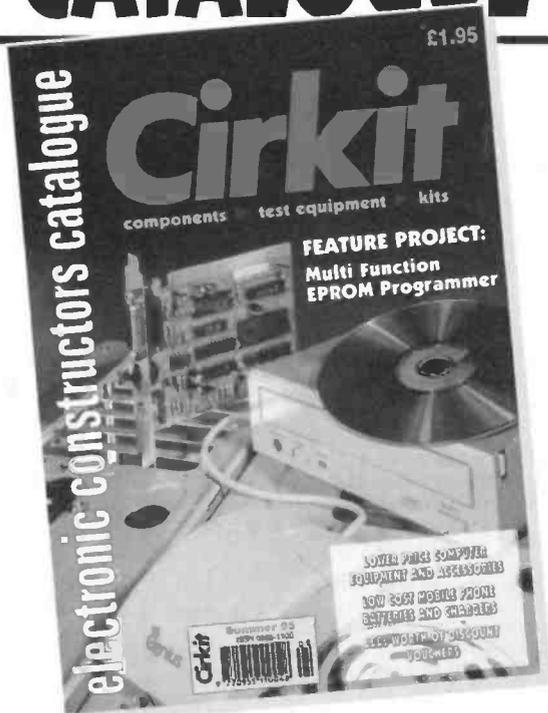
Finally, once the setting of the variable capacitors has been established for each band, small plastic markers were affixed to the front of the unit to effect a quick band change.

With a little thought and a reasonable junk box that trapped dipole can be improved. Go on have a go, you might improve your system!

PW

Fig. 2: The full circuit. Ideally S1 should have a ceramic former with silver plated contacts, but most good quality switches with large contacts should be suitable. An inside view of the Project is shown above.

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# It's A Classic....

Ben Nock G4BXD takes a look at the KW Vespa, another 'old faithful' rig from the 1960s that's still capable of hard work in the mid 1990s.

As one of the many interesting sets to come out of their Vanguard Works in Dartford, Kent, the KW Vespa is described in its manual as being "similar to the transmitter section of the KW 2000." The Vespa first appeared in the late 1960s.

The transmitter has 11 valves and can be matched with several receivers of the period. These include the KW201 for instance, which makes a very smart (at that time and even now) amateur radio station.

## Vespa Versions

Apparently there were two Vespa versions produced by KW. The differences appear to be a change of p.a. valve and output power, 90W p.e.p. in the MkI and 220W p.e.p. in the MkII.

The set, housed in the familiar KW light blue, 'C' line styling, perforated case measures approximately 355 x 17 x 28mm and weighs in at 8.2kg.

The separate p.s.u. weighs 6.8kg (MkI) or 8.2kg (MkII). The frequency coverage is restricted to the six old bands, 1.8, 3.5, 7, 14, 21, 28MHz and in 200kHz segments, in a total of 11 ranges but this I feel is not too much of a hardship to suffer.

Let's now look at the transmitter design, and to help I've provided a block diagram in Fig. 1. The audio side starts with a high impedance microphone which is connected to the grid of the microphone amplifier (V1). This is amplified and coupled to the cathode follower via a front panel mounted microphone gain control.

The cathode follower feeds the balanced modulator with the amplified microphone signal. The output of the balanced mixer is then 'mixed up' to the different bands of operation using the v.f.o. signal and a switched crystal oscillator as in the block diagram, Fig 1.



# The KW Vespa SSB Transmitter

The circuitry around the microphone plug is a little odd. The cold end of the cathode resistor and bypass capacitor are connected to one of the microphone plug pins, the grid to another and the p.t.t. line to the third! A three pin DIN socket is used for connecting the microphone.

So, to activate the set on voice, the cathode pair needs grounding along with the p.t.t. line. The microphone is fed to the grid, assuming the case of the DIN plug is considered to be ground potential.

I've slightly rewire my Vespa so as the ground is one pin, the grid another and the p.t.t. line the third. I have also soldered the cathode resistor/capacitor to 'deck' in the transceiver.

## Balanced Modulator

A pair of OA79 semiconductor diodes form the balanced modulator in the KW Vespa. They're fed with the microphone signal and the output of the carrier oscillator (V8), the upper and lower sidebands are passed to the amplifier (V3).

The 455kHz signal then passes on through a 2.1kHz mechanical filter. The selection of upper or lower sideband being dependent upon the front panel Function switch selecting the required carrier oscillator crystal. The now single sideband suppressed output is fed to the

first mixer.

For a.m. or c.w. operation a small d.c. voltage is fed to one of the diodes, controlled by the Carrier control on the front plate, unbalancing the balanced modulator and causing some carrier output.

The triode pentode, (V10), operates as a Colpitts oscillator buffer at 2.5 - 2.7MHz. To maintain alignment between upper and lower sidebands the v.f.o. is moved in frequency by the switching in of a 1-turn relay shorting link, which is relay operated.

## The Output

The 455kHz s.s.b. signal and the v.f.o. output are fed to the balanced mixer (V4). This produces an s.s.b. signal in the range 2.955 - 3.155MHz.

A broadband coupler then feeds the second balanced mixer (V5) which, along with the output of the crystal oscillator, produces an output in the required amateur band. The crystal oscillator is always 3.155MHz higher than the lower edge of each band.

A Pre-selector control gangs the output tuned circuits of V5 and the anode of the driver (V6). The output of the driver is capacity coupled to the p.a. stage, which is operating in linear class.

A standard Pi network is used to provide p.a. tuning and antenna loading/tuning,

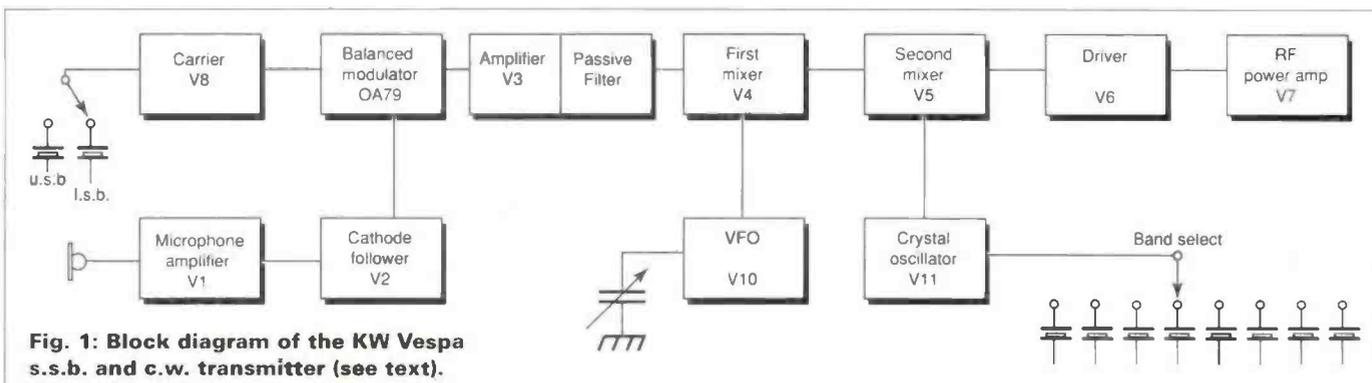
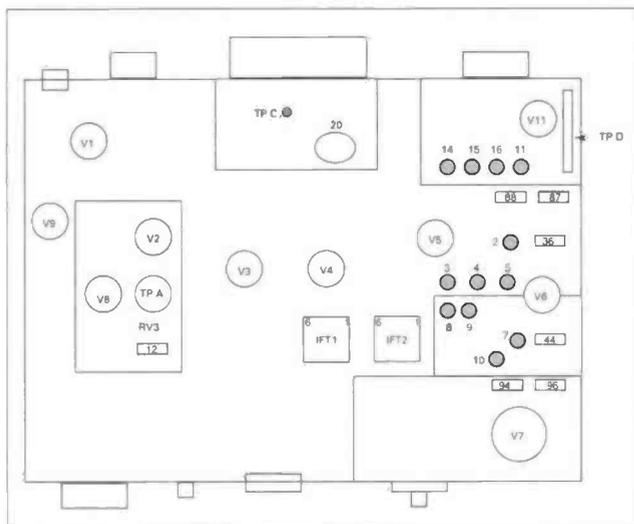


Fig. 1: Block diagram of the KW Vespa s.s.b. and c.w. transmitter (see text).



**Fig. 2: Diagram showing positions of valves, test points and inductors. The v.f.o. valve (V10, an ECF82) is mounted on its side on the left of the screened box behind the main tuning assembly (see Fig. 3). Other figures and test points refer to alignment details provided by G4BXD, (but not published because of space limitations,) which is available from PW office in return for an A5 s.a.e.**

separate front panel **Tune** and **Loading** controls are provided.

### Power Supply

The power supply unit's transformer has four secondary windings. These provide the h.t. volts, a negative bias voltage, a heater voltage and a negative relay supply.

A switchable 200/300V winding is rectified and doubled to give 580/750V d.c. h.t. for the p.a. There's also a separate 200V winding gives a rectified 245V for the remaining valves.

There's a 100V winding which is rectified to produce a 110V d.c. negative supply. This is provided with a potentiometer to adjust the standing current on the p.a. valve.

A low voltage winding supplies both heater volts a.c. and, via a single diode and filter, a 12V negative supply used to operate the relays in the set. The tapped primary can be set to operate from 105 to 240V a.c.

A 15 pin multi-way plug and socket is used to connect the transceiver to its power supply. The connections are as shown in **Table 1**.

### Valves And Lamps

You should be aware that the valve heaters and dial lamps are wired in series parallel for 12V operation. The valve line-up is provided in **Table 2**.

And don't forget of course that when replacing any valve or lamp, they must have the same current rating as the original item.

### Servicing Chassis

When servicing is required, the Vespa chassis is easily removed from the case. You start by removing the two rear feet.

Next you should remove two plugs in the front feet to gain access to the screws followed by the removal of the feet. The chassis then slides easily out of the front of the case.

### On The Air

On the air, the operation of the Vespa is straightforward enough. After tuning the receiver to the frequency of operation required, the net switch is thrown, and the transmitter v.f.o. netted to zero beat on the received signal.

Next, place p.a. **Tune** and **Load** controls fully clockwise. Now rotate the function switch to **Tune**, and a small amount of carrier is inserted (say 50 mA of p.a. current) and the pre-selector is then rotated for a peak in the reading.

I recommend that you use a system of on-tweak-off to save straining the p.a. valve with heavy current for too long.

Once the pre-selector is tuned, with 190mA of current indicated, the p.a. **Tune** is rotated to dip the current. Watching on an in-line power meter should provide an indication. Finally, you should adjust the **Load** control anticlockwise 're-dipping' as

required to get as much r.f. out as possible.

### Microphone Gain

In the s.s.b. mode, the microphone gain should be advanced to show an average p.a. current of 120mA. It should be peaking at 200mA or so.

If a compressor or clipper type microphone is used, the meter will show a higher average current reading. And again, care should be taken though not to over strain the p.a. valve.

It's always best to seek reports over the air to ensure you're not overdriving the set. And the audio quality will be a good clue to that possible problem.

Considering the price of modern plastic, eastern delights, and that rigs such as this can be bought quite cheaply, then operating on the h.f. bands needn't cost you an arm and a leg. Or even a second mortgage!

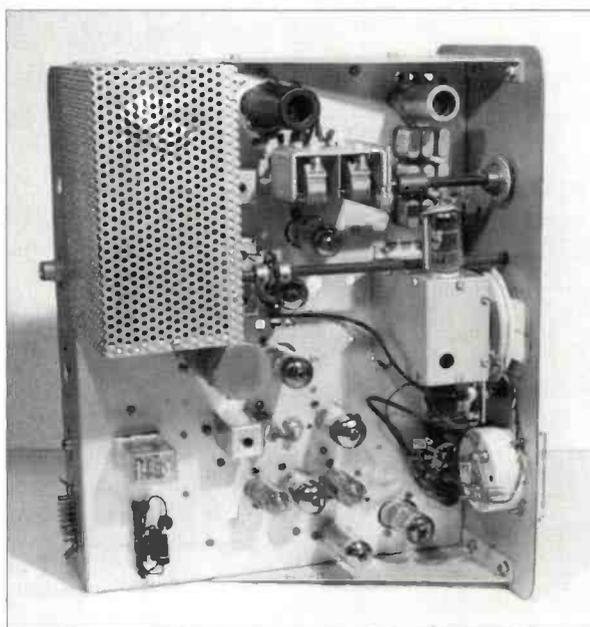
Old valve sets are a joy to operate, and even if there's a little loading on your pocket, all the better. See you on 'Top Band'!

PW

**Table 2. Valves Used In KW Vespa MkII**

Numbers refer to those used in diagrams

- V1: Microphone amplifier 12AX7
- V2: Audio cathode follower 12AT7
- V3: 455kHz amplifier EF183
- V4: 1st Mixer 12AT7
- V5: 2nd Mixer 12AT7
- V6: Driver 6CH6
- V7: Power amplifier 6HF5 (6146 in MK I)
- V8: Carrier oscillator 12AT7
- V9: Voltage stabiliser OA2
- V10: Variable frequency oscillator ECF82
- V11: Crystal oscillator 6AM6



**Fig. 3: Above chassis view of the KW Vespa (see text for details on how to remove chassis for inspection. The power supply must be disconnected during removal for safety reasons.)**

**Table 1: Power connections to 15-way plug and socket.**

Pin	10/8	14	7/9	15	6	11	1/3/4/5	2
Use	a.c. on/off	750V d.c.	GND	245V d.c.	-65V d.c.	bias -55/-110V	12.6V a.c.	-13V d.c.

# Antenna Wo

"The learn'd is happy nature to explore, the fool is happy that he knows no more".

Alexander Pope (1688-1744) 'An Essay on Man'

When the sun shines and the weather warms up, the radio amateur is drawn away from the workshop and shack and pulled to enjoy the great outdoors. Often at the behest of other members of the family!

But all is not lost because amateur radio can be more than enjoyable when pursued in the open air. A compact QRP station, a battery supply and an easy to erect temporary antenna can open the door to a lot of fun.

For many years I have attempted to combine some of my holiday time with a little amateur radio operating. In more recent years this has often been the only time when I have consistently operated on the air over several successive days.

I have operated from holiday cottages, caravans and even from the car parked in a suitable spot. This has been from a variety of home-built QRP Transceivers and a couple of commercial QRP Transceivers.

My portable antennas have varied from a second-hand set of Hustler whips to a simple piece of wire thrown up in to a tree. This article describes three antennas I have used with success from portable locations in the last few years.

The useful bonus to suitable portable antennas is that they also make good antennas for any temporary location or from the smaller back garden. They are good "get you on the air" antennas.

## The W3EDP Antenna

The W3EDP Antenna first saw the light of day in an article by Yardley Beers W3AWH, in the QST for March 1936. This was when he described an unusual antenna by his friend, Mr. H. J. Siegel W3EDP.

Siegel's brainchild, was my favourite portable antenna for many years. It's a well known antenna in the annals of the amateur radio QRP literature. I make no excuse for featuring it again in this article and hope that it may expose it to amateurs who have yet to give it a try.

