

# practical Wireless

MARCH 1996 £2.20

**INSIDE** - The PW Guide To  
The London Amateur Radio &  
Computer Show

PICKETTS



*Build -*

- The Short  
Twenty Antenna
- PW Changer HF  
Converter
- Solar  
Powered  
Charger



**Where In The World Are We?**

The GPS 45 Personal Satellite Navigator Reviewed By G3XJS





ADMS-1  
COMPUTER  
PROGRAMMABLE

# Ultra Compact Handhelds FT-10/40R

**TOP NOTCH™**  
Multi-function knob  
controls programming  
and volume.

**ARTS**  
Tracks range of 2 identically  
programmed HTs.

**PTT THUMB SWITCH**  
Ergonomically designed,  
conveniently located,  
insures maximum comfort.

**ALPHANUMERIC  
DISPLAY**  
Allows 4-character  
labelling of important  
frequencies.

**SUPER LOUD AUDIO**  
State of art miniaturization  
gives greatest RX volume  
and clarity.

**RUBBER GASKETS**  
Protects against corrosion  
from dust, rain or spray.

**12 V DC JACK**  
Use optional E-DC-5B  
power adapter in your car  
for 5 W PWR O/P.



"This HT is the first  
amateur radio with  
built-in Digital Coded  
Squelch (DCS) for  
RX and TX."

"For a radio this small  
and rugged, the audio  
is genuinely LOUD!"



"I used ADMS-1 to  
program my FT-10  
when we went  
camping, and the  
new ARTS system  
to keep track of my  
kids on the trails!"

"Yaesu did it again!"

## Military spec commercial grade HTs loaded with new features and a choice of keypad, too.



**FTT-10/A16S**

16-Key, CTCSS Enc/Dec,  
DCS Enc/Dec, Digital Voice Recorder  
99 Channels



**FTT-10/A16D**

16-Key, CTCSS Enc/Dec,  
DCS Enc/Dec,  
99 Channels

**FTT-10/A06**  
6-Key, CTCSS Enc,  
DCS Enc/Dec,  
30 Channels

**FTT-10/A16**  
16-Key, CTCSS Enc,  
DCS Enc/Dec,  
30 Channels

## Specifications

- Frequency Coverage  
FT-10R  
2m: RX: 140-174 MHz  
TX: 144-146 MHz  
FT-40R  
70cm: RX: 420-470 MHz  
TX: 430-440 MHz
- Choice of 4 keypad options  
(6, 16 or Deluxe and  
DVR16 Keypads)
- Auto Range Transpond  
System™ (ARTS™)
- MIL-STD 810
- High Audio Output
- 12 V DC Direct Input
- Alphanumeric Display
- RX/TX Battery Savers
- Digital Coded Squelch  
(DCS)
- Digital Voice Recording  
System (DVR16)  
w/FTT-10/A16S
- True FM for better voice  
clarity
- High Speed Scanning  
System
- 2.5 and 5 W available
- Full line of accessories

The FT-10/40R is a totally new HT concept!  
Built to rugged, tough military spec,  
commercial radio standards inside and out, it's  
small, powerful, feature-packed and ready to roll out  
in four versions!!

Four different keypads – count 'em, FOUR!  
First true user-choice customized HT on the  
market, offers a 6, and three 16 keypad selections  
plus 2.5 and 5 W battery choices, too! Easy for  
Yaesu, the electronics are in the keypad. Easy for  
you, they're already installed. Just pick the one that  
suits your HT "style"!

New technology high-efficiency speaker design  
provides super-loud audio. No small surprise – after  
all it is Yaesu!

First ever, amateur HT rated MIL-STD 810!  
What else could you hope for? This, maybe. Dual  
Watch – see two frequencies displayed simultane-

ously in the display. No other single band HT has  
this feature. Another Yaesu exclusive, the Auto  
Range Transpond System™ (ARTS™) alerts you  
visually and audibly when a companion HT is out of  
simplex range. Most radio functions, are controlled  
of the Top Notch™, the neatly placed knob on the  
HT. This minimizes complex key sequences. Only  
Yaesu has this. Digital Coded Squelch (DCS) – for  
convenient semi-private operation. Digital Voice  
Recording System (DVR16) – records voice messages  
for playback, and received messages. And, of course  
Omni-Glow™ display, because you won't be able to  
put this one down!

The FT-10/40R is a military-tough,  
commercial-quality force in a small package.  
Exactly what you've come to expect from Yaesu!  
Better get one now, before the dealer sells out!



**FT-51R**

Dual Band  
with Windows  
Spectrum Scope™,  
Alphanumeric,  
Scrolling Menu,  
Battery Voltage  
Display. 2 or 5 W.  
World's smallest  
dual band HT!



**FT-11/41R**

Slim, trim and  
powerful!  
Alphanumeric,  
Compact Battery  
Design, Up/Down  
Thumb Control,  
RX/TX Battery  
Savers.  
2 or 5 W Available.

# YAESU

Performance without compromise.™

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Cerritos, CA 90703, (310) 404-2700.  
Specifications subject to change without notice.  
Specifications guaranteed only within amateur bands.  
Some accessories and/or options are standard in certain  
areas. Check with your local Yaesu dealer for specific  
details.

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



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# SOUTH MIDLANDS COMMUNICATIONS

## LONDON SHOW SPECIALS

**IN THE  
RED HALL  
STAND M**

FT-1000	Yaesu's HF flagship .....	only <b>£2999</b>	save £1000
FT-990	ATU & PSU built in .....	only <b>£1899</b>	save £500
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TS-690S	HF 100W + 6 metres .....	only <b>£1399</b>	save £250
FT-2500M	50W 2m mobile .....	only <b>£299</b>	save £100
FT-416G	2m Handi 5 watt .....	only <b>£239</b>	save £90
FT-10R/A06	New Yaesu 2m Handi .....	only <b>£219</b>	save £50
RL-402	Rexon 70cm Handi .....	only <b>£149</b>	save £50
RL-102	Rexon 2m Handi .....	only <b>£139</b>	save £50
C-188	Standard 2m Handi .....	only <b>£149</b>	save £130

ALL OFFERS SUBJECT TO AVAILABILITY.



**NEW**

only  
**£69**

### TECOM 938V

2m, 2 watt, single channel & c/w.  
nicad & charger crystals fitted S22



**NEW**

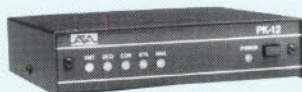
only  
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### GEE-890 2m HANDI

- \* 1 watt output at 7.2v
- \* 2 channel S20 & S22
- \* External mic/speaker socket
- \* Cell case with DC socket
- \* Hi/low power switch
- \* Helical & telescopic antennas

### AEA TNCs and Data Modems

**NEW** DSP232 – Multimode data  
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£499 inc.  
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**PK900** – Deluxe multimode data terminal  
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*Proven Reliability for Today's Amateur!*

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**RS40XII** PSU 1-15V 32/40A .....£169.00

**CN101L** 1.8-150MHZ 15/150/1500W ....£59.50

**CN103LN** 150-525MHZ 20/200W 'N' .....£68.00

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**CS201GII** 2 Way Switch 'N' 1KW PEP .....£23.50

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80-60W Out Pre Amps .....£345.00

**DX10N** 2m/70cm Duplexer UHF/N .....£22.50

**CP10Y6** Cigar plug lead for FT530, etc. ....£6.50

Practical Wireless, March 1996

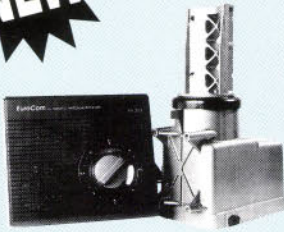


## ANTENNA ROTATORS



### AR-303

Light duty rotator  
offset mounting.

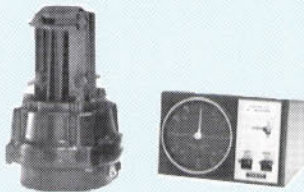


only **£49.95** inc

AR-200AB matching offset  
bearing

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G-1000SDX	H/D version of G-800SDX .....	£499.00	D
G-2700SDX	H/D rotator 450° .....	£959.00	D
G-500A	Elevation rotator .....	£289.00	D
G-5400B	AZ/EL rotator .....	£529.00	D
G-5600B	AZ/EL rotator H/D .....	£629.00	D
RC5-1	Medium duty create .....	£329.00	D
RC5-3	Medium duty + preset .....	£439.00	D
RC5A-3	H/D v/speed + preset .....	£659.00	D
RC5B-3	V H/D v/speed + preset .....	£989.00	D
GC038b	Lowes clamp G-400, 800, 1000 .....	£25.00	B
GC038G	Lowes clamp G-600 .....	£25.00	B
MC½	Lowes clamp create .....	£49.95	C
GS-050	Rotary bearing up to 1½ mast .....	£29.00	B
GS-065	Rotary bearing 2" mast .....	£45.00	B
CK46	Create rotary bearing 2" mast .....	£57.00	B
CD-45	Telex meter controller .....	£315	D
HAM IV	Medium duty meter controller .....	£449	D
HAM V	HAM IV with digital controller .....	£749	D
T2X	H/D with meter controller .....	£525	D
T2XD	T2X with digital controller .....	£795	D

## TELEX HY-GAIN

### TELEX HY-GAIN HF ANTENNA

12AVQS	10-15-20m vertical, 4.1m	£109	C
14AVQ/WBS	10-15-20-40m vertical, 5.5m	£159	C
DX88	10-80m vertical	£315	C
DX77	10-40m vertical	£369	C



## COMET ANTENNA ACCESSORIES

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CK-3MB	Mini Cable Assembly	£26.50
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HL 100B/80	7MHz 100w out	£210	C
HL 66V	50MHz 10w in 60w out	£169	C
HL 166V	50MHz 3/10 in 160w out	£299	C
HL 37VSX	2m 5w in 35w out	£119	B
HL 62VSX	2m 5-25w in 50w out	£235	C
HL 180V	2m 5-25w in 170w out	£389	C
HL 36U	70cm 5-10w in 30w out	£155	B
HL 63U	70cm 10-25w in 50w out	£259	C
HL 130U	70cm 3-25w in 120w out	£485	C
HL 2K	HF 2Kw PEP, 2x3-500Z	£1750	E
HL1K/6	6m 10w in 500w out	£995	D



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APR18A	Radial Kit	£49.00
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A3WS	12/17m 3-ele Yagi	£275.00
A103	30m Extension A3WS	£115.00
204CD	4 ele 20m Yagi	£469.00
154CD	4 ele 15m Yagi	£279.00
D4	Dipole 10/15/20/40m	£249.00
D3W	Dipole 12/17/30m	£189.00
A4S	3-4 ele Yagi 10/15/20m	£439.00

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AR2	2m Vertical 1.2m long	£35.00
AR6	6m Vertical 3.1m long	£59.00
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A144-20T	2m 10-ele Cross Yagi 12.2 dBd	£99.00
13B2	13-ele 2m Yagi	£99.95
17B2	17-ele 2m Yagi	£189.00
A50-3S	3-ele 6m Yagi	£75.95
A50-5S	5-ele 6m Yagi	£149.00
A50-6S	6-ele 6m Yagi	£229.95
424B	24-ele 70cms Yagi	£115.00
22XB	2m 22-ele Yagi c/w polarization switching	£229.00
738XB	70cms 38-ele Yagi c/w polarization switching	£199.00

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at rock bottom prices, OK for 70cm

Packet conversion

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Single channel **Only £79**

### SMC 1045L2/B



2 channel **Only £89**

MICS AVAILABLE £10 EXTRA

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FTC-4625 (12.5)	UHF 25w 7ch .....	£95
FTC-4625 (25)	RPT UHF 25w 7ch .....	£99
FTC-740A	lowband 40w 12ch .....	£79
FTC-1625	VHF 25w 7ch .....	£89

All sets intended for conversion for  
packet radio use mic's extra.

**All discounts are based on recommended retail prices.**

**CARRIAGE: BASE ANTENNAS £9.50 MOBILE ANTENNAS £5.00 STATION ACCESSORIES £5.00**

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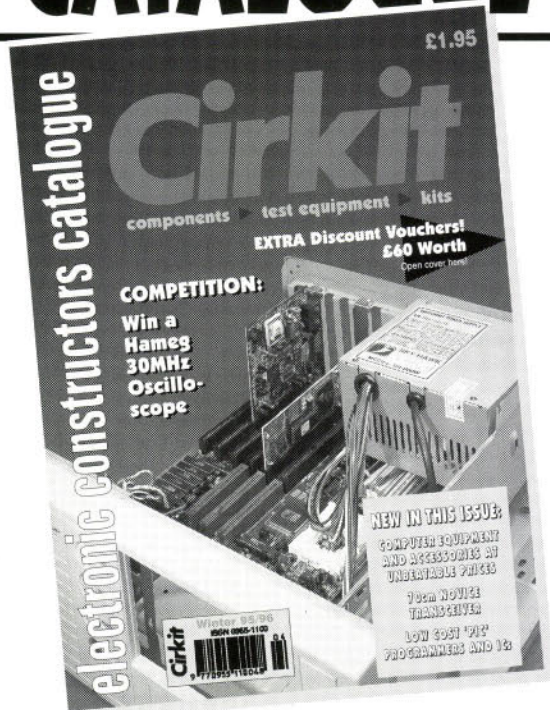
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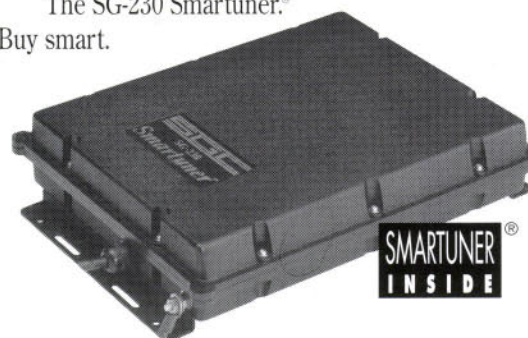
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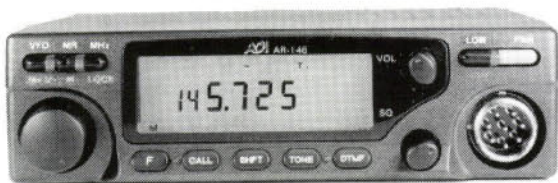
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If I had to name a 'Mr Practical' it would have to be **Don Watson GW3RJY**. 'Practical' should have been his middle name! This amazing personality would think nothing of stripping down an old Austin Seven car, totally rebuilding it and making it as good as new! Usually over a couple of weekends.

Don died on Sunday 7 January at the ripe old age of 83. But, 'old age' was not a term Don Watson would accept. "No Sir" (to quote his favourite phrase!) 'You're only as old as you feel'! And to judge by his actions, and his never-ending enthusiasm for life and anything he did, he was very much a young man at heart.

Usually, any words such as I'm writing at the moment, are solemnly referred to as 'Obituaries'. But, in the case of Don GW3RJY, 'obituary' is definitely not the correct term. And, like his funeral service in Kerry, near Newtown in the delightful old Welsh county of Montgomeryshire I'm aiming this piece to be a 'celebration of a wonderful long life'.

I knew Don Watson for over 40 years. I first came across him as a civilian radio instructor when I joined the Royal Navy. His job was to

# EDITOR'S

## Keylines

**Rob Mannion's viewpoint on the World of Amateur Radio**

teach (often very bored) young Royal Navy Fleet Air Arm recruits the radio basics. Well, his lecture style and enthusiasm were infectious. We all 'caught the bug' and enjoyed his teaching, wondering (as it was the dawn of the semiconductor age) just how he could pack a 100W transmitter into one of his famous "Eight by Eight" (inches!) metal cubes?

In those days Don had a delightful home on the edge of Hampshire downland. The hillside the house perched on was so steep we were going to build a funicular railway at one time!

Eventually Don and his late wife Phyllis, retired to mid-Wales. There he was as busy as ever, and despite living alone for 11 years after his wife's death, he thought nothing of flying to Arizona

to see his daughter Sue and family, and combining that holiday with helping out on the G-QRP 'booth' at the Dayton HamVention, touring the show with me and making new friends.

The beautiful little Anglican church in Kerry was full of his old friends at the funeral. They joined his daughters Sue and Joanne and their families on Saturday 13 January. **Paul Essery GW3KFE**, RSGB Council Member and friend, read an appreciation of Don's life (Eulogy is not the correct term here either!) and the lesson was read by **Phil Cardwell GW3FXI**.

For once, the rain held off as the congregation wended its way to the nearby cemetery. But it wasn't too solemn...as I realised if Don had been amongst us that day

he would have motorised the bier or at least have had it radio controlled. My seemingly irreverent remark amused everyone because they knew that's just what I would have done!

A tiny bag of Arizona desert sand was interred with GW3RJY. It was brought over by his daughter Sue from near her home, and it seemed a fitting tribute to a man who generated international friendship throughout his life.

We'll miss Don on the annual trip to the Dayton HamVention and I'll miss his friendship. However, as long as 'home-brewing' is practised by radio enthusiasts, the GW3RJY spirit will live on in other radio amateurs. It has to, otherwise our hobby would die.



**Don Watson GW3RJY**  
1912 - 1996

*Rob Mannion*  
**G3XFD**

# Spot the Difference



It seemed to be a good idea to organise an 'Editor's Corner' for the Picketts Lock Show in March. The idea was so that *Practical Wireless* readers could meet Editor Rob Mannion G3XFD at one end of the PW & SWM Stand (Stand T in the Red Hall) and Editor of *Short Wave Magazine* Dick Ganderton G8VFH at the other end. However, we had forgotten they were both railway enthusiasts! Dick has built another miniature steam locomotive and Rob has borrowed an appropriate uniform to run BR (Bob's Railway, while readers wait for their books to arrive on platform! So, come and join the fun on March 9 and 10, we'll look forward to seeing you.

**There are 12 differences to mark on the right-hand version of the cartoon this month, good luck.**

Entries to reach us by **Friday 22 March 1996**.

**Practical Wireless, March 1996**

Name ..... Callsign .....

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Send your entry (photocopies acceptable with corner flash) to: **Spot The Difference Competition, March 1996, 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.

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**Mar. '96**



# RECEIVING You

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

## Manufacturer's Viewpoint

Dear Sir

I read with some amusement 'Manufacturer's Viewpoint' in the January 1996 *PW*. David Wilkins G5HY's long letter about how he manages to 'separate' while admitting to control over both simply fails to ring true in a big way. Does he really think that we are all going to go round saying 'well, we've had it from the horse's mouth now, so it **MUST** be genuine'. I rather think what we received was from the horse's other end.

About *PW*'s review policy and taking Bill Kitchen's question of 'Still Amateur Radio?' (also *PW* Jan 96) into consideration isn't it time that *PW* came out of the closet and renamed itself 'Wireless Review'? This would justify the modern design of the magazine, it's content and it's purpose so much more effectively to its readership.

P. Walton  
Manchester

**Editor's comment:** The *PW* Editorial team strive to create a 'balance' of articles which appeal to readers. Our reader surveys consistently indicate that equipment reviews are very popular features. Because of this we try to publish varied, accurate and unbiased reports. The reviews include kits and ready-built equipment obtained from manufacturers ranging from 'one man' companies to large international concerns. They aim to reflect all price levels and interests. All reviews are written by authors who are chosen

and commissioned specifically by an Editor who guards his professional journalistic independence and high ethical standards (and those of *PW*!) very closely. G3XFD.

## The 1930s

Dear Sir

Thank you for the 1000th issue and the Diamond Jubilee issue of *Practical Wireless*, I have found the articles and pictures relating to the 1930s very interesting. I made up the 'Lissen' s.w. kit and remember well tuning into W2XAD Schenectady, New York, it was quite something then. Also, the picture of the 30 line disc television receiver reminded me of the shop window in Guildford in which it was being demonstrated.

F. J. Waller  
Cornwall

**Editor's comment:** Mr Waller wrote to us after discovering *PW* on sale in a local newsagent. It appears that he had last experienced radio construction (and *PW*!)

before the Second World War. I sent him copies of our special celebration issues as I'm very pleased that both the magazine and pre-Second World War readers are much in evidence! And in fact, the team would be very interested to hear from readers who have memories of *PW* from before 1939.

## Letter To America

Dear Sir,

Ref: Ed Taylor WT3AU's 'Scene USA', *PW* January 1996. Thanks Ed for your article (particularly with reference to 'The Morse Test'). I have felt for some time that the requirement for a 'One Time' proficiency in Morse does nothing to assist anyone to access the h.f. bands.

I am the first to recognise the value of c.w. as possibly the only method of communications under certain conditions and also the great pleasure that it gives to its adherents. To this end I would like to suggest that a portion of all h.f. bands must be kept for

the sole use of c.w. practitioners. If the non-c.w. operators wish to practice Morse then they have access to specific frequencies in the v.h.f. and u.h.f. bands.

As a s.w.l. I have listened to s.s.b. contacts on the h.f. bands well as v.h.f. and u.h.f. And I have to say that in my experience you will hear more courtesy and correct operating procedures on the latter bands! The passing of a Morse Test does not seem to carry with it the wisdom or manners that some people seem to think it merits.

My suggestion would be that the current Morse Test remains in place for those who wish to have access to the c.w. frequencies on the h.f. bands. I also think that access to the non-c.w. part of the h.f. bands be made available to 'Class B' operators after a period of not less than two years operations on the v.h.f. and u.h.f. bands.

Hopefully this would give time for newcomers to the hobby to learn the niceties of behaviour on bands, which in general, are confined to working contacts within the UK.

When such experience has been obtained, an operator should be able to operate in a considerate manner and to give a good account of themselves when making international contacts on the h.f. bands.

I realise that many c.w. operators will not be happy with my suggestion, but how many 'would-be' h.f. operators practice c.w. after they have successfully passed the Morse Test? I suggest that it is not a very large proportion. Perhaps you and/or other radio amateurs have ideas on the subject. I would be interested to hear them!

Keith White G7HQR  
Dorset

## Attracted Into Radio

Dear Sir

I would like to suggest that if more young people are to be attracted into the hobby of amateur radio, it might be a good idea if you reprinted some of the construction articles from previous years, 1960-1990 perhaps. I have in mind some of the circuits, such as the Direct Conversion

## Morse Test

Dear Sir

There is a lot of controversy about Morse at the moment in the radio amateur community. I have just passed my Morse test and would like to say that whilst studying some of it was less than helpful.

I have a full time job and there were times when I had to force myself not to sit in a chair in front of the TV, but to turn the computer on and spend an hour or so doing Morse. It was I suppose a great advantage that I am not married or it could have ended in divorce on the grounds on unreasonable behaviour!

In the area that I live there are no Morse classes and although a friend of mine had offered to send me some Morse for a few weeks before the test, illness stopped this. So I had nothing but my computer and the very excellent Morse program from D. Brandon G4UDX. This program

not only gives random Morse, but also has QSO style Morse tests and a facility to connect a key and practice sending. I cannot overstate my gratitude to Mr Brandon.

May I say that the feeling of elation I got on opening the letter containing the RSGB's pass slip has more than made up for the struggle of learning Morse. Despite being as nervous as a kitten on the big day, the examiners did all in their power to put me at ease.

So for me, h.f. will not just be another band, but will be something I have earned a right to use and will respect all the more for having done so. I hope that this letter is of some help to others learning or thinking of learning Morse at a time when so many voices are saying why bother, it will be worth it in the end, not only for access to h.f., but also for the feeling of self-respect.

G. Fowler G7MHT soon to be G0???  
Derby



Superhet of Jan 1978 for instance. This is a super little set and gives a very good account of itself.

There were circuits for Resonance Indicators, Continuity Testers, Aerial Tuners, Low Cost Power Units, etc. All could be made from a handful of components in a paper bag, consisting of very little.

I agree with Bill Kitchen G4GHB (January 1996 *PW*) that it is not a good beginning for youngsters to start out on 100W-400W, all singing and dancing rigs costing thousands of pounds. Anyone can go to a shop with plastic and buy the most exotic creation, but very little satisfaction will be achieved having done so. That's not what amateur radio is about.

Progress towards that goal perhaps, but it is not the place to start.

**Eric Smith ex RAF W/Op 1943-1947**

**Woking  
Surrey**

## Middle Class Attitudes

**Dear Sir**

Did it ever occur to the people clamouring to keep the Morse Test, that the hobby might just attract more incomers by ditching its traditional 'Middle Class' attitudes?

Going by the numbers of 'old timers' writing on the subject you'd think that abolishing the Morse Test was the first step to abolishing the Monarchy and declaring a Republic! It's high time the Morse Test was replaced by something more relevant and practical. Let's face it, the Morse Test now belongs to the same era as 'Means Tests' and outside toilets!

**G. R. Wilkie  
GM0RMT  
Stirling  
Scotland**

## The RAE, QSL Cards & G4BXD

**Dear Sir**

This is a 'double-barrelled' letter to *PW* in reply to 'Editor's Keylines' on the RAE and other club matters.

Through our club we have a commercial agreement with the Bilston Community College For Adult Further Education. (Our Club Secretary is the RAE lecturer). There is a condition though, to take advantage off the agreement you must be a Student Club Member and put in an agreed number of hours at club meetings. But the bonus is that students get their RAE tuition free and only pay for their exam.

The areas we cover are Willenhall, Wednesfield, Walsall, Wolverhampton, Essington and many other places. Next, I must mention our club card and logo. We are lucky because the club QSL card which we use for special event stations is sponsored by the Lock Union!

Finally, I must mention Ben Nock G4BXD. I have seen Ben in action and was very impressed indeed by his talk on 'Valve & Vintage' at our club. Ben makes light of his disability and he has my admiration.  
**J. H. Clifton G0UTU  
Willenhall & District  
Amateur Radio Society**

**Editor's reply: An interesting letter Mr Clifton. The arrangement**

## Same Vintage

**Dear Sir**

Ref. Bill Kitchen G4GHB's 'Star letter' published in the January 1996 edition of *PW*. As an amateur of the same vintage as Bill and still using only my 21 year-old Heathkit SB102/200, I agree with his sentiments concerning the barrier posed to the entry of dedicated youngsters to the h.f. bands by the high cost of commercially built transceivers. The problem being compounded by the loss of ability these days to construct home-brew equipment.

It was of particular interest to read the copy of the Director of Mobile Services Radiocommunications Agency's letter in the same column where it is clear from his choice of words that the distinction presently existing between Class A and B Licences is about to be removed. In such, (I think) now inevitable circumstances it seems, with

## Crystal Attraction

**Dear Sir**

Bill Kitchen G4GHB (January *PW*) has hit the nail on the head, how can we expect anyone to become interested in amateur radio at all, when all they see at special event stations is equipment costing hundreds, if not thousands of pounds?

As a former Scout Leader, amongst the several bits of equipment I used to take along to Scout JOTA stations was a home-made crystal set. This was built using 'breadboard' construction to look deliberately 'Heath Robinson'.

On most occasions I offered a prize to anyone who could tell me how it worked. Every conceivable explanation was given, solar power and wind power being the favourite!

Of all the bits of equipment used, or on display, my old crystal set was often the centre of attraction.

Personally I find it sad that today many amateurs can no longer build even simple equipment such as power supplies, aerials (not antennae which are found on insects), simple a.t.u.s, etc. I take more pride in showing visitors home-made equipment than any of my commercial gear.

Judging by your practical projects articles, you are attempting to highlight the practicalities of the hobby. You might consider it worth repeating articles from several years ago, such as the 'Marchwood' power supply for example and re-starting the 'Mods' column for newcomers to *PW* and amateur radio who have not had the opportunity to read these items.

Be assured, once you start making your own equipment, the bug bites and it adds an extra dimension to the hobby.

**Colin Topping GM6HGW  
Fife**

your club has made with the College of Further Education seems to be one which could be copied in other locations. The 'sponsored' QSL card is a good idea too. (Well, a certain electricity generating concern 'sponsors' the weather forecast on ITV don't they? So why not QSL cards?). And I feel sure Ben G4BXD will be pleased to hear you enjoyed his talk on 'V&V'.

*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.*

## Specifications Explained

**Dear Sir**

I have followed Ian Poole G3YWX's series 'Specifications...The Mysteries Explained' with great interest. Ian's writing skill and the 'short, sharp and concise' style of his monthly column has been a great help to me (and no doubt to others).

As a student hoping to take Electrical/Electronic Engineering as a subject when I go on to University from Sixth Form College, I feel that Ian's series would make an interesting book. Perhaps *PW* might consider my idea?

**Steve Andrews  
Newark  
Nottinghamshire**

**Editor's comment: Ian's excellent series comes to an end soon. Perhaps readers would let us know what they think of your suggestion Steve. And we wish you the best of luck with your studies.**

due respect to Bill, that the high cost of h.f. rigs may become the only bulwark against severe deterioration of the presently good standard of operation and courtesy found on the h.f. bands.

I would never agree to privilege based upon ability to pay but strongly support the suggestion already put forward that Licence Grading based upon willingness to prove an increasing level of technical knowledge would protect the already crowded h.f. bands from ruin by overcrowding while at the same time reintroduce the (largely) lost ability for home-brew, thereby partially surmounting the problem of the high cost of commercially built radio equipment and the elitism which goes with it.

The Morse Code test is dead. Long live home-brew and licence grading by proven technical knowledge.

**Robert Percival G4DBA  
Cumbria**

THIS MONTH'S STAR LETTER

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



# NOVICE

## Natter

For Radio Beginners Of All Ages

*This month Elaine Richards G4LFM dips into a selection of newsletters and leaflets to bring you her usual interesting and informative read.*

As I'm writing this column during the Festive break there aren't many letters around. And as I've got lots of different newsletters and leaflets that have been sat on my desk for a month or two, so I thought I'd pull some information from these for a change.

## Metroplex

Metroplex is the second largest amateur radio repeater club in the USA and their reference guide has been passed on by **Phil G3YPQ**. What an organised group!

Part of the Metroplex reference guide is their *Operating Practice* for their repeaters. It made very interesting reading and many of the 42 points travel well across the Atlantic.

Many of the 'rules' are really just good manners - like not barging into conversations uninvited, using unnecessary jargon and not hogging the repeater. But

there was one point that made me stop and think: **'Thieves Are Listening'**

If you are taking your family on holiday for a week, do not tell the world. You may return to find a house that was broken into by thieves.

The thieves knew they had plenty of time and that you live in a white house with green trim on the corner. They knew exactly how to get to your house because you gave out directions over the repeater last week.

Thieves listen on radios and scanners. Wait till you get back home before you start boasting about your vacation.

What do you say if someone on a repeater innocently asks "Where is Harry W2QAQ?". Please, please do not say he has taken his family to Hawaii for two weeks!

What good advice! If you are new on the air, sit and think about some of the things that get said over

## STELAR

Just last month I mentioned the STELAR (Science & Technology through Educational Links With Amateur Radio) group, since then I've heard from **David Haigh** who took the course early last year. He found it very hard work, but says it was a most enjoyable experience.

David recently set-up a radio station at his local primary school and hopes that some of the interested children will take up radio as a hobby. While on the course, Mr Haigh took a few photos showing what went on.



A representation of the radio room on the STELAR course which David Haigh attended.

The STELAR course students look on as Richard Horton G3XWH takes to the airwaves.

If you're interested in joining in with the activities of STELAR then why not contact **Richard Horton G3XWH** at Harrogate Ladies College, Clarence Drive, Harrogate, North Yorkshire HG1 2QG. E-mail: [g3xwh@amsat.org](mailto:g3xwh@amsat.org)



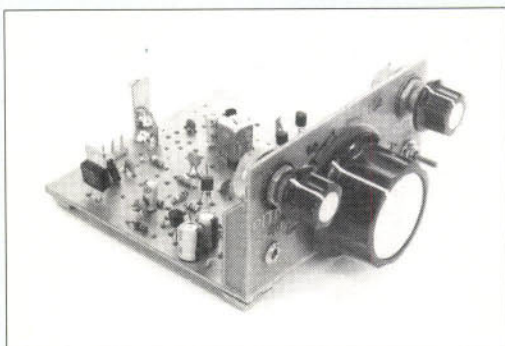
## Ideal Starter Kit

I've mentioned **Walford Electronics** in 'Novice Natter' before, and they've got a new kit out now. It's a regenerative t.r.f. receiver, called the Pitney.

The Pitney is able to receive all the normal modes (a.m., c.w. or s.s.b.) and has a basic frequency coverage of 1 to 5MHz. It's able to run off a 9V battery or a 12V supply and uses 'Walkman'-type headphones.

Walford Electronics' Pitney is supplied complete with all hardware and detailed instructions. A single unit costs £27 plus £1 P&P, but discounts are available for clubs ordering 10 or more.

For more information contact **Walford Electronics, Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ. Tel: (01458) 241224.**



repeaters (or on 144MHz, etc.). Are you or others being careless about what you say?

Please be careful about what you are saying, not only for your sake, but for others too. The bit about saying someone else has gone off on holiday could catch any of us out.

## Morse Net

Morse is in the amateur news a lot at the moment with the business of the no-code license. Details have reached me (a bit late I'm afraid) about **Alex 2E0AJS** from Cheddar who is trying to get a Novice and Newcomers

QSR Net going on Thursdays at 7pm local time and Sundays at 9am local time on 3.575MHz.

Alex is just 13 years old and should be encouraged in his venture. It could be worth having a go and joining in, Alex has worked Brazil with just 2W on c.w., so it can be a useful mode no matter what you have read recently.

Thanks to **Nigel G0WIW** who sent the information to the PW office in the first place.



## Scottish News

I was reading the Winter 95 edition of *FM News*, the publication of the Central Scotland FM Group and found a good anecdote.

**Alasdair GM3AXX** writes a column in *FM News*

and mentioned the following story: 'Bob GM6FT, at aged 87, caused consternation in a recent YU contest. It happened thus - instead of giving a signal report plus serial number e.g. 59001 for the first contact, in this contest you give a signal

report plus the year you were licensed.

'In among the 5990s and 5986s. Bobs report of 5925 caused many pregnant silences. He has since received letters and cards with congratulations and requests for a QSL card!'

Good for you Bob.

Just for the record, I found plenty of other things of interest in the *FM* newsletter, those of you who belong to that repeater group and therefore receive the newsletter are fortunate indeed.

The article 'Getting in the Picture' by **Simon Lewis GM4PLM** about amateur television and 'Observations from a 'failed DXer' by **Wallace Shackleton GM0GNT** were both informative and entertaining. Great reading!

## First Steps

### AMSAT-UK

I 'started out' on the subject of AMSAT-UK this month after reading that the RSGB had presented a cheque for £25,000 to **Ron Broadbent MBE G3AAJ** for the AMSAT Phase 3D satellite project.

