

# Wireless

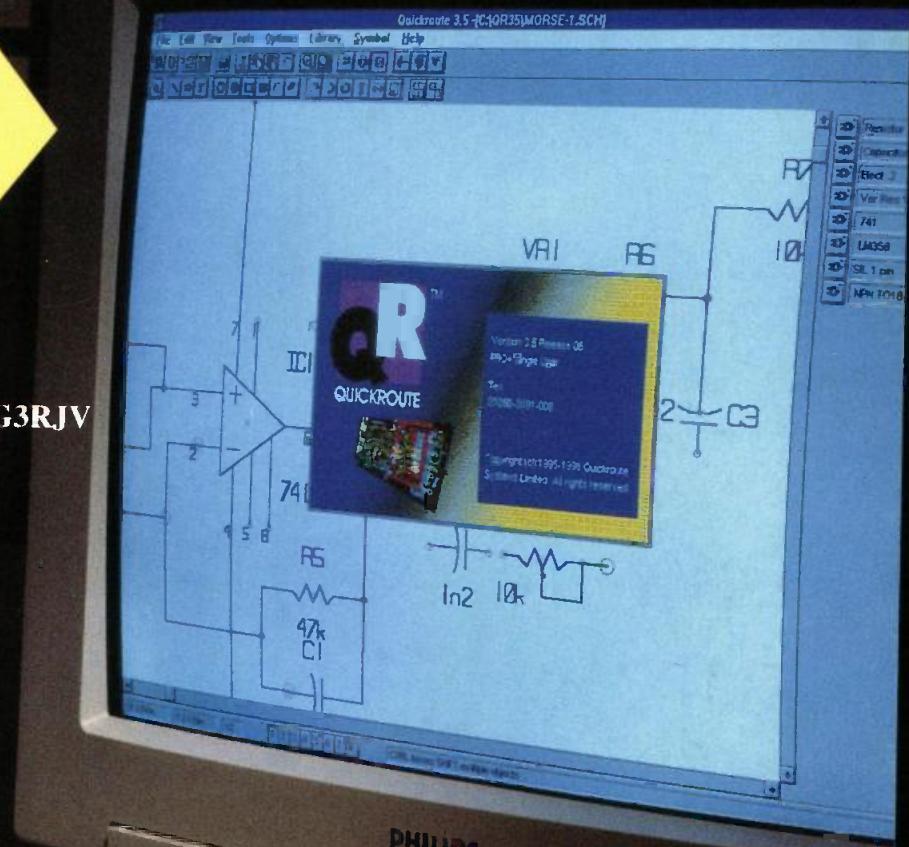
## REVIEWED QUICKROUTE Circuit / PCB Design Package

### Build

- The Sprat 3.5MHz Transceiver by G3RJV
- The PW Codecard by G4PSL
- A 1.8MHz Antenna by G4BXD

### Features

- Key Tips by G3XJS
- Morse Methods by G0SKR
- Practice Makes Perfect by G4SSH



**MFJ-9406**

Budget-Beating  
50MHz Transceiver

**REVIEWED**

**WIN**  
**An IC-706**  
DONATED BY MARTIN LYNN



0.7 >

FREE  
READER'S  
ADS

# FT-50R

Ultra Compact Dual Band Handheld

# One tough little dual bander!

## Features

- Frequency Coverage  
Wide Band Receive  
RX: 76-200 MHz, 300-540  
MHz, 590-999 MHz\*
- TX: 144-146 MHz,  
430-450 MHz
- AM Aircraft Receive
- MIL-STD 810 Rating
- Digital Coded Squelch (DCS)
- 112 Memory Channels
- 12V DC Direct Input
- High Speed Scanning
- Alphanumeric Display
- CTCSS Encode (Decode  
w/FTT-12)
- Auto Range Transpond  
System™ (ARTS™)
- Dual Watch
- Direct FM
- High Audio Output
- ADMS-1C Windows™  
Programmable
- Four Battery Savers:  
Automatic Power-Off (APO)  
Receive Battery Saver (RBS)  
Selectable Power Output (SPO)  
Transmit Battery Saver (TBS)
- Time Out Timer (TOT)
- 2.5 and 5 Watt Versions  
Available
- Optional Digital Voice  
Recording System (DVRS)
- Full line of accessories



"You notice how loud this HT's audio is?"

"Yeah, it's Mil Spec tough like a commercial HT."



"Easy to operate, small, great price!"

"Yaesu did it again!"



For the foremost in top-performing, durable, dual band handhelds there is one choice. The FT-50R. Manufactured to rigid commercial grade standards, the FT-50R is the only amateur dual band HT to achieve a MIL-STD 810 rating. Water-resistant construction uses weather-proof gaskets to seal major internal components against the corrosive action of dust and moisture. And, the rugged FT-50R withstands shock and vibration, so throw it in with your gear!

Dynamic and exclusive features set the FT-50R apart, too. Wide Band Receive includes 76-200 MHz (VHF), 300-540 (UHF), and 590-999 MHz\*. Dual Watch checks sub-band activity while receiving on another frequency, then when a signal is detected, shifts operation to that frequency. Digital

Battery Voltage displays current operating battery voltage. Digital Coded Squelch (DCS) silently monitors busy channels. Auto Range Transpond System™ (ARTS™) uses DCS to allow two radios to track one another. And, the FT-50R is ADMS-1C Windows™ PC programming compatible, too. To round out the FT-50R, it has four battery savers, and super loud audio—remarkable in an HT this size.

A reliable companion where ever you go, the FT-50R is one tough little dual bander with all the features you want!

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FT-10/40R

Ultra Compact Handhelds  
VHF or UHF. Similar to FT-50R  
including MIL-STD 810, and  
other exclusive features.

# practical Wireless

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'TEX' Swann G1TEX

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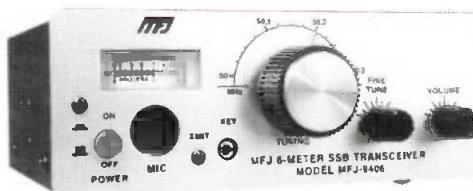
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# SOUTH MIDLANDS COMMUNICATIONS

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Yaesu  
Flagship

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price

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CS201GII	2 Way Switch 'N' 1kW PEP	£23.50	B
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AR2	2m Vertical 1.2m long	£39.00
AR6	6m Vertical 3.1m long	£59.00
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G-1000SDX	H/D version of G-800SDX	£499.00	D
G-27000SDX	H/D rotator 450°	£959.00	D
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GC038G	Lowes clamp G-600	£25.00	B
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HAM IV	Medium duty meter controller	£449	D
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T2X	H/D with meter controller	£525	D
T2XD	T2X with digital controller	£795	D

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See News section of this  
magazine for further information

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W/H	Model	Make	Price inc. Vat	PX	FT690RII	Yaesu	£375.00	RECEIVERS	
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				PX	FL2025	Yaesu	£119.00	PX	AR3000
				PX	FT727R	Mariner-99	£225.00	PX	AOR
				PX	IC900E	Icom	£475.00	AOR	£359.00
				PX	IC2SRE	Icom	£295.00	PX	AOR
				PX	TH28E	Kenwood	£199.00	PX	HF225
				PX	TH79E	Kenwood	£339.00	PX	FRG7700M
				PX	DR130	Alinco	£259.00	PX	FRG9600
				PX	C58	Standard	£149.00	PX	ICF-SW7600
				PX	C188	Standard	£169.00	PX	Sony
				PX	C500	Standard	£245.00	PX	Sony
				PX	ICU101	Icom	£139.00	PX	Comel
				PX	FT290RII	Yaesu	£400.00	PX	Grundig
				LX	FT290R	Yaesu	£250.00	PX	Realistic
				LX	FT727R	Yaesu	£259.00	PX	AIR7
				LX	TH21E	Kenwood	£100.00	PX	M568
				LX	TH47E	Kenwood	£195.00	PX	Satellit 500
				LX	TR8400	Trio	£175.00	PX	PRO2006
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				RX	DJ560	Alinco	£335.00	LX	AR1000
				RX	AMR1000	.....	£175.00	LX	AR2000
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				RX	FT726	Yaesu	£1295.00	RX	AOR
				RX	FT76	Yaesu	£155.00	RX	PRO34
				RX	FT270R	Yaesu	£165.00	RX	PRO-80
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				RX	FT470R	Yaesu	£240.00	RX	HF225 Europa
				RX	FT480R	Yaesu	£230.00	RX	JRC
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				RX	FT203R	Yaesu	£75.00	RX	FRG7
				RX	FT727R	Yaesu	£225.00	RX	FRG9600
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				RX	IC28RE	Icom	£225.00		
				RX	IC290E	Icom	£245.00		

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BEST DEALS

01703 251549

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RX	FV707DM	Yaesu	£99.00
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RX	FT7	Yaesu	£225.00
RX	FT7B	Yaesu	£195.00
RX	FT74GX	Yaesu	£475.00
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RX	FT757GX	Yaesu	£525.00
RX	FC757AT	Yaesu	£250.00
RX	FT980	Yaesu	£625.00
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RX	IC735	Icom	£595.00
RX	PS55	Icom	£140.00
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RX	IC100	Icom	£195.00
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**SMC**



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RX	DSP-2232	AEA
RX	MBA-RC	AEA
RX	AMT-2	ICS
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The SG-230 Smartuner®.

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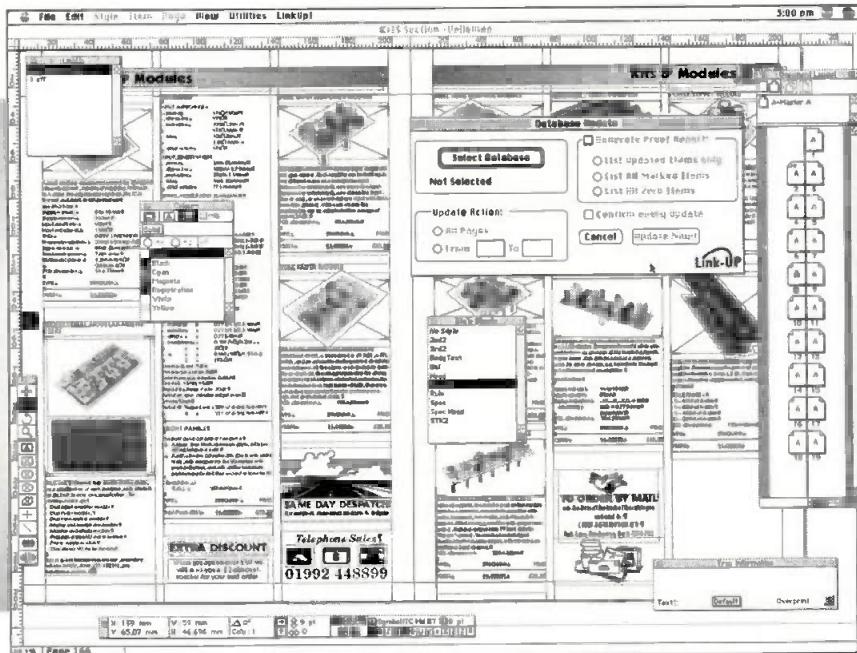
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# EDITOR'S

## Keylines

Rob Mannion's viewpoint on the World of Amateur Radio

**R**adio is fascinating isn't it? Our hobby has provided me with a great deal of enjoyment over the years and I'm always amazed what 'side track' interests (forgive the deliberate pun on railways) arise from Amateur Radio and I must admit that I find meteorology to be an absorbing subject indeed.

I've only had a few days in the office after returning from holiday in County Cork, Ireland (from 23rd April to 4th May), before having to rush off to the Dayton Hamvention. But I had great weather during my stay in Ireland and I really began to wonder how much connection there is between the weather and h.f. band conditions. I say this because I really do think the weather conditions on earth do play more of a part with h.f. propagation than we realise.

During my stay (as a guest of my old friend John Tait EI7BA) at the former Coastguard Station at Power Head near the entrance of Cork Harbour, I had some excellent weather and there were one or two v.h.f./u.h.f. 'lifts'. The effects of temperature inversions and 'marine ducting' also proved to be fascinating indeed.

At one time, the West Cornwall 144MHz repeater came romping in on my hand-held transceiver and 70MHz QSOs from the Derby/Nottingham areas were being received at S9+. However, the 'DX' that intrigued me was provided by my 'Orange' cellphone!

Although I had last used the cellphone on the M4 near Swansea (the service is apparently only just starting in Ireland although there's nothing available in Cork) I

propped the telephone up in the window of the house to see what happened. And sure enough, several times an hour the telephone displayed the 'Orange' (service available) message.

It was obvious that I was seeing the results of s.h.f. marine ducting as the house was set 35m above the water, with a stunning direct view of the sea over towards the horizon, Wales and the Cornish peninsula. What cellphone station did my telephone lock onto? I'll never know but it was fascinating to see it in action!

Band II v.h.f. f.m. broadcast station signals from Spain, France and elsewhere over-rode local stations (with deep QSB) and 144MHz was very good. However, as it was during the week and mid-day, I didn't hear much on the band except repeater idents.

But, to my surprise I found that h.f. conditions were also better than expected. And although the 28MHz band appeared to be 'dead' for most of the time (even the 27MHz CB band, when monitored on the Alinco DX-70 I was using, seemed to be virtually silent with very little short skip CB evident) the other bands seemed lively.

Using the Alinco DX-70 (in conjunction with a crude but effective long wire antenna) I was having my first prolonged session on

the 17 metre (18MHz) band. The improved conditions really did seem to coincide with the clear, cold and dry weather associated with the high pressure atmospheric conditions.

I found all the higher h.f. bands to be providing really good DX. There also seemed to be some strange noise 'bursts' on 18MHz mid-week (2nd May)...did anyone else hear them? Was is connected with solar activity?

Also, during that week, I found that 14MHz was 'wide open' to the USA (east and west) until 0100UTC. I was getting 59+ 20 reports from my temporary station running less than 70W into a what was (to be quite honest) a very crude antenna.

I would be interested to hear from anyone else who might be thinking on the same lines as myself. Is there much more of a direct correlation between h.f. conditions and the day-to-day weather than we think? But whatever the outcome of my observations are, I'm now determined to be more active on 10 and 18MHz. It was great fun using the

bands, and (for the time being anyway) you avoid the 'scrum' on 14MHz!

### On The Air

As I wasn't so mobile this last holiday, I took full advantage of my Doctor's orders to help my left foot recover from an operation -

so I went on the air. It was great to chatter away on the microphone and on the key, without worrying about what work I had to do. After all...I was on holiday!

I filed many log-book pages as EI/G3XFD and one page was overwhelmed by Dutch callsigns. I chose to go on the air during the Dutch National holiday which celebrates the Dutch Queen's birthday!

Once our friends in Holland heard me on (7 and 14MHz, with some activity on shortskip 18MHz) they all telephoned each other and I was soon having a whale of a time. It was marvellous to talk to my friends and brought home the truly international flavour of our wonderful hobby.

I also worked a station

located only a five minute walk away from my home in Dorset. We've often talked on the telephone, but I had to go to Ireland to work him on the band!

I came away from my holiday with the resolve that working (effectively) full time in amateur radio, spoils my chances of getting on the air regularly. That's going to change!

Finally for this month, I have a very personal, proud announcement to make. The callsign G3XFD/G will now be heard on the air as I've become a Grandfather!

My eldest daughter Charlotte presented my wife Carol and I with our first Granddaughter - Georgia Olivia on Saturday 4th May. The very day I came back from Ireland! And if she runs true to family form, perhaps she'll be unscrewing my locked study door to sneak read PW (as I did to my Grandfather, the late 2FD to read his magazine) in a few years time!

*Rob Mannion  
G3XFD*

Rob G3XFD enjoyed using the Alinco DX-70 on his recent trip to Ireland.



The Star Letter will receive a voucher worth £10 to spend on items from our Book or other services offered by Practical Wireless. All other letters will receive a £5 voucher.

# RECEIVING You

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

## Novice Net

Dear Sir

I'm writing in connection with an article in your March '96 issue in the 'Novice Natter' section about Alex 2E0AJJ from Cheddar starting a QSR Net for Novice and newcomers and was wondering how to get involved. I'm new to the hobby myself and have just taken the Novice RAE exam and have gained my callsign 2E1EUQ. Obviously my next step is the 5w.p.m. Morse.

I'm currently learning it at my local club Manchester & DARS and have purchased the MFJ-411 Morse Tutor, which I carry with me at work.

I notice the suggested Net is obviously on a band not allocated to my callsign. So I am wondering how somebody like myself who would like to practice two-way QSOs in c.w. would go about it. I would be grateful if you could pass the letter onto Alex. Russ 2E1EUQ Manchester

**Editor's reply:** No problem Russ, and good luck with your Morse test. If any other Novice Operators (or anyone else is interested in the Net) writes into us, we'll be pleased to pass their letters on.

## Good Old Days

Dear Sir

I have just been reading the most interesting and nostalgic article 'The Good Old Days' by Jack Belcher in PW May. It made me wonder how many G0s would know what was meant by an O-V-1 or a triode?

The set that sticks out in my memory is the Prefect 3 which a friend and myself constructed - with advice from GM6RI, now sadly a silent key. The result of our efforts in building the receiver was the evening we logged W2XAD/W2XAF from Schenectady in the USA.

Our schoolboy enthusiasm exceeded our technical knowledge. In an effort to 'peep-up' the project, we added four i.f. stages, all transformer coupled, except the last which was resistance capacity coupled. One or more of the triodes had become microphonic. The result? We had a 1930s synthesiser playing strange electronic noises!

In these days of blissful ignorance, I had saved up for an h.f. choke, price 9d (less than 5p nowadays). Having obtained the article by post from a mail order firm, I resolved henceforth to wind my own coils, etc. A lot of winding was done on toilet roll centres and old valve bases!

It was great fun and resulted in me enlisting in the RAF some years later as a Radio Mechanic and the acquisition of my own GM3 call in the fullness of time.

Thanks again to Jack Belcher and PW for the memories of the good old days.

J. MacPhee GM3VNW Scotland

## Photo Acoustics

Dear Sir

I recently purchased a used SGC Inc. SG 2000 from Photo Acoustics. After a week's use I found that the programming had become temperamental

## American Constructor

Dear Sir

I have recently started subscribing to your magazine and am really impressed with your publication. The construction articles are great. I have enjoyed building several of the antenna projects and had very good results with the performance of the antennas.

Here in the States, it is easy to purchase equipment, if you have the money. I enjoy building anything that I can and in this respect, find *Practical Wireless* a real gem for construction projects. Please keep up the good work with PW. It certainly is a great magazine and I really enjoy each issue.

Ed Slabe N8TQP  
USA

**Editor's reply:** Nice to hear from you Ed and the team hope you carry on enjoying the magazine. Incidentally, Ed sent us details of an interesting construction project which we are now researching for use in PW and we'd also like to hear from our other worldwide readers about kits and projects that they've built which originated from their country.

and the Transmit/Receive relay at times would not quite make contact when switching over to receive.

On contacting Photo Acoustics about the problems, they in turn contacted SGC in the USA and it was decided by both firms that the radio should be returned to the manufacturers.

The radio was duly despatched and 22 days later it was back in my shack and working to full specifications. Also the radio had been brought up-to-date and had a new Control head exchanged for the old one - all this was done free of charge!

Many thanks for their excellent after sales service to Photo Acoustics and SGC Inc. USA.

Peter Igo GI4NQJ  
Co. Down

**Editor's comment:**  
Amazing service Peter. You'd be hard pressed to get a reply from an ordinary airmail letter in that time, let alone sending and receiving a packaged transceiver! Well done Photo Acoustics and SGC.

## Antenna Reviews

Dear Sir

It's nice to see reviews of antennas in your magazine. Is it possible to review a 3.5 to 28MHz vertical sometime, as this is what I'd be personally interested in. I believe that there are three on the market, one from Cushcraft, another from Nevada and the third I can't remember. Of course there may be more. Verticals without ground planes is what we want!

Meanwhile thanks for the interesting magazines. I particularly liked the 'Filters in Receivers' article in the April SWM. It brought back many memories.

Howard G3UPZ  
Reading

**Editor's comment:**  
Bearing in mind that many readers are stuck for antenna space, we intend to devote a future edition of 'Antenna Workshop' entirely to vertical antennas. In the meantime Howard I hope you found our recently published 'Antenna Data Sheet'

## Letters Received Via The 'Internet'

Many letters intended for 'Receiving You' now arrive via the 'Internet'. And although there's no problem in general with E-Mail, many correspondents are forgetting to provide their postal address. I have to remind readers that although we will not publish a full postal address (unless we are asked to do so), we require it if the letter is to be considered. So, please don't forget to include your full postal address and callsign along with your E-Mail hieroglyphics! Editor

## Farewell To Ferranti

Dear Sir

After reading Roger Barrow G8ILD's letter in the April '96 issue of *Practical Wireless* I feel I must also write with reference to the Ian Poole's 'Farewell To Ferranti' article in the February '96 issue.

I started work at Ferranti, Edinburgh, in 1956 and retired in 1992. Two names stick out from Ferranti's the early 'Cold War' days. One, Sir John Tootle, was an Englishman who loved and did a great deal for Scotland, and a Scot who he employed to head a team to design and build a system to machine the complex waveguides required for radar systems. Early circuit boards, discrete components, hard

## Vintage Radio Problems

Dear Sir

Just about every radio amateur, engineer or hobbyist regularly finds themselves giving advice at one time or another, often without even seeing the set in question. This can be fraught with danger as we often find ourselves answering one question or another without knowing the whole story. Here's an example that befell me a while ago.

I was mindlessly looking at an old valve radio in a second-hand market along with a middle aged man and his eager, radio mad and wide eyed young son. Just like I was many (well...18 or so!) years ago at the tender age of 11.

Neither of us bought the set as it was seriously overpriced, but I ended up talking to this young lad in a language (that of triodes, pentodes and cathodes!) that his unfortunate dad could not understand.

The son had a problem radio...a GEC valve radio, Model BC402, which was completely silent. With amazing detail, he told me of all the parts he'd changed because he had been told to do so by various other experts to no avail.

All the valves, the output transformer, speaker, various other parts and even the volume/tone combined control had been changed because the output stage was inoperative. Hence no output.

I ended up with this set on my bench after (against my better judgement at the time!) agreeing to have a look at it after it had arrived quite late one evening, no doubt after bedtime! So, after a MacDonalds and a couple of beers (ahem!) I hauled the back off to look at senior's (or junior's) soldering. Oh dear....!

After a complete tidy up and refit of the volume control, output transformer and most of the components round the base of the UL84 and UABC80, I gingerly switched on. Silence. Not even h.t. buzz.

Not one of the many people who had given advice to these unfortunates had asked 'Do you have h.t.?' and as a result, over £30 had been spent on replacement parts. The mains dropper was open circuit so all the valve heaters were glowing merrily away but that was all.

The cost of a replacement wirewound resistor soldered safely across the blown section of the mains dropper was about 20p. No doubt the little kid was pleased, but Dad looked distinctly sick when I told him what the fault was and how much it cost to put it right!

All because of advice given without showing the set to the people who were being asked! So, next time you're asking/giving advice, count to ten and have a think first. It could save a lot of money and time!

Steve Pendlebury  
Lancashire

wiring and miniature valves!

The Scot was none other than D. N. 'Theo' Williamson of valve amplifier fame. I had the good fortune to work with the small team that Williamson set up north of Edinburgh. Apart from the specialised work I also worked on prototype electrostatic loudspeaker

systems, later manufactured by Quad. (My introduction to hi-fi!).

Williamson was decades ahead of his time - from the 1950s milling machines at Ferranti he moved south to work and where he designed 'system 24' the 'daddy' of robotic machines factory machines! (all now made in Japan, USA, etc. Like

Ferranti, most British machine tool manufacturers are history. I have no doubts that as a small boy in Edinburgh, Theo Williamson read *Practical Wireless* and it's ironic that its readers today probably are along with hi-fi magazine readers, the only ones to have read anything about Williamson.

Deans Thomson  
Edinburgh

## Flying The Flag

Dear Sir

Reference the subject of 'invisible antennas' in the June issue of *PW* ('Antenna Workshop', p48), there is yet another means of erecting an 'invisible' sky wire. That is by no means of a 'temporary' flagpole, hinged at the bottom to a short post and at the top by a removable bracket. Thus held in place, it can truly be described as being of only a temporary nature.

However, be sure to fly a flag from the top on such occasions as highdays and holidays as well as birthdays and suitable occasions. Then the neighbours will not have any suspicions as to its true purpose, and will merely think you are slightly round the bend!

The actual aerial can be an inverted 'V', a vertical trap dipole running up the side of the (wooden) pole and the other side to the neighbours house, or even a very thin horizontal inverted 'L' - so thin that nobody will notice it from a few yards away.

Douglas Byrne G3KPO  
Isle of Wight

**Editor's comment:**  
When I was on holiday recently, I worked several people on the h.f. bands who had overcome the problem of 'no antenna' rules at their home. One (a Dutch radio amateur) was

legitimately able to park his sailing dinghy in his driveway, and although not ideal, the metal mast made a very useful 7m

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*.

thanks once again.  
Kenneth Allen GI4RSI  
Co. Tyrone

## Transmissions Below 30MHz

Dear Sir

As a relative newcomer to amateur radio, I would like to express my opinion regarding 'Transmissions below 30MHz', why should I have to pass a Morse test? I cannot think of any reason other than it's a traditional method of radio communication.

I regularly listen to QSOs on h.f. and find it annoying that I am not allowed to reply to a CQ call on s.s.b. or f.m. just because I do not understand a series of dots and dashes. I don't ask my wife if the tea is ready by sending Semaphore and asking her to reply by Aldis lamp!

My RAE course and exam were thorough and covered all aspects of amateur radio and I think a newly licensed operator should be asked to obtain several years' experience before becoming a 'real radio amateur'.

Most of the Class A operators I know have forgotten the code and never used it since passing the test!

Steve Eastwood G7POT  
Castleford

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

# NEWS

## 1996

Compiled by Donna Vincent G7TZB

### Hand-in-Hand - SMC & Siskin

As briefly reported in last month's *PW South Midlands Communications* have recently acquired Siskin Electronics, the UK's premier supplier of digital amateur radio equipment transmission equipment. Phil Bridges G6DLJ, the well known driving force behind Siskin, has moved the complete company operation to a dedicated facility at SMC's HQ in Eastleigh.

Phil has said that he feels the acquisition is "great news for all Siskins' customers old and new, which will mean better demonstration facilities together with the additional bonus that Siskin products and 'know-how' will be available at all of SMC's branches".

Graham Taylor SMC's Retail General Manager, commented that "Siskin's approach to a 'plug-in-and-play' solution with all the radio/computer cables being ready-made and bundled with software has got to be the answer for today's busy radio amateur. As Siskin and SMC were both already Official Factory Appointed AEA distributors it made sense to team up and offer our customers a complete solution. All existing Siskin products, will be introduced into SMC branches making one-stop shopping for the

### New Amateur Band

The Radiocommunications Agency (RA) have just announced a new amateur band allocation in the I.F. part of the radio spectrum. The allocation of 71.6 - 74.4kHz has been assigned as a result of many requests from the amateur radio community.

Operation on the new 73kHz band is permitted on an experimental basis by Notices of Variation (NoV) to holders of individual A Class Amateur Radio Licences, who wish to investigate I.F. propagation including transmission to underground caves. All operation should be carried out from the main station address with an e.r.p. of 1W on any mode.

No mobile or maritime mobile operation is permitted on the 73kHz. Any Amateur wishing to use a Temporary location needs to give seven days notice to the District Office of the Radio Investigation Service.

The Radiocommunications Agency has arranged for the RSGB to process all applications for NoVs. All requests must include Name, Callsign, Main Station Address, Modes to be used and the details of whether the applicant intends to operate from a temporary location.

Some background information explaining the reasons for making the application and its intended use must also be included when applying for a NoV. Applications should be sent to LF Allocation, HF Committee, RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.

radio enthusiast a reality at last. We also intend to apply Phil's expertise to many of our commercial radio projects."

For further information on the full range of products available please contact Graham Taylor or Phil Bridges at South Midlands Communications Ltd., SM House, Chandlers Ford Industrial Estate, Eastleigh, Hampshire SO53 4BY. Tel: (01703) 255111, FAX: (01703) 263507 or E-mail: smc@tcp.co.uk.

### Knutsford Knowledge

For the last 20 years or so, Cheshire-based Gordon Adams G3LEQ has been producing cassette-based audio teaching courses to help students learn Morse.

Gordon's system is based on the idea that most people have access to a cassette recorder, and that it can be turned to their advantage as a 'teaching machine' for learning Morse and other requirements. Gordon says

in his promotional material that "The sets of C90 cassettes have helped many radio amateurs get their A licence".

More recently, Gordon has introduced a set of cassette-based RAE lessons, which covers the full syllabus of the examination on 10 C90 cassettes.

Full details of RAE course, prices and syllabus of the Morse Course are available direct from Gordon Adams G3LEQ, 2 Ash Grove, Knutsford, Cheshire WA16 8BB. Tel: (01565) 652652 or FAX: (01565) 634560.

### Holdings Streamlines

Harry Leeming G3LLL proprietor of Holdings Amateur Electronics, 45 Johnston Street, Blackburn BB2 1EF. Tel: (01254) 59595 has recently been looking at the possibilities of separating the sales and repair side of his business, to allow him more time to concentrate on repairs and renovation of second-hand equipment. He had hoped that a partnership could be arranged but unfortunately this has not been possible, so Harry has decided to reduce the shop's opening times.

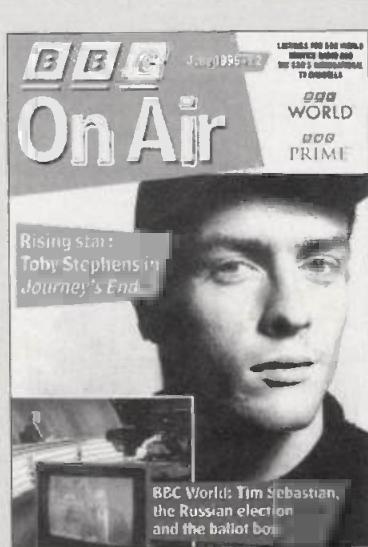
From July, Holdings Amateur Electronics will open on three consecutive days only, Thursday, Friday and Saturday. This will enable Harry and Brenda more time to themselves and will mean that Harry can spend more time in his workshop.

### On Air With The BBC

Recently landed on the *PW Newsdesk* is a new publication from the BBC. The new monthly magazine, *BBC On Air*, contains the daily listings for BBC World Service radio programmes as well as the schedules for BBC World and BBC Prime television which is available in Europe. The magazine has been designed to provide a helpful and informative guide to the BBC's vast range of programmes from news coverage through drama to documentaries.

The World Service programme listing section of *BBC On Air* is divided into labelled sections giving the reader details about the contents of specific programmes which then cross refer with the day-by-day schedules. All the frequency charts are colour coded to match the five streams of programmes available on the World Service. Also included is information about which BBC transmitters are 'in play' at any one time.

A yearly subscription to *BBC On Air* costs £18 and all enquiries should be addressed to PO Box 765, Bush House, Strand, London WC2B 4PH. Tel: 0171-257 2211 (answerphone) or FAX: 0171-240 4899.



### Eddystone User Group

Owing to increasing numbers of membership enquiries Ted Moore of the Eddystone User Group has been experiencing difficulties in dealing with all the incoming mail himself. Therefore, Ted has arranged for all newsletter and technical mail to be dealt with by Jim Murphy, EUG, 63 Wrose Road, Bradford, West Yorkshire BD2 1LN and all requests for subscriptions and copies of manuals to be dealt with Mr Graeme Wormald 15 Sabrina Drive, Bewdley, Worcestershire DY12 2RJ.

## Reduce That Noise!

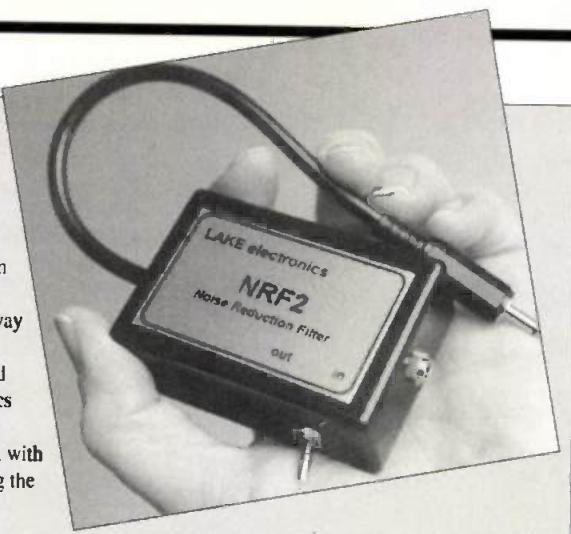
### Lake Electronics NRF2 Noise Reduction Filter

Many simple receivers have one major problem, excessive high frequency noise (hiss). This noise on a signal makes it very tiring to listen to for long periods. What is needed is a noise filter - to take away the noise and just leave the wanted signal.

An ideal filter wouldn't need a power supply, and may be added to any receiver. The Lake Electronics NRF2 filter is such a filter.

The NRF2 is a simple looking 70x48x24mm box with an input lead, an output socket and a switch to bring the unit in and out of operation. It's supplied with two adapters (3.5/6.3mm and 6.3/3.5mm) to fit into the headphone socket of the radio, the NRF2 can cope with any combination of socket and plug on the radio and headphones.

The NRF2 is very effective. (*The noise almost disappears leaving a quieter but more clear signal - a useful addition to any receiver.* GITEX), and costs £16.50 plus £1 P&P. To order yours contact Alan Lake at 7 Middleton Close, Nuthall, Nottingham NG16 1BX. Tel: (0115) 9382509.