The antenna was developed completely as a result of experimentation. It was a "cut and try" antenna evolved to fit his space. And W3AWH confirmed the effectiveness of the antenna by "having worked Europe several times with a pair of '10s" (valves).

The W3EDP is simply an end-fed 25.6m length of wire fed against a short counterpoise wire. The optimum length for the counterpoise is 5.18m for 7MHz and 1.98m for 14MHz and above, although no counterpoise is required on 28MHz.

The antenna is resonated using a tuner of the open wire fed antenna type. The diagram, Fig. 1, shows the layout of the W3EDP antenna complete with a suitable tuner for 7-28MHz. This tuner is the one I have used for portable operation with the W3EDP.

The W3EDP antennas I've built have all been from cheap pvc covered wire bought on reels at radio rallies. And the

tuner is made from two inductors wound on a 35mm film canister and uses two polyvaricon variable capacitors of the type found in portable transistor radios.

The polyvaricon capacitors are commonly available as surplus items, although the Maplin type FT78K would work well in this application. These are quite adequate for output powers of up to 10W. The radiator wire has usually been strung up in trees and the counterpoise laid out across the ground or along the sides of a room.

You may feel that some 25m is a long run of wire for a temporary antenna. But in practice I've found that the radiator wire can be 'dog-legged' or bent around to fit the required space without seeming to reduce the effectiveness of the antenna.

The W3EDP costs virtually nothing to make and can be fitted into most portable locations. It has given me good service from many unlikely sites.

## Film Canisters

In the past I've used 35mm film canister when making antennas. One of the simplest antennas for portable operation is a half wave dipole cut for the band that is to be used and strung up to any high points that are available. A multi-band version is shown in Fig. 2a.

The inner section of the antenna shown in Fig. 2a is a 28MHz dipole and the bands are added by adding on lengths of wire at either end via a series of links. The lengths of the dipoles depend upon the favoured end of each band for operating. The lengths may be calculated from the usual formula:

$$\text{Length} = 75 \text{ divided by } f$$
 [frequency in MHz].

In practice it is best to cut and try by using a dipmeter to resonate each section. Begin

with the inner dipole and work outwards, a section at a time. An invaluable aid for this method of working is the popular MFJ-249 SWR Analyser.

The physical construction of the multi-dipole shown uses a 35mm canister as a basic centre piece for the dipole. Other, cut-down, film canisters are used as the joiner support parts for the centre point, shown in Fig. 2b, a loop of string through two holes in the end of the canister will hold the canister aloft. Two more holes in the sides of the canister take the two legs of the dipole which are knotted inside to hold them in place and soldered to the coaxial feeder line.

The canister lid has a hole to accept the feeder and provide a fair degree of waterproofing. Not the best dipole centre piece in the world, but it is simple and extremely cheap.

Portable dipole elements can be made from thin coaxial cable, such as RG174. Such an antenna may be rolled up and stowed in a compact space. I have often used such a dipole for 14MHz operation. The 14MHz band is good band for portable operation especially when using QRP.

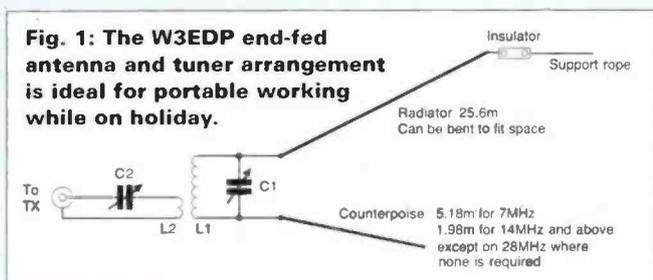
A variation of this antenna is to cover several bands with one antenna built with links to convert it into a series of half wave dipoles for several bands. The practical methods for joints are legion but Fig. 2c shows one practical example I've found successful.

Once again the idea uses 35mm film canisters. For a four-band antenna, six canisters are cut as shown. In the base of each canister is mounted a 2mm socket (Maplin HF44X or similar).

There are many ways to make suitable links. But again a 35mm canister can provide a simple solution.

The inner end of each outer element is attached to the wall of the cut down canister via two holes with a large knot. A 2mm

**Fig. 1: The W3EDP end-fed antenna and tuner arrangement is ideal for portable working while on holiday.**



# Workshop

Wires in the fields - the Rev. George Dobbs G3RJV, describes three simple and practical portable antennas.

Plug (Maplin HF38R or similar) is soldered onto the end as shown.

If care is taken when cutting the canisters and mounting the socket in the base then it can be strong enough for normal tension. The system is secure enough for most portable use and provides an easy means of making or breaking the links as required.

With a little careful pruning and setting up, this arrangement can provide an antenna that doesn't require a tuner and covers several bands. At the Freidrichshafen amateur radio exhibition I bought an excellent fibre glass fishing pole which extends from about a metre long to 10 metres and have used it as a centre support for such a dipole. (In this country you might look for a 'Roach Pole' fishing rod. But they're not cheap in the UK! Ed).

What useful little items the film canisters are, and thousands of them are thrown away every year! If you lack a supply, speak to a friendly assistant at the shop where you leave your films for developing. They usually throw lots of them away.

## Dave's Dipole

Another multi-band dipole idea which is worth sharing came from Dave Raynor G4XNP. The antenna first appeared as an arrangement for switched multi-dipoles in the G-QRP Club journal *SPRAT*. This is a cunning arrangement using slotted ribbon feeder and wire to make a dipole to cover 14, 21 and 28MHz

The G4XNP antenna achieves

three-band working while occupying a length of only 9.375m. It was designed for small space home locations but it does make a very useful portable antenna. The arrangement if shown in Fig. 3.

The slotted ribbon feeder is used to form a folded 14 and a 21MHz dipole. A cut is made in each side of the slotted feeder as shown in Figure 3 to fit the two dipoles on the feeder line.

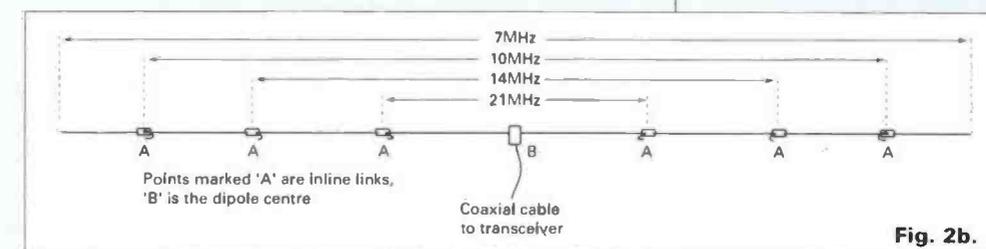


Fig. 2b.

An extra 28MHz dipole is cut to weave between the slots in the ribbon feeder. All three dipoles are

connected to the same feeder. Dave G4XNP used 75Ω flat feeder but I have built this antenna in a temporary form using twin domestic lighting cable.

I have not tried it with coaxial feeder but have every reason to think it would work well if care was taken with the pruning of the lengths. The use of twin feeder and a simple Antenna tuner does, I know, produce good results.

I used a T-Match tuner but an L-Match would probably work just as well. This is a good idea, well worth trial and experimentation to yield a simple portable antenna.

So there's three antenna ideas for you to try on a summer's day. Cut some wire and go out and enjoy yourself.

PW

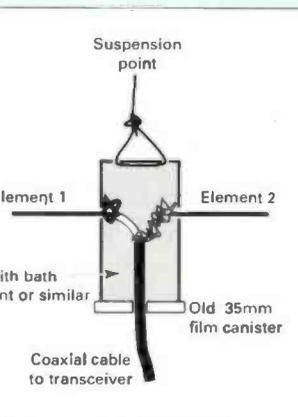
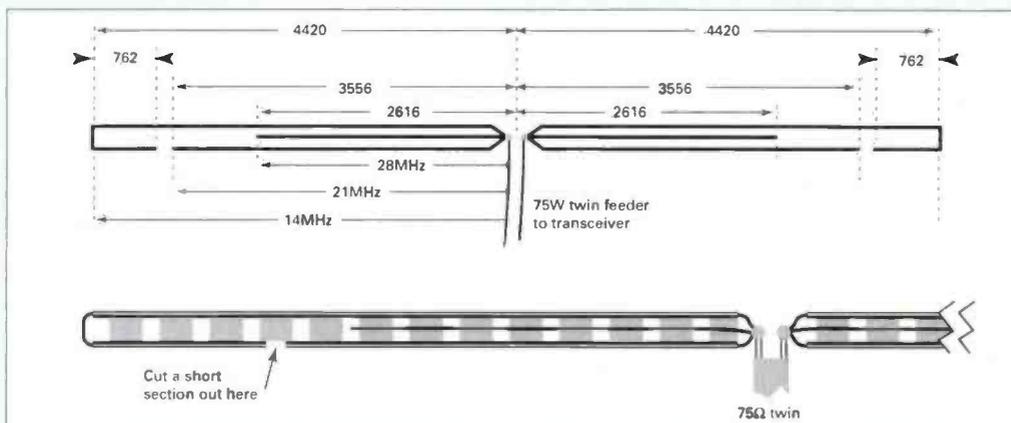


Fig. 2a: A 35mm film canister makes a good shroud for the dipole centre.

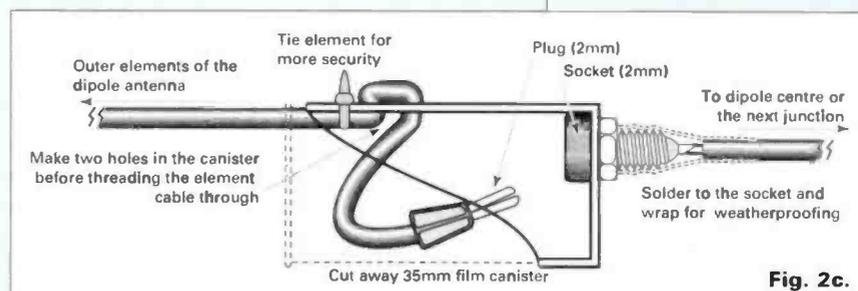


Fig. 2c.

Fig. 2b: A cheap four-band dipole antenna set may be made up very cheaply from items that would normally be thrown away. See Figs. 2a and 2c for more detail.

Fig. 2c: Other, modified, film canisters make simple and cheap joiners for a variable length dipole set.

Fig. 3: Dave's dipole. Dave Raynor G4XNP uses a simple, but effective, three band dipole with this layout. The 28MHz elements are threaded through the holes of the slotted 300Ω feeder.

## EQUIPMENT

## SPECIFICATIONS

This month Ian Poole G3YWX looks at what digital signal processing is and the advantages it has for amateur radio equipment.

**D**igital signal processing (d.s.p.) is making steady inroads into the amateur radio market. For a number of years the professional radio market has been moving over to d.s.p., and now the same is happening to top end amateur rigs. Whilst there is plenty of 'tech talk' about the fact that rigs have d.s.p., there is usually very little about what the real advantages are and exactly what it does.

### Rapid Growth

There has been a rapid growth in the use of microprocessors over the past few years. Nowadays most receivers employ at least one microprocessor, but this is usually used to control the functions in the set.

Usually the controls and displays on the front panel together with the frequency setting commands are all controlled by a processor. This growth has given many advantages in terms of the flexibility, making the set much easier to use on today's crowded bands.

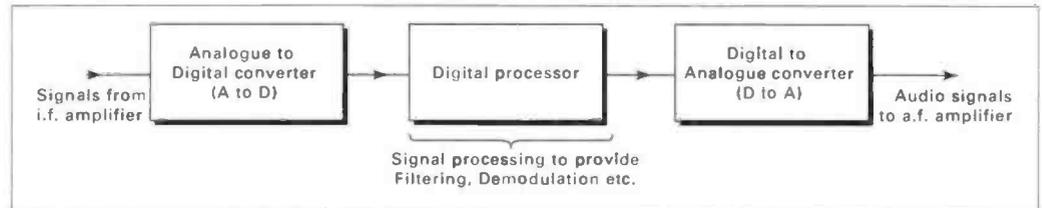
It's also possible to use processors to perform some of the functions traditionally performed by analogue components like filters, mixers and amplifiers. To achieve this, a very fast form of processor designed specifically for the purpose is generally used.

A growing number of these processors are becoming available on the market. Although many are still quite expensive.

### The Idea

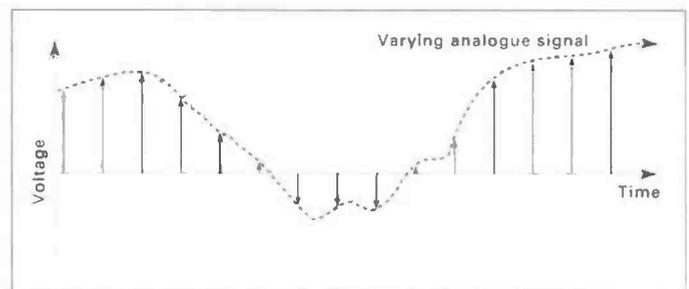
Digital signal processing is based upon the idea that by taking successive samples of a waveform and converting the levels at these points (Fig. 1) into a digital format, it's possible to build up a mathematical picture of the signal. Once this has been done, the processor can perform mathematical operations on the digitised signal.

We all know the limitations of the filters in receivers, and some of the demodulators used. By applying



**Fig. 2: A basic block diagram of a digital signal processor for use in a communications receiver.**

**Fig. 1: Diagram showing how a waveform is sampled at regular intervals (see text).**



digital signal processing techniques it's possible to greatly improve on the physical limitations of the components themselves.

By using d.s.p. perfect components can be used in the calculations. Unfortunately there are still mathematical limitations so it's not possible to generate the proverbial 'brick wall' filter with perfectly straight sides.

In fact, the filters contained within the mathematics of a digital signal processor will still exhibit many of the same limitations of analogue filters. They will have in-band ripple, out-of-band ripple, and sides which do not rise infinitely fast.

Despite this they are able to easily out-perform their analogue equivalents. They give a distinct improvement in performance.

In addition the processor is also able to perform other functions including demodulation. These functions show a similar improvement in performance.

### Block Diagram

Three main circuit blocks are required to perform digital signal processing (Fig. 2). First it's necessary to convert the signal from its analogue format into a series of digital numbers to represent the amplitude at successive times. To

achieve this a circuit called an analogue to digital converter (A to D converter) is used.

A clock signal is fed into the circuit so that at a regular interval it samples the signal, analyses the level and produces a digital number representation. Once in this format this information can be passed into the processor itself. Here all the processing is accomplished, producing another signal which is again in a digital form.

The digital signal needs to be converted back into an analogue form so that it can be amplified by an audio amplifier and passed into a loudspeaker or headphones to be heard. This function is provided by a circuit called a digital to analogue converter (D to A converter). A wide variety of i.c.s are available to perform the D to A and A to D converter functions. By using an i.c. and a few other components the circuitry is considerably simplified and a high level of performance can be achieved.