So, I thought that perhaps it was time to chat about the group. Mind you, I had to do some searching for the answers too.

Fortunately, AMSAT (the parent organisation) have sites on Internet (it does have its uses), so does AMSAT-UK. Anyway, this is what I learned.

The AMSAT organisation is a world-wide group of amateur radio operators who share an active interest in building, launching and then communicating with each other through non-commercial amateur radio satellites. But you don't need to be budding satellite designers to join. Anyone who is prepared to

support the group financially to further the satellite causes is welcome.

The first satellite, OSCAR 1 was launched at the end of 1961, followed six months later by OSCAR 2. These satellites were built in people's garages and basements. They contained relatively simple beacon transmitters that used non-rechargeable batteries that meant they were only useful for a few weeks.

The early AMSAT satellites were principally launched on missions carrying weather satellites into orbit. Since that time they have shared launch vehicles with a whole host of other commercial, scientific and navigational satellites from a number of countries.

The organisation AMSAT-UK was set up in the early 1970s with just an occasional newsletter, but as time went on it got larger and demanded more time from the volunteers involved. Then in 1978, **Ron Broadbent G3AAJ** became the Honorary Secretary and started to organise the group on a more formal basis.

Ron built up the organisation in his spare time whilst he was working with Trinity House attending to the UK's lighthouses and lightships.

Then when he retired in 1985 he worked full-time for AMSAT, although how you can call the effort Ron puts into the organisation full-time I'm not sure - it ought to be called a life's work! Ron's hard work was rewarded at the beginning of 1995 when we were awarded an MBE.

So, having sung the praises of the AMSAT-UK group, what do they do. Well, they support the amateurs in the country who use or want to use the network of amateur radio satellites.

They also raise some of the funds necessary to build and launch these complex pieces of electronics. But using satellites doesn't necessarily need masses of expensive equipment.

Let's look at using OSCAR-21. You need a 430MHz s.s.b./c.w. transmitter and a 144MHz s.s.b./c.w. receiver, so a 144 and 430MHz transceiver would work just fine. Another example is satellite RS10/11 which needs a 144MHz rig and an h.f. rig.

A very unflattering description of an amateur satellite is that it's a 'flying repeater'. By that I mean you talk to it on one frequency and listen on another frequency.

The specialist bit of satellite operation centres around your antenna systems. Not only do the antennas need to have high gain, but it's preferable to have elevation as well as the usual horizontal (azimuth) control. The high gain is necessary both to project your signal to the satellite and also to make the most of the low power return signal.

Rather than recommend specific antennas here, I would recommend you read-up on the specialist literature to pick the system that will best suit your location and budget. As to antenna control, there are now many rotation and elevation systems available both new and on the second-hand market.

Of course having the kit is only part of the problem as you need to know where to find the satellite. This is one area where computing and amateur radio match together extremely well.

There are a wide selection of low cost and free programs available that will calculate the azimuth and elevation settings for all the current satellite systems. The only time that things get a bit complicated is when you want to work the fast moving Low Earth Orbiting (LEO) satellites.

Tracking LEO satellites requires computerised control of the positioning system. However, the later Phase 3 satellites move much more slowly and can be worked with manual antenna positioning.

If you are even remotely considering working through a satellite, send an s.a.e. (and 2 x 1st class stamps) to AMSAT-UK asking for their information package and application forms. Or you could send £2.50 for a recent copy of their *OSCAR News*, the AMSAT-UK magazine to AMSAT-UK, 94 Herongate Road, London E12 5EQ.

I hope you've found this month's 'Novice Natter' interesting and don't forget I'm always pleased to receive your news and 'natterings'. Send queries, questions and suggestions to the address at the top of the column. Cheerio for now.

*Elaine G4LFM*



Ron G3AAJ's hard work was rewarded at the beginning of 1995 when we were awarded an MBE.

Send your letters to Elaine Richards G4LFM, PO Box 1863, Ringwood, Hants BH24 3XD.



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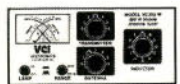


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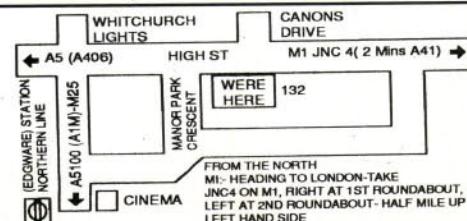
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# CLUB Spotlight

Compiled by Zoë Shortland

## Dacorum Amateur Radio Transmitting Society

The **Dacorum Amateur Radio Transmitting Society** is your local radio club and welcomes members new and old, male and female, whether licensed, interested in short wave listening or computing and electronics. The club meets two times each month at the Girl Guide Headquarters, Queensway, Hemel Hempstead, next to the British Legion.

The first meeting in the month is an informal evening and is held on the first Tuesday of the month. This is a social evening where members talk radio and computers, sort out equipment problems, etc.

The second meeting of the month is an informal evening held on the third Tuesday of the month where a lecture or a talk on radio and computing is presented to the members. From time to time, non radio related talks are also given. Liquid refreshments are available at all club meetings.

The present membership is about 50, with ages ranging from 20 to over 80. The Dacorum ARTS also have licensed members, short wave listeners and members working towards the various types of licence that are now available.

The Society provides full training for the Novice 'A' and 'B' licences, help with the 'B' licence and training for the 12w.p.m. Morse code test for the 'A' licence. The present club membership has a variety of interests and skills.

## Canadian Update

Remember reading in last month's Club Spotlight about the Canadian Amateurs? Well, Club Spotlight has recently received a FAX from **Jim Hatch G3OOL** regarding the proposed Net, and Jim says that a frequency for 3.5MHz has been found.

The Net will meet on 3.632.4 every Thursday afternoon at 1500Z. Further frequencies and meeting times will be forthcoming in the future.

These range from computing through construction to Morse code operation.

Amateur radio is a fascinating hobby, encompassing computing, long-distance communication, short wave listening, construction and operation of equipment.

The Dacorum ARTS provides an amateur radio display at the local carnival and is responsible for the marshalling of the parade using amateur equipment. The Society also helps with local scout and guide events like Jamboree On The Air (JOTA) and Thinking Day.

The annual membership fees are: Basic - £8.50, UB40 & Retired - £7.00 and Family - £12.50. This membership fee includes a copy of the Society's club magazine, *DARTS*, which is produced four times a year.

Why not pop along to one of the meetings, you'll surely be made most welcome. If you would like to know more and cannot get along to a meeting, contact either the Club Chairman, **John G0FSP** on (01442) 66789 or the Club Secretary, **Nick G7KFQ** on (01582) 620507.

## All Change At Stockport

At the **Stockport Radio Society's** AGM held on December 13, the following changes occurred. The new Hon. Sec is (once again) **Jim France G3KAF**, whose address is **34 Ladythorn Road, Bramhall SK7 2ER** and the new Chairman is **Bernard Naylor G3SHF**, and his address is **47 Chester Road, Poynton SK12 1HA**.

## Southampton Amateur Radio Club

The **Southampton Amateur Radio Club** meet every Monday

evening either at Cantell School, Violet Road, Southampton or at the QTH of **Malcom G1UWL**. Full details can be obtained from **Harold McIntyre, 42 Dunvegan Drive, Lordswood, Southampton SO16 8DD** or telephone on **(01703) 737715**. New members are always welcome.

The club hopes to run a special event station on Saturday June 29 1996 to celebrate 135 years of Lockerley Primary School. The callsign **GB2LPS** has been applied for (further details nearer the time).

## All Time High For Trowbridge

The year 1995 has seen club membership of the **Trowbridge & District Amateur Radio Club** rise to an all time high of 44. The club has also been involved with several special event stations including **GR5OS** and **GB125BRS**. The club also provided the talk-in station **GB4LR** for the 38th Longleat Mobile Rally.

Club membership has been bolstered by

candidates from last year's RAE course held at the club venue and more recently by the weekly c.w. tuition class. Throughout the year, the club has enjoyed several interesting and informative talks and social nights have been well supported.

The diary for 1996 is well in hand and topics covered will include QRP, home-brew equipment and quad antennas. It is also hoped that an RAE class will run from next September.

The current c.w. class is due to run until early February. Visitors are very welcome to attend on main meeting nights, however, there is a small charge.

The Trowbridge Club is a small and friendly group providing a focal point for the hobby, in and around the West Wiltshire area. Meetings are held at the **Southwick Village Hall, Southwick, Nr. Trowbridge, Wiltshire**. All meetings, unless otherwise stated, start at 8pm.

The Club also meets on the 3rd Wednesday of each month for an



Some of the members of the Southampton ARC taken at Cantell School just before the Christmas break.

Practical Wireless, March 1996



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

## Club Reminders

The **Wimbledon & District Amateur Radio Society** meet on the second and last Friday of each month at 7.30pm at St. Andrews Church Hall, Herbert Road, Wimbledon SW19. The first meeting of the month is a general natter night, combined with Morse practice and tuition and some h.f. 'phone operation using the club callsign G3WIM.

On February 9 there is an evening of Morse practice and h.f. operating using the club callsign and on the 23rd there is an surplus equipment sale. On March 8, again this is an evening of Morse practice and h.f. operating using the club callsign.

For further information contact the club secretary **Charles G7OYN** on **0181-679 1387** or E-mail **chasr@cix.compulink.co.uk**

Meetings are held at 7.30pm for the **Newquay & District Amateur Radio Society** at Treviglas School, Newquay, Cornwall. Membership is about 15 and the age group ranges from 12 to some retired gentlemen! and include Novices as well as Class A and B members.

There is no pre-arranged programme, but there are various evenings which include talks, demos, equipment building activities, quite a bit of nattering (an important part of any radio club!) and always coffee and biscuits! The members are also keen on contest work and participate in several contests throughout the year.

The club callsign is G4ADV and the club say they welcome any stations who hears their call. Anyone with an interest in amateur radio can visit or join the club. More information and details can be obtained from **Maggie Reed G0KEM**. Secretary, on **(01726) 882752** or via Packet BBS GB7NEQ.

The **Guildford & District Radio Society** meet on the 2nd and 4th Friday evening each month at 7.30 for 8pm in the Guildford Model Engineers Society Clubhouse, Stoke Park, Guildford, Surrey. Throughout the year, the Society try to arrange a series of interesting speakers on club nights as well as natter and construction evenings and junk and equipment sales.

The Society is active in contests such as h.f. and v.h.f. Field Days, organises d.f. hunts and has the occasional club BBQ. Visitors and new members are always welcome at the club nights and further details can be obtained from the Honorary Secretary **Michael Marshall G0RXX** on **(01932) 344351**.

The **St. Austell Amateur Radio Club** meet on the 1st and 3rd Monday of the month at the 'Skywave' premises, 47 Trevarthian Road, St. Austell, Tel: **(01726) 70220** or during term time at 'Poltair School', Trevarthian Road, St. Austell.

For more information, contact the club's Secretary, **Reg G4TRV** on **(01726) 72951**.

The **(Wigan) Douglas Valley Amateur Radio Society** have now found a permanent venue. The Society now meet on the first and third Thursday of the month at the Wigan Sea Cadet HQ Training Ship Sceptre, Brookhouse Terrace, off Warrington Lane, Wigan.

Contact **D. Snape G4GWG** on **(01942) 211397** for more details.

The **Sutton & Cheam Radio Society** meet on the 3rd Thursday of the month at 7.30 for 8pm at the Sutton United Football Club, The Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Natter nights are the 1st Thursday of each month at 8.30pm (approx) in the bar.

On February 15 there is a constructional contest and on the 18th, it is the RSGB National VHF Convention at Sandown Park, Esher. On March 2 there is an annual dinner.

Find out more by contacting the Secretary **John Puttock G0BWV** on **0181-644 9945**.

Formal meetings are held on the 1st and 3rd Fridays of each month for the **Mid Sussex Amateur Radio Society**, at Marle Place Further Education Centre, Leylands Road, Burgess Hill, which opens at 7.30 for a 7.45pm start. The Clubroom is open on all other Friday evenings for informal gatherings and natters.

Contact **Paul Everett G7SRV** (Secretary) on **(01444) 458372** for more details about the Society.

On March 14, the **Kings Lynn Amateur Radio Club** have a talk on the Nuclear Industry by a member of the Speakers Panel Service, British Nuclear Fuels, Sealfield, starting at 8pm. All are welcome. Refreshments will be available.

The location for this talk is at the Scout HQ, Chequers Lane, North Rington, Nr. Kings Lynn, Norfolk. For talk-in call on RB4, GB3KL. For more information, contact **Ian Cooper G0BMS**, Honorary Secretary, on **(01553) 765614** or @ GB7OPC Packet BBS.

## Visit From Waters & Stanton

Waters & Stanton will be visiting the **Hoddesdon Radio Club** on Thursday 29 February for the third time and all visitors will be most welcome. This is always an enjoyable evening when new products and rigs are on display.

All local clubs will be notified as usual. Further details on the club including a map and magazine can be obtained from **Don G3JNJ** on **0181-245 3678**.

informal natter/social night (except in October when it will be on the 1st Wednesday). Visitors are always welcome (fee of 50p). Access is satisfactory for disabled visitors, from the adjoining car park.

For further details, contact the Club Secretary **Ian Carter G0GRI** on **(01225) 864698** (evenings and weekends).

## Hernia Cup Competition 1996

Having won the aptly named Hernia Cup at Farnborough last year, the **Echelford Amateur Radio Society** are now arranging and hosting the competition in 1996. To those who don't know, or who have forgotten, the competition takes place annually between radio clubs in the local area and consists of a Question and Answer session between teams of up to five people. A club may field more than five, but the team will consist of the five who make the most marks.

At this early stage, the society need some idea of the number of clubs who

would like to take part this year. The proposed date is Thursday 28 March 1996 at 1930 for a 2000 start, at the location on The Community Hall, St. Martins Court, Kingston Crescent, Ashford, Middlesex. This is about a mile or so east of Staines town centre, just off the Kingston Road.

A map will be enclosed with the final details of the evening arrangements nearer the time. Tea and coffee will also be served during the evening. At this time, however, an expression of interest is all that is required.

The invitation is being sent to the following radio clubs: Bracknell, Farnborough, Guildford, Racal and Reading. If it arrives at the QTH of someone no longer an official, the society are asking for members to pass it on to the current secretary.

To find out more, contact **Pete Townshend G6PMT**, Hon. Sec. on **(01344) 843472** or write to: **48 Cabrera Avenue, Virginia Water, Surrey GU25 4HA**.

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



# The Garmin GPS 45 Personal Navigator

By Peter Barville G3XJS

*Peter Barville G3XJS tries out an interesting satellite-based navigation system. And now Peter is equipped with SatNav there should be no doubt what WAB 'square' he's in!*

An unusual and different review for me this time! So, before describing the operation of the GPS 45 Personal Navigator, it will probably be useful to offer an explanation of the satellite Global Positioning System (GPS).

As a result of difficulties experienced in the Vietnam conflict, the US military decided to develop an accurate navigational system for use by its forces. Early experiments involved a localised LORAN system, but these were not very successful.

The USA then turned to a system employing four satellites in high orbit above the earth. Although offering advantages over earth based radio systems, the satellite system still tended to be inaccurate, as positional fixes could only be obtained every two hours.

## Nav-Star System

The Nav-Star system was the next to be developed, and was operational (in a limited way) from 1986. But the small number of orbiting satellites meant that there was only three to four hours coverage per day.

Plans to increase the number of satellites were severely delayed by the Challenger Space Shuttle disaster of 1988, as the shuttle was the main launch vehicle for the satellites.

However, the present GPS system became partially operational when hostilities in the Gulf commenced in 1990. By this time a useable constellation of 21 satellites were in position, and the US Defence Department offered the system to civilian use a little later. It is this same system which we are able to use today.

There are now 24 GPS satellites. They orbit the earth twice a day, 11,000 miles above the earth, transmitting information about their precise position and elevation.

A GPS receiver (such as the GPS 45) acquires the signals from each available satellite. Next, it measures the interval between transmission and receipt of the signal, and then determines the distance between it and the satellite.

Once the receiver has calculated the data for (at least) three satellites, its location on the earth's surface can be determined. Almanac data is general information on the location (and health) of each satellite in the constellation, and can be received from any of the satellites.

A GPS receiver with a current almanac in its memory knows where in the sky to look for satellites, given its last known position, and the time of day.

## Almanac Information

When the GPS 45 is switched on for the first time, it will have no almanac information in its memory. So, it will need to discover which satellites are available, and their positions.

Signals from the satellites do not travel well through obstructions (buildings, trees, etc.). So, in order to let the GPS 45 carry out this operation, the manufacturers recommend finding a large open area with a clear view of the sky from horizon to horizon.

The manual suggests the initial acquisition period will be between seven and a half and 15 minutes, although the review model took around 20 minutes. Once this operation is completed, however, the GPS 45 (when it is next switched on) will already have a 'last known position' in its memory, and the satellite

acquisition time drops to around two minutes.

The GPS 45 is not dissimilar in size, and weight, to the average mobile phone or amateur hand-held rig. The attractive black and white case is well constructed, and should be able to withstand the rigours of outdoor life.

A carrying case is provided (with belt attachment strap) for additional protection, although it's not possible to operate the receiver whilst in the case. The unit fits easily into the hand, and the liquid crystal display (which takes up nearly half of the front panel) is easy to read. A back-light is provided for night time conditions.



*"There are now 24 GPS satellites. They orbit the earth twice a day, 11,000 miles above the earth".*



## Seven Buttons

With only seven buttons on the receiver, the front panel has a very uncluttered appearance. But don't be misled - the GPS 45 is an extremely versatile piece of equipment.

There are four main display 'pages' which can be scrolled through using the **Page** button. And a very large number of additional facilities can be accessed via the on-screen menu system.

When the GPS 45 is switched on, the **Status** page will appear. This provides a visual reference of satellite acquisition (and their position in the sky) along with signal strength bars for each.

Once sufficient signals have been acquired, the Status page will be replaced by the **Position** page. This shows not only your precise position (to within 15m!), but also your heading and speed (assuming you are moving), altitude and the exact time.

I didn't have any trips to unknown territory planned. So, I decided to take the GPS 45 for a walk around the village where I live.

The Position page provided immediate indication of my heading and speed, while the **Moving Map** page drew a graphic display of the route I was taking. Usefully, this dynamic map display is automatically updated in real time as you travel. In addition, particular locations can be marked (and named) as you reach them.

Each of the locations is called a **Waypoint**, and I chose to mark my start point, the village pond and the local pub. A potentially very valuable feature is the GPS 45's ability to provide graphic steering guidance to any of the stored Waypoints. At least I could now find my way back to the pub, or (perhaps more to the point) home again after a visit there!

## Moving Map

It's possible to zoom and pan around the Moving Map display. With 12 different map scales to choose from, the whole route can be viewed, or just a small part of it.

It was quite remarkable to see my route around the village being displayed on the receiver's screen. However, because the unit is continually plotting its position, I found it prone to short term inaccuracies, due to temporary

loss of signal from one or more of the satellites.

The problem was caused by proximity to buildings, trees, or even the screening effect of my own body. More reliable results were obtained by holding the GPS 45 away from my body, but this wasn't comfortable for long periods.

Because of the screening problems, I felt the need for a facility to be able to 'freeze' (or pause) the system. This would enable the user to study the

the receiver began losing the satellite signals.

However, it's possible to remove the small antenna from its BNC socket on the receiver and install it outside the car, fed via a length of coaxial cable. In fact, a remote antenna mount (with a small suction pad) is available at an additional cost of £41.

I've no doubt that the external antenna will provide much better results for in-car use, and (except in built-up areas) provide superb navigational information.



## Manufacturers Specifications

### Physical

Case	Waterproof, dry nitrogen-filled.
Size	150.5 x 50.1 x 10.23mm
Weight	284g with batteries
Temperature Range	-15 to 70°C

### Performance

Receiver	Differential-ready MultiTrac8
Acquisition time	Approx 20 seconds (warm) Approx 2 minutes (cold) Approx 7.5 minutes (AutoLocate)
Update Rate	1/second, continuous
Position Accuracy	15 metres RMS (*) 5-10 metres with DGPS corrections (**)
Velocity Accuracy	0.1 knot RMS steady state
Dynamics	Performs to specification to 3G

### Power supply

Input	4 AA batteries or 5-40V d.c.
Battery Life	10 hours (normal mode) Up to 20 hours (battery saver mode)

\* Subject to accuracy degradation to 100m 2DRMS under the US DOD-imposed Selective Availability Program.

\*\* With optional GARMIN GBR 21 Beacon Receiver Input.

displayed information without running the risk of screening the receiver from its satellites, and thereby producing 'false' positional data.

## In The Car

My next experiment was to take the receiver with me in the car. And in order to give it the best possible view of the sky, I put it above the dashboard, just inside the windscreen.

I expected the screening effect of the car body to prevent the GPS 45 from working too well, but to my surprise it seemed able to plot our position as I drove along. Once again, I felt that a 'system pause' would have been very useful because, as soon as I removed it from inside the windscreen to look at its display,

## Latitude And Longitude

The default setting for the positional information is latitude and longitude (degrees and minutes). You can also select degrees, minutes and seconds; degrees only; UTM co-ordinates; or British, Irish or Swiss Grid formats.

When the British Grid format is selected, the GPS 45 will show which 'Worked All Britain' (WAB) square you are in. This is ideal for mobile and portable WAB operators.

Many is the time I have been asked when mobile (even on the h.f. bands) which WAB square I was in at the time, and have had to admit that I didn't know. The GPS 45 will solve this problem

*"It was quite remarkable to see my route around the village being displayed on the receiver's screen".*

Continued on page 22



NEW

**ICOM IC-736. SAVE £300!** Now that the six metre "season" is with us, why not treat yourself to a new 100w HF Transceiver, 100w 6M transceiver, PSU & auto ATU?  
RRP: £1969. ML Price: £1679. DEPOSIT FROM ONLY £279!



**ICOM IC-706. SAVE £150!** If your not lucky enough to win my donated one to the RSGB, then the next best thing is to buy one cheap cheap!  
RRP: £1199. ML PRICE: £1049. DEPOSIT FROM ONLY £99!

**ICOM IC-775DSP. SAVE £600!** The only new 200 watt design from the top three Jap manufacturers in the last twelve months. Add DSP and you'll hear them as well as they hear you!  
RRP: £3699. ML PRICE: £3099. DEPOSIT FROM ONLY £399!



**ICOM IC-2350H. SAVE £120!** One of the best selling dual band mobiles during 1995. Fifty watts on 2M and thirty five on 70cm, you can't afford to miss this bargain!  
RRP: £649. ML Price: £529. DEPOSIT FROM ONLY £59!

**KENWOOD AT-850. SAVE £30!** An internal auto tuner for the TS-850. If you purchased your rig without the ATU because of the price, then our bargain offer is a must!  
RRP: £149.95. ML Price: £119. THATS LESS THAN TRADE!

**YAESU FT-900AT. SAVE £500!** A full size HF base station performer in a small compact package! 100 watts with most of the facilities of its "big brothers"  
RRP: £1649. ML Price: £1149. DEPOSIT FROM ONLY £199!

**YAESU FT-290RMK2. SAVE £100!** The only 2.5 watt 2M multimode transportable available. Special offer for those who want it with or without the matching 25 Watt linear amp!  
RRP: £599. ML Price: £499. Matching FL2025 25W linear  
RRP: £159. ML Price: £129.

**YAESU FT-736R. SAVE £500!** At nearly £2000 list, sales have slowed down. Not at the Lynch's stable however. We've still got old priced stock at loads a money off list!  
RRP: £1999. ML Price: £1499. Add a SIX metre card for only £259! (Whilst stocks last).

**THE YAESU FT-840 "STATION". SAVE £200!** Getting back into the hobby, or wanting to clear out your old gear and trade up for new? How about this little package.

Yaesu FT-840 (RRP £959)  
Watson W-20 PSU (RRP £89)  
1/2 size G5RV (RRP £22)  
VCI 300M ATU (RRP £119)  
Coax, plugs (RRP £15)

OVER £1200 WORTH, ALL FOR ONLY £999. DEPOSITS FROM ONLY £109

**YAESU FT-23R. SAVE £59!** Engineered like no other 2m handie available today, the FT-23R will form the basis of a sturdy "commercial grade" transceiver for many years of operation.  
RRP: £259. ML Price: £199.95 incl. Nicads & Charger.

**YAESU FT-51R. SAVE £100!** Complete with nicads and charger, offered with CTCSS included, this dualband handie is a real winner.  
RRP: £529. ML price: £429. DEPOSIT FROM ONLY £49.

**YAESU FT-1000. SAVE £1100!** Down to the last few at a massive slice off the RRP. 200 watts and the only transceiver available with two fully independent receivers. (when fitted with the BPF-1)  
RRP: £3999. ML price: £2899. BRAND NEW & BOXED.

**YAESU FT-1000MP. SAVE £420!** The latest offering from the Yaesu camp. "EDSP", built in PSU & the advantage of Collins filters.  
RRP: £2899. ML Price: £2479. DEPOSIT FROM ONLY £479!

**YAESU FT-990AC. SAVE £668!** Place an order for this 100 watt HF Base Station complete with Auto ATU, Internal PSU and Digital filtering and Yaesu will throw in two optional filters, FREE of Charge! But hurry - offer ends mid March!  
RRP: £2567. ML Price: £1899. DEPOSIT FROM £399 WITH FREE FILTERS!



**AEA DSP-232 \*NEW\***

The latest all mode DSP driven TNC from AEA. 9600 & 1200 Packet. All standard HF & VHF modes, two switchable radio ports, plus more.



**SPECIAL INTRO PRICE: £479.95**

AEA PK-96 9600 baud packet controller. £219.95  
AEA PK-12 The best selling low cost starter TNC. £129.95  
AEA PK-232 MBX Bench mark in all mode Data TNC's. £319.95  
AEA PK-900 Commercial grade all mode TNC. £479.95

**Alinco DJ-G5. SAVE £100!**

Dual band handie, nice big display & a favourite of Graeme, G4XOF. "The best fun I've had with my trousers on for a long time!"  
RRP: £489 ML Price: £389. DEPOSIT FROM ONLY £49!



**ALINCO DR-610. SAVE £70!** 50 watts on 2 & 35 on 70, a massive 120 memories, AM/FM wideband receive and its reduced in price!  
RRP: £649. ML price: £579. DEPOSIT FROM ONLY £79!



**ALINCO DJ-191 SAVE £20!**

Massive display and a delight to use, the new DJ-191 is out selling the rest!  
RRP: £249.95 ML price: £229.95  
Monthly payments from only £18.50

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**WATSON W-20AM**



A fully metered 20-25 amp PSU for £89.95.

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W-285 2m, 5/8th, 3.4dB, 200W. £15.95

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**Hatch/Trunk Mount W-3HM. £14.95**



**W-3CK 5M Cable kit. £18.95**

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**Fittings.** These fibre glass aerials are pre-tuned for optimum UK coverage. Just attach to any convenient support and feed with 500hm cable terminated in PL-259. Great DX performers.



W-30 2m/70cm, 3/5dB, 1.15m. £39.95  
W-50 2m/70cm, 4.5/7 2dB, 1.8m. £39.95  
W-300 2m/70cm, 6.5/9dB, 3.1m. £39.95

**ADI AR-146**

First viewed at the Lynch's Open Day, the AR-146 is a real low cost FM mobile for 2 metres. Styled rather surprisingly on another main manufacturer's transceiver, this new offering from Taiwan is a 50 Watt 130-170MHz unit offered at a ridiculously low price. But who's complaining?  
RRP £269. Deposit £49, 12 payments of only £18.33, interest free ZERO APR.



**ADI AT-200**

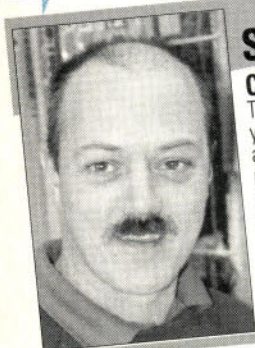
Simple to use 2M handie at a very affordable price. Keypad entry, 130-170MHz coverage all for only £164.95. (supplied with empty cell case, nicads and charger are available for £29.95 extra)



**ADI AT-400**

Identical to that of the 2m version, the AT-400 covers 420 465MHz and operates on 70cm.

Priced at £189.95 supplied with empty cell case.



**SpotLight on Staff**

**Chris Taylor GOWTZ (ex-G1FMH)**

This months feature is on Chris Taylor, Sales Manager. Chris has been with me almost four years and is responsible for costing all the trade-ins, looking after the rest of the sales team and anything else I can sling at him. When he joined, he had long thick flowing hair down to his navel, but such is the pressure to ensure customers always get the best deal on new and used equipment, the top of his head at least, has suffered. Probably where he keeps smacking his forehead when saying "you want to pay HOW MUCH?!"

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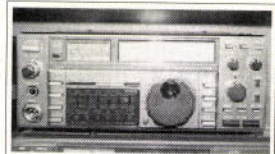
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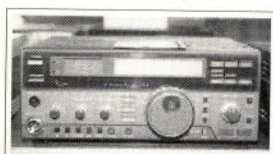
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**ICOM IC-735** 100W HF Transceiver. The benchmark for 7 years. Eight examples to choose from. **From only £629.**



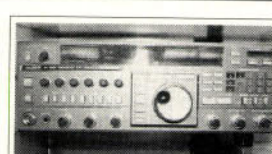
**KENWOOD TS-140S** 100W HF Transceiver. Simple to use no frills fun on the Amateur Bands. **From only £629.**



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**YAESU FT-767GX** 100W HF/10W VHF Transceiver. The only HF base to accept 2/6/70 modules. **Four to choose £899.**



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**ICOM IC-765** 100W HF Base with Int. PSU + ATU. As brand new. 1 owner **£1495.**



**ICOM IC-707.** One owner machine as new in its box. 100 watt HF transceiver. **Only £599.**



**KENWOOD AT-230** 200W Antenna Tuner. 160-10M, 200W with 3 way coax switch & SWR/Pwr Meter. **Excellent cond' £159.**



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**TRIO KENWOOD TS-830S.** If you don't mind PA valve's, then this excellent example is ideal for getting on the H.F. bands with 100 watts. **Only £495.**



**YAESU FT-690R MK11.** 6M transportable all mode. Used example, as new with box & packing. **Only £369.**



**YAESU FT-290RMK11** 2.5W 2M portable. Always a large selection, an ideal all mode "starter" rig. **From £349.**



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**KENWOOD TS-950SDX.** 150 watt, dual RX, DSP etc. This 1 owner is virtually unused. Offered with 15 month warranty. **Only £2295.**



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Introduced in December 1995, this new service is a first for Amateur Radio. Unlike other ordinary Fax Back services offered in the past, the system in operation at the London Showroom actually allows YOU to choose what information you require. For example, if you want to see the latest used equipment list, dial the FAXBAK number, hit key 1, then 11 and a complete listing will be sent. For a brochure on new items, key 2 then the MODEL NUMBER required, (i.e., for details on the IC-735, key "735"), and so on. You can also retrieve our latest newsletter, (key 5 then "5" again), new Equipment prices key 3 and so on. Its a first once again, from MARTIN LYNCH!

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**YAESU FL-7000.** At £2400 these are very expensive. This one is very clean, produces over 500 watts out on all HF bands & a- includes an Auto ATU. **Only £1395.**



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## MORSE TESTS ON DEMAND

Due to the enormous success during the OPEN DAY of Morse Tests being taken without the requirement of "pre-booking", for a trial period, the facility for sitting the test will be available for three months at the London Showroom. Starting in February 1996 through to April, the tests will take place on the first and second Saturday of each month, between 10:00 and 14:00 hrs. For those wishing to take the 12WPM Morse test, please ensure that you arrive with two passport photographs and the £18 administration fee.

FOR FURTHER DETAILS, CALL STEVE JELLY ON 0181-566 1120



# Garmin GPS 45 Personal Navigator

Continued from page 19

for you, but do **NOT** try to watch its display whilst driving. If you have a passenger with you, I suggest they do the navigating!

The receiver is (normally) powered by 4 AA alkaline batteries, and the Status page gives a very good (bar graph) indication of their state. Although NiCads may be used, the bar graph calibration is only correct for alkaline batteries. The optional Power/Data Cable allows connection to an external supply of between 5 and 40V.

## Extremely Sophisticated

The facilities offered by this extremely sophisticated receiver are too numerous to describe here. Many of them are perhaps of more relevance to marine applications than to amateur radio.

However, it's worth mentioning a few of the facilities, because I'm quite sure the GPS 45 will find its way onto many an amateur's list of essential equipment.

For example, Waypoints (up to 250 can be stored and used) may be entered by taking an instant electronic fix. They can be manually set by entering their co-ordinates, or even by entering the range and bearing from an existing Waypoint. The **GOTO** function guides you to any of them, and gives a 'roadway' graphic display as you go.

In fact, the roadway display is quite fun to use, and not unlike playing a computer game. A slow 180° turn results in the roadway rotating within the receiver's display (almost makes you feel sea-sick!), but there is no confusion as to which way to travel as there is always an arrow clearly indicating the correct direction.

Additionally, you're also given the distance from destination and the correct heading, plus your current heading and speed. As you approach the destination, a 'finish line' appears in the

roadway, and you are given an audible and visual alert as you approach even closer. You can plot a route from one place to another using a set of pre-defined Waypoints, and see your actual position in relation to each of them as you travel. A computer interface is available, which (with the optional PC kit) allows you to save details of routes, Waypoints etc to and from a PC.

The GPS 45 will let you optimise its display to your own requirements, and is a very user-friendly piece of equipment. There's no doubt that its navigational versatility is quite astounding, and the technology has clearly derived enormous benefit from the receiver's military origins.

In order to ensure optimum performance, it's necessary to give the receiver an uncluttered view of the sky. This may mean using the detachable antenna mounted (for example) on the roof of a car, or boat.

The GPS 45 may not function well within a built-up area. But then I don't suppose you would need a satellite Global Positioning System to find your way around town!

## Precise Location

I imagine the ability to be able to determine your position with pin-point accuracy, or follow a course to a pre-determined and precise location will be regarded as an invaluable asset by those setting up DXpeditions to the more remote spots. Indeed, perhaps such navigational aids should be

After seeing a copy of G3XJS's review, Richard McLachlan of Lowe Electronics sent us the following comments:

Thanks for letting me add a couple of comments to the very comprehensive review by Peter Barville G3XJS.

We have been selling the GPS 45 for around five months now, and we have found that one of the most popular Amateur Radio applications that customers have asked about is using their GPS together with a packet TNC for automatic position reporting over a v.h.f. radio link. The GPS 45 provides position data in NMEA format from its serial port that can be connected to any GPS compatible TNC, such as the latest version of the Kantronics KPC3.