## Optoelectronics Catalogue

A new 22-page full colour Optoelectronics catalogue featuring frequency counters, recorders and many items of hobby related equipment is now available from UK distributors Waters & Stanton Electronics. To receive your copy just send your name and address together with a first class stamp to 22 Main Road, Hockley, Essex SS5 4QS.

radio enthusiast.

The award is open to anyone under 18 who has an interest in radio and is a resident in the UK, Channel Islands or the Isle of Man. Entrants must be nominated by an adult sponsor although there is no requirement for entrants or nominees to hold an Amateur Radio Licence.

The following areas of activity will be considered when the applications are assessed. Radio construction (d.i.y.), operation of radio, community service, encouraging others and school

projects. The first prize of £300 together with an invitation to visit the Radiocommunication Agency's Monitoring station at Baldock will be awarded at the Radio Society of Great Britain's HF Convention during October.

All applications and nominations should be sent to Young Amateur of the Year Award, Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Tel: (01707) 659015. The closing date for entries is 31 July 1996.

## Young Radio Amateur Of The Year

The closing date is looming for nominations to find the 1996 Young Radio Amateur of the Year. The competition, which is aimed at generating interest in amateur radio and encouraging people to get involved, has been running annually since 1988 and each year the award is presented for the most outstanding achievement by a young amateur

## STOP PRESS New National Society

Just as this issue was going to press we received news of the United Kingdom Radio Society (UKRS), which aims to become a new national radio society. The UKRS organisers say that has been formed in response to overwhelming demand from all over the UK and will cater for enthusiasts in all aspects of the radio hobby.

The UKRS press release states that one of the main aims of the UKRS will be to take demonstrations into schools and colleges giving youngsters an insight into amateur radio. They also say it's hoped that a combination of the UKRS and the RSGB working in parallel for their members' common interests will have a much wider reach for radio.

For more details and membership application forms please send an s.s.a.e. measuring at least 9 x 5in to Greg Reilly-Cooper G0MAM, United Kingdom Radio Society, Box 100, Northwich, Cheshire CW8 1FA. Tel: (01606) 783270, E-mail: info@ukrs.org

## Low Power Introduction

Dick Pascoe G0BPS of Kanga Products has just published his second book. *Introducing QRP* is an A5 sized book containing a wealth of information. Chapters include 'What is QRP', 'Typical QRP Equipment', 'Antennas', 'Q Codes' and 'QRP Clubs around the world' to name a few.

*Introducing QRP* is written in the same similar, friendly and easy to understand format as Dick's first book, *Pascoe's Penny Pinchers* and should fit comfortably on the book shelf of both the established and would-be QRPer alike. Dick's book should make a useful reference guide, no matter what your level of QRP expertise and is a must for any serious QRPer.

To order your copy of *Introducing QRP* contact Kanga Products, Seaview House, Crete Road East, Folkestone, Kent CT18 7EG. Tel/FAX: (01303) 891106.



## Single Frequency Radio Travel

Eurotunnel, NTL and Radio Services Ltd. have launched a new concept in radio broadcasting. Travellers heading down the M20 towards the Channel Tunnel can now hear music, news, travel information and weather reports on **Channel Travel Radio** which is broadcast on 107.6MHz.

Channel Travel Radio works by using multiple low power transmitters all on the same frequency. This means that listeners don't need to re-tune as they head towards the Channel.

The Crawley (Hampshire) based company NTL were awarded the contract to design, build and operate the single frequency network by Eurotunnel. The network installation consists of a main transmitter near the Eurotunnel terminal building in Folkestone together with three 'repeater' sites covering the M20 approach road back beyond Ashford.

It's hoped that the single frequency network (the first of its kind to be constructed in the UK) will be adapted to run along other British motorways. This would give road users their own dedicated radio service and would do away with the need for re-tuning to local stations as travellers from region to region.

## A Date For Your Diary

On Saturday 17 August 1996 South Midlands Communications will once again, after the absence of a few years, be holding an Open Day. The doors will be open from 9am at SM House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hampshire SO53 4BY.

Among the attractions planned will be a free draw, rig checks, American licence walk-in testing, Morse testing, local BBS and Packet cluster demonstrations. There will also be all the usual SMC product lines available together with special offers and bargains. Why not make a date in your diary to go along and meet the team?



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TSB-3303	GF 144/70, 3/6dB (1.1m)	£39.95
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TSB-3001	AL 144MHz, 3.4dB (1.4m)	£29.95
V-2000	GF 6m/2m/70cm, 2.1/6.2/8.4dB (2.5m)	£134.95
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### ACCESSORIES P&P £2.00 on the following

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### HIGH QUALITY NISSEI MOBILE ANTENNAS P&P £4.50

DB-7900	144/70 cms, (5/7.6dB) 1.5m	£49.95
DB-770M	144/70 cms, (3/5.5dB) 1m	£24.95
DB-1304	144/70 cms, (2.15/3.8dB) 41cms	£19.95
DB-EL2E	144MHz, 4ths, 4.5dB (1.8m)	£29.95
DB-285	144MHz, 4ths, 3.4dB (1.3m)	£15.95

### ACCESSORIES P&P £2.50 on the following

MT-1301	H/Duty Mag Mnt + Coax	Top Quality £24.95
MT-3302	H/Duty Hatch/Trunk Mnt	Top Quality £24.95

### HF ANTENNAS P&P £10

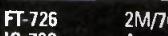
R5	10/12/15/17/20 vertical	£295.00
R7	10 thru to 40m vertical	£389.00
AV-3	14-21-28MHz vertical 4.3m long	£89.00
AV-5	3.5-7-14-21-28MHz vertical 7.4m long	£159.00
APRA	8 Band Vertical	£199.00
A35	14-21-28MHz Yagi	£349.00
Carolina Windom '2' 40-10m (66ft)		£88.95
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### HUSTLER RANGE NOW IN STOCK

4BTV	Four band HF vert 10, 15, 20, 40 1.5kW	£169.95
5BTV	Five band HF vert 10, 15, 20, 40, 80 1.5kW	£189.95
RM-20	20m mobile (reduced length) 400W	£24.95
C-32	Ball mount assy + plate (4ths fitting)	£26.95

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### ICOM IC-706 Ex-demo model £899.95



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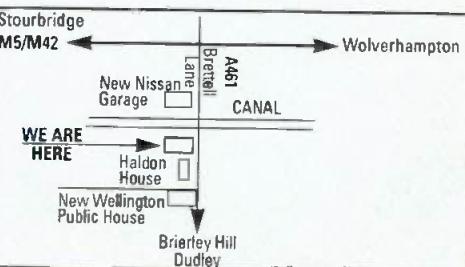
FT-726	2M/70cm 6M fitted	£899.95
IC-738	As new	£1099.95
FT-990DC	As new	£1399.95
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TS-430S	VGC	£699.95
TS-830S	VGC	£549.95
TS-530SP	VGC	£549.95
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DR-610	As new	£549.95
FT-2500M	Ex-demo	£289.95
DJ-580	2M/70cm handheld	£339.95
DJ-G5	2M/70cm handheld	£339.95
DJ-560	2M/70cm handy	£249.95
TH-48E	70cm handheld	£229.95
Standard C-520 2 + 70 handy		£299.95



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# NOVICE

## Natter

For Radio Beginners Of All Ages

This month Elaine Richards G4LFM looks at the broadcast bands, has news of a club for budding builders and looks towards the Millennium with the Air Training Corps.

### Hours Of Enjoyment

If you have an h.f. amateur bands transceiver, then you have a piece of equipment capable of providing many hours of enjoyment. Over the next few months I want to look at each of the bands individually - who uses them, why and what will you hear. Let me know if you have any questions you want answered.

Firstly I want to look at the receiving side of the set. Let's assume we are looking at a middle range (and middle priced!), modern amateur multi-mode transceiver.

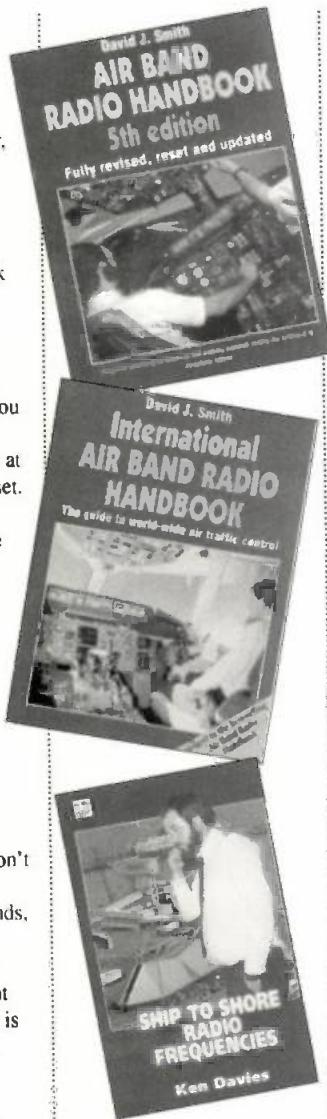
Many of these amateur multi-mode radios cover most of the modern-day amateur bands for the transmitting side, and something like 100kHz-30MHz or so on the receiving side. As you don't need all this coverage to listen on the amateur bands, what is it there for?

Answer: Lots of things!

Even the most ardent amateur radio enthusiast is going to come across an evening when they just can't find anything interesting to listen to, or anyone to talk to. It does happen - not often, but it does happen!

So, you can either switch off and go and watch the TV or you can tune around and find something different. There are a lot of things around on all kinds of bands that you may find interesting.

How about a bit of marine band listening, or air band for that? You can



listen to air band radio from the top end of 2MHz right through to something like 23MHz, all on single side band (s.s.b.).

There are also marine stations operating right through the h.f. bands. There are many frequency guides available from places like the PW Book Service that will help you find your way around these bands.

### Short Wave Bands

By far the most well-known area of non-amateur listening must be the short wave broadcast bands. For some who have recently come into the amateur hobby this is regarded as 'old-fashioned' and boring, but it's not!

Recently I had cause to be stay up late (very late!) using the computer, I put the radio on for company and found it very interesting. There are several radio stations that run programmes just for the dedicated radio listener.

Radio Netherlands (RN) for example has a programme that goes out on the air several times on a Thursday called *Media Network* (e.g. 0730 on 9.720MHz; 1330 on 9.89, 13.7 & 15.15MHz; 1730 on 6.02, 7.12 or 11.655MHz; 2130 on 1.44MHz). In forthcoming programmes, RN's Jonathan Marks will be reviewing the Grundig Yacht Boy 320 and the Telefunken MR1500 receivers.

It's difficult to get exact dates from stations like Radio Netherlands as the programmes are made on a Wednesday evening and then broadcast on a Thursday. So, with the lead times I have, I can't give you any further detailed information, however you could write to Radio Netherlands at PO Box 222, 1200 JG Hilversum, The

Netherlands and request a programme schedule so you know what to listen for and when.

Other broadcasters have interesting music programmes, documentaries or special programmes. If you were listening to Radio Österreich International on April 20 then you may have heard their Shortwave Panorama programme when they linked up with the special event station OEM1 celebrating International Marconi Day. If you did hear that programme you can

send for the special QSL card too.

You can even learn a foreign language by listening to broadcast stations, stations like Deutsche Welle run language courses with text books available! Their language course, *German - why not?*, teaches the everyday usage of German and is aimed mainly at young adults.

The books that go with the course are available free of charge from Deutsche Welle, 50588 Cologne, Germany. You can choose any one of 29 different languages for the course book from English to Russian and Bengali to Swahili!

All broadcast stations produce schedules of their programmes and once you discover the ones you find most interesting it's worth getting these schedules for reference. Try listening around one evening, you may find it interesting and it is another aspect of our amazing hobby!



RADIO NEDERLAND, Hilversum (Holland)



## Short Wave Special Event

### Budding Builders

I've a couple of items that could interest those of you who enjoy building things. Although I know of course the summer months are not usually the time for sitting indoors building bits and pieces of radio equipment - more likely mending the lawn mower!

Anyway Richard Q. Marris wrote (and it is a long time since we last had dealings. Richard - doesn't time fly when you're having fun!) with some news for the constructors among you. He was in a large W.H. Smith's and noticed a number of small d.i.y. kits in the children's section.

One of these d.i.y. kits was a crystal set, but before he got the chance to open it and check it out an assistant kindly pointed out that you're not supposed to open the kits. They cost around £9 each and I wondered if anyone has had a go at building one of these yet, if so what are they like?

Richard says that he built his first crystal set when he was seven or eight years old and has enjoyed home construction ever since.

I've mentioned the kits produced by Tim Walford in the past, now I've discovered he publishes a quarterly newsletter called *Hot Iron* for members of the Construction Club. A subscription to this Club costs £5 for the year (£7 overseas) and runs from September 1 each year.

The Spring 1996 issue has details of updates to the various kits that Tim produces, diary dates of interest to the home constructor, a couple of hints and tips, and article on 'Workshop Practice' and an article on 'Signal Generator Design'. If you are interested in the

Whilst reading *Monitor*, the Newsletter of the International Short Wave League (ISWL), I read about a very unusual special event station. During July, the station **EISINS** will be on the air celebrating the golden jubilee of the Irish Naval Service.

The unusual thing about the EISINS station is that there is a set of seven QSL cards available for working or hearing this station, one for each band from 1.8 ('Top Band') to the 144MHz band. They will be operating both c.w. and s.s.b. on the h.f. bands and f.m. on the 144MHz band, so hopefully many amateurs and s.w.l.s will have a good chance of collecting all seven of the cards.

Having mentioned the *Monitor* newsletter perhaps I should tell you a bit more about what you can expect to read in it each month. The A5 newsletter is sent out to members of the ISWL and contains many regular columns as well as interesting articles.

The 'Amateur Bands Review' column in *Monitor* gives details of stations heard by members during the month of February in their March issue. The column starts with 1.8MHz and works its way through the bands to 28MHz.

Each person who has sent in a log is listed along with the most interesting stations they heard on the band as well as the time at which they heard them. For example on 18MHz, Arthur Miller heard FSSPL at 1600UTC on s.s.b. as well as TI2LL at 1400 and 9Y4NW on 1500.

There is also a 'QSL News' column with details of QSL managers for special calls heard on the air. Other interesting columns for the radio amateur are 'Transmitting Topics', 'Equipment Review', 'Contest Reports' and 'QRP Corner'.

So, you can see that there is quite a bit to interest the transmitting amateur. For details on the International Short Wave League, you should contact the ISWL HQ at 3 Bromyard Drive, Chellaston, Derby DE73 1PF. Don't forget to include an s.a.e. with any queries.

Constructors Club, then drop a line to The Construction Club, Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9N.J.

### Air Cadet Radio

At the London Amateur Radio Show, the Air Training Corps (ATC) released their new Air Cadet Radio Document outlining their ideas towards the Millennium. If you are aged between 13 and 20 years old then the Air Cadet Corps could open up a few opportunities for adventure - of course if you are older than that, then they are always on the look out for instructors to help teach the new radio syllabus.

Let me tell you a bit more about this nationwide group. They are a uniformed youth organisation who aim to encourage in young people a practical interest in aviation and the Royal Air Force, to provide useful

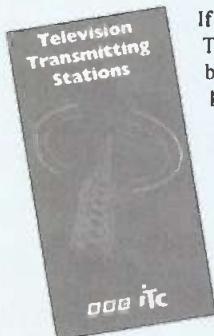
training and foster a spirit of adventure and leadership.

Although they encourage an interest in the RAF, there is no obligation to join at all. Cadets have the opportunity to fly in both powered aircraft and gliders, take part in training exercises and sporting

activities.

The ATC was formed in 1941 and since 1948 cadets have been operating the radio on the frequencies allocated to them by the RAF. They still have a Sunday morning h.f. Net, but now also have v.h.f. and u.h.f. allocations.

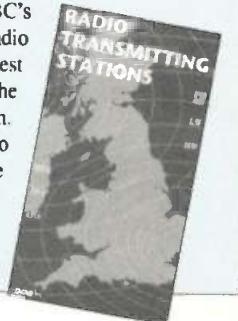
### Broadcasting Information Booklets



If you're fascinated in the many different aspects of radio and TV broadcasting, you'll be interested to know of two (free!) booklets available from the BBC. Information is essential in knowing where to find radio and TV stations - on the dial and on the map. To this end, the BBC and the Independent Television Commission (ITC) jointly publish the *Television Transmitting Stations* booklet.

*Television Stations* is packed with channel, frequency, programme contractor (ITV) and regional (BBC) information along with fascinating technical details and National Grid References so you can locate them easily on the map. Ideal for the TV 'DXer'!

The second booklet, the BBC's *Radio Transmitting Stations* is ideal for the radio enthusiast, engineer or general listener who wants to get the best reception possible. And interestingly, along with all the information on long wave, medium and v.h.f. Band II f.m. transmissions, the booklet has details for satellite radio reception (particularly useful for listeners living outside the UK). Booklets and further information available from BBC Engineering Information, White City, 201 Wood Lane, London W12 7TS, Tel: 0181-752 5040.



*That's all the 'natterings' for this month so, until next time cheerio and don't forget to write to me with your hints and tips for interesting radio. Letters should be sent to me at PO Box 1863, Ringwood, Hants BH24 3XD.*

When the Novice Amateur licence was created, this attracted the attention of Sqn. Ldr. Tony King at ATC HQ. It seemed an ideal addition to the ATC training syllabus and so he started discussions with the RSGB.

Cadets go through about 30 hours of training for their ATC Operators Certificate and then they are encouraged to go on for their Novice Licence. So now the ATC are looking towards organising a major ATC Radio event to celebrate the Millennium.

So, if you qualify, either as a cadet or as an instructor, and are interested in finding out more about the radio aspects of belonging to the ATC, contact HQ Air Cadets (TG2) RAF Cranwell, Near Sleaford, Lincs NG34 8HB. Tel: (01400) 261201 ext. 7619.

*Elaine G4LFM*

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

# CLUB Spotlight

Compiled by Zoë Shortland

## Raising Money - The Amateur Radio Way

**Tony Faulkner G0SKG** shares his story of how he became a licensed radio amateur.

I took my City & Guilds examination in 1991 holding the callsign G7JYX until I passed the Morse test in September 1992. My callsign now is **G0SKG**.

Now, you may say, so what? But I suffer from Multiple Sclerosis and heart problems. The hobby has however kept me in remission now for the past four years. On top of that, I wanted to put something back into the hobby.

I first became a Novice Instructor doing one-to-one teaching at my own home. To date all those I have tutored have passed first time. Then I began to teach Morse c.w. on the 144MHz band.

To date I have assisted about ten people through to obtain their 'A' licence callsigns. My claim to fame here is getting the youngest English person through. A ten year old girl who passed the 12w.p.m. test at her first attempt. I was beaten for the record by a nine year old living in Northern Ireland.

I was then approached by the RSGB to take up the post of Regional Liason Officer (RLO) for the West Midlands, a post I have held now for the past 18 months. This again gives me the opportunity to put back a little more into the hobby. I can

honestly say that the benefits I have had from all this, plus the friends I have made, make each and every day worth living.

Well, 18 months ago I decided, after a visit to Helen Ley Home (a respite care centre for people who suffer from MS), to try to raise money to equip a new physiotherapy unit being built at this very moment. With the help of other amateurs, in particular Mr G. Woodford G0KNM, the event is taking place on June 22/23rd 1996.



A total of 12 stations have agreed to take part using h.f. v.h.f./u.h.f. and in some cases using Packet radio. I myself will be using my own equipment to run one of these from Helen Ley Home with the assistance of G0WLK, who also suffers from MS and members of the Stratford ARS who are also loaning their portable tower.

The stations taking part and their callsigns are 1) Helen Ley Home GB4MSR - Multiple Respite, 2) Stourbridge & DARC GB2MS - Multiple Sclerosis, 3) Aldridge & Barr Beacon ARC GB0MSR - MS Respite, 4) Sandwell ARC GB0MSC - MS Care, 5) Bromsgrove ARS GB2MSC - MS Care, 6) Salop ARS GB4MS.

Care, 7) Hillcrest School ARS GB4MSH - MS Help, 8) Powys & DARS GB2MSH - MS Help, 9) West Bromwich Central RC GB0M.S. Help, 10) Kidderminster & DARS GB8MS Multiple Sclerosis, 11) Wolverley & DARC GB6MS - Multiple Sclerosis and 12) South Birmingham RS GB5MSR - MS Respite.

To raise money an award will be issued to any station contacting four stations and a remittance of £2.50. For anyone contacting ten of the 12, a large award will be available at a cost of £10. All persons will receive a QSL card.

For those stations abroad, all relevant information will be written on the inside of the card asking for a donation to obtain the award, they incidentally will only need to contact one station.

The other way we have of raising money is from donations of radio equipment from the following firms, like Stuart Crystal, Tandys, Currys, Momentum Communications who are

## New Members Required!

The Mid-Somerset Amateur Radio Club has recently held its AGM and the new committee are particularly keen to publicise the club with a view to attracting new members. The club has been very inactive for a number of years, but now has access to an excellent venue.

The club meets on alternate Tuesdays from 1900 to 2100hrs at Whitstone Community School, 11 Charlton Road, Shepton Mallet, Somerset. It is hoped that the Morse class, run by Colin G4KLD, will take place between 1900 and 1930hrs, ie. the first half hour of each meeting.

The club has a permanent h.f. station set-up and this will be on the air at each meeting when there are no guest speakers present. If you'd like to find out a bit more, then contact Peter Grosjean (Publicity Officer) on (01749) 676875 preferably in the evenings or at weekends.

donating two prizes, total value £300. Practical Wireless has donated a 12 month subscription plus binders.

**Waters & Stanton Electronics** are pledging a further two more prizes to the value of £100. But, other firms I have written to have yet to contact me with their pledges.

I have spoken to **Martin Lynch, Lowe Electronics and SM Communications** who are also donating something, as yet I know no what. A bottle of 12 year old Malt whisky is being donated from a friend whom I met

Your pages - your stories! Have you moved into a new club room, won a contest, got a funny story or news of a special event? Then let's hear from you. Send in your club logo too, if you've got one. You never know, you'll probably recruit new members at the same time!

through the RAE and a 35mm camera has been donated by two anonymous friends.

The idea is to make up a list of prizes and (at a cost of £1) and the draw will be done by a well known personality on the Sunday, just prior to the event closing. One last thing, sponsorship forms are available for anyone who wishes to raise money.

For further details, contact **Tony Faulkner G0SKG, 105 Corbyn Road, Russells Hall Estate, Dudley, West Midlands DY1 2JZ.**

## The Club With No Subs!

Yes, it's true - there are no subscriptions to the Folkestone & District Amateur Radio Society (although naturally the club reserve right of entry!). The monthly meetings are held on the first Monday in every month at 7.30 for 7.45pm on floor A at 11 Earls Avenue, Folkestone (side entrance - down the steps). There is no need to pre-book - just turn up.

The aim of the F&DARS is to encourage the attendance of anyone interested in amateur radio - young or old, licensed or not - and to that end there is no subscription fee. The only charges are for tea, coffee and orange juice, which are available at 40p during the interval for those who want them.

## North Wales Activity

The North Wales Radio Rally Club meet every Thursday at 7pm at the YMCA Building, Queens Drive, Colwyn Bay, where Novice classes and Morse tuition is held and occasional guest speakers give talks on different aspects of the hobby. Also h.f., v.h.f. and u.h.f. is on air using the club callsigns GWONWR/GW7NTU.

The club organise the Llandudno Radio,

Electronics & Computer Show each year, this year being the 10th show on November 9 & 10th. Since October 1991 the club have been registered a City & Guilds Examination Centre for the Novice exam and radio amateur exam.

In 1995 the club took part in the IOTA Contest, transmitting from Puffin island off the North Wales coast coming 40th (although they're aiming to better their position this year, by learning from the mistakes they made). The club also takes part in the *Practical Wireless* QRP Contest, and has done since 1990, reaching 2nd place overall in 1994 using the callsign GWONWR and the group name 'North Wales Wafflers'.

One June 29/30th the members of the club will be transmitting from the Colwyn Bay Pier on h.f., v.h.f. and u.h.f. to commemorate National Pier Day.

If you'd like to find out a bit more, why not contact Barrie Mee **GW7EXH**, Secretary, on (01745) 591704.

## The Rooster Net & GB3WD

Nearly another year has gone by since 'Club Spotlight' mentioned the 'Rooster Net Breakfast' in the August 1995 issue. So, what's been happening?

Well, the 'Rooster Net' in the south west continues to flourish - **Paddy Baker G0TQR** explains all.

"There has been good attendance at all the breakfasts that have been held at different locations all over Devon and Cornwall. As well as our famous breakfasts, **Ken G0VUG** organised a Christmas dinner at a local pub and everyone had a very enjoyable meal and good company on the night.

By the way, Ken has taken over as Net Controller from **Ray G0KZQ**, who is now mostly in listening mode. Ray still organises the breakfasts and attends them all, and it is a great pleasure to see both him and his good lady Gwen at these events.

## Spotlight Trophy

**David Barlow G3PLE** has great admiration for Amateur Radio Club magazines and newsletters - and the people who put the hard work into producing them. So David, a retired Marketing professional and former member of the Birmingham Press Club who now lives in Cornwall, wrote to the **Rob Mannion**, Editor of *PW*, and **Zoë Shortland** suggesting a special trophy for the best Radio Club Magazine or newsletter.

Rob and Zoë thought David's idea was an excellent way of encouraging the (often hard-pressed!) magazine and newsletter editors. **Dave Wilkins G5HY of Kenwood (UK)** Ltd. thought so too! The result is that a new award, The Spotlight Trophy, Awarded To The Radio Club Magazine of The Year by *Practical Wireless* and Kenwood (UK) will be presented at the Leicester Show in October.

So, let's see your magazine, whether it be weekly, monthly quarterly, glossy, duplicated A4, PC produced or whatever. They're all of interest and yours could win! To enter your Club Magazine for the award, send two of your most recent club magazines and details on how they're published, to the *PW* Editorial offices at the very latest by Monday 22nd July. Remember to mark your envelope 'Spotlight Club Magazine Competition'.

The panel of judges: **Dave Wilkins G5HY**, **Zoë Shortland**, **Jim Bacon G3YLA**, **David Barlow G3PLE** and the Editor are looking forward to reading your club's magazine! Get busy, the spotlight's on!



## Club Reminders

Meetings are held at 8pm (on Fridays) for the Dunstable Downs Radio Club at Chews House, High Street South (A5), Dunstable, Bedfordshire. Some events to come will include construction competitions, talks, junk sales, fox hunt, etc. as well as the usual natter nights.

New members and visitors are always welcome. Just drop in or call **Paul G7TSJ** on (01582) 861936.

The Strathmore & District Amateur Radio Club meet every Tuesday, from 7.30pm, at 2231 Squadron (Forfar) Air Training Corp., Lochside Road, Forfar. Club shack is available for use and Morse classes are run.

RSGB videos are shown on the last Tuesday of every month with lectures/visits on the second Tuesday. More information can be obtained from Alan **GM4JCM** on (01382) 644585.

Members of the Salisbury Amateur Radio Club meet every Tuesday at the Scout Hut, St. Mark's Avenue, Salisbury at 7.30pm. The club runs a course for the RAE and caters for the many interests of members.

Further information and details of the club's forthcoming activities are available from George Tollefson **G7OAM** on (01722) 329398 or from Dick Fox **G0MZI** on (01722) 337711.

Secretary Mr D. Webster has written in with information about the Dukeries Amateur Radio Society. Meetings are held at the Ambleside Community Centre, New Ollerton, Notts on the 2nd Tuesday of each month at 7pm. The club callsign is **G4XTL**.

**George K4DSD** and his wife Pattie will be visiting from Florida shortly and as always we are all looking forward to his wise cracks and of course trying to get him to speak the 'Queen's English' correctly (only

kidding George!). Reminds me of the time way back in 1960 when I first met my wife June and she said because of my Belfast accent that she was going to send me to elocution lessons. I went for two weeks and now

there is a fellow in Plymouth who talks just like me!

The Net uses the repeater **GB3WD** has been playing up a bit. There is an intermittent fault for people living on the east side of Dartmoor where sometimes we get low output from the repeater.

As I use the A38 to travel to and from work, sometimes I am not able to access until I reach the new flyover at Marshmill. With summer fast approaching I hope the problem will be soon be sorted out.

Speaking of summer, anyone who happens to be down this way on holiday, don't forget to give a shout on 145.700MHz and you will be made more welcome and better still, if you would like to come along to one of our famous breakfasts throughout the year on the first Saturday of each month, I know you will leave a better person.

Remember, you don't need to hold a transmitting licence, just have an interest in radio. There are no fees either way, just the price of a cup of tea or coffee. Hope to see you soon!"

All visitors are welcome and if you have any enquiries, they should be addressed to Mr D. Webster 2E0AMK at 2 Ambleside, New Ollerton, Newark, Notts NG22 9UR or 'phone on (01623) 860476.

Members of the Reading & District Amateur Radio Club meet on the 2nd and 4th Thursday of every month at Woodford Park, Woodley, Berkshire. Meetings start at 8pm.

The secretary is Peter Swynford **G0PUB**. Peter can be contacted on (01734) 617388 or mobile (0956) 117069.

The South Normanton & District Amateur Radio Club meet at the Community Centre, New Street, South Normanton every Monday (except Bank Holidays) at 7.30pm. The club has a varied programme of events and provides Novice and C.W. instruction.

Following the AGM, there is now a new chairman, Mick Bullock **2E0AAL** who offers a welcome to all new members. Further details are available from the Secretary Russell Bradley **G0OKD** on (01773) 863892.

The Wincanton Amateur Radio Club meet on the 1st and 3rd Monday (2nd and 4th if the 1st is a bank holiday) of the month at 7.30pm at King Arthur's Community School, West Hill, Wincanton.

Just a few up and coming events are: June 17 - Club night night with RSGB video at club QTH, 30th - The Longleat Amateur & Computer Rally, July 1 - A talk on UKRS by one of its co-founders Greg Reilly-Cooper **G0MAM**. Greg is well known in the Nottingham area for his on going work with RAYNET. This is one not to be missed and on July 8th there is a committee meeting at Tim's QTH **G6RCT** at 1930hrs.

For more information contact Tim Stellar **G6RCT** on (01963) 31788.

Send your club information to Zoë Shortland at the PW Offices.

# Q: WHY BOTHER TO SUBSCRIBE TO THE UK's BEST SELLING AMATEUR RADIO MAGAZINE?

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Isn't it time you subscribed to *Practical Wireless* and got the VITAL COMPONENT to bring your hobby to life?

# RADIO Dirby

Compiled by Zoë Shortland

## 1996

**June 16:** The Newbury & District Amateur Radio Society are holding their 9th Annual Radio Boot Sale at the Recreation ground, Cold Ash, Newbury, Berkshire. The site is just under two miles from the A4/A34 road junction and is well signposted. Admission and parking free for buyers and a generous plot will be available at £8 to those selling. Access allowed to the site for setting up from 8am. Refreshments/toilets/disabled parking and children's playground on site. Talk-in with GB4NBS on S22. Further information from George on (01488) 682814.

\***June 30:** The 39th Longleat Amateur Radio and Electronics Rally, organised by the Bristol Group of the Radio Society of Great Britain will be held at Longleat Park, near Warminster, Wiltshire. A major feature of the rally will be the Bring & Buy section. There are also all the other usual Longleat facilities such as the Safari Park, House and beautiful lake and grounds. Gordon G0KGL on 0117-940 2950.

\***July 13:** Cornish Radio Rally. More information from Ken G0FIC on (01209) 821073.

**July 14:** The 16th Sussex Amateur Radio & Computer Fair is being held at the Brighton Race Course from 10am to 4pm. There will be over 100 trade stands, free parking and admission is only £1.50. The rally is one of the largest in the South of England. Refreshments and bars at reasonable prices. A rally not to be missed! (01273) 501100.

**July 21:** The 13th McMichael Mobile 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 10am and admission is £1.50. Car boot sale £7 per pitch on the day (no advance bookings). For trade bookings, contact Chris G0MZM on (01734) 874870. Other details from Dave G3SET on (01628) 486554.

**July 28:** The Rugby ATS 8th Annual Radio Rally will be held at the BP Truckstop on the A5, three miles east of Rugby and just 2.5 miles North west from junction 18 of the M1 motorway. Doors open from 10am and admission is £1 per car and facilities include a good cafeteria and toilets. Talk-in on S22 by GB8RRR. Further details from Peter on (01455) 552449 or Steve (for bookings) on (01788) 824214.

\***July 28:** The Scarborough Amateur Radio Society Amateur Radio, Electronics and Computer Fair will be held at The Spa, South Foreshore, Scarborough. More details can be obtained from Ross Neilson G4ZNZ on (01377) 257074.

**August 11:** The 39th Annual Derby Mobile Rally takes place at the Littleover Community School, Pastures Hill, Littleover, Derby. Doors open at 9.30am. The school is located off the A5250 (Burton Road) south of Derby, one mile south of the village of Littleover and the A5111 Derby Ring Road. There will be a large flea market, tables by the hour, wide range of radio and computer traders, monster radio & computer junk sale run by the society - with silly prices, famous for many years, starts at 11am. There will also be a wide range of refreshments available. Ample accommodation if wet. Martin G3SZJ, QTHR. Tel/FAX: (01332) 556875.

\***August 11:** Flight Refuelling ARS Hamfest 96 will take place at the Flight Refuelling Sports Ground, Merley.

Wimborne, Dorset. The event will run from 10am to 5pm and will include the usual mix of traders, Bring & Buy, craft exhibitors, car boot sale and field events. Talk-in will be on S22. Richard Hogan G4VCQ on (01202) 691021.

**August 16:** Cockenzie & Port Seton Amateur Radio Club Radio Junk Night will be held from 1830 to 2130 in the Cockenzie & Port Seton Community Centre. Bring along your own junk and sell it yourself. Tables will be provided free of charge on a first come first served basis. Entry fee £1 and refreshments will be available. All money raised to go to the British Heart Foundation. Bob GM4UYZ on (01875) 811723.