### Processing Not Limited

Digital signal processing is not limited to use in communications receivers. Its uses are far ranging. Still in the radio field d.s.p. techniques will be used in the new digital audio broadcasting system which is being started by the BBC in

September of this year.

In fact the new BBC system relies totally on d.s.p., and without it the system would not be able to function. The d.s.p. technique is also used in many other applications.

The new Digital Compact Cassette, and Sony MiniDisc systems use it to compress the audio into smaller storage areas. Another area where these techniques are used is in television where many of today's special effects are generated by d.s.p.

In the years to come d.s.p. will be found increasingly in communications equipment. It enables the performance of the set to be improved and enables a wider number of signal processing functions to be included just by the addition of extra software.

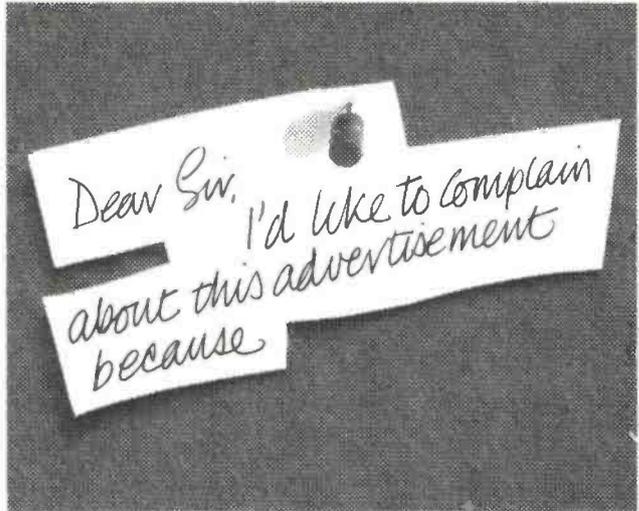
I hope this has helped to solve some of the mysteries surrounding digital signal processing. Next time I'll be looking at direct digital synthesis.

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ECL82	3.00	OC3	2.50	Z803U	25.00	6E4S	1.85	811A	18.50
ECL83	3.50	OD3	2.50	ZD21	3.50	6F6	3.50	812A	55.00
ECL86 Mult	3.50	OD3	2.50	3B26	20.00	6FQ7	7.50	813	27.50
ECL86 Mult	3.50	PCF80	2.00	4CX250B STC	55.00	6GK6	4.00	833A	85.00
ECL86 Mult	25.00	PCF82	1.50	5R4GY	6.00	6H6	3.00	866A	25.00
EF37A	3.50	PCF86	2.50	5U4G	5.75	6H56	3.00	872A	20.00
EF39	2.75	PCF801	2.50	5V4G	4.00	6J5	3.00	881A	25.00
EF40	5.00	PCF802	2.50	5Y3GT	2.50	6J6	3.00	1060A GE	10.00
EF41	3.50	PCL82	2.00	5Z3	4.00	6J7	4.00	5751	6.00
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ELL80	25.00	PL508	5.50	6AUSGT	5.00	6Q7	4.00	7586	15.00
EL41	3.00	PL509	6.00	6AUB	2.50	6RH8B/6KN8	12.00	7587	23.00
EL81	3.00	PL519	6.00	6AW8A	4.00	6SA7	3.00	7868	15.00
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Looking back at the recent 'Victory Europe' commemorations Ron Ham pays tribute to the B2 set which was often used by operators who risked their lives every time they went on air. Many paid the ultimate sacrifice and PW salutes their bravery and memory.

# W valve & Vintage

**A**s this issue of *PW* is published, the 50th anniversary of the ending of the Second World War in Europe, VE Day, has been remembered throughout the land. With this in mind I have dedicated Valve & Vintage to the famous B2 transmitter and receiver. **Fig. 1.**

The B2 was used by Allied agents in enemy occupied territory during the conflict, at great personal risk. Many paid the ultimate price in the service of their country.

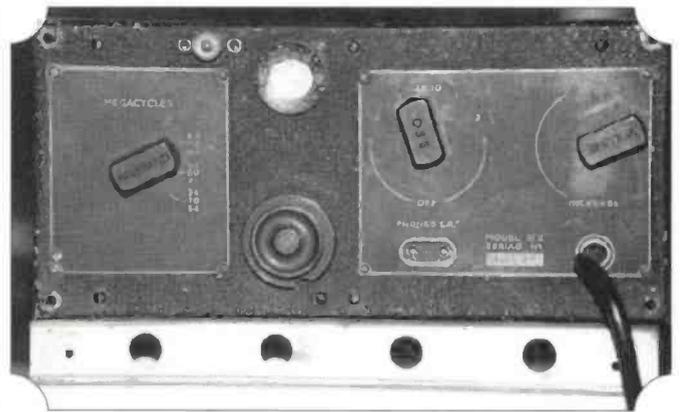
## Attache Case

The B2 is also known as the 'attache case' set, because the equipment is

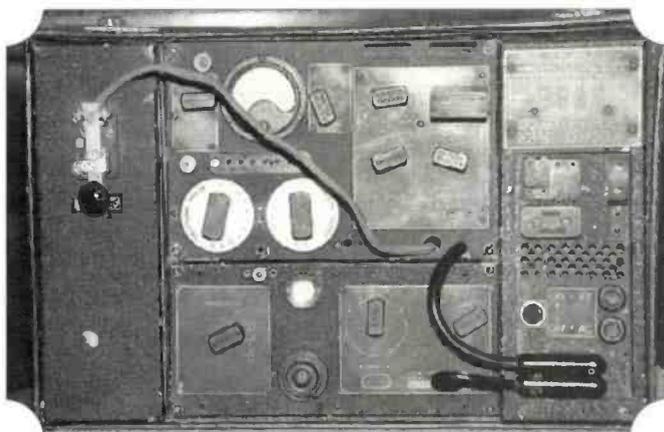
housed in just such a case. Very often the operator had to carry the set to different sites before sending or receiving messages and then hide it when not in use.

The B2 could have been placed on top of a wardrobe or in a cupboard along with other suitcases with the hope that it would be missed during a house to house search. These clandestine wireless-operators were very brave people and risked terrible consequences if they were caught.

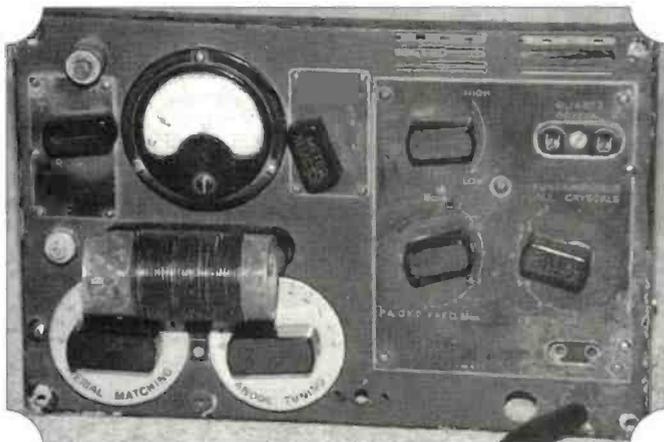
In addition to their operating skills, agents, when using sets like the B2, required a good technical understanding of the equipment. This was especially important when changing the transmitter's frequency.



**Fig. 3: Receiver section of the B2, showing magnifying lens mounted above tuning scale and slow motion tuning knob (see text).**



**Fig. 1: The B2 h.f. transmitter/receiver used in clandestine operations during the Second World War.**



**Fig. 2: Transmitter section of the B2 (see text).**

## Four Units

The B2's leather attache case contains four independent units. They comprise the accessories box, left **Fig. 1**, the transmitter **Fig. 2**, the receiver **Fig. 3**, and the adaptable power supply unit, **Fig. 4**.

The B2 has three wave-bands covering 3.1 to 5.4MHz, 5.2 to 9MHz and 8.7 to 15.5MHz. These ranges are selected on the receiver by the knob on the left of **Fig. 3** and tuned by the slow motion drive in the centre of the illustration.

The dial, situated above the knobs, is magnified for ease of use and calibrated 0 to 180°. The controls on the left are for the b.f.o. and volume respectively.

## The Accessories

The transmitter tank-coils, quartz crystals, Morse key and headphones are stored in the accessories box. And while the set is in action, the key can be secured by two bolts to the cover of the box as shown in **Figs. 1** and **5**.

The transmitter tank coils are plugged into a six pin socket. This is seen below the meter on the transmitter panel, **Fig. 1** and shown fitted in **Fig. 2**.

Each coil is marked **A** on one side of its base and **B** on the other. This is because that four coils can be

used on eight frequency ranges.

For example, L1A covers 3 to 4MHz, turn it the opposite way so that L1B is showing and the range becomes 3.75 to 5.25MHz and so on.

The operator can find the information under the lid of the accessories box, **Fig. 5**. The coils L2A and B cover 4.5 to 6.25 and 5.5 to 7.5MHz. Coils L3A and B cover 6.5 to 9 and 7 to 10MHz and L4A and B provide 9 to 13 and 12 to 16MHz coverage respectively. **Fig. 6**.

## Quartz Crystals

The 10XJ type quartz crystals plug into the two-pin socket at the top right of the transmitter, **Fig. 2**. In **Fig. 1**, the crystal is shown fitted in the socket.

The fundamental frequencies of the crystals are within six preset ranges from 3 to 8MHz. They are switch-selected by the knob below the socket in **Fig. 2**.

To the left of the crystal selection knob is the control to set the power amplifier (p.a.) grid frequency in switched steps between 3 and 16MHz. Above that is a variable control for the p.a. grid tuning.

Below the tank coil are the controls for antenna matching and the anode tuning for the p.a. valve. This valve is a 6L6 with a 6.3V at 900mA heater and an international octal base.



# SCENE USA

Recently emigrated Ed Taylor WT3U (G3SQX), reports from across the 'pond' from his new home in Denver, Colorado, USA.

Every quarter, Ed will be reporting from the Rocky Mountains in this, his new column entitled 'Scene USA'. The column will cover everything from the local (personalities, rallies) to the global (American amateurs and the way their activities affect the world).

He'll be looking at new equipment, talking to people in the news, and explaining how things are done. The idea is to give you a flavour of what amateurs on the other side of the 'pond' get up to, perhaps comparing it with the way we do things.

## A Big Place

Many of you will have visited the USA, or will be planning to do so soon. In fact, each year, several dozen radio amateurs join the PW trip to that amazing extravaganza, the Dayton Hamvention.

But, if you talk to people who have been to the USA, they all come home with different impressions of the country. Why is this? I think the main reason is that there's such a lot of it!

A tourist in New York City will have a very different idea of what America is like compared with someone who has been exploring the desert. But one thing is obvious as soon as you arrive - the USA is a very big place!

If you want to fly from London to Denver (the city where I live), you are only just over half-way there when you reach the East coast of the USA. The amount of land is vast, and the population is comparatively low, so most of North America is sparsely inhabited by European standards.

What does this vast country mean for the radio amateur? For many, the most important factor is that they can easily find a place for

their antennas, even in towns.

Houses are normally detached, with their own patch of garden, and there is not the same problem (generally) with planning permission. Driving around the suburbs, I see h.f. and v.h.f. beams, some as high as 25-30 metres, every few blocks. Luckily, the stations are not usually all on the air at once!

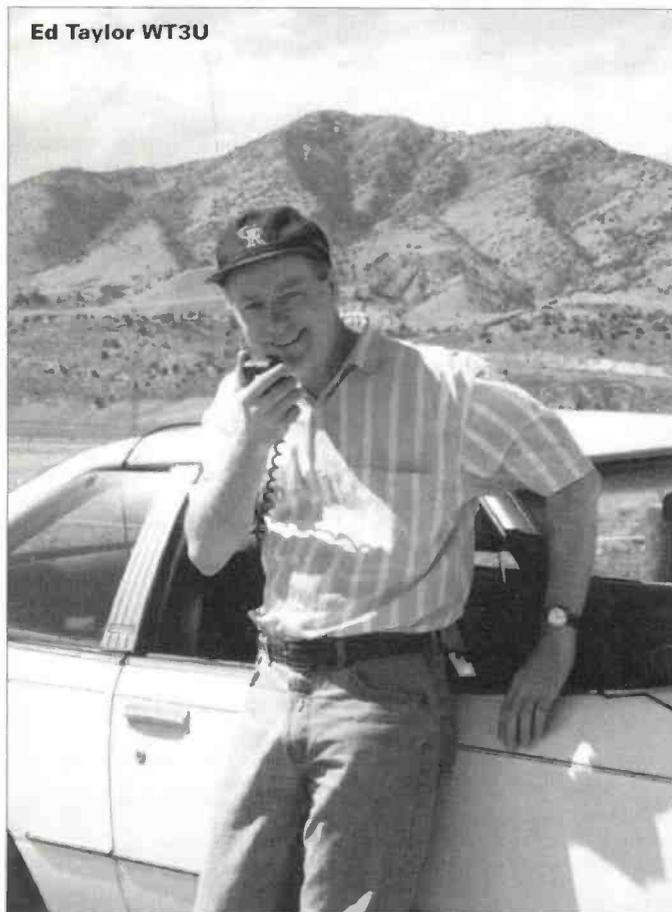
If you want to buy land out of town, and start putting up antennas, you'll have plenty of scope. I will report in the future on some of the antenna farms that can be found in the USA.

## American Attitude

There is a greater tolerance in the States by most people of the often curious things that radio amateurs do. This is partly as a result of the American attitude towards individuality.

Matters are also helped by the fact that there are about twice as many radio amateurs, in proportion to the population, as in the UK. I will set out my thoughts on why this might be in a future column.

It's also the case that amateurs here have a much better 'public



Ed Taylor WT3U

relations' image than we are accustomed to. The useful work done in organising back-up emergency communications is well-known in the USA.

There is also a public awareness of the merit of technical training, which is not considered a particularly valuable resource in the UK. In the USA, a qualified engineer is considered as a respected member of the community, carrying out a valuable function. I am sorry to say this is still not the widely-held view in the UK.

American radio amateurs are seen as people who have voluntarily achieved a technical status partly overlapping the professional learning of the electronic engineer, for the radio amateurs' own pleasure and for the benefit of the community.

Of course, the UK has always suffered from the idea that an art education is better than a scientific education. We are unlikely to be able to change this on our own.

However, we can be ambassadors for our own cause by stressing the technical training that amateur radio offers to those who

participate, particularly young people. This is something the USA can teach us.

## Swapmeets & Hamfests

Having recently arrived in Colorado, I thought there could be no better way to meet some of the local radio amateurs, than to visit a Mobile Rally. There are plenty of these, about one a month in the winter, and more in the summer.

The rallies are known by several names, generally Hamfests or Swapmeets, and are very popular. In winter these gatherings are held indoors, but in summer they are frequently in the open (as in the UK).

The Aurora Repeater Association recently sponsored a Swapmeet in the town of Henderson, just outside Denver, at the Adams County Fairgrounds. This is a multi-purpose set of halls in a nicely landscaped park area.

The good news about these events is that there is generally plenty of parking, you can just drive up and park outside. The bad news



Ed thinks the IC-775 is sure to be a hit in the USA, one to watch out for in Europe too!

is that they start pretty early. The Aurora swapmeet began at 8am, and it was in full swing by the time I arrived at 9.30.