If this is hooked up to a portable transceiver, it will beacon its location every 30 seconds back to a control point, where position can be displayed on a PC using the Automatic Position Reporting Software (APRS), which is freely available on the Internet. The end effect is very like the aircraft plotting tables seen in wartime films, with a number of annotated targets moving in real time on a map display. This feature has obvious applications for RAYNET use, where, for example, ambulance and rescue vehicle positions can be displayed automatically.

You can also upload and download lists of waypoints and track information etc, via the data port on the GPS 45 to an external computer. This is done using the optional Garmin PC interface cable and software control package.

**Richard McLachlan G3OQR**

an essential piece of safety equipment.

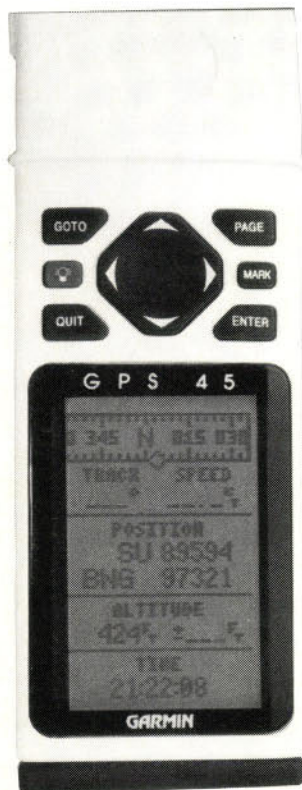
Keen WAB operators, needing to know quickly and easily which square they are in, will certainly find the GPS 45 helpful. And the altitude indication will be useful to v.h.f. and u.h.f. operators considering portable locations.

The price of this advanced technology has fallen dramatically in recent years. So, if you need to know where you are, or where you're going - the GPS 45 price of under £300 must represent good value for money.

All I need to do now is to find my way to the PW office to return the GPS 45. It's a pity, but I can't claim I lost my way and couldn't return this fascinating piece of equipment!

My thanks go to Lowe Electronics Ltd, Chesterfield Road, Matlock, Derbyshire DE4 5LE. Tel: (01629) 580800, FAX: (01629) 580020 for the loan of the review GPS 45. It's available from them at £289 plus £10 P&P next day delivery.

PW



Close up view of an example of the data displayed on the



# Power From The Sun

By Ben Nock G4BXD

*Ben Nock G4BXD is banking on another sunny summer over in Kidderminster this year! Ever on the look out for a bargain, he's developed a sun-powered battery charging unit using a budget-priced solar panel.*

Heading Photograph: The solar panel and associated regulator unit connected to an Icom 144MHz hand-held transceiver.

Fig. 1: Diagram showing solar panel connections and associated constant current regulator. The alternative circuit using a 50Ω potentiometer arrangement is shown inset above the main circuit (see text).

Given the falling price of solar panels these days a thought crossed my mind that one might be worthwhile as a simple charger. After all, at the moment the sunlight seems to be the only free thing left!

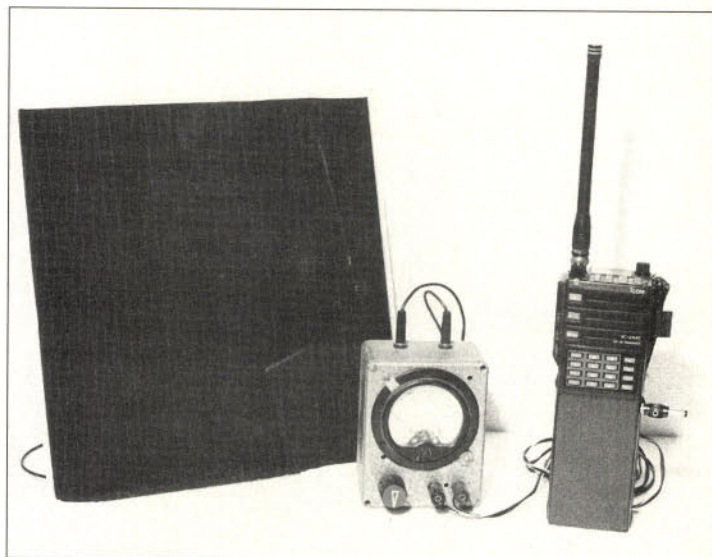
With free power in mind I'm going to describe a simple solar-powered charger. The project, shown in the heading photograph, is suitable for charging hand-held transceiver batteries, flashguns, just about anything that needs 12V or less at several hundred milliamps.

The solar panel I bought measures approximately 305 by 305mm, and cost about £12. The panel is not very thick but rigid enough to be free standing.

The current regulator used in conjunction with the panel is fitted in a small box. I used a meter as an indicator to set the current but a switched resistor or a suitable scale around the potentiometer would have done.

My solar panel provided over 20V d.c. (no load) in full, bright sunlight. On load, with full sunlight the panel would supply 12V at 250mA, more than enough for most NiCad batteries.

As a four panel unit, only 610 x 610mm square, would supply 1A, I had a brainwave. How about fitting the entire roof with them? It was only the intervention of 'she' who must be obeyed that stopped the idea!



## Constant Current

A simple constant current regulator is used in the project because I've assumed that most of the devices to be charged will contain NiCad cells. The regulator built using the L200 regulator i.e., available for under £2 from most suppliers.

A constant voltage circuit could also be used but seemed less useful. The circuit diagram is shown in Fig. 1, and the L200 pin-out configuration in Fig. 2.

Construction is straightforward enough and can be housed in either a metal or plastic box. If you decide to use a meter, then the regulating components can be hung off the meter terminals. The regulator i.e. itself can be bolted to the box if it's a metal type metal, otherwise a small heatsink can be fitted.

I used 4mm sockets for the panel connections and 4mm terminal posts for the regulated output. The choice of plugs and sockets is very much up to the constructor.

In my prototype I used one of those flying leads with a 4-way multi-type plug on the end which I found useful in fitting hand-helds, flashguns and the like. I could even run a small transistor portable off the charger (only during the day of course!).

If a meter is fitted then the current determining resistor can be a variable. In this case the potentiometer would simply be adjusted to give the required current reading on the meter.

## Current Settings

If a switch is used, a four-way single-pole switch would allow the selection of four different current settings. For example they could include: 11, 18, 45 and 150mA, to suit AAA, PP3, AA and C/D cells respectively.

The four fixed resistors I've shown in the circuit diagram are the calculated values. In practice you'll have to use the nearest standard value or make up a closer value from several resistors.

The value of the required resistor is found by dividing 0.45 by the required current in amps. This calculation gives the resistance value in ohms.

## In Use

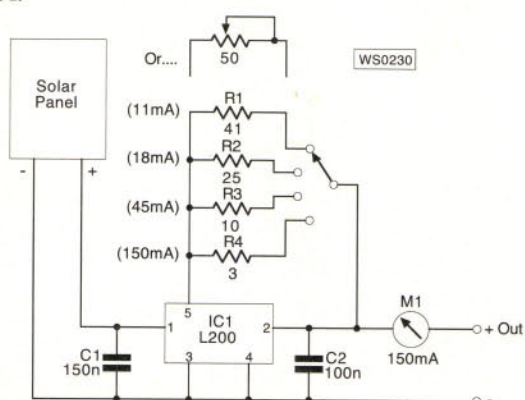
In use, I placed the solar panel in the sloping window of my attic workshop. As luck would have it the window faced just west of south, so it received sunlight for most of the day.

I did have some thoughts about using small motors to step the panel around so as to follow the sun. This idea is still being worked on and might form the basis of a future article.

During normal daylight alone, the charger would happily sit there all day and charge one or two AA NiCad cells in series. This is handy for maintaining a battery backup for equipment.

In bright sunlight I used the

Fig. 1.





charger on my big press flashgun. Its 6V battery will quite happily take 150 to 200mA while charging. And even in the winter the local watery Worcestershire sunlight proved the unit will charge a couple of AA cells in series.

## Handy On Holiday

I would imagine that the panel and charger would be handy if you're going away on holiday to sunny climes. Leave the panel on the balcony and radio batteries,

flashguns, hand-helds, etc., could all be charged during the sun-filled day while you're on the beach.

You could come back to fully charged batteries. They would be ready for that night's party pictures or evening QSO!

I suggest that you obtain a small stout

carrying case, something that would not get bent easily (a briefcase perhaps). This could be used to transport the panel, the regulator simply sitting in the case.

I hope you find the unit useful, I have had mine charging away for quite a while now and am fully convinced it has paid for itself already. It's not often you can get something for nothing!

PW

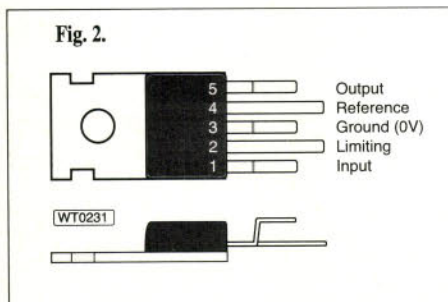


Fig. 2: Pin-out configuration of IC1.

# Errors & Updates

## *PW Helta An Experimental Loop Antenna, pages 39 - 41 PW February 1996*

Further to the PW Helta Loop Antenna in the February issue of *PW*, Richard Marris G2BZQ asked us to emphasise that the wire used to wind coils L1 to L5 should be at least a 6A type. Any wire thinner than this will probably result in a dismal failure.

On the prototype Richard used a 26/0.2mm 6A rated pvc covered wire with an overall diameter of 2.05mm. This is available from most large suppliers. He also mentioned that he used only two metres of RG58 cable to connect to his transceiver.

One value, left off both the diagram and the shopping list, is that for capacitor C2. This item should be a 1000pF (1nF) silver mica type.

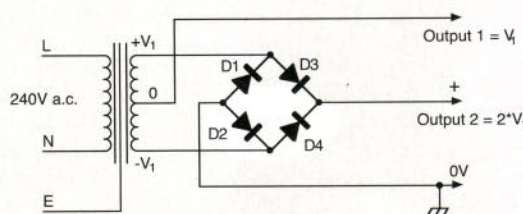
*My apologies for these errors. Editor*

## *Harding's Home-Brew, pages 36 - 38 PW December 1995*

In the circuit diagram of the 'two rail' power supply shown in **Fig. 1** on page 36 of the December issue of *PW* an unfortunate error crept in. The two diodes D2 and D4 were both shown with the wrong orientation.

Refer to the corrected new circuit diagram shown here. The cathodes of D3 and D4 should point towards Output 2. The other two diodes, D1 and D2, should have their anodes pointing towards the 0V rail.

*My apologies for these errors. Editor*





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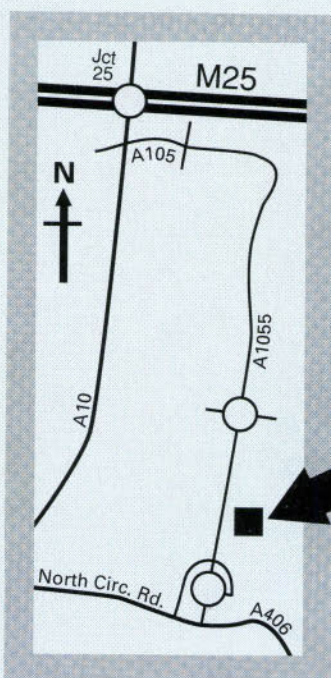
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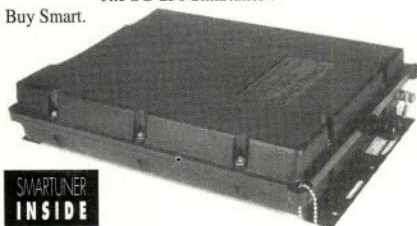
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# The Short Twenty

By Frank Lee G3YCC

**Frank Lee G3YCC describes an inductively loaded, shortened dipole system he uses for successful DX operations on 14MHz.**

The antenna I'm describing is an inductively loaded dipole for the 14MHz band. It may be found to be useful for amateurs with limited space and for taking on holiday!

The first time I came upon the idea for this antenna was in an article in *Amateur Radio Techniques*, by Pat Hawker G3VA, published by the RSGB. (It's in Edition 5).

To build the antenna I used readily available aluminium tubing. It only needed a handful of extra hardware.

The original article used coils of 63.5mm diameter. This makes construction difficult, so I modified the idea by using a much smaller diameter pvc tube (or dowelling), which also joins the two halves of each element. The dimensions for the 'Short Twenty' dipole are in **Fig. 1** and construction methods are illustrated in the photographs.

## Aluminium Tube

I bought six pieces of aluminium tube to build my prototype. Four were 1067mm long sections of 25mm outside diameter and two 610mm lengths of 22mm outside diameter. (These were the only two available from my local supplier that are a sliding fit).

Two 305mm long off-cuts of 22mm pvc pipe were available, which is a reasonable fit in the larger tube. This is strengthened by inserting pieces of hard wood dowels and they're used to join the



Photograph showing loading coil detail (see text).

two halves of the larger tubing as illustrated. (They also act as a former for the two small loading coils).

To ensure a good fit, the pvc tubing is wrapped with a couple of layers of adhesive tape. The free ends of the larger tubes have three saw cuts in them and a hose clip is used to secure the sliding inner tube when tuning the antenna.

## Centre Piece

The centre piece of the dipole in my prototype was made from a defunct nylon chopping board, which was approximately 255mm square and 6mm or so thick. (Any strong insulated material could be employed here, possibly marine quality plywood treated with polyurethane yacht varnish).

The dipole elements are secure to the centre plate by suitable car exhaust clamps. Another piece of 22mm pvc tubing strengthened as above with dowel (approximately 152mm long) is inserted into the elements at the centre to help with rigidity.

Again, to ensure a good fit, a couple of layers of adhesive tape is applied. I used self-tapping screws to secure the aluminium tubing to the pvc joining sections at the centre and at the location of the loading coils.

## Loading Coils

The loading coils were wound using 18 turns of plastic coated single strand wire. I secured the ends under the self-tapping screws with suitable washers.

I then used pvc tape to cover the coils to prevent the turns moving. (When the antenna is finished, the coils and their associated fastening

screws I suggest you cover them with heat-shrink tubing).

## Coaxial Cable

The coaxial cable connection is achieved by using crimp-on connectors, which are available from the local motorist's accessory shop. They're fixed under suitable washers and screws at the centre of the dipole as can be seen from the photographs.

I treated the end of the coaxial cable with a coat of 'Waxoyl' to prevent the entry of water. The various screws and fasteners were similarly treated.

The method I've used has proved to be an effective way to waterproof antennas and coaxial cable joints. The ends of the thinner tubing can be sealed with an insert of dowelling, dipped in polyurethane varnish.

Finally, the dipole is fastened to the mast support using suitable sized U-bolts to suit the mast diameter. The two U-bolts pass through the nylon centre as illustrated in the diagram.

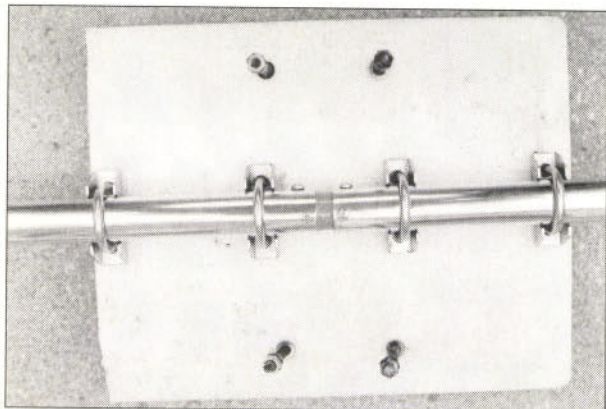
## Tuning The Antenna

Tuning the antenna is simple. However, it should be done with the dipole in the clear, **preferably** in its final position.

In my case, the tuning-up was done with the help of an MFJ Antenna Analyser. But it can be done satisfactorily using rig on low power and s.w.r. bridge, adjusting the end tubes a little at a time for minimum reflected power.

If the dipole is initially tuned near the ground, it will need to be readjusted when raised to its final position. This will be to compensate for effect of the ground.

The G3YCC prototype antenna used a Nylon kitchen chopping board as dipole centre piece (see text for alternatives).





With my prototype antenna, initial tuning was done at a height of approximately 2m and resonance was easily obtained. At this point though, I decided to wait until the next day before finally attaching the dipole to the crank-up mast (it was getting dark!).

### Rig Connected

However, my MFJ-9420 QRP rig was connected up to the antenna in the shack and signals were being received quite well. But surely it would be no use trying to transmit using the dipole at 2m above ground, or would it?

A strong CQ came thundering through from S59DBC in Slovenia, so why not try? The station came straight back to my QRP call with a

59 report! So, if it works at 2m above ground....it should be useful at 10m, at the top of a mast!

The next day, with the 'Short Twenty' at the top of the mast, I worked several stations at good strength with the QRP rig. The only one of note was VL1F, a special event station on Cape Breton Island (IOTA NA10) who I managed to work with the 10W through a pile-up with a RST of 599. A good test for my antenna

I also worked many European stations with good results. And after the successful results my initial impressions are that this loaded dipole will be a useful antenna, especially where space is at a premium.

PW

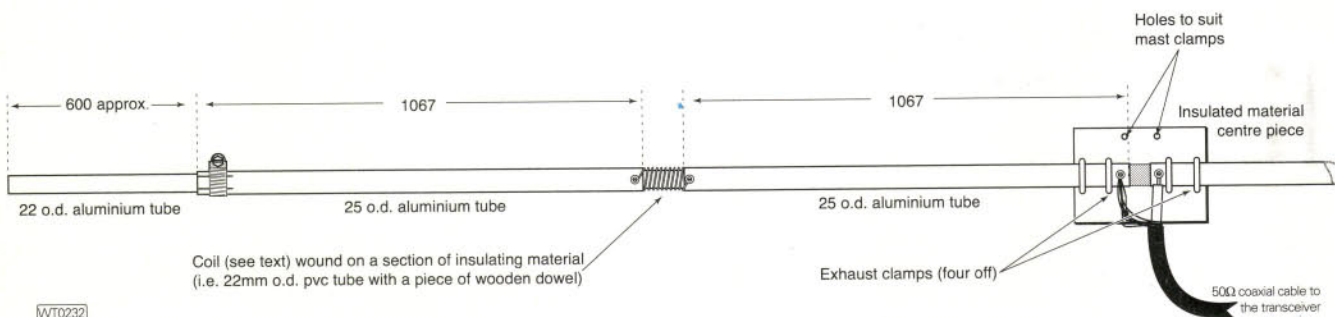
### Shopping List

You need some 22mm outside diameter (OD) 18 gauge seam-welded aluminium tube (two lengths, 610mm long. You also require some 25mm OD 18 gauge seam welded aluminium tube: four lengths 1067mm long. 22mm pvc plumber's tubing Insulating material for dipole centre, approximately 255mm square and 6mm thick (see text). Two hose clamps and four exhaust clamps. Self tapping screws, suitable washers, pvc tape, plastic covered wire, U-bolts, etc.



Fig.1: Diagram showing (one side only) constructional information for G3YCC's inductively shortened dipole antenna for 14MHz (see text). The antenna is fed using 50Ω coaxial cable.

Fig.1



## 1996

**February 11:** The Northern Cross Rally is to be held at a new and better venue, the Thornes Park Athletics Stadium, Wakefield, just out of town on the Horbury Road. Easy access from M1 junc. 39 & 40 - well signposted and with a talk-in on 144 and 430MHz. Doors open at 11am (10.30am for disabled visitors and Bring & Buy). Details from **Dave G0FLX** on 0113-238 3622.

**February 17:** Computer Fair's (Northern) computer/rally fair and games fair is to be held at the G. H. Carnall Leisure Centre, Lostock Road, Davyhulme, Manchester, immediately at J4 off the M63 motorway. Doors open 10am to 3pm. The show is open to traders of both computer and radio backgrounds alike. There is easy access for disabled visitors and a massive free car park, cafe and bar. Admission is £1.50 for adults, first 400 + free £2.25 mag or CD. 0161-627 2502.

**February 24:** The Rainham Radio Rally is to be held at the Rainham School for Girls, Derwent Way, Rainham, Gillingham, Kent. Talk-in on S22 by GB4RRR. Doors open at 10am to 3.30pm. Disabled and wheelchair users from 9.30am. Admission is only £1.50, under 14s, free. There will be the usual mix of trade stands, Bring & Buy, many special interest groups, etc. There's plenty of off road parking, a licensed bar, food and refreshments available with an area to sit and eat and watch the world go by. Further details from **Martin G7JBO** on (01634) 365980.

**February 25:** The Barry Amateur Radio Society are holding their annual Radio and Computer Rally at the Barry Leisure Centre, Barry. Doors open at 10.30am (10am for disabled visitors). More information can be obtained from **Brian Brown GW0PUP** on (01222) 832253.

**March 2:** The 3rd West Wales Amateur Radio and Computer Rally is being held at a new venue - the Penparcau School, Aberystwyth, near new Safeways complex. Doors open at 11am and there is ample free car

## RADIO

Compiled by Zoe Shortland

parking. Easy access all on one level. Snack bar. Admission is £1. There will be trade stalls, special interest groups, Bring & Buy, Repeater Groups, DX Cluster Group, Computers, Demonstrations, h.f. & v.h.f. stations on the air, Packet radio and lots more the radio amateur and computer hobbyist. Talk-in on S22. Best in the West. Details or trade enquiries from **Katy GW0SFO, QTHR** on (01545) 580675.

**\*March 9/10:** The London Amateur Radio & Computer Show is to be held at the Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London N9. Doors open 10am to 5pm each day. There will be trade shows, lectures, a Bring & Buy, on-demand Morse tests (two photos needed), talk-in on 144 and 430MHz disabled facilities, priority admission for disabled visitors, bars, restaurants and ample free parking. **Steve White G3ZVW** on 0181-882 5125.

**March 10:** Wythall Radio Club will be holding their annual radio rally at Wythall Park, Silver Street, Wythall (near Birmingham on the A435, two miles from junction 3 on the M42). Doors open 10.30am to 4pm. There will be all the usual traders in three halls and a marquee. Bar and refreshment facilities will be available. In addition there will be a Bring & Buy stall run by the club. Talk-in on S22. Admission only £1. **Chris G0EYO** on 0121-430 7267.

**March 17:** The largest single day amateur radio rally in the UK - the Norbreck Radio, Electronics and Computing Exhibition by the Northern Amateur Radio Societies Association at the Norbreck Castle Hotel Exhibition Centre,

Queens Promenade, North Shore, Blackpool. Doors open at 11am (10.45am for disabled visitors). Over 100 trade stands, Bring & Buy stand, RSGB stand and book stall, club stands, amateur computer stands, construction competition, free car parking, free shuttle bus from car park, wheelchair access to all stands, radio talk-in on S22. Admission is £2, OAPs £1 and under 14s free. More information obtained from **Peter Denton G6CGF** on 0151-630 5790.

**March 24:** Bournemouth Radio Society's 9th Annual Sale will be held at Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth. Doors open at 10.30am until 4.30pm. Talk-in from G1BRS on 2m S22. Amateur radio, computer traders, clubs and specialised groups. Excellent refreshments. Admission £1. Details from **Malcolm G0UCX, QTHR** on (01252) 845900.

**March 24:** Pontefract & District Amateur Radio Society Annual Radio Rally & Components Fair. Details from **Colin Wilkinson G0NQE** on (01977) 677006.

**March 31:** Thames Valley Electronics Rally is to be held at Kempton Park Racecourse, Staines Road East, Sunbury On Thames, Middlesex. Doors open 10.30am to 4.30pm. There will be refreshments and a bar available. Admission is £1.50 for adults, OAPs £1 and children up to 14 years old free. The entire event is on one level. There will be retailers, accessory suppliers, antenna suppliers, a Bring & Buy stall, etc. More information can be obtained from **HD Promotions** on (0494) 450504.

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.

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Editor





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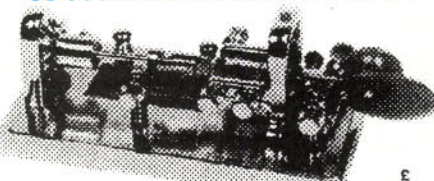
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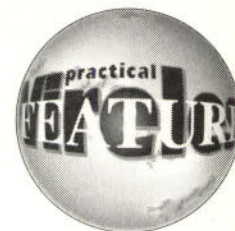
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73 from Dave G4KQH, Technical Manager.



# Lucky Lutterot



By Jan Lutterot GOLUT

**Former Marine Radio Officer Jan Lutterot GOLUT (ex PAOLUT) modestly reflects on the unsung heroism displayed by merchant seamen who served on oil tankers during the Second World War. We owe much to this modest man and his compatriots, many of who did not survive.**

Jan Lutterot GOLUT and his wife Gabby photographed taking delivery of Jan's SG-2000 prize transceiver in the PW office.



I had always thought that I had used up my quota of luck during the Second World War, when, as a deepsea 'sparks', I had several narrow escapes.

I think the nearest I came to death was on the ocean going tanker on which I served as Chief Radio Officer (CRO). It received a direct hit on the bridge and radio room instantly killing everyone, but me.

As luck would have it, I had just come off watch and was having a chat with the second Officer, who had just started his midnight to four o'clock stretch. I was sitting on the bridge railing when we heard a 'plane approach.

## **Prepare For Action**

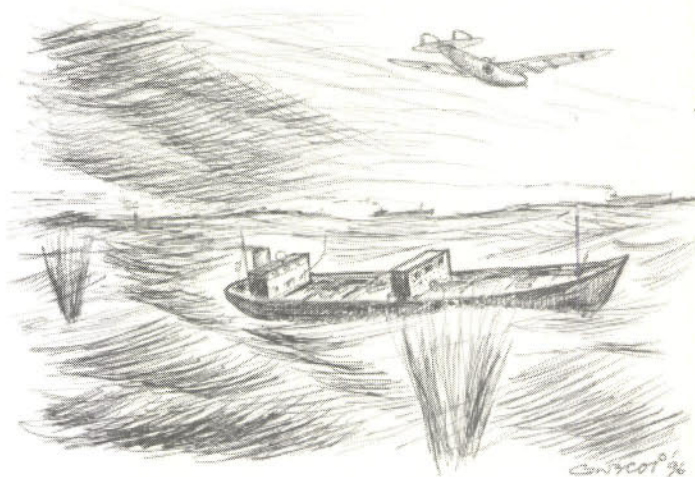
The second Officer told the guncrew to prepare for action, but one of the gunners replied: "One of ours, Sir"! Those were his last words, as at that moment the bomb hit us and the blast of the explosion blew me backwards from my perch and I landed in the midship's lifeboat, not knowing what had happened, but still alive and well.

However, the young 18 year-old third Radio Officer, who had been on board less than week, and was making his first trip, was not so lucky. I can still picture him, coming on board in his new uniform and carrying a battered old suitcase. His war did not last very long.

## **Radio Holland**

And looking back to December 1939, I must have been very lucky when Radio Holland called me back from leave to sign-on as Second Radio Officer. It was to be on a passenger liner, bound for the Dutch East Indies.

However, my train was late and when I arrived at the Radio Holland offices



**"I must honestly say that first of all I did not fancy living on top of a volcano. But my luck held out and I lived to tell the tale, while very few of my friends from 'The class of 1938' survived".**

in Amsterdam, I was told that an old classmate had 'pipped me to the post'. Instead I was sent to a small freighter going to the West Indies.

To be quite honest, I did not feel so lucky then. But I later heard that as soon as he arrived in Batavia, my friend was 'collared' by the military. He was later captured and spent the rest of the war in a Japanese prison camp near Nagasaki.

## **West Indies**

I spent some time in the West Indies on board the freighter until May 1940, when in Curacao, I signed on as Chief Radio Officer on a small passenger liner. It was busily trading between the Dutch West Indies, South and Central America and the USA.

The previous CRO had been interned in Curacao as he belonged to the Dutch Nazi party. And we were now officially at war, although on board our ship, you would not have noticed it. We were still painted in the normal peacetime colours and at night we showed every light possible!

The full illumination was done for our US and South American passengers, whose countries were still neutral and expected 'cruising standards'. And so, while all around us 'blacked-out' ships were being torpedoed, we sailed through it all unscathed. The ship survived the war!

After a year of cruising, I left the

ship in Curacao and was sent to a large ocean-going tanker. I spent the rest of the war and indeed the rest of my life at sea on aviation fuel tankers.

I must honestly say that first of all I didn't fancy living on top of a volcano. But my luck held out and I lived to tell the tale, while very few of my friends from 'The class of 1938' survived.

## **Entered Every Contest**

After retiring from the sea in the mid-1950s, I entered every radio related contest imaginable, but always without success. So, when I received a letter from the Editor of PW telling me that I had won first prize in the October to December Special Competition in 1993 to win an SG-2000 transceiver. I just could not believe my eyes. I thought that some friends were playing a trick on me!

But the day came that my wife Gabby and I were invited to the PW Editorial Offices to meet the staff, have lunch and receive my prize. Well, I can honestly say that PW did us proud and it was an unforgettable, interesting day.

As soon as we were back home that evening, I started working my way through the 200 pages of the manual, which proved to be quite a job. But at last, the long awaited time arrived that I was ready to 'have a go' on the air.

Continued on page 33



# Wooden Wonder For Two

By Maurice Schofield G4WUP

**Maurice Schofield G4WUP shows you how to 'grow your own' half-over-half wave collinear for use on 144MHz.**

When I thought of designing this antenna, I approached the job with cheapness combined with functionality in mind. So, not only is this a cheap antenna, but the experience in making and getting it to work is very valid.

The antenna support consists of two pieces of dowelling available most d.i.y. stores. It consists of one base section 420mm long section of 22mm diameter. The top section is a piece of dowel 12mm diameter some 820mm long

The wire used for the windings can be enamelled copper wire, or it may be recovered from old household wiring. A length of high current cable stripped will provide suitable wire of at least 1mm diameter. But wherever you get the wire from, it must be approx 4.3m long.

Have a look at the drawing in **Fig. 1**. The lower helical section is wound up to the phasing coil using about two metres of wire. The phasing coil is wound with six turns close wound. The upper section is wound on the 12mm diameter dowel, and also uses approximately two metres of wire.

## Ground Plane

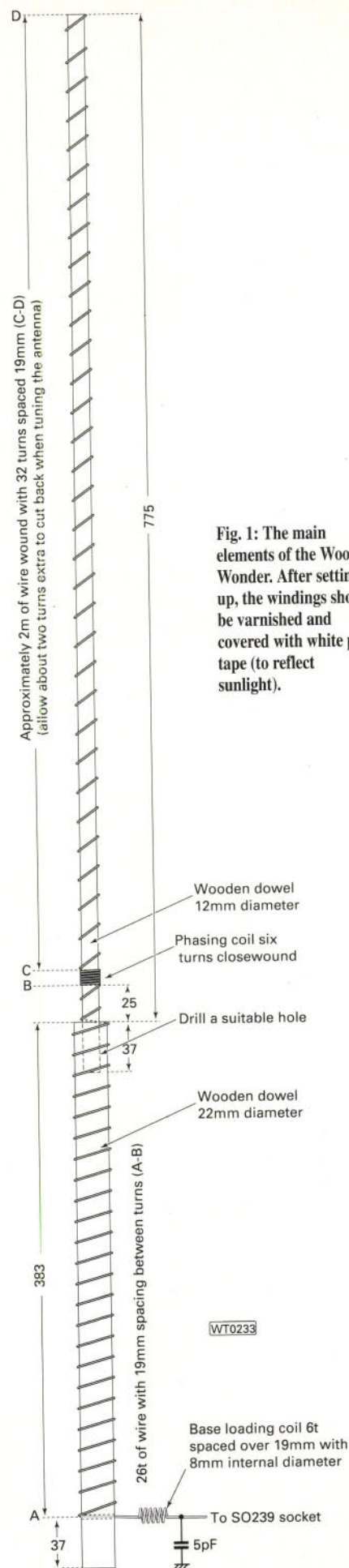
The ground plane shown in drawings **Fig. 2** and **3**, which I made from odd bits of aluminium plate. Whatever you use it should be at least 2mm thick. The 'earth' plane consists of two rods.

The drawings **Fig. 2** and **3**, show how to make the earth-plane. Each rod is twisted through 90° so as to allow the extended ground plane to stick out 90° to the antenna.

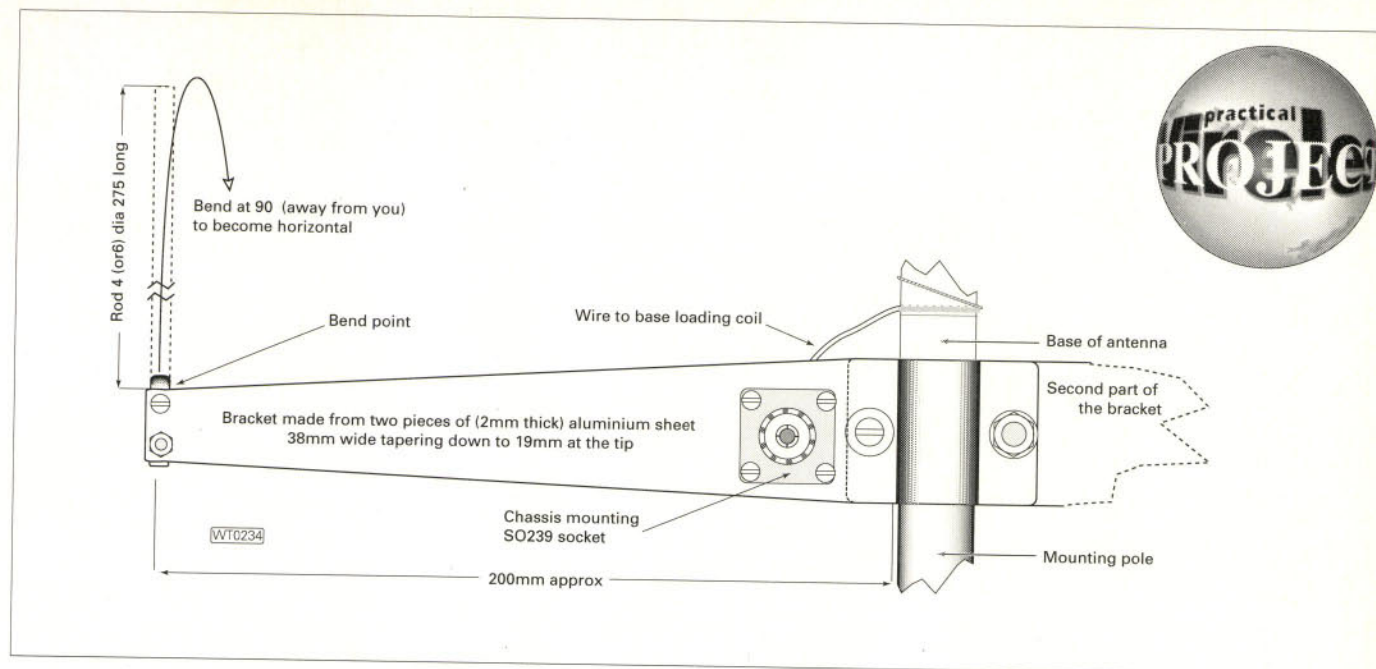
To match reasonable well into a 50Ω coaxial cable, a small base loading coil and capacitor assembly is needed. The matching coil is made up of six turns on a 8mm drill

## Shopping List

One 420mm length of 22mm dowelling.  
One 820mm length of 12mm dowelling.  
Two 300mm lengths of 4 or 6mm aluminium rod (or tube).  
Two pieces of 2mm thick aluminium plate (see Figs 2 and 3).  
One 5pF (4.7pF) silver mica or high voltage ceramic capacitor.  
One SO239 coaxial socket (or other socket to suit).







shank and made 19mm long.