**August 18:** The Red Rose Rally is being held at Horwich Leisure Centre, Victoria Road, Horwich, Nr. Bolton J6 M61. There will be a cafe, bar, Bring & Buy, RSGB stand, special interest groups, parking for 300 cars, free cash draw every hour, children's activity room up to seven years, supervised by parent. Doors open at 10.30am and admission is £1, free for children. Talk-in on S22. Albert G7RZW on (01204) 62980.

**August 18:** The 7th Great Eastern Rally is to be held at the Cattle Market, Hardwick Narrows, Kings Lynn. Doors open at 10am (9.45am for disabled visitors). There will be an outdoor car boot area, a spacious indoor area with national exhibitors, a Bring & Buy, talk-in on S22, free parking, refreshments on site, easy access for disabled. It is a good family day out with Sunday car boot nearby and close to Hunstanton Beach & Sandringham House. For bookings and information contact G0BMS on (01553) 765614 or at GB7OPC or E-mail leo@feline.conqueror.co.uk

**August 25:** The Galashiels and District Amateur Radio Society Open Day and rally will be held at a new and larger venue. The Volunteer Hall, St. John's Street, Galashiels from 11am to 4pm. There will be a Bring & Buy, refreshments and a raffle. Talk-in on S22. (01896) 850245 or (01896) 755943 evenings only.

**August 25:** East Coast Amateur Radio & Computer Rally, Clacton Leisure Centre, Vista Road, Clacton-on-Sea. Sharward Promotions, Upland Centre, 2 Upland Road, Ipswich, Suffolk IP4 5BT. Tel: (01473) 272002.

**August 26:** The Huntingdonshire Amateur Radio Society Annual Bank Holiday Monday Radio Rally is to be held at Elmulf Community School, St Neots, Cambridgeshire. Doors open at 10am and admission is £1. Refreshments available. Talk-in on S22. Further details from David Leech G7DIU on (01480) 431333.

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

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

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

Editor

\* Practical Wireless & SWM in attendance

# Win IC-706

## 'TOP TO TWO' COMPETITION

AN ICOM IC-706 HF & VHF MOBILE TRANSCEIVER WORTH OVER

**£1000!**

Donated by Martin Lynch & Son of the Amateur Radio Exchange Centre

Martin Lynch has very generously donated an IC-706 together with 10 of his T-Shirts printed with his logo as prizes for this very special competition.

**FIRST PRIZE:** IC-706, a Martin Lynch T-shirt & a three year subscription to Practical Wireless.

**SECOND, THIRD & FOURTH PRIZES:** A Martin Lynch T-shirt & one year subscription to Practical Wireless.

**NOT RUNNERS-UP PRIZES:** A Martin Lynch T-shirt

### How To Enter

All you have to do is answer the three multiple choice questions below, (all the answers can be found in this issue), get your answers from the May & June issues and then tick the appropriate answer boxes on the form below. Don't worry if you've missed a set of questions as back copies of the May & June issues of PW are available from our Post Sales Dept. on (01202) 659930.

### QUESTIONS

**Q1:** What do the initials F B stand for in Samuel Morse's name?

- A. Flynn Baker    B. Frederick Brown    C. Finley Breese

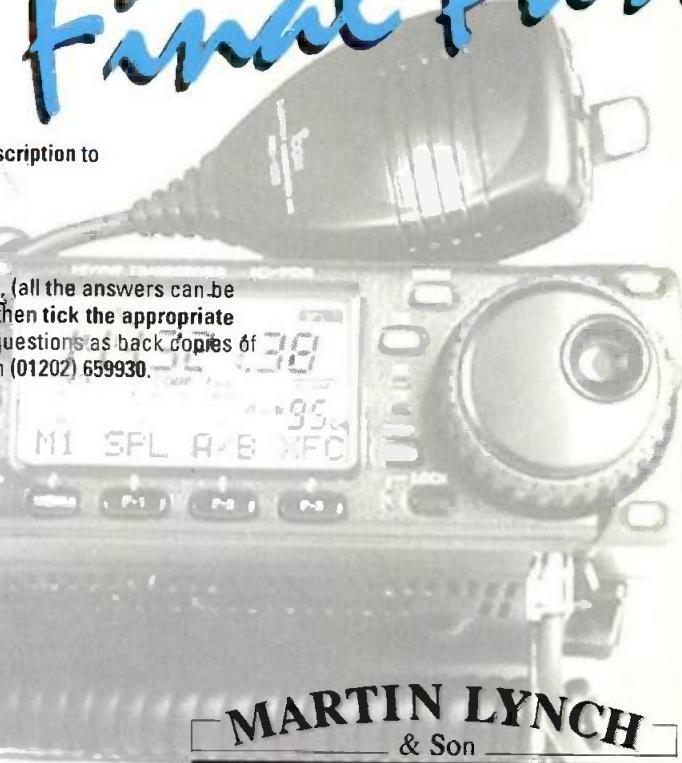
**Q2:** How much is the IC-706 prize worth?

- A. Over £3000    B. Over £1000    C. Over £1500

**Q3:** On which band does the Simple Loop Antenna operate as described by G4BXD?

- A. 1.8MHz    B. 10MHz    C. 28MHz

# Final Part



**MARTIN LYNCH**  
& Son  
THE AMATEUR RADIO EXCHANGE CENTRE

### IC-706 Entry Form

#### May Answers

- |           |                            |                            |                            |
|-----------|----------------------------|----------------------------|----------------------------|
| <b>Q1</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/> |
| <b>Q2</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/> |
| <b>Q3</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/> |

#### June Answers

- |           |                            |                            |                            |
|-----------|----------------------------|----------------------------|----------------------------|
| <b>Q1</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/> |
| <b>Q2</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/> |
| <b>Q3</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/> |

#### July Answers

- |           |                            |                            |                            |
|-----------|----------------------------|----------------------------|----------------------------|
| <b>Q1</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/> |
| <b>Q2</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/> |
| <b>Q3</b> | A <input type="checkbox"/> | B <input type="checkbox"/> | C <input type="checkbox"/> |

Name .....

Callsign .....

Address .....

.....

.....

Postcode .....

If you do not wish to receive future mailings as a result of entering this competition please indicate.

Send your entry (photocopies acceptable with corner flash) to: IC-706 Competition, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Editor's decision on the winner is final and no correspondence will be entered into. Closing date for entries is Friday 26 July 1996.

# The MFJ-9406 50M

By David Butler G4ASR

**David Butler  
G4ASR puts the  
new MFJ 50MHz  
'budget priced'  
s.s.b.  
transceiver  
through its  
paces to  
discover its  
potential on the  
'Magic Band'.**

As a keen 50MHz DXer I'm always pleased to see new equipment being developed for use on this exciting band. And I was even more pleased when I was asked by Rob Mannion G3XFD if I would like to get my hands on the latest delivery from the MFJ stable to review it for PW!

In recent years a number of the major manufacturers have been producing transceivers that cover the h.f. bands and the 50MHz band as well. Of course these all sing, all dancing rigs do have an obvious attraction but they also have one major drawback!

You can end-up paying a fair amount of your hard earned cash on facilities that you don't want or are not allowed to use. Indeed, for a number of operational reasons, many DXers prefer not to put all their eggs into one basket opting instead to use separate transceivers for different bands.

The radio I'm reviewing is tailored specifically for single band 50MHz operation...admirably fitting the bill. And because it's an entry level transceiver the price won't make a big dent in your bank balance either.

## Transceiver Coverage

The MFJ-9406 is a 10W s.s.b./c.w. transceiver with coverage encompassing the band 50.000 to



50.300MHz. Although the 50MHz band in the UK is 2MHz wide, this 300kHz frequency slot adequately encompasses all of the present activity to be found on both s.s.b. and c.w. modes.

If conditions are right you'll be able to explore all of those exotic propagation modes that I've been describing recently in my 'VHF Report' column. These can include sporadic-E, F2-layer, aurora, meteor scatter, tropo and many more besides.

The transceiver covers the beacon and c.w. areas of activity (at the l.f. end of the band). It also covers all of the DX segment (approximately 50.090 to 50.150MHz) and frequencies used for local communication, centred on 50.200MHz.

Within Europe, a number of countries have much narrower allocations than we're fortunate to have been granted in the UK. These include for example France and Andorra (no operation allowed below 50.200MHz) and Italy (a 25kHz slot around 50.160MHz). Importantly this transceiver covers all of these and similar allocations throughout the world.

Another feature of the MFJ-9406 is that it uses energy efficient analogue circuitry and is thus suitable for both fixed station, portable or mobile

operation. Because of its low power drain the unit can either be operated from a fixed 13.8V power supply unit, a NiCad battery pack or an optional MFJ-4110 wall socket transformer and regulator module.

## Low Noise Receiver

Now I'll take an in-depth look at the receiver. This basically comprises of a single-conversion superheterodyne using a 10MHz intermediate frequency (i.f.) and an analogue variable frequency oscillator (v.f.o.) running on the low-side at 40MHz.

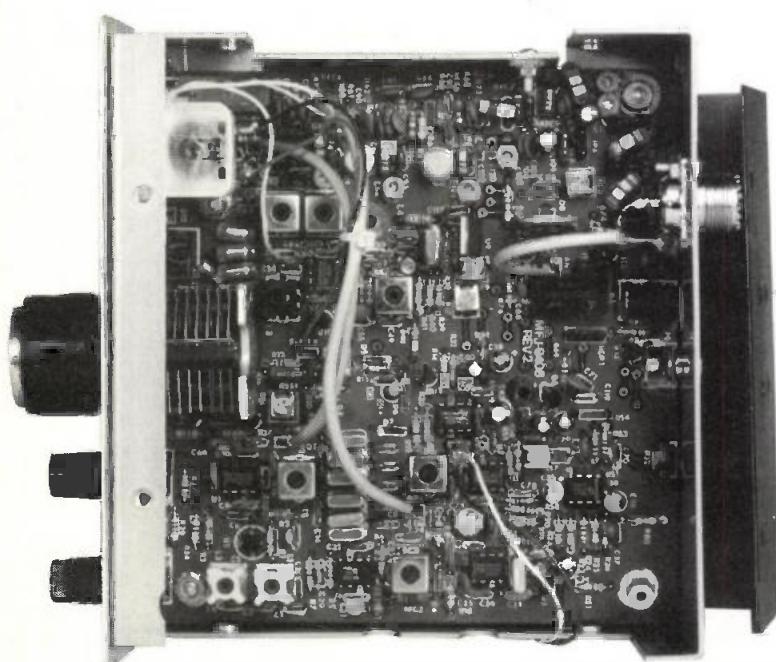
At the front-end of the receiver a four-pole band-pass filter pre-selects the incoming signal before being amplified in a low noise preamplifier. Following amplification, the signal is passed to an active mixer and mixed with the v.f.o. frequency.

The resultant 10MHz i.f. is then filtered by a six-pole crystal ladder filter and passed through to an automatic gain controlled (a.g.c.) amplifier and subsequent product detector. This detector demodulates the incoming s.s.b. signal and also provides audio-derived gain adjustment for the a.g.c. amplifier. Finally, the demodulated audio signal is amplified and passed to an internal speaker.

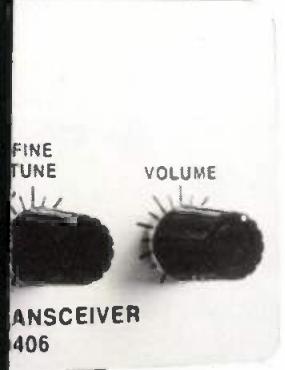
## Filter Type

The transceiver uses a conventional filter-type transmitter to generate the s.s.b. signal. Audio from the microphone is amplified and passed to a balanced modulator.

The double-sideband output signal, at 10MHz, is then filtered by the six-pole crystal ladder filter, as used in the receive side. The filtered u.s.b. signal is then compressed



# Hz Transceiver



using a 'syllabic' speech processing technique which is claimed to provide up to 6dB of signal punch.

Mixing of the signal with that of the v.f.o. is carried out to provide a resultant output within the 50MHz band. The v.f.o. incidentally is produced by mixing a free-running oscillator at 6MHz with a 34MHz crystal controlled oscillator to produce a final output frequency from 40.0 to 40.3MHz.

Finally, the s.s.b. signal at 50MHz is passed to two radio frequency (r.f.) amplifiers before being presented to the power amplifier (p.a.) stage. This final amplifier uses a ballasted common-emitter device operating in Class AB to develop 10W peak envelope power (p.e.p.) output.

A seven-element low-pass filter following the p.a. output matching network reduces harmonics and spurious content. This aids in the reduction of interference to radio and television apparatus.

### *Compact Transceiver*

The MFJ-9406 transceiver is very compact. It measures 170mm wide, 60mm high and 150mm deep.

The main chassis is of pressed steel construction with a tough vinyl-clad case. The front comprises a brushed aluminium panel which gives a pleasing finish.

The front panel is simply laid out with controls for main tuning, fine tune and volume. The power switch, microphone and Morse key input sockets are also located on the front panel as is an I.e.d. to indicate when the transmitter is keyed.

An analogue meter displays signal strength on receive and doubles as an indicator of microphone processor gain on transmit. On the rear panel are

located sockets for 12V power, external amplifier control and an SO-239 for the antenna connection. Also located at the rear is a screwdriver slot for microphone gain adjustment.

All circuitry associated with the transceiver are located on a single high quality through-plated printed circuit board (p.c.b.). The board is screen-printed with each component being individually identified.

Alignment adjustments and test points are clearly marked. I liked these features very much as they are a great aid when it comes to any possible servicing of the equipment outside of the warranty period.

All components are wire-ended, no surface mount technology (s.m.t.) here, another great aid to do-it-yourself. I should also add at this point that I found the instruction manual to be **very** informative. Not only did it include a complete circuit diagram and explanation of all circuitry but it also gave a comprehensive tune-up guide and technical assistance contact points.

### *Operating The Radio*

Now it was time to actually put the transceiver to test. (I don't know if you're like me but when I get a new radio out of the box I want to be able to play with it right away).

Unfortunately it wasn't immediately possible with the MFJ-9406 because there's no power lead supplied. So, it was out with the soldering iron, find some solder and side-cutters, hunt around for some suitable cable and then terminate the wires onto the supplied plug. (Yes I know it's a budget price radio but I'm sure it wouldn't have been too much trouble to supply it with a power lead!).

Operation of the radio is very simple. With the receiver switched on it was gratifying to hear the background noise increase when the antenna was plugged in. I say this because it immediately indicates that the receiver has sufficient sensitivity.

Simply put, if you cannot detect an increase in (sky) noise when you connect your antenna into a 50MHz receiver then it's totally deaf and needs corrective action!

The sky noise temperature at

50MHz is quite high and is basically the inherent background noise that is always present. (Fitting an external low noise amplifier or designing a radio with a super low noise front-end is a total waste of time as the limiting factor is the background noise. You won't achieve any more sensitivity, you'll only end up overloading the receiver)

Tuned Around

I immediately tuned around the band looking for a signal but, typically for the 50MHz band, none were to be heard. (Unfortunately I was testing the radio in March/April when there is always a distinct lack of 'popular' propagation modes).

I could however, hear the GB3NHQ beacon some 200km away from my QTH coming in at its normal 569 signal. So, there was nothing for it but to put out a CQ call having first checked that the microphone gain control was correctly adjusted. This is simply achieved by speaking normally into the microphone and adjusting the microphone gain potentiometer for correct deflection on the front panel meter.

My CQ call was immediately replied to by G7MWW (located in the Forest of Dean). He then reported that my transmission sounded very distorted. I listened on my monitor receiver and sure enough it did sound distorted.

I then carried out some tests during which I ascertained that the receiver was also badly out of alignment. Tuning in an s.s.b. signal gave indications to my well trained ear that all was not well.

I had no doubt that the six-pole crystal lattice filter, common to both transmit and receive, was very much mis-aligned. Furthermore the balanced modulator was also mis-aligned as I could detect a large amount of injected carrier.

Unfortunately I was not able to carry out further testing with G7MWW as after only six minutes use the transmitter stopped working. I could just detect the transmitted signal weakly on my monitor receiver so I suspect that something in the driver/p.a. department had failed.

Two weeks later I received



**six  
mass  
two  
and  
a  
group**

# MFJ-9406

Continued from page 23

*After seeing a copy of G4ASR's review, Jeff Stanton G6XYU sent us the following comments:*

As MFJs largest export customer, Waters & Stanton have the opportunity to test and publicise pre-production and prototype products from this prolific manufacturer. The first two 6m (50MHz) rigs which David Butler G4ASR had were early prototypes and as soon as we heard of the problem we passed this back to MFJ who modified actual production and now we are not seeing this problem with the transceiver. Similarly, we asked for a headphone socket to be provided at some future stage. MFJ plan to include a d.c. lead free of charge in the next production.

**Jeff Stanton G6XYU**

another MFJ-9406 from the importers, Waters & Stanton. I immediately plugged it in, having kept the original power lead!

Straightaway it was obvious to me that this radio was a completely different animal from the first review model. I heard two local stations having a 'rag chew' and decided to join them.

But first I did some tuning tests to see how the controls felt. I must admit that I thought I would have trouble tuning in stations quickly and accurately with the 'coarse' analogue tuning mechanism.

### Pleasantly Surprised

However, I was pleasantly surprised. The tuning was very smooth and agile and it was very easy to 'zero in' on stations. The fine tune control, which gives  $\pm 3\text{kHz}$  tuning either side of nominal, actually seemed a little academic because of this. Some operators might need it but I certainly didn't.

Although I didn't have time to carry out any proper measurements the selectivity provided by the crystal filter seemed excellent and well matched for s.s.b. communication. However it should be noted that there's an awful lot of difference between two stations having a 'rag chew' on a flat band compared to an intense summer

**My thanks go to Waters & Stanton Electronics of 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835, FAX: (01702) 205843, for the loan of the review transceiver which costs £269.95.**

There are various accessories available for use with the MFJ-9406, these include:

Accessories	Order Code	Price
CW Adapter	MFJ-416	£45.95
50MHz a.t.u.	MFJ-903	£49.95
50MHz a.t.u./Wattmeter	MFJ-906	£84.95
13.8V p.s.u.	MFJ-4110X	£39.95
Portable NiCad p.s.u.	MFJ-4114X	£76.95

### Sporadic-E opening!

My only criticism in the tuning department refers to setting a frequency. I was actually unable to set the receiver accurately to any specific frequency.

The printed dial is calibrated every 100kHz with indicating marks every 25kHz. Tuning to a specifically marked frequency on the scale, 50.2MHz in this instance, and checking on my monitor receiver showed I was 2.8kHz off frequency.

Next I made a guess at where 50.110MHz, the DX calling channel, was. (Don't forget that the nearest calibration marks are at 50.100MHz and 50.125MHz.) In this case I was over 4kHz out. I suspect if you own one of these transceivers you'll end up with a dial full of ball-pen marks of your favourite frequencies!

Finally it was time to join those two stations, G1URJ and G1UPX, who I heard having the 'rag chew'. Both are located in Oxfordshire, about 120km away from my QTH so I was pleased that the 10W was reaching them on tropo.

Each station then gave me critical reports of signal quality. The operator at G1URJ said the audio quality sounded very good and G1UPX was very similar in his appraisal reporting that the rig possessed nice audio with a good treble sound.

### Manufacturer's Specifications

#### Receiver Section

Frequency coverage	50- 50.300MHz
Receiver type	Single-conversion Superhet
Frequency control:	Heterodyne v.f.o.
Intermediate frequency	10MHz
Intermediate freq. selectivity	-6dB @ 2.5kHz
Automatic gain control	Audio-derived 70dB dynamic range
Sensitivity	0.15µV for 12dB S/N
Audio output	1W into 8Ω at 10% THD
Average receive current	60mA (S-Meter bulb disabled)

#### Transmitter Section

Power output	10W p.e.p.
Matching (v.s.w.r.) tolerance	3:1 Maximum
Peak transmit current	2A
Speech processor	r.f. compression, syllabic rate
Spurious attenuation	60dB
Microphone input	600Ω dynamic
Morse (c.w.)	600Hz tone (optional generator)



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DCS2 "S meter" Kit: £10.90  
HA20R hardware pack: £28.90



### SWR Indicator

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HA12R hardware: £10.10

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Assembled PCB modules: £27.90

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Assembled PCB modules: £27.60



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Kit (inc. hardware): £29.90  
Factory Built: £49.90



#### Receiving ATU with balun

CTU9. All the features of the CTU8 plus a balun for balanced feeders, bypass switch for VLF etc. Additional terminals for balanced inputs, single wire and earth.

Kit (inc. hardware): £39.90  
Factory Built: £69.90

Please add £4.00 P&P, or £1.50 P&P for electronics kits without hardware.

HOWES KITS contain good quality printed circuit boards with screen printed parts locations, full, clear instructions and all board mounted components. Sales, constructional and technical advice are available by phone during office hours. Please send an SAE for our free catalogue and specific product data sheets. Delivery is normally within seven days.

73 from Dave G4KQH, Technical Manager.

# Morse Methods

By John Goodall G0SKR

**John Goodall  
GOSKR describes  
several methods he  
used when trying  
to learn Morse  
code, but begins  
with a little history  
just to remind us  
how it all started.**

Above: John G0SKR uses a Stillwell 'Rolls Royce' of Morse keys in his shack.

There are a variety of Hi-Mound keys available, pictured here are the HK-705 and HK-708.

**S**amuel Finley Breese Morse, 1791 - 1872, devised the code named after himself. Morse Code. But I often wonder just how many radio operators, who use Morse code, ever look to the man who started it all.

All those years ago this code was transmitted over land by wire, using simple make and break of an electrical circuit. Only the advanced methods of sending and receiving the code has changed over the years.

From that early journey on the Steamship *Sully*, in 1832, when Samuel Morse devised it, to the present day, the code has changed little. During the late 1800s speeds of some 70w.p.m. were regularly being sent and received via cable.

Regular radio communications with Morse code was being used by Marine operators during the early 1900s. Putting on my retired hat (or helmet!) this reminds me of a particular piece of radio history.

The arrest of a well-known arch villain from the past, Dr. H. Crippen, was achieved by Morse Code. Dr. Crippen had brutally murdered his wife and with mistress in tow, had set off for Canada on the *SS Montrose*.

The Captain of the vessel soon became aware of the true identity of this passenger and partner. He sent a Morse Code radio message direct to the Commissioner, New Scotland Yard. As a result Crippen was duly arrested and brought to justice.

## Fascinating Sound

Over 35 years ago I first became fascinated by the sound of Morse Code. The musical notes emitting from the loudspeaker of the old 19-set proved simply mysterious.

What were those Dots and Dashes - oh? Forgive me, I must start as I mean to go on - Dits and Dahs! - what were they saying.

I must surely be able to learn how to read this 'ere Morse Code. After all I was a budding musician, and the grey cells were as sharp as a razor. However, many years were to elapse before I was to be rewarded with that pleasure.

I tried to learn the code using books, tapes and even early computer programs, all unsuccessfully. During the 1970s, short wave listener Bill Bennett of Coventry, couldn't push or kick me to success.

Despite his ability to read Morse at a steady rate, Bill tried tirelessly to teach me. Many hours of frustration usually ended with a mug of tea and 'Another day tomorrow!' I must have been a lousy pupil!

After my retirement, in the late 1980s a move to the sunny South Coast followed. Sometime later, by chance, I bumped into Rob Mannion G3XFD, Editor of this very magazine.

Rob listened to my tales of failure and offered to help. Monday evenings for over three months saw me undergoing the Three M's. 'Mannions Morse Method' (MMM)! PW June 1995 carried the article 'Mannions Morse Method', back copies available for £2.30 on (01202) 659930. Ed.

Allow me a brief description of MMM. Nothing special, Rob would say, but the proof of the pudding is in the eating. As with most Morse learning processes, the alphabet and

numerals were mastered first.

This I found not too difficult as I had been trying for 35 years! With the aid of the Datong D70 Morse Tutor, several groups of letters were first played at 7w.p.m. with maximum delay (3 seconds) between characters. Rob announced and copied the correct letters and the pupil, myself, copied, hopefully, likewise.

Answers were then checked and corrected and the whole process repeated. The Morse sessions lasted no more than one hour, with a compulsory half-time tea break. The 'delay' between characters is gradually reduced and speed increased.

I have used the MMM system with several pupils of my own and it certainly works. Once a satisfactory speed and copy result have been achieved, progress to the test format must follow. This should ideally be on a one-to-one, hand sent basis.

## Varied Applications

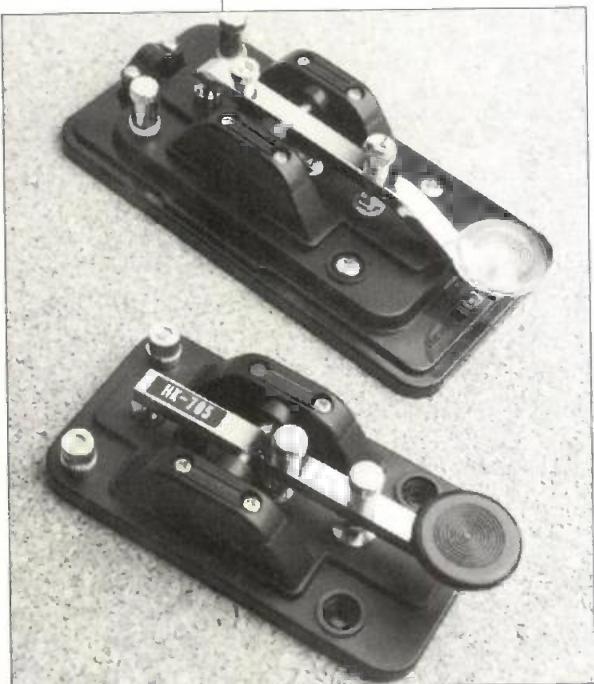
Many varied applications for learning Morse Code are available. I will say at this point that no one method suits everyone. Each person should turn to the one that he or she is most comfortable with.

No matter what method an individual chooses to use, here is an important tip. From the start, the character speed should be set as near as that of the final speed required, with a large thinking time gap between letters (This is Rob's method).

The thinking gap can be progressively reduced until the correct overall timing is achieved. Reducing this gap, or thinking time, gives the impression of increasing the overall speed.

One favourite method of mine, tried and tested over the years, is that of Margaret Mills G3ACC. She advocated several lessons with set letters to be learnt for each lesson.

Margaret's method again uses a trained operator or a programmable computer program. Her methods were excellent up to and including the old style Morse test.



However, the test is now in QSO style format. A change has therefore to be made to move to QSO format sending and receiving exercises.

### Computer Programs

Computer Programs are readily available for learning Morse Code. These again are many and varied. Some are good and some are not so good, but there are far too many to list here.

I am not a believer in sticking with computer generated Morse right up to the test. However, that is my personal view and I do know of test candidates who have done just that - and passed. I also know of many who have failed!

I feel it's often far better to have some one-to-one hand sent Morse prior to the test. After all, the 12w.p.m. Morse test is hand sent!

One program I was impressed with was the Supa-Tuta Morse Tuition System from **Derek Brandon G4UXD**. A single 3.5in disk for IBM (or compatible) computers, gives an extremely comprehensive Morse Tutor.

Do not be fooled by the single disk. This is one powerful program!

The Supa-Tuta Morse Tuition System has a vocabulary of no less than 4260 words, character speeds of between 10 and 100w.p.m., random letters, random numbers, random callsigns (over 3000 stored), no less than 150 ready made QSO format practice Morse Tests, punctuation, abbreviations, Q-Codes, choice of 238 'three minute' plain text, Class A or Novice and a host of other useful goodies.

The price of the disk at only £10.99, does not reflect the power of this program. You can even stick your key into your PC, and it will read your sent Morse Code. A shock for a few who have never tried that before! It doesn't like badly sent Morse!

### Learning The Alphabet

A mention at this point on learning the alphabet. One of the methods employed by the Royal Signals is the Flip Card system. The cards are similar to playing cards but have Morse characters on one side, with the respective letter, number or punctuation on the other.

I use a pack of Flip Cards for teaching from square one, with both Class A and Novice and find them a very useful item for Morse Instructors.

The cards can still be obtained from **Flip Cards, Longheadland, Ombersley, Worcester**. Tel: (01905)

### Suppliers Details

**Derek Brandon G4UXD**, 1 Woodlands Road, Saltney, Chester CH4 8LB. 'Supa-Tuta', Tel: (01244) 683563.

**Derek Stillwell Engineering**, 27 Lesley Owen Way, Shrewsbury, Shropshire SY1 4RP Tel: (01743) 354119.

**F. H. Watts G5BM**, Samson Keyers, Woodland View, Birches Lane, Newent, Gloucester GL18 1DN.

**Kent Keys**, 243 Carr Lane, Tarleton, Preston, Lancs PR4 6BY. Tel: (01772) 814998.

**South Midlands Communications**, S.M. House, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hants SO5 3BY. Tel: (01703) 255111.

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

620000. (Flip Cards operate a Mail Order service).

### Comfortable Key

Learner or accomplished sender, it matters not, when it comes to sending Morse, find a key that feels comfortable. It is no use paying the earth for a gold plated key on a mahogany or marble base, if the damned thing isn't comfortable to use.

Individual choice may just point you to the most cheap and cheerful. If you are just getting into the Morse scene, or have been in it for ages and are not happy with your key, why not pop along to your local Emporium and ask to try several keys. There's nothing worse than 'pump handle elbow'!

Position the key on a level surface, in a place comfortable to the operator. Try not to position the thing so you have to stretch to reach it remember you may be operating for quite a time.

A nice relaxed pose is ideal. Once a suitable location has been found for the key, try fixing it in place with a couple of lumps of the old Blu Tak!

Even with heavy based keys, they can still move around the operating area. There's nothing worse than half way through a QSO if you end up chasing the key all over the shack!

Individual preferences dictates how your fingers and thumb should be on the knob of the key. I usually recommend the first and second finger lightly resting on the top of the knob, with the thumb positioned just under the rim of the knob. But each to his own preference and what is best for the individual.

The movement should be fluid and from the

wrist. Don't stab at the thing as though you are chopping an onion! Smoothness is what it's all about.

### Keys Available

Hi-Mound produce a wide variety of keys, with a budget class key the HK-705 at around £40. The HK-708 Standard Key sells for around £50 and is one of the most popular of the range.

Kent Keys have been around for quite a time, and the size and feel of the traditional Kent straight key is a pleasure to all. This low profile traditional brass pump handle is a joy to use and available at around £60.

A relative newcomer to the world of Morse Keys is Watson. They produce hand-made keys out of brass with solid wood bases. From the GME model at around £35, to the GMV at around £50, they are very well made and comfortable to use. (Hi - Mound, Kent and Watson keys are available from South Midlands Communications, Kent Keys and Waters and Stanton).

The key I use in my shack is a wonderful piece of engineering from Stillwell Engineering. A solid brass

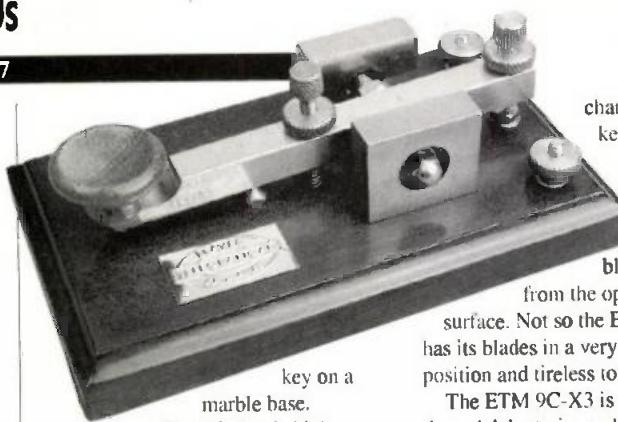
Kent Keys produce a wide range of keys and keyers.



## Morse Methods

Continued from page 27

Watson keys are hand-made from brass with solid wood bases.



key on a marble base.

Stillwell's key is high precision engineered throughout and is smoothness at its best when in operation. Truly a 'Rolls Royce' of Morse keys.

### Paddles And Keyers

Paddles and keyers are the next thing for the enthusiast to venture into. This area is a vast market with something for everyone. Too vast indeed to include all within this article.

However, sometime ago I had the pleasure of testing a range of Samson keyers. A new addition to this range is the ETM 9C-X3.

The ETM 9C-X3 is a CMOS controlled keyer with built-in paddles. It features state of the art technology having a host of functions.

Variable speeds from 5 - 60w.p.m. with ultra speeds from 70 - 990w.p.m! Memories for over 1500

The ETM 9C-X3 is just one of the keyers available in the Samson range.

characters. Some keyers with built in paddles have the paddle blades too high

from the operating surface. Not so the ETM 9C-X3 has its blades in a very comfortable position and tireless to use.

The ETM 9C-X3 is powered from three AA batteries and would be a favourite in any shack. It is available from the sole UK supplier **Frank Watts G5BM**.

Operating paddles with a keyer does take some time to get used to. Again, comfort is the all essential factor.

Have the paddles placed where you are relaxed and comfortable and resting the wrist on the operating surface does help. In right-handed operation the left blade sends dits and the right one sends dahs. This obviously can be changed over to suit individual tastes.

Smooth squeeze operation between thumb and the first finger is all that is needed. After practice you will find the method most suited to you so, don't give up after a couple of sessions. Practice

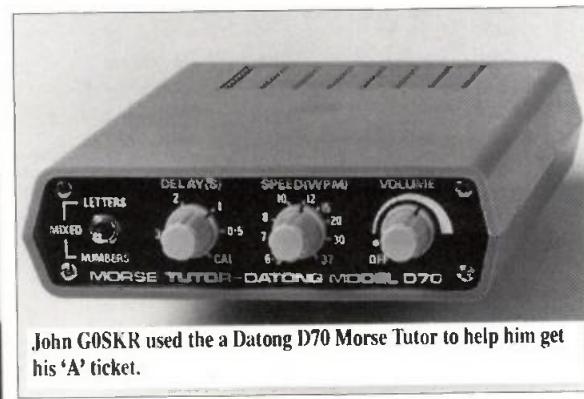
makes perfect and errors soon become less and less.