About 50 tables were occupied, mostly by individual amateurs selling accumulated stuff. A few were occupied by dealers, and some were clearly taken by 'weekend traders' who had acquired items with a view to re-sale.

As with the UK mobile rallies, you could find everything: many junk boxes appeared to have been raided, with components for a few cents. But there were also one or two items of almost new equipment costing \$1000 or more.

Again as in the UK, computers have become more evident at the events. Complete machines were for sale as well as boards and components of all descriptions. If you had a few hundred dollars to spend, you could make up a very nice PC system, with a big hard disk, colour monitor, memory and plenty of boxed software.

The only thing I didn't see as much of as I expected was h.f. rigs. There were some older models, of the TS-830 variety, and some old all-valve rigs. But there was nothing at all like a TS-930 or IC-735.

In discussing this with the locals, I found that most amateurs keep their old rigs as standbys, or for use outside the shack. Another factor is that it's difficult to sell higher priced gear at this sort of event because you have no easy way of collecting cash. A cheque is no more certain in the US than it is in the UK!

So, did I buy anything? Yes I did, in the form of a 144MHz f.m. rig (Icom 25A), long in the tooth, but alright for packet and chatting. The price was \$150, about the same as the UK.

I also bought a dumb terminal, for packet use, very reasonable at \$1. I'm glad there's plenty of room in US houses, the terminal would make a fine boat anchor, occupying quite a lot of space!

## Licence Examinations

I suppose the one thing you will find at most US Hamfests, and not in the UK, is testing facilities for the amateur licence. To understand how it works, you need to know that all licence examinations in the USA are administered voluntarily by fellow radio amateurs.

Anyone who wishes to be a volunteer examiner has to meet fairly stringent requirements, and must use questions from a standard selection. There is no time limit, but surveillance rules are strict.

After taking the exam, it's marked on the spot, and you know the result immediately. If the examiner will allow it, you can re-take a failed exam straight away - naturally this will have different questions!

All examinations are multiple

choice, and the pass mark is 74%. You can take the exams anywhere, even outside the USA, this is what I did, getting my US callsign in London.

If you think that you could guess your way through to an American licence, you'd be wrong! A newcomer to the hobby with no technical background would need to work hard (as in the UK). Even an experienced operator will need to study diligently to upgrade to a higher class.

The volunteer method is also used for Morse testing, usually with an audio tape at the appropriate speed. The standard of copying accuracy to be achieved is lower than in the UK.

To me, the standard seems to be closer to what the amateur service actually needs, assuming you believe that a Morse qualification is sensible for h.f. operation. No sending test is required, which is probably not in theoretical accord with international regulations. If you have been really studying, you could walk out of the Hamfest with immediate authorisation to run 1.5kW in your hand.

The American licence system is complicated by the fact that there are six different licence categories. One of these corresponds to our Class B - v.h.f. only with no Morse test. The others require c.w. as well as a technical exam.

The easiest licence to obtain is the Novice, then there is gradually increasing difficulty with Technician, General, and Advanced. Finally, the Extra class licence is the most difficult, with a wide technical range, as well as morse at 20w.p.m.

Having undergone every level of the testing process (you have to pass each stage before you go onto the next), I can vouch for the efficiency and fairness of its operation. There is a nominal charge for expenses, and the licence itself is free, lasting for ten years. It's a mark of the generally high level of esteem for the amateur radio service that the American taxpayer seems willing to pay the costs of running the system.

## New Equipment

I'll try to bring you information on new radios that I hear about, since most rigs are sold in the USA before they come to Europe. American amateurs are very interested in new equipment, particularly h.f. transceivers. But the number of launches of h.f. gear seems to have diminished in recent years, so the latest one from Icom is generating lots of interest.

Icom have always been associated with more upmarket equipment, and their attempts to get into the lower priced end of the h.f. market have had mixed success. Many amateurs say that they should stick to what they know best, and



The opportunity of being able to take the amateur licence is popular and something that you will find at most US Hamfests.



The Aurora Swapmeet was in full swing by the time Ed arrived at 9.30am.

they certainly seem to have done so with their latest offering, the IC-775.

The IC-775 is expected to be in the US stores soon. It's more compact than similar rigs, and contains a built-in switched-mode power supply. Presumably Icom have eliminated the interference sometimes associated with these power supplies!

The main feature of the IC-775 is that it uses Digital Signal Processing (d.s.p.) throughout.

To explain (briefly), the signal is converted into a stream of binary digits, in a similar fashion to a CD recording. These bits can then be treated as numbers, and acted upon by mathematical formulae, in order to produce the required effect.

So filtering, selectivity, gain levels, compression, keying and so on are done by software, rather than with actual components. This provides performance which would be impossible with ordinary hardware, as in a conventional radio.

When the digital processing has been done, the revamped signal is converted back into analogue form, and transmitted in the normal way (or routed to the loudspeaker as required).

Other features include twin v.f.o.s, each with its own knob -

something which has helped with the popularity of Yaesu's FT-1000. There is a built-in antenna tuner, and a larger than average meter (the small size of meters has been the subject of some complaints on previous rigs). Direct connection to a computer is anticipated, with a closer interface than most radios hitherto.

The IC-775 should be a strong competitor to the FT-1000, which has been the rig of choice for some contesters of recent years. It will apparently be priced at just under US\$4000, plus tax, so should be quite competitive. Of course, this is not going to attract the beginners' market, but might shake things up as far as serious h.f. operators are concerned!

That's all for 'Scene USA' for this quarter. Let me know if there's anything you'd like me to cover in future editions. Deadline time for the next edition (October PW) is middle of July, so get writing soon. Send your letters to me Ed Taylor WT3U, PO Box 261304, Denver, Colorado 80226, USA.

**END**

# HF FAR & WIDE

Our new columnist Leighton Smart GWOLBI gets straight down to business in our new-look column for everyone interested in working world-wide on h.f.

**A** warm welcome to 'HF Far & Wide'! And first of all, I would like to extend thanks to Paul Essery GW3KFE for the sterling work carried out on his 'HF Bands Report' column in the past. Secondly, let me tell you that 'HF Far & Wide' is your column. What you the readers put in will make this new feature work.

If you have any information, reports, suggestions, photographs and items of interest to the h.f. operator, then please send them to me. Hopefully, by doing this other h.f. operators may benefit from your knowledge and experiences.

In the same way, short wave listener's reports are equally welcome. Very often the keen s.w.l.s will dig out something of interest that the h.f. operator will have missed! So, I look forward to hearing from you!

## Setting Up Skeds

I recently received some information from Dave Wilson AA0RS (via Ed Taylor WT3U..thanks Ed!) who is interested in setting up skeds and/or listening periods for UK stations. Dave will report to this column which stations he has heard or worked.

Dave lives in Colorado and works mainly on c.w. He can be heard most weekdays around 1200UTC on 1.8, 3.5, and 7MHz, and again at 0300UTC Tuesday to Saturday (mornings). And as Dave likes to work UK stations in particular, I intend to arrange listening periods with him so that readers of this column can, if they wish, receive reports from him.

Dave says the safest bet is 7MHz. So, as soon as I'm able to arrange times, etc., details will be announced in this column. I'm also hoping to set up UK - Australia and New Zealand skeds or listening periods, so watch this space!

## Your Reports

On to your reports now and I'll start off with 1.8MHz. First time reporter Steve Locke GW0SGL from Mountair Ash, used a Yaesu FT-757 GX and an end loaded long wire at 10m to contact Z08Z on Ascension Island and K2HSY, Long Island, New York with 100W s.s.b.

For his 1.8MHz log John G3BDQ

near Hastings had a near miss with S79MX in the Seychelles. This station responded to John's CQ but did not provide him with a report. John has now 'retreated' from 1.8MHz, as DX conditions in March have bottomed out.

## The 3.5MHz Band

Using a Kenwood TS-950 SDX and a Butternut vertical antenna at ground level, Don McLean G3NOF in Yeovil worked TP3CE using s.s.b. on 3.5MHz. Don found conditions quite good in early March, but very poor towards the end of the month.

Neal Jones GW0VQZ of Mountain Ash here in South Wales raised GM0RSE/P using a Yaesu FT-747 GX, a 'heavily loaded' shortened long wire antenna and 5W of c.w. Incidentally, GM0RSE is the callsign of the 'Morse Enthusiasts' Group Scotland'. They operate on 3.530MHz every Monday and Thursday evenings between 1900 and 2100UTC.

## The 7MHz Band

On the 7MHz band Eric Masters GOKRT in Surrey uses a QRP Lake DTR7 c.w. transceiver running 2W in to a W3EDP wire antenna. Eric says his best QRP DX on the band has been W1KM in Massachusetts; also worked were EA3AHQ in Spain, YO3FRI, Romania, plus HB9BWW in Spiez, Switzerland.

For his 7MHz log Don G3NOF snagged P39P in Cyprus, XX9X Macao, and YV5A in Venezuela, all on s.s.b. Don's success proves that 7MHz is a band that should not be ignored, despite the heavy QRM.

## The 14MHz Band

Venturing onto the 14MHz band, Steve GW0SGL, using 100W s.s.b. into a Hi-Gain 2-element beam at 8m took part in the WPX contest. Steve raised, amongst others, 6Y5DA in Jamaica at midday, VY2DX, Prince Edward Island, and ZF1DX in the Cayman Islands at around 1400UTC. On the second day, Steve reports good signals from VP2MDE, Montserrat, at S9+20dB at 17.26UTC.

Now over to Don G3NDF, who states that the long path on 14MHz has been opening to Australia, New



Keen QRP operator Clemed Nilsson SM7DRM's station showing solar panel power supply (see text).

Zealand and Japan at around 0800UTC, followed by some Asian openings. Don reports that the short path to Africa and Asia at 1500UTC has brought in some rare ones.

Using a TET HB33SP 3-element beam antenna at 20m, the cream of Don G3NOF's report are A71A Qatar, BV9AYA Taiwan, HH2PK Haiti and JWOC Svalbard Island. He also worked 3B8GF Mauritius, 3D2CT Conway Reef, 9G4BS Ghana, 9M0A Malaysia, 9Q5FH Zaire, and 9X5EE Rwanda.

As a footnote to 14MHz operations, Clemed Nilsson SM7DRM reports his completion of Worked All Continents QRP. He achieved this by working Maggie NP2GP in the Virgin Islands, receiving a 549 report using a Cushcraft multiband beam antenna. Clemed uses low powered rigs such as the MFJ-9020, Argonaut 2, etc., as well as homebrewed equipment. He also utilises solar energy to provide power for his station, see Fig. 1. Clemed says he would like to work stations from the UK, and uses 14.060MHz regularly.

## The 18 & 24MHz Bands

Now it's on up to the 18 & 24MHz bands. John G3BDQ who uses all wire antennas, worked XU95HA in Cambodia, 9X5FTA in Kigali, Rwanda and WA6BEX Boulder, Colorado on 18MHz.

Don G3NOF indicates short path openings to Japan around 0900UTC, followed by other Asian signals on 18MHz. African stations appeared during the afternoon, with North American signals between noon and 1800UTC. The band produced some nice DX in March as Don lists FY5GF French Guyana, G3UXO/MM (on the Cunard Line's *Queen Elizabeth II*) N6BFM/9K2 Kuwait, P40MR Aruba, PJ8AD Leeward Islands, S0RASD

Western Sahara, TU2ZR Ivory Coast, W7LR Montana, VU2TRI India, YB2ARW Indonesia, and YS1SX El Salvador, while 24MHz produced CP8XA Bolivia, Z21CS Zimbabwe and VP8CIL Falkland Islands, all on s.s.b.

## The 21MHz Band

Steve GW0SGL found conditions variable on the 21MHz band, but says conditions tended to peak around noon to 1400UTC. His log indicated s.s.b. contacts with Alex D2RU in Luanda Angola, (QSL via GM0FET), Patrick FG5GZ Guadeloupe, (QSL via F6CLK) and EA8CAL Tenerife.

For his 21MHz report John G3BDQ logged s.s.b. contacts with YC9BV Indonesia, AP2JZB Pakistan, 6D2X Mexico, ZP0Y Paraguay, and H20 in Cyprus. He also mentions that fairly frequent east-west contacts have all but disappeared of late, to be replaced by some interesting DX from the Far East on 21MHz.

Finally for 21MHz Don G3NOF mentions that with his TET HB33SP 3-element beam he worked ZS6BJH South Africa, 4X2T Israel, 5N0SAI Nigeria, and 9G1BS Ghana. Don says there were a few openings during March/April in the afternoons to north Africa, while some southern African stations were heard around 1700UTC.

## Signing Off

Time to sign off. So, reports, information on your station, antennas, conditions, etc., will be appreciated by the 15th of each month (at the latest). It's your column, and I look forward to hearing from you soon! Write to me Leighton Smart GWOLBI at 33 Nant Gwyn, Trelewis, Mid Glamorgan, Wales CF46 6DB

**END**

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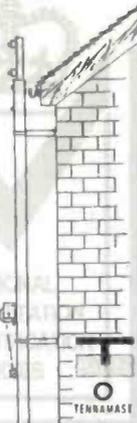
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# BITS & BYTES - COMPUTING IN RADIO

*Mike Richards G4WNC has news on software suppliers, Internet access and wants you to help him find the ultimate computerised station.*

**N**ick Ashby of Ruislip has recently contacted me with some useful details of software suppliers for the Atari computer. In the UK he recommends **B & J Telecommunications, 9 Queens Walk, Thornbury Nr. Bristol BS12 1SR. Tel: (01454) 416381.**

**Alan Jones G3AZT** runs the B & J organisation and provides specialist radio related PD and Shareware for the Atari and Amiga computers. The next suggestion is to try the Canadian Atari Microcomputer Network, AD: ASTRA.

The AD ASTRA network is operated entirely by radio amateurs and features a weekly net on 14.235MHz every Sunday at 1600UTC. The librarian for this group is **John Adams KC5FW-1011, Impala Isle-Granite Shoals-Texas 78654 USA.**

All you need do is send a formatted disk, return mailing label and sufficient IRCs to cover the return postage. Programs available include WEFAX, SSTV and one disk containing PACTOR, AMTOR, C.W., RTTY and ASCII by W8ZZO. If any readers know of other sources of non-PC software, please write and let me know the details.

## Ultimate Computerised Station

The ultimate computerised station, no I haven't found it yet, but I'm looking! With so many different software systems and combinations of radio equipment, I'm sure readers have developed all manner of neat set-ups.

Well, I'd like to hear about your station with a particular accent on how you use the computer. I'm especially interested to know what software packages are being used and the various pro's and cons of other systems you may have tried. If you can also manage a photo of the station that would be even better.

What may also be interesting is to put together the idea of a dream system. This is where you put to one side the limitations of what's currently available and start thinking about what you would like a

computerised station to be able to do.

In my experience, once you set out the requirements there's usually a bright programmer somewhere that will come up with the software. If you have any ideas or would like your system featured in the column, just drop me a line with the details - I might even be able to come up with a prize or two!