The capacitor is a 5pF ceramic (or silver mica) item, connected from the PL259 socket to ground plane. An ideal method is to attach it to one of the screws clamping the ground plane to the bottom end of the antenna.

This antenna is ideal for packet or local 'natter', etc. and

it's cheap to make. The v.s.w.r. should be better than 1.2:1 when built and adjusted with care and patience. Ideally the finished unit should be varnished and taped with white tape when completed.

I hope you all enjoy building the Wooden Wonder. See you all on 'two'.

PW

Fig. 2: The vertical view of one half of the 'ground' plane.

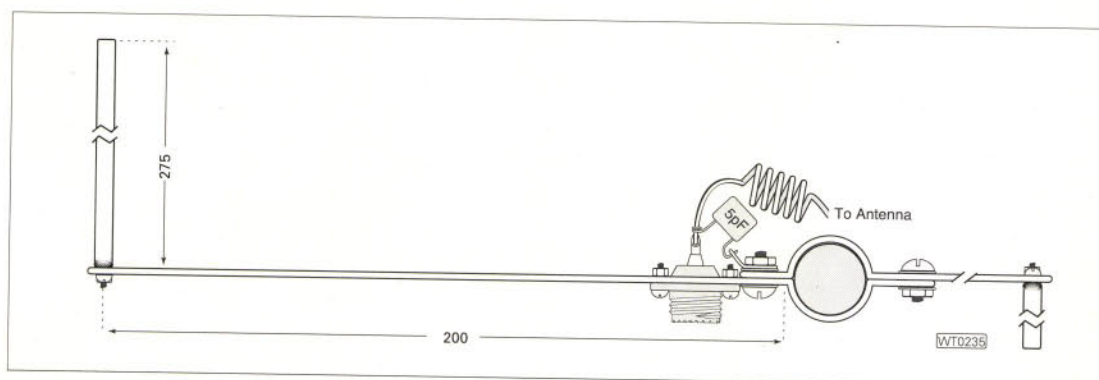


Fig. 3: Looking down on the 'ground' plane.

# Lucky Lutterot

Continued from page 31

## On The Air

For a start on the air I chose the 18MHz band, because my trusty FT-101 MkI does not cover the WARC allocations. I've always had a soft spot for this band, as 45 years ago, this was the band to 'get in touch with the Dutch' (PCH) wherever you were in the world.

So, I switched on and gave a tentative CQ call. Straightaway a DL7 from Berlin came back and gave me a 56/79 report. "Well, I thought that was not too bad, considering I was using a makeshift vertical antenna, about 2m above ground!"

But then to my surprise, I was called by PT7WX who gave me 599 and as soon as that QSO was finished JR3SRB appeared on the frequency (579 both ways). All this happened within 20 minutes.

Practical Wireless, March 1996

My success left me thinking of the long hours I spent after the war, trying to get through to PCH to get rid of a couple of telegrams. My ship was only equipped with a 'straight' Telefunken receiver and a 200W short wave transmitter that was built like the proverbial battleship!

Then, when at long last contact was established, more often than not you received 'QRY' followed by a number (QRY = your turn is...). And very often there were two or three passenger liners ahead, carrying ex-prisoners of the Japanese or repatriated troops, each ship having some 25-40 telegrams on hand.

## International Vocabulary

During those times, my international vocabulary of swearwords came in real handy! But I guess that many amateurs will know the feeling when

they are trying to work some rare DX station during a pile-up!

But I see things have progressed tremendously when I look at the SGC SG-2000. Only the remote control-head stands before me on the desk, while the rest of the transceiver (which is only slightly larger than a shoe box) is hidden from view. All I have to do is key the required QRG and I am ready to transmit.

The set tunes itself to each chosen frequency. The old slogan "The world at your fingertips" comes to mind and I think that for one, the advertising boys were right when they thought of it.

PW



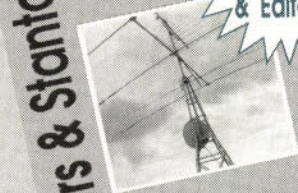
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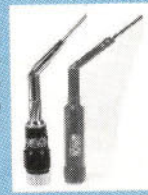


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For the UK Bands!

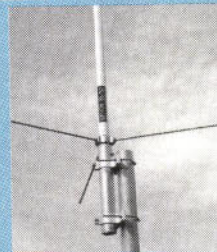
No other range offers the same value  
or the performance!

W-285 2m 5/8th £15.95  
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**Base Station**  
**2m/70cms**  
**Fibre Glass**  
**2" Mast fittings**

These fibre glass aerials  
are pre-tuned for optimum  
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tach to any convenient sup-  
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259. Great DX performers



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Price Ever!

2 Watts

6 x AA dry cell pack

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Rx 130 - 174MHz

1750Hz tone.

DTMF built-in

Programme Scanning

Illuminated Keypad

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70cms AT-400 £189.95

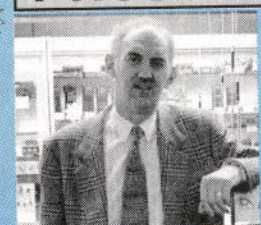
AT-200  
£164.95

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Coming January  
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zine - it's that simple! We're proud to be  
ham radio's number one dealer.  
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To have Passed  
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**VISA** Branch Shop: 12, North Street, Hornchurch, Essex. RM11 1QX Tel: 01708 444765 **ACCESS**

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# PICKETTS

# 1996

# LOCK

# practical Wireless

## The *ESSENTIAL* guide to The London Show

Your 'Key' to the Picketts Lock Amateur Radio Show

Picketts Lock -  
The Beginning

Editor's Corner

News 1996

Floor Plan

Questionnaire

Vintage Fair

Fly with *PW* to  
the Dayton  
HamVention Holiday

In this 16-page special section you'll find a show floor plan, to help you find your way round the ever expanding event, an interesting 'potted history' of the show itself from one of the organisers and a little corner from **G3XFD**. So, even if you can't make it to London on March 9 and 10, you should find something of interest.

Also included is a comprehensive news section (**Donna G7TZB** our News Editor has been really busy!), information on the newly-introduced Picketts Lock 'Vintage Fair', and an invitation for you to join us on the annual *PW* Dayton HamVention Holiday to the USA in May.

And you can help us to help you! By filling out the Questionnaire form inside this section, you can help us plan an even better *PW* for you in the future.

Finally, regular readers don't have to spoil their precious magazine! Copies of this 16-page section will be available free on the *PW* & *SWM* stand at the show. So, you can still have your guide to Picketts Lock, fill out your Questionnaire and keep your copy in good condition!

## Enjoy the show!





**NEW**  
Dual Band HT

# Dual Band Handheld **FT-51R**

Only one Dial/Volume knob required for easier use.

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

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

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

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

The new FT-51R Dual Band HT is state-of-the-art, and easy to use!

So easy, you won't need an operating manual. Its exclusive, scrolling instruction menu located in the large, backlit display "window", guides you through total operation while simultaneously viewing the main display window.

You'll like some of the other new, exclusive features, too. Like Spectrascope™. This unique feature displays real time, continuous scanning of activity on adjacent frequencies in VFO mode or 8 of your favourite

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

"Scrolling instructions tell me what to do next!"



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

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

"Yaesu did it again!"

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

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

## Specifications

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

# YAESU

Performance without compromise.™

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

Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.



# PICKETTS

19

LOCK

## Picketts Lock- The Beginning

*Steve White G3ZVW of RadioSport Ltd., provides a little background history of the popular London Amateur Radio & Computer Show. His story explains how a successful partnership between a club and commerce has provided the South with a very popular event.*

Heading photograph: Picketts Lock, site of the London Amateur Radio & Computer Show.

The first Picketts Lock Show in 1990. The PW & SWM stand is on the far right of the photograph.



Practical Wireless, March 1996

Our story begins in 1980, ten years before the first London Amateur Radio Show. This was the year in which Alexandra Palace was destroyed by fire, which resulted in the RSGB moving their annual exhibition to the NEC in Birmingham, leaving London without an Amateur Radio event.

During the years of the 'Ally Pally Rally' members of the Southgate ARC had manned the talk-in station. So, it wasn't long before thoughts turned to the club running its own event.

Several proposals were made. But they were rejected on the grounds that more money than the club had ever possessed would be needed to hire the hall, let alone advertise an event.

However, the idea was not forgotten about. This was because eventually a meeting was convened between a small group of club members with a view to financing such an event privately.

### Members' Money

The log jam was broken when three members of the Southgate ARC offered to put up their own money and protect the club from any potential losses. They were Steve Blayer G4UKR, Ron Lindsay



G3KTZ and Steve White G3ZVW.

The initial idea was to stage a one day rally and to hold it in only one hall of Lee Valley Leisure Centre in Edmonton, North London. A small group of Amateur Radio retailers from the London area were shown the venue. But after seeing it, they insisted that such an event should not only be staged over two days, but should also take place in two halls. So, it was over the course of just one evening that the proposed event literally quadrupled in size.

### Brenda And Bernie

It was at this point that Brenda and Bernie Godfrey of the Amateur Radio Exchange entered the scene. They were invited to become partners in a co-operative, because they knew most of the likely exhibitors.

Paperwork was produced and the new London event was launched in April 1989. The expectations were that it would be quite difficult to fill the space, but by September of the same year, over 90% of the stands were filled. And by the time the first London Amateur Radio Show took place at Picketts Lock in March 1990, all the stands were filled.

The working arrangement was that the five organisers dealt with sales, advertising and ticketing. The radio club members provided the on-the-day manpower to staff the event, Southgate ARC being the sole beneficiaries of the Bring & Buy stand and the raffle. It is an arrangement which continues to this day.

### RadioSport Registered

It was almost immediately apparent that a more formal arrangement was required to run the event. So, by 1991, RadioSport was registered as a company.

Other than the company registration formalities, little has changed other than the days of the event (altered from Friday and Saturday to Saturday and Sunday). This, coupled with the fact that news had got round that the London Show was really worth visiting, resulted in a dramatic rise in attendance.

With the increasing adoption of computers in the shack, by 1992 the official title of the show had become the London Amateur Radio & Computer Show. The event also increased in size, to occupy all three halls at the Lee Valley Leisure Centre.

These days, the show attracts many thousands of radio and computer enthusiasts. They come from not only from around Britain, but also extensively from Continental Europe and beyond.

However, RadioSport is not one to rest on its laurels. So, this year the company has introduced a new attraction, the Vintage Sound & Vision Fair, which visitors to the Radio Show will also be able to visit.

PW





**Rob Mannion G3XFD**  
explains why he's  
looking forward to  
meeting readers at  
the London Show. He  
also explains how you  
can get a chance to  
talk to him if you  
can't get to Picketts  
Lock in March.

In my job as Editor of *Practical Wireless* I consider the opportunities, provided by shows and rallies, to meet and talk to readers to be of prime importance. That's why I'm looking forward to meeting as many readers as possible at the London Show on March 9 and 10.

This year we're arranging the PW Publishing stand (Stand T in the Red Hall) so that I have my own 'small corner' at one end. But, I don't think it will be anything like Worthington (our cartoonist) has drawn it in his 'Spot The Difference' picture this month as unfortunately Dick is unable to attend the show as he will be away 'playing' with his trains!

However, *Short Wave Magazine*, the only monthly magazine devoted to the listener will be well represented. *Short Wave* columnists **Graham Tanner** ('SSB Utility Listening') and **Elaine Richards G4LFM** ('Junior Listener') will in attendance and on-hand to answer all your questions.

I must stress that I'm not at the London Show to sell you anything (apart from the fact that I want you to share PW!). I'm there for you. So, don't hesitate to come and talk to me. Your suggestions, ideas, complaints and opinions are very valuable. We need your input to help provide a good readable magazine with as good an editorial 'balance' as possible.

To help us prepare PW in the way you want, you'll find a Questionnaire included in the magazine. Please spare a little time to fill it out. By doing this, it will guide us to provide you with an even better magazine and give you the chance to win a prize!.

### Other Events

If you're not fortunate enough to be attending the London Show, there are other events coming up throughout 1996 when I will be delighted to meet you. So, if there's something particular you want to say, suggest (or complain about!) why not look out for me (I'm quite easy to spot!).

This year I'm planning to be at the

Dayton HamVention (USA), the Woburn Rally, the Wimborne Hamfest, the Rochdale QRP Convention and The Leicester Show. Additionally, I've got Club talks planned in Bangor (Northern Ireland), Cornwall, the South Manchester club and North Ferriby in Humberside.

Meeting readers (and non-readers) provides me with many opportunities. Very often readers provide ideas and valuable feed-back. And the best example I can think of in this respect is Ian Poole's series 'Specifications...The Mysteries Explained'. This series came about directly because of suggestions and ideas from talks I gave to clubs.

### Data Sheets

I'm pleased that we've been able to introduce our 'Data Sheets' to help readers' get even more benefit from the hobby. We've got more ideas planned for further Data Sheets, but have you got any suggestions?

Did you like the first issue of the new information charts contained in the sheet offered free with the January PW? So, as I've already mentioned, your comments and ideas are welcome.

One of the first comments I've had from readers recently, concerned the 'Wall Planner' we published in the January issue of the magazine. The readers who contacted me were asking several things ranging from

"Can you publish in December"? to "Could you please make it larger"?

Of course, the PW team want the charts/wall planners to be as useful as possible for readers. So, please let us know what you'd like. We'll do the rest (and our best) at the same time!

To round off my 'Editor's Corner' I'd particular like to hear from you regarding practical projects in the magazine. Do you prefer smaller projects? Or would you like larger ideas to build...but concentrating on items not easily available commercially?

*Practical Wireless* values its readers. So, this is your chance to help us to help you. I wish you good reading and much enjoyment of our absorbing hobby.

**Rob G3XFD**



Compiled by Donna Vincent G7TZB

## Icom UK Ltd.

Icom's design teams in Japan have been busy and the result is that two new models are on their way as we go to press. First on the scene is the Icom IC-T7E which the manufacturers stress is **NOT** a single band handheld...although it may look like one!

In fact Icom state that IC-T7E is smaller than many single-band transceivers although it is a full feature dual-band transceiver, covering 144 and 430MHz. Icom's design approach has incorporated a single p.a. power stage for both bands. The transceiver also employs single circuits for the receiver, i.f. and transmitter drivers, bringing additional miniaturisation benefits.

The IC-T7E provides up to 4W output on v.h.f. and 3W on u.h.f., has 70 memory channels, has tone squelch as standard. There are many innovations for ease-of-use (including a single volume control). And Icom say all this technology fits comfortably in the palm of your hand!

A new mobile transceiver from Icom, the IC-2710H will also be launched for the London Show. The dual-band f.m. transceiver comes complete with a multi-function remote control microphone as standard, but Icom report they are also to provide an optional infra-red wireless remote control microphone.

The IC-2710H features optional front panel separation (kit required) and also has independent dials for each band. The new mobile transceiver provides up to 50W output on v.h.f. and up

to 35W on u.h.f.

Designed around a double-conversion receiver package, the IC-2710H also features seven types of ultra high speed scans, 220 channel capacity memory, r.f. attenuator (linked to squelch control) and built-in duplexer. The transceiver is fitted with independent tuning controls, volume control, squelch and functions control for simpler operating.

More details on the IC-2710H priced at £675 and IC-T7E priced at £329 will be 'launched' from Icom UK on **Stand S** in the **Red Hall** at Picketts Lock or by calling (01227) 741741.

## Yaesu UK Ltd.

Although **Yaesu UK** won't actually be launching any new products at the London Show this year they will be emphasizing their recently launched FT-1000MP. The FT-1000MP all-mode h.f. transceiver is still fairly new to the UK market and will therefore form the centre piece of the Yaesu stand.

Also on view will be the new ADMS-1B Windows PC programming software for the FT-10R/40R/11R/41R/51R series of hand-helds as well as the ADMS-2 for the FT-8500. This new ADMS software allows the user to quickly program the transceiver from a PC, all the information such as frequencies, repeater offsets, power output levels etc can be stored in the PC.

And that won't be all! The full Yaesu range will of course be featured and we're sure the Yaesu team will be pleased to demonstrate any of their radios to you. You'll find them on **Stand Q** in the **Red Hall** or alternatively call 0181-814 2001.

## Sandpiper Communications

The Welsh based antenna technology and design company of **Unit 5**,

**Enterprise House, Cwmbach Industrial Estate, Aberdare, Mid-Glamorgan, Sandpiper Communications** will be on **Stand M** in the **Red Hall** where they will be exhibiting a large new range of h.f. vertical antennas.

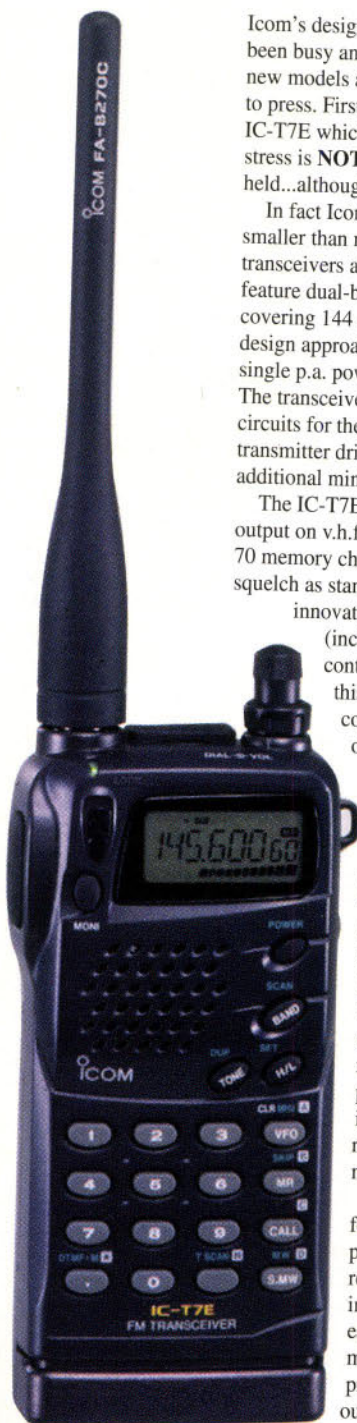
The 'V' range includes the MK2 which measure approx 19ft high and covers 1.8 to 28MHz and the Mini V, approx 10ft high. Both antennas can be bought as single banders and then upgraded to all bands as required.

Alternatively you can buy the antennas with any number of bands as required. There is also a 35ft versions suitable for the DX enthusiast. Chris from Sandpiper states that the mini V range is ideal for portable work or for use in caravans as it is telescopic and shortens to approx 1 metre.

## Trio-Kenwood UK Ltd.

**Trio-Kenwood UK** won't actually be launching anything new for the London Show but the emphasis will be put on their latest model, the TS-870s h.f. transceiver. **Dave Wilkins G5HY** will be on-hand on **Stand N** in the **Red Hall** to demonstrate the TS-870s together with the recently issued Windows software designed for use with this already popular h.f. rig.

You will of course be able to see, pick-up literature and discuss the complete Kenwood range from hand-helds through mobiles to base station radios. If you can't wait until March 9 & 10 call (01923) 816444 now for information.





## The QRP Component Company



**Chris Rees G3TUX** will be taking a break from the workbench at the **QRP Component Company** over the weekend of March 9 & 10 to exhibit his full range of Morse keys at the London Amateur Radio & Computer Show.

In addition to a range of keyers, Morse trainers and practice

oscillators you will be able to view the newly introduced Swedish pump key and the rather interestingly named DK1WE Twinky and Minky miniature keys. In addition to this there will also be a selection of valve and vintage equipment and components for you to feast your eyes upon.

Visitors to the London Show will be able to find Chris in the **Blue Hall** on **Stand G**. For those of you who can't make it to the show, we're sure Chris would be happy to tell you more about his products, should you wish to call him on (01428) 641771 or visit his shop at **7 Kings Road, Haslemere, Surrey** (ring first to check opening times).

Mike Haydon pictured second from left with Phil Hutnall and Olliver D'Allessandri at the 1995 Leicester Amateur Radio Show (G7TZB, far left on loan for photographic purposes!).

## Haydon's Expanding!



**Mike Haydon** who has been trading for the past four years from his shop at **132 High Street, Edware, Middlesex HA8 7EL** Tel: 0181-951 5781/2 is expanding his business by opening a new showroom in the West-Midlands towards the latter part of

February. Mike has told the 'Newsdesk' that his new shop will be stocked with all the usual 'goodies' together with plenty of other items of interest.

The West-Midlands branch of Haydon Communications will boast an on-site radio amateur who will be on-hand to demonstrate equipment and offer advice. The exact date of opening and location are yet to be confirmed so, watch this space! Mike's mail order will continue to be run from the Edware shop so all enquiries of that nature should be directed there.

The *PW* team would like to wish Mike Haydon and his team all the best and every success in the future and hope that he will continue to uphold the reputation as being one of the UK's largest dealers for scanners, shortwave and amateur radio equipment. Look out for Haydon Communications on **Stand Z** in the **Blue Hall**.

## Hooker Hangs-Up

One of the best known 'characters' in the Amateur Radio Retailing Industry, **Alan Hooker G4OEM** has decided to 'hang-up his headphones' and retire. Alan, although based at his shop in Doncaster, Yorkshire, was a very familiar and friendly figure seen at many of the major rallies in the UK.

Alan, now 55 years old, has been advised to "sit back and relax a little" from the busy commitment of running a radio business. "Since my heart by-pass operation some 10 years ago, I've been feeling much better, but my doctor says I'll do much better and last longer if I sit back a bit" Alan told *PW* in his usual straightforward manner!

This friendly and forthright Yorkshireman has many funny stories on hand and delights in telling one against himself which happened in the days when he was selling ex-GPO

teleprinters.

"It was in the days when we were just doing rallies, and I was offering teleprinters at bargain prices of around £35" Alan told *PW*. "This chap came up to me and said he wanted a printer for his young son. He asked me how I wanted paying and I told him.....in money!"

Alan said that his somewhat sarcastic reply brought unexpected results! "Five minutes later the chap arrived back at the stand and paid me the £35 in pennies! It was the contents of his son's money box. Oh well, I couldn't complain....I'd said I wanted paying in money!"

There are many stories like this to come from Alan Hooker. And although he closed for business as from Friday 12 January, his many friends in the amateur radio world are sure to see him at rallies in the future. "Although I've rented out the shop, We're staying on in the flat above it" said Alan "I'm not disappearing yet and look forward to seeing old friends again during the rally season".

Everyone on *PW* wishes Alan, his wife Val and son Jason well for the future. We hope that by 'taking it easy' he'll have more time to dish out the welcome doses of 'Hooker Humour' to cheer us all up on rainy days. And we're wondering if the rumour about Alan buying up all the photographs of himself ("Fetch a better price if they're rare" he said!) is true!

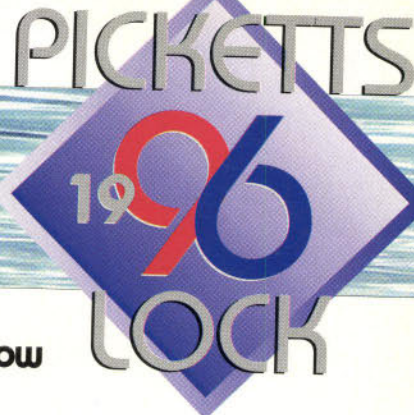
## Waters & Stanton Electronics

Hockley based **Waters & Stanton**

continued on page 46



# Floor Plan



## Your Guide to the London Amateur Radio & Computer Show

March 9+10

### Blue Hall Exhibitors

Exhibitor	Stand
AA Computers	O
AJP Communications	X
AKD	T
ARE Communications	Q
BD Media	V
Bring & Buy	A
Computer Junk Shop	Y
Deecom	F
Discs Direct	M
Electrocomp	ZA
Field Electrics	Z
Haydon Communications	P
Howes Communications	L
IC Electrical	T
Kent RA Ltd.	V
Keytronics	H
LCE Len Cooke Enterprises	V
Loutronics	J

Mailtech	H
Micro Direct	O
Mirage Designs	P
No Nuts	N
Proops	K
QRP Component Company	G
RAIBC	M
RAYNET North London	N
RSARS	E
RSGB	*
Satellite Surplus	*
Siskin Electronics	T
Squire V Ltd.	G
Strikalite	M
Sudbury Electronics	O
Telecomm Services (SW) Ltd.	V
Telford Electronics	M
Tennamast Scotland	U
Thornton P	M
Vector Computing	V
Waters & Stanton	W
Woudstra Ltd.	U

### Red Hall Exhibitors

Exhibitor	Stand
Agile Tools	P
AOR (UK) Ltd.	X
Bill Macdonald Ltd.	P
Bonex Ltd.	C
Cheshunt & District ARC	W
Coltec Electronics	E
Compelec	W
Display Electronics	L
Dosher J Ltd.	P
Eastern Communications	J
Garex Electronics	D
Ham Radio Products	W
Holderness H J	J
Icom UK Ltd.	S
Linear Amp UK	G
Lowe Electronics	F
Martin Lynch & Son	R
Nevada	H

Oasis Computer Systems	V
PW Publishing Ltd.	T
Radio Research	P
Rich Electronics	K
Sandpiper	M
Semi-Conductor Archives	L
SEM	O
SGS	O
Shacklog	P
SMC	M
SW Shareware	O
Sweet Box	Lobby
Syon Trading	B
Time Step Electronics	K
Trio Kenwood UK Ltd.	N
UBM	A
Venus Electronics	U
Westlake W. H. Ltd.	P
Yaesu UK Ltd.	Q

### Green Hall Exhibitors

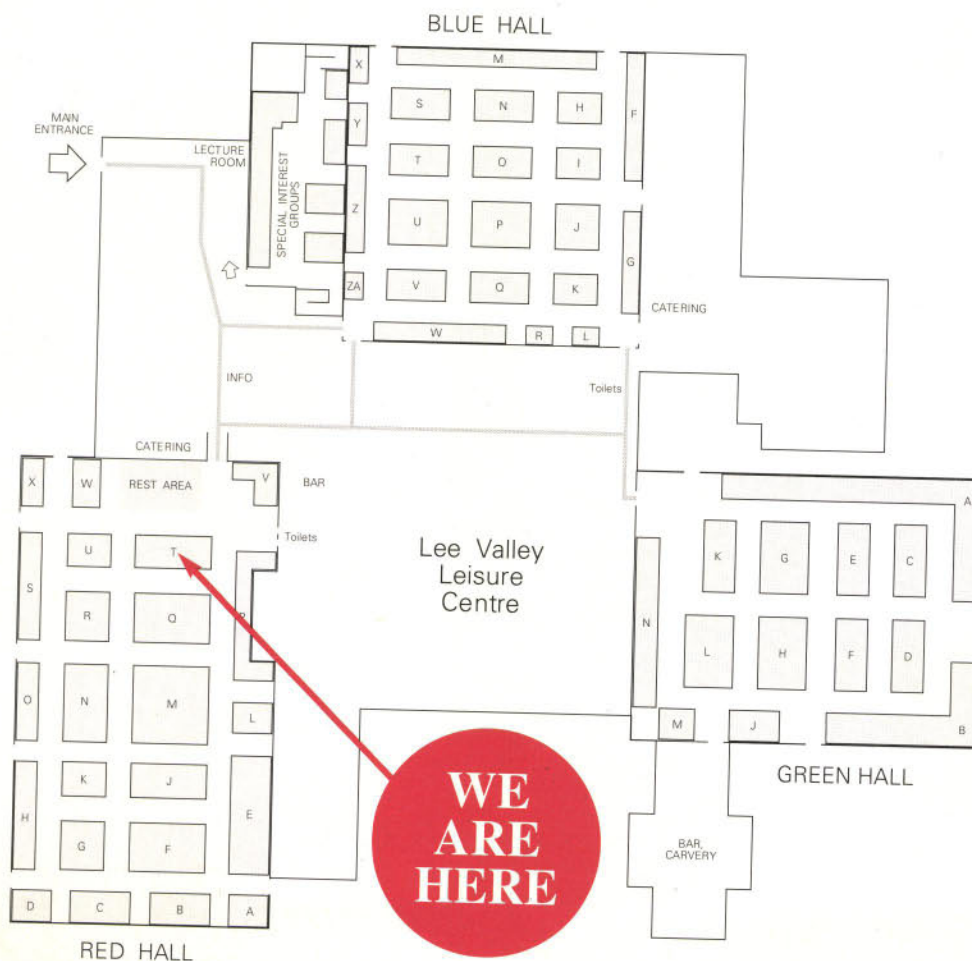
Exhibitor	Stand
J & J Classic Juke Boxes	J112
Jim Cookson	B34
Len Thompson	B33
Old Time Supplies	A1
RAB Surplus	*
Radio Bygones	K125
Radio Fix	F80
Southern Aerial Services	L128
Sunrise Press	J114
Supertronics	*
Talking Machine Review	B35

### Special Interest Groups

Exhibitor	Stand
Air Training Corps	10-11
AMSAT-UK	15-17
BARTG	5-6
British ATV Club	27-28
British DX Club	*
Grafton A R Society	9
Guide Dogs For The Blind	18-20
Hoddesdon Radio Club	8
RAOTA	24
Remote Imaging Group	1-3
RNARS	31-32
TARTS SSTV & Data Group	29-30
Worked All Britain	7

\* Stand number unconfirmed at time of going to press.

Details correct at time of going to press in January.





(Please tick as appropriate)

## 1 ARE YOU INTERESTED IN AMATEUR RADIO?

YES ☐ 'YES', Continue. NO ☐ If 'NO', Do not continue  
Thank you for your help

## 2 ARE YOU?

MALE ☐ FEMALE ☐

## 3 PLEASE COULD YOU SPECIFY YOUR AGE BAND?

☐ Under 15 ☐ 15-25 ☐ 26-35 ☐ 36-45  
☐ 46-55 ☐ 56-65 ☐ Over 65

## 4 HAVE YOU EVER BOUGHT HOBBY RELATED BOOKS FROM THE FOLLOWING SOURCES?

PW Publishing Book Service ☐  
Adverts in "Practical Wireless" ☐  
Adverts in "Short Wave Magazine" ☐  
RSGB ☐  
Radio Dealer ☐  
NO ☐  
If yes, state name of dealer \_\_\_\_\_  
Other (Please specify) \_\_\_\_\_

## 5 HOW INTERESTED ARE YOU IN THE FOLLOWING?

	Interested	Not Interested
Computing in Radio	<input type="checkbox"/>	<input type="checkbox"/>
Morse	<input type="checkbox"/>	<input type="checkbox"/>
Antennas	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>

(Please specify) \_\_\_\_\_

## 6 IF YOU WERE READING ABOUT A SPECIFIC TOPIC SUCH AS ANTENNAS WOULD YOU PREFER:

A whole issue devoted to antennas including the regular features ☐  
A separate supplement devoted to antennas attached to the magazine ☐

## 7 HOW MANY ISSUES OF PW DO YOU BUY A YEAR?

Under 5 ☐ Go straight to BLUE 'Occasional' section.  
6 - 9 ☐ Go to 8.  
10-12 ☐ Go to 8.  
Stopped Buying ☐ Go straight to GREEN 'Lapsed' section.  
Never Buy ☐ Go to TURQUOISE 'Never Buy' Section.

## 8 HOW COULD WE IMPROVE PW

Reduced cover price but to detriment of quality e.g. fewer pages ☐  
Make it easier to locate in shops ☐  
Special novice section ☐  
More competitions ☐  
More special offers and give-away offers ☐  
Change in topics covered ☐  
More colour ☐  
Increased technical content ☐  
Reduced technical content ☐  
More practical construction projects ☐  
Other (Please specify) \_\_\_\_\_

## 9 DO YOU SUBSCRIBE TO PW

YES ☐ If 'YES' Go to 13 NO ☐ If 'NO' continue

## 10 IS THERE A SPECIFIC REASON WHY YOU HAVE NOT TAKEN OUT A SUBSCRIPTION?

Too expensive ☐  
Lack of special offers and incentives ☐  
Prefer browsing and buying off the shelf ☐  
Not consistently interested ☐  
Lack of student/junior rates ☐  
Member of the RSGB ☐  
Other (Please specify) \_\_\_\_\_

## 11 HAVE YOU EXPERIENCED ANY PROBLEMS OBTAINING YOUR COPY OF 'PW'?

YES ☐ If 'YES' continue NO ☐ Go to 13

## 12 PLEASE INDICATE WHICH OF THE FOLLOWING DESCRIBES YOUR PROBLEM OBTAINING 'PW'

Local newsagent/shop doesn't stock ☐  
Cannot order from local newsagent/shop ☐  
Not available in surrounding area ☐  
Other (Please specify) \_\_\_\_\_

## 13 PLEASE STATE YOUR NEAREST TOWN

NAME: ..... CALLSIGN: .....

ADDRESS: .....

Thank you for your time, all details will be treated in the strictest confidence and privacy.