### Outdated Mode?

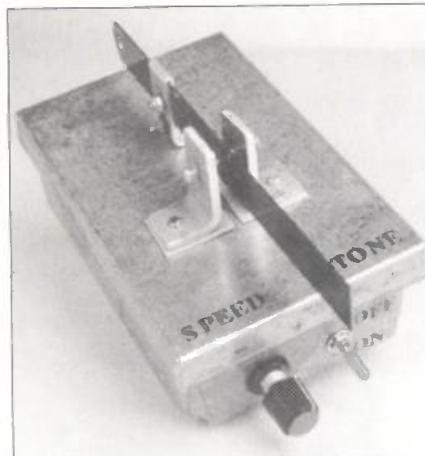
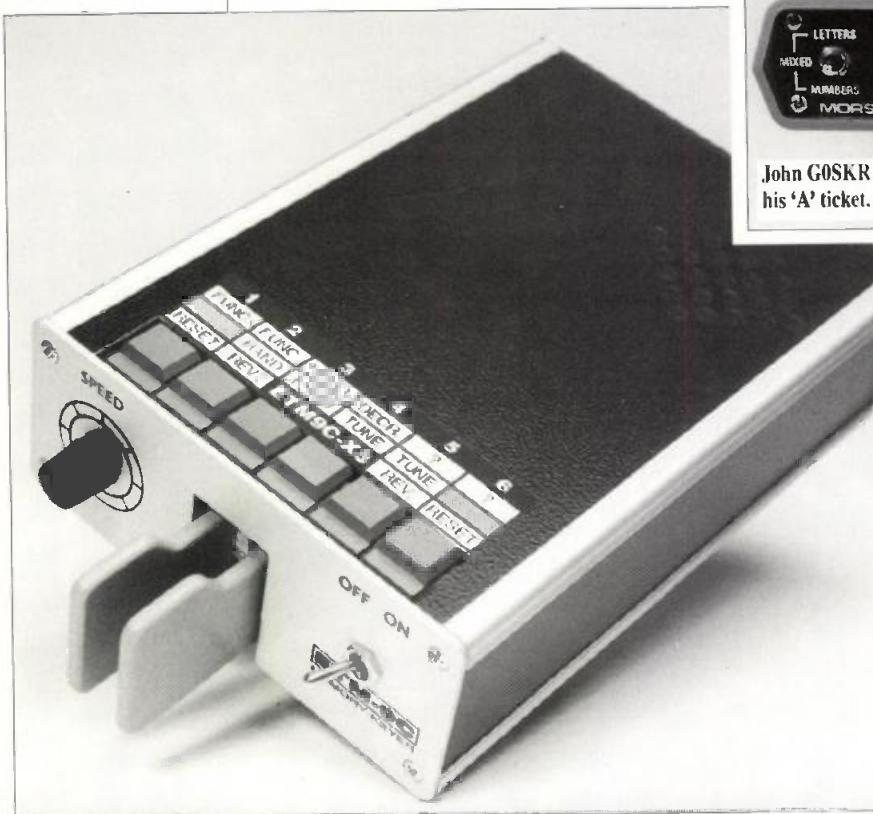
Morse Code, an outdated mode of communication? I think good old Samuel Finley Breese Morse can rest peacefully, I am certain his Code will be around for many many years yet. Dah dah di di dit - Di di di dah dah de John G0SKR.

My thanks go to all those who have helped me through the years with the Morse Code, particularly Bill Bennett, Rob Mannion G3XFD, **Audrey** and **Don King G0IRL** and **G0IJE**. Thanks also to suppliers of review material and equipment for the loan of the same.

PW



John G0SKR used the a Datong D70 Morse Tutor to help him get his 'A' ticket.



Why not build your own keyer? This one designed by Ben Nock G4BXD was featured in PW June 1995 (back copies available on (01202) 659930, price £2.30).

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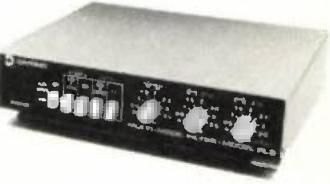
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# Key-Tips

By Peter Barville G3XJS

**Experienced QRP  
c.w. operator  
Peter Barville  
G3XJS shares  
some of his 'key'  
tips for successful  
QSOs.**

Much has been said recently about the future of continuous wave (c.w. or Morse), and its value within amateur radio. Whether or not it should continue to form part of the requirements for obtaining an h.f. licence is an argument which can easily distract from the ability to appreciate the mode for the extremely effective, and enjoyable, means of communicating.

The level of activity to be found on the c.w. segments of the various h.f. bands surely challenges those who dismiss the mode as being outdated. Take a listen!

So, whilst many may see c.w. simply as an obstacle to obtaining their h.f. licence, there can be no doubt that a very high percentage of operators around the world choose to use the mode on a regular basis. In fact, many use the mode exclusively.

For the QRP operator, c.w. tends to be the preferred mode, and it's certainly true to say that the two interests (low power operating and c.w.) go very much 'hand-in-hand'.

That's not to say that QRP 'phone operators don't get a look in. I know that many enjoy using low power s.s.b. with excellent results.

There is no doubt that c.w. is one of the most effective modes for providing reliable communication under difficult conditions. In other words - when the chips are down, c.w. is more likely to get through than almost any other mode.

One reason is that the receiving station is able to use a narrower filter,

and so reject much of the noise and QRM (interference). It can be quite astounding what results are possible when running just a watt or two of c.w., even against powerful competition in a 'pile-up' situation.

## Back To Basics

I suspect most QRP operators, such as myself, are supporters of the 'back to basics' school of amateur radio.

Although many QRPs use commercial equipment, many others build their own transmitters, receivers and/or transceivers.

Simple QRP c.w. transmitting equipment is so much easier to build than an s.s.b. circuit, and the sense of satisfaction which results from using a home-brew station is impossible to achieve in any other way. It also underlines that there are plenty of ways to enjoy the hobby without spending 'loads of money', and that an output of 100W (or more!) is not necessary most of the time.

There are many QRP clubs in different countries around the world, and the **G-QRP Club** is certainly amongst the best. Its quarterly magazine *Sprat* always contains a number of constructional ideas, many of which are very simple, covering from keyers to antennas.

Back issues of *Sprat* are a rich source of information for anybody looking for QRP circuits. If you want to put together a small portable station, or something for the shack, that's a pretty good place to start.

## Commercial Equipment

However, there is no reason not to use commercial equipment for QRP c.w., and there's even some which has been specifically designed as QRP rigs. For example, MFJ market a small mono-band 4W c.w. transceiver (the MFJ-9020 is the 14MHz version) which is ideal for taking on holiday.

I've had several QRP/QRP contacts with stations using the rig from exotic locations. If you are looking for a more sophisticated multi-band QRP rig then try the Index Labs QRP Plus Transceiver (The MFJ and Index rigs

are available from Waters & Stanton Electronics).

Most of the modern commercial high power transceivers provide excellent c.w. facilities, including narrow filtering and full break-in. They also normally have provision for reducing the output power.

However, not all transceivers will go down to true QRP c.w. levels (5W, or less). If this is the case, there is usually an internal adjustment with which you can pre-set the minimum power output available with the main (front panel) power control.

If you don't like the idea of getting inside that expensive 'grey box', it should be possible to reduce the power by applying a small negative voltage to the a.l.c. pin on its accessory socket (on the back panel). This is most easily achieved using a PP9 battery, and suitable potentiometer, mounted in a small box.

The current drain will be negligible and so battery life is not a problem. If a switch is included in the circuit, then it becomes very quick and easy to switch between high and low power levels.

One of the most enjoyable aspects to QRPing is that QSOs between QRP stations tend to be of a very relaxed nature, and often consist of an exchange of ideas and opinions about different QRP circuits, or rigs. The (internationally recognized) QRP calling frequencies on each band are real meeting places for like-minded operators and many good friends can be found there.

## Give It A Try

So, you want to give it a try? Your rig is producing some low power c.w., perhaps the power meter is barely moving and you are anxious to get some reports.

Probably the best first port of call will be the 3.5MHz QRP c.w. calling frequency, 3.560MHz. Unless conditions are very poor, it's unusual not to raise other QRPs on that part of the band.

Try calling 'CQ QRP' and await results. Alternatively, you may well

The Kenwood TS-850 transceiver shown with home-brew keyer on top and a Vibroplex paddle Morse key to the right.



hear others calling 'CQ QRP' themselves, or already in QSO.

By the way, I suggest you do not use '/QRP' as a suffix to your callsign (eg G3XJS/QRP) as this is not strictly legal. If you wish to indicate that you are a QRP station, it is better to simply leave a space between your callsign and the 'QRP' (eg G3XJS QRP).

The other widely used QRP c.w. frequencies are 7.030 (7.040 in the States), 10.106MHz (although 10.116 is now more commonly used), 14.060, 21.060 and 28.060MHz. On both 7 and 14MHz there has been a recent tendency for some of the high powered digital mode stations to creep a little low in the band and encroach into the c.w. sections.

The digital stations cause considerable QRM to QRP operators, but they are otherwise both good bands for finding other QRPs, and for making good two-way QRP contacts. For some reason, the QRP world has not yet been able to reach quite the same level of agreement over the choice of recognised frequencies for 18 and 24MHz.

There is no reason not to work QRO (high power) stations, of course, and so you don't have to stick to the QRP frequencies. Neither do you have to announce that you are a QRP station when calling. In that way, you will receive a genuine report, and probably surprise yourself with the reports you obtain, as well as giving the station you are working an even bigger surprise when you 'come clean'.

In my experience, QRO stations often find it difficult to believe that you are only running (say) a couple of Watts, and ask you to confirm the power output - sometimes more than once. Hi!

## Careful Thought

However, it pays to apply some careful thought about the best way to operate with low power when away from the QRP frequencies. You will obviously be weaker than a station running QRO, but the difference may not be as much as you might imagine.

For example, the difference between an output power of 100W and 1W is 20dB - which translates as the difference between S9 and just under S6 on an S-Meter. Or put another way, if the station you are working is 20dB over S9, then you should still be around S9 yourself.

Clearly, calling a QRO station who is only S3 is less likely to be successful than calling one who is a good strong signal. On the other hand, there have been occasions when I've been able to raise weak DX stations (even rare ones) that have been on a quiet frequency, so it's

always worth a shot.

Calling a rare DX station when they are running a pile-up probably calls for a degree of patience, and operating skill, but can still prove very successful. The most important thing is to discover where they are listening.

The rare DX station is unlikely to be listening on their own frequency, but on a frequency (or range of frequencies) a little higher than they are. They will probably indicate where they're listening by sending 'up', or perhaps 'up 2' which means they are listening 2kHz higher than the transmit frequency. They may even send something like 'up 5/10' - i.e. you should call between 5 and 10kHz up the band.

Try to find the stations the DX works (as opposed to those who are still calling, but not yet making a QSO), because it's only if you call where they are listening that the DX station will stand the best chance of hearing you (with a narrow filter). But remember that you are likely to be a weaker signal than the others who are calling, and it's probably better not to put your transmit frequency amongst the high power opposition.

It might be worth calling just at the top frequency limit of the DX station's tuning range, where the QRM should be less. If you can find yourself a fairly clear frequency, and the DX station centres you in his receive filter, then you will make the contact.

Chasing the DX is not everybody's cup of tea, and split frequency operation can prove difficult with the more basic equipment, but give it a try sometime. I think you will be surprised what rare DX you can work with just a watt or two.

## Portable Operation

Most QRP equipment can be very small indeed, and the current drain very small, and so it is ideally suited to portable operation. By 'portable', I do mean portable.

With some of the neatest home-brew QRP rigs I've seen (particularly the small home-brew equipment) it's almost a case of 'slip it in your pocket portable'. But back-packing is certainly a real possibility.

However, quite a few commercial rigs well suited to portable operation, are available of course. For example, there are now three very small multi-band, multi-mode, h.f. transceivers on the market, the Kenwood TS-50, Icom IC-706 and Alinco DX-70, all of which are small enough to be easily transportable.

Although the lowest of the TS-50's three pre-set power levels is 10W, and therefore too high for true QRP c.w.

operation, there's an internal adjustment which will bring the output down to 5W, or less. The specification of the IC-706 quotes the lowest h.f.

power setting as 5W, which is just OK, but the DX-70 has to be adjusted internally, like the TS-50.

When choosing a rig for c.w. operation, it's also very important to compare the c.w. filtering available for each. A narrow c.w. filter, and i.f. shift control, will make it far easier to copy signals amongst the QRM.

Both the Alinco and the Icom allow c.w. reception on either sideband. This is another useful facility when fighting QRM.

But real fun can be had, particularly when portable, by using something you've built yourself. Perhaps a small single band transceiver from one of the numerous kit suppliers, or something based on one of the many circuits to be found in the various QRP journals.

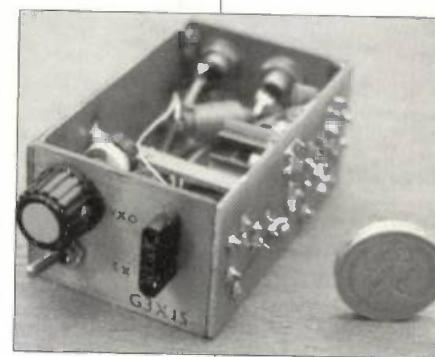
If you're going to try portable operation, the sealed 'maintenance free' rechargeable 12V batteries can be an ideal power source. Details of simple antenna matching units are also easy to find, and so the antenna shouldn't be a problem.

A resonant dipole, fed with coaxial cable, will often be the easiest to use (although 1.8 and 3.5MHz dipoles can be difficult to handle), but it's usually a case of using whatever you can put up in the particular location. Tall trees are not always just where you want them!

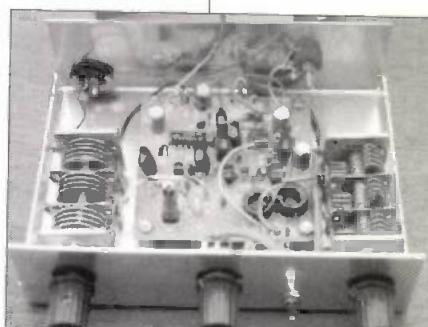
If you've not tried the QRP style of amateur radio before, give it a go. Remember, QRPs do it for fun, and (if you'll pardon the pun) c.w. is the key to it all!



**Home-brew QRP**  
equipment can give great satisfaction when c.w. operating. This 3.5MHz transceiver has an additional digital frequency read-out and audio filter - the keyer on top is home-brew too!



**The OXO transmitter**  
with suitable output filtering will transmit on any h.f. band depending on which crystal is fitted. The output power is around 1W on the i.f. bands, but this decreases on the higher bands.



An example of a home-brew 3.5MHz receiver, this one was built by G4XRV from a C.M. Howes kit.

# The PW Codecard

It's on the cards - Terry Grice G4PSL says Morse skill is easy! Now you can make Morse sound great, however 'hamfisted' you are.



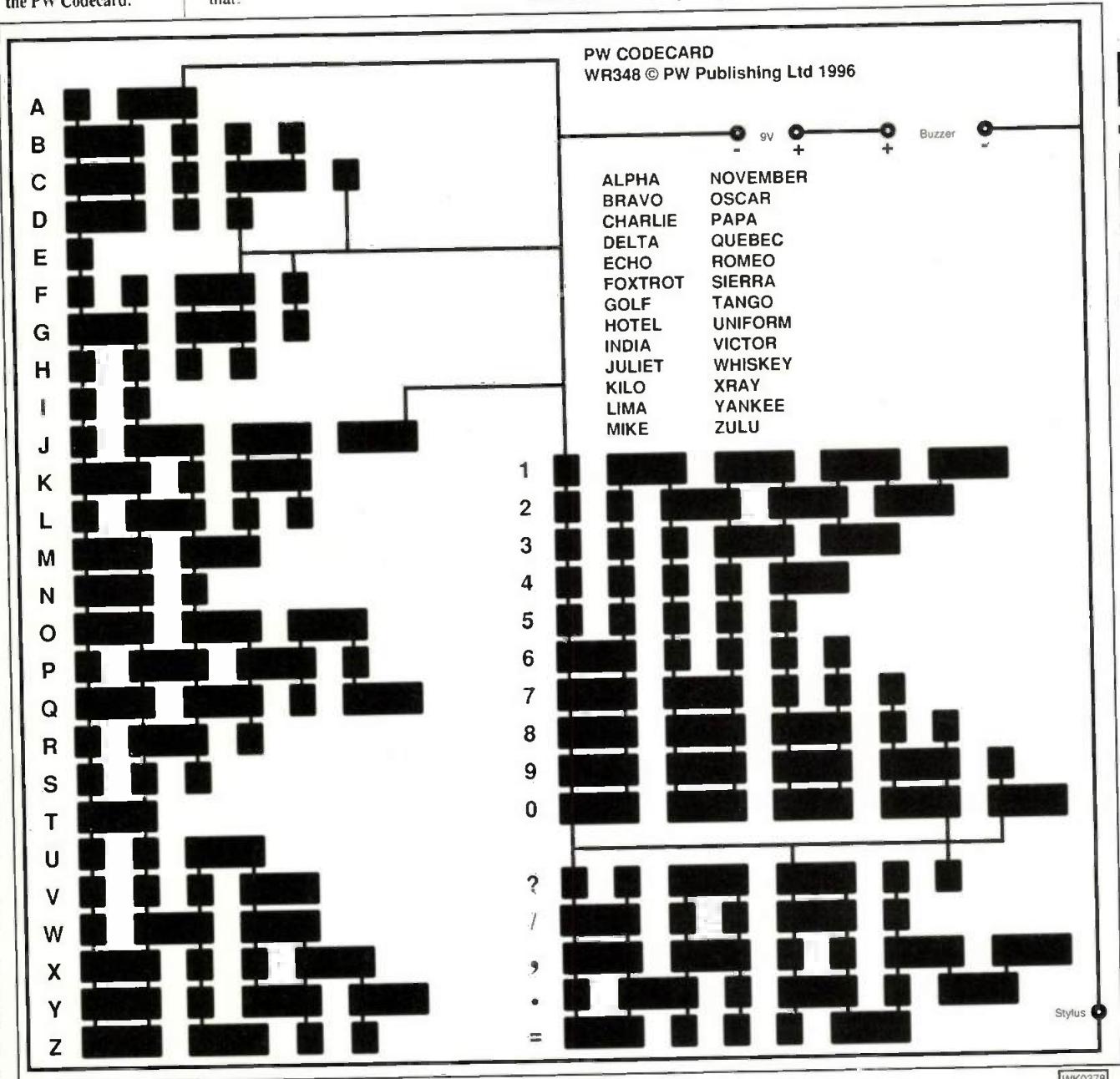
By Terry Grice G4PSL

The p.c.b. layout for the PW Codecard.

The basis of the PW Codecard was to create the proper sounds of the Morse alphabet and numbers no matter how hamfisted you are. Some would say if you cannot send Morse code properly you're not hamfisted. But, I'm not going to get into an argument over that!

The method of producing Morse code using the PW Codecard goes back to the first years of Samuel Morse's system. At first, Morse code was sent using a series of mechanical switches to create the correct makes and breaks of the circuit. Only later did the human hand replace the machine almost completely.

Have a look at the p.c.b. layout of Fig. 1 (which is shown at 80% size to get it on the page). This also happens to be the circuit diagram for the PW Codecard as well. The switches are the various copper areas (lands) of the p.c.b. Take the letter 'A' for instance, one short (dit) land and a longer (Dah) land.

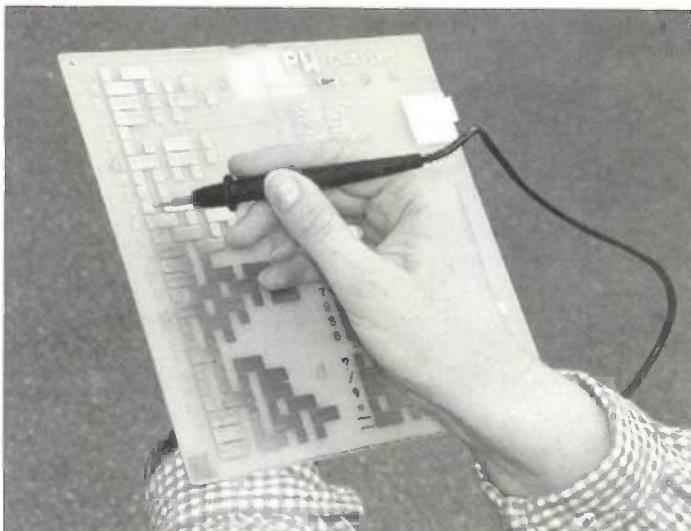


When the stylus is drawn horizontally across the plate beside the letter 'A' the buzzer will produce 'Di-Dah', the correct sound of the letter 'A'. Similarly drawing the stylus across say the number 8 line gives 'Dah-Dah-Dah-Di-Dit'. It's difficult to imagine how it could be made easier!

The circuit consists of a 9V battery (such as a PP3 type) and a buzzer connected intermittently by the lands and a stylus. I used a probe from a multimeter for the stylus. But if one isn't available then the body of a ball-point pen and a 2.5 or a 3.5mm jack plug could be pressed into service as a stylus.

When I made my prototype I mounted the battery in the middle of the reverse side of the board with double sided 'servo tape'. In this position it also acts as a 'foot' to angle the board in use.

The sounder is mounted with its pins as shown, facing forwards on the board. Should your sounder not have



the correct pin spacing then merely mount it on flying leads and stick it to the board as well.

A useful modification would be to drill a couple of holes near the right-hand edge of the board (without breaking the copper track) to act as a

tie-down point for the stylus lead. This will make the lead less likely to break in use.

That's it, it couldn't be simpler. It's clever this Codcard eh (Di-Di-Dah-Dah-Di-Dit).

PW

# Practice Makes Perfect! - Official Morse Procedures

*As Chief Morse Examiner Roy Clayton G4SSH is familiar with the common problems encountered by Morse test candidates. Here he passes on some useful hints and tips, which, if followed, should help you gain the pass slip, the coveted entry 'key' to h.f. operating.*

By Roy Clayton G4SSH

The United Kingdom amateur radio Morse test consists of a typical exchange of signals as used on the amateur radio bands. It's designed to ensure that the instruction undertaken is of practical use for world-wide communication, using basic equipment, and enables successful candidates to go straight on to the c.w. part of the h.f. bands, to exploit the exceptional advantages of the mode.

The most common cause of failure to pass the Morse test is a combination of poor preparation and poor instruction. The failure rate is particularly high for self-taught



candidates, many of whom have only a vague idea of the format of a QSO

style Morse test and rely solely on their ability to recognise individual Morse symbols, learnt from an automatic Morse tutor. Candidates must have the ability to copy mixed letters and figures and a knowledge of procedural characters.

In addition, more candidates fail the sending part of the test than the receiving. In the majority of cases this is a direct result of not being shown how to hold the key correctly.

The most common fault is for candidates to place the Morse key at arm's length in front of them, lay their arm on the table and attempt to shake dots off the end of their fingers, resulting in little control. In many cases the candidates have been taught to do this by colleagues who use an automatic key in this position.

The highest success rate is among candidates who have received tuition by an experienced c.w. operator, listened to the GB2RS slow Morse broadcasts or had skeds on the air. With the demise of the traditional apprenticeship of a period spent as an

s.w.l., many newcomers have never listened to a live QSO on the amateur bands, and need the benefit and guidance of an skilled instructor.

The following advice I'm passing onto candidates can make the difference between success or failure.

## Receiving

Your biggest problem on the receiving test will be nervous tension. During the test this will be transferred to your fingertips causing you to grip your pen hard, with excess pressure on the writing pad. Although it's difficult to relax under test conditions, do try to write the Morse symbols at a steady rate, reading one or two characters behind if possible.

The examiner will send at a steady 12w.p.m. You must avoid writing frantically at a very jerky 25w.p.m. by scribbling the individual letters onto the paper just as soon as the Morse symbols are sent.

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May I add that the advice you gave me on the benefit of taking out insurance for an extended warranty has proved invaluable, the set being collected and returned free of charge under the extended scheme. It might seem a little bit extra at the time but it has paid me to take it out, especially when it is a dealer like yourself who can repair equipment on the premises.

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## Practice makes Perfect

Continued from page 33

Your brain will be racing ahead of the Morse, attempting to guess the word before it's finished. You must react to spaces between words, and even more importantly, do not leave a space if one is not sent. Nine out of ten candidates will write the text 'QTH ISTANBUL' as 'QTH IS TANBUL'.

### Error Signals

You must practice receiving the error signal in the middle of a passage, and recovering, so that this will not cause you to panic during the test. The examiner will not deliberately make a mistake when sending the test passage, but should this occur by accident, do not let it throw you. Look upon this as a bonus!

The examiner will send eight dots and start the word or group again, so you will have two shots at that word. If you are uncertain where the word started, then just continue writing after the error signal, you will not be penalised for writing the word twice, or joining words together.

Try to put a dot every time you miss a letter. This can assist you greatly at the end of the QSO when you are trying to make sense out of the passage.

If you wish to correct a word then cross it out and write the correct version above. Corrected errors are not counted in the receiving test, but you will not have time to re-write the entire passage.

If you can leave a double space between lines when copying the passage then you will have space to write any corrections afterwards. You are allowed a total of six uncorrected errors, but the maximum number of errors that you can be penalised for in one word or group is two.

For example, if you missed the name of the QTH and this was 'WOLVERHAMPTON' you would only pick up two errors, even though you missed 13 letters.

At the end of the test passage you will be given two minutes to read through your copy and make any corrections. Remember that a bad guess at a letter is no worse than a space, so fill in the gaps.

Check that your callsigns at the start and finish are identical. If not, then one is wrong. Can you remember having difficulty with one of the characters?

Which letters do you have problems with? A common difficulty occurs on words that consist of all dots. If so, then try substituting words that do not make sense with other dots.

type letters.

You would be surprised at the number of candidates who turn in a test passage reading 'UR RHT IS H79' instead of 'UR RST IS 579'.

### Without A Key

It never ceases to amaze examiners that some candidates turn up for a Morse test without a Morse key. There will be a choice of keys for you to select, but a Morse key is a most personal object and individuals get used to a particular gap and spring tension. To attempt to send perfect Morse on a strange key is an obstacle that you should never burden yourself with on the day of the test.

You will be given an opportunity to send a short practice passage. Take advantage of this and get used to the note and volume of the oscillator.

When you are given the test passage to send, read it through first and check that you understand the procedural signals as written. If you have any queries at this stage then please ask the examiner before you commence sending.

The candidate does not have to send 'CT' to start the sending test, and it is not written on the test passage, but this is a good habit to get into. Quite a few candidates are nervous and make a mistake on the first character of the test.

Sending 'CT' is not part of the test and is not marked, so you have not commenced the test. Take all the advantages going.

Another common cause of failure is a candidate who makes a mistake in sending and does not correct with the error signal. It's no use muttering under your breath, or shouting 'sorry'.

If you make a mistake Stop. Send eight distinct dots (slowly, and count them) then commence the word or group again.

The Department of Trade & Industry stipulate that the error signal is eight dots (not a minimum of eight dots). If you send seven, or nine dots you have made an uncorrected error that will count as an automatic failure.

Practice sending the error signal until you are perfect. There is no excuse for not sending eight dots correctly, it indicates to the examiner that you cannot control the Morse key.

### Practice Contacts

Practice, practice, and listen to live on air c.w. contacts if possible. Copy Morse from more than one person with a variety of different oscillator notes.

There are no difficult test passages. Every single one is based on actual QSOs heard on the amateur radio bands.

The examiner has 100 different passages from which to choose, and will pick one at random just before the test commences. The test passage will be changed for each batch of candidates, so ignore any tips in the waiting room from candidates who have been into the test.

### On The Day

Give yourself plenty of time to get to the test centre and find a parking place if travelling by car. Remember to take along two passport-type photographs, and if you want to use them, a pair of headphones and a Morse key.

Although there will be a selection of pens, you will feel more comfortable if you take along your own (with a spare). You may consider using a pencil, which cannot run dry in the middle of a test.

The examiners are not looking for perfection. All they ask is that you can demonstrate your ability to receive Morse and control the key when sending, making corrections when necessary.

You are no longer preparing yourself just to pass the test, but to communicate on the International Amateur Radio bands using a new language and procedures that will enable you to carry out a conversation with fellow amateurs all over the world, regardless of language difficulties. This must be worth the effort involved.

If you pass the QSO format Morse test then you can be absolutely certain that you are competent enough to commence using c.w. on the h.f. bands straight away.

### Average Year

In an average year, the Radio Society of Great Britain Morse Test Service examines over 1000 candidates, ranging from eight to over 80 years old, with a pass rate of around 70%, so seven out of ten candidates pass first time. The only people who fail to pass the Morse test are the ones who give up trying.

So, 'good luck', but even more importantly, good preparation!

PW

# Looping over the Lawns

By Ben Nock G4BXD

**Ben Nock G4BXD describes a simple loop antenna design which could solve your 'Top Band' problems and provide good performance within a small space.**

Fig. 2: The transformer is made from a section of coaxial cable and four ferrite rings.

Fig. 1: The overall picture of how the loop should be mounted (not to scale).

The antenna I'm describing was originally developed by Robin Wood G4UDK of Redditch. It will fit into a very small space, needing only six metres or so of length, yet will radiate very well on the 1.8MHz band.

It's simple and the design consists of the loop itself and a small matching transformer. None of the elements in this design were critical, Robin simply experimented until he got good results!

Actually, the design, erection and use of this antenna are all the more surprising considering that Robin is in fact a 'white stick' operator. The diagram, Fig. 1, shows the typical layout of the loop.

In the actual location where it's used the loop is anything but vertical, the wire running at all weird angles, around the shed, up the pole, etc., but its very general appearance is of a vertical loop.

### Lowest Leg

The lowest leg is only some 1.5 - 2m off the ground. The top of the loop is held up by any suitable fixing, in the design QTH a small stand-off mast holds up the highest end, about 8m high from the ground with a tree the other end.

The loop can be supported with the traditional 'egg' insulators or by using the polypropylene type of rope. At the feed point corner a small strip of plastic, or Paxolin, can

be used to hold them apart.

Then the loop is brought into the downstairs shack. Finally, it's coupled to the rig via the transformer.

### The Transformer

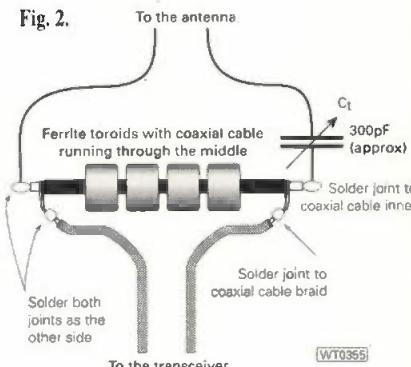
The transformer itself consists of four large ferrite rings with a 150mm length of large diameter coaxial cable passed through them, as in Fig. 2.

The loop is attached to the inner of the coaxial cable via a 300pF variable capacitor in series with one of the legs. Note that both ends of the capacitor are in line so it cannot be screwed to any conducting surface.

The two ends of the coaxial cable's outer screening are then taken to either the rig via a short length of coaxial cable or to an antenna tuning unit (a.t.u.).

At Robin's location an FC902 a.t.u. is used to 'tweak' out the very lowest v.s.w.r. On direct connection, I discovered the v.s.w.r. was around 1.5:1 to 1.8:1, but careful pruning could get this lower.

I suggest you use a small plastic box to house the rings and coaxial cable with the tuning capacitor mounted on the top. A large insulated knob should be attached to the capacitor spindle as otherwise you will get r.f. burns. However,



having warned you, there's no real reason to worry. Just use common sense!

In use the series capacitor is rotated first for maximum received signal. Then, under transmit conditions, you should adjust for a minimum v.s.w.r. reading and the normal tune/load procedures taken on the rig in use.

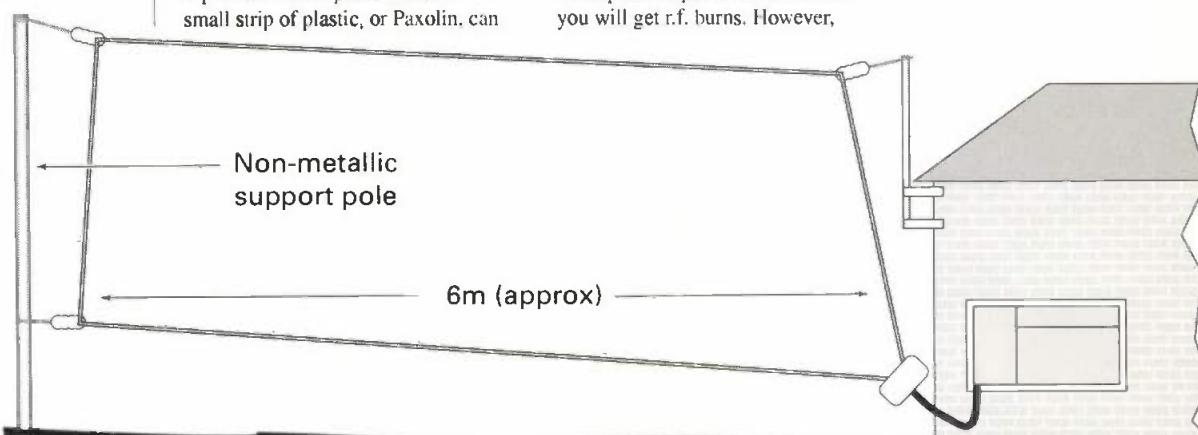
### Loop Performance

In use the loop's performance is such that in general, if a station can be heard they can be worked. Operations from Robin's QTH have brought QSOs with GMs, GWs and south coast stations alike.