## CompuServe Internet Access

If you're thinking of joining the Internet but not sure how to start, CompuServe could be the answer. CompuServe are famous for their world-wide data network and have now opened up full Internet access.

For many the most daunting aspect of the Internet is the wide range of service suppliers and software systems. As CompuServe are experts in providing data services to new users, they've put a lot of effort into making the Internet connection very straightforward.

If you run a PC with Microsoft Windows, CompuServe provide a package called NetLauncher that can be downloaded from CompuServe free of charge. This provides a dedicated Internet dialler that set's up the Internet connection for you.

Also included is a special version of World Wide Web browser Spry Mosaic and a graphics file viewer. This gives you a very good starting point for Internet work.

An additional feature of the CompuServe software is that it is fully Winsock compliant. This means that the basic connection software will work with the wide range of excellent shareware applications that can be downloaded from the Internet.

To cope with the increased demand from the new service, CompuServe are upgrading all their dial-up nodes to run at up to 28.8kb/s in line with the V.34 standard. During the coming year they are also going to more than double the number of access lines from the current 42 000 to 85 000 lines.

Not only does it look as though the CompuServe Internet offering is

going to be very powerful, but could be one of the cheapest. For the standard CompuServe monthly subscription of £6.50 you get full access to CompuServe's main services plus two hours of free Internet time. If you use more time, this is charged at £1.70 per hour.

Should you need greater access time, you can join the CompuServe Internet club and pay an additional monthly subscription of £10. This provides 20 hours per month of access with additional hours available at £1.30 per hour. If you'd like more details you can contact CompuServe's UK sales line on (0800) 289378.

## Practice RTTY

If you want some practice with your RTTY operation, why not have a go at the SARTG World Wide RTTY contest.

As contests go, the SARTG contest is relatively civilised in its operating periods which are 0000-0800UTC and 1600-2400UTC on Saturday August 19 plus 0800-1600UTC on Sunday August 20th. The bands used are 3.5, 7, 14, 21 and 28MHz and for each contact you have to exchange RST and a QSO number starting with 001.

The entry classes are: single operator, all bands; single operator, single band; multi-operator, single transmitter, all bands; short wave listener, all bands. The scoring system works as follows: Own country 5 points; own continent 10 points; other continents 15 points.

In addition multipliers are scored as follows: Each country as per the DXCC list counts as one multiplier on each band. Each call district in Australia, Canada, Japan and USA will also count as one multiplier on each band. The overall score is the sum of QSO points x sum of multipliers.

To enter the contest logs must be received by October 10 and they must contain: band, date/time (UTC), callsign, message sent and received, points and multiplier. Plus for each band you must send a separate summary sheet showing the scoring, entry class, callsign(s), Name(s) and address.

The logs need to be sent to the contest manager, **Bo Ohlsson SM4CMG, Skulsta 1258, S-710 41 Fellingsbro, Sweden.**

## Special Offers

Here's a summary of the latest special offers for 'Bits & Bytes' readers. I try to turn orders around in a week or two, but **please allow up to two weeks for delivery.**

**JVFAX 7.0 - FAX & SSTV** transceiver for IBM compatible computers.

**HAMCOMM 3.0 - RTTY, CW & AMTOR** transceiver also for IBM compatible computers.

**NuMorse - Comprehensive** Morse tutor for Windows 3.1 users.

**UltraPak 2.1 - TNC-2 driver** for Windows 3.1 users.

**FactPack 1 Interference - Help** with those difficult computer interference problems.

**FactPack 4 JVFX and HAMCOMM Primer -** Receiving your first FAX and RTTY signals.

**FactPack 5 On the Air with JVFX and HAMCOMM -** preparing for that first transmission.

**FactPack 6 Internet Starter -** Basic guidance to get you started on The Internet.

To receive any of these offers just send a self addressed sticky label plus 50p per item (£1.50 for four or all eight for £3.00). If you're ordering JVFX/HAMCOMM/NuMorse/UltraPak you will also need to send a blank, formatted 3.5in 720k disk for each program or just two 1.44Mb high density disks.

**Time and space have caught up with me so until next time cheerio and please keep those letters coming to me Mike Richards G4WNC, 'Bits & Bytes', PO Box 1863, Ringwood, Hants BH24 3XD. CompuServe: 100411, 3444; Internet: mike.richards@bbcnc.org.uk**

**END**

# VHF REPORT

This month David Butler G4ASR looks again at the possibilities of transatlantic Sp-E contacts on the 144MHz band and also discusses E-layer propagation.

In recent issues of *PWM* I've been considering the possibility of making the first authenticated QSO between Europe and North America on the 144MHz band. Note that in this context any contacts made via e.m.e. (earth-moon-earth) or satellites are excluded.

The debate has centred on making an s.s.b. or c.w. DX contact via conventional propagation modes such as tropo, Sp-E or meteor scatter.

And I'm pleased to report that the Irish Radio Transmitters Society (IRTS) has announced that it is sponsoring an award to the first pair of stations to establish two-way communications across the Atlantic on the 144MHz band. So, if you've been following this column in recent months you'll know exactly what is required!

The Brendan Trophy, as the award is known, is actually a pair of beautiful Waterford Crystal cut glass vases. They're something well worth aiming for.

The trophies are named after St. Brendan, a 5th century Irish monk and explorer. Brendan the Navigator, as he was also known, travelled widely in the north Atlantic region. (St. Brendan's Day is actually celebrated on May 16). I'll be providing the full set of rules for this 144MHz Trans-Atlantic challenge in next month's issue.

Ken Osborne G4IGO was interested to read the comments made by Andy Nicholls G3VMZ in the April column. It was regarding statistics that showed that the 144MHz band could support communication over a path length of 3500km.

Any QSO would be accomplished via Sp-E propagation in late May or early June. Ken mentions that his records also indicate that this is possible but disagrees that it would necessarily apply to the westerly UK-USA transatlantic path.

Ken states that he would love to be proved wrong over this assertion. He does however, agree that UK operators should look for evidence of v.h.f. E-layer propagation on this path. But it's no good saying you heard some super DX without corroborative proof.

Tape recordings of station identification and written confirmation are needed.

## Previous Tests

Referring to previous tests made by Derek Hillier G4CQM (1070) Ken questions how he can be sure that the station on 95.5MHz was specifically CBC in Sydney, Nova Scotia. According to G4IGO there are many European stations that use this frequency.

Similarly, just because the antenna was on a beam heading of 295° doesn't mean that the received signal came from that direction. Although the time of reception was the peak for lower frequency v.h.f. propagation it would also be a prime time for back-scatter signals from Europe. Ken suggests that G4CQM should make his Band II f.m. antenna rotatable to ensure that he's not misleading himself.

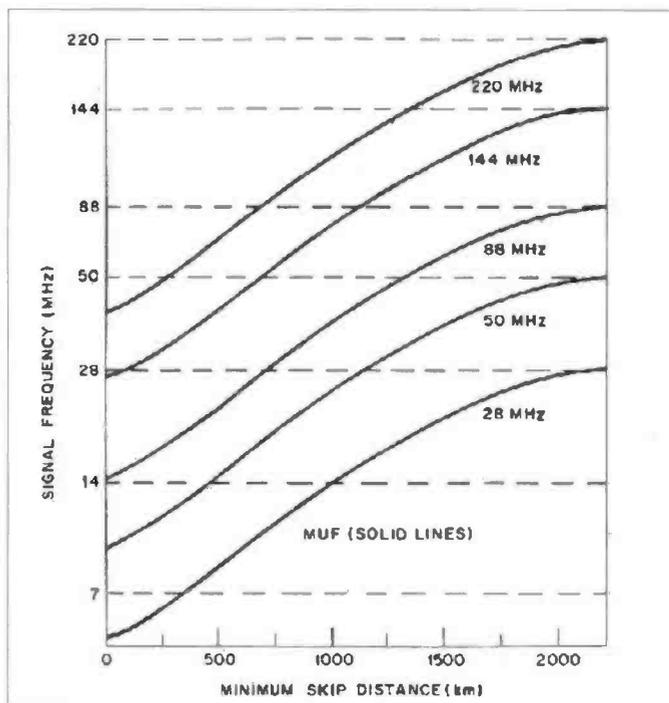
Another operator who has been listening for North American v.h.f. stations is Mark Holloway G4YRY (1090). He, like G4CQM, has also been monitoring signals on Band II (88-108MHz).

Mark's interest was heightened following Sp-E contacts made on the 144MHz band in 1993 with DX stations located in the Canary Islands. He reports that every summer he consistently hears f.m. broadcast stations from the same area off the African coast and has verified this with EA8AEA in Tenerife.

Recalling an excellent opening in July 1994, Marks reports that was when EA8 stations were heard for nearly four hours on the 144MHz band. Signals were weak but very consistent.

Mark is not convinced that propagation was via 2-hop Sp-E as no Portuguese stations were heard at the mid-point. He suggests it may have been caused by tilting of the Sp-E clouds thereby avoiding double-hop.

Although Mark's theory may well be correct I don't think that the other options should be excluded. Making the observation that nothing was heard from the midpoint doesn't mean that two hops weren't



Graph produced by Emil Pocock W3EP showing the relationship between path distance, frequency and m.u.f. (see text).

present.

It's not simply a case of measuring the distance from G to EA8 and deducing that Portugal is midway. Propagation paths don't work in neat numerical divisions!

A 3000km path doesn't equate to two 1500km hops. It could be 1200km and 1800km or whatever combination you choose.

In the case of the G-EA8 path it's quite likely that the reflection point (if indeed there was one) was in the Atlantic Ocean. And as you know there's very little activity there!

## Monitoring Band II

Mark mentions that results of monitoring Band II f.m. broadcast stations has been very rewarding. He advocates listening on these frequencies first rather than Band I TV or 50MHz.

In his opinion Mark thinks the skip distance is too short and the Sp-E cloud is too near when the maximum usable frequency (m.u.f.) is very high. (Note however that this statement was challenged by G4IGO in the June issue of *PWM*)

Mark reports that Arabic broadcast stations are often heard for hours at a time. Although they are over 1800km away he notes that

this rarely means that the m.u.f. will reach up to the 144MHz band. He also mentions the graph constructed by W3EP, shown in Fig. 1.

The graph shows the relationship between path distance, frequency and m.u.f. for signals propagated by means of Sp-E clouds at an altitude of 105km. The chart assumes a single-reflection path from one E-layer cloud.

To use the graph in Fig. 1, read the signal frequency from the left hand vertical scale. The m.u.f. is read from the solid lines and minimum skip distance from the horizontal scale.

The graph allows determination of E-cloud m.u.f. when path length and signal frequency are known. Alternatively it gives the maximum path length for a given signal frequency when the E-cloud m.u.f. is known.

Mark G4YRY uses this table to estimate the m.u.f. and with accurate station identification (on Band II) can often predict an opening at 144MHz. During a Sp-E opening last year a number of EA stations were worked at a distance of under 900km. The m.u.f. on this occasion probably exceeded 200MHz.

## Six News Journal

In the April issue of *Six News* (the 48-page quarterly journal of the **UK Six Metre Group**) **Emil Pockock W3EP** gave his reasons why it's more difficult to work between 2400-2800km on Sp-E than shorter or longer distances. Although the discussion was aimed at 50MHz propagation it's still relevant to E-layer contacts at 144MHz.

Emil reports that the maximum single-hop distance for Sp-E contacts is around 2300km. This is a geometric constraint based on an average height of E-layer ionisation of 105km or so.

Curiously, Sp-E paths in the 1800-2200km range are probably the most common. This is because the single-hop distances near the m.u.f. are also the longest.

As the m.u.f. rises above 50MHz the path shortens up. It may also be possible that some Sp-E paths at 2400km or even longer are also completed by unusually long single hops.

The problem is that 1200km paths are unusual at 50MHz because the required m.u.f. to create such short hops is high, perhaps in the 100MHz range. Thus in order to complete a 2400km path at 50MHz, two separate Sp-E centres with m.u.f.s of 100MHz and spaced 1200km apart (or so) are needed.

As the path lengthens from 2400km the required m.u.f. for the two Sp-E centres drop, thus making it more likely that the required geometry will be achieved. In theory this suggests that as the distance approaches 4600km there should be a greater incidence of double-hop Sp-E.

## Doughnut Shape

When the probability of contacts are graphed in two-dimensional space a doughnut shape emerges. (Sp-E contacts shorter than 400km are rare - that's the hole in the middle of the doughnut).

As the distance lengthens from 400km the occurrence of Sp-E contacts increases until 2300km is reached. (That's the main part of the doughnut).

There's a well defined drop-off between 2300-2800km amounting to a sharp boundary. Beyond this range contacts become more likely until 4600km when a second, but less sharply defined boundary, is reached.

At 4600km and longer there are many possible configurations of hops that make the 4600-5200km void less clearly defined. A 4800km path could be completed by three 1600km hops for example.

The m.u.f. requirements for 1600km hops are not as high as for 1200km. Although finding three Sp-E centres lined up optimally is not common either.

You can make your own calculations and discover the various possibilities for difficult distances. This line of logic suggest that there may be some prime distances for multi-hop Sp-E.

If the most common single hop contacts near the m.u.f. fall into the 1800-2200km range then the most common multi-hop paths might be expected at 3600-4400km, 5400-6600km, and so on.

Wouldn't it be nice if a system could be devised that could actually see what was happening in the E-layer? And that's exactly what **Geoff Brown GJ4ICD** and **George Viale F8OP** have developed.

## Modified Marine Radar

According to a recent packet radio bulletin from Geoff, the GJ4ICD/F8OP system consists of a modified marine radar unit with XY outputs. This feeds into an analogue/digital interface and then to the serial port of a computer with special software.

In use Geoff and George's equipment can display colour images of Sp-E clouds as they form and move about. Geoff hopes that this idea will enable operators to predict when DX openings will occur.

Recent usage has been limited by the lack of Sp-E events but on October 23 1994 much activity was seen. George F8OP was able to make a scan showing three areas of intense ionisation.

One area stretched from the Swiss Alps to Luxembourg, another over Italy and a third over Croatia.

Another scan, 30 minutes later, showed that the Swiss Alpine cloud had decreased in size. But the Italian cloud had disappeared and the Croatian cloud had expanded in size.

## Extensive Openings

At the time of the GJ4ICD/F8OP observations by there were extensive openings on the 50MHz band throughout Europe. My records show that the band opened up around 1730UTC with propagation into ES, SM, OZ.

By 1800UTC stations in DL, OK and SP were being worked from the UK. This continued throughout the evening with the propagation slowly moving clockwise.

Many OE, YU and S5 stations could be worked from 1900UTC onwards and from 2100UTC Italian stations appeared. At my QTH (IO81) the opening finished around 2330UTC.

During the Christmas period Geoff left the 'transcanner' running in the hope of spotting some winter Sp-E propagation. On December 26 from 1200UTC he noted E-layer clouds forming over Scandinavia.

Half an hour later stations in

north-west England were reporting contacts on the 50MHz band into ES, OZ and OH. Much better results were obtained on December 28 when a number of separate openings were observed.