# OCCASIONAL

## 01 DO YOU HOLD AN AMATEUR RADIO TRANSMITTING LICENCE?

YES(Class A) ☐ (Novice A) ☐ NO ☐  
(Novice B) ☐ (Class B) ☐

## 02 IS THERE A SPECIFIC REASON WHY YOU DON'T BUY "PW" ON A MONTHLY BASIS?

(Tick a maximum of 3 boxes)

Too expensive ☐  
Prefer to buy varied selection ☐  
Dislike format ☐  
Unattractive cover ☐  
Technical content too complex ☐  
Technical content too basic ☐  
Lost interest in hobby ☐  
Dislike content of features ☐  
(Please specify) \_\_\_\_\_

Rather buy a rival publication ☐

(Write name) \_\_\_\_\_  
Other (Please specify) \_\_\_\_\_



## 03 HAVE YOU EXPERIENCED ANY PROBLEMS OBTAINING YOUR COPY OF PW?

YES ☐ NO ☐

## 04 PLEASE INDICATE WHICH OF THE FOLLOWING DESCRIBES YOUR PROBLEM OBTAINING PW

Local newsagent/shop doesn't stock ☐  
 Cannot order from local newsagent/shop ☐  
 Not available in surrounding area ☐  
 Other (Please specify) \_\_\_\_\_

## 05 PLEASE STATE YOUR NEAREST TOWN

## 06 IS THERE ANYTHING IN THE FOLLOWING LIST WHICH WOULD ENCOURAGE YOU TO BUY PW ON A MONTHLY BASIS? (Tick a maximum of 3 boxes)

Reduced cover price but to detriment of quality eg fewer pages ☐  
 Change in Format ☐  
 Change in topics covered ☐  
 Cover re-designed ☐  
 Special novice section ☐  
 Technical content less complex ☐  
 Technical content more complex ☐  
 Other (Please specify) \_\_\_\_\_

## 07 WHAT MOTIVATED YOU TO BUY PW WHEN YOU DID? (Tick a maximum of 2 boxes)

Eye-catching cover ☐  
 Special offer/incentive/free gift ☐  
 Recommendation ☐  
 Special interest in a particular article/theme ☐  
 Seasonal interest (Write season in) \_\_\_\_\_  
 Other (Please specify) \_\_\_\_\_

## 08 PLEASE INDICATE YOUR LEVEL OF SATISFACTION WITH THE FOLLOWING FEATURES? (Tick one box per line)

	EXCELLENT	GOOD	FAIR	POOR
Advertisements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Antennas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Broadcasting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Book service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Constructional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Competitions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
News Pages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reviews	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special Offers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regular Features	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ANY EXTRA COMMENTS \_\_\_\_\_

## 09 IS THERE A SPECIFIC REASON WHY YOU HAVE NOT TAKEN OUT A SUBSCRIPTION? (Tick one box only)

Too expensive ☐  
 Lack of special offers and incentives ☐  
 Prefer browsing and buying off the shelf ☐  
 Not consistently interested ☐  
 Other (Please specify) \_\_\_\_\_

*Thank you for your time, all details will be treated in the strictest confidence and privacy.*

## LAPSED

## L1 DO YOU STILL HOLD AN AMATEUR RADIO TRANSMITTING LICENCE?

YES Class A ☐ If YES, Skip L2, go to L3  
 YES Class B ☐ If YES, Skip L2, go to L3  
 YES Novice A ☐ If YES, Skip L2, go to L3  
 YES Novice B ☐ If YES, Skip L2, go to L3  
 NO ☐ If 'NO', go to Question L2  
 Other (Please specify) \_\_\_\_\_

## L2 (IF UNLICENSED) ARE YOU STILL INTERESTED IN READING ABOUT THE HOBBY?

YES ☐ NO ☐

## L3 HOW LONG AGO DID YOU STOP BUYING PRACTICAL WIRELESS?

6 months ☐ 1 year ☐ 2 years ☐  
 3 years ☐ 4 years+ ☐

## L4 IS THERE A SPECIFIC REASON WHY YOU STOPPED BUYING PW? (Tick a maximum of 3 boxes)

Too expensive ☐  
 Lack of incentives/special offers ☐  
 Unattractive cover ☐  
 Quality of paper ☐  
 Disliked layout ☐  
 Disliked journalistic style ☐  
 Technical content too complex ☐  
 Technical content too basic ☐  
 Loss of interest in hobby ☐  
 Prefer a rival publication ☐ If yes, which one \_\_\_\_\_  
 Difficult to find in local shops ☐ If yes, state area \_\_\_\_\_  
 Disliked topics covered (Please specify) \_\_\_\_\_

Other (Please specify) \_\_\_\_\_

## L5 HOW WOULD YOU RATE THE LOOK OF THE PRACTICAL WIRELESS FRONT COVERS

Poor ☐ Fair ☐ Good ☐ Excellent ☐

## L6 HOW COULD WE IMPROVE PRACTICAL WIRELESS (Tick a maximum of 3 boxes).

Reduced cover price but to detriment of quality e.g. fewer pages ☐  
 Make it easier to locate in shops ☐  
 More money off vouchers for products ☐  
 Special novice section ☐  
 More competitions ☐  
 More special offers and giveaway offers ☐  
 Change in topics covered ☐  
 More colour ☐  
 Increased technical content ☐  
 Reduced technical content ☐  
 Other (Please specify) \_\_\_\_\_



# PICKETTS

19

# LOCK

## Questionnaire

**L7 IF THOSE CHANGES WERE MADE, DO YOU THINK YOU MIGHT START TO BUY PW AGAIN?**

NO ☐ YES ☐

**L8 PLEASE SPECIFY WHY YOU WOULD NOT START TO BUY PW AGAIN**

Please specify \_\_\_\_\_

*Thank you for your time, all details will be treated in the strictest confidence and privacy.*

## NEVER BUY

*If you have picked up this questionnaire at a rally, and have never seen a copy of Practical Wireless please ensure you have looked through an issue on our stand before completing this part of the form.*

**N1 DO YOU HOLD AN AMATEUR RADIO TRANSMITTING LICENCE?**

YES (Class A) ☐  
YES (Novice A) ☐

YES (Class B) ☐  
YES (Novice B) ☐  
NO ☐

**N2 HAVE YOU EVER READ A COPY OF PW?**

NO ☐ YES ☐

**N3 IS THERE A SPECIFIC REASON WHY YOU DO NOT BUY PW ON A REGULAR BASIS? (Tick a maximum of 3 boxes.)**

- Dislike the appearance of the cover ☐
- Dislike format ☐
- Too expensive ☐
- Lack of incentives/gifts/offers ☐
- Technical content too simple ☐
- Technical content too complex ☐
- Prefer another publication ☐
- State name \_\_\_\_\_ ☐
- Difficult to find in local shops \_\_\_\_\_ ☐
- Name area \_\_\_\_\_
- Lack of interesting features (Please specify) \_\_\_\_\_

Other (Please specify) \_\_\_\_\_

**N4 WHICH OF THE FOLLOWING CHANGES WOULD ENCOURAGE YOU TO BUY PRACTICAL WIRELESS?**

(Tick a maximum of 3 boxes)

- Cheaper price ☐
- Technical content more complex ☐
- Technical content less complex ☐
- Modified format ☐
- Appearance of the cover ☐
- Topics covered ☐
- Easier to locate in local shops ☐
- More incentives and special offers ☐
- Other (Please specify) \_\_\_\_\_

**N5 HOW WOULD YOU RATE THE LOOK OF THE COVERS OF PRACTICAL WIRELESS.**

Poor ☐ Fair ☐ Good ☐ Excellent ☐  
Other (Please specify) \_\_\_\_\_

**N6 NOW YOU HAVE SEEN PRACTICAL WIRELESS WOULD YOU CONSIDER BUYING IT IN THE FUTURE?**

NO ☐ YES ☐

*Thank you for your time, all details will be treated in the strictest confidence and privacy.*

**REMEMBER BEFORE SENDING YOUR COMPLETED QUESTIONNAIRE IN MAKE SURE YOU'VE FILLED IN YOUR NAME AND ADDRESS ON PAGE 42.**

## COMPETITION

**Win! A REXON RL-102 144MHz f.m. hand-held transceiver worth £199 from The Short Wave Shop!**



Fill out the questionnaire, help us to plan the *Practical Wireless* you want to read - and you could win the Star prize of a REXON RL-102 144MHz f.m. hand-held transceiver, kindly donated by **Bob Burrows G6DUN**, of the Short Wave Shop in Christchurch, Dorset. The two runners-up will each receive one year subscriptions to *PW*.

To enter the free competition all completed questionnaires must be sent to the *Practical Wireless*, Editorial Offices, Freepost, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW by **11 April 1996**. Alternatively you can drop your completed questionnaire into the 'Bin' on the *PW Publishing* stand at the London Show.

The first questionnaire drawn out by the Editor will win the sender the REXON transceiver. The two runners-up will each win the one year subscriptions. The Editor's decision is final and no correspondence will be entered into. Unfortunately, the Freepost facility is only available to readers within the United Kingdom, Northern Ireland, Channel Islands and Isle of Man. Despite this, although readers living abroad will have to pay the postage to return their questionnaire they will still have free entry to the competition. And with the closing date of **11 April 1996** we have allowed plenty of time for entries to arrive from around the world. **Editor.**





# The Affordable Duo

## DX-70



£995

## DJ-G5E



£439

## Now Cost Even Less!

**DX-70** 160m - 10m plus 6 metres  
100W (10W 6m) SSB CW FM AM  
Narrow Filters for SSB & CW  
Receive: 150kHz - 30MHz  
Fast & Slow AGC; Noise Blanker  
3 Stage Attenuator; IF Shift  
Full break-in; Linear Switching  
100 Memories; CW Carrier Shift

**Accessories:** Mic, DC lead, handbook

**DJ-G5E** 2m & 70cm Dual Band Handheld  
2W on ni-cads - 5W on 12V DC  
CTCSS & DTMF included  
11 Channel Spectrum Scope  
100 Memories; Illuminated Display  
Electronic Volume & Squelch  
Receive: AM/FM 108 - 173.9MHz  
Receive: FM 400-511.9/800-9MHz  
Cross Channel Repeater Mode

**Accessories:** Ni-cad pack, AC charger, aerial, belt clip, carry strap, handbook.

**From All Good Dealers  
Or Direct from UK Importers**

## Waters & Stanton

22, Main Road, Hockley, SS5 4QS  
Tel: (01702) 206835 Fax: 205843





The Waters & Stanton sales team comprising of (l-r) Andy Tietjen G7NZH, Elaine Ingram, Tammy Millard, Mark Francis G0GBY Technical Support Manager, Jeff Stanton G6XYU and Steve Hoy G7JPU.

will, for the seventh year, be attending the London Show at Picketts Lock.

The sales team will be manning **Stand W** in the **Blue Hall** where they will be displaying a vast array of stock, including the full Alinco range.

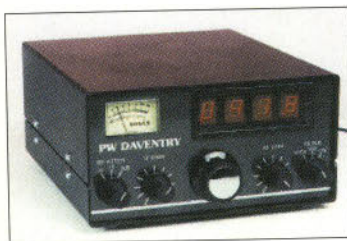
Included in the Alinco display will be the recently introduced DJ-

190 priced at £199 and the DJ-191 priced at £249. Other products on show will be the new ADI AR-146 144MHz 50W f.m. mobile transceiver costing £269 (look out for the review in April's *PW*), as well as the latest versions of the MFJ-784 d.s.p. filter and MFJ-259 antenna analyser.

**Jeff Stanton G6XYU** has also told *PW* of a new miniature brass Morse key, the GMP. It measures just 108 x 73mm, is manufactured under the Watson name, sells for £39.95 and will also be on show.

**Jeff G6XYU, Peter G3OJV** and the rest of the sales team will be eagerly awaiting your visit to their stand so, why not drop by on either March 9 or 10th? If you can't wait until then to view the full Waters & Stanton range you'll have to go to **22 Main Road, Hockley, Essex. Tel: (01702) 206835.**

## C. M. Howes Communications



Three new products will be debuting on the **C. M. Howes** stand at the 1996 London show in the shape of the CTU9, ASU8 and the RA30. These will all be available in the kit form, with the CTU9 and ASU8 also available

ready built.

The ASU8 is an antenna selector, the CTU9 an antenna tuning unit and the RA30 receiver attenuator. The RA30 consists of a rotary switch and a

small p.c.b. that fits on the rear of the switch and the resistors to make the attenuator network.

In addition to the newly introduced items you will also be able to find the full range of Howes kits, which includes the *PW* Daventry 7MHz receiver as featured in the October and November 1995 issues of *PW*.

You'll be able to find Dave Howes on **Stand L** in the **Blue Hall**. However, if you want to find out more before the London show you can contact him on **(01327) 260178** or at **Eydon, Daventry, Northants NN11 3PT.**

## Lowe Electronics Limited

**Lowe Electronics Ltd. of Chesterfield Road, Matlock, Derbyshire DE4 5LE. Tel: (01629) 580800**

will be showing for the first time ever in the UK a new receiver concept at the London Show. This new concept, WinRadio Multimedia consists of a receiver card, which plugs into the option slot of a PC and Windows base software to give a user front-end and control panel.

The receiver covers 500kHz to 1.3GHz continuously so that it can be used for h.f., v.h.f. and u.h.f. listening. Built-in functions include scanning and memories together with a database of over 300,000 frequencies sourced from all over the world. It's also possible for the user to create their own database of local frequencies.

The Windows user interface gives control of all receiver parameters that are normally presented in a normal radio front panel. This means that all the control functions are immediately obvious.

WinRadio Multimedia will be launched with a price tag of around £399 inc. VAT, which will put it in the same range as many hand-held scanners. A professional version featuring d.s.p., spectrum analyser, real time signal oscilloscope and data decoding of WinRadio will also be available soon.

To find out more about this exciting new concept stop off at Lowe Electronics, **Stand F** in the **Red Hall** where the staff will be more than happy to answer your questions.

## AKD

The **AKD** team from Herts will have their range of newly styled transceivers on display on **Stand T** in the **Blue Hall** at the London Amateur Radio & Computer Show over the weekend of March 9 & 10.

As well as being restyled, the transceivers have been given a new colour and the front panels have been remodelled to achieve a more aesthetically pleasing shape. However, they still retain their no-nonsense functions. All the internal workings have undergone a change so that they meet the new CE requirements.

The TVI filters which **AKD** produce have also seen changes in that the once familiar tube shape has been replaced by a purpose made moulding designed to give a 'new lease of life'. All filters can be bought individually or as a kit.

In addition to this when you're talking to **AKD** why not ask them about their new h.f. transceiver which they are currently developing. If you can't attend the London Show and want to find out more contact **AKD** on **(01438) 351710.**

## South Midlands Communications

In addition to the usual range of radio products on display on the **SMC Stand M** in the **Red Hall**, **Graham Taylor** and his team will be selling a new World Time Clock, and an Electronic Barometer, a lightweight Rotator and budget priced transceivers.

The World Time Clock is of a see through design and features world and home time for 24 major cities, 100 year calendar from 1990 to 2089, selectable temperature display in °C or



°F, daily alarm, and 12 month weather data showing min/max temperature together with the number of rainy days for each city. This see through clock manufactured by Lafayette is very affordable at just £21.50 and would make a attractive addition to any radio shack.

The Electronic Barometer also from Lafayette, features a barometric pressure trend display, realtive humidity display, external temperature probe, 12 or 24 hour clock and calender and can be table or wallmounted. The temperature range is from -5°C to +50°C (indoor), -50°C to +70°C (outdoor) and has a humidity range of 25%RH to 95%RH (indoor only). For propagation enthusiasts this should be certainly worth a look.

The AR303 lightweight rotator will be available for £49.95 together with a matching support bearing the AR200AB for £14.95. Two types of budget transceivers will be on display in the shape of the GEE890 2 channel 1 Watt costing just £65 and the Tecom 938V single channel 2 Watt complete with NiCad and charger for £69.

There will also be plenty of special offers and bargains to be found so don't miss out, make sure you scoot round to SMC and if you can't get there give them a call on (01703) 255111.

## Nevada Communications

The new Trident VIII multi-band h.f. vertical will be on display on the Nevada Communications Stand H in the Red Hall for the first time at Picketts Lock. The Trident VIII has been manufactured here in the UK under the DRAE name and is designed to withstand the British weather as it's made from high quality materials with stainless steel fittings. Nevada tell us that it's also ideal for the amateur who has limited space and wishes to work DX. The selling price for the Trident will be £239.

Another item to look out for is the recently introduced Timewave DSP- Practical Wireless, March 1996

599zx d.s.p. filter. This offers a unique alphanumeric display, quick select push buttons and optical encoders. Continuous filtering is also featured designed to cope with wider bandwidth modes. The retail price of the DSP-599zx is £349.

Mike Devereux G3SED and the Nevada team will be eagerly awaiting your visit to their stand and in the meantime if you can't wait to find out more about the Nevada Communications range of products why not contact them on (01705) 662145?

## Eastern Communications

Eastern Communications, who have been a major amateur radio dealer since 1980 will be occupying Stand J in the Red Hall. Tim Thirst of Eastern will be there to discuss any of his product range with you.

The range includes Mosley h.f. beam antennas, Sigma wire antennas, Vibroplex Morse keys, the Autek RF1 antenna analyser covering 1.2 - 35MHz and their newest range of accessories the DELTA two and four way coaxial switches.

Many of the products on offer from Eastern Communications are exclusive to them and therefore if you've been looking for any of the items mentioned above you really should speak to Eastern. If you want to know more now give Tim a ring on (01692) 650077.

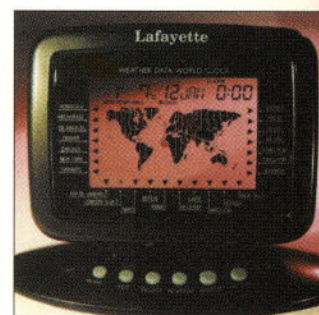
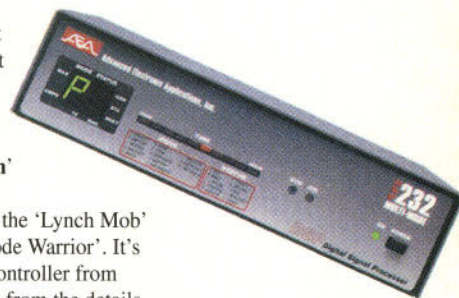
## MicroHenry & Mode Warrior At Martin Lynch

There's an added attraction on the Martin Lynch stand at the Picketts Lock Show this year....in the shape of young 'MicroHenry Lynch'. If you catch him 'on duty' Martin and Jennifer Lynch's young son (who'll be almost five months old and is the only

item on the stand **not for sale!**) can distract your partner while you look at what's on offer on the 'Martin Lynch & Son' stand!

Also on display at the 'Lynch Mob' stand will be the 'Mode Warrior'. It's the latest DSP data controller from AEA in the USA and from the details supplied to PW it looks most impressive.

The new state-of-the-art multimode controller is designed round a high speed digital signal processor which, the manufacturers claim, provides the "ultimate" in digital signal filtering. Featuring 9600 and 1200bps packet, all standard h.f. and v.h.f. modes, and Mailbox expandable to 240k. There's also full mailDrop facility for packet radio, AMTOR, PACTOR, two switchable radio ports, SIAM, Memory ARQ and many other facilities. Available from Martin Lynch for £499.95. For further details on the AEA DSP-232, contact Martin on Stand R in the Red Hall.



Above: See South Midlands Communications

## PW Publishing Ltd.

The staff of *Practical Wireless* and *Short Wave Magazine* will be pleased to see you in the Red Hall on Stand T, where they will be able to answer your questions and queries and welcome you to the world of amateur radio and short wave listening.

Not only will you be able to buy copies of your favourite magazines and take out subscriptions but you will be able to browse through the comprehensive selection of radio related publications. Don't forget that this will be your last chance to subscribe at the old rates to both PW and SWM as all rates will increase with effect from the April issues - so make sure you subscribe before then!

Among the books on sale will be PW Publishing's very own *More Out of Thin Air*, a collection of antenna theory, design and construction articles. This book is well worth a look, as it has been completely re-written and compliments the original *Out of Thin Air* making it a must for any antenna enthusiast.

Make sure you don't leave the Red Hall without having stopped by the *Practical Wireless* and *Short Wave Magazine* stand.



# PICKETTS



# Vintage Fair

**Rob Mannion**  
**G3XFD takes a look**  
**at a new section**  
**which is being**  
**introduced at**  
**Picketts Lock this**  
**year - in the form**  
**of some old ideas.**  
**Read on...all will**  
**be explained!**

Heading Photograph:  
Geoff & Barbara Arnold  
on duty looking after the  
*Radio Bygones* stand where  
you will also find *Morsum*  
*Magnificat* on sale.

This year for the first time, the Picketts Lock show will incorporate a section for the vintage equipment enthusiast. It's an ever popular aspect of radio and electrical engineering and one which I find totally absorbing.

I'm always fascinated while looking at vintage equipment. As a mainly 'post War' product myself, I've a particular fascination for radio, electronic and mechanical items produced in the 1940s and 1950s.

A few years back, the Radio Society of Great Britain (RSGB) held its last National Show at the Birmingham NEC that coincided with the very successful National Vintage Communications Fair (NVCF). Taking time off from the RSGB show, Tex Swann G1TEX and I attended the NVCF. We both thoroughly enjoyed our visit.

Organised by **Jonathan Hill**, the NVCF is a treasure trove of everything remotely radio and electrical. I even saw a Polyphon (a gigantic mechanical precursor to the 'Juke Box'!).

We saw many old copies of *PW* on sale and hundreds of very collectable radios. We thirsted for more!

## Jonathan Hill

The name of Jonathan Hill is synonymous with today's vintage radio collecting scene. He is Founder member of the British Vintage Wireless Society (BVWS), Director of a radio and communications museum in Devon and an established author.

Jonathan's book *Radio! Radio!* has become the collector's bible. And the author says "I am still in my early 40s, but many people assume that because I know so much about the subject I must be well past retirement age!"  
You can meet

**AUDIO! AUDIO!**



Jonathan at Picketts Lock where he'll be on Stands J114/J115 in the Green Hall selling a range of his own books on vintage radio and audio including his latest publication *Audio! Audio!*

Jonathan will also be publicising the next (very successful) National Vintage Communications Fair which is to be held at the Birmingham NEC on Sunday May 5.

So, if you're interested in early technology such as vintage radio, 405-line TV, gramophones, early telephones, classic audio/hi-fi I suggest you call in and see Jonathan at Picketts Lock. And if you're keen on any old equipment (nowadays this includes transistor sets too!) you'll find something to interest you at Picketts Lock in March and at the NEC in May.

## The Radiophile

We're privileged in *PW* to have **Charles Miller**,

*Editor of The Radiophile*, writing for us on a regular basis. At the moment in his 'Valve & Vintage' slot, Charles is presenting a fascinating history of the radio valve (it's surprising how devious the early pioneers were sometimes!).

*The Radiophile* magazine, Edited and produced by Charles is a subscription-only publication. It's well known for the strikingly nostalgic front covers. Just looking at them transports you back to the 1920s and 1930s!

Although I can't tell you the number of the stand where you'll find Charles...you can't miss him as he'll be dressed in his straw boater and an Edwardian-style Eton pinstripe blazer. Just look for *The Radiophile* placard above his stand and you'll be transported back to the days of summer picnics, 78r.p.m. record players and (only available in black)



Austin Seven cars.

## Radio Bygones

**Geoff Arnold G3GSR** is well known as founding Editor of *Radio Bygones*. Geoff's magazine is another subscription-only publication and it's established itself as an authoritative source on military radio history and is popular with collectors.

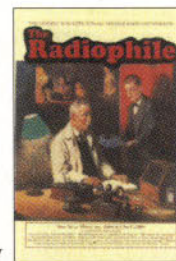
Recently, Geoff Arnold has published a remarkable new book on British Army Radio Communication equipment (first of two volumes). Entitled *Wireless For The Warrior*, the book has been written by Louis Meulstee after many years painstaking research.

Louis Meulstee's weighty soft back book is packed with an incredible amount of information. The detail has to be seen to be believed. If you've got the remotest interest in old British Army equipment...this book is for you. At £27.50 the book is not cheap...especially for a soft back book. On the other hand it contains information I've never read before, is extraordinarily well prepared and easy-to-read. (I can visualise many ex-Army radio types burying their noses in this book for days at a time!).

You can meet Geoff Arnold and his wife Barbara on Stand K125 in the Green Hall at the Picketts Lock Show. While you're there I've no doubt you will ask Geoff the obvious question: "When's Volume II of *Wireless For The Warrior* being published?"

So, there's a treat in store for vintage equipment enthusiasts at Picketts Lock this year. I don't know how many traders there'll be, but if this aspect of the show grows in the same way as the parent event...it should prove very interesting.

PW



Charles Miller in  
characteristic costume on  
duty on *The Radiophile*



# Hurry.....The Dayton HamVention Flight '96 Calling At New York & Dayton is Boarding At Gate PW

**Come & Fly With Us On The Practical Wireless HamVention Holiday May 13-21 1996. Don't Miss The Flight....We're looking Forward To Your Company!**

The PW Dayton HamVention holidays have established themselves on the amateur radio travel calendar. In 1996 you can join us on a two-centre trip and have the option to extend the holiday and 'Flexi-Fly' wherever you wish in the USA. And like the passengers who travel aboard the Cunard Line's *Queen Elizabeth II*, you too can enjoy the sights of New York!

Following many years of Ohio's late April variable weather, the organisers have moved the Dayton HamVention date to mid-May when it should be warmer and drier! Unfortunately, the

change brings the return airline flights into the summer season, with the inevitable increase in cost. To get over the increased flight and accommodation costs our professional tour organisers - Gullivers Groups & Incentives Ltd. - have come up with an interesting two-centre package based on New York and Dayton.

## London To New York

The 1996 PW HamVention Holiday departs from London (Gatwick) on **May 13**, when we'll fly direct to New York with Continental Airlines. On arrival, the party will be transferred by bus to the Edison Hotel in Manhattan for a three night stay.

Following the opportunities to explore and enjoy the sights of New York, the party will fly to Dayton on Thursday where we'll be staying in the Englewood Holiday Inn for four nights. The Holiday Inn has a good sized indoor heated swimming pool, a bar and restaurant, and there are a

good selection of reasonably priced 'diners' nearby, together with the excellent 24-hour opening Meijer's department store only a short walk away.

The HamVention opens Friday lunchtime ('Flea' market open from 6am) and runs until Sunday afternoon and there's plenty of good shopping in the nearby shopping malls (public transport is frequent and is good value in Dayton). The HamVention bus service departs from the Hotel car park and although a small charge was made in 1995, we understand that the service will be free this year (subject to confirmation).

The party then departs from Dayton on the Monday lunchtime **May 20**. We then fly on to New York to join our connecting flight, arriving in London (Gatwick) on Tuesday morning **May 21**.

You can join the 1996 HamVention Holiday for **£785\*** per person. The £785\* cost is based on two people sharing a twin-bedded room but single rooms are available for a

supplement.

The price includes: economy class flights London to New York, New York to Dayton and return to UK. Also included are three nights accommodation in New York, four nights in Dayton, return airport/Hotel transfers, entrance fees to HamVention, UK and US Airport taxes, US State and City Taxes and VAT.

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(Photograph courtesy of Cunard)



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(Photograph courtesy of Cunard)

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# ONE Chip ONE Receiver!

By Steve Ortmyer G4RAW

**Steve Ortmyer G4RAW describes a circuit using the very useful, but often overlooked ZN414 t.r.f. all-on-one chip receiver. It provides surprising results and can provide a lot of fun for both beginners and experienced builders.**

Diagram illustrating the 'drawing pin' board layout. A telephone type dynamic earpiece insert can be used instead of high impedance earphones by connecting the insert between the battery +ve and the 'free' end of the resistor R2.

Before the days of transistors and i.c.s the radio constructor faced a big step after making a crystal set if they were to advance in the hobby. In fact, it was not really a step at all, but a giant leap!

Valves involved great expense and potentially dangerous high voltages. Fortunately nowadays the next step now after a crystal set is quite small, thanks to the ZN414 i.c.

Developed by the famous Ferranti company, the original ZN414 (there are now several versions) looks like a black plastic TO92 transistor. But appearances can be misleading, because in fact it's a complete 10 transistor t.r.f. radio in one package.

The ZN414 only needs few extra components to make it work. It's also available with an audio amplifier built onto the same 'chip' which is designated the ZN415E.

## Drawing Pins

The circuit, shown in Fig. 1, is laid out on a wooden base using drawing pins. And the board layout (It's a favourite method of

mine....as many readers will remember!) is shown in Fig. 2.

Circuitry for the ZN414 receiver as you can see from Fig. 1, is simple. However, it's sensitive enough to use a ferrite rod antenna.

To prepare the antenna coil, carefully wind 80 turns of 0.32mm (30s.w.g.) enamelled copper wire onto the ferrite rod. Once wound, fix it with plastic tape.

Important: The earth tag (moving vanes) of C2 should go to R1 and C1. The capacitor, C3 should be close to the i.c.

Although the ZN414 is not expensive (approximately £1) there's no point in ruining it. Use a 'croc' clip to act as a heat sink when soldering the i.c. to protect it from heat damage (especially if you're not used to a soldering iron yet).

Because switches are expensive, I didn't bother with one. Instead I just slipped a bit of stiff card in the

battery box between the box contact and the battery's positive terminal.

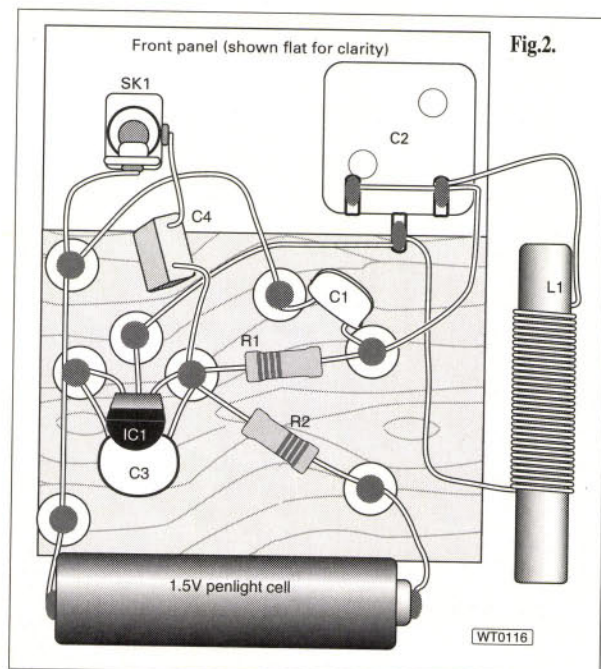
## Headphones

When complete, check the wiring and connect high impedance headphones or a crystal earpiece. Next, switch on (pull out the card!) and you should be able to hear stations.

If you have one of the sensitive dynamic telephone earpiece inserts, the ZN414 output will drive one of these to considerable volume with a local station. To use this type of earpiece, connect the earpiece directly in line with the 1kΩ resistor. (C4 is not then required).

This little project makes a quite useful radio. And in fact, if a lot are built the Japanese could become quite worried. They may try to import them into Japan!

PW



## Shopping List

### Resistors

Carbon film 5% 0.4W (any type will probably work)

1KΩ	1	R2
100kΩ	1	R1

### Capacitors

Miniature disc ceramic

10nF	1	C1
100nF	1	C3

Metalised Polyester film

220nF	1	C4
-------	---	----

Miniature variable

500pF	1	C2 (use both halves of a double 250+250pF polyvaricon type)
-------	---	---

### Semiconductors

ZN414	1	IC1 (Maplin Ref. QL41 U)
-------	---	--------------------------

### Inductors

L1 see text.

### Miscellaneous

You will also need a socket (SK1) suitable for the earphone you use, a section of wood or 'chipboard' about 60 x 40mm along with six to eight drawing pins, a small piece of aluminium sheet or p.c.b. material to make the front panel and a 1.5V battery.



Clive Hardy G4SLU decided to try out the ZN414 project on some novice constructors. He had some interesting results!

Once again Steve has thought of another design using drawing pins. And he's chosen a useful device.

The ZN414 is a wonderful component. The performance of the device, which needs so few external components to make it into a useful radio, is superb.

Additionally, the chip also seems to be very tolerant of abuse. So, because of its qualities, I think that Steve's drawing pin design using the ZN414 is an ideal first project.

I tested out the 'buildability' of the design on four boys who belong to the 'Campaigners'. They are an evangelical uniformed youth organisation, at my local church. And they had great success.

Building the radios was part of the practical requirements for the

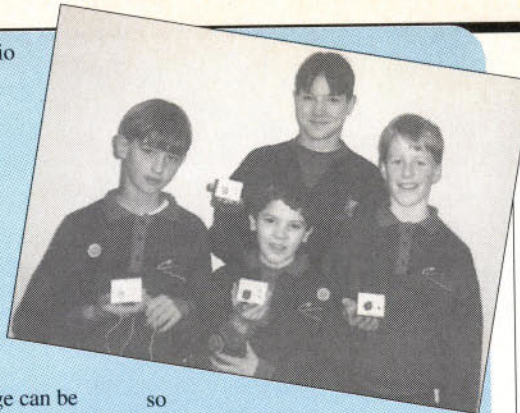
young Campaigners Radio proficiency badge. It proved to be a very popular activity.

All the radios worked well, and first time! The picture shows Steve, Lewis, Gary, and Michael showing off their first working radios.

In Poole where I live, several stations in the 800 to 1300kHz range can be heard. In practice it doesn't seem to make much difference to the coverage whether eight or ten millimetre diameter ferrite rod is used.

The number of turns of wire on the rod isn't that critical either. About 80 turns of 0.45mm (26 s.w.g.) e.c.w. provides good results.

Commonly available ferrite rods for antennas are about 100mm long,



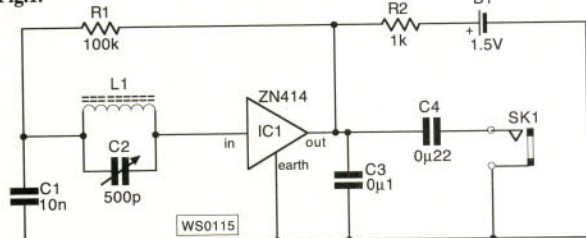
Young 'Campaigners' Steve, Lewis, Gary and Michael proudly showing their completed (and working) ZN414 receivers.

Heading Photograph: The PW prototype ZN414 radio as built by Clive Hardy G4SLU.

so they can be cut to make two 50mm rods. Maximum current drain is around 650µA so you don't need too much battery power!

The cost is around £6.50 and I think it makes an ideal 'starter' project. Nothing discourages a beginner more if a project won't work and this one certainly works well!

Fig.1.



**Free earpieces!** Do you want to build the ZN414 receiver? If you're aged 15 or under, the Editor has 20 sensitive dynamic earpieces to give away. The first 20 young readers to write in will receive an earphone each. Send to Editor's Earpiece Offer, Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. All we ask is that you send us a photograph and a few words about you and your radio.

Circuit of the ZN414 receiver.

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# The PW Changer

By Kevin Walker G4AES

*Kevin Walker G4AES is a keen homebrewer with a eye to saving money. So much so that he's used plastic cash till roll cores to provide the basis for some neat plug-in coils! It's an ideal starter project for novice s.w.l.s.*

Pic. 1: General layout of the various coils used in the PW Changer.