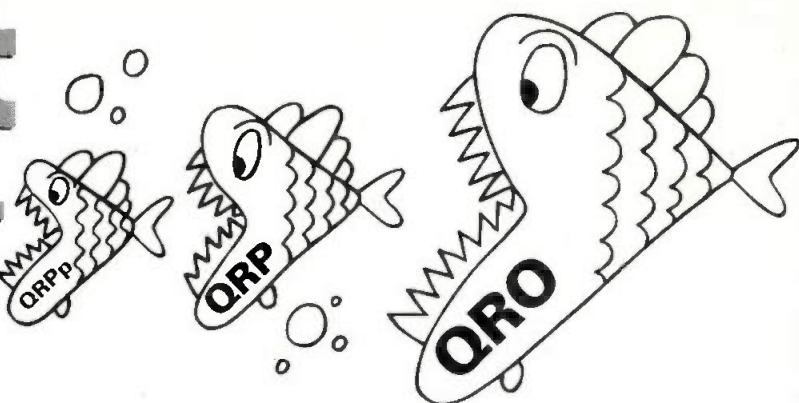
Considering the very small space needed, this antenna should appeal to those with the limited gardens or the desire not to have something looking Jodrel Bank Radio Telescope in the back yard!

The design is very simple and lends itself to experimentation quite well. No complicated winding of coils is required and no great masts need erecting. Have a go, and I hope it gives a few PW readers ideas to play with. See you on 'Top Band'!

PW



# The Sprat Transceiver



By Rev. George Dobbs G3RJV

**The Rev. George Dobbs G3RJV has come up with a compact QRP c.w. transceiver for the 3.5MHz band. We've called it the 'Sprat', to commemorate the G-QRP Club's own magazine, which of course is edited by G3RJV!**

The 3.5MHz band offers good pickings for the QRP operator. Many QRP operators hang around the International QRP Calling Frequency on 3560kHz and QSOs with the whole of the UK and many continental countries are easily available with a few watts of r.f. power.

The Sprat project was designed to provide a viable QRP Superhet (superhet) c.w. station. It's ideal for low power operation on 3.5MHz although the Sprat receiver is so designed to be used alone.

This also means that the receiver, always the trickiest bit of a transceiver, can be built first. Once the receiver is working, the constructor can go on to complete the transmitter board.

The receiver would be a useful project in its own right for those who only wish to listen on the band or would like a stand-by receiver for 3.5MHz. It also makes a very compact stand-alone receiver.

## Novice Operators

The 3.5MHz band is available to the Novice operator so the transmitter is designed to deliver the 3W output allowed to Class A Novice licensees. The power amplifier, a single m.o.s.f.e.t. device, is operated in Class AB.

My choice design may appear to be a waste of power. But for novice builders, the 'wing and a prayer' Class C amplifier, so common in

simple QRP transmitter designs, can lead to all sorts of problems.

Why Sprat? Well - the Editor of PW suggested this little project to me, saying that he wanted it to be called the 'Sprat' in tribute to another (rather special) journal. *Sprat* is the name of the journal of the G-QRP Club, which I've edited for the last 21 years.

The name Sprat is quite appropriate because it stands for Small Powered Amateur RAdio Transmission following as a suggestion from G3DNF when the journal first appeared.

## The Receiver

The receiver (Fig. 1.1) is a superhet circuit based on the Motorola MC3362 chip. The MC3362 was designed as a single chip narrow band v.h.f. f.m. receiver but has enough

*"The little fishes of the sea,  
They sent an answer back to me..."*

From *Through the Looking Glass*, by Lewis Carroll.

completed the first full version of the Sprat than a design from Bernie Pallet G3VML, appeared in the October and November issues of *RadCom* using the MC3362 in a receiver!

But after consultation with Rob G3XFD, I decided to proceed with my original project. After all, we were almost ready to go in any case!

## The Circuit

Considering the circuit from the input: C1, L1, and D1-4 form an input protection circuit for the transceiver to operate in full break-in mode.

A two-pole band-pass filter, around L2 and L3 selects the 3.5MHz band signals which are coupled, via C5, to the first balanced mixer in the chip. The MC3362 performs all the receiver functions as far as the audio stages.

The internal varicap local oscillator (l.o.) is tuned from 7.933 to 8.033MHz by using L4/C9 as the tank circuit and R2, with R1 and R3, as the tuning control.

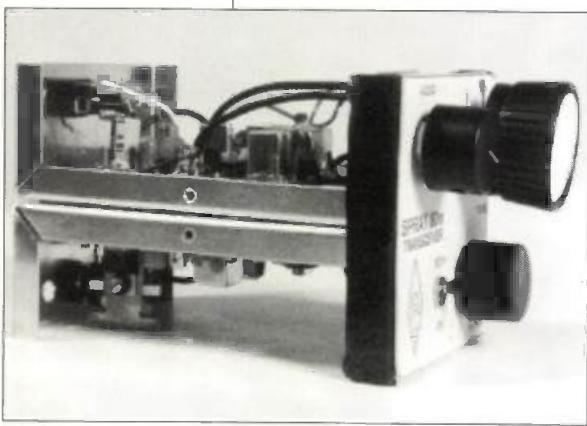
The MC3362 provides a buffered output from the l.o. on pin 20. This output is used to drive the transmitter.

The i.f. selectivity is provided by a three-pole 4.433MHz crystal filter, XL1, XL2 and XL3. The filter is of the ladder configuration, computer designed with Butterworth coefficients for a nominal 500Hz bandwidth.

Several filters have been built using standard 'off the shelf' TV colour burst crystals. All worked well without any need to find a matched set of crystals.

The second l.o. (using pins 3 and 4 and another colour burst crystal) is used for the beat frequency oscillator (b.f.o.). A trimmer capacitor 'pulls' the crystal to vary the beat note.

The recovered audio (at pin 5) passes to Tr1, the audio muting part of the change-over system. The receiver is on in both receive and transmit modes so during transmit,

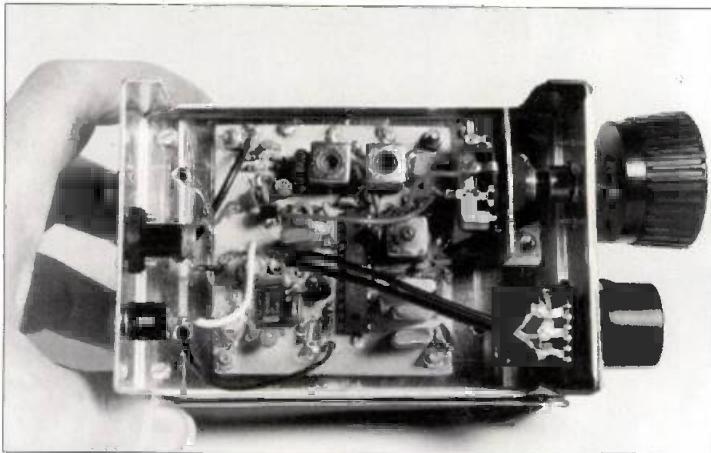
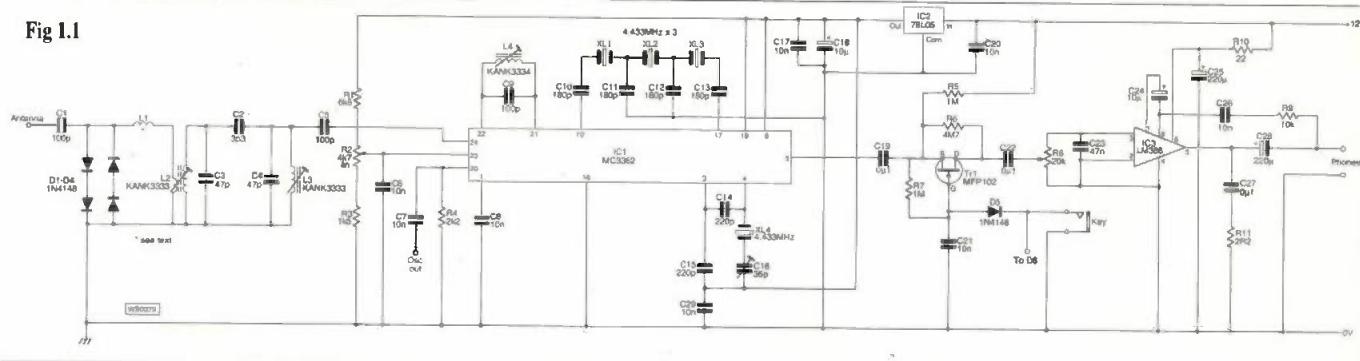


internal functions available at the pins to receive c.w. Several designs for h.f. receivers, configuring the MC3362 with a product detector, have appeared in recent years.

The first person to exploit the MC3362 for h.f. c.w. use was Gary Breed K9AY, in his 'Portable QRP c.w. Transceiver' in *QST*, December 1990. There was a simplified version of the circuit by Peter Parker VK6BWI, published in *Lo Key*, the journal of the VK c.w. Operators QRP Club in March 1993.

The MC3362 had not been featured in any UK designs and my first prototype suggested that it could produce a very useful little h.f. receiver. Although no sooner had I

Fig 1.1



the key mutes the audio output via Trl.

A conventional LM386 audio output circuit gives adequate loudspeaker output under quiet room conditions. The feedback filter provided by R9/C26, reduces the high frequency noise often associated with the LM386.

## *The Transmitter*

The Sprat transmitter is designed to produce a comfortable 3W of r.f. power thus complying with the requirements of the novice and QRP operator. It's perhaps a somewhat 'over designed' but very simple transmitter circuits have an unpleasant tendency to misbehave. The transmitter circuit, Fig. 1.2, shows the complete transmit board.

The signal from the receiver board is fed to a BC183 buffer stage, which produces a clear signal which doesn't shift frequency between receive and

transmit. A preset control, R14, adjusts the amount of drive available to the mixer.

The mixer stage is the commonly used NE602 (IC5). The internal oscillator of the NE602 generates a signal at the 4.433MHz i.f. The crystal may be 'pulled' by C37 to align the transmitted signal to the received signal.

Because the receiver remains on, but muted, during transmit, the transceiver monitors the actual transmitted note. This not only provides a 'live' side tone to monitor the Morse but ensures the transmitter and receiver are on the same frequency. Additionally, if the station being worked is at the same audio pitch as the monitored transmitter signal, the transceiver is netted with the other station.

The transmit mixer output is coupled to a 3.5MHz band-pass filter (L5/L6), followed by a two stage buffer-driver circuit to the power

amplifier stage. In this project the power amplifier is an IRF510 m.o.s.f.e.t. device running well within its power handling capabilities. However, it does require a heatsink.

As an attempt has been made to keep the p.a. stage trouble-free and stable the power amplifier has a manually controlled biasing circuit, set by R24 across Zener diode D7. There is also some feedback via C53 and R22.

The output is through a trifilar wound 4:1 balun transformer (T1) (5 turns 0.32mm wire on an FT37-43 toroid). Note the heavy decoupling at the top of this transformer (C49/52) which helps to minimise r.f. leakage to the 12V power source.

The output is taken through a seven element low-pass filter. This filter follows the W3NQN values for standard capacitor value low pass filters. Coils L9 and L11 are 25 turns of 0.32mm (32s.w.g.) enamelled copper wire on a T37-2 toroid. Coil L10 has 27 turns on a T37-2 toroid.

The input to the receiver is 'picked off' between C57 and the low-pass filter allowing the filter to remain in circuit on receive.

The transmitter mixer and buffer stages are keyed via  $T_{r5}$ , a *PNP* transistor acting as a switch. The power amplifier remains on all the time. This produces a nice keying characteristic (good reports have been obtained on the air).

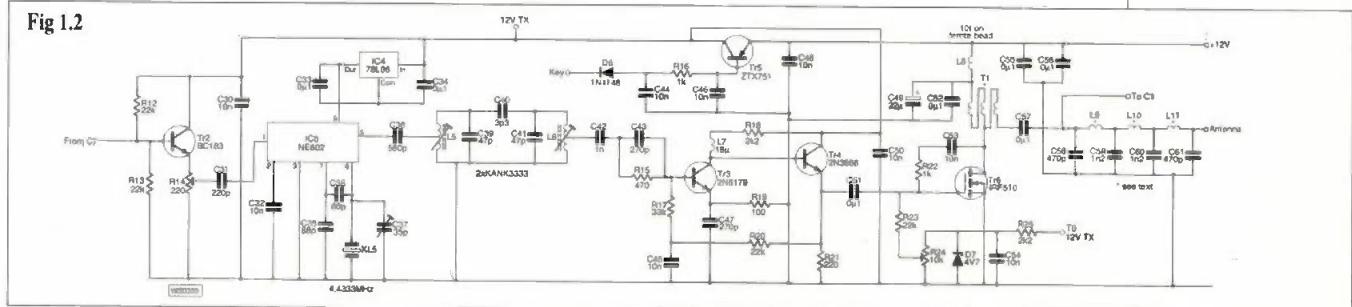
I'm sorry that's all I have space for this time. Next time I'll show you how to build the Sprat Transceiver.

**Fig. 1.1: The Sprat superhetrodyne receiver has a crystal filter in the i.f. for improved performance. It also provides an output signal to couple to the transmitter.**

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**Fig. 1.2:** Taking the l.o. signal from the receiver and mixing it with a reference at the i.f. allows the Sprat receiver to control the frequency of the transmitter.

Fig 1.2



# The First 100 CW QSOs

MORSE SPECIAL

By Dr. Richard Lau G0TBX

**Dr. Richard Lau  
G0TBX recalls the  
problems of being a  
newly-licensed  
amateur using c.w.**

With the debate about the relevance of retaining Morse code for h.f. licensing still raging, I thought it might be useful to let readers know how a relative newcomer has been faring with c.w. It was thanks to John G3SJE's efforts on the air and during club evenings that I passed my Morse test in December 1992 and then sat the RAE exam later that month.

I received my callsign in March 1993 and made my first s.s.b. contact later that month. However, it was not until May that I attempted my first two-way c.w. QSO.

I had tried c.w. a little earlier, but the mistake I made was trying to reply to CQs from stations sending a lot faster than I could receive. The other 'problem' I noticed was that amateurs working c.w. on 14MHz aren't terribly friendly!

Anyway, to cut a long story short, I bought myself a Sandpiper whip antenna for 7MHz and attached it to my wife's rotary clothes dryer in the back garden, in the hope that it could be used as a ground plane antenna. For radials, I used four lengths of insulated bell wire about 6m long and buried

them in the ground.

The antenna worked surprisingly well. I disconnected my microphone and plugged in my straight key for some serious operating.

## Operating Limited

Because of work and family reasons, most of my operating was limited to the late evening, usually after 10.45pm. I also tended to answer CQs rather than initiate them.

Although most of my first QSOs were punctuated by 'PSE QRS' and 'SRI NAME AGN BK' things have improved a little, but most of the time I have tended to sail rather close to the coast and get by with 'rubber stamp' QSOs with exchanges of signal report, QTH and name.

There are six permutations to this! I have undertaken a statistical analysis of my first hundred c.w. QSOs and the results are as follows: mean duration of QSO - 14.3 minutes, sample range 1-37 minutes!

Notable rag chews were with Bill G0OUI in Middlesborough and Harms DL8NDN in Bamberg (both over 25min). In all, I worked 29 UK stations and my best DX on 7MHz was with Alex UD6DCP in Baku and Rob WB4FNH in Florida.

## Gained Confidence

Having gained a little confidence on 7MHz, I decided to graduate up to 14MHz, again taking G3SJE's advice to stay clear of the lowest end of the band and to

concentrate my efforts between 14.040-14.060MHz. I dismantled by whip, re-attached my coaxial cable to the magnetic loop I normally use for the band and tuned it to resonate at 14.050MHz.

My first QSO with a Swedish station and my second was with Mike N8UJZ in Weston, West Virginia! I was even more pleased to hear Bill G0STR tail-ending with N8UJZ, but I think he must have been hit a little later with some very heavy QRM. (did you manage to get through, Bill?).

Other 14MHz notables were with two VE3s within ten minutes or so. I also had a 30 minute rag chew with HB0/DL2YEF/P on a caravan holidaying in Vaduz.

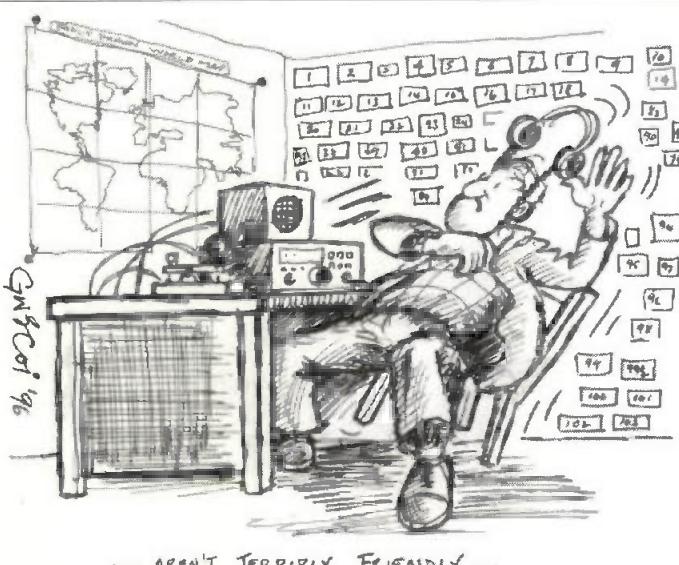
You can see from what I've done that I've found c.w. quite a useful mode for communication. It does require a little perseverance initially and without the help of some 'good' G stations and a few like minded Europeans willing to slow down, I don't think I would have enjoyed myself as much as I have.

## Encourage Operators

I hope this short piece will encourage other newly licensed operators to take the plunge and maybe even a few of the more senior members as well. You will soon find that identifying individual Morse letters is NOT the way to go - it is actually a lot easier to pick-up c.w. phrases en bloc.

I particularly like the palindromic sequences such as BEST and 73, but with a little practice it will be quite easy to identify frequently used pro-signs and abbreviations such as CQ, QTH, etc. I achieved 100 c.w. QSOs in two and a half months. This is an average of 1.3 QSOs a day - well within the reach of most of us. Give it a try - I promise you won't regret it!

PW



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ECC85	3.50	GZ37	6.00	UY41	4.00	6CH6	5.00	12HG7 12GN7	6.50														
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EL84	2.25	PY88	2.00	BB8	4.00	GS57	2.50																
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# Meters Made - TAIWANESE STYLE!

By Mike Haydon G1KVO

*Mike Haydon G1KVO shares the interesting experiences he had during a trip to Taiwan watching meters being made by hand!*

In August of last year I was privileged to be invited to The International Electronics Show in Taiwan's capital city - Taipei. The show runs for five days and attracts buyers from around the globe.

At the exhibition visitors find anything from the very latest in communication equipment to laser light equipment. You can even buy a 'Flow Solder Machine' if you've got room in the shack at home!

Taiwan is a delightful country to visit, with over 18 000 square miles of beautiful countryside and culture that stems back many hundreds of years. With a population of nearly 21 000 000 people, most of whom seem to speak some English, you'll certainly not get lonely there.

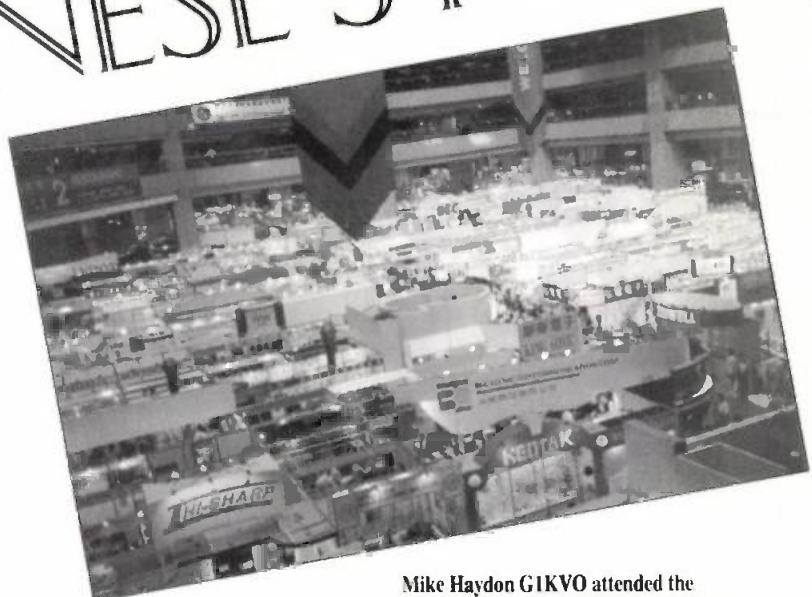
The country is becoming a major contributor to the world's computer and electronics industry with most of its manufacturing concentrated into Taipei. I would like to add that on my visit I found the Taiwanese people to be incredibly friendly and extremely hospitable - qualities which the British were known for not so long ago!

## Taiwan Nissei

During my visit I was fortunate to be invited to the factory of 'Taiwan Nissei' - an offer I could not refuse! Taiwan Nissei are a fairly large sized company, employing over 120 staff.

The company is part Japanese and part Taiwanese owned. Principally, they've been making moving coil meter movements' for over the last 30

First of many? Mike Haydon G1KVO receives the first example of what is planned to be wide range of products to be entirely made within the Taiwan Nissei Company's factory in Taipei, from General Works Manager, Mr Yueh Chung.



Mike Haydon G1KVO attended the 1995 International Electronics Show in Taipei, Taiwan and ended up visiting a very interesting company where everything is hand-made.

time the company had gone one step further from just producing a 'meter movement' to producing a complete product.

## Production Room

Next stop was the 'meter' production room. Access to this room was through an air conditioned hall, which had a peculiar type of rubber coated flooring.

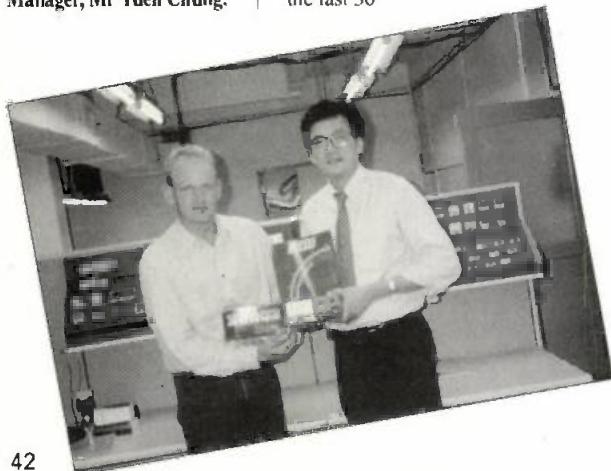
Before I was permitted to enter the room I had to remove my shoes and replace them with what looked like a pair of 'flip-flops'. If that wasn't enough, I then had to put on a large white overcoat - I felt like a holiday camp entertainer!

On entering the room I could not believe my eyes. There, in front of me, were over 30 members of staff sitting at what looked like sewing machines.

The people were actually winding the 'coil' sections of the meter by hand. This was carried out using a mechanical counter to monitor the number of turns made onto the 'former', a normally cylindrical mandrel used to shape the coil on and hold it in its permanent position.

Research & Development, as most people are aware, is very important to any company. And to illustrate this, I should mention that Taiwan Nissei spent over 15 months from start to finish on their first range of s.w.r./power meters.

The new power meter was the pride of the company. It was the first





**Assembling the meter movement.** All the assembly work is carried out by hand. Even winding the 'moving coil' element is carried out with a device that looks like a sewing machine!

### Spring Section

Next I was shown the 'spring' section. Here, minute springs were assembled by hand which would later give the 'pointer' its return action required to read 'zero'. A job for the steady hands only!

A few tables along there was perhaps the hardest job of all - the assembly of the meter movement and parts. Here, very careful hands assembled the coil and magnet into the plastic meter housing (made downstairs in yet another department) and then attaching the return spring and pointer into the assembly.

Next job, (one I didn't fancy having a go at) was the soldering of the 'moving coil' wires to the rear solder tags. Small hands again were needed for this task.

By now I think I would have found myself on hands and knees trying to find the missing return spring. (I bet you too have tried to repair an old watch with the same results!).

After a little more 'titivating' (no, not me, they wouldn't let me back in the accounts room!) the meter was finally assembled. It made me sweat just to watch this intricate hand work taking place.

The meter then had its final 'indicator' plate attached before it headed off for testing. Each hand-made

meter is tested for full scale deflection (f.s.d.) against a supplied current, ie.  $10\mu\text{A}$  f.s.d. Any meter that falls outside the permitted tolerances is discarded.

### Printed Circuit Boards

Time pressed on and it was now time to leave the 'sweat shop' (where you couldn't even have a smoke) and visit the p.c.b. assembly room. Here again everything is assembled by hand.

Staff were busy building the calibration p.c.b. along with the s.w.r. sensor unit. All soldering was done by hand and there was not one flow soldering machine in sight.

Assembly of the 'r.f.' sensor unit is a very skilled job. Great care has to be taken in not damaging the configuration of the components and so altering the s.w.r./frequency response of the meter. (The r.f. sensor is a small box, normally made of tin, located at the rear of the s.w.r. meter housing).

The unit uses special diodes, the r.f. passing through what appears to be waveguide. Here it's sampled and the current generated provides the basis on which the meter can indicate forward/reflected power levels.

Once the sensor and calibration p.c.b.s were finished, it was time to assemble the main unit. Both the meter and calibration unit were then fitted into the prefabricated (injection moulded) front panel which was then attached to the 'pressed' aluminium/tin rear housing box.

### Test Equipment

Next I was taken to yet another small room surrounded by Marconi & 'Bird' test equipment. I even spotted a Kenwood multi-bander on each of the test benches (well, they need something for reference!).

In the test room the meter was calibrated using a Bird Thru-line test unit. Power checks were made at

various pre-determined power levels for the necessary fine tuning to be made. The v.s.w.r. checks were made against numerous loads with pre-defined v.s.w.r. ranging from 1.1-1 to 5-1 to verify the accuracy.

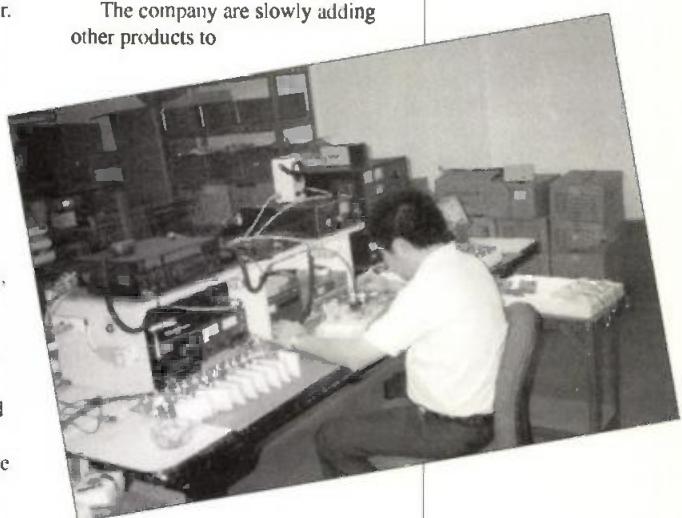
The meter was finally ready to be fully assembled and last checks carried out. Amazingly, it was a totally hand-made product! This was the pride of the company, their first complete product made from start to finish entirely by them. Well done!

### Large Scale

Taiwan Nissei are now producing the meters on a very large scale (forgive the deliberate pun!). All products are still made by hand.

The company is slowly adding other products to

**The r.f. test and alignment 'department'.** Mike Haydon spotted a Kenwood transceiver amongst the test equipment, where initial tests are made on the partially assembled power/v.s.w.r. meters.



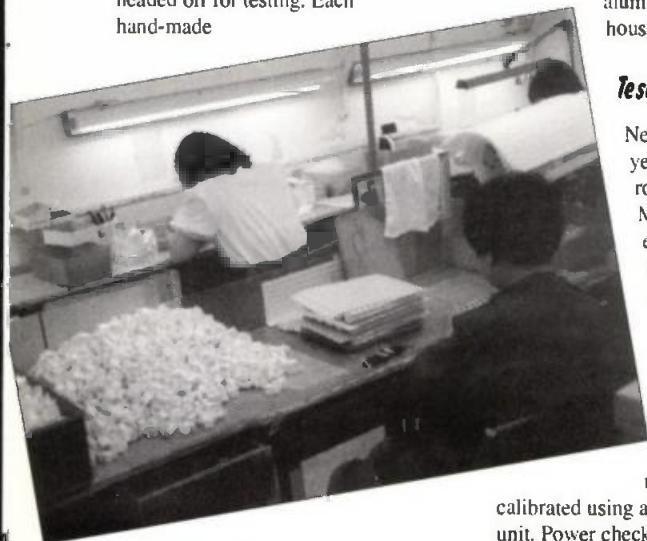
their range. And I was truly amazed during my visit to see that everything, within reason, was made by hand and the attention to detail that was needed at every stage of the production.

Nowadays, we all tend to think that everything comes off the end of a conveyor belt as a finished product. Let's hope that there will always remain a need for such quality hand craftsmanship.

My visit would not have been possible without my hosts' welcome. So, I would like to thank Mr Kevin Lin and members of staff at Nissei for their kind hospitality and patience in providing me with answers to my continual questions. And next time you look at your meter, spare a thought for Kevin Lin and all his workers.

PW

**A suitable case for treatment?** The v.s.w.r/power meters cases are injection-moulded in a lower ground floor department. Here they are shown being prepared for final assembly. Mike was surprised that everything is actually made in the factory. Nothing, apart from the raw materials, is brought into the Taiwan Nissei Taiwan factory.



# Quickroute 3.5

By 'Tex' Swann G1TEX

**'Tex' Swann G1TEX,  
our technical sub-  
editor, checks circuit  
diagrams and p.c.b.s  
on a day-to-day basis.  
So, who better to have  
a look at a new  
release of Quickroute  
3.5 the schematic and  
p.c.b. design  
program?**

Part of my task within the magazine is checking and if necessary creating circuit diagrams and p.c.b.s for the various projects within PW. So, when a new version of *Quickroute* v3.5 became available, Rob Mannion, the Editor, asked me to have a look at it.

Here at PW we are very 'Mac' based. Almost every part of publishing the magazine, as you see it, is carried out on Apple Macintosh computers.

But *Quickroute* is designed to run on IBM PCs (or 'clones') under Windows 3.1. The question is, would it be as easy to use, or make the circuits look as good?

## Ancient PC

So, I dusted off an ancient '486/33 PC to get to grips with the program. But let me first say what my machine has in the way of 'bits'. It's a '486/33 with 16Mb of RAM, a 170Mb hard disk and a 1Mb video card.

I've tended to go for more memory as an aid to running programs more effectively than the pure processor speed would imply. But would my system be suitable for such a program as *Quickroute*?

The object of *Quickroute* is to create circuit diagrams or p.c.b.s as easily as possible. As with other electronic circuit and p.c.b. programs available, these two similar processes are quite separate. You choose to create a schematic or a p.c.b. layout.

Two additional tricks 'up the

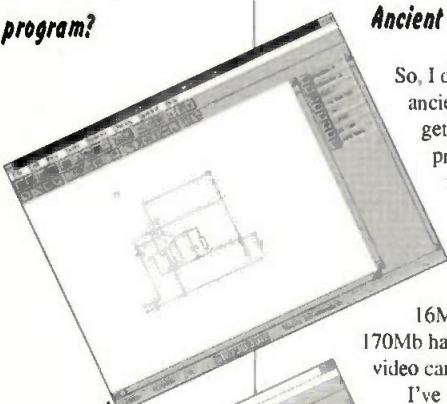


Fig. 1.

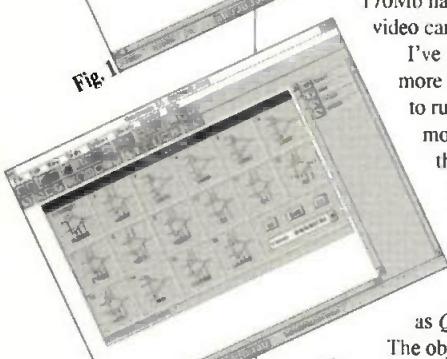


Fig. 2.

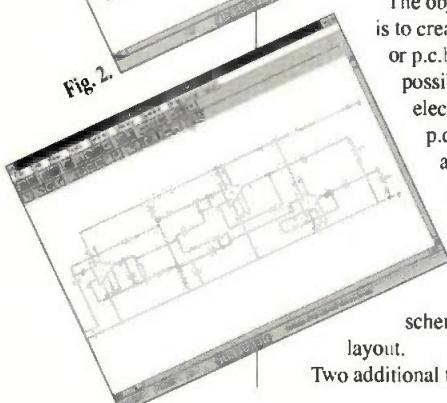


Fig. 3.



sleeve' of *Quickroute* is that if you produce a correctly connected circuit diagram, it can dramatically shorten the time to creating the p.c.b. It can also create a 'Netlist' to be exported to the *SpiceAge* program, which will analyse your circuit from an electrical viewpoint.

## Two Disks

When I opened the package I was surprised to find only two high density disks, a 180 x 225mm ring bound manual and a similarly sized manual of the extended library symbols. Where were the dozens of compressed program disks of Windows programs?

The answer is that the program is written to fit onto one of the two disks 1.44Mb floppy disk. Inserting the program disk into the A: drive and starting to install the program from within windows was all that was needed to get going.

To install the extended libraries (about 200 other symbols) on the second disk is also easily done. Five minutes and I was ready to go. However, I had to install a 'dongle' (security) onto the printer port of the PC.

A 'dongle' is an adapter that a program can check to see if it is present. This is an aid to minimise the theft (by multiple copying) of software. Without this piece of (software) security hardware the review copy wouldn't run (this limitation is being removed on production copies of the program).

## Simple Project

To try the software out I decided to recreate a version of a simple project that I made some time ago. It was a mono to stereo adapter to help with listening to Morse on crowded bands.