My propagation log shows the first event taking place between 1000-1230UTC into DL, ES, LA, OH, OZ and SM. Later in the day, between 1515-1720UTC, a smaller event was in progress allowing UK stations to make further contacts into Scandinavia.

From 1730UTC yet another cloud formation had developed allowing communication into OE and SP. An E-layer cloud over the North Sea was simultaneously giving a communication path into the OZ/SM area.

By 1830UTC the clouds had dissipated and the band was devoid of DX stations. I think Geoff and George's efforts have provided excellent results and GJ4ICD is to be congratulated on this innovative idea.

## Message Via Internet

And now to my first message received via the *PW* Internet mail system. It's from **Paul Whatton G4DCV** who used to be a very active v.h.f. DXer a decade ago. (Unfortunately his present QTH doesn't allow him to put up big antennas now.)

Paul has very been interested in the possibility of a transatlantic QSO for many years and is surprised that it still hasn't been achieved. He thinks the reason for this is that no one has really tried the seemingly impossible.

The probability of two stations being on the right frequency, with antennas in the right direction, at the right time is very low. Paul therefore suggests that a series of organised transatlantic tests be carried out during peak propagation times. Paul thinks that one of the problems might be finding suitably equipped DX stations in North America to participate. He concludes that if a QSO was made it would be a great way to finish the 20th century!

## Stations Listening

One of the stations that will be listening for UK stations this year is **Emil W3EP**. During the summer he will be monitoring the s.s.b. calling frequency on 70.200MHz. So if you work him on the 50MHz band ask him to listen for you crossband on 70MHz.

Although not listening for transatlantic signals, **Marcel F5DQK** is also interested in receiving stations on the 70MHz band. He used an FT-736R and an RN Electronics transverter.

Marcel has a choice of antennas is available, either a 2-element

## UK Six Metre Group

Membership of the **UK Six Metre Group (UKSMG)** costs only £7 and can be obtained by writing to **Chris Gare G3WOS, Old White Lodge, 183 Sycamore Road, Farnborough, Hampshire GU14 6RF.**

HB9CV or a dipole. He's located in Paris (JN18), which is too close for Sp-E propagation into Southern England.

In his report, Marcel says that signals are normally heard via the Sp-E mode from around 500km away. Crossband contacts (normally to 50MHz) have been made with **GOMEJ (IO84)**, **GM4ISM (IO85)**, **GM4JJJ (IO86)**, **GS3RIJ (IO85)**, **GV4ALG (IO81)**, **GW3MHW (IO82)** and **ZB0T (IM76)**. The beacon **GB3ANG (70.020MHz)** is also frequently heard.

In April I reported that my records showed that the winter Sp-E season (Dec 94-Jan 95) was particularly good. Ken G4IGO supports this by mentioning that openings during the same period in 1988 totalled five, that in 1992 amounted to 14, dropping to eight in 1993.

In the winter season ending 1994 Ken noted 18 openings but this year the number had increased to 18 Sp-E events. However, G4IGO mentions that the large increase in amateur activity must also be taken into account. In his opinion the general incidence of E-layer propagation is actually declining.

Personally I think Ken may be on sticky ground here. It's true that there have been some spectacular E-layer openings in the past but records of these particular events have probably only been properly recorded for maybe three or four solar cycles. That's only about 45 years which is infinitesimally small compared to the grand scheme of things!

## Deadline Time

Deadline time again! And by the time you've read this the first of many 144MHz Sp-E openings would have occurred.

So, if you caught any events or want to pass on any v.h.f. news please let me know about it. I'm also looking for photographs of your shack or antennas to be printed in the column.

Send details 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.**

**END**

## BROADCAST

## ROUND-UP

*Peter Shore has all the latest broadcasting news together with details of radio stations who have recently joined the ever growing Internet.*

**A**s I reported last month, although the tests of Prague-based commercial station Radio Metropolis brought the largest post bag I have had since this column started, the station itself was one of the shortest lived!

Confirmation came at the end of April when the Czech press reported that along with three other commercial stations, Radio Metropolis will lose its licence to broadcast on January 1, 1996. This means that no more will there be an alternative to Czech Radio's international service.

If you want to tune in to Radio Prague on short wave, English is heard at: 0600-0627 on 15.64 and 7.345; 1030-1057 on 9.505 and 7.345; 1600-1627 on 17.485 and 5.93; 1700-1727 on 15.64 and 5.93 and 2000-2027 on 11.64 and 5.93MHz.

### On The Net

Meanwhile Czech Radio is available on the Internet. If you can send and receive E-mail, send a message to [cr@radio.anet.cz](mailto:cr@radio.anet.cz) with the subject line of "Subscribe English". The station will then send a transcript of its weekday news bulletin and a daily Czech tip, ranging from a recipe for Czech dumplings to what's new in and around Prague.

If you want to find out about other stations on the World Wide Web, or W3 as it is often known, look for a list prepared by Theodric Young (whose address is [theodric@mit.edu](mailto:theodric@mit.edu)).

A version of his list updated to April 12 shows 424 stations around the world who make use of the Internet, and 19 other broadcasting networks from Radio France Internationale to YLE Radio Finland. Some offer audio via the Internet, so if you have a computer and a modem that can cope with large files, start downloading programmes to listen in digital quality at a time you choose!

### Summer Schedules

The English service of Radiodiffusion Algerienne is on the air to Europe at 1800 on 11.715MHz with a 50kW transmitter. At 2000, the station airs to South America in English using a 100kW transmitter on 15.215 as well as the 50kW sender on 11.715MHz. At 2200 on 15.215, the station transmits

programmes from the Polisario Front.

The summer schedule from Radio Netherlands shows programmes in English to Europe: 0930-1030 on Astra via the World Radio Network on transponder 22; 1130-1330 on 9.65 (via Deutsche Welle at Nauen) and 6.045; 1630-1730 on Astra via the World Radio Network on transponder 22; 1830-1930 on planned Astra 1D transponder 64 at 10.936GHz, audio subcarrier at 7.74; 2030-2230. Also on 1386kHz medium wave from Kaliningrad and planned Astra 1D transponder 64 at 10.936GHz, audio subcarrier at 7.74MHz; 0030-0130 on planned Astra 1D transponder 64 at 10.936 GHz, audio subcarrier at 7.74 MHz; 0230-0330 on World Radio Network and on the planned 1D channel and 0430-0530 on planned Astra 1D

The weekly communications programme *Media Network*, now co-hosted by Diana Janssen and Jonathan Marks, airs on Thursdays at 0951, 1151, 1551, 2151, and on Fridays at 0051, 0251 and 0451UTC.

Since late April, Radio Netherlands has had pages on W3. The frequency schedules of four languages are shown as well as

### Radio Romania International has made changes to its schedules.



### Belgium's Radio Vlaanderen International is transmitted on shortwave and satellite.

background information about the station. Coming soon, according to *Media Network*, are electronic versions of the printed booklets *Antenna Advice* and *Info Dutch*. Computer users can access the pages through <http://www.rnw.nl/rnw>

Neighbouring Belgium's Radio Vlaanderen International has English to Europe at: 0630-0655 on 9.925MHz and 1512kHz; 0900-0925 on 17.595, 15.545 and 6.035MHz and 1512kHz (Mon-Sat only); 1230-1255 on 13.67 and 1512kHz (Sunday only); 1300-1325 on 13.67 and 1512kHz (Mon-Sat only); 1800-1825 on 5.91 and 1512kHz and 2100-2125 on 5.94 and 1512kHz. All RVI transmissions are also carried on Astra 1C at 10.921GHz and the audio subcarrier at 7.38MHz.

Radio Romania International made a last-minute change to its summer European frequency schedule. At 1900 and 2100, new 9.550MHz replaces existing 9.75MHz.



### Holiday Listening

Holiday time is coming up soon. So, *PW* readers planning to jet off into the sunshine of the Mediterranean might care to tune to the international service of the country they are travelling to.

The Voice of Greece is now on the air to Europe between 0600 and 0800 on 9.375, 9.425 and 11.645MHz, with Greek and English. At 2000 tune to 9.375MHz for a number of languages including English.

The RDP Portugal station has English on weekdays only at 2000 and 2030 on 15.515, 9.815, 9.78 and 6.13MHz.

Kol Israel has English at 0400-0415 on 7.465 and 9.435MHz; 1000-1030 on 15.64, 15.65 and 17.575MHz and 1900-1910 on 15.64, 11.685, 11.603, 9.435 and 7.465MHz.

Radio Bulgaria has English to Europe for an hour at 1900 and 2100 on 9.70 and 11.72MHz. Both transmitters are at Plovdiv, with the 31 metre band channel using 500kW and the 25 metre band frequency using 250kW.

Radio Korea International's European English service can be heard at: 0800-0900 on 13.67 and 7.55M; 1600-1700 on 9.87, 9.515, 6.48 and 5.975; 1900-2000 on 7.275, 6.48 and 5.975; 2100-2200 on 15.575 and 6.48; 2200-2230 on 5.965MHz (via the BBC World Service Skelton transmitter in Cumbria)

Next month I hope to be reporting on a device that could make f.m. DXing very easy - it's a fully Radio Data System (RDS) compatible f.m. tuner that can be fitted to a PC. This will enable users to tune to across the f.m. bands at times of sporadic-E activity, when f.m. signals travel enormous distances, and gain instant identification of those transmitting Radio Data System information. Until then, keep your ears to the bands, and let me know of any interesting finds.

**END**

# PACKET PANORAMA

Roger Cooke G3LDI continues his report on his trip 'down-under', is outwitted by the BARTG secretary and brings you news of a change of sysop.

**W**hile staying in Sydney I helped John VK2SB, my host, get going on packet. We visited the radio shops in and around Sydney, the largest of which is Dick Smith's. There are stores with this name all over VK and they are very well-established.

John bought a KPC-3, a new 144MHz collinear antenna and we assembled the whole lot in a couple of hours. The local BBS, VK2OP was quite strong and we soon logged on and I spent quite some time showing John how to use the BBS.

Since then John has also changed his computer to an IBM compatible (using 486DX2 chip). He's becoming proficient in the art of sending mail!

In my last article I mentioned Jo Harris VK2KAA. Jo is a very active packeteer and is on the committee of the Australian Amateur Packet Radio Association (AAPRA). We visited Jo at her house in Wahroonga and had a very enjoyable afternoon with her and David Ramsay VK2KLX, who is the President of AAPRA.

## Active On Packet

Jo is very active on packet radio and has about three or four systems running on several frequencies. One of the very neat ideas in her shack is the ability to be able to walk round to the rear of the equipment to change cables, etc. This takes away all the hassle associated with the wires at the back of transceivers, etc.

Incidentally, Jo also runs one of the most comprehensive callbook systems that I have ever seen. Admittedly it only covers Australia, but it takes up all those books you can see in on her shelves.

The reason for the size of the system is that if you looked up a callsign, it gives not just the name and address, but a potted life-history and photograph of the person. It has taken Jo years to accumulate all this information.

Australia's AAPRA is a very active packet organisation and helps to sponsor the VK network. This is possible due to the fact that membership has grown enormously

since AAPRA's inception around nine years ago. In fact there are several UK stations who are members and they receive the very nice quarterly newsletter.

Jo is pictured in Fig. 1, along with David Ramsay VK2KLX, the President of AAPRA. Membership of AAPRA is available to overseas amateurs and is actively encouraged.

The fee for overseas members is SA18 per annum. Their newsletter contains very useful information, including network news, hints and tips on various software packages, the Program Library listing, various articles, chat columns and a very impressive membership list. The association also make available TNCs, books and manuals, EPROM updates and so on.

Packet is growing quite rapidly in Australia. Although it must be one of the worst places in the world to build an efficient network, as 'just down the road' can take on a whole new meaning, as I found out to my cost.

'Just down the road', as used loosely down under, means about 100 miles! However, in the immediate district of Sydney there are several BBSs active and quite a lot of users, which grow by the day. I asked John why he was not a member of the Sydney Radio Club. It turns out that the club, which is still termed as being in Sydney is about 70 miles from where John lives!

John is the one on the left and, yes it is me standing next to him, Fig. 2, somewhere in Queensland!

## Working Secretary

Members of British Amateur radio Teledata Group (BARTG) will all know Ian Brothwell G4EAN, their hard-working Secretary. I've been pestering Ian for a station photograph for some time now, fully expecting that this was the sneakiest way of getting his photograph for this column.

Well, sure enough, Ian's station is featured in Fig. 3, but there's no sign of an operator. It seems he is sneakier than I am!

Ian runs the FT-757GX on h.f., with an auto a.t.u. He uses the 144MHz FT-290 and a KAM for

**Fig. 1: Jo Harris VK2KAA the secretary of AARPA sits with David Ramsey VK2KLX, the president of AARPA, on her right.**



**Fig. 2: John VJ2SB and Roger Cooke (wearing the tourist version hat) pictured 'somewhere in Queensland'.**



**Fig. 3: Ian Brothwell outwitted Roger with this picture of his (Ian's) shack. Roger had wanted a picture to include Ian!**

packet and his computer is the Commodore C-64 with disk drives and printer.

The antennas used at G4EAN are a 4-ele quad antenna in the attic for v.h.f. and a TH3 and G5RV for h.f. Ian's spelling checker is the *Chambers Dictionary*! Well, I also have one of those, very functional together with a Thesaurus! Ian can also be reached on Internet at [ibx@cs.nott.ac.uk](mailto:ibx@cs.nott.ac.uk)

## Sysop Change

And now for a change of sysop, Andy Matheson G3ZYP, has just taken over as Sysop of GB7MXM in

Felixtowe. Andy is responsible for sending out the BARTG news on packet and always makes sure that I get the copy for my local server.

That's all I have to say this month, other than 73 and happy packeting de Roger, G3LDI@GB7LDI or Tel: (01508) 570278.

**END**

## Essex Amateur Radio Services

4 Northern Avenue, Benfleet, Essex SS7 5SN

Telephone: 01268 752522

Mobile: 0860 947010 Alan

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 FT-747GX boxed new Special Price  
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 IC-706 boxed new Special Price  
 DX-70 boxed new Special Price  
 FT-757GX boxed (2)  
 FT-757GXII boxed  
 FT-747GXII boxed (3)  
 TS-120V boxed  
 IC-735 boxed  
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 Dressler AR430 active antenna h.f.  
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Dr James L. Lawson W2PVP  
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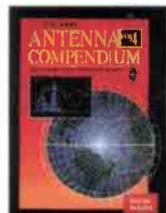
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#### HOW TO PASS THE RADIO AMATEURS' EXAMINATION (RSGB)

Clive Smith G4FZH and George Benbow G3HB  
The background to multiple choice exams and how to study for them with sample RAE paper for practice plus maths revision and how to study for the exam. The majority of this book is given to sample examination papers so that candidates can familiarise themselves with the examination and assess their ability.  
88 pages. £7.99

#### RAE MANUAL (RSGB)

G. L. Benbow G3HB  
The latest edition of the standard aid to studying for the Radio Amateurs' Examination. Updated to cover the latest revisions to the syllabus. Takes the candidate step-by-step through the course.  
127 pages. £7.99



## RAE REVISION NOTES (RSGB)

G.L. Benbow G3HB

If you're studying for the Radio Amateur's Examination, this book could be useful. It's a summary of the salient points of the Radio Amateur's Examination Manual, the standard textbook for the exam. It's A5 size, and therefore can be carried with you wherever you go. Easy-to-read, it's divided into 13 chapters with topics like receivers, power supplies, measurements; operating procedures; licence conditions and a summary of the formulae all dealt with. 92 pages. £4.99.