Fig. 1: The circuit diagram of the simple PW Changer.

Newcomers to amateur radio and short wave listening nowadays have a problem that wasn't encountered by 'Old Timers' like myself! How do you start off as an s.w.l. without having to spend a considerable amount of money on an all-band receiver?

Many years ago, when I began, surplus military equipment was commonly used by beginners. This option is no longer available, the sets which were cheap and plentiful, have become highly prized items for collectors.

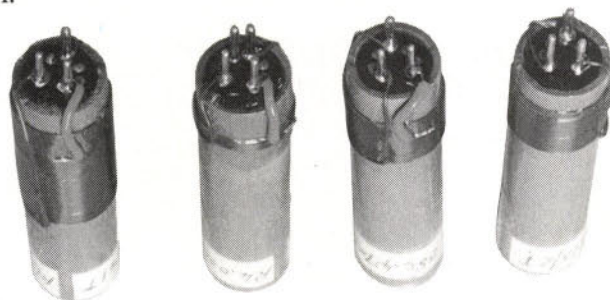
A direct conversion receiver is now a very popular and cheap starter radio. However, from my own experience, they don't compare favourably with a superhet set. Resolving an a.m. broadcast is difficult, due to annoying heterodyne whistles.

My first receiver was a one valve tuned radio frequency (t.r.f.) with plug-in coil for each band. This set covered from medium wave up to about 21MHz. I was later loaned a 'Minimitter' converter, which I fed into a portable broadcast receiver. For this project I shall be using the same conversion method.

## All-Band Converter

A big problem with building an all-band converter is the large number of

Pic. 1.



coils and associated switching that's often necessary. This can be even more of a problem with a complete receiver.

However, if the plug-in coil technique is used, no band switching is required. You are free to choose which area, and how much of the h.f. spectrum you are interested in.

The PW Changer converter I've built covers 1.7 to 30MHz in four ranges. The design uses eight coils in total, two for each range. The four r.f. and four oscillator coil winding details are shown in Table 1. Please note that the r.f. coil for Range 4 is wound differently to the coils for the other ranges.

## Overlap Tuning

I've incorporated a reasonable

amount of tuning overlap on the various ranges. This is to avoid using the very low capacity end of the tuning where tuning compression takes over. With this compression, a small tweak on the tuning capacitor changes the oscillator frequency rapidly.

The coil manufacturer Denco (sadly no longer in existence) manufactured a range of plug-in coils. The coils were constructed to fit into a B9A valve holder. Occasionally you still see these coils in the 'junk-box' section at rallies.

Sadly most of the Denco coils have been rewound for other uses. So, what is needed is an accessible replacement for the Denco range of coils.

My idea stemmed from a suggestion by regular PW author

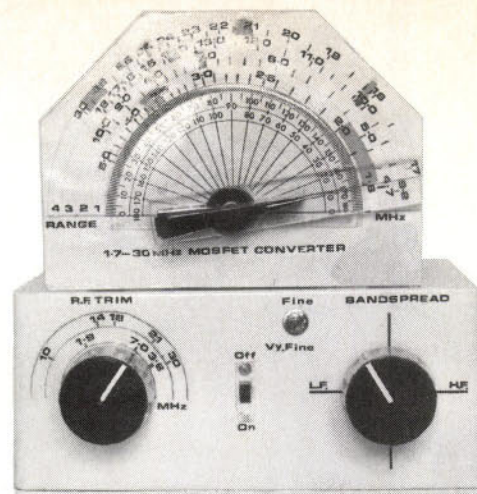
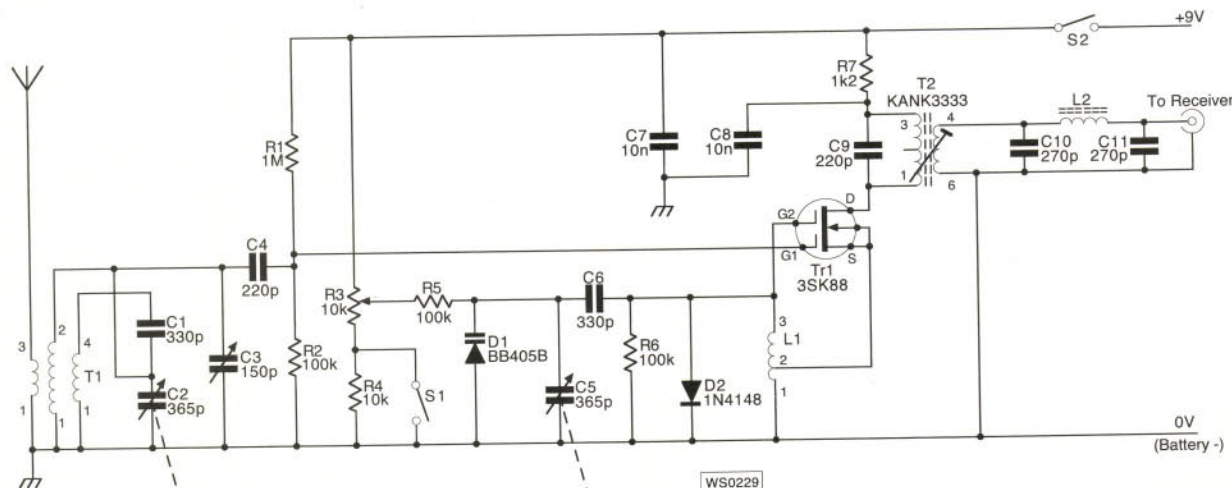


Fig. 1.

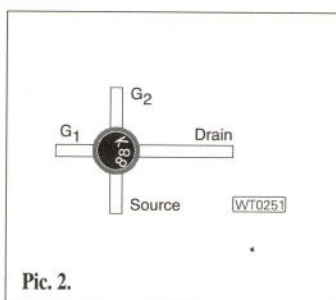




Steve Ortmyer G4RAW. Steve must have been an avid viewer of BBC's *Blue Peter* TV programme, and recycled many loo roll tubes!

I've used a similar idea with the plastic tube centres from cash till rolls. These roll centres also just happen to be manufactured locally to me, and so I naturally used them for the coil formers.

The internal diameter of the till roll tube is just right to accommodate the plastic/pin section from a DIN plug. This is very convenient! The DIN plug section may be fixed in place with a fast setting epoxy glue, to complete the coil former.



Pic. 2.

## Obvious Choice

For the circuit, the obvious choice was to use an field effect transistor (f.e.t.) oscillator and a dual gate metal oxide field effect transistor (m.o.s.f.e.t.) mixer. But bearing in mind this project is meant for the beginner and being an advocate of the 'Keep It Simple...Stupid' (KISS) principle, I wondered if the m.o.s.f.e.t. could be used as a self-oscillating mixer.

I've not seen this circuit idea I mentioned published, so I found some experimentation was necessary. I also found that the Hartley oscillator (here the coil is tapped a little way up from the 'earthy' end) was the obvious choice for a plug-in coil system.

Initial tests showed me that conventional forward biasing for the m.o.s.f.e.t. was not suitable. I found that a simple potential divider was the answer, and the resulting oscillator has proved to be fairly stable. The total current consumption of the converter is only about 1.5mA so, it's not worth fitting an l.e.d. or other on/off indicator!

The conversion gain of my unit seems to be good when compared with a conventional receiver. Despite this, a pre-amplifier will improve the sensitivity of the higher frequencies (a possible future project!).

To avoid using padder and/or trimmer capacitors to get the tuned circuit tracking right, I opted to use a variable capacitor as an r.f. trim control. Tracking is where the input (or r.f.) tuning and the oscillator

tuning stay in step (the i.f. apart throughout the whole of the tuning range).

In my circuit I have a separate capacitor, C3, that acts as an r.f. 'peaking' control. This control is in parallel with the C2 section of the standard dual tuning capacitors. A separate control has a side effect, it also doubles as antenna trim and keeps the antenna and input circuitry in resonance.

## Good Bandsread

Good bandsread is essential, particularly when resolving s.s.b. signals. To achieve this, I have used a varicap diode (D1) with the tuning voltage from a ten turn potentiometer (R3) to form the bandsread control.

By adding another 10kΩ resistor (R4) in series with the potentiometer, the degree of bandsread can be varied. By shorting this second resistor out by S1 a greater bandsread is available.

The converter has been designed for an i.f. of 1.6MHz so, the receiver is tuned to 1.6MHz. However, if broadcast break-through interference is experienced this may be changed slightly without any real problems.

In normal use (Ranges 1-3) the oscillator is tuned on the high side of the received signal. But on Range 4 the oscillator is tuned on the low side of the r.f. This is in the interest of frequency stability.

The i.f. output at 1.6MHz is taken via an SO239 socket to the transfer loop. There is a low pass filter (C10, C11 and L2) to attenuate the oscillator output. Take the converter output to any medium wave receiver that can be tuned to 1.6MHz. While it is better, it's **not** necessary to have an input socket on the receiver.

If no input socket is available on the receiver, wind about six turns (the actual amount not critical) around the radio to form a coupling coil. This coil makes the receiver act as a fixed tuned 'i.f.' stage. For best sensitivity the coil should be somewhere near the m.w. coil on the ferrite rod. A small portable receiver is ideal to act as the i.f. part of the system.

## Winding Horror

When coil winding is mentioned, many constructors tend to throw up their hands with horror! But in this project most coils are wound on small formers with fine wire. The coils are wound on 16mm formers and use a very easy to handle 0.56mm (24s.w.g.) copper wire.

When it comes to the coil winding, I recommend that before you start, you stick a few short pre-cut pieces of Sellotape about 12mm long to the edge of a table (not the lounge table!).

Then if at any time you want to pause in the winding process, one piece of tape can be stuck over the end of the winding.

When winding the r.f. coils, **wind the coupling coil onto the former first**. Then bare the ends of the wires and wind them on to the appropriate pins. **Do not solder these wires to the pins just yet.**

Now to wind the second part of the coil. Bare one end of a new length of copper wire and wind it around the common pin. (Pin 1 for the r.f. transformer T1, and pin 2 for the oscillator coil).

Start the new winding adjacent to the end of, but not over the top of the first winding. Then winding in the same direction continue with the required number of turns (see Table 1 for details).

Keeping the winding tight, scrape off the insulation from the wire and wrap it around the end pin (Pin 3 or 4 for T1 or Pin 3 for L1). Now all the various coil ends may be soldered onto the relevant pins.

The oscillator coil has a tapping point. Instead of two windings carefully scrape the enamel off the wire at the tapping point before winding it around pin 2. If you don't feel confident, it is better to treat the winding as two coils as before.

All coils except the Range 1 r.f. coil are wound with a single layer. For the Range 1 r.f. coil, first wind a layer of 26 turns, then place a length of clear tape over the first winding. Then a further 13 turns (making a total of 39) is wound on over the top of the first part.

## Plug-In Coils

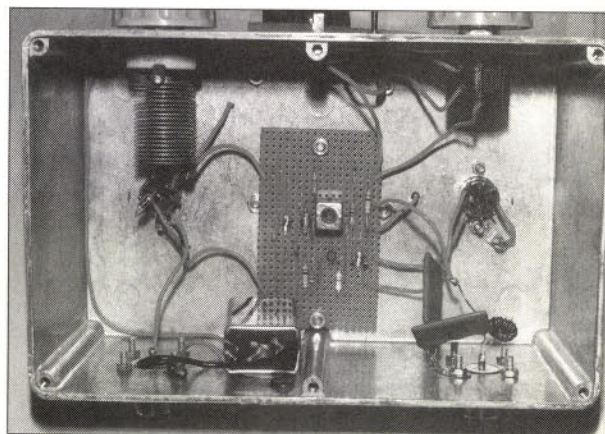
To create the the plug-in coils I fixed them into some (cheaply obtained) DIN plugs. The plugs I bought were 7-pin types and I removed the unwanted pins with long nose pliers. Removing the pins makes the coils easier to plug-in and out.

Please note that Range 4 r.f. coil has a different layout. When using Range 4, Pin 4 brings into operation a



Fig. 2: Pinout of the 3SK88 (and other m.o.s.f.e.t.s) as seen from the top (number side).

Pic. 2. The author's prototype. The bandsread control resistor is on the right, and the r.f. peaking control is on the left.



Continued on page 56



# PW Changer

Continued from page 55

padding capacitor (C1) to correct the tracking of both tuned circuits.

To finish off the coils, after the converter has been set-up and calibrated, they should be given two or three coats of clear polyurethane varnish.

With only one r.f. coil, there can be a problem removing the 3.2MHz image frequency. To minimise this happening I have kept the antenna coupling very low. This low loading helps to keep up the r.f. coil *Q*, which increases the off-frequency rejection. Where broadcast stations appear in this area, using an a.t.u. is essential.

## Setting-Up

To start setting-up the converter, a little help and a signal generator is required. Or better still (if you're not already a member) join your local radio club!

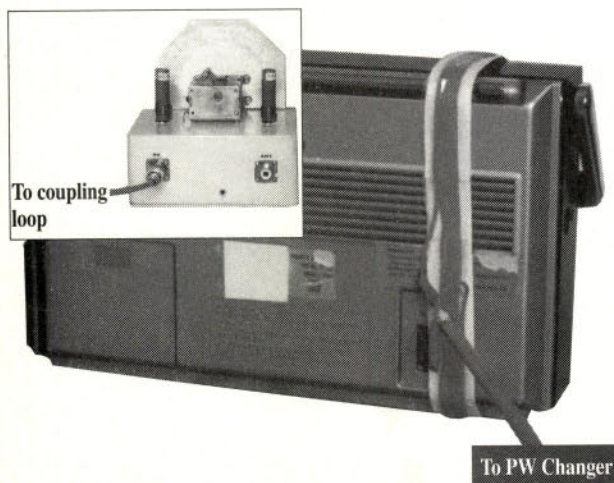
For the following steps put the bandspread control R3 in about the middle of its travel. First, tune the receiver to 1.6MHz. Then inject a modulated 1.6MHz signal (through a blocking capacitor (about 10-100pF) onto the junction of R1 and R2. Adjust the core of T2 for maximum audio on the receiver.

Plug the Range 1 coil into the socket. Inject a 1.7MHz signal into the antenna connection of the transverter. Tune in the signal using the dual capacitor C2/C5 and adjust C3 (r.f. trim) for maximum audio output.

The two dial positions of tune and trim can then be marked on their scales. Now repeat the process for other frequencies in the band and repeat those steps for each of the other coils.

That was the method I originally used for calibration, but it is easier to use a frequency counter to measure

**Pic. 3:** This is how to couple the PW Changer to a radio that doesn't have an antenna socket.



## Shopping List

### Resistors

Carbon film 0.25W 5%

1.2kΩ	1	R7
10kΩ	1	R4
100kΩ	3	R2, 5, 6
1MΩ	1	R1

Ten-turn potentiometer

10kΩ	1	R3
------	---	----

### Capacitors

Polystyrene 5%

220pF	2	C4, 9
270pF	2	C10, 11
330pF	2	C1, 6

Disc Ceramic

10nF	2	C7, 8
------	---	-------

Air spaced dual variable

365+365pF	1	C2/5 (J Birkett can supply a suitable item)
-----------	---	---

### Semiconductors

3SK88	1	Tr1
BB405B	1	D1

### Inductors

T2 is a Toko KANK3333R type prewound coil.

See Table 1 for more details of the r.f. and oscillator coils.

Coil L2 is made up of 15t of 0.45mm (26s.w.g.) enamelled copper wire on ferrite toroid FT37-61.

### Miscellaneous

A small section of 0.1in Veroboard or perfboard veroboard (80 x 30mm) one PP3 battery plus connector, knobs, 2 x s.p.s.t. switches, aluminium box or chassis, two coaxial sockets, enough DIN plugs for the number of coils, till roll tubes, hook up wire, enamelled copper wire, nuts and bolts, solder tags.

**Table 1**

(Figures refer to number of turns)

Range	Covering (MHz)	Oscillator (MHz)	RF Coil (t)			Osc. Coil (t)	
			1-2	1-3	1-4	1-3	tap
1	1.7 - 5.0	3.3 - 6.6	39	3		41	8
2	4.7 - 10.0	6.3 - 11.6	15	2		16	4
3	9.2 - 18.0	10.8 - 19.6	5	1		7	2
4	17.0 - 30.0	15.4 - 28.4	4		1	4	2

the oscillator frequency at Pin 2 of L1. You must be careful that the frequency counter doesn't 'pull' the oscillator too much, otherwise when you remove it the calibration is not accurate.

To resolve s.s.b. signals, a b.f.o. is needed at some point in the chain. Ideally you should have one fitted to the receiver itself. But if one is not available you can improvise using another receiver placed close to the first.

Tune this second receiver to

around 1.2MHz until the first receiver's local oscillator is heard. at this point if the two sets are close enough you should be able to hear the b.f.o. effect. Tuning s.s.b. signals is a bit difficult at first. But you'll soon get the hang of it. Happy short wave listening!

PW

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# Antenna Workshop

By Ray Fautley G3ASG

*It's wire and tape measure at the ready this month as Ray Fautley G3ASG, shows you how to make your attic space into a pair of delta Yagis.*

Have you noticed that the attic roof space in most houses is triangular? I looked at the attic space at home and thought: what about using that shape for a triangular, or delta, loop antenna? This type of antenna 'grew' from the antenna I described in the September 1995 issue of *PW*.

Observation showed that the angle at the peak of the roof of my bungalow was rather more than a right angle. Look at the cross sectional drawing of **Fig. 1**. The angle between the two sloping sides I estimated the angle to be about 120°, after squinting through a protractor at the roof ridge. The actual angle is **twice** angle B shown in the cross section (so angle B is about 60°).

After groping about in the attic with a long tape measure, the floor of the attic was found to be 9.9m between walls (dimension O - Q). Using a little trigonometry, rather than acrobatically trying to measure the lengths of the roof sloping sides (P - Q and P - O) with the tape, I calculated them to be each 5.72m long.

If you're faced with the same measuring problems, use the little bit of maths shown below. On **Fig. 1**, the width of the attic floor is shown as (b+b) or 9.9m. The dimensions to be calculated are for the two sloping sides of the roof.

As both sides are obviously the same (well, they should be!), only one side needs to be calculated. The maths uses the **Sine rule** (not that it really matters!) and the bit to use is:

$$\frac{a}{\sin(A)} = \frac{b}{\sin(B)} = \frac{c}{\sin(C)}$$

The required sloping length is c in **Fig. 1**.

$$\frac{a}{\sin(A)} = \frac{b}{\sin(B)} = \frac{c}{\sin(C)}$$

so

$$c = \frac{b \times \sin(C)}{\sin(B)} = \frac{4.95 \times \sin(90^\circ)}{\sin(60^\circ)}$$

As  $\sin(90^\circ) = 1.0$  and  $\sin(60^\circ) = 0.866$

then

$$c = \frac{4.95 \times 1.0}{0.866} = 5.72\text{m}$$

Using the same Sine rule, the height of the roof space is found to be 2.86m (not that that matters much either!). So, the total length of one triangular loop will be:

$$\begin{aligned} \text{Length} &= b + b + c + c = 2b + 2c \\ &= 2 \times (4.95) + 2 \times (5.72) \\ &= 9.9 + 11.44 = 21.34\text{m} \end{aligned}$$

The calculated length of 21.34m is very close to one wavelength of a signal at 14MHz. The feed point could be at the centre of the 9.9m section (on the floor of the roof space), which is easier to get at than anywhere else!

## Not Recommended

Coaxial cable is not recommended as the feeder of choice. I always use 300Ω twin feeder for any form of balanced antenna. I shall assume that you will also use the same feeder in this article.

Any length of twin feeder may be used, provided (and here it comes again!) the 300Ω twin feeder is connected to the balanced output terminals of the antenna tuning unit. This ensures that the whole antenna system is tuned and matched to the 50Ω required by most modern transceivers.

An indication of forward and reverse power is necessary so that

the a.t.u. controls can be adjusted to give zero (or very low) reverse power. These adjustments should be made with low transmitter power, so as to minimise interference to other operators.

But let's return to the antenna itself. Practically any type of copper wire is suitable for the loop, except perhaps cables with pvc insulation. Mainly, I use bare single strand tinned copper wire for my indoor antennas.

## Furniture Stapler

To secure the wire to the attic timbers, I use a furniture stapler to staple the wire directly to the woodwork. I've used this system of holding wires in place for a long time in my various attempts to find antennas that operate in the roof space, without apparent problems.

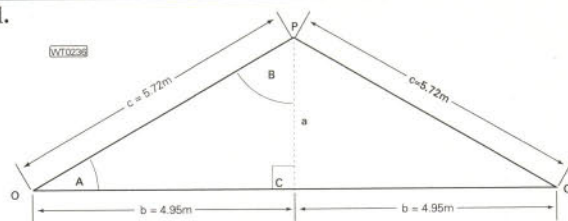
A few measurements to provide about 0.1 wavelength spacing (about 2m on 14MHz) between the elements will fix their positions, shown relative in **Fig. 2**. The total length of the common 'reflector' element can be increased to about 105% of the 'driven' elements and the two 'director' elements reduced to be about 95% of the overall length.

**Fig. 1:** Dimensions and angles in my roof space. See text for the mathematical methods used.

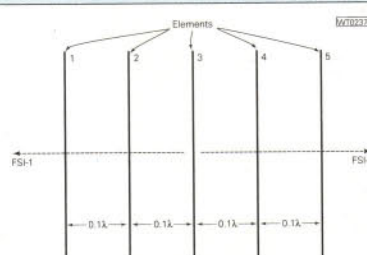
**Fig. 2:** Looking down on the system showing the two directions of maximum radiation.

**Fig. 3:** A three dimensional view of the antenna system without the various bits of woodwork getting in the way.

**Fig. 1.**



**Fig. 2.**





If, due to difficulties you cannot secure varying sizes of element to the woodwork, then I have a trick to help you out. Cut the total length of the reflector and directors all to be about 0.5m shorter than the calculations indicates.

Next, in the middle of the bottom run, stubs (bare wires about one metre long and spaced about 20mm apart) can be soldered to elements 1, 3 and 5 as shown in Fig. 3. These stubs will be adjusted by a shorting link slid along the length of the stub. (Adjustment of these stubs will enable both maximum forward gain and back-to-front ratio to be achieved).

Measurement (of the r.f. fields) during adjustment can be done in two ways:

A) by using a Field Strength Indicator (f.s.i.) near the antenna site as detailed in the separate panel or

B) by using a couple of local amateurs to check your signal strength. That is if you can find fellow amateurs in just the right directions!, (ie. in the directions of the f.s.i. positions FSI-1 and FSI-2 in Fig. 2).

## Second Method

Let's now go on to the second method I mentioned. That was using the two amateurs (if you're lucky enough to find them in the right places!). Just repeat the

above steps using their signal reports each time instead of f.s.i. readings.

It's possible that better results can be obtained by using the antenna described above, not as delta loops, but as inverted-V elements. This may be possible only at frequencies higher than 14MHz where the element lengths (only  $c + c$ ) will be nearer a half wavelength at the 24 and 28MHz bands.

To create an inverted-V beam, just omit the horizontal part of the antenna (the wires on the floor of the attic). Then split the wires at the apex of the roof space to connect the feeder. Again, this makes two 3-element fixed beams antennas.

Stubs are then fitted into the centres of elements 1, 3 and 5 as before. Feeders are connected to the top of elements 2 and 4. The set-up procedure is as for the loops.

With indoor antennas the achievements can't be expected to equal what can be done 'out in the open' but when it's a question of indoors or nothing at all - the answer's obvious!

Best of luck, see you next time.

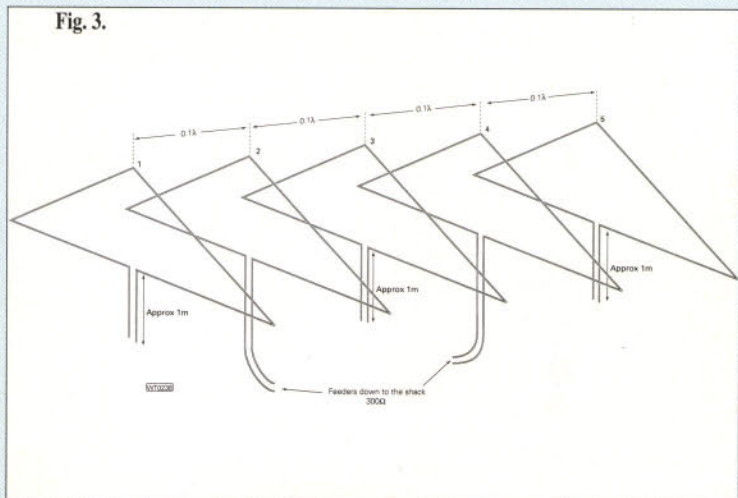
## Steps Carried Out

Let's now look at the steps to be carried out when using a field strength indicator.

- 1) Connect the shack end of the feeder from element 2 to the balanced antenna terminals of the a.t.u.
- 2) Set the f.s.i. several wavelengths (50 to 60m) away from the house in the required direction of maximum radiation, ie. in the direction FSI-1.
- 3) Connect all the shorting links about half way down the stubs. (I use a short length of tinned copper wire, about 25mm, with a clip on each end until their final positions are established).
- 4) Apply low power at the operating frequency (about 14.15MHz for the antenna dimensions given) to element 2.
- 5) Tune and match using the a.t.u. until the reflected power is zero (or very nearly zero).
- 6) Note the f.s.i. indication.
- 7) Switch off the transmitter.
- 8) Change the position of the shorting wire on the stub on element 1 by about 20mm to lengthen (or shorten) the element.
- 9) Apply low power at the operating frequency again.
- 10) Tune and match using the a.t.u. controls for zero reflected power.
- 11) Note the f.s.i. reading again.
- 12) Switch off the transmitter.
- 13) Continue to change the position of the shorting wire in the same direction as step 8 (remembering to switch the transmitter off each time) until the maximum indication on the f.s.i. is obtained. If the stub length is required to be greater than the 1m suggested, just length it! If, however, it needs to be shorter, then cut some 150mm off each of the open ends of the element and move each of the two bottom corners of the element 150mm inwards. Reconnect the stub and restart from step 3 again.
- Rather a lot of detail perhaps! But it can be very frustrating if the reader, particularly a beginner, isn't told what to do if things don't work out first time!**
- 14) Switch off the transmitter.
- 15) Reposition the f.s.i. several wavelengths away in the opposite direction, ie. in FSI-2 in Fig. 3.
- 16) Switch on the transmitter.
- 17) Tune and match using the a.t.u. controls for zero reflected power.
- 18) Note the f.s.i. reading.
- 19) Switch off the transmitter.
- 20) Change the position of the shorting wire on the stub on element 3 by about 20mm, either to lengthen or shorten it.
- 21) Switch on transmitter
- 22) Tune and match with the a.t.u. controls again if necessary.
- 23) Note the f.s.i. reading.
- 24) Switch off the transmitter.
- 25) Continue to change the position of the shorting wire on the stub on element 3 until the minimum f.s.i. reading is obtained.
- 26) Switch off the transmitter.
- 27) Disconnect the element 2 feeder from the a.t.u. and replace it by the 300Ω feeder from element 4.
- 28) Without moving the f.s.i., adjust the position of the stub on element 5 for maximum indication on the f.s.i. (remember to switch off the transmitter each time before you touch the stub!).

After carrying out the above steps, a re-check of the whole procedure, to ensure the best performance may be worthwhile. When you're satisfied, replace the crocodile clip shorting leads by about 80mm of tinned copper wire (approximately the length of the clips plus the wire) and solder them in exactly the same positions on all three stubs.

Fig. 3.



PW

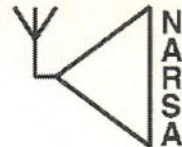


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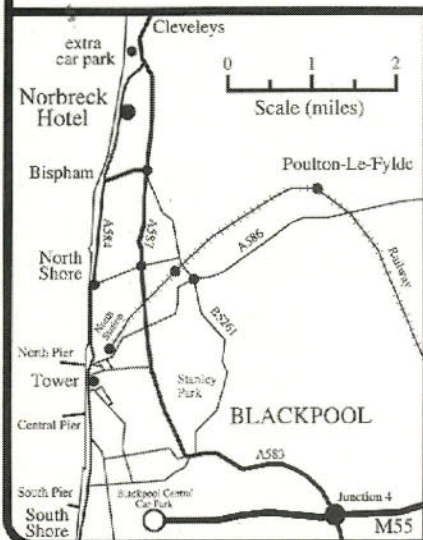
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# Would You Be Eligible?



Written by John Worthington GW3COI

**John Worthington  
GW3COI gets down to  
the nitty gritty talk of  
fostering enthusiasm  
and skill, but for  
what? Read on and  
find out.....**

It struck me again recently the remarkable number of c.w. clubs there are, to name a few, the First Class Operators, FISTS, RNARS, RAFAR, Tops and the BTKB. Yet, as far as I know, there is no recognised club for 'phone users. And, of course, the latter far outnumber the users of c.w., so I would have expected a club for them would have germinated many years ago.

One of the main 'planks' of all the c.w. clubs is to foster enthusiasm and skill for their chosen mode. And there is little doubt that the practice of repeating the initials of the club when calling 'CQ' or 'DX' can often lead to a QSO, which would leave non-members little hope of DX success.

So, isn't it strange that no one has come forward to propose the formation of a club for 'phone? I have no wish to put myself forward as a founder member, because I think it is probably vitally important that senior members should have a superior speaking voice for obvious reasons.

Being a chap who worked in Birmingham for many years and who was born within a short distance of the Black Country, I still have more than a trace of that area's dialect in my everyday speech, which would not be conducive to the recruitment policy. Don't for a moment think I am ashamed of my origins, as I often amuse many foreign tourists with my recitals. However, I know from experience that used on 'phone, my accents often inspire requests from other parts of the UK for repeats of what I have just said!

## **President's Voice**

I visualise the president of a 'phone club should be someone with a voice akin to Sir John Gielgud. There are such amateurs about and the encouragement and development of the perfect speaking voice is something the club would foster.

A government grant might be

in line in due course as soon as the 'powers that be' realise the tourist attraction angle. The Americans love the John Snagge voice (to name an old favourite), but are often baffled when they hear me! There could be a quarterly magazine for members carrying microphone adverts and other relevant products like throat spray and elocution tapes.

Short articles on operating seating department, dental problems and diet would be written by members or commissioned from experts. Of course, there would be an annual convention, possibly held in the 1930s airship hangar at Cardington. The lofty roof there would be very challenging to the entrants of the annual loudest voice contest (first prize, the enormous Alderman Bellow Silver Trophy, which depicts a pair of gleaming tonsils, free swinging).

## **Tempting Offer**

As a tempting offer to all interested, I would think a full page advert in *Practical Wireless* would be the thing plus a specially low first year's sub of £3. This very low figure would bring the member a quarterly broadsheet, a smart lapel badge and forage cap with sides that let down (ideal for field day operations 'al fresco').

A name for the club would have to be modern, incisive and to the point. I have been mulling over one or two and think I have perhaps the ideal. What about 'World Institute of Mainly 'Phone Club' or 'Phone Radio's Are Tops'! or



'World Association of Likely Lads In Every Sense'. Of course, on the badges we would use only the initials of the above!

Small booklets would be published from time to time on techniques of 'phone operation. Voice projection and production are very important, although sadly neglected subjects in the hobby press.

Of course, any members wishing to contact others in the club would add the latter's initials

in his CQ and it is fair to say that it would become so popular that some sort of sharing arrangement would have to be negotiated with the WAB Club, as far as frequencies go.

## **Annual Contests**

There would naturally be annual contests in which members would exchange perhaps beautiful quality sound bites limited to five words per contact or something of the sort. The Trophy, a replica of which would be awarded yearly, would be a solid gold D104 mounted on a Greco Roman solid marble plinth about four feet high to discourage theft or vandalism.

This Trophy would be presented to the winner at the club's convention by a celebrity of some sort, GW3COI has already let it be known that he is not available, so the field is open to offers. Enquiries should be addressed to me, wrapped in one of the new tenners QTHR.

PW

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# Valve & Vintage

By Phil Cadman G4JCP

*It's Phil Cadman G4JCP's turn to look after the PW vintage 'wireless shop'. This time Phil describes the first part of an interesting valved amplifier project. So, get that soldering iron out and ready!*

**D**isaster! A blown cylinder head gasket prevented me from attending the National Vintage Communications Fair Christmas Special that was held at Birmingham's NEC in December (Life's Like That....!). But my spies tell me I missed a good show but I'd still like to know what other people thought.

Now, on to cheerier things. I see, from reading your letters, that some of you are keen to start a constructional project. Well, Ladies and Gentlemen, it's time to stand by your soldering irons.

## High Voltages

Before diving into valve projects using normal high h.t. voltages (250V or more) I thought it might be safer for all you neophytes if I began with something less potentially dangerous. A simple receiver using miniature battery valves seemed an ideal starter.

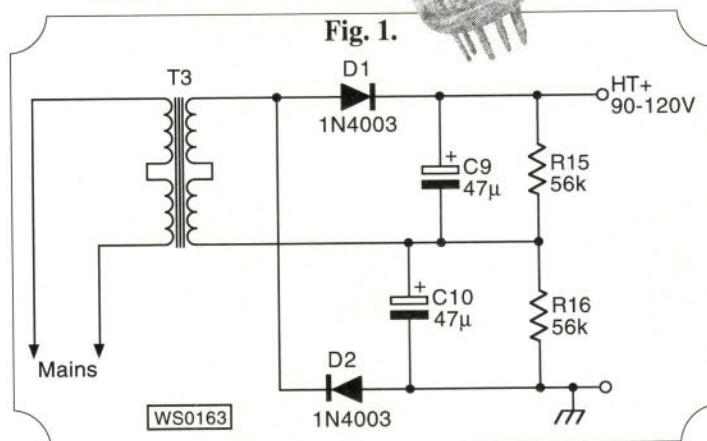
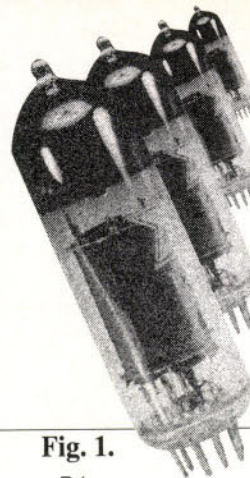
On reflection however, I thought of several disadvantages regarding the use of battery valves. For instance, they are quite delicate and their filaments are all too easy to burn-out accidentally. Battery valves don't ease power supply requirements either. Whilst a battery can supply the 1.4V needed for the filaments a mains supply is the only sensible way to provide the h.t. rail.