The first impression I got was that (as it's supplied), *Quickroute* is more

aimed towards the digital or 'computer' type of project. I say this because within the various symbol libraries there are few symbols for r.f. components.

The lack of r.f. symbols seemed to be a limitation. However, I then came across a section in the manual showing how to create your own symbols.

Within the package you can create almost unlimited new symbols to suit yourself, so the lack of symbols is only a small irritation. And making your own circuit symbols turned out to be a relatively simple operation.

When creating your own (or editing existing) symbols the user should try to get the input and output pins on the correct spacing. I found that if I made the grid step too small it was very fiddly to connect up later on. (This created problems with 'Netlisting', but I'll explain that later).

## Well Laid Out

The program is extremely well laid out with three separate areas to consider on screen. You'll see this by having a look at Fig. 1, where I've shown a complete screen.

The start of the circuit is shown in the main area, with the tool area above. Over on the right hand side is the 'Parts Bin'. This is where commonly used components are kept during creating a circuit.

You can add, or remove, parts to the Parts Bin at any time, while working on a diagram. This is done by moving the pointer over the Parts Bin, clicking on the left hand mouse key and adding the current symbol to the bin, for quicker selection later. Clicking the right hand side mouse key removes the current symbol.

Incidentally, the reason there are so many types of resistors and capacitors is that each one relates to a different p.c.b. pad layout. Take capacitors for instance, a 220µF electrolytic can have different can sizes. It can also have both pins at one end or at opposite ends.

The same principle applies to resistors, and I've not even considered

# A Review



coils! On that score you will have to create most of your own coils as they are not very well catered for in *Quickroute*.

I have one small observation with the colour of the symbol as it's being positioned prior to placing. It's a yellow colour that doesn't show up very well. And if you turn off the 'display in colour' it disappears altogether!

The 'screengrab' in Fig. 2 shows a new circuit element being chosen from the 'Linear Component' library. On choosing the component it's then available to place anywhere on the diagram.

The cursor is of the 'snap-to-grid' type. The grid being defined as 20 to 0.2mm in eight steps (or 1 to 0.001in, again in eight steps).

## Circuit Diagram

After a while I had the start of my circuit diagram as shown in Fig. 3. (Notice I've 'turned off' the Parts Bin area to make more room on the main area). This is a great help for those with only a VGA or small display size (640x480 pixels) screen.

Now take a look at the close-up in Fig. 4, which shows an i.c. in more detail. Note that circuit component 'joinings' have to be made very accurately, otherwise when you come to make a 'Net Compile' they aren't considered to be coupled together electrically (I'll explain later).

To create a p.c.b. layout automatically using *Quickroute*, the circuit diagram **must** be absolutely correct. All points that should be linked **must** be linked. Have a look at Fig. 5, this shows a few errors that I made early on.

In Fig. 5 the joined points are shown with a solid dot. While those only approximately joined have unfilled circles at their common (similar) points.

To show you what happens if the circuit is not absolutely correct, I've carried out a 'schematic capture' at that point, **before** corrections. However, before making a schematic capture, you **must** save the circuit diagram, as schematic capture

replaces it with a 'rat's nest' p.c.b. layout.

As you can see with the rat's nest layout in Fig. 6 there are very few lines connecting the p.c.b. layout symbols that correspond to the circuit components.

## Rubber Banded

When you move the components around on the p.c.b. the connecting tracks are 'rubber-banded'. (They act as if the points are connected together with a length of rubber).

To complete the p.c.b. layout you have to manually move tracks to achieve non-contact. This can be easier said than done on complex circuits.

To save a little time I took a demo circuit file and created the rat's nest p.c.b. layout as shown in Fig. 7. As you can see, the main components are in the right places, but the tracks need a bit of 'pulling' around until you can end up with one layout as shown in Fig. 8.

When you've finished your circuit diagram and p.c.b. layout, you can export circuits and layouts using the clipboard. You could now incorporate the diagrams into your own newsletter. Depending on the level of the program you're using you can import and export information to and from other programs.

To make *Quickroute* easier to use, many of the commands are on the tool button bar shown in Fig. 9. Each of the commands (and any keyboard shortcuts) are well documented in the manual, which should be read thoroughly before attempting your first 'real' circuit diagram and p.c.b.

## Very Capable

The overall package that I've reviewed is a very capable circuit and p.c.b. drafting program. It also offers

extremely good value for money for such a comprehensive package.

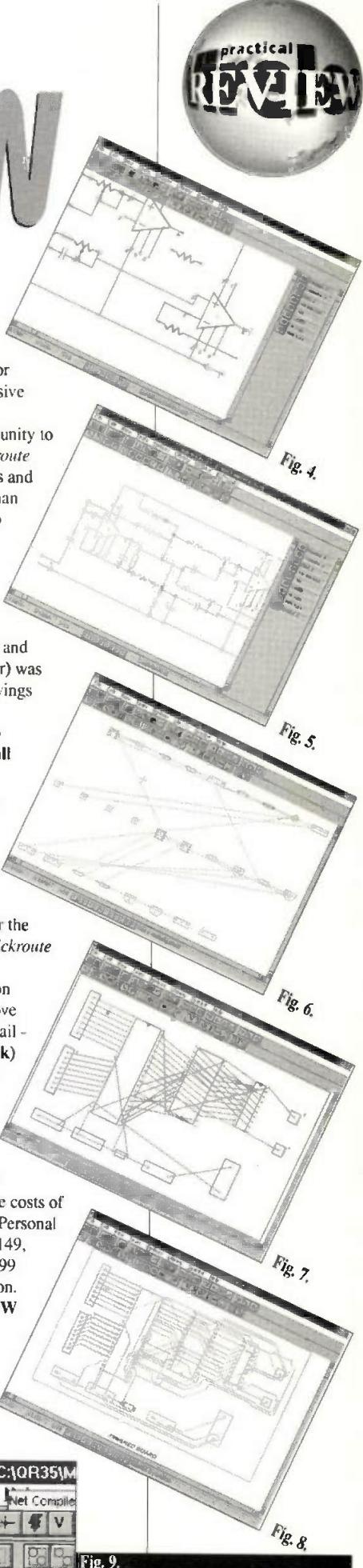
I had the opportunity to try running *Quickroute* on a variety of PCs and anything greater than a '386/20 seems to provide a more than adequate performance. An early portable '386/20 PC with only 4Mb and built-in video (poor) was used to create drawings fairly easily.

My thanks go to Robinson Marshall Europe PLC, Nadella Building, Leofric Business Park, Progress Close, Coventry CV3 2TF. Tel: (01203) 233216 for the review copy of *Quickroute* 3.5.

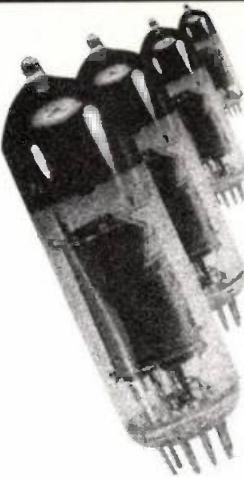
Contact Robinson Marshall at the above address (or by E-mail - Qroute@rme.co.uk) for a demo copy of *Quickroute* 3.5.

The program is available in: Personal, Designer, PRO and PRO+ versions. The costs of these versions are: Personal - £68, Designer - £149, PRO - £249 and £399 for the PRO+ version.

PW



# Valve & Vintage



By Charles Miller

It's Charles Miller's turn to look after the PW vintage 'wireless shop' again, and he continues the story of the fascinating characters and exciting developments in the early days of radio.

**W**ilst the shenanigans with de Forest were in full cry in America, back in Britain various rather less flamboyant, not to say reclusive, figures were busy. They were 'beavering' away in the laboratories of the Post Office in search of a repeater for long distance telephone circuits.

A team of engineers had been assembled and was working towards producing a valve to do the job when the work was pre-empted by the arrival of a young man called S. G. Brown. He'd devised what he called a relay, which was already up and running.

Brown's idea was a straight electromechanical 'gubbins'. Effectively, it was an earphone connected to the incoming call was coupled to a microphone which then re-sent the outgoing call.

Mechanical advantage in the coupling was supposed to give a gain of about 20. Brown's technique sounds a bit improbable, but it satisfied the Post Office enough for it to start installing them and to abandon work on the valve idea.

## Captain Round

Now it's over to Marconi's Wireless Telegraph (MWT) Co. and a certain Captain H. J. Round. He was astute enough to figure that it was worth carrying on where the GPO team had left off!

Eventually Captain Round came up with a 'soft' (low vacuum) triode. It had an oxide coated filament (an idea borrowed from some German inventors) and tubular

grid and anode.

Round's valve depended on there being a slight amount of gas inside the envelope. To provide this there was a little extra tubular bit of glass above the anode in which lived a pellet of asbestos.

Fortunately for progress, this took place some 70 years before the EEC took control of Britain. Otherwise Round would undoubtedly have been imprisoned for shattering safety directives in all directions!

As it was, Round bunged in the asbestos and lived to tell the tale, and the device actually worked. The interesting thing was that when these valves were new they started to function within three seconds of the current being applied to the filament.

However, as they aged the waiting time gradually got longer. It would have been embarrassing had not some bright spark discovered that the valve could be goaded into action by the application of a lighted match to the glass around the asbestos pellet (not surprising, really, since anyone would get a move on with a lighted match stuck up his anode). Perhaps this was the origin of the term 'warming-up time'?

## Patent Agreement

A couple of years after Round had produced his 'soft' valve MWT got together with Telefunken of Germany and signed a cosy patent. With this agreement MWT was to concentrate its efforts on receiving types and Telefunken on transmitting types.

Had it worked out, the agreement would have given the two firms a near

duopoly in European valve manufacture. But unfortunately the respective Governments, like Tweedledum and Tweedledee, resolved to have a fight.

It was rather strange for two countries ruled by royal cousins! But all families have disputes now and again.

In August of



A BTH B-E valve of 1923, complete with BBC marking on the envelope.

1914 the shooting by a student of a Grand Duke in Sarajevo provided a suitable excuse for the quarrel to erupt into a war. It was a war that would last four years and wipe out almost a generation of British, French and German manhood plus a great number of the Americans before it was finally sorted out.

True to tradition ('follow me lads, I'll be right behind you') no casualties were reported among the brave politicians who had got everyone into the fine mess in the first place!

So in the euphoria of Summer, 1914, the gallant First Hundred Thousand marched off to be slaughtered. All that could be heard was the sound of cash registers in Whitehall ringing up taxpayers' money to finance the adventure.

## Good Communications

Since good communications are a great help to those hell-bent on killing as many people as possible in the shortest time, money flowed. It also filtered through to fund the development of radio telephony, both on the ground and in the air.

By this time Round had developed his 'C' type valve which again used the asbestos pellet idea and was reputed to have as much gain as any three other types put together.

The 'C' was to find its way into a number of military receivers, together with the later type 'N'. This type had the advantage of being capable of working in 'reflex' circuits whereby a single valve

**Before the advent of 'mains' power supplies, the listener had to use batteries such as the 'Winner' for h.t. supplies. (The 'Winner' was still being made well into the 1960s!).**



dealt simultaneously with both radio frequency and audio frequency signals.

### Transmitting Valves

With the enforced lapsing of the Telefunken agreement Round had also moved on making transmitting valves. These commenced with the ingeniously named 'T' type.

The 'T' type was a 'hard' (high vacuum) valve which worked at far higher anode voltages than the 'soft' variety. This factor enabled it to generate the high power oscillations

development was rated at no less than 2000V. (It's worth comparing these voltages with the 30-50V common for 'soft' valves).

By the end of 1914 military transmitters and receivers using Round's valves were in use on the battlefield. They were also in the air above the trenches in the Royal Flying Corps' aircraft, being used for spotting enemy troop movements and positions.

Direction finding (d.f.) equipment was also developed by MWT for aircraft. They were produced under contract by BT-H from December 1914.

The d.f. gear used the 'C' valve



Valve filament supplies were provided by 2V accumulators and many people can remember having to take them to the local garage for 'recharging'. Meanwhile, valve designers were desperately trying to reduce filament current consumption without affecting other characteristics.

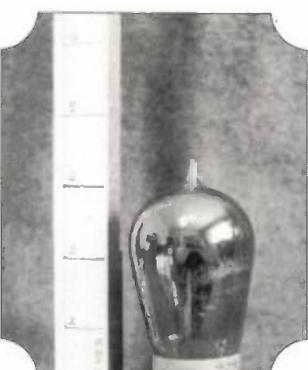


We'll be hearing quite a lot about a certain Captain Stanley Mullard, formerly of the Royal Flying Corps, next time it's my turn to look after the 'wireless shop'!

needed for transmission.

The 'T' was followed by the 'LT' (a misnomer if ever there was one since it would handle an h.t. supply of 1500V on its anode!).

Even more impressive, the 'TN'



An M-O 'R' valve with a 4V 700mA filament. It required an anode voltage of between 30 and 100V. Note the attractive silvering effect of the 'gettering'.

which, in the low temperatures encountered at high altitudes became reluctant to start working. So, as it was not a very safe proposition to play about with lighted matches in the

cramped quarters of a wood-and-canvas aeroplane carrying large quantities of petrol, a special electrical heater for the asbestos pellet was devised to fit around the valve!

### Valve Manufacturing

The BT-H Company also went into valve manufacturing, initially making a British version of the de Forest Audion. These were successful, proving able to work over the frequency ranges of military equipment.

However, the Audion's limited useful life brought about their abandonment within 12 months in favour of a new type developed in BT-H's own laboratories. It was itself based on a French military valve called the 'TM' (from Telegrapic Militaire).

The new valve, the 'R' type became perhaps the best known of all the early British valves. Examples still change hands nowadays at high prices between collectors. And almost incredibly, even after 80 years the odd brand-new-in-a-box one will still turn up!

The 'R' was a hard valve with a tungsten filament that was comparatively economical at the time, being rated at 4V, 700mA. The grid was a wire helix surrounding the filament, and the anode a nickel cylinder enclosing the whole.

The valve worked with between 30 and 100V on its anode and had an amplification factor of nine. Its globular envelope with a sealing 'pip' at the top and a four-pin base that subsequently became a standard in Britain make it, perhaps for the first time, recognisably a valve to modern eyes.

### Generic Name

In fact 'R' became something of a generic name for a number of types closely or otherwise related to it. The valve was not perfect - we'll look at its faults in a moment - but it was so much better than what had gone before that all the British valve manufacturers of the time were contracted to produce it.

(Rivalries were not quite abandoned in this war-effort co-operation, however, Ediswan calling its version the ES1).

Something rather odd now happened if the available documentation (admittedly muddled) is to be believed. At any rate, when the 'R' proved to have too restricted a frequency range for all military applications, and moreover was 'microphonic' (sensitive to slight mechanical shock), BT-H appears to have 'stepped back'.

The company regressed for a while to soft valve techniques with the gas-filled type 'R2'. Initially the gas used was hydrogen, but this was changed during the production run to helium. (I can't help wondering if these valves had to be tethered down to prevent their floating off into the stratosphere!).

### Restricted Frequency

The R2 may have got over the microphony problem but it still suffered from a restricted frequency range. This caused a lot of head scratching on the part of the BT-H laboratory workers.

Eventually, following the pattern of happy accidents set by de Forest and McCandless, someone stumbled on the answer when a batch of production R2s was found to have a remarkably enhanced frequency limits.

Apparently something had gone awry during the sub-manufacture of the electrode structure. This resulted in the filament becoming distorted and ending up much nearer the grid than planned.

Rather than rely on chance, as did de Forest with his X-grade Audions, BT-H essayed a valve that should have the close filament-grid alignment as standard. The first attempt may have been called the R3, but if it was no one knows for certain and the successful final result was the R4.

The R4 valve was not soft, nor very hard and it worked with an anode voltage of between 45 and 55V. The filament was greedier than that of the R, demanding just over 1A at a voltage of between 3.5 and 4V, adjusted by the operator.

Again, a number of other firms made the R4. Initial examples had a reasonable working life of about 1500 hours, but when Osram decided to make a really hard variant this was improved at least twofold, with some examples chalking up no less than 8000 hours.

Success increases of the valves' working life didn't prevent further tinkering with the specification. And this time the technicians were trying a more economical filament.

The economical filament aim was achieved with its replacement by one rated at less than 500mA at between 2.5 and 4V. But the penalty was a return to the 1500 hour life expectancy and noisy operation to boot!

So, it was back to the drawing board and the emergence of the R4B valve. This had another new filament with a narrow 3.4 to 3.9V voltage specification and a current consumption of again just under half an amp.

The R4B was followed by the R4C which had a slightly lower filament voltage range of 3.2 to 3.85V. Eventually there was an R5, but this bore little resemblance to the previous R series, having an unreliable electrode assembly, a non-standard base and a tendency to break its filament during evacuation of the envelope.

In fact, the only good reason for mentioning the R5 here is that the latter was designed by a certain young Captain Stanley R. Mullard of the Royal Flying Corps. And we'll be hearing more of this gentleman very soon!

Cheerio from Charles, see you in October.

# SCENE USA

*Ed Taylor WT3U finds out about the man who invented, and gave his name to the Morse Code. He also looks at US Morse tests, and asks if we're being unnecessarily demanding in the UK.*

You can be on the air using Morse for quite a while before discovering that the code you're using is named after a real person. You may be even more surprised to learn that the inventor of Morse Code was responsible for a communications revolution, comparable to TV and the Internet in our own era.

We take it for granted that we know what is going on anywhere in the world almost as soon as it has happened. Maybe a sister in Australia has broken her leg, maybe a president has been assassinated but we expect to hear immediately.

However, until just over 100 years ago, the fastest way of getting a message through was by horse, train and ship. You might have waited for months to find out whether or not your country was still at war!

A remarkable American changed all this. Professor Samuel F. B. Morse, who looks out at us from Fig. 1. It's no exaggeration to say that his electric telegraph, and the methodology needed to use it (Morse Code), had a dramatic effect on communications. For the first time ever, information about events could be made available to everyone in a matter of minutes.

## Foundation For Success

I should say right now that the efforts of many other scientists laid

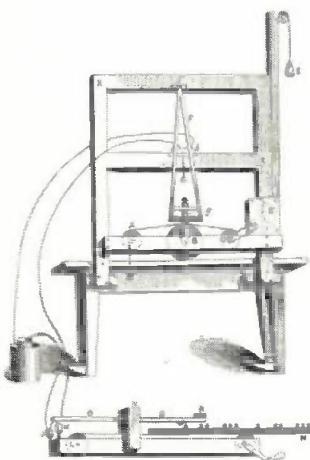


Fig. 3: The telegraph recorder invented by Morse.

the foundation for the success of Samuel Morse. He studied the work of other pioneers, such as Ampere, Oersted, Volta and others, whose names have been used for electrical units we are familiar with.

One of the most interesting aspects of Morse's life is that he was accomplished in several fields of study. When he was born, in 1791, there was not the same separation between science and art that there is today. A well-educated person was expected to have a knowledge of science as well as traditional subjects.

Samuel Morse studied to become an economist, but (to the dismay of his father) he decided to make his

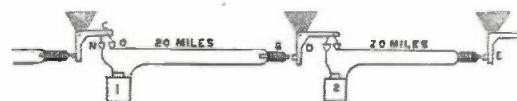


Fig. 2: Morse's sketch showing the use of relays.

living as an artist. In fact, it seems he preferred to go out shooting with his friends, and had to repeat part of his course!

## To London

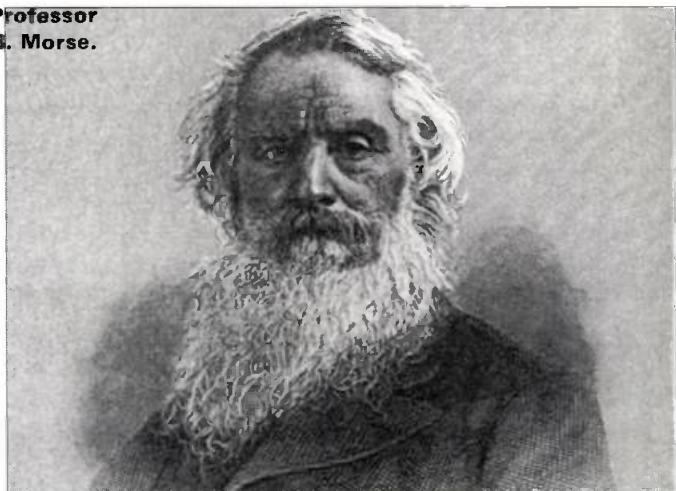
But he finished university, and set off for London to study painting, even though Britain and the USA were at war. You might think that anyone

who arrives in a country which is at war with their own is likely to be arrested as a spy, or at least, deported. But, Morse found the British quite friendly, and experienced little prejudice.

He was a keen art student, and after four years was expert enough to make his living as a portrait painter. Before the development of photography, this was a valuable skill.

Morse returned to the USA in 1815, to live in New York state, where he received commissions from eminent families. His pictures are considered to be of high quality and many were for eminent families, including a

Fig. 1: Professor Samuel F.B. Morse.



famous portrait of US President Monroe.

While supporting his family as an artist, Morse was busy with research into electricity and other areas of applied physics. Many of his experiments related to the

he formulated his major inventions - Morse Code in conjunction with the Electric Telegraph.

Others had speculated that messages could be communicated by signalling over wires, but Morse actually made the telegraph work. While other proposed systems were using 20 or 30 wires to represent numbers and letters of the alphabet, Morse found that a pair of wires would be adequate for the purpose.



Fig. 4: The Morse code went through many changes before it became as we know it today.

developing field of electromagnetism.

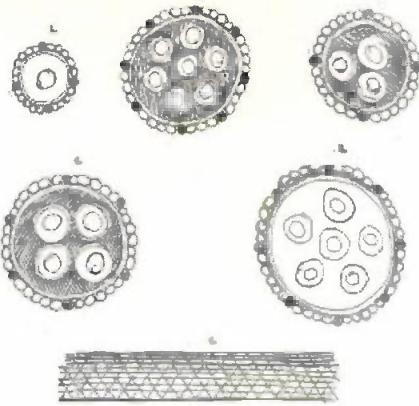
Samuel Morse was aware that a battery connected to a coil of wire would create a magnet. With a strong enough battery the same effect could be produced many miles away.

It was on one of his many transatlantic crossings in 1832 that

## Distance Barrier

The attenuation of signals over distance was thought to be a barrier to long distance communication. As it turned out, by using enough batteries, the problem was partially resolved.

Anyway, Morse didn't know this,



**Fig. 5: Morse's designs for a multi-wire transatlantic cable. No. 2 and 5 were considered the most efficient in space utilisation.**

and so he invented the Relay, which provided switching and a crude form of 'amplification'. They are still in use and little changed from his original design. Fig. 2 shows a relay-based system, using a 'repeater' every 20 miles.

Morse also decided it was essential to have a permanent record of the messages received, which was not a feature of other competing methods. He invented a recorder, using an electromagnet with a pencil acting on a roll of paper driven by clockwork (see Fig. 3). This enabled a single operator to monitor the apparatus.

The first working system was demonstrated in 1837. To begin with, the code Morse devised only encompassed numbers. He spent much time making a 'dictionary' showing the correspondence of numbers to words.

The numbers to words technique was abandoned quickly, but we still have a remnant of the idea with our usage of 73 and 88 in amateur work. Morse's code went through several variations before it reached the form we know now. One of these changes was sketched out by Morse as shown in Fig. 4.

began to achieve fame and fortune, in a field far removed from that of portrait painter. The next major step was to cross rivers.

Then ultimately, in 1858, the telegraph crossed the Atlantic. Given the technology of the time, it was amazing this was achieved so quickly. A diagram of various cable designs for underwater use is shown in Fig. 5.

Professor Morse was never a wealthy man, although the royalties from his inventions kept him comfortable in later years. He had to defend his patents, which came under attack from many sources.

Ten European countries (not including Britain) awarded Morse the splendid sum of 400 000 Francs as a mark of their appreciation of his work. In an unsavoury act of chauvinism, his British patents were turned down, even though his claims were legitimate.

By this time, Morse Code was being used globally, and Professor Morse was an international celebrity. A special circuit was connected to his house in upstate New York (pictured in Fig. 6), so he could send and receive messages in his old age!

Morse met and was honoured by

## World-Wide Success

Morse petitioned the US congress for funds to construct a telegraph to send real messages, and eventually was allowed \$30 000. He put up a line between Washington DC and Baltimore (about 40 miles).

After many tribulations, the system worked, and was a big success. Soon lines were springing up all over the USA, linking major cities.

Now in his 50s, Morse

many international leaders and a statue was erected in Manhattan's Central Park. When he died in 1872, the news was sent around the world in hours something which Morse himself had made possible.

When radio became a reality early in the next century, Morse Code was the obvious way of communicating for the new medium. What an amazing inventor Samuel Morse was!

## Morse Testing

I think Samuel Morse would have been gratified to know that his code, changed only a little, was still in use a century and a half after he invented it, and for a purpose (radio) he could only have dreamed about!

So, now let's find out what is required for the US amateur radio licence now as far as Morse testing is concerned. (We'll continue our look at theory exams in the October issue).

The US Morse tests are administered by volunteers, and it's fair to say that they are less strict than those in the UK. The three speed levels tested correspond to various classes of licence, and are at 5, 13 and 20 words per minute (w.p.m.).

About a minute of practice is sent, then the actual test passage. It lasts five minutes and reproduces a QSO. Examinees are given 10 questions about the text, and have to answer seven correctly.

The questions asked are about the 'contact'. For example, 'What is the home town of the station who called CQ?' and so on.

An amateur failing that can also pass by showing 100% copy of any one minute of code out of the five. There is no sending test.

I wonder what you think of this? Personally, I feel the accuracy required in UK Morse testing is unnecessarily high.

Since we are not passing life or death traffic, I think we do not need to achieve a super-high level. A standard similar to the Americans' would be perfectly adequate.

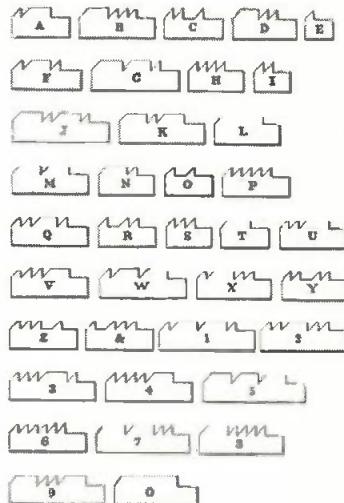
Additionally, the fact that there is no sending test is probably realistic. Particularly at 21w.p.m., when most operators will be using an electronic key or keyboard rather than a straight key.

## Correspondence

Many thanks to those who have written with comments, suggestions and criticisms. I am still collecting information from those who have

obtained a reciprocal licence for the USA. Please let me know your experiences of getting the licence, of travelling with equipment and of operating in America.

Here are some of the ideas that you have had. **Wyn GW8AWT**, writes regularly about many topics. He is a Novice instructor, and envies the US system of low-cost examination and licensing, as well as the speed with



**Fig. 7: A sample of the first mechanically produced Morse code. It was discovered later that a human sender was more convenient.**

which exam results and licences can be obtained.

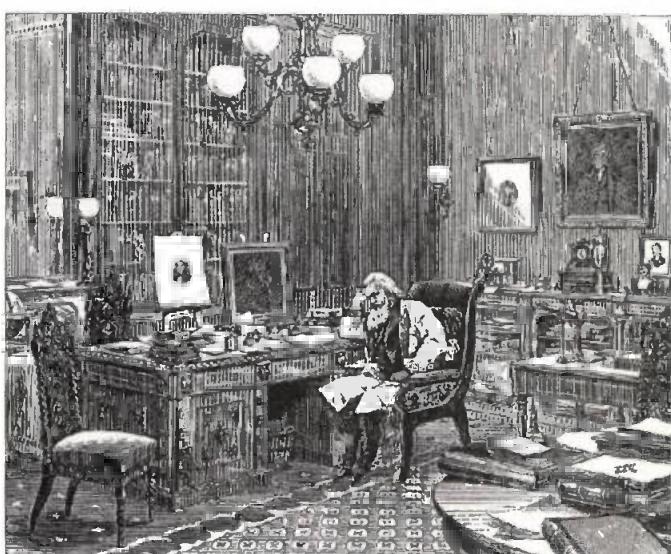
**Dave G8ZRE** has had positive amateur radio experiences from his US trips. While **Peter G3CCX** has had difficulty getting a reciprocal licence.

**Tom GOGQJ** visits the USA every year, so decided to take the tests and get an American callsign (N8WHF). He was keen enough to become a Volunteer Examiner (VE) for US exams.

**Keith GOZK** is concerned that standards of knowledge and operating have declined, and enquires about the situation in the USA.

**Allan G3JMO** has sent several good suggestions for future inclusion in 'Scene USA', thank you. **Keith G7HQR** proposes a change in licensing requirements, given that most Class A licensees learn Morse for the test, then never use it (same in the USA!).

**That's all I've got room for this quarter so 73. I appreciate all your thoughts so, please write to Ed Taylor WT3U, PO Box 261304, Denver, Colorado 80226, USA, or on E-mail at 102662.2222@compuserve.com The deadline for October column is the middle of July.**



**Fig. 6: Professor Morse's study.**

# HF FAR & WIDE

**Leighton Smart reports on the past month's activities, compiled from your reports. It's the column which can't be prepared without your help!**

**A**s I write this month's column, the birds are singing, the trees are bursting into life and spring is well and truly in the air - at long last! However, the impression from our reporters is that the improvement in the weather has not corresponded with a long-awaited improvement in h.f. propagation conditions!

Conditions it seems, and the present low sunspot numbers, mean that h.f. DXers are still having to use all their skills, knowledge, and talents to dig out that juicy DX on the bands.

I heard recently that the low point of the sunspot cycle was over, and that over the next couple of years we will see an improvement in general propagation conditions. Well I don't know if you're like me, but I wish that improvement would come a little sooner!

Perhaps I should stop wishing my life away! I did however, receive a telephone call from Eric Masters GOKRT as I was preparing the column (the 28th of April) who informed me that 28MHz had been open for most of the day. So, it looks as if the Sporadic 'E' season has started. At last, I can give my 28MHz rig a bashing!

## Transceivers For CB

Following the debate over the conversion of 26/27MHz transceivers in the pages of PW over the past few months, I received a letter via the Editor. It's from someone who claims that 'a great many of the stations using 27MHz s.s.b. are radio amateurs, both in the former Soviet Union and the UK'.

The letter's author says the possibility of converted rigs getting "back into the hands of 'pirates' are not slim". However, not having any evidence of this allegation, I'm not convinced. All the amateurs I know on a personal level want to keep their licences, and even if they wanted to, would not operate on 27MHz s.s.b. for fear of losing both their ticket and their equipment.

The writer signed the letter 'Anon', so it was impossible for me to reply directly to the letter and the points raised, but if he/she would

like to write to me direct, I would like to debate this matter directly. I will of course guarantee the utmost discretion as far as identity is concerned.

**Editorial comment:** *Anonymous letters cause us great problems. It's difficult for us to reply or act on anything in cases like Leighton mentions. So, please supply your full name and address so that a reply can be sent or the matter dealt with. I guarantee full confidentiality. It's unfortunate that we have to literally ignore interesting comments, questions or statements because they can't be attributed to a source as they are unsigned or return-addressed.*

G3XFD.

## News - DX

Now it's over to the extremely informative RSGB's DX Newsheet, for the latest news. I start with news that J37Q and J37P will be active from Grenada in May at the 'bottom end of 14MHz' in the early hours of their local time, and also that Hrane, YT1AD will be active from Tunisia as 3V8BB between the 23rd and 30th of May.

For those looking for The Gambia on the lower frequency bands, there's news that KC4YDP will be operating from Banjul as C56/KC4YDP on c.w. during the month of June, QSL via the home call. And Jim N3GKY will be active from the Philippines in Mid July using the callsign DU2/N3GKY.

There's also news that a group of Japanese radio amateurs are attempting to get a licence to operate from North Korea. If this expedition comes off, it'll be something well worth looking for, although given the present political situation on the Korean peninsula, it may be doubtful, but even so, let's wish them luck!

Warren VK0WH on Macquarie Island says he is now active on Mondays, Tuesdays and Thursdays only. He's usually on 7.010MHz c.w. listening 3kHz up, or occasionally on 14.038 and 14.260MHz, at times along with VK9NS his QSL manager.

Additionally, F5PWJ will be operating from Lebanon as



**The Index Laboratories QRP Transceiver is favoured by GOKRT (see text).**

OD/F5PWJ until September on all bands, QSL to F5PRR.

There's news that Terry G3WUX, who is a white stick operator will be QRV from Greenland between the 10th of July and 25th of August as part of the Trans-Greenland Expedition. They'll be using c.w. on 14.002MHz and s.s.b. on 14.200MHz with a 5 watt QRP Plus transceiver and Windom antenna; QSL to his home call. Good luck Terry, hope to hear you!

Finally, Ron ZL2TT says that the May ZL8RI operation from Kermadec Island has a "target of 40 000 contacts". He says that thanks to the support from both commercial amateur radio companies and amateur clubs and individuals, the expedition should be a success. Listen out for them and help them reach that target!

## Your Reports

I'm starting your reports with 1.8 and 3.5MHz. As usual, we'll see what 'ace QRPer' Eric Masters GOKRT in Worcester Park, Surrey, has turned up on the bands this month.

Eric is pleased with working Kaliningrad for a new country on 1.8MHz. He's surprised with what he's achieving there, given that his antenna is not designed for 'Top Band' operation.

The GOKRT 1.8MHz c.w. list includes EI6AK (Republic of Ireland), at 2159, HB9ATA (Switzerland) at 2120, and UA2BD (Kalininograd) at 2131, while his 3.5MHz c.w. contacts

include DL3XK (Germany) at 2104, ON4BAE (Belgium) at 1917, and R5P (Russia) in the Russian DX Contest at 2322UTC.