## REVISION QUESTIONS FOR THE NOVICE RAE (RSGB)

Esde Tyler G0AEC

In effect Esde Tyler's book could be considered as being a training manual for the NRAE. Answers are supplied and the book provides a useful reference source. 60 pages. £5.00.

## SHORT WAVE COMMUNICATIONS

Peter Rouse GU1DKD

Covers a very wide area and so provides an ideal introduction to the hobby of radio comms. International frequency listings for aviation, marine, military, space launches, search and rescue, etc. Chapters on basic radio propagation, how to work your radio and what the controls do, antennas and band plans. 187 pages. £8.95.

## THE NOVICE LICENCE STUDENT'S NOTEBOOK

John Case G4WHWR

This is the recommended course book for anyone taking the Novice Licence. Covering all aspects of amateur radio and electronics it would be useful to anyone starting out in amateur radio. Every left hand page is for your own notes of explanation. 124 pages. £5.99.

## TRAINING FOR THE NOVICE LICENCE A MANUAL FOR THE INSTRUCTOR (RSGB)

John Case G4WHWR

Aimed at the Novice licence instructor this manual provides the syllabus and an excellent framework/textbook to help novice, instructor and beginner alike. An excellent basic reference work. 101 pages. £6.50.

## WTFB'S HELP FOR NEW HAMS (ARRL)

Doug DeMaw W1FB

This book covers everything from getting acquainted with new equipment to constructing antennas, station layout, interference and operating problems to on-the-air conduct and procedures. 155 pages. £8.95.

## Callbooks

### RADIO AMATEUR CALLBOOK INTERNATIONAL LISTINGS 1995

73rd Edition

The only publication listing licensed radio amateurs throughout the world. Also includes DXCC Countries list, standard time chart, beacon lists and much more. Over 1400 pages. £20.95.

### RADIO AMATEUR CALLBOOK NORTH AMERICAN LISTINGS 1995

73rd Edition

Listings of US amateurs (including Hawaii). Also contains standard time chart, census of amateur licences of the world, world-wide QSL bureau, etc. Over 1400 pages. £20.95.

## Computing

### AN INTRODUCTION TO COMPUTER COMMUNICATIONS BP177

R. A. Penfold

Details of various types of modem and their applications, plus how to interconnect computers, modems and the telephone system. Also networking systems and RTTY. 72 pages. £2.95.

### ELECTRONIC PROJECTS FOR YOUR PC BP320

R. A. Penfold

102 pages. £3.95.

### HOW TO EXPAND, MODERNISE AND REPAIR PCs AND COMPATIBLES BP271.

R. A. Penfold

Recently revised, this book has seven chapters dealing with IBM PC/ATs or 'clones'. Starting with an overview of PCs and hardware, before describing upgrading disks, video and memory. Three chapters cover repairs, building a PC from bits, and recent developments. A good grounding in PCs. 166 pages. £5.95.

### INTERFACING PCs AND COMPATIBLES BP272

R. A. Penfold

86 pages. £3.95.

### NEWNES COMPUTER ENGINEER'S POCKET BOOK Third Edition

Michael Tooley

An invaluable compendium of facts, figures, circuits and data which is indispensable to the designer, student, service engineer and all those interested in computer and microcomputer systems. This enlarged third edition covers a vast range of subjects at a practical level, with the appropriate explanatory text. 256 pages. £12.95.

### PCs MADE EASY. Second Edition

James L. Turley

A friendly, comprehensive introduction to every personal computer - including Macs! This book is packed with valuable tips on every aspect of computer technology available today and will help you to get comfortable with your computer - fast. 438 pages. £15.95.

## EMC

### INTERFERENCE HANDBOOK

William R. Nelson WA6FOG

How to locate & cure R.L.L. for radio amateurs, CBers, TV & stereo owners. Types of interference covered are spark discharge, electrostatic, power line 'cures' are suggested. 250 pages. £9.50.

### THE RADIO AMATEUR'S GUIDE TO EMC (RSGB)

Robin Page-Jones G3JWH

This paperback book provides essential information and reading for anyone who has an EMC (interference) problem. With the help of the well-illustrated text and techniques, much of the mystery from the troublesome world of electromagnetic compatibility is removed. 117 pages. £7.99.

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## Historical

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Edited by Hugo Gernsback

A fascinating reprint from a bygone age with a directory of all the 1934 s.w. receivers, servicing information, constructional projects, circuits and ideas on building vintage radio sets with modern parts. 260 pages. £11.60.

### THE BRIGHT SPARKS OF WIRELESS (RSGB)

G. R. Jessop G6JP

This hardback book is well illustrated with some excellent photographs. It pays tribute to and takes a good look at the personalities behind the early days of amateur radio and the equipment they used. A good read. 90 pages. £12.50.

### WORLD AT THEIR FINGERTIPS (RSGB)

This book comprehensively covers the fascinating history, techniques, equipment used and personalities behind amateur radio from the very beginnings of the hobby to the late 1960s. John Claricoats G6CL. 307 pages. £6.00.

## Maps and Log Books

### AMATEUR RADIO LOGBOOK (RSGB)

This standard spirally bound amateur radio log book has 100 pages and is marked out with the format required in the UK. There are columns for date, time (UTC), frequency, power (in dBW), station worked/called, reports, QSL information and remarks. £2.99.

### NORTH ATLANTIC ROUTE CHART

This is a five-colour chart designed for the ATC in monitoring transatlantic flights. Supplied folded. 740 x 520mm. £6.50.

### QTH LOCATOR MAP OF EUROPE

Traxel DK5PZ

Radio Map Service

This comprehensive map of the European callsign area has now been updated and enhanced. This well thought out, coloured map covers from N. Africa to Iceland and from Portugal in the west to Iran in the east. Folds to fit into the 145 x 240mm clear envelope. 1080 x 680mm. £5.95.

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## Microwaves

### ARRL UHF/MICROWAVE EXPERIMENTER'S MANUAL

Various Authors

A truly excellent manual for the keen microwave enthusiast and for the budding 'microwaver'. With contributions from over 20 specialist authors. Chapters covering techniques, theory, projects, methods and mathematics. 446 pages. £14.50.

### MICROWAVE HANDBOOK RSGB

Volumes 1, 2 and 3

Edited By M. W. Dixon G3PFR

Approximately 350 pages (each volume), Vol. 1 costs £9.99, Vol. 2 and 3 cost £14.99 each.

## Morse

### INTRODUCING MORSE

Collected Articles from PW 1982-1985

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### SECRET OF LEARNING MORSE CODE

Mark Francis

Updates for the Novice Licence. Designed to make you proficient in Morse code in the shortest possible time, this book points out many of the pitfalls that beset the student. 84 pages. £4.95.

## Operating and Handbooks

### AMATEUR RADIO TECHNIQUES RSGB

Pat Hawker G3VA

Anyone who enjoys Pat Hawker's 'Technical Topics' in *Radio Communications* will enjoy this book. An amateur radio manual itself, this paperback book, the 7th edition, can only be bettered by a new edition. A truly excellent reference source with a practical bias. 366 pages. £9.50.

### ARRL HANDBOOK FOR RADIO AMATEURS 1995

This is the 72nd edition of this handbook and contains the best information from previous issues. New for this edition is some information on feedback-loop design for power supplies, a new gel-cell charger project, updates on antenna systems and new coverage of balloons, propagation programs are compared and colour SSTV and telephone FAX machines are also covered. Finally there's a new section on 'for the workbench' with new projects for the reader to build. 1214 pages. £19.95.

### ARRL OPERATING MANUAL

Another very useful ARRL book. Although written for the American amateur, this

book will also be of use and interest to the UK amateur. Topics covered range from short wave listening through operating awards to repeaters, operating and satellites. 684 pages. £12.95.

### ARRL SPREAD SPECTRUM SOURCEBOOK

Many readers thought an article about spread spectrum communications in the April 1993 PW a spoof, but this book shows the reality of the technique. The ten chapters contain descriptions of the basic theory, the designs, and the techniques involved, and there are basic transceiver building blocks for your experimentation. 360+ pages. £14.50.

### COMPLETE OX'ER

Bob Locher

This book covers equipment and operating techniques for the DX chaser, from beginner to advanced. Every significant aspect of DXing is covered, from learning how to really listen, how to snatch the rare ones out of the pile-ups and how to secure that elusive QSL card. 204 pages. £7.95.

### HINTS AND KINKS FOR THE RADIO AMATEUR

Edited by Charles L. Hutchinson and David Newkirk

A collection of practical ideas gleaned from the pages of *QST* magazine. Plenty of projects to build, hints and tips on interference, c.w. and operating and snippets of information from amateurs who've tried and tested the idea. 129 pages. £4.95.

### MARINE SSB OPERATION

J. Michael Gale

How do you stay in touch when you sail off over the horizon and into the blue? What you need is a single sideband radio, a marine s.s.b. This book explains how the system works, how to choose and install your set and how to get the best out of it. There is also a chapter on amateur radio with the emphasis on the increasingly important maritime mobile nets. 96 pages. £10.95.

### MARINE VHF OPERATION

J. Michael Gale

A v.h.f. radiotelephone is essential equipment for any sea-going boat, but what can you do with it? Who can you call, and how do you make contact? Which channel do you use, and why? What is the procedure for calling another boat, calling the family through the telephone system, or making a distress call? This book will tell you. 48 pages. £7.95.

### RADIO COMMUNICATION HANDBOOK (RSGB)

6th Edition

Dick Bliddulph G8PDS

This long awaited new edition has been extensively up-dated and is full of diagrams and photographs. This book is a complete handbook/reference work and project book all rolled into one. The final innovation is that the necessary p.c.b. templates for the featured projects are provided at the end of the book making them much easier to work from when making your own p.c.b.s. 750 pages. £20.00.

### SETTING UP AN AMATEUR RADIO STATION BP300

I. D. Poole

Ian Poole G3YWX provides a helpful guide for anyone setting up an amateur radio station and covers: station design, construction, antenna, equipment, lay-out and the construction and use of basic test equipment, and helpful 'on the air' operating hints. 81 pages. £3.95.

## Packet

### PRACTICAL GUIDE TO PACKET OPERATION IN THE UK

Mike Mansfield G6AWD

Introduces the concept of packet radio to the beginner. Problem areas are discussed and suggestions made for solutions to minimise them. Deals with the technical aspects of packet taking the reader through setting up and provides a comprehensive guide to essential reference material. 220 pages. £9.95.

### PACKET: SPEED, MORE SPEED AND APPLICATIONS (ARRL)

There is a lot to see, learn and do with packet. You don't need to be a 'guru' to join in the fun. This collection of articles and updates from ARRL *Computer Networking Conference Proceedings*, *TAPR's Packet Status Register*, *OEX QST* and the *ARRL Handbook* promises an exciting ride for both packeteers and future packeteers. Hang onto your seat and start-up your modem! 144 pages. £12.95.

### YOUR GATEWAY TO PACKET RADIO

Stan Horzepa WA1LDU

What is packet radio good for and what uses does it have for the 'average' amateur? What are protocols? Where, why, when? Lots of the most asked questions are answered in this useful book. It included details of networking and space communications using packet. 278 pages. £8.95.

### YOUR PACKET COMPANION

Steve Ford WB8IMY

This American book goes to considerable lengths to explain in simple terms how the radio amateur can get going on packet, how it works and what the various systems are. There are chapters dealing with assembling a packet station, sending and receiving packet mail and exploring advanced networking systems. Your Packet Companion goes a long way to explain some of the mysteries of packet radio. 170 pages. £5.95.

## Propagation

### AN INTRODUCTION TO RADIO WAVE PROPAGATION BP293

J.G. Lee

How does the sun and sunspots affect the propagation of the radio waves which are the basis of our hobby? They affect the ionosphere, but differing frequencies are treated differently. Find out how to use charts to predict frequencies that will be the most profitable. What effect will noise have on the signal? Find out with this book. 116 pages. £3.95.

### LOW PROFILE AMATEUR RADIO - OPERATING A HAM STATION FROM ALMOST ANYWHERE (RSGB)

Jim Kearman KR1S

This book delves into the techniques of being a 'hidden Ham'. There are chapters on specialised equipment, operating techniques and antennas to name but a few. If you have a fascination for spy type radio equipment or like the idea of having a complete h.t. or v.h.f. rig built in a suitcase, then this little American book is for you. 124 pages. £5.95.



## SPACE RADIO HANDBOOK (RSGB)

John Branegan G4M4JH  
236 pages. £12.50

## QRP

### G-QRP CLUB CIRCUIT HANDBOOK

Edited by Rev. G. Dobbs G3RJV

This paperback book has been compiled from circuits published in the G-QRP Club journal *Sprat* from the years 1974 to 1982. Essentially it's a collection of circuits and projects covering everything from receivers, transmitters, antennas and accessories together with sad QRP test equipment. This book is aimed at the keen constructor and provides all the information required to build the host of projects described.

96 pages. £8.50

### QRP CLASSICS (ARRL)

Edited by Bob Schetgen

Operating QRP is fun. The equipment is generally simple and easy to build, but often performs like more sophisticated commercial equipment. Some QRP Field Day stations operate a full 27 hours on a car battery - it's the perfect equipment for emergency communication when the power fails. Extracts from QST and the ARRL Handbook.

274 pages. £9.95

### W1FB's QRP NOTEBOOK (ARRL)

2nd Edition. Doug De Maw W1FB

The new improved and updated 2nd edition of this book, covers the introduction to QRP construction methods, receivers and transmitters for QRP. This workshop-notebook style publication, which is packed with new designs for the keen QRP operator, also covers techniques, accessories and has a small technical reference section.

175 pages. £7.95

## Television

### ATV COMPENDIUM

Mike Wooding G6IQM

This book is for those interested in amateur television, particularly the home construction aspect. There isn't a 70cm section as the author felt this was covered in other books. Other fields such as 3cm TV, are covered in depth. A must for the practical ATV enthusiast.

104 pages. £3.00

## Test Equipment

### GETTING THE MOST FROM YOUR MULTIMETER BP239

R. A. Penfold

This book is primarily aimed at beginners. It covers both analogue and digital multi-meters and their respective limitations. All kinds of testing is explained too. No previous knowledge is required or assumed.

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### HOW TO USE OSCILLOSCOPES & OTHER TEST EQUIPMENT BP267

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104 pages. £3.50

### MORE ADVANCED TEST EQUIPMENT CONSTRUCTION BP249

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A follow on from Test Equipment Construction (BP248) this book looks at digital methods of measuring resistance, voltage, current, capacitance and frequency. Also covered is testing semi-conductors, along with test gear for general radio related topics.