A far more robust alternative to battery valves are those made for television receivers. These valves were designed to operate with a relatively low h.t. - around 170V - and so are not too unhappy with a 100V h.t.

Working with a low h.t. is considerably safer than working with an h.t. of 250V. That's not to say you shouldn't take care. Treat the design as if it did have a 250V h.t. At least if you do accidentally come into contact with the h.t. rail then this won't end up being your last valve project. Remember, 100V can still 'bite'!

## Long Wave Radio

Let's face it, no-one builds valve equipment in order to out-do commercial gear. We build valve stuff for fun. If we can make something useful in the process then that's a bonus.



You have, I've no doubt, noticed that there are many transistor radios that lack long-wave coverage. So, I thought, why not build a valve radio specifically for long waves?

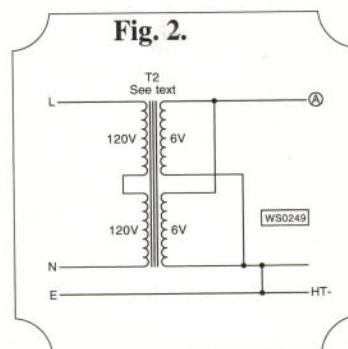
I've kept the design simple. It utilises components that are easily obtainable and the design is particularly suitable for anyone new to valve radio construction. Because of space limitations I've broken the design into three parts - the p.s.u., the a.f. amplifier and the r.f./detector section. This month's column covers the p.s.u. and a.f. sections.

The diagram, **Fig. 1**, shows the h.t. power supply. The transformer (T3) can be any type providing it has a total secondary voltage of between 30 and 40V and a rating of 6VA or more. (Note: 6VA equates to a minimum secondary current of 75mA.)

Looking at **Fig. 1**, you'll see that the transformer is shown with both a split primary and a split secondary. Despite this, transformers with single primary and/or secondary windings are just as suitable. If your transformer has an electrostatic shield then connect it to mains earth.

The components shown in **Fig. 1**, are not critical. Diodes D1 and D2, should ideally be type 1N4003 rectifiers but any diode with similar or better characteristics will do. Capacitors C9 and C10, need to be rated at 63V working if your transformer has a 30V secondary or 100V if it has a 40V secondary. Larger values of capacitance can be used but don't go above 220µF.

As for R15 and 16, these are simply 'bleed' resistors which discharge C9 and C10 when the power supply has no load. Again, their value is not critical and anything from half to double the



quoted resistance will be satisfactory.

By now, clever types will have recognised **Fig. 1**, as a voltage doubler circuit. Using this type of circuit allows us to use transformers intended for transistor power supplies to generate the necessary h.t. Even better, there are companies who advertise in *PW* and other electronics magazines who sometimes have these transformers for sale at knock-down prices!

## Heater Supply

The diagram in **Fig. 2**, shows the heater supply for the radio. Again, the same comment about substituting single winding transformers applies here too.

The total secondary current should be 1.5A or more (10VA). However, there is no reason why you can't use two lower-rated transformers. Indeed, for the prototype I used two transformers, each providing 6V at 1A. One feeds the audio section, the other the r.f./detector section.

There is only one important point to bear in mind (and this doesn't just apply to this design). You should keep



the heater voltage as measured at the valve pins as close as practicable to 6.3V. This is because small transformers, particularly if they are lightly loaded, may give a much higher voltage than they're supposed to.

If the heater voltage measures higher than 6.5V you should add some series resistance (at point A in Fig. 2) until you get 6.3V. (Very low value resistors are a bit thin on the ground so I make them up by winding lengths of 0.56mm (24s.w.g.) tinned copper wire into coils.). Should you find the heater voltage is less than 6V get another transformer!

## Audio Amplifier

The audio amplifier is shown in Fig. 3. Although it has been designed for an h.t. of 100V it will work satisfactorily over the range 85 to 120V. But beware, the ECC88 has a maximum anode voltage of just 130V so on no account exceed this figure.

The input stage uses one half of an ECC82 directly coupled to a 'concertina' phase splitter. Anti-phase outputs are fed from the anode and cathode, via C3 and C4, to the grids of the push-pull output stage.

None of the capacitors in the design are critical, look upon the values given as the minimum you should use. But under no circumstances use capacitors with a lower voltage rating.

In contrast, most of the resistors are critical and only the stated values should be used for R4-7, R10 and R11. Resistors R5, 10 and 11 set the bias points for the individual valves. You'll find that even a slight variation in the value of these resistors has a marked effect on the amplifier's performance.

Because the first half of V1 is operated at a very low anode voltage, resistor R5 may require some adjustment. Try a 680Ω resistor to begin with and check that

the voltage across R7 measures between 25 and 35V. If it's outside this range then try a slightly higher or lower value resistor for R5.

## Output Transformer

Transformer T1, is a small push-pull output transformer and will probably be impossible to obtain. But, it's well known, amongst the make-do-and-mend fraternity, that a small mains transformer will double for an output transformer in a low-fidelity design such as this. The question is how to choose a suitable type!

First, the load VA rating of the transformer should be at least five times the output power of the amplifier. This little amplifier only has an output of around 250mW so even a 3VA transformer will do fine.

Next, the required ratio has to be calculated. The ratio, taken over the whole of the primary to the secondary should be equal to the square root of the required anode-to-anode load divided by the loudspeaker's impedance.

In this design the ECC88 should 'see' an anode-to-anode load of around 17kΩ, so for a loudspeaker impedance of 8Ω the ratio required is

$$\sqrt{\frac{17000}{8}} = \sqrt{2125} = 46.1$$

For all practical purposes the ratio is 46:1 ratio. The corresponding ratios for 3 and 16Ω loudspeakers are 75:1 and 32:1 respectively. Finally, the ratios have to be put in terms of primary and secondary voltages.

We don't have much choice over the primary voltage, that's set to 240V by the mains supply. It's just the secondary voltage we have to work out.

A transformer with a 240V primary and a 6V secondary has a ratio of 40:1 ( $240 \div 6 = 40$ ) That's close enough for an 8Ω loudspeaker. A 3V secondary will

match a 3Ω loudspeaker (coincidence, that's all) and either a 6V or a 9V secondary will match a 16Ω loudspeaker.

Because this design uses a push-pull output stage a transformer with two 120V primary windings is necessary. (Make sure you wire the two primaries as if for 240V mains operation - h.t. to the centre tap.) Split secondaries can be connected either in series or in parallel to obtain the required voltage.

## Separate Sections

Although you can build the whole radio on one chassis, I suggest you (at least) separate the combined p.s.u./a.f. sections from the r.f. section. That way you can use the a.f. section as both a general purpose amplifier and as an audio stage/p.s.u. for other radio projects. (By the way, capacitor C8 is only necessary if the a.f. and p.s.u. sections are built on separate chassis).

Layout is not critical with one exception. Both valves have appreciable gain at v.h.f. (the ECC88 in particular).

So, to prevent any unwanted v.h.f. oscillations the 'grid stoppers' R2, R12 and R13 should be wired as close as possible to their respective valve holder pins. That's to say the wire lead between the body of the resistor and the valve pin needs to be as short as is reasonably possible (the wire from the other side of the resistor body can be as long as you like).

Both valves are readily obtainable. Unfortunately, the ECC88 is beloved by the hi-fi fraternity and branded examples are outrageously expensive.

If the list price makes you wince ask if there is a cheaper, un-branded alternative. Both valves were used in TV sets, so I suggest you ask around for second-hand examples before buying new.

## Amplifier Performance

Let's take a look at the amplifier performance. My prototype had an 18V-0-18V transformer for T3, which gave an h.t. of 110V.

The output stage draws about 8mA for each half of V2. (You can work out the anode current of each stage by measuring the voltage drop across the corresponding cathode resistor).

## Shopping List

### Resistors

<i>Carbon (or metal) film 5% 0.25W</i>		
330Ω	2	R10, 11
680Ω	1	R5
10kΩ	4	R2, 8, 12, 13
47kΩ	2	R6, 7
56kΩ	2	R15, 16
100kΩ	1	R4
1MΩ	3	R3, 9, 14
<i>Rotary linear</i>		
1MΩ		R1

### Capacitors

<i>Metallised Polyester film (250V working minimum)</i>		
1nF	1	C7
22nF	3	C2, 3, 4
<i>Electrolytic (16V working)</i>		
47μF	2	C5, 6
<i>Electrolytic (63V working minimum)</i>		
47μF	3	C1, 9, 10
<i>Electrolytic (150V working minimum)</i>		
22μF	1	C8

### Semiconductors

1N4003	2	D1, 2
--------	---	-------

### Valves

ECC82	1	V1
ECC88	1	V2

### Transformers

One heater 6.3Va.c. transformer (10VA load) for T2, One 3VA miniature for T1 (see text for ratio), one 6VA mains transformer, for T3, with a total secondary output voltage of about 30-40V (see text).

### Miscellaneous

You will also need either aluminium sheet (or p.c.b. material) to make up a chassis (or a suitable two piece aluminium box), interconnecting wire, screened coaxial lead, and for the p.s.u. a length of good quality three core cable.

Using a 'proper' output transformer the amplifier gave an output power of just under 300mW. This is all you can expect from tiny triodes operating at such a low h.t..

Power output will fall to around 200mW with a 90V h.t. and a mains transformer substituted for the output transformer. The sensitivity of the amplifier should not change appreciably however; 100mV of audio input ought to produce an output power of 125mW.

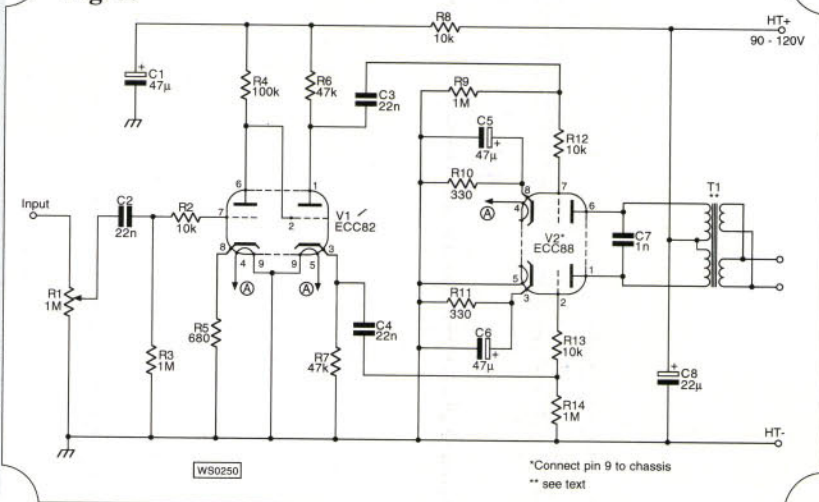
## Closing Time

It's closing time already and there's been no room for my component spot. So, until it's my turn 'in the shop' again I'll say cheerio and good luck with the project.

Please keep your letters and E-mails coming. You can send your letters to me either via the PW offices, via E-mail to [phil@oldpark.demon.co.uk](mailto:phil@oldpark.demon.co.uk) or direct to me at 21 Scotts Green Close, Scotts Green, Dudley, West Midlands DY1 2DX. PW

Cheerio from Phil, see you in June.

Fig. 3.





## EQUIPMENT

## SPECIFICATIONS

*Ian Poole G3YWX takes a look at the mysteries behind speech processing.*

For many years speech processors have been a standard item in most single sideband (s.s.b.) transmitters and transceivers. They perform the vital function of increasing the effective power, giving effective gains of about an 'S' point or more. This means that a good processor can give as much gain, and probably a more effective output than a linear amplifier, and at a fraction of the cost.

It's a well known fact that human speech contains very high peaks. When compared to the peaks the average intensity levels are comparatively small as shown in Fig. 1.

To prevent the amplifiers being overloaded and causing interference the transient peaks must be within the capability of the transmitter. This means that the transmitter will only be able to operate at its maximum output for a short time and the average power level will be comparatively small.

By using a speech processor the transient peaks are removed enabling the average level of the transmission to be increased. This makes the signal sound much stronger and able to be copied at much lower levels.

## Clipping

Most communications processors use a process called 'clipping'. Using this any peaks in the signal which are above a certain level are removed as shown in Fig. 2. With the peaks removed it can be seen that the ratio of the peak to average power level is much improved.

Often, a clipping level is quoted. This is simply the ratio of the peak level of the waveform if no clipping was present to the peak level with clipping.

It might be imagined that clipping would distort the signal beyond recognition. Fortunately this is not the case because the ear (mainly) recognises the frequency content of the signal and not the amplitude envelope which would be seen on an oscilloscope.

However, clipping does introduce some distortion which

can reduce the intelligibility of the signal. The process is non-linear and introduces harmonics and intermodulation distortion.

The harmonics and distortion have to be removed wherever possible so that they do not detract from the intelligibility of the signal. Many of these signals fall outside the normal communication audio bandwidth, Fig. 3a, of 300 to 3kHz, and can be removed by filtering.

Any harmonics of low frequency signals will fall within the wanted bandwidth and cannot be removed. This is why normal audio frequency clipping has to be limited to 12 to 15dB, and can only give an effective gain of around 5dB. Any higher levels of clipping make the signal sound more distorted and reduce the intelligibility.

To overcome the problem a process called r.f. clipping can be used. Here an s.s.b. signal is generated and clipped. Any harmonics which are generated fall at multiples of the radio frequency signal as shown in Fig. 3b. These are well away from the wanted signal and are easily removed by a simple filter.

Often r.f. clipping is contained within an s.s.b. transmitter and can be included as part of the signal generation with the addition of very little extra circuitry. For a stand alone unit the s.s.b. signal is generated and the clipped audio is regenerated before it's applied to the microphone input of a transmitter.

Processors for r.f. are able to operate at much higher levels of clipping, some processors being capable of providing 30dB or more. Whilst the signal sounds different once it has been processed there is no great loss of intelligibility. With the highest levels of clipping up to 8dB of effective gain can be obtained, making r.f. processors the preferable option when compared to their a.f. cousins.

## Range Limited

Apart from clipping the audio to ensure the best use of the transmitted power, the audio frequency range can also be limited. This has to be undertaken

for two reasons.

The first reason is that hi-fi type transmissions with a wide audio bandwidth occupy too much space on the amateur bands, and with today's crowded conditions this is clearly not acceptable.

Secondly, any frequencies which don't contribute to the intelligibility are wasting valuable power. Most amateur transmitters use an audio bandwidth of about 300Hz to 2.7kHz.

Even within the 300Hz to 2.7kHz bandwidth it's sometimes useful to reduce the level of the lower frequencies as they contribute more to the naturalness of the sound and add little to the intelligibility. Reducing these lower frequencies before clipping also helps a.f. processors.

This is because the harmonics these low frequencies would have produced fall inside the wanted frequency band and reduce the intelligibility.

Finally it's worth noting a couple of points about clipping. Care must be taken when using an a.f. clipper not to use to high a level of clipping as this may reduce the intelligibility of the signal.

Care must also be taken not to let any r.f. signals enter the clipper. The level of clipping is equal to the additional amount of audio gain, and this means that even small amounts of pick-up can give rise to distortion or howl round effects.

**That's all for this month, next time I'll be looking at transmitter output impedances, but in the mean time you can write to me c/o of the Editorial Offices with your queries.**

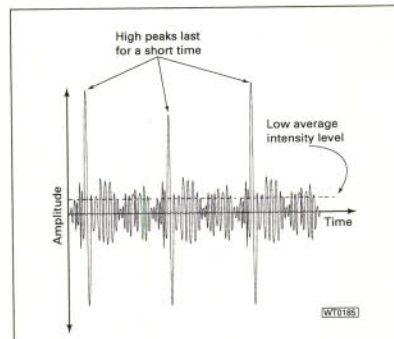


Fig. 1: A typical speech waveform.

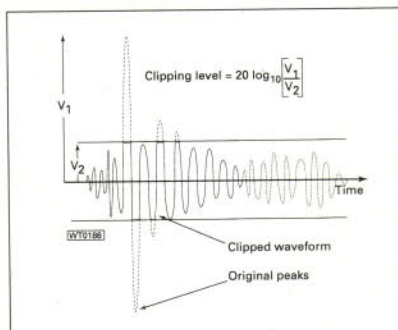


Fig. 2: Action of clipping a signal.

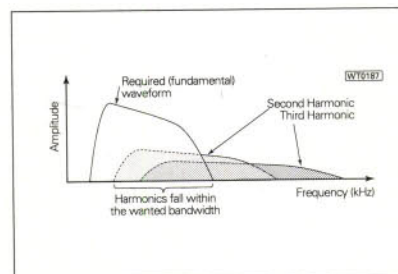


Fig. 3a: Clipping at a.f. showing the position of harmonics.

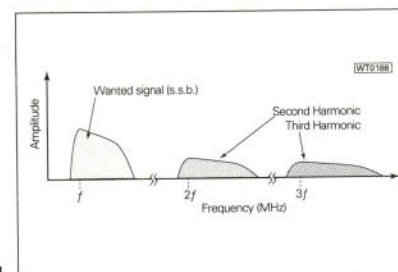


Fig. 3b: Clipping at r.f. showing the position of harmonics.

**END**



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ECC88 Mull	6.00	GZ37	6.00	UL84	3.50	6CH6	5.00	12HG7 12GN7	6.50
ECC91	2.00	KT61	10.00	UY41	4.00	6CW4	8.00	30FL1/2	1.50
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ECL86 Mull	3.50	PCF80	2.00	4CX250B STC	55.00	6GK6	4.00	813	27.50
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EF37A	3.50	PCF86	2.50	5U4G	5.75	6HS6	4.95	865A	25.00
EF39	2.75	PCF801	2.50	5V4G	4.00	6J5	3.00	872A	20.00
EF40	5.00	PCF802	2.50	5Y3GT	2.50	6J6	3.00	931A	25.00
EF41	3.50	PCL82	2.00	5Z3	4.00	6J7	4.00	2050A GE	12.50
EF42	4.50	PCL83	3.00	5Z4GT	2.50	6J86A GE	19.00	5751	6.00
EF80	1.50	PCL84	2.50	6AH6	4.00	6J56C	20.00	5763	10.00
EF85	1.50	PCL85	2.50	6AK5	1.50	6J6C	20.00	5814A	5.00
EF86	10.00	PCL86	2.50	6AL5	1.00	6J56C GE	20.00	5842	12.00
EF91	2.00	PCL805	2.50	6AM6	2.00	6K6GT	3.00	6080	7.50
EF92	2.00	PD500	6.00	6AN5	5.00	6K7	4.00	6146B GE	15.00
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EL184	2.00	PL81	1.75	6AQ5	3.25	6L6	10.00	6883B GE	16.00
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# BITS & BYTES - COMPUTING IN RADIO

Mike Richards G4WNC brings you the latest 'Computing in Radio' news in his monthly round-up.

**S**teve Townsley from the Thompson Partnership has just sent me their latest CD-ROM, *The Best of British*. The CD contains a host of good quality shareware programs for DOS, Windows and even some OS/2 packages.

The two most notable points about *The Best of British* CD are its price, £5 plus VAT and the high quality presentation. I've seen many so called jumbo CD-ROM's most of which are just about unusable as they contain masses of compressed files with little information.

As a result you have to install the software just to find out what it does. Inevitably, you soon gets extremely frustrated with this process and the CD becomes a useful indoor Frisbee for use while working through DX pile-ups!

However, the Thompson CD is very different. For a start it has its own built-in browser so you can scan through the various programs on offer.

Once you find an item of interest you simply double click and you are presented with a series of folders that provide program description, system requirements and a screen shot. If the program can be run from the CD, a button is added to the display panel so you can do just that. Should you decide the program is for you, a click on a second button will automatically install the selected programs.

*The Best of British* is certainly the best shareware CD that I've seen and well worth a look at just £5. For more information contact the Thompson Partnership at Lion Buildings, Market Place, Uttoxeter ST14 8HZ. If you prefer to access via the WWW their home sites are: <http://www.ttp.co.uk> or <http://www.smartcode.com>

## Another Buzz

There's yet another buzz-word for those of you interested in Internet access. Demon, much criticised for their network overload problems and lack of local access, have taken a major step forward with their new comms network.

Whilst their previous network tie-up with Energis introduced the concept of Virtual Points of Presence (vPoPs), they have now

enhanced this with links to Mercury to provide local call access throughout the UK. As part of this upgrade they have abandoned the term vPoP in favour of ROMPS - Regionally Organised Modem Pool!

This new set-up gives customers direct access to super-fast v.34 28,800bps modems. For more details on the access points contact Demon at <http://www.demon.co.uk/dispatches> or 'phone Demon on 0181-371 1000.

## Popular Prediction

Geoclock 7.0 is the latest version of the popular grey line prediction program, which has recently arrived for review. The program is available in two versions, one for DOS, and one for Windows operation.

The main purpose of the Geoclock program is to give the operator a graphical view of the daylight/darkness areas of the Earth. In its most basic mode it shows a picture of the Earth with differing levels of illumination for day and night times.

From a radio point of view, the most important area is the period of dusk/dawn. Within Geoclock this area is very clearly shown and can be used to discover those areas of the Earth that lie in the grey line at the same time as your own location. At this time you will generally find enhanced propagation between points on this line. Hence the term grey line DXing.

As well as showing the current situation you can alter Geoclock's internal clock to give useful projections of forthcoming DX openings. Geoclock can also be customised for your own location and features a gazetteer database to simplify the set-up.

As well as the standard Global map there are a number of other maps included for a more specialised view. For UK operators the European map is likely to be used the most.

You can also use Geoclock to calculate the bearing and distance (miles & km) between any two points on the globe. Geoclock is available from a number of sources including the Public Domain & Shareware Library, Winscombe House, Beacon Road, Crowborough, Sussex. The program is also available from most

of the popular on-line sites both BBS and Internet.

## Amiga ScanMate

Michael Strecke of MSoft in Cologne has contacted me with details of his latest FAX and SSTV package for Amiga computers. Although not cheap at around Deutsche Mark (DM) 448, ScanMate includes a lot of advanced features and has been specifically designed to be easy to use.

Included in the array of new features is the integration of the Vlab video digitiser which enables real time digitization of video images right through to transmission. So, instead of working with prepared images you could use a video camera to capture events as they happen.

For those of you that are always looking for improved image quality ScanMate includes a high definition SSTV mode that supports 320 by 512 pixels. I think FAX users will appreciate the new slant correction mode that lets you correct a slant after the picture has been received.

At the heart of the new ScanMate is a d.s.p. interface that has its own processor to handle all the front-end signal conditioning. If you're heavily into multi-band operation this interface can be supplied with software switchable inputs for up to three transceivers.

Prices at the time of going to press were; DM448 for ScanMate interface with connections for 1 transceiver, DM598 for the 3 transceiver version and DM698 for 3 transceivers plus an a.m. option for weather satellites.

For more details of UK prices

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Here's the full list of reader's offers with all the latest software. Please leave up to two weeks for delivery.

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**Disk C** (Order Code **DKC**) - NuMorse 1.3.

**Disk D** (Order Code **DKD**) - 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** JVFAX and HAMCOMM Primer (Order Code **FP4**).

**FactPack 5** On the Air with JVFAX 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 7 and £3.00 for 9). For software send £1.00 per disk (£1.75 for 2, £2.50 for 3 or £3.00 for 4 or £3.50 for all 5) and a self addressed sticky label (don't forget provide the disk!). Please make cheques payable to M. Richards.

and features contact Msoft via Michael Strecke, Brabanter STR. 5, D-50674 Cologne, Germany. Tel: +49 221 9520194 or FAX: +49 221 9520752.

**That's all for another month so, until next time cheerio and keep those letters and queries coming to me Mike Richards G4WNC, 'Bits & Bytes', PO Box 1863, Ringwood, Hants BH24 3ZD. CompuServe 100411,3444; Internet [mike.richards@bbcnc.org.uk](mailto:mike.richards@bbcnc.org.uk)**



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# VHF REPORT

*This month David Butler G4ASR reminds you that now's the time that auroral propagation is most likely to occur on the v.h.f. bands.*

**Y**ou may possibly have noticed that the length of day and night at the moment are almost of equal duration. When they are exactly equal we have reached the time of the year called the spring or vernal equinox.

The spring equinox occurs in March, with the autumnal equinox being encountered in September. This transitional period interests me greatly as it's also the time of year when certain types of radio propagation events are more likely to take place.

I'll cover some of the modes unique to the 50MHz band in two months time but this time I'm concentrating on one of my favourite propagation modes, that of aurora.

Why do I rate aurora among one of my favourites? Foremost I guess it's because I can use it to work DX in areas that other modes rarely reach and secondly because I can wind up my iambic keyer and really let zip! So, maybe it's a bit anti-social for those slow-speed c.w. operators amongst you but I sure do make a lot of DX QSOs when the band is open.

## Aurora Glow

The Aurora is a phenomenon usually observed as a glow coming from the upper atmosphere in the northern sky. In the northern hemisphere it's referred to as the 'Northern Lights' or aurora borealis. In the southern hemisphere the effects are known as the 'Southern Lights' or aurora australis.

Up until a few years ago the popular theory was that solar flares caused large magnetic storms that affected high frequency radio propagation and produced aurora on the Earth. However, a paper written in 1992 by J. T. Gosling makes it very clear that solar flares are not a cause of anything very much at all.

Many flares indeed are simply a product of something called a Coronal Mass Ejection or c.m.e. (sorry yet another acronym to remember!). As this mass ejection rises off the sun it draws out

magnetically opposed field loops which subsequently reconnect and produce a flare.

However, the flare is a secondary effect which when compared to the coronal mass ejection and the tremendous shock wave it propagates into the solar wind, is of little consequence.

Equally important, the output of the flare covers only a narrow cone angle, whereas the output of a c.m.e. can cover up to half of interplanetary space. This solar material is made up of charged particles (ionised hydrogen, electrons, protons) and is carried towards us via the solar wind before becoming trapped in the earth's magneto-tail.

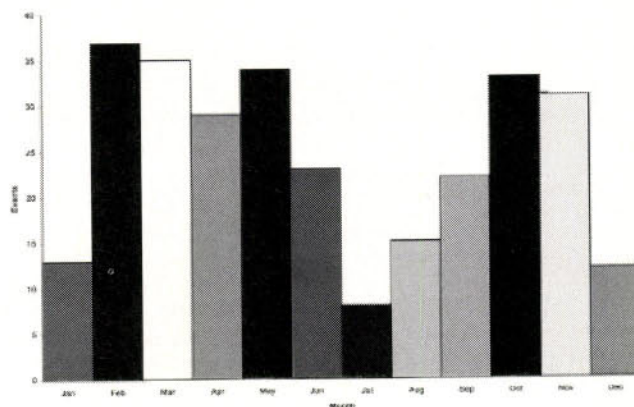
An increase in this particle flux, by a c.m.e. or to a lesser extent by a coronal hole, stretches the magneto-tail until it snaps and reconnects. When this happens some of the trapped particles are propelled towards the earth by the contracting magnetic field lines leading ultimately to an auroral event.

## Number Of Emissions

Charged solar particles are only one of a number of emissions that emanate from the sun. When solar activity takes place two other types of emission occur. These are electromagnetic radiation and cosmic-ray particles.

Electromagnetic radiation travels at the speed of light and reaches the earth in 8.3 minutes in the form of ultra-violet radiation, X-rays, visible light and radio waves. These emissions may increase the ionisation of the D, E and F-layers, causing short-wave fadeouts (Dellingers) and Sudden Ionospheric Disturbances (s.i.d.).

Cosmic-ray particles reach the earth some 15-120 minutes later and contribute to delayed terrestrial effects. Finally, the charged solar particles arrive at the earth having taken 20-40 hours to arrive via the solar wind, those from c.m.e. events arriving a little quicker than those from coronal hole events.



**Fig. 1: Radio auroras observed at the QTH of David Butler G4ASR (IO81MX) during the five-year period 1991-1995 (see text).**

## Doughnut Shaped

Auroral activity is centred in a doughnut-shaped region surrounding the magnetic poles. These zones are termed the auroral ovals and are normally located around 65-70° of geomagnetic latitude.

For European stations the southern most part of the oval arc will usually be located over Greenland, Iceland and northern Scandinavia. With increasing geomagnetic activity the auroral ovals expand, moving south towards the equator.

During major magnetic storms the auroral ovals may even migrate to 45-50° of latitude. They can then encompass the UK and large parts of Europe.

Typically the aurora is at an altitude of approximately 80 to 150km in that part of the ionosphere called the E-layer. At these altitudes the aurora can be seen for hundreds of kilometres.

Stations located in Scotland and Scandinavia can often 'see' the polar auroral oval above their horizon maybe three nights out of four. Thus stations at these latitudes experience considerably more openings than those in central UK for example.

## Solar Events

As I've mentioned earlier, there are two types of solar events that relate to auroral activity. These are the coronal mass ejection and the coronal hole.

Large c.m.e. events are more

prevalent during the years of sun spot maximum, whereas coronal holes reach a maximum in the last few years of the sun spot cycle. This period is between the ending of the spots of the previous cycle and the beginning of a new cycle.

(If you've been reading this column regularly you'll know that we are very near solar minimum, predicted to be between June-December 1996).

During sun spot minimum auroras are predominantly of the recurrent form. For example of the 55 events noted at my QTH during 1995, 44 appear to have a connection with a previous 27-day solar rotation.

## Spring And Autumn

Aurora can occur at any time of the year. But it tends to peak around the spring and autumn equinox in February-March and October-November. The reason why it peaks at these times is based on the varying position of the auroral oval during the year.

In the northern winter the magnetic pole is on average tilted further from the direction of the sun and therefore the oval moves to lower latitudes. The chart, shown in Fig. 1, shows these peaks quite clearly. It's based on auroras observed at my QTH during the five year period from 1991 to 1995.

Auroral backscatter communications have two well defined daily peaks of activity. The first and largest peak occurs in the late afternoon usually between 1400-1900UTC. (It may be useful to note



that frequently I have worked my best DX during the period 1500-1700UTC).

The second peak occurs near local midnight although this peak is very much dependent on geomagnetic activity and generally only occurs during major magnetic storms. Of course it can happen at other times, for instance I've noted openings at 0600UTC and at midday. What I have never observed is an opening between 0800-1200UTC.

## At The Oval

To make contacts via the aurora you need to beam at the auroral oval itself. So, regardless of your station location, you should beam north when auroral activity is suspected.

When signals are heard swing the beam either side of north to maximise the signals. (Hands up all you that have set your rotator stop at 0°!). Set it to due south, recalibrating the compass dial if necessary.

Depending on the extent of the opening increment the antenna towards the east. Different beam-headings will give propagation into different areas of Europe.

As a generalisation stations in central England should beam 010-030° to contact stations in GM, 030-060° to contact LA, OH, OZ, SM and 050-080° to contact eastern Europe and the ex-Russian republics.

In general the longest distance stations peak the furthest away from due north. The geometry of auroral radio reflections dictates that contacts can only be made up to certain specific distances from your location.

The region within which auroral contacts are possible is called the 'boundary fence'. It's approximately oval in shape, about 2000km to the magnetic east and west of your QTH and about 1000km to the magnetic north and south.

For example, from my QTH in western England (IO81) many contacts have been made with stations between 1800-2000km away in the ex-Russian republics and eastern Europe. But none have been achieved with stations in southern France or Spain.

## Best Bands

In theory auroral propagation works best on the 10 and 70MHz bands. However, I find that DX activity is often much better on the 144MHz band. This is probably because of the increased international availability

and the ease with which much higher transmit effective isotropic radiated power (e.i.r.p.) can be generated.

Contacts on the 430MHz band are fairly scarce. And they're usually limited to the larger auroral events.

To my knowledge no one has claimed a two-way contact on the 1.3GHz band. (Although professional radar observations indicate reflections are possible even at 3GHz).

However, I did mention some seven years ago that the station of G4FUF (JO01) made a one-way contact with HG2RD (JN87) over a path length of 1300km. This took place during the huge auroral event on 13/14 March 1989 when G4FUF received a 55A report from the Hungarian station.

Unfortunately the station of HG2RD was only running 2W output and therefore a record breaking two-way contact was not established. It's worth noting that approximately 12kHz of Doppler shift was present on the received signal. Future attempts at a world record on this band will probably require the use of two v.f.o.s if a successful contact is to be made.

## Badly Distorted

Signals propagated via the auroral plasma will always be badly distorted. This is caused by a random wideband Doppler shift imparted to the signal by the wave-like motion of the aurora.

The shift produces a characteristic 'hissing' sound making voice signals very difficult to copy. Morse on the other hand is far easier to copy (providing you know c.w.!), the signals sounding exactly like keyed white noise.

Because auroral working is essentially a weak-signal mode the use of s.s.b. or c.w. is preferred. These transmission modes can be copied right down to the noise floor unlike f.m. that requires a signal strong enough to exceed the demodulator threshold. (That's not to say that f.m. won't work, it just needs a very strong auroral event and probably an increase in the audio deviation for it to be successful).

My preference is always to use c.w. because that's where all the 'real' DX is. It's also a much quicker and efficient way of making contacts. Try it some time...it even works at Novice speeds!

## Power Helps

High power is not obligatory for aurora operation **but it certainly**

**helps.** Because of the non-optimum geometry of the path signals are generally quite weak. Therefore stations running low power will require a lot more perseverance especially if the event is quite weak.

A 10dB increase in power from 10 to 100W will make your signal more readable when it's close to the noise floor. Increases in power above this level will be equally worthwhile bringing with it more consistent results.

Any good Yagi-type antenna can be used for auroral work. Multiple antenna groups, such as a 4 x 17-element array, can be a disadvantage during general operation.

Some e.m.e. operators have reported that it's harder to make many QSOs with a narrow beamwidth system. A single Yagi will have a much wider beamwidth enabling reception of more stations over a greater geographical spread.

On the other hand a large array will provide stronger signals in specific directions. This is exactly the same common volume mismatch that is experienced with troposcatter and meteor scatter.

Basically it means that the wider the beamwidth the more likelihood there is of finding an optimum reflecting point. The ultimate of course is to have two antenna systems, one for general DXing and the other for making distance records!

## Not All Good

Large auroral events are not all good news to everyone though! The emissions have completely knocked out long distance h.f. radio communications and caused disruptions to earth satellite communication systems.

The low earth orbiting Oscar satellites RS1 and RS8 were possibly the first examples of satellites 'killed off' by cumulative radiation damage. And proton events have permanently damaged the sensitive processor systems in some geostationary satellites even though they use supposedly 'space hardened components'.

Geomagnetic effects have caused lack of compass accuracy and loss of directional abilities in homing pigeons! Induction of heavy currents in pipelines, railway tracks, telecommunication cables and electrical power transmission lines have also caused severe problems.