Talking of antennas for 1.8MHz, John Heys G3BDQ says a friend of his, John Tausley G4RIT, worked an American station on 1.8MHz s.s.b. with 100W at the end of March using just a bottom loaded 3.2m vertical rod! Its base was about 3m above ground and used a single 42m counterpoise. John says it just goes to show what can be done on this band even without enormous antennas! Dead right John!

Meanwhile, Carl Mason GWOVSW of Skewen in West Glamorgan has been afloat. He operated the GB2RN station aboard HMS Belfast during Easter Week.

Carl has also been busy on the 3.5MHz band and using 100W into a G5RV dipole antenna reports c.w. contacts with DJ3XG (Germany) at 1744, KA1ZEQ (USA) at 0633, as well as YL2GKB (Latvia) at 1825UTC.

Now it's over to 'our Ted' Trowell G2HKU on the Isle of Sheppey, Kent. Ted used his QRP Icom IC-721S at 5W output c.w. and a G5RV antenna on 3.5MHz to hook up with T9/LA8PT (Bosnia-Herzegovina) at 2000. And using his 70W Ten Tec Omni V transceiver, in conjunction with G5RV, magnetic loop, and vertical antennas, accounted for c.w. contacts with OJO/OH2KI (Market Reef) on 1.8MHz at 2000, and VE3EJ (Canada) on 3.5MHz at 0600UTC.

Finally for the two lower bands, s.w.l. Charlie Blake RS96034, in

Milton Keynes, who, by the way, has just passed his 12w.p.m. Morse Test and is now having a go at the RAE (Well done, Charlie!), offers 3.5MHz reception reports of SV2ASP (Greece) working WA3DCG in the USA at 0442, and 9H1EU (Malta) working J5AQC (Ginea Bissau) at 2130UTC, all on s.s.b.

### The 7MHz band

Starting '40' off this month is Ted G2HKU. He's again been 'QRPing' with his 5W rig.

On 7MHz Ted has listed c.w. contacts with 3V8BB (Tunisia), 5B4/DL8KWS (Cyprus), and TA2ZW (Turkey) all at 1500 with his 5W, while 70W of c.w. gave him JW5HE (Svalbard Island) in the Arctic Circle, YV6ACZ/3 (Venezuela), VK3MR (Australia), PJ2AM (Netherlands Antilles), and C56CW (Gambia), all contacts taking place around 0600UTC.

Meanwhile, Charlie RS96034 has been maintaining a keen watch on his favourite band. (Won't be too long till you'll be heard here yourself, Charlie!).

He reports s.s.b. reception of HK4DF (Colombia) working IK7CNK in Italy at 0650, ZL3OY (New Zealand) in contact with G40JH Andy, at 0709, VK2APK (Australia) working EA1MO (Spain). At 0721, Charlie heard an interesting station, Apollo SV2ASP. He's a monk in the Mount Athos Monastery and was working WA3DCG in the US. Finally, there was CE3RLT (Chile) in contact with SM5HPB in Sweden at 0628UTC.

Back to Eric GOKRT now, who has been quite busy on 7MHz. He lists amongst others, low power contacts with HAMONAP (Hungarian special call) at 2233, RZ9WY (Asiatic Russia) at 1909, SV1CDP (Greece) at 2250,

WA2AYW (USA) at 2138, YL2BI (Latvia) at 2131, and 9A1CRJ (Croatia) at 0035UTC, all on c.w.

Carl GW0VSW reports 100W contacts using a G5RV antenna with C56CW (The Gambia) at 0654, QSL via DL7DF, and HR2JEP (Honduras) at 0610, QSL via Box 200, El Progreso, Honduras, both on c.w. His single s.s.b. report was with CU2DX (Azores Islands) at 1846UTC.

### The 10MHz Band

The 10MHz allocation is a band that isn't featured in this column very often. It's not for lack of interest I assure you - but for lack of space!

Carl GW0VSW, again using his G5RV antenna reports 10MHz contacts with OE2KBP (Austria) at 1612, and OK1MIQ (Czech Republic) at 1625UTC.

Eric GOKRT lists EA5FLQ (Spain) at 2028, OH5MMO (Finland) at 1804, UR5VKX (Ukraine) at 1835, and ES2RW (Estonia) at 2005UTC.

### The 14MHz Band

It's the 14MHz band that still carries most of the daylight DX traffic at this point in the sunspot cycle. It's the most reliable of the higher bands, although 18 and 21MHz are allowing some reasonable DX communication at times.

Ted G2HKU has been cracking some nice stuff, and his list includes c.w. contacts at 70W output with 7X2CR (Algeria), RZ9DX/T (Dickson Island), 6W6/K3IPK (Senegal), OJO/OH2KI (Market Reef), 9H1BM (Malta), W9KNI/6 (USA), VQ9DX (Chagos Island), CO6DE (Cuba), and C56CW (The Gambia) at around 1600UTC.

Now over to John Heys G3BDQ near Hastings, who says that the

lack of sunspots is really hitting his h.f. DXing. But nevertheless he still managed s.s.b. contacts with BV7WV (Taiwan), CN2LN (Morocco), 3V8BB (Tunisia), and JH4JNG (Japan) despite the low numbers.

Eric GOKRT had loads of fun with his low power c.w. during the Russian DX Contest. He worked all parts of the Russian Federation, as well as contacts with N8FU (USA) at 1841, LY3BA (Lithuania) at 1246, UR5FWP (Ukraine) at 1835, and IT9UU (Italy) at 1731UTC.

In Bristol, s.w.l. Gordon Foote G7NCR, using his monoband receiver and loft mounted wire antenna reports things very quiet this month. His log indicates s.s.b. reception of TJ1GB (Cameroon) working VE1YX in Canada at 1814, SU1SK (Egypt) in contact with SV3AQR (Greece) at 1831, 9H1BBY (Malta) working Jimmy G0WNI at 1745, 9H4CM (Gozo Island - 'The Garden of Malta') working G0USM, JY5IM (Jordan) in contact with K8AEM in the US at 1825UTC, and finally RA3DEJ (Russia) working GW0WGK.

Our other s.w.l. reporter this month is Len Stockwell from Grays. He reports s.s.b. reception on 14MHz of KC4PE (Antarctica) at 1345, OD5LT (Lebanon) at 1347, J52AK (Guinea Bissau) at 1350, and KD1NW (USA) working 9A2OM in Croatia at 1358UTC.

### The 21MHz Band

Just a quick look at 21MHz this time around. And I start with a letter which has arrived (with an apology from the Post Office for late delivery) from Andrew Betts G0VLC. Andrew sends information of the Lancing College Amateur Radio Club which is one year old, and whose club call is

### G0VSI.

The LCARC are entering five students for the Novice exam in June, and recently built and used the 'Weekend Special' antenna featured in last October's PW. The club logbook indicates contacts using this antenna on 21MHz and 100W of s.s.b. with ZS1AU (South Africa) at 1520, SU1SK (Egypt) at 1436, C56DX (The Gambia) at 1616, and H5ANX/A25 (Botswana) at 1440UTC. Nice to hear from you Andrew!

John G3BDQ hooked up with 7P8FJ (Lesotho) at 1551, FR5ZN (Reunion Island) at 1408, YB1JO (Indonesia) at 1350, 9Q5QR (Zaire) at 1401, A41LZ (Sultanate of Oman) at 1408, and J28PP (Djibouti) amongst other at 1409UTC.

### Signing-Off

Well that 'wraps it up' for this month, it's time to be signing-off. Thanks to our dedicated reporters who provide the material for this column.

I'm always inundated with information, and it's gratefully received. Space is my only limitation, but I try as best I can to 'squeeze you all in'.

My apologies for not being able to reply on an individual basis to all reporters. But my work schedule is now so heavy, (up to 60 hours a week at present, including weekends) that all I seem to do these days is work and sleep!

As usual, reports and information by the 15th of each month to: Leighton Smart GW0LBI, 33 Nant Gwyn, Trelewis, Mid-Glamorgan CF46 6DB, Wales. Tel: (01443) 411459. Cheerio for now.

## PW Listening & Operating Watch List. All times in UTC

**Charlie Blake RS-96034** listens: 0500-0700 on 7.061MHz s.s.b. with an NRD 525 receiver & Sloping Wire antenna.

**Steve Locke GW0SGL** operates: 1100-1500 most days around 14.180MHz s.s.b. using a Kenwood TS-940 & TH7 beam antenna, normally beaming to OC.

**Don Mclean G3NOF** operates: 1030 Saturdays on 3.685MHz on the ISWL Net or 1030 Sundays on the Yeovil ARC. Net 3.665MHz s.s.b. using a Kenwood TS-950 & trap dipole antenna.

**Leighton Smart GW0LBI** operates: Most Sundays at around 1000-1300 on 28.500MHz s.s.b./c.w. using a Ham International Concorde 2 transceiver and a wire dipole antenna.

**Rob Mannion G3XFD** listens and operates: (weekdays & weekends) 1800-1830 3.7MHz 100w s.s.b., & 3.530/3.560MHz QRP c.w. using a KW2000B/Trio TS-120V and trap dipole/long wire antennas. Also at 2300 on either 3.530, 7.025MHz (c.w.) or 3.7MHz s.s.b. Occasionally on 7.025MHz c.w. between 0100 -0200.

**Gordon Foote G7NCR** listens: 1730-1930 & 2030-2200 (weekdays) and 1430-1630 (weekends) on 14.250MHz s.s.b. using a Howes DcRx receiver and loft mounted wire antenna.

**T. Ibbetson G0VTI** operates: each evening between 1900-2000 on or around 7.020MHz c.w., or 14.035MHz c.w. using a Ten Tec Scout at 50W.

**David Kennedy G7GWF** listens: on 7MHz using a Howes Lake DTR 7 Transceiver.

**END**

# VHF REPORT

*This month David Butler G4ASR takes a look at a transatlantic challenge which investigates the possibility of contacting North America on the 144MHz band.*

The month of February this year marked the 75th Anniversary of the first attempt in 1921 to hear amateur radio signals across the Atlantic. This followed reports in the previous year of long-distance (DX) contacts being made on wavelengths of around 200m (1.5MHz).

Although a considerable number of amateurs took part in the February 1921 tests no signals across the Atlantic were identified. In December 1921 another series of tests were conducted which resulted in positive identification of transatlantic signals.

The next obvious challenge was to complete a two-way contact between the British Isles and North America. A further series of tests were arranged to take place in December 1922 which culminated in success. The transatlantic path had finally been bridged!

Since those early days many radio amateurs have attempted and succeeded in equalling the two-way transatlantic achievement on frequencies much higher than 1.5MHz. Nowadays of course this feat is normal practice. Transatlantic QSOs are made regularly over much of the h.f. spectrum, even as high as the 28MHz band when solar conditions are favourable.

## Higher Frequencies

But what of even higher frequency bands? On numerous occasions it has been proved that transatlantic contacts can be made on the v.h.f. bands. (As you're probably aware I've been reporting openings on the 50MHz band for a considerable time).

In recent years, 50MHz openings have been occurring regularly each summer via multi-hop Sporadic-E (Sp-E). Around the years of sun-spot maximum, lengthy openings via F2-layer propagation are also possible, not only to North America but worldwide.

During the periods of high solar activity crossband contacts have even been made on the 70MHz band between the UK and Canada. This left a number of DX operators wondering whether it was possible

to raise the limits to the 144MHz band.

Over a decade ago a few dedicated enthusiasts (myself included) arranged extensive transatlantic tests on the 144MHz band. Although the tests proved very interesting with parts of callsigns being heard no confirmed terrestrial two-way contact between Europe and North America has ever been made at such an elevated frequency.

Incidentally, there may be some readers that regard the 144MHz band as only capable of short distance communication. This however is far from the truth!

Long distance contacts up to 2000kms are routinely made by top-notch DXers via propagation modes at E-layer heights. Tropo ducting over sea paths, particularly between the UK and the Canary Islands, occur nearly every year enabling paths in excess of 3000kms to be worked.

I've included details, in the chart Fig. 1, of existing European distance records on the 144MHz band. I think you'll be surprised at the distances that have been achieved so far.

It's because of these European distance results that interest has been generated in establishing the first terrestrial two-way QSO on the 144MHz band across the Atlantic Ocean without the aid of satellites or other orbiting 'reflectors'.

## The Brendan Trophies

In 1995 Paul Martin EI2CA, a very keen 144MHz DXer, initiated the transatlantic challenge. An approach was then made to the Irish Radio Transmitters Society (IRTS) to establish the 144MHz transatlantic challenge.

The Waterford Crystal Company were contacted and they kindly agreed to donate a pair of Waterford Crystal cut glass trophies for the 144MHz Transatlantic challenge. The glass vases, known as the Brendan trophies, are named after St Brendan (Brendan the Navigator), a 6th century Irish Abbot and missionary.

As an explorer, St. Brendan sailed widely in the north Atlantic region reaching Iceland, Greenland and

possibly Newfoundland. St. Brendan later founded a monastery in Galway and died in Annaghdown, Galway in 577AD. St. Brendan's Day is celebrated on May 16.

## Transatlantic Challenge Rules

The Brendan Trophies are awarded to each of the operators of the two amateur radio stations which first establish two-way communication between the continents of Europe and America within the 144MHz band. The two stations must be located on land or non-tidal waterways within the continental shelves of Europe and America.

Operators applying for the award must have held a current amateur radio licence at the time of the contact. They must have operated within the provisions of their licence during the contact, particularly in respect of power and frequency limitations.

Any information regarding the stations demanded by the awards panel must be provided. If required, the stations must be made available for inspection by nominated representatives of the awards panel.

## Confirmation Of Report

Two-way communication will be deemed to be established when each station has received both callsigns in full, received a signal report and received a confirmation (R or Roger). The generally accepted systems of reporting are the RST or meteor scatter number system.

All information must be exchanged within a maximum period of four hours. The contact must be made via natural reflectors within the atmospheric mantle of the earth.

The use of man-made reflectors such as aircraft or satellites as well as e.m.e. is excluded. The contact may be made in any mode, for example s.s.b., c.w. or digital.

## Proof Of Contact

The onus of providing proof of the contact rests on those involved. The level of proof required by the awards panel will depend on the

circumstances under which the contact was established.

For example, if the contact was pre-arranged via a series of schedules, then the panel would expect a high level of proof. This would probably take the form of recordings of the signals.

On the other hand, if the contact resulted from random operation then signed statements of both operators may be all that is required. However, all relevant facts will be taken into consideration when evaluating a claim.

Applications for the award must be made in writing to the Chairman of the awards panel, a sub-committee of the Irish Radio Transmitters Society.

The challenge has now been set. Experts would say that this venture is far more difficult to achieve than the early transatlantic short wave contacts established three quarters of a century ago. It's now up to dedicated radio amateurs in Europe and North America to prove the experts wrong.

## Propagation Modes

So, how is the transatlantic contact going to be made and what propagation modes will be usable? Without going into the technicalities, this type of contact can only be made with the use of high power c.w. or s.s.b. equipment.

The antenna system will also be a vital part of the overall system. So I suggest you invest in the double-optimised Yagis that the DXers use.

Let's take a brief look at the different propagation modes you could use. If you look at the chart, Fig. 1, you'll see I've mentioned five propagation modes.

The greatest distance worked (in Europe) so far is the 7843km contact made via trans-equatorial propagation. Unfortunately though, this mode only works for paths that cross (at 90°) to the geomagnetic equator.

The next greatest distance worked is the 4281km path achieved via Sp-E propagation. In my opinion this mode is a definite contender for the transatlantic path.

Also a strong contender are

**Fig. 1: The IARU Region 1 Distance Records on the 144MHz Band (Feb 1996).**

Mode	Call	Loc	Call	Loc	Mode	Date	Kms
TEP	I4EAT	JN54	ZS3B	JG73	c.w.	30 March 1979	7843
Sp-E	OE1XLU	JN88	RI8TA	MM37	s.s.b.	21 July 1989	4281
Tropo	GM0KAE	IO86	EA8BML	IL27	s.s.b.	9 Sept 1988	3264
Meteor	GW4CQT	IO81	UW6MA	KN97	c.w.	12 Aug 1977	3101
Aurora	G4VBG	IO94	UA3IFI	K076	c.w.	7 Feb 1986	2324

contacts made via extended tropo. Although super DX (over 3000km) via this mode is normally worked to the south of the UK I don't have any problems in envisaging an opening across the Atlantic at some time in the future. We can always dream!

Finally I'm going to discount the last two remaining modes, that of meteor scatter and aurora. Because of the non-optimum geometry of these modes, the resultant signals will be inaudible over such a vast distance. Therefore I suggest you plan your tests to coincide when the greatest incidence of Sp-E and tropo openings occur.

### Stations Active

One operator who has been monitoring North American stations via Sp-E is **Mark Holloway G4YRY** (IO90). This followed contacts made via Sp-E with stations located in the Canary Islands, some 2500kms from his QTH.

Mark suggests listening for f.m. broadcast stations on Band II (88-108MHz). He mentions that signals from the same area off the African coast are consistently heard every year.

**Andy Nicholls G3VMZ** is another operator who has been keeping records of DX openings via Sp-E for a number of years. He reports that a 3500km path on the 144MHz band is very probable on several days during the summer.

Andy suggests that stations should beam towards VO1, VE1 and W1 and pay special attention to the band at peak times. He suggests this would be between 1800-0100UTC during the last two weeks of May and throughout the month of June.

**Ken Osborne G4IGO** reported last year that his records also indicate that these sort of distances are possible. However, although he agrees that it is very likely to occur on southerly paths, he disagrees that it would apply to the westerly UK-USA transatlantic path.

Nevertheless Ken suggests that UK operators should look for evidence of v.h.f. E-layer propagation over this path. And one station you could look for is that of Fred Archibald VE2SEI. He sent an E-mail on behalf of the West Island Amateur Radio Group, Montreal reporting that the group are attempting the transatlantic challenge.

### Nova Scotia

The Canadian Group have been undertaking v.h.f. DXpeditions for several years and are planning to operate this year from two different locations in Nova Scotia during July. It's expected that one week's operation will take place from a lighthouse on Seal Island.

The Canadian Group will then move to the old Marconi station in Glace Bay to operate for a further week. Using the call sign XJ1CWI they will run 750W output into a 42-element 'ladder' Quagi beaming towards Europe.

The 42-element 'ladder' Quagi antenna (featured in *QST* March 1995) provides approximately 22dB gain and will be located at 3m above smooth ground overlooking the Atlantic Ocean. An automatic c.w. keyer will operate beacon style for much of the time sending the message 'CQ DX de XJ1CWI...K', followed by a 30 second receive period.

Obviously to make a serious attempt at the record requires close co-ordination. To arrange this you can contact Fred VE2SEI by telephone on 001 514 694 3441 (evenings) or via FAX: on 001 514 630 4134. Fred can also be contacted via E-mail, archibald@aparican.ca or at archibal@nash.pubnix.net.ca

It's interesting to note that v.h.f. signals from Nova Scotia have already been heard in the UK. **Derek Hilleard G4CQM** (IO70) has been carrying out transatlantic tests on the 144MHz band since 1989.

As an aid to propagation Derek monitors the 88-108MHz f.m. broadcast band with a Sony receiver and a 5-element Yagi beaming at 290°. Last year on June 15 between 2314-2319UTC and on June 22 between 2148-2158UTC. Derek heard identifiable signals from CBC, Sydney, Nova Scotia. According to the station of VE1KG this local broadcast station, on 95.9MHz, runs 500W e.r.p. (effective radiated power).

The results on the 88-108MHz band are very encouraging. However, there's a world of difference between these frequencies and the 144MHz band. So, will someone ever make that elusive transatlantic QSO?

Contacts on the 50MHz band via 3 or 4-hop Sp-E are common enough to be no longer surprising. Also broadcast stations on 100MHz (Band II) have been heard many thousands of kilometres away.

Within Europe three stations (to my knowledge) have made Sp-E contacts over 4200kms on the 144MHz band. In the US a few operators have made contacts as high as the 220MHz band.

On balance therefore I would say that it's possible that someone will eventually make that elusive contact. You never know, it could be you!

### Beacon Stations

To aid research into propagation over the transatlantic path, a number of high power beacons operating within the 144MHz band need to be built and commissioned. These should be situated in optimum locations within Europe and North America, beaming towards each other.

As an initial start to this project, the keeper of the beacon station VE1SMU (FN84) has agreed to beam the antenna towards Europe during the Sp-E season. Operating on 144.285MHz it runs 20W (too low for

real results I suspect) into an 11-element Yagi.

In my opinion, a beacon running around 1kW e.r.p. is the absolute minimum for this type of experiment. That equates to 100W into a 10dBd gain antenna.

Although they don't have any beacon equipment the **Poldhu Amateur Radio Club** does have a superb location. Their club house is located on the site of the famous Marconi radio station at Poldhu, Cornwall.

The location on the south-west tip of England is ideal for transatlantic propagation experiments. According to the Chairman **G3AGA**, the Poldhu club is quite small without much in the way of financial or technical resources.

However, the Poldhu club are willing to consider providing accommodation for a beacon to any group or organisation wishing to install one. This is course is subject to detailed agreement. Beacon groups interested in this exciting project can contact **G3AGA** on (01736) 710454.

### Deadlines

It's deadline time again. If you do manage to make any Sp-E contacts this summer please let me know about it. Send reports, or any other news (to reach me by the end of the month) to **Yew Tree Cottage, Lower Maescoed, Herefordshire HR2 0HP**. You can also contact me via packet radio @ **GB7MAD**, the DX Cluster @ **GB7DXC** or E-mail via [davebu@md1hr1.igw.bt.co.uk](mailto:davebu@md1hr1.igw.bt.co.uk) Alternatively you can telephone me on (01873) 860679.

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2.0 - 12.0MHz available in HC6/U HC33/U HC18/U or HC25/U only					
12.0 - 22.0MHz HC6/U HC33/U HC18/U HC25/U HC45/U HC18/T or HC25/T.					
Where holders are not specified, crystals above 2.00MHz will be supplied in HC25/U.					
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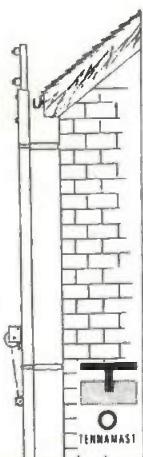
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# BITS & BYTES - COMPUTING IN RADIO

*Mike Richards G4WNC rounds-up the latest news and views from the 'computing in radio' world.*

If you're a keen v.h.f./u.h.f. DXer a good understanding of weather patterns can be extremely useful for predicting enhanced propagation conditions. But whilst it's relatively simple to use FAX and RTTY programs to receive up-to-date weather information, there's very little data around to help you understand the charts.

The gap has now been bridged by Philip Mitchell's book - *FAX and RTTY Weather Reports*. It's published by Interproducts and provides detailed descriptions of the various chart types and gives tips on how to interpret them. Also included is some well researched guidance on decoding systems. *FAX and RTTY Weather Reports* book currently costs £8.95 inclusive of post and VAT and can be obtained from **Interproducts**, Tel: (01738) 441199.

## Internet Update

One of the best finds this month has been Ron Klimas W2IV's *Ham Radio Bookmarks*. This HTML document contains an impressive cross reference of amateur radio related Web sites.

The *Ham Radio Bookmarks* page can either be downloaded direct from the Web page or via a compressed archive file titled **hamwww4.zip**. This can be found on many of the popular Internet archive sites.

If you want to go directly to the bookmark page the Web address is: [http://uhavax.hartford.edu/disk\\$User/data/faculty/newsvhf/www/hamwww.html](http://uhavax.hartford.edu/disk$User/data/faculty/newsvhf/www/hamwww.html) Yes, I know it's a mouthful, but it really is worth the effort!

## Quest Questionnaire

Jeff Harris of **QUEST** has just sent me version one of their RAE Questionnaire and Information Disk. This is an easy-to-use DOS based package that could prove very useful to anyone just starting in amateur radio.

As the **QUEST** program is DOS based the computer requirements are very modest. All you need is an IBM PC or compatible with MSDOS 2.0 or later and at least 640K of RAM. Even the old Amstrad 1640 can manage this!

The package is very closely based on the RSGB book *Radio Amateurs Examination Manual* (available from

the PW Book Service priced £7.99 plus P&P) and it's recommended that you have a copy handy to make best use of the program. One of the problems with basing the program so closely on the Radio Amateurs Examination Manual is you really do need to have a copy in order to use the program - this is an additional cost.

Once the program is installed and running, you are presented with a simple text display of menu options. Pressing the appropriate letter takes you directly to the next step in the program.

The display system was really very crude indeed and there had been no attempt to format the text or even use simple line draw characters to provide a more professional look to the package. Whilst the test features of the program were quite useful, there were a few minor bugs present.

At the end of one question the program failed to let me know whether or not I'd answered correctly. I also came across a few minor typing errors.

In addition to the RAE training program, the disk contained a number of useful amateur

shareware programs designed to assist anyone learning about radio/electronics. The complete package is available from **QUEST** 44 Fourth Avenue, Frinton-on-Sea Essex CO13 9DX. The price is £9.99 plus £2.50 post and packing.

## Worked All States Map

The *Worked All States Map* program is not particularly new, but the latest version (v2.7) looks to be very good. This Windows based program has been written by John Kirkham KC4B and, as the name implies, provides an electronic map for those trying for the Worked All States (WAS) award.

The original idea for the WAS program came from the practice of colouring-in paper maps to keep track of WAS progress. Whilst this is OK for a single band award, it can get expensive and cumbersome if you're going for a multi-band award.

By creating computer based maps you can easily maintain a separate map for each band. This program is designed to do just that and there are a full set of maps that you can mark-up as you work the various states.

The map is automatically completed in colour and you have the option to select your colour preferences. The latest version of this excellent package is currently available through CompuServe's HAMNET forum and registration is just \$10US.

## Special Offers

Here's the full list of reader's offers with all the latest software. Please leave up to two weeks for delivery.

### IBM PC Software (1.44Mb disks)

- Disk A (Order Code DKA) - JVFAZ 7.0, HAMCOMM 3.0 and WEFAZ 3.2.
- Disk B (Order Code DKB) - DSP Starter plus Texas device selection software.
- Disk C (Order Code DCK) - NuMorse 1.3.
- Disk D (Order Code DDK) - UltraPak 4.0.
- Disk E (Order Code DKE) - Mscan 1.3 and 2.0.

### Printed Literature

- Beginners Utility Frequency List (Order Code BL).
- Complex Signals Utility Frequency List (Order Code AL).
- Decode Utility Frequency List (Order Code DL).
- FactPack 1 Solving Computer Interference Problems (Order Code FP1).
- FactPack 2 Decoding Accessories (Order Code FP2).
- FactPack 3 Starting Utility Decoding (Order Code FP3).
- FactPack 4 JVFAZ and HAMCOMM Primer (Order Code FP4).
- FactPack 5 On the Air with JVFAZ and HAMCOMM (Order Code FP5).
- FactPack 6 Internet Starter (Order Code FP6).

For the printed literature just send a self addressed sticky label plus 50p per item (£1.50 for four, £2.50 for seven and £3.00 for nine). For software send £1.00 per disk (£1.75 for two, £2.50 for three or £3.00 for four and £3.75 for all five) and a self addressed sticky label (don't forget I provide the disk!). Please make cheques payable to M. Richards.

I hope you've enjoyed this month's column, cheerio for now and keep those letters coming to me Mike Richards G4WNC, Bits & Bytes', PO Box 1863, Ringwood, Hants BH24 3ZD. CompuServe 100411,3444: Internet mike.richards@dial.pipex.com

END

# BROADCAST ROUND-UP

*Peter Shore, in this 'summery' edition of Broadcast Round-up, has all the latest news from the international broadcast bands.*

If you're lucky enough to be going off on your summer holidays to the Mediterranean this year, you might like to tune in to stations broadcasting from that part of the world to get you in the mood for all that sand, sea and...distant DXing!

If you plan to visit Malta, maybe you could put on your 'Sherlock Holmes' hat and find out what the **Voice of the Mediterranean** is up to. During April, the station carried out some test transmissions on 9.88 and 11.925MHz. Nothing unusual in that you think, except that this station used to be transmitted from the **Deutsche Welle** relay station on the island, which regular readers will remember closed at the beginning of the year.

So, where is it being beamed from? We've tried to contact the station by FAX, but as this column went to press, there has been no reply. Try yourself, if you want to. The FAX number is +356 241 501. If you discover anything, let me know and I'll pass the news on through this column.

## Holiday Briefings

If Turkey is your destination, tune to the English service of the **Voice of Turkey**. You'll find it on the air at: 0400-0500 on 9.56, 9.655 and 9.685; 1330-1430 on 9.445; 1930-2030 on 9.445; 2300-2400 on 7.28 and 9.655MHz.

For briefings on the Spanish Costas, **Radio Exterior de Espana** could help. English is on the air every day at: 2100-2200 on 6.125 and 2200-2300 on 11.775MHz.

In neighbouring Portugal, try weekdays at: 2000-2030 on 6.13, 9.78, 9.815 and 15.515MHz.

For the Italian lakes and Riviera, tune to **RAI Radio Roma**. English for Europe is heard at: 0425-0440 on 5.975 and 7.275 and 1935-1955 on 7.235, 9.67 and 11.905MHz.

## Station News

**Deutsche Welle** has reopened its relay station in Trincomalee, in one of the parts of Sri Lanka worst-affected by the continuing civil war in the island state.

**Voice of America** (VoA) is to

launch new African language services for listeners in Burundi and Rwanda. Kirundi and Kinyarwanda will go on the air during the summer, funded not by the usual VoA means, but with the cash coming from the US Agency for International Development, USAID.

**Voice of America** has inaugurated the first of its new short wave transmitters in Sao Tome. English can be heard from one of the two operational 100kW transmitters at 0300-0630 on 6.08 and 1630-2230 on 6.035MHz (to 2130 on Saturday, 2200 on Sunday).

Massive expansion is planned by the Asian branch of **Adventist World Radio**. The Asian station (AWR) currently broadcasts programmes in 26 languages, but is to add a further 18 new language services during the coming months.

**Radio Norway** may close its transmitting station at Fredrikstad in an effort to save money. Broadcasting of **Radio Norway International**, and **Radio Denmark**, is to be consolidated at Sveio and Kvitsoy.

## Summer Schedule

Although many stations now make only two major frequency changes each year (at the end of March and September), **China Radio International** tinkers with its frequencies four times a year. The summer schedule, which took effect on 7 May, lists English to Europe:

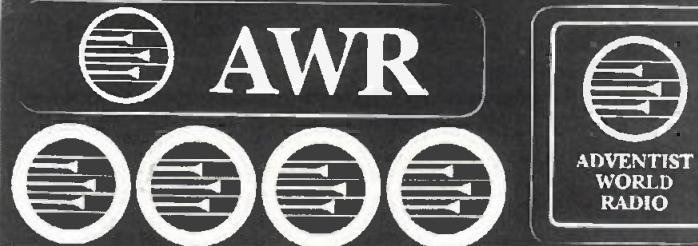
2000-2200 on 6.95 and 9.92; 2100-2130 on 3.985 (via Switzerland) and 2200-2300 on 9.88MHz.

I am still confused as to why the station operates a second programme from a Swiss transmitter to Europe at the same time as one of the direct broadcasts from China. Does anyone have a sensible answer?

## News From Israel

Israel has been in the news again recently with its incursions into southern Lebanon trying to wipe out the Hezbollah who, it is believed, are launching attacks, in Israel. You can

## ADVENTIST WORLD RADIO



follow the news from Jerusalem by tuning to Kol-Israel, the **Voice of Israel**.

It has English transmissions beamed to Europe: 0400-0415 on 7.465 and 9.435; 1400-1430 on 12.077 and 15.615 and 1900-1930 on 7.465, 11.605 and 15.615MHz. **Radio Yugoslavia** is on the air with English at 1830-1900 on 6.10 and again at 2100 on 6.10 and 6.185MHz.

## Language Teaching

Short wave radio has the potential to be an excellent educator. Many people in the developing world have learnt English listening to the **BBC World Service**, **Voice of America** or **Radio Australia**. But language-teaching is not restricted solely to English.

Some years ago I collected the course books that supported language courses broadcast from a number of radio stations. There was Dutch by radio, Russian by radio and Chinese by radio.

I was also amazed to see that **Radio Korea** still runs its 'Let's Learn Korean' course. It is broadcast each week in the current programme line-up from Seoul, and you can write for free course books. The address is **Radio Korea International, 18 Yoido-dong, Youngdungpo-gu, Seoul 150**.

**Radio Korea International** broadcasts to Europe in English direct from South Korea: 0800-0900 on 7.550 and 13.67 and 2100-2200 on 6.48 and 15.575MHz. And from the **BBC World Service** transmitter at Skelton in Cumbria: 1830-1900 on 3.955MHz.

## Voice of Nigeria

Finally this month, rumours abound that the **Voice of Nigeria** is soon to return to the short wave bands. The station has been off the air since last

autumn when its last remaining transmitter gave up the ghost. The station had been operating on 7.225MHz at times including 1000-1600.

The **World Radio TV Handbook** lists the Nigerian transmitting station at Ikorodu as having five 500kW, one 300kW and two 100kW short wave transmitters and suggests that it was one of the 500kW transmitters that was last on the air, but running at half-power.

The handbook says that there is a listeners' answerline on +234 1 269 3078, but as anyone who has tried to ring to Nigeria knows, getting through is all but impossible, unless you are prepared to try at three o'clock in the morning!



That's all I have room for this month. Please let me know if you discover any interesting facts about international broadcasting, write to me at the PW offices in Broadstone. Until next month, 73s.

END

# PACKET PANORAMA

**Roger Cooke G3LDI has news of new software, a round-up of who's who at BARTG, as well as some tips for newcomers.**

**Ray Dobson VK5DI's shack from where he hopes to operate a Satgate in the near future (see text).**



**P**hil Bridges from Siskin Electronics brought to my attention some new software from AEA. It's the new LOG Windows 3.0, this upgrade offers some new features which include:

**On-line Call-book Enhancements** supports the Radio Amateur Callbook, CD-ROM, HAM\_db, SAM, QRZ, HAMCall and Amsoft. Users can query the call-book at any time.