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This book is primarily intended as a follow-up to BP239. Getting the most from your Multi-meter. By using the techniques described in this book you can test and analyse the performance of a range of components with just a multi-meter (plus a very few inexpensive components in some cases). The simple add-ons described extend the capabilities of a multi-meter to make it even more useful.

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### OSCILLOSCOPES, HOW TO USE THEM, HOW THEY WORK, 3rd Edition

Ian Hickman

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### TROUBLESHOOTING WITH YOUR TRIGGERED-SWEEP OSCILLOSCOPE

Robert L. Goodman

This book steers you through the various features - old and new - that scope technology provides and is an invaluable guide to getting the best out of your scope. An overview of available scopes will help you choose the one that best suits your needs. Areas covered include spectrum analysis, test applications, multiple-trace displays, waveform analysis, triggering, magnified sweep displays, analogue and digital scopes, etc.

309 pages. £17.50

## VHF

### ALL ABOUT VHF AMATEUR RADIO

W. I. Orr W6SAI

Written in non-technical language, this book provides information covering important aspects of v.h.f. radio and tells you where you can find additional data. If you have a scanner, you'll find a lot of interesting signals in the huge span of frequencies covered, 100-300MHz & 50, 420, 902 & 1250MHz bands.

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### AN INTRODUCTION TO VHF/UHF FOR RADIO AMATEURS BP281

L.D. Poole

An excellent book to go with the new Novice or full call sign. Nine chapters and an appendix deal with all aspects and frequencies from 50 to 1300MHz. Topics include propagation, descriptions of the bands, antennas, receivers, transmitters and a special chapter on scanners.

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### VHF/UHF OX BOOK

Edited Ian White G3SEK

An all round source of inspiration for the v.h.f./u.h.f. enthusiast. Written by acknowledged experts this book covers just about everything you need to know about the technicalities of v.h.f./u.h.f. operating.

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G. R. Jessop G6JP

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50 circuits for the s.w.f., radio amateur, experimenter or audio enthusiast using f.e.t.s. Projects include f.t. amplifiers and converters, test equipment and receiver aids, tuners, receivers, mixers and tone controls.

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As its title suggests, this book covers the basic terms involved in electronics and with its short, clear and precise explanations is a helpful guide and useful textbook for the beginner and anyone preparing for an examination.

472 pages. £5.95

### A REFERENCE GUIDE TO PRACTICAL ELECTRONICS TERMS BP287

F. A. Wilson

A reference guide laid out in alphabetic order with an index, this book provides a useful source for the experienced and beginner alike.

431 pages. £5.95

### AUDIO ELEMENTS OF ELECTRONICS - BOOK 6 BP111

F. A. Wilson

This book studies sound and hearing, and examines the operation of microphones, loudspeakers, amplifiers, oscillators, and both disk and magnetic recording. Intended to give the reader a good understanding of the subject without getting involved in the more complicated theory and mathematics.

308 pages. £3.95

### BEGINNER'S GUIDE TO MODERN ELECTRONIC COMPONENTS BP285. R. A. Penfold

This book covers a wide range of modern components. The basic functions of the components are described, but this is not a book on electronic theory and does not assume the reader has an in-depth knowledge of electronics. It is concerned with practicalities such as colour codes, deciphering code numbers and suitability.

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Written to help you create and experiment with your own electronic designs by combining and using the various standard 'building block' circuits provided. Deals with filters, amplifiers, voltage comparators, etc.

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### CIRCUIT SOURCE BOOK 2 - BP322

R.A. Penfold

Complimentarily to Circuit Source Book 1, helps you create and experiment with your own electronic designs by combining and using the various standard 'building block' circuits provided. Covers signal generation, power supplies and digital electronics, etc.

214 pages. £4.95

### FILTER HANDBOOK

A Practical Design Guide

Stefan Mhewiadomski

A practical book, describing the design process as applied to filters of all types. Includes practical examples and BASIC programs. Topics include passive and active filters, worked examples of filter design, switched capacitor and switched resistor filters and includes a comprehensive catalogue of pre-calculated tables.

195 pages. £30.00

### GUIDE TO CREATIVE CIRCUIT DESIGN

Robert Grossblatt

A book that takes you through all stages of design and building of (mainly) digital circuits, though many of the principles apply to all forms of design and building. One nugget from the book, "if you can't replace it - don't use it".

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### NEWNES AUDIO AND HI-FI ENGINEER'S POCKET BOOK

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### NEWNES ELECTRONICS ENGINEER'S POCKET BOOK

Keith Brindley

This convenient sized volume is packed with information which everyone involved in electronics will find indispensable. This book is an invaluable compendium of facts, figures and formulae. Managers, designers, students and service personnel will find it useful at all stages in electronics processes.

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Owen Bishop

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### TEST EQUIPMENT CONSTRUCTION BP248. R. A. Penfold

Describes, in detail, how to construct some simple and inexpensive, but extremely useful, pieces of test equipment. Stripboard layouts are provided for all designs, together with wiring diagrams where appropriate, plus notes on their construction and use.

104 pages. £2.95

### W1FB's DESIGN NOTEBOOK (ARRL)

Doug DeMaw W1FB

This book is aimed at the non-technical amateur who wants to build simple projects and obtain a basic understanding of amateur electronics. Your workshop does not need to be equipped like an engineering lab to be successful as an experimenter. Don't let a lack of test equipment keep you from enjoying the thrills of experimentation.

195 pages. £8.50

## Data

### ARRL ELECTRONICS DATA BOOK

Doug DeMaw W1FB

Back by popular demand, completely revised and expanded, this is a handy reference book for the f.t. designer, technician, amateur and experimenter. Topics include components and materials, inductors and transformers, networks & filters, digital basics and antennas and transmission lines.

260 pages. £8.95

### EVERYDAY ELECTRONICS DATA BOOK

Mike Tooley BA

250 pages. £8.95

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F. A. Wilson

450 pages. £4.95

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Ian Hickman

This book provides an easy-to-read introduction to modern f.t. circuit design. It's aimed at those learning to design f.t. circuitry and users of f.t. equipment such as signal generators and sweepers, spectrum and network analysers.

320 pages. £16.95

### PRACTICAL ELECTRONICS CALCULATIONS AND FORMULAE BP53

F. A. Wilson

Written as a workshop manual for the electronics enthusiast, there is a strong practical bias and higher mathematics have been avoided where possible.

249 pages. £3.95

### PRACTICAL ELECTRONIC DESIGN DATA BP316

Owen Bishop

In essence this book is a helpful collection of designer's 'building block' circuits, information, connection data and back-up information complete with an index.

327 pages. £4.95

### RADIO AMATEUR AND LISTENER'S DATA HANDBOOK.

Steve Money

This is a unique collection of useful and intriguing data for both the traditional and modern radio amateur as well as the high-tech listener. Familiar radio topics are covered - abbreviations and codes, symbols, formulae and frequencies - while the newer features of the hobby radio world - decoding, airband, maritime, packet, slow scan TV etc. are also dealt with.

240 pages. £14.95

### SOLID STATE DESIGN FOR THE RADIO AMATEUR (ARRL)

Les Hayward W7ZDI &

Doug DeMaw W1FB

Back in print by popular demand! A revised and corrected edition of this useful reference book covering all aspects of solid-state design. Topics include transmitter design, power amplifiers and matching networks, receiver design, test equipment and portable gear.

256 pages. £10.95

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B.B. Babani 106 pages. £2.50

### HOW TO DESIGN AND MAKE YOUR OWN PCBs BP121 R. A. Penfold

R. A. Penfold

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### PROJECTS FOR RADIO AMATEURS AND SWLS BP304

R. A. Penfold

This small book covers the construction and use of radio frequency and intermediate frequency projects, and audio frequency projects. Under the first heading ideas include a crystal calibrator, an antenna tuning unit, a wave trap, a b.o. and other useful projects. On the audio side projects include a bandpass filter, a by-pass switch, a c.w./RTTY decoder and many other practical ideas and suggestions for the home constructor.

92 pages. £3.95

### SHORT WAVE SUPERHET RECEIVER CONSTRUCTION BP276

R. A. Penfold

A general purpose receiver to build, from antenna to audio, described in understandable English.

80 pages. £2.95

### SIMPLE SHORT WAVE RECEIVER CONSTRUCTION BP275

R. A. Penfold

Before discussing projects and techniques, the author provides essential information on theory, propagation, receiver designs and techniques. Finally, the author provides design for and describes the construction of practical receivers.

88 pages. £3.95

# ENDNOTES

I've been allocated this little 'tail ending' in *PW* so I can squeeze in news, ideas and also provide you with an idea of what's coming in next month's issue. And for my first effort I'm pleased to report that we've got an interesting review coming up in the August issue.

But firstly, the *PW* team hope you've enjoyed the 'Out & About With Amateur Radio' special themed issue. On behalf of the Editorial team I can say that we found the articles fascinating this month. The vision of the rescue helicopter mentioned in Dr. Andrew Taylor G4SSC's article on Mount Everest (operating above its maximum 'ceiling') having to stagger off the ground and then literally heading 'downhill' struck me - as a now permanently 'grounded' pilot - as being very 'hairy' indeed!

Secondly, it's not often we can announce that a major manufacturer has entered the amateur radio market with a product that is new and indicates a change of direction for them. However, in the case of Alinco, that's just what's happened with their new DX-70 h.f. and 50MHz multi-mode transceiver.

Alinco's venture into h.f., from their usual v.h.f. territory is good news as far as I'm concerned, and in a way I feel partly responsible! That's because I 'badgered' the company four years or so ago (via their European representative) to enter the h.f. market while trying to keep the price to a reasonable level.

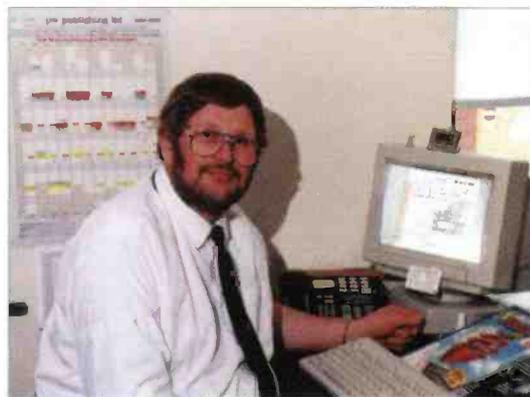
So, despite the fact that Alinco were probably already working on the rig...I like to think I had something to do with the inception of the DX-70. The rig by the way...is something rather special. Watch this space!

For all the many readers who are sending me E-mail, I have a message. Because the electronic mail has been bypassing the normal mail 'logging in' system, items have gone astray. So, in future, all E-mail will join the rest of the post. In this way I can keep trace of everything, and you'll get a reply in due course. Please ensure that (if you're not QTHR) I have a postal address along with the E-mail address.

Finally, we've got our ever-popular 'Antenna Special' coming next month. Judging by the interest shown in antennas I feel sure it will be a particularly good issue.

Cheerio for now.

Rob G3XFD



## PW SERVICES

### Queries:

Practical Wireless,  
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- 5: Only one problem per letter please.

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Review - 'Alinco's Award Winner' - Rob Mannion G3XFD tries out the newly-introduced h.f. plus 50MHz mini-mobile multi-mode transceiver and he's obviously impressed!

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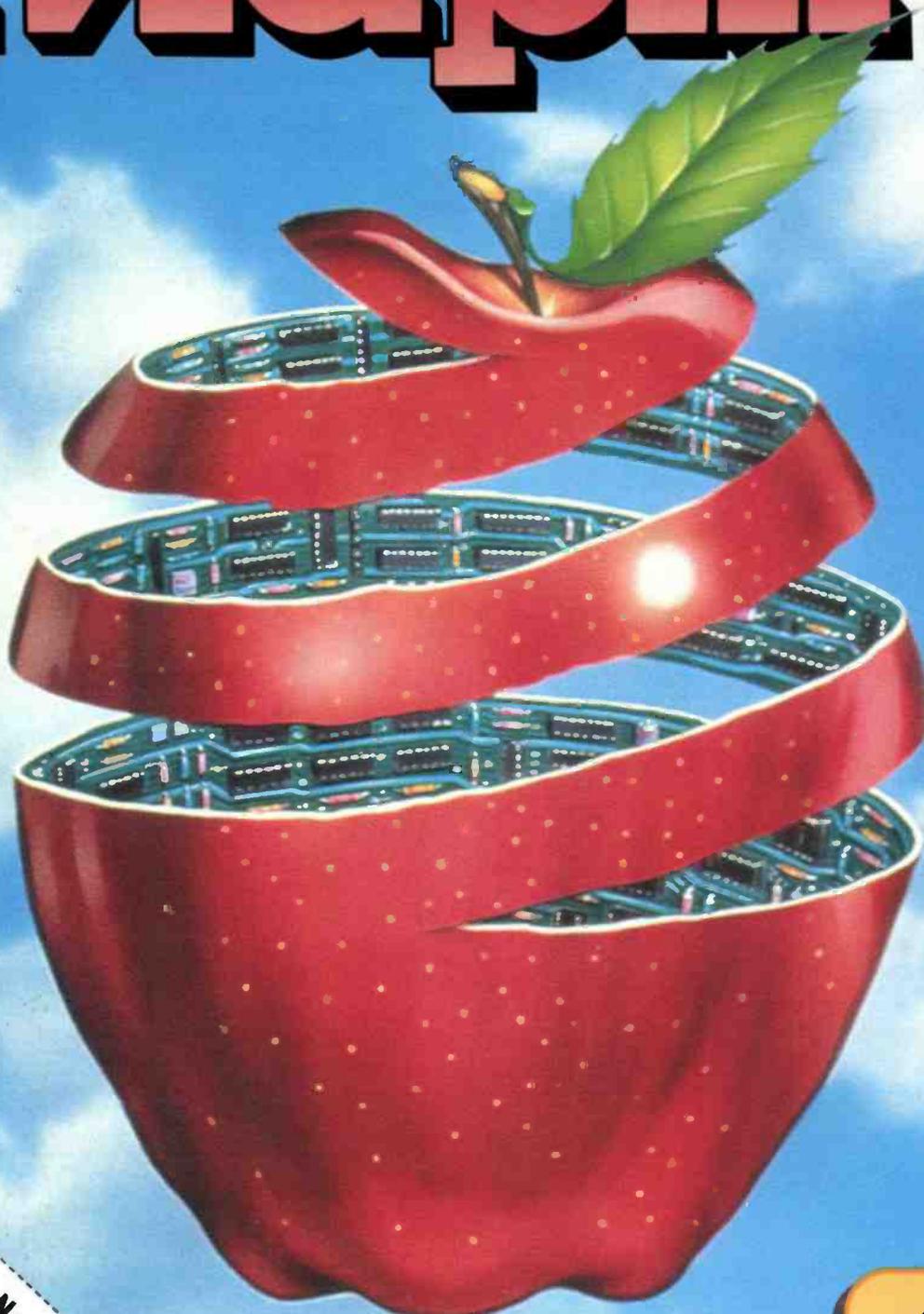
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