However, it's the detection and logging of these effects that can

enable you to predict when an auroral event is likely.

## Measuring Instruments

There are a number of measuring instruments you can build yourself to detect disturbances in the earth's magnetic field. One of the simplest magnetometers is a bar magnet suspended in a jar of damping oil.

Changes in the magnetic field are detected by the use of Hall-effect devices. A more professional device, although complicated to build, is the fluxgate magnetometer.

Another method is to measure the current in the earth by burying two rods a minimum of 50m apart in a north-south direction. The overhead ionospheric current develops a voltage in the ground which can be amplified and fed to an indicating meter.

Or you could build a radio telescope and detect increases in solar noise. This is simply accomplished by pointing your v.h.f. array towards the sun and making daily measurements.

You could even spend all your time listening on the h.f. bands waiting for a short-wave fadeout. Then there's monitoring of Band I television signals and 27-day auroral calendars.

Additionally, there are the WWW propagation announcements, propagation warnings on h.f. and v.h.f. beacon stations, the DX Cluster, the Internet and even the telephone network. So, now it's over to you and hopefully I'll hear you on the air in the next event!

## Deadline Time

It's deadline time again. And as usual please send any news (to reach me by the end of the month) to: **Yew Tree Cottage, Lower Maescroed, Herefordshire HR2 0HP.**

You can also contact me via packet radio @ **GB7MAD**, the DX Cluster @ **GB7DXC** or E-Mail via **davebu@mdlhr1.igw.bt.co.uk** Alternatively you can telephone me on **(01873) 860679.**

**END**



# HF FAR & WIDE

*Leighton Smart GWOLBI reports on your h.f. log books for the past month and takes a look at the RSGB's DX Newsheet.*

I'll start this month with a look at the RSGB's *DX Newsheet*, which is widely seen as a 'must' for all serious DX operators and listeners. Amongst some of the information included is news that **Ted LZ1WR** is hoping to be active from Libya in March from 5A1A, and intends to improve the l.f. antennas while he is there. Maybe we'll hear Ted on 1.8MHz soon.

There's also news that **Allen KN6AH** will be operating from the Mariana Islands (KH0) about mid-March. He will be active for or five days from Tinian Island on both s.s.b. and c.w. on the bands between 7 and 28MHz.

Allen will accept skeds via FAX on: (916) 898-4407. Alternatively you can use Internet to E-mail him as:

**asherwood@oavax.csuchico.edu**

**Malcolm VK6LC** plans to operate from Sandy Island in the Lacedpede Island group in May this year. The four islands in the group, Middle, West, Sandy and East, are located in the Indian Ocean and are all part of a nature reserve. Malcolm already has the relevant permission, and intends to finalise his plans soon.

## Saudi Arabia

I've received some information from **Mike Manafa K3UOC**, who operates 7Z500 in Saudi Arabia. He's provided some interesting details on the background of the station.

One thing that did surprise me is that amateur radio is technically illegal in Saudi Arabia. In fact, 7Z500 is licensed to a member of the Saudi Arabian Royal family, and apart from a handful of other stations (such as HZ1AB) there is no publicly available amateur service in the country!

Mike's station is located in Riyadh, and consists of an IC-765 transceiver. This is backed up by an Alpha 91B linear amplifier capable of running 1kW output.

Antennas include an R7 vertical, a high power version G5RV, and inverted 'V' antennas for 3.5 and 1.8 MHz.

Mike has been operating the station since the 11th of October 1994, and so far has made a staggering 39,332 contacts, 97% of which have been on c.w. (One of

which was our own John Heys G3BDQ. John worked him on Friday Jan 5. Editor).

Mike says that the hardest part of setting up a station in Saudi Arabia is the near impossible task of setting up a good earth. However, he sorted that problem out by using the Royal Palace's cold water system, and says that it works adequately!

In his letter, Mike tells me he will be active from 7Z500 until July this year, operating generally around 0800-1000UTC on a daily basis, mostly using c.w. At around 0900 he checks the 24MHz band for any openings on that band, otherwise operating on any band which is open.

## Band Conditions

Our reporters indicate (in December) that band conditions have been improving of late. The 21MHz band carried an increasing amount of reasonable DX traffic.

It still seems that 14MHz is the main band for most DX operators. But perhaps as conditions continue to improve at the higher end of the h.f. spectrum, we may see a gradual drift to the 21, 24, and 28MHz allocations.

Of course, with the dark evenings of winter, the l.f. bands tend to be at their yearly peak. As a result they in turn attract a great deal of DX activity.

Although a difficult band to work, 1.8MHz (Top Band) has always been a favourite of mine, especially during those long winter evenings in front of the fire, microphone in one hand, glass of wine in the other!

## Your Reports

On to your reports now and this month I'm starting with 'early bird' **Ted Trowell G2HKU** on the Isle of Sheppey in Kent. Ted uses a Ten-Tec Omni V transceiver at 70W output and a selection of G5RV, HF6 (Vertical) and MFJ loop antennas. He reports 1.8MHz c.w. contacts with 9A1A (Croatia), TF3EJ (Iceland), OY9JD Faroe Islands), ZB2X (Gibraltar) and TK2C (Corsica), all at around 0600.

Next comes **John Heys G3BDQ**



**Richard Evans G0VCW** (in 'snazzy' shorts!) confesses that he's a "QRP nutter" in his first report to 'HF Far & Wide'. The photograph was taken at the Woburn Rally in 1995 and shows **Nick G4OOQ** (left), **G0VCW** himself, **John G7DDU** (he is also 2E0AJY), and **John G3FWH** outside the Bedford 144MHz Net hospitality tent.

near Hastings, who's been having a whale of a time on 1.8MHz. He uses a Kenwood TS-870 transceiver with a 3/8 wave sloper antenna plus a shielded loop receive antenna in the loft.

John lists some very nice 1.8MHz c.w. DX including K12M (USA) at 2238, VK3DXI (Australia) at 1847, TA4ZM (Turkey) at 1908, VE3JB (Canada) at 2151, UA9CMD (Asiatic Russia) at 1905, plus a string of north American contacts in the morning at around 0700UTC.

(Propagation on 1.8MHz is usually at its best during the months January to March inclusive. So this is really the best time of the year to crack a few new countries on this band).

## The 3.5MHz Band

Now it's over to **Steve Locke GW0SGL** in Mountain Ash in South Wales, who has been trying 3.5MHz DX operating for the first time. Steve says that '80' has been producing some excellent DX with good signal strengths in the 'DX window' (around 3.790MHz) at the top of the band.

Steve seems to be quite taken by the 3.5MHz band after operating mostly on the higher frequencies. He has heard all parts of the world recently, and has managed to contact AP2N (Pakistan) at 2356, (QSL via AP2MMN), 9K2MU (Kuwait) at 0013, VO1WLQ (Newfoundland) at 0023, and W9QQ (USA) at 2340UTC, all on s.s.b. Steve uses a Kenwood TS-940 transceiver at 100W output, and a trapped dipole up at 15m for this band.

At around 0700, Ted G2HKU again used c.w. to work EA9PB (Spanish Morocco). He also raised RA2FJ/MM in the North Sea bound for Wales, and W1MK (Massachusetts, USA) during a brief period on 3.5MHz.

## The 7MHz Band

The 7MHz band is the one you either 'love or hate'! And it certainly seems to provide consistent long distance contacts regardless of time of year.

As a consequence 7MHz has its dedicated aficionados. On the other hand, it's a band which is affected by high levels of QRM due to it being such a narrow (100kHz) allocation, and that's enough to put paid to some amateurs' enthusiasm!

I think it's about time the 7MHz band was extended here in Europe. And I don't mean up into the '41m' 'megawatt' broadcast allocation, but down into the 6.9MHz range - after all, it seems to be one of our most reliable - and well supported - DX bands!

Over now to 7MHz enthusiast **Charlie Blake RS-96034** in Milton Keynes, Buckinghamshire. He reports that English-speaking QSOs have become virtually non-existent of late, and as a consequence, he has been spending some of his precious spare time on 14 and 18MHz.

Charlie's report for 7MHz band includes s.s.b. reception of CP6DA (Bolivia) at 0646, HC20A (Equador) at 0653, VK2SIL (Australia) at 0704, TG9NT (Guatemala City) in contact with DJ4XA at 0639. He also logged



ZL3NZ (New Zealand) working EA5AHK at 0705, HR2JPQ (Honduras) working F50KK at 0722.

Other 7MHz signals were FG5BG (Guadeloupe) in contact with EA5AMK at 0709, Tony G0EKD working F6IWD in France at 0731, YS1XS (El Salvador) working F8YV at 07.36, and 6W1QL (Senegal) working LZ1K0Z at 0615. Charlie uses a NRD 525 receiver and a sloping wire receive antenna.

John G3BDQ has been busy on 7MHz too. He lists c.w. contacts with VU2PTT/C (India), FP8EJ (St Pierre & Miquelon Islands), VK2KM (Australia), YB6JV (Indonesia), AP2MY (Pakistan), JT1BH (Mongolia), UA0AGI (Asiatic Russia), and XZ1A (Burma), all between 1900 and 2100UTC.

## The 14MHz Band

I've received a detailed log (as per usual) from **Don Mclean G3NOF** in Yeovil, who says that 14MHz has only been open during daylight hours recently. At around 0800 the long path to Australia and New Zealand has been open, also to Asia and South America.

Don lists his s.s.b. contacts with BV6DF (Taiwan) at 1011, C02WF (Cuba) at 1710, DU1SSR (Philippines) at 1024, JA4KFA (Japan) at 0916, TT8BP (Chad) at 09.55, (QSL via IK5JAN), and S92PI (Sao Tome & Principe Islands) at 09.35. Don also logged VK4SJ (Australia) at 0932UTC, and ZP5WYV (Paraguay) at 0930, the operator was, incidentally, just 11 years of age!

Moving west now to **Carl Mason GW0VSW** in Skewen South Wales, who has been giving the c.w. key a right bashing according to his log! Carl has notched up c.w. contacts with CG2QK (Canada) at 1340, ZL3BSH (New Zealand) at 0830, PY7JQ (Brazil) at 1744, VU2BK (India) at 1232, and a 'gotaway' in the shape of 7M3KS? in Tokyo at 0816UTC. All were achieved using 100W output and a G5RV dipole antenna.

Steve GW0SGL meanwhile says that conditions to Australia have been excellent on the short path at around 1030. But he has found the long path difficult of late. (The band has started to change at around 3.45pm, when African stations have started to come through).

Steve also lists s.s.b. contacts, using 100W output into a TH7 beam antenna, with 9M6TI (Malaysia), VK1MJ (Australia), A41LP (Oman), Brunei club station V85BG, QSL via Box 373, MPC-3703, Brunei, ET9AA (Ethiopia), (QSL via Box 60258, Addis Ababa, Ethiopia), A92GE (Bahrain),

and 1A0KM (Sovereign Military Order of Malta) QSL via IK0FCV.

Keen 14MHz listener **Gordon Foote G7NCR** of Bristol, using a Howes DcRx 20m receiver and a loft mounted receive antenna, reports s.s.b. reception of HV3SJ (Vatican State) working K8IKW and KB1DGV in the USA at 1435.

Also logged were IY40TA (operated by Martin G3ZAY at the IOTA Conference) working G0IAV, G4UOX, and GW2DDX, as well as JX3EX on Jan Mayen Island in the Arctic Circle, and BZ4BZ in China. Gordon also reports hearing Robin G3TKF/M in Bath city centre working UA1CAW at 1811, and C5BHD in Gambia in contact with WA3BG (USA) at 1800, and Hilary Clayton Smith G4JKS working W2ONV while she had a BBC film crew present!

Ted G2HKU, again using c.w., hooked up with ZL1ALA (New Zealand) at 0800 and WA7DHB (Idaho, USA). He also logged FY5YE (French Guyana), and TU/N7BG (Ivory Coast) at around 1600, and D68SE (Comoros Islands), WJ60 (California) and VE7FJE (British Columbia) at 1700UTC.

## The 18 & 24 MHz Bands

I'll start the 18 and 24MHz reports with the contribution from new reporter **Richard Evans G0VCW** in Rushden, Northants. Richard apart from sporting a snazzy pair of shorts, **Fig. 1**, informs me that he is a "QRP nutter" (nice to meet a fellow 'nutter' Richard!).

Our new reporter sent in a short log detailing low power contacts on 18MHz with VE1KB (Canada), and the CQ7M DXpedition (location?) both with 3W of c.w. Richards also worked FS5PL (French Saint Martin), VU2TRI (India), CN2EWE (Morocco) and HK4DF (Colombia) all with 8W p.e.p. on sideband and a 55m doublet antenna. His single listed contact for 24MHz is ZP5PT (Paraguay) again with 8W s.s.b.

Back over to Don G3NOF now who reports 18MHz s.s.b. contacts with HK0TCN (San Andreas Islands) at 1151, HZ1AB (Saudi Arabia) at 1032, VK2CLB (Australia) at 1014, ZL4DJ (New Zealand) at 0930, and FP5KE (St Pierre & Miquelon) at 15.54, QSL via FP5CJ, while his 24MHz contact was with 7Q7A (Malawi) at 1215UTC, who (says Don), will automatically send a QSL card, but does not require yours.

Lastly for 18MHz, comes s.w.l. Charlie Blake RS96034. He reports s.s.b. reception of 7X2WAK (Algeria) working I6EZB in Italy at 1456, TA1BM (Turkey) working KD5ZM at

1453, PT7BZ (Brazil) working TA1BW in Turkey at 1529, (QSL via bureau), and CN3EME (Morocco) working PA3ADA at 1259UTC, (QSL via F6BGC).

## The 21MHz Band

To 'wrap things up' this month I'll take a brief look at 21MHz. This is where it seems a lot has been happening. Starting with John G3BDQ who has been using both s.s.b. and c.w. on this band and who reports contacts with YC1XUR (Indonesia), YS1ZV (El Salvador), 7Q7A (Malawi), 5T5SN (Mauritania), TD91GI (Guatemala), and C07JC (Cuba) on s.s.b., while c.w. accounted for contacts with VP2MEJ (Montserrat), D68S (Comoros Islands), HS7AS (Thailand), 9X4WW (Rwanda), V31UA, (Belize) and ZD8Z (Ascension Island).

Finally, the report from Ted G2HKU includes 21MHz c.w. QSOs with 9Q5MRC (Zaire), TI4SU/HI (Dominican Republic), 7Z500 (as mentioned earlier), EA9EU (Spanish Morocco), 3DA0NX (Swaziland), PY0FF (Fernando de Noronha Island), TY5A (Benin), SU2MT (Egypt), VP5FOC (Turks & Caicos Islands), all at around 1000, and HK0/DL4MEH (Malpello Island) at 1500UTC.

## Sign Off

Time to sign off, and again, my grateful thanks to all our reporters who spend what is surely a great deal of time putting together reports for 'HF Far & Wide'. I am unable to 'fit it all in' due to space limitations, but

## 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 Oceania.

**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 & trapped dipole antenna.

**Leighton Smart GW0LBI** operates: Every Sunday at around 1100 on 28.500MHz s.s.b. 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., & 3.530MHz QRP c.w. using a KW2000B/Trio TS-120V and trapped 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. Ibbitson 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.

the variety of information you send makes the column readable and the success it is. Keep up the good work!

As usual, reports and information by the 15th of each month to: **Leighton Smart GW0LBI, 33 Nant Gwyn, Trelewis, Mid-Glamorgan Wales CF46 6DB. Tel: (01443) 411459.**

**END**



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**PHONE 01707 659015 FAX 01707 645105**



# BROADCAST

## ROUND-UP

*Peter Shore reports on the latest developments from the international broadcasting world.*

International broadcasting is likely to suffer a loss at the end of March. It was announced in mid-December that the Canadian Foreign Affairs Ministry was to withdraw its funding of Radio Canada International (RCI) at the end of the financial year.

Currently, the Foreign Ministry shares the cost of running RCI with the nation's public service broadcaster, the Canadian Broadcasting Corporation (CBC). The timing of the announcement was inauspicious, just a fortnight before Christmas, giving RCI's staff an unwelcome Yuletide gift. And it seems to many practitioners and supporters of international radio a short sighted move.

Radio Canada International's total operating budget is just over Can\$16 million (about £9 million) and reaches a known audience of 12 million people through its services in seven languages. The CBC faces a budget reduction of several hundred million dollars, and decided it could not justify spending the Canadian public's money on maintaining an overseas service.

### Celebrated Anniversary

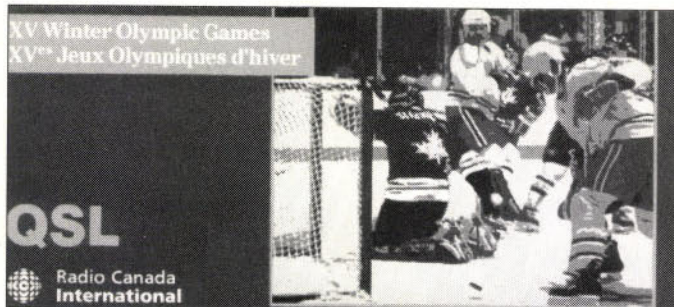
Just 12 months ago, RCI celebrated its 50th anniversary. The station started on February 25 1945, with the aim of broadcasting to Canadian military forces overseas, and, in the words of Mackenzie King, the then Prime Minister of Canada, 'to bring the country into closer contact with other countries'.

At the time of writing it was unclear whether any short wave broadcasting would continue from RCI. Readers may know that CBC domestic programmes in English and French are carried by RCI, and at the time of writing, no decision had been reached as to whether short wave relays would continue. Nor had a decision been taken over the transmitter exchanges RCI operates with the BBC World Service, ORF Radio Austria, NHK Radio Japan and China Radio International.

The BBC World Service is facing its own budgetary problems, with a reduction during 1996-97 in the money government provides for 'capital' spending (in other words new transmitters, studios, computers, building maintenance) and a likely cut

in 'revenue' spending in 1997-98 (staff costs, travel budgets, power, etc.). That means in theory it may not be able to afford to spend money to hire the Sackville transmitters it currently uses under the exchange agreement. The result could be far worse reception in North and Central America for World Service programmes.

It seems there is no easy solution,



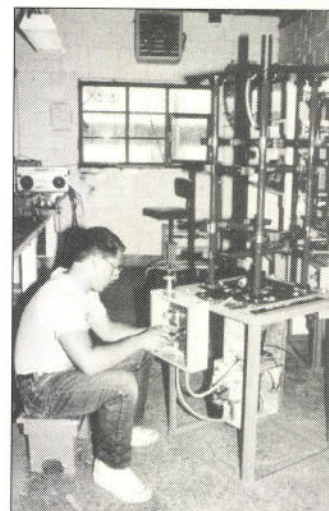
**A Radio Canada International QSL card from 1988.**

so my advice is listen while you still can. If there is any change in the grim outlook for the Montreal station, I'll let you know.

### Schedule News

Now for schedule news. Radio Canada International is on the air to Europe in English at: 0500-0530 Mon-Fri on 6.05, 7.295 for Canadian forces in the former Yugoslavia; 1330-1400 daily on 15.315, 15.325, 17.82, 17.895 and 21.455; 1645-1700 Mon-Fri on 9.555, 11.935, 15.325, 17.82; 2000-2100 daily on 5.995, 7.235, 11.985, 13.65, 13.67, 15.15, 15.325, 17.82 and 2100-2130 daily on 5.995, 7.235, 11.69, 13.65, 13.67, 15.15, 15.325, 17.82MHz.

Channel Africa is on the air to sub-Saharan Africa in English at: 0258-0455 on 9.585 and 5.955; 0458-0555 on 11.90 and 7.185; 1458-1755 on 9.53 and 7.155 and 1558-1655 on 15.24MHz. Readers with Astra satellite equipment can also hear Channel Africa in studio quality via the World Radio Network relay at 1030UTC, and if you are lucky enough to be on holiday in South Africa, you can hear Channel Africa's programmes on the national English language f.m. network, SAFM, between 104 and



**Maintenance being carried out at RCI's Sackville shortwave transmitting station.**

under the protection of Denmark). **Michele Ernsting** examines the political, economic and social evolution of the country during the past 20 years as it has attempted to determine the realism of self-rule, and looks at how reviving the traditional Inuit culture can help young people in Greenland face an uncertain future.

On February 14 you can hear *Crossing the River by Feeling the Stones*. In this program **Ardi Bouwers** examines the crisis in China's social security system as the country undergoes a radical transformation from socialism to capitalism.

On February 28, **Helen Barrington** looks at Hemp. She traces the history of this extraordinarily versatile fibre, from early uses like rope and textiles to modern high fashion clothing and - believe it or not - protein-rich hempburgers. Tune in to find out more!

The English service is on the air to Europe daily at: 1130-1325 on 7.19 and 6.045; 2130-2325 on 1386kHz m.w. (via Kaliningrad).

The Netherlands station is also heard on the World Radio Network daily at 1030, 1730 and 0030. You can contact Radio Netherlands by mail at **PO Box 222, 1200 JG Hilversum, The Netherlands. Tel: +31 35 6724 222** or by **FAX: +31 35 6724 239** or by E-mail at **letters@rnw.nl**

Listening to Radio Netherlands' Media Network recently I heard a report that the BBC World Service relay station in Hong Kong, used to send programmes into mainland China, will be taken to bits before the end of British ownership of the colony. The new Thailand relay station, at the moment being built, will take over the duty of beaming programmes from Bush House to China. The Thailand station should be operational towards the end of this year.

**And that is all for this month. Let me know if you hear anything interesting on the broadcast bands, and I'll pass on the information to other readers. Good listening.**

### Radio Highlights

Highlights of programmes in the English service of Radio Netherlands during late January and February include *Greenland* on January 31 and February 7.

Greenland is considered by many to be the last frontier on the planet, populated mainly by Inuit hunters and fishermen (it's officially part of Europe

**END**



# PACKET PANORAMA

Roger Cooke G3LDI has news of friends, news broadcasts, test successes and technical advancements at GB7LDI this month

I have many 'phone and packet radio friends in the Pacific Northwest. One of the latest converts to the digital mode is **Dave Snape VE7IM**. Dave's 'conversion' is the result of a little 'bullying' and a visit to **Jack Balfour VE7FMY**.

Jack runs a very busy BBS about half a mile up the road from Dave, and we spend an interesting few hours with Jack. He has radios and computers in just about every room of his house, such is his enthusiasm!

Some enthusiasm must have rubbed off onto Dave who is shown together with Jack in **Fig 1**. The station shown is Jack's. I wish I could keep my station as tidy as this and I can confirm that it was not tidied just for the picture!

The computer systems and radios Jack has in use for packet operation are extensive. Try sending a message to Dave or Jack, I'm sure they would love to make more UK friends on the packet network.

## Teledata News

The British Amateur Radio Teledata Group (BARTG) news is still being broadcast in RTTY mode, using the callsign GB2ATG. The schedule of GB2ATG is that transmissions are made during the first full week commencing Monday each month as shown in **Table 1**.

The news is also posted to the UK packet network and to Packet Clusters. Items to look for, are messages to BARTG @ GBR. It's also available from the files area at GB7BBS and GB7MXM (in the C:\BARTG sub-directory).

For those on Internet but without RTTY, the news is also available on the Internet BARTG Web site: <http://cs.nott.ac.uk/~ibx/BARTG/> It's also posted to a number of Internet news areas including: [info-hams@ucsd.edu](mailto:info-hams@ucsd.edu) [uk.radio.amateur](mailto:uk.radio.amateur)

The GB2ATG news Editor, **Bob**

**Canning G0ARF**, likes items of interest for publication to reach him before the 25th of each month. Contact him via packet as: **G0ARF @ GB7MAD.#24.GBR.EU**, or QTHR, or E-mail as: [bcanning@kc3ltd.dircon.co.uk](mailto:bcanning@kc3ltd.dircon.co.uk)

## EMC Test Success

Also from BARTG, is the proud announcement that their 'New Improved Multiterm' multi-mode data terminal unit has just passed the rigorous EMC testing in compliance with the EEC standard EN50082-1:1993.

Tests were carried out by the York Electronics Centre at the University of York. They tested the unit for radiated immunity, immunity to electrostatic discharge and immunity to electrical fast transient bursts.

The tests involved frequencies up to 1000MHz with a field strength of up to 3V/m. Static discharges of up to 8KV, were applied to the unit under test in both 'air space' and 'full contact'.

The BARTG tell me it's believed to be the first instance of an amateur radio club having obtained compliance to the EMC tests. The EMC standard EN 50082-1/1993 applies to within the residential environment. Further details can be obtained by contacting: **Ken Godwin G0PCA, 11 St Lukes Way, Allhallows, Kent, ME3 9PR. Tel: (01634) 271548.**

Table 1

Day	Time (local)	Freq. (MHz)	Mode
Monday	2000	3.584	RTTY AFSK
Tuesday	2000	3.584	PACTO0R FEC
Wednesday	2000	3.584	RTTY AFSK
Thursday	2000	3.584	AMTOR FEC
Friday	2000	3.584	RTTY FSK
Saturday	2000	3.584	AMTOR FSK
Sunday	1000	3.595	RTTY FSK

Times and modes for the GB2ATG news broadcasts.



Dave Snape VE7IM (left) during his conversion to packet radio at the shack of Jack Balfour VE7FMY. Jack (right) always keeps his shack this tidy!

## Baycom Project

The Baycom project, a simple and cheap computer based TNC, was published in a BARTG Journal. Sometimes however it's difficult to obtain information or documentation for Baycom in English.

A supplement, designed to get the newcomer up and running with the simple Baycom 2 or 3 chip board, has been written by **Jim G4RGA**. Jim is willing to supply it on disk if required as long as the usual mailer and postages are included.

The supplement is also in the CLIVE database and can be downloaded from there. Jim is **GB7GUN.#45.GBR.EU** or on E-mail as: [jayemd@cix.compulink.co.uk](mailto:jayemd@cix.compulink.co.uk)

## Easyterm For Windows

A copy of 'Easyterm for Windows' was recently sent to me from **Mustafa Topukcu, 1B1AD**. Written by **John Henley W1EOR**, Easyterm for Windows supports most of the

major TNCs.

Unregistered users can have 100 free trials by using the serial number 999. After that, registration is necessary. The program has an impressive set of features and is well worth it. If anybody would like a copy of the program, then send me a formatted disk + disk mailer and return postage.

## Satgate at GB7LDI

At long last, and after a series of catastrophes, the satellite gate (Satgate) is up and running at GB7LDI. Mail for MDLE, OC, AF now goes via UO-22.

My usual h.f. forwarding will still be maintained and also the server between GB7LDI and GB7LAN (in Lancaster). After running for a month or so (fingers crossed) all systems appear to be go!

Support for Satgate should be by either joining AMSAT, or making a donation towards the cost of building and launching the amateur satellites. Files are available giving further information at the Satgate.

There is also a tag-on message automatically added to mail imported from the satellite. Members of AMSAT do not receive this message.

That's all for this time, 73 de Roger, G3LDI @ GB7LDI.#35.GBR.EU. Tel: (01503) 570278.

END



# BARGAIN Basement

Compiled by Zoë Shortland

## For Sale

**AR1000 hand-held scanner receiver**, 8-600MHz (no gaps), 1000 memories with instruction manual, case, rechargeable batteries, in as new condition, £165. Eddystone 770R (scarce set), 19-165MHz, excellent condition, £135. Tel: Yorks (01482) 869682.

**Bereavement forces electrical shop stock sale:** Resistors, capacitors, c.r.t.s, transistors, tuners, hundreds of i.c.s, valves, valve characteristic meter, TV pattern generators, 1000s of manuals for TVs and radio's, etc. (Location Grimsby). Andrew, Tel: (01472) 603378 or Stefan 0181-947 2176.

**Collins Trcv. KWM2a inc.** spare tubes and Mic MM1, £800. Collins wattmeter 302C-3, 2kW, £70. Daiwa active filter, AF-606K, £80. Kenpro rotator FR-400, £80. Walter, London. Tel: 0181-994 9982.

**Cossor CDU150 solid state oscilloscope**, dual channel, d.c. to 35MHz at 5mV/cm, 8 x 10cm display, delayed timebase with gated mode, photocopy of handbook. Tel: Southampton (01703) 454886.

**Eddystone communications receiver** type 40A, 130kHz to 30MHz, a.c./d.c. operation, a.m./s.s.b. level measuring with CISPR detector, £125. Scorpion 2m (144MHz) transverter, 28MHz I/P, 50W o/p, works with FT-101 series, spare QQVO-64-A and 7-element ZL Special, £80. Tim Hague G8GGP, Milton Keynes. Tel: (01908) 563600.

**Electrical, test and laboratory equipment**, OLP, some collectable. From estate of J. D. Cooper (medical research council, retired). Send s.a.e. for list to J. Hone, 43 Gwydir St., Cambridge.

**FT-101ZD h.f. transceiver**, £295. Lowe HF-125 receiver, £300. Icom 02E 2m (144MHz) transceiver, £120. Diamond SX200 s.w.r./power meter, £50. ZX Spectrum/Morse/RTTY software, £45. All good condition with extras. Tel: Stockport 0161-494 1817.

**FT-790RI**, £275 o.n.o. FT-101Z, £250. Drake R8E, £700. Datong AD370 outdoor active antenna, £40. Trio TS120V

100W h.f. mobile, £275 o.n.o. Zenith Trans-Oceanic portable valve m.w./s.w. 1953? vintage?, £150 o.n.o. Steve G7VFF, London. Tel: (0956) 544202.

**Icom 551D** (50MHz), exchange for Icom R7000 or sale for, £550. J. Nunes. Tel: 351-1-7577786 or FAX: 351-17577981.

**Kenwood TR851E** 70cm (430MHz) transceiver, all-mode, 25W or 5W, as new, with box and manual, £450. Tel: Exeter (01392) 74607.

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**Netset PRO2032 base scanner**, frequency coverage 68-960 with gaps, four months old, still under guarantee, boxed, £115 o.n.o. Realistic DX200 short wave receiver, 0-30MHz, £90 o.n.o. Tel: Carlisle (01228) 595816.

**Oscilloscope** Gould Advance 05255 twin trace 15MHz, good working order, £65. Tel: Essex (01702) 522929.

**Philips PF8s**, two off, v.h.f. Pye PF70s, two off, v.h.f. Pye base TX/RX inc crystals for 2m (144MHz). 2m (144MHz) Pye RX all easy conversion to amateur, sell or swap Delta 1 or Reflec. A. Morphy G7UAD. Tel: Derbys 0115-930 8096.

**Practical Wireless**, copies missing shown, 1991 February, 1992 October, November, December, 1994 January, March, April, October, 1995 August. *RadCom* 1991, 1992 May, 1993, 1994, 1995, £10 o.n.o. plus postage. Vic, Cornwall (01579) 348127.

**Shack clearance:** Yaesu FT-101 transceiver, nice condition, £225. KW Atlanta TX/RX with 80W output, pair 807 in p.a., £195. Marconi Electra RX internal power unit, S-meter, £195. 18 Set sender, £75. Tel: Cornwall (01872) 862291.

**Signal generator**, Murphy M-3, 100kHz to 60MHz. CW+400Hz MCW+400Hz a.f., size 330 x 250 x 210, weight 8kg, good working order/condition, mains operated, picture available, £25, delivery extra. HRO coils

wanted, any range, any condition. E. F. C. Owen, 28 Chartfield Road, Reigate, Surrey RH2 7JZ.

**Sony ICF-7600 receiver**, excellent condition, box, manual, £90. Ham International Concorde II multi-mode 10m rig (prof. conversion plus authority), £75. Microset PC30 variable p.s.u., £75. Tel: Basildon (01268) 413598 after 6pm.

**Tanberg R-R** crossfield heavy duty series 3300X recorder with 12 tapes, £300 to clear. Motorola f.m. generator, type T1034C, 25-960MHz, £250. 110V auto avail. Bill Orpington on (01689) 839386 or write to: 16 Gillmans Road, Kent BR5 4LA.

**TS-690S** h.f./6m (50MHz) transceiver, auto a.t.u., s.s.b. and c.w. filters fitted. SP23, £1200. TR751E 2m (144MHz) all-mode 25W transceiver, v.g.c., £450. Sony PRO80 150kHz - 223MHz portable, all-mode receiver, £95. Terry G4OXD, Hitchin. Tel: (01462) 435248 after 6pm.

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**Yaesu FT-ONE** general coverage all modes solid state transceiver, memory board,

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**AVO coil winder**, anything considered. Also original head sets/mikes for No. 88 sets, complete set-up considered. Tel: Middlesex 0181-844 2173.

**Eddystone receivers urgently required** to complete collection, models 890 and 930 please. Also needed EC10, EB35, others considered. A few doubles for sale, please enquire. Peter Lepino, Surrey. Tel: (0374) 128170 anytime.

**Hallcrafters S-36-A**, preferably in full working order, complete, unmodified and in good condition, describe and state price, delivered to E. F. C. Owen, 28 Chartfield Road, Reigate, Surrey RH2 7JZ.

**Help!** Have tried usual channels, does anyone have a Praktica PCL3 camera body? I can use it. G3EGC, QTHR. Tel: Bolton (01204) 301502.

**KW107 antenna tuning unit**, KW1000 linear, Rascal, a.t.u., Rascal l.f. adapter, cabinet for RA17, Rascal valve transmitter, wattmeter, sensitive valve voltmeter with probes and spare UX valves for my HRO. Tel: Yorkshire (01482) 869682.

**McElroy bug key**, complete or not, could swap or pay reasonable price. Please help. I need key to use! John G4LGX, North Yorks. Tel: (01423) 567390 after 6pm.

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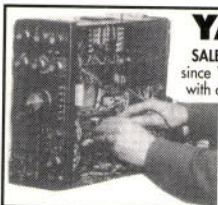
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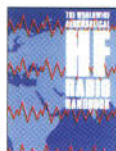
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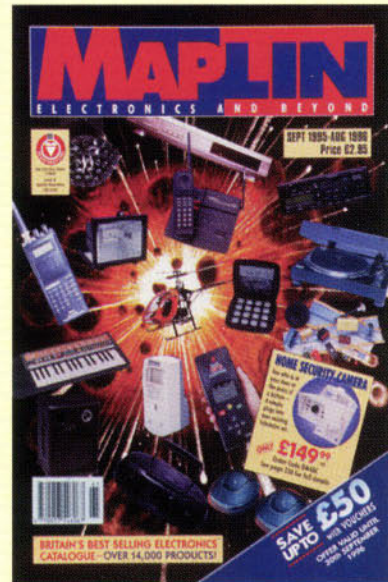


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