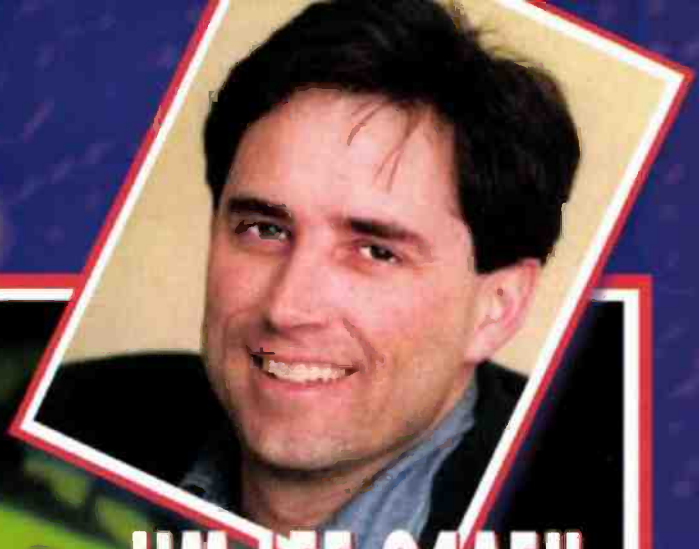
Practical Wireless

PW

amateur radio & more!



JIM LEE G4AEH ADMITS USING 500kW!

FT-1000MP REVIEWED

PRACTICAL PROJECTS

- BUILD THIS G3RJV '2222' TRANSMITTER FOR 7MHz

February 1999 £2.20

9 770141 085037 02>

Waters & Stanton PLC

22, Main Road, Hockley, Essex. SS5 4QS
Shop hours 9.00am - 5.30pm Monday - Saturday
Web Site www.waters-and-stanton.co.uk
e-mail: sales@wsplc.demon.co.uk
General 01702 206835 204965
Trade 01702 203353
Fax 01702 205843

VISA MasterCard

ISO 9002 REGISTERED FIRM

Order Line
Freephone 0500 73 73 88

AT-600 Dual Band