**Label set-up Menu Command** allows the use of laser printer sheet-fed labels or dot matrix tractor-fed labels for printing QSO labels or Callbook addresses.

**Log Windows QSL Manager** provides an internal database to store your QSL manager and address changes in, also integrated into database functions.

**Operator Notes** allows the user to enter and maintain Operator notes for a given call.

**Browser Enhancements** for those users who do not use the Packet Cluster, the TNC window can be replaced with the browser window which is then visible all the time.

**Radio Control** - the Radio Menu command allows the control of basic functions of your attached radio.

Other Features include: full-time status window at the bottom of the screen, data entry fields can be passed to the attached TNC via User Buttons, detail award reports can be saved to a text file for printing, faster QSL card record handling, antenna rotor can be configured for an offset value, support for MM and AM prefixes.

Log Windows 3.0 was created to automatically display DX spots and allow users to move to the designated frequency quickly, log the contact, and then save the information in a log. It also has the ability to announce DX spots with a voice-synthesised DX announcement.

A filter can be turned on so Log Windows will only display and sound an alarm for DX contacts that are needed, preventing unnecessary spots from distracting people from other tasks. Users can display the 30 most recent DX spots, choose one to enter in the display and grab it.

This automatically sets the transceiver frequency and mode, and prepares the log-book to record the contact. Log Windows does not

require an AEA TNC.

You don't need to use an AEA TNC for the Packet Cluster, but if you do Log Windows is compatible with AEA's PC PakRatt for Windows version 2.0 TNC control program. Users can then have the superior TNC control of PC PakRatt for Windows 2.0, coupled with the powerful logging and tracking of Log Windows.

However, even with all this automation, I think you will still have to make you own coffee!

## Packet Newcomers

Newcomers onto packet are often confused, not only by the enormous amount of new jargon that needs to be learned, but also by a new mode of operation which with the modern TNC, is daunting to say the least. The first thing that any newcomer wants to do is to get on the air.

I wonder how many really read the book first and then put the TNC on the air? More often than not, it

will be the other way round!

However, most BBS carry 'help' files of some sort. Some are written by UK amateurs, like the series by Brian G8ASO.

These 'help' files can usually be found in the Library or files section of the BBS. The trick for the newcomer is knowing how to obtain them in the first place!

Guiding the user to the right place is often done with a LOGON message, or new-user help file. The most useful server to appear for a long time, for the newcomer, is the Teletext type server.

Lots of help files can be arranged in such a way that the new user can plough their way through them just by typing numbers, from the index page 200 upwards. This is much like the Teletext on the television channels and is extremely easy to use, with no limitation as to the size of file, or number of pages. I

have several sets of help files in both the Library and the teletext server, as have many other BBS users.

Recently Pat G3IOR, with reference to BBS sysops and other users, undertook to write a Users Charter. The Charter, although long, some 25k now, has just about all the points a newcomer would need to know in order to set-up their system and operate in a socially acceptable way.

I passed the Charter around on the UK network, and in general it has been received very favourably. I have it filed in three places on my BBS, in the Library, the files section and best of all the Teletext server. I hope that you can find it on your local BBS as it's well worth a read.

## Satgates

I was recently visited by Ray Dobson VK5DI. He had to come to Wymondham to sort out some personal problems, and he visited me on several occasions.

Ray hopes to operate a Satgate from Adelaide, as the present one has had to close. All mail for the Western parts of Australia presently is sent to the VK2 Satgate and then terrestrially on 7MHz to the West.

It's an uphill struggle to get to grips with the requirements of a Satgate, but Ray is retired and can devote some time to the task. His station is shown above. He will have to add a considerable amount of extra equipment of course, when he starts operations, but it won't be for some time yet!

## News From BARTG

There have recently been some changes at BARTG. Here is an update on the 1996 committee together with mailing, Home BBS and E-mail addresses:

**GB2ATG Bob Canning G0ARF**, News Editor, Green Lane Cottage, Eardisland, Leominster, Herefordshire HR6 9BN. **G0ARF @ GB7MAD**, bcanning@kc3ltt.dircon.co.uk

**Ken Godwin G0PCA**, Publications & Rally Co-ordinator, 11 St Lukes Way, Allhallows, Kent ME3 9PR. **G0PCA @ KOMTV**, 101461.3054@compuserve.com

**Arthur Bard G1XKZ**, Datacom Editor, 9 Linden Road, Oak Park, Cullompton, Devon EX15 1TE. **G1XKZ @ GB7MXM**, arthur.bard@btinternetc.com

**Bryan Le Grys G3GOT**, Membership Secretary, 8 Kitchener Way, Shotley Gate, Ipswich, Suffolk IP9 1RW. **G3GOT @ GB7MXM**

**Andy Matheson G3ZYP**, Chairman & Publicity, 1 St Edmunds Close, Bromeswell, Suffolk IP12 2PL. **G3ZYP @ GB7MXM**, g3zyp@anglianet.co.uk

**Mike Kerry G4BMK**, Computer Queries, 2 Beacon Close, Seaford, East Sussex BN25 2JZ. **G4BMK @ GB7MXM**. Please enclose an s.s.a.e. with all enquiries.

**HB9AK**, 100577.1452@compuserve.com

**Ian Brothwell G4EAN**, Secretary, 56 Arnott Hill Road, Arnold, Nottingham, NG5 6LQ. **ibx@cs.nott.ac.uk**

**Nigel Roberts G4KZZ**, Awards & Components Manager, 13 Rosemore Close, Humbley, North Yorkshire 014 0NB.

**John Barber G4SKA**, Contest Manager, P.O. Box 8, Tiverton, Devon EX16 5YU.

**Sam Halis G8EX**, Treasurer, 22 Westbury Close, Hitchin, Hertfordshire SG5 2NF. **100015.2552@compuserve.com**

**Alan Hobbs G8GOJ**, President, 83 St Peters Street, South Croydon, Surrey CR2 7DG.

**Peter Adams G6LZB** Committee Member, 464 Whippendell Road, Watford, Hertfordshire WD1 7PT.

Please note there's been a change of membership Secretary and all enquiries should now be addressed to: **Bryan W. Le Grys G3GOT**, 8 Kitchener Way, Shotley Gate, Ipswich, Suffolk IP9 1RW. **G3GOT @ GB7MXM**. Please enclose an s.s.a.e. with all enquiries.

That's it for this month. Happy packing, Reports, messages and news to me at The Old Nursery, The Drift, Swardeston, Norwich, Norfolk NR14 8LQ. Tel: (01508) 570278. **G3LDI@GB7LDI**

**END**

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**Alinco S10E** dual-band transceiver, 45W, mobile mount, good condition, extended receive, £175 or exchange for Signal R535 v.h.f/u.h.f. airband scanner. G0JPS, Kent. Tel: (01227) 792867.

**Alinco DJ-580E** 2m/70cm (144/430MHz) hand-held inc. extended RX, remote mic., case, £275. Kenwood NiCad packs PB32, £25 each or £40 for two, o.n.o. These are new packs. Tel: N. Wales (01745) 730148 evenings.

**AOR AR3000A receiver**, excellent condition with indoor aerial for 25-1300MHz, £450. Pete, Lancs. Tel: (01524) 701689.

**Base type microphone AM3039**, perfect condition, £50 or v.n.o. Tel: Derbyshire (01283) 221870.

**Circuits, manuals, etc.** Also plug-in modules for HP157A scope, photocopies available, also have 1950s scope, swap for good quality marine/airband receiver. R. Burrell, 2 Clachamish, Bernisdale, Isle of Skye, Scotland.

**Clark Scam 40** telescopic pump up mast, ex-military, free standing, 250 o.n.o. Buyer collects. Mast goes up to 40ft. Tel: Dorset (01202) 426687.

**Clear out sale!** Can't list it all, includes TX/RX equipment, test gear, computer equipment, misc. items, etc. Send s.a.e. or call for a list by FAX, approx 90% items work. Tel: (01502) 678246. PO Box 19, Beccles. NR34 0DP

**Collector's h.f. radios** AR88LF (superb), £215. Eddystone 730/4, £135. RCA AR77, £80. All g.w.o., also Burndepot BE201 military v.h.f. TX/RX plus headset, mint, £115 and WS C12 tank transceiver, v.g.c., £110. Tel: E. Yorks (01482) 869682.

**Complete packet station** for sale or swap for 6m (50MHz) all-mode rig, consists of Viglen 486 8Mb RAM sound card, mouse, keyboard, VGA colour monitor, Tiny-2 modem plus FT23R 70cm (430MHz) handle, all in very good condition. Roy G7UVO,

Hatfield. Tel: (01707) 275920.

**Dating FL3 filter**, complete with power supply and leads, only used twice, £80. Jack, Dorking. Tel: (01306) 887057.

**Drake R8E receiver**, mint, boxed with manual, £700. Roger, Cheshire. Tel: (01270) 528667.

**Drake SPR-4 solid state communications receiver**, twenty four 500kHz wide bands between 200kHz and 30MHz, includes all amateur bands, box and manual, excellent condition, mains powered, bargain at £365. Tel: Bridgewater (01278) 458579.

**Drawing spec**, bits of Cossor CR1504A, free for collection. Reading area. Tel: Reading 0118-950 7976.

**Eddystone 770U/2** (150-390MHz). £75. AM/FM wide range oscillator, £40. Marconi frequency counter, £20. Universal AVO meter, £50. Alinco 2m (144MHz) F.m. transceiver, £150. Selection of RTTY equipment. Tel: Surrey 0181-654 8544.

**Fairmate HP200** hand-held scanning receiver, 500kHz to 1.3GHz, 1000 memory channels, complete with aerials. NiCads, charger, case and original packing, mint condition, little used, £190. No offers! John, Coventry. Tel: (01203) 465328 after 6pm.

**FR/FL50 h.f. RX/TX**, £90. Heathkit QRP HW-8 transceiver, £75. GRC-9 with p.s.u., mic., l.s., £200. German WWII field phones, £110. Danish WWI F.P., £105. Gas mask microphone WWII, £150. Tel: Worcs (01562) 743253.

**FT-101ZD MKIII c.w. filter**, cooling fan, d.c.-d.c. converter, YD148 base mic., FV-101ZD v.f.o., FC-902 a.t.u., all boxed, manuals, one owner from new, all in mint condition, delivery at cost, £500. Colin GM0AVR, Shetland Islands. Tel: (01860) 242836 evenings 1800-2000 please.

**FT-101ZD MKIII**, WARC, f.m., fan, new p.a. valves, digital frequency display, c.w. narrow filter, complete with Yaesu microphone and SP90! ext. speaker, original manuals, boxed, £425. o.n.o. Dave GORDT, Northampton. Tel: (01604) 757368.

**FT-101ZD**, speaker and manual, £350. FT-101B, £160. Daiva s.w.r. meter, £30. 2m (144MHz) linear, 30W, £60. Kent key, £40. Home-brew EL key, £15. BC221 wave meter, £20. Jap mechanical key, £10.

Hatfield. Tel: (01707) 275920.

**FT-102 desk mic. MD-1**, as new, £60. Microvitec 653 14in VDU, only used twice, £80. Jack, Dorking. Tel: Nr. Brighton (01273) 418713.

**Hygahn TH2 h.f. beam** plus G400 rotator, £150. Buyer collects. G3UPZ, Berks. Tel: (01734) 863535.

**Icom 728**, excellent condition, boxed, £585. Trio TS-830S plus external v.f.o., both items excellent condition, boxed, £465. Collect or plus carriage. Tel: Norfolk (01953) 882076.

**Icom IC-275II** 100W 2m (144MHz) all-mode transceiver, excellent condition, little used, original packaging and manual, £850 collected. Ewan GM0VMV, QTHR. Tel: 0131-447 0849.

**Icom IC-726** h.f. and 6m general coverage, v.g.c., £600 o.n.o. Mike GOKAS, Epsom. Tel: (01372) 810612.

**Icom IC-740** h.f. transceiver, Icom AT-150 auto antenna tuner, Icom IC-PS20 power supply unit, all mint condition, complete with manuals and original packing, £550. Tel: Kidderminster (01562) 515305.

**Icom R-7000** h.f. v.h.f. radio receiver, stepless tuning or scanning, 25MHz-2GHz, £600. K.J. Faulkner. Tel: 0161-905 3123.

**Icom R70 E.W.ORD**, £310. Datong multi-mode audio filter, excellent condition, £50 or sold together, £345. Also Yaesu FT-200 nr. mint condition, £195. Completely new valves. Tel: Mr. Keighley (01535) 635433 anytime.

**Jaybeam 88-element multibeam**, dismantled, £50 o.n.o. Log periodic 50 to 500MHz, £100 o.n.o. Yaesu YM49 spk. mike, suitable for FT-290, etc., £10 o.n.o. Tel: SW London 0181-547 3466.

**Kenwood 690S** h.f., 6m (50MHz), filter, £900. Yaesu 726R 2m/70cm (144/430MHz) plus sabboard, £580. Cushcraft 17B2, £80, 70cm (430MHz) crossed, £25. Diamond SX200, £45. Quad 20, 17, 10, £100. Yaesu 450XL, £180. Strumech P40, £250. Tel: West Midlands (01384) 370695.

**Kenwood R2000** receiver, boxed, manuals, including Datong indoor active antenna, hardly used, excellent condition, price, £300. No offers.

Dave G1AMM, Leeds. Tel: 0113-282 2013 (home) or (0589) 008199 (work).

**Kenwood TM431E** 70cm (430MHz)

35W, £200. Yaesu FT-270RH 2m (144MHz), 45W, £150. These with all extras and mint. KW201 receiver, exceptional, £95. General coverage, Lafayette HE80 rec., good working order, £40 collected. Tel: West Midlands 0121-474 4856.

**Kenwood TS-140S** h.f. transceiver with matching AT-250 auto a.t.u., boxed, A1 condition, £750 o.n.o. GOWYE, Surrey. Tel: (01737) 842967.

**Kenwood TS-440S** auto a.t.u., boxed, manuals, £650. Storno 5334 4m (70MHz) wanted Icom IC-505. Tel: Kent (01304) 379580.

**Kenwood TS-520SE** inc. digital read-out, manuals and boxed, excellent condition, £225. Mike G4XDL, Cheltenham. Tel: (01242) 510138.

**Kenwood TS-830S** h.f. transceiver, additional filter, £545. Yaesu FT-747GX h.f. transceiver with f.m. board, £525. Both immaculate condition, genuine reason for sale. Dave GW3YAF, QTHR. Tel: (01269) 870076.

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**Lowe HF-225** complete with f.m. board, keypad, manual, boxed as new, little used, £350. Datong FL3, £75, both for £400. Tel: Barking 0181-594 0869.

**Lowe PR150** pre-selector with magnetic long wire balun and isolator, £175 o.n.o. Also Sony AIR-8 airband receiver with external slim Jim antenna, £130 o.n.o. Bob GOWOK, South Glos. Tel: (01454) 218787.

**MFJ-748B** d.s.p., must sell, £100, less than half price, manual, etc. A. Rogers, Essex. Tel: (0279) 443957.

**MM 30W 2m (144MHz) linear amp.** £30. 2m (144MHz) Baycom modem with installation disk and manual, £30. Eddystone 'S' meter, £25. Bill, Staffs. Tel: (01782) 624838.

**Morse practice tapes**, 10 to 15w.p.m., five tapes, £15 plus P&P. SEM power meter, £15 plus P&P. All payments to JA Butterworth, 9 McKenzie Road, Buckie, AB56 1DH.

**Murphy B40**, £90. Eddystone 770S receiver to 1GHz, £150. 730/4, £125. 730/1A, £130. 840C, £100. 770U admiralty Q5, £80. EP17K panadaptor, £120. BC348, £75.

RA17L, £140. R107, £75. Collins TCS receiver, 1.5-12MHz, £65. AVO CT446 transistor analyser with book, £60. Marconi TF2700 precision portable i.c.r. bridge, £70. Most with manuals. Tel: Berks (01344) 27869.

**New FT-243** Jan crystal 7.030MHz fitted with calibration, cert: £5. also spare parts and valves for Heathkit RAI/RG1 RXs and Cedar AT5 TXs, send 'wants list' to: R. Marrs, 35 Kingswood House, Farnham Road, Slough, Berks SL1 1DA.

**Offers for Eddystone 840C**, good condition, cash or swap for Heathkit HW7 or KW2000E, anything considered in good working order, could collect, deliver locally. Tel: Cornwall (01209) 832154.

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**Panasonic DR28** mains/battery all wave receiver, excellent condition, complete with mains cord and manual, £60. Tel: Oxon (01491) 824094.

**PCs**, one Compaq 286 20Mb hard drive, floppy, etc., £90. One Tulip 286 20Mb hard drive, floppy, etc., £95. Assorted 20Mb and 40Mb HDSS and other bits to clear, offer? Andy GM7WJP, Scotland. Tel: (01387) 251065.

**R-2000 receiver**, fitted v.h.f. converter, 118-173, boxed with manual, v.g.c., £375. Colin, 112 Chichester Road, South Shields, Tyne Wear NE33 4HN.

**Rare ship's receiver (IMR) model SR401 hybrid (valve/transistor)**. 85kHz to 25MHz, quality RX, £120. Racial RA17 operating instructions, circuit, £125. Vintage army receivers, R109, £110. R210, £85. Eddystone 840C receiver, £120. All g.w.o. Tel: Yorkshire (01482) 869682.

**Shack clearance**, TS-820S, TS-830S, FT-101ZD, FT-707, Icom AT160, IC-260E, IC-W2E, IC-202S, Trio TR-751E, Kenwood AT230, Mizuho 20m (14MHz) s.s.b., Alinco DJ-1FE, DJ-460E, Hustler 4BT, Alinco DR-510, Weltz SP200, VFO820, SP820, David, Romford. Tel: (01708) 374043 evenings.

**Sommerkamp FLDX500**, £75. Yaesu FRDX400, £75. Bendix signal frequency meter, £30, all o.n.o. Buyer to collect. Dave GOMUX, North Yorkshire. Tel: (01423) 323296.

**Standard C528** dual-bander handheld transceiver, u.h.f. and v.h.f., good condition, rechargeable batteries and charger, cost £390 new, will sell for, £200. Tel: Berkshire (01344) 50021.

**TS-830S**, a.t.u. 230 s/p/erker 230, v.f.o. 230. Tel: S. Yorks (01382) 859451.

**Two Yaesu FT-101Z h.f. transceivers**, both in immaculate condition, £295 and £345. Yaesu FTV901R transverter, 4m (70MHz), 2m (144MHz), 70cm (430MHz) modules, s.s.b., a.m., f.m., c.w., immaculate condition, £300. Tel: Lincs (01406) 380037.

**Uniden UBC2901XL** wideband receiver, good condition, £100. Yupiteru 7100 wideband receiver, various accessories, £290 o.n.o. Martyn, Coventry. Tel: (01203) 650572 (24 hr).

**Vectortronics VC300M** a.t.u., mint, £50. Daiwa 14 amp p.s.u., mint, £40. Serem TSB-3302 dual-band antenna, newish, £25. 40m (7MHz) RG213/Y, £25. Realistic DX-100L h.f. receiver, mint, £50. Scanning directory, £10. Mark, SW London. Tel: 0181-255 6573 after 6pm.

**Versa Tower**, 35 feet, wind up, mobile to avoid planning + cage and bearing, two years old, £250 o.n.o. SWR and power meter, 3.5-150MHz, 100W, £25. 40m (7MHz) RG213/Y, £25. 16-element J-beam, £25. 5-element beam, new, £20. Power supply, 20m coaxial cable, s.w.r. meter, mics, plugs and connectors, mobile antennas plus lots more! £50 the lot. Darren Smith, Kent. Tel: (01732) 822236.

**Yaesu FT-101Z** f.m., very good condition with many spares, £250 o.n.o. Roy, NE London. Tel: 0181-504 3260.

**Yaesu FT-102** a.m./f.m. board fitted, narrow filters, spare driver and p.a.s., workshop manual, v.g.c., £475. Also Ten-Tec Corsair II with matching p.s.u./speaker, mic., and all info, mint condition, £625. Tel: NE Lancashire (01282) 617481.

**Yaesu FT-401B** 560W transceiver, good condition, c/w manual, etc., £150. Yaesu FRG-7 receiver, 2.2kHz filter added, good condition, c/w manual, £90. Telephone for more information. Bill. Tel: (01202) 246515.

**Yaesu FT-530** dual-band hand-held

transceiver with extended receive, complete with external speaker microphone, soft case, battery and charger, original boxes and manuals, cost, £500 new, only, £275. Tel: Plymouth (01752) 663763 evenings.

**Yaesu FT-747GX** with fitted f.m. h.f. transceiver, manuals, boxed, as new, £475. Tel: 0161-301 3750.

**Yaesu FT-7B** plus YC7B digital read-out unit, also mono hand scanner, complete with disks and manuals, one 25/30VA variable voltage p.s.u., type DPS2512. SAE to: Peerless, 157 Fairmead Crescent, Edgware HA8 8YS.

**Yaesu FT-900AT** under one year old, narrow filter, remote kit, used for receive only, £700. Tel: 0181-508 9703 (day) or (01277) 821827 evenings.

**Yaesu FT-901** h.f. rig, also FC-902 a.t.u., new valves and serviced, £330 or exchange for TS-430 or similar radio. C. Brown G0UNJ, Manchester. Tel: 0161-681 0529.

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**Yatesu FT-290II** all-mode 2m (144MHz) transceiver, complete with mic., manual, charger, case, carry strap, boxed, £300. Stan G7SRD, QTHR. Tel: Cheshire 0161-432 6560.

### Exchange

**Ferrograph tape recorders**, one type, 4 CFN and type 422U, model 'D' and 7 AVO meters. Armstrong AF208 radio chassis. Leak through line tuner and leak point one TL10 amplifier. 1930 KB radio wanted, working TX/RX. Bill, Norfolk. Tel: (01945) 585857 anytime.

**OAP - have an Eddystone transistor comm receiver EC10**. Exchange for valve military radio, short wave, any size. Tel: Coventry (01203) 440637.

**Trio JR-310** for Sangean ATS-803A or w.h.y.? Please write and will 'phone back. David Hamilton, 31 Richmond Terrace, Cumnock, Ayrshire, Scotland KA18 1DN.

**TS-830S**, very good condition with manual and service manual, plus Shure 444 mic., exchange for general coverage TS-430S or similar with f.m. Stuart, Stroud. Tel: (01453) 752411.

**WWII 103 receiver** with spares unit box. RCA USA signal corps, BC-348-C receiver. Pye 5-band receiver PE94 MBQ/LW. Wavemeter D No. 1 MkII. Component bridge unit type B101, unknown condition. Wanted working TX/RX. Bill, Norfolk. Tel: (01945) 585857 anytime.

**Yaesu FRG8800** receiver with FRV-8800 internal v.h.f. converter, FRT-7700 antenna tuner, all g.w.o., with manual, for Yaesu FT-902DM, prefer with FC902, must be g.w.o., with manual, G4MNB, QTHR. Tel: Swindon (01793) 826325.

### Wanted

**2m (144MHz) s.s.b. only transceiver**. David, SE London. Tel: 0181-302 4470.

**Any 2m (144MHz) transceiver**, must be multi-mode and in good condition, please contact Simon G7WKX or Martin G7WKW on (01952) 604822 after 7pm weekends only (hand-held) thank you!

**Any information** on the history of the McMurdo radio company, please write to Ted Moore, 5 Love Lane, Wakefield, West Yorks WF2 9AG. Will refund all mail and copying costs or can copy and return.

**Bush table radio model v.h.f. 64** or Bush radio gram SRG66 or Grundig radio model 3365 or Philips table radio model 561AT or Philips model B7X14A. Hugh McCallion, No. 8 Strathard Close, Coleraine, Co. Londonderry, N. Ireland BT51 3ES. Tel: (01265) 43793.

**Cassette flap for R9002H** stardeck radio cassette player. Carrick, Lyndene, St Aubyn Cres, Newquay, Cornwall TR7 2RQ.

**Copy of Morse transceive program**, on cassette, to suit old Commodore C16 computer (16k), price and particulars to: Tel: Leeds 0113-260 9456.

**Eddystone general coverage receiver**, late valved model 830 or 940 or w.h.y.? Must be good condition and working, urgently requiring free

**90 TV type valves** (50 boxed), cost of postage, Jim McGowan, 20 Keats Avenue, Romford, Essex RM3 7AR. Tel: (01708) 340304.

**Eddystone receivers**, models EC10, 1570, EM34, EB35, 960, 890, 930, 870, 870A, plus any Mimco sets and other models, also scrap sets for spares please. Some doubles for sale. Peter Lepino, Surrey. Tel: (0374) 128170 or (01372) 454381 anytime.

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**For 'B2' receiver**, i.f. coil (470kHz) circuit reference (L8E) or Wearite type M800 transformer will do, and its oblong knobs or similar type please, if able to help ring Andrew Humphriss, Warwick. Tel: (01926) 400876.

**Help wanted** - SL6700 a.m., s.s.b., c.w., i.f. detector. Matt, Lincoln. Tel: (01522) 721897.

**Instruction manual** for Ten-Tec a.t.u. (or copy) will re-imburse expenses. Model No. 4229. G001Z, Kent. Tel: (01304) 374612.

**Kenwood TS-440S** with filters. Tel: Cumbria (0539) 442240.

**KW202 receiver**, exchange for \$640 Eddystone receiver, in good condition, cash adjustment. Jack, Rugby. Tel: (01788) 811295.

**Military radio sets**, British, USA, etc., receivers, transceivers, valved plus acc's, aerials, bags, also large tent, 40s style. Have sets to swap 10823 wanted, also No. 12 set. Tel: Worcs (01562) 743253.

**PK88 TNC wanted**. Clearance of shack bits. Europa for 4m (70MHz), two off. Pye 290S, SMC52 speaker mic., TH205 and TH27 power leads, dry battery box for 2TE. Other bits. Tel: Tyne & Wear 0191-512 0373 or (0378) 026491.

**Please has anybody got any SL1612** i.f. amp i.c.s for sale or is there an equivalent? A. Seed, Devon. Tel: (01626) 334917.

**Please help!** I need a diagram of the printed circuit board for Philips S2925 receiver. Your price plus expenses. J. Boal, Belfast. Tel: (01232) 659577.

**Pump-up mast** 40/50 feet, will collect around M25 area, must be in good condition. Brian, Kent. Tel: (01634) 671301.

**Spy/Clandestine radio sets wanted**

by collector, American, British, German, Polish, Russian, etc., also accessories for same. Details and price wanted to: Bill G8PUJ, QTHR. Tel: E. London 0181-505 0838 evenings.

**Tektronix 503 oscilloscope** circuit diagram/instruction manual, loan or purchase. Also to purchase audio sine square wave signal generator. Marconi TF-1370 or similar. Tel: Southampton (01703) 615722.

**Top \$ for Yaesu FT-50 transmitter** and FR-50 rxv with manuals, must be excellent to mint condition, will pay shipping to USA. Gary Wagner K30MI, 11124 Oak Hollow Road, Knoxville, TN 37932 USA.

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**VHF-UHF Manual**, fourth edition, RSGB - GR Jessop. John William, Orkney. Tel: (01856) 711355 after 9pm.

**Wanted: old battered computers**. Atari 400, Tandy TRS-80 (model 1), Enterprise 64, Spectavideo SV-318 and 328, Spectrum clones, Apple II, KIM 1, Apple LISA, Altair 680, etc. Enrico Tedeschi, 54 Easthill Drive, Brighton BN41 2FD. Tel/FAX: (01273) 410749 or mobile (0850) 104725.

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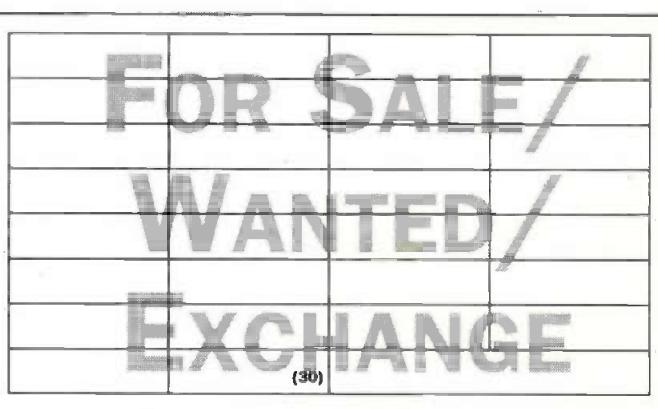
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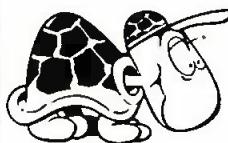
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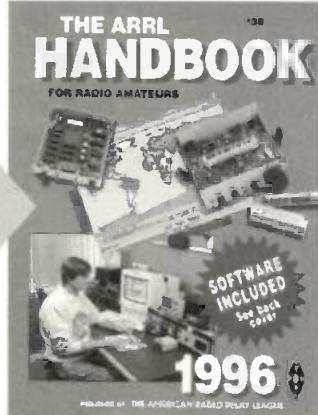
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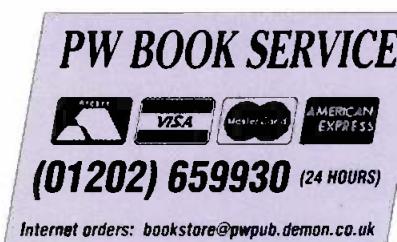
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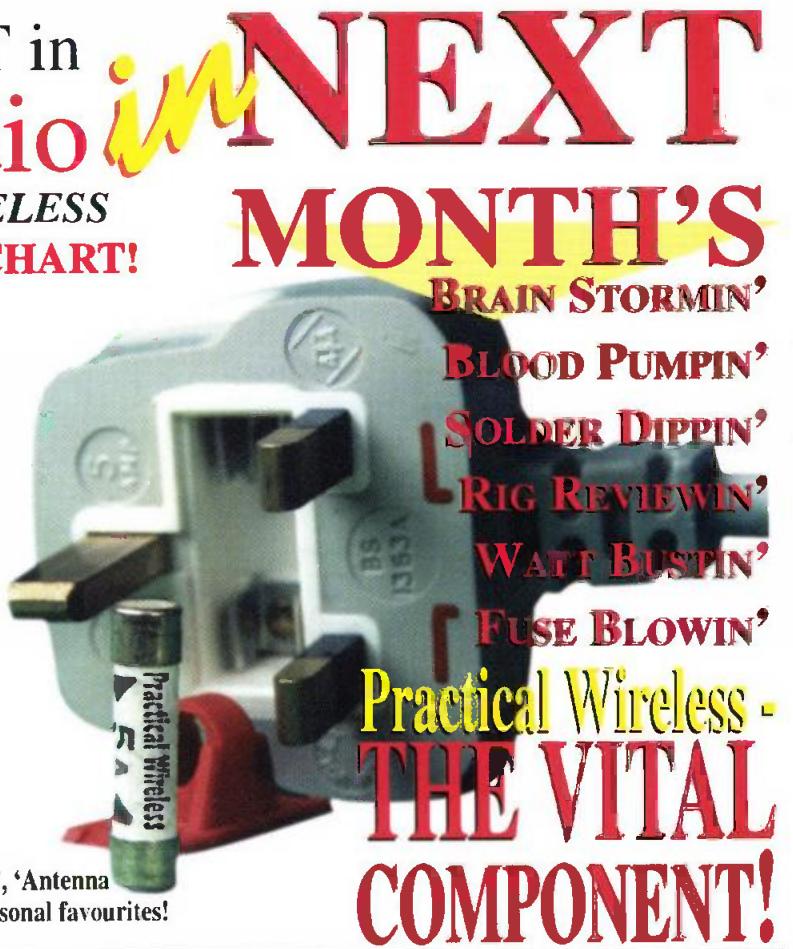
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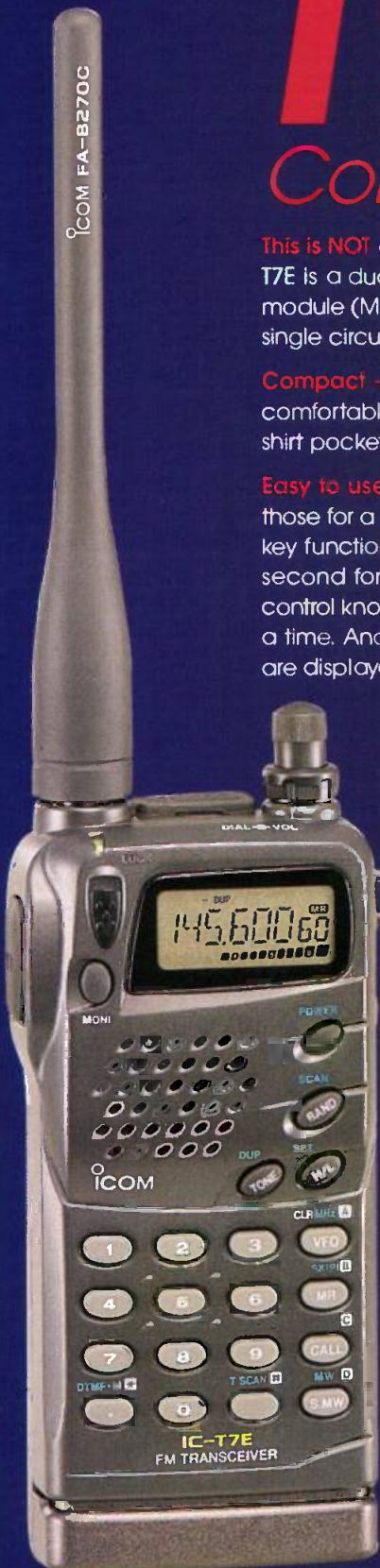
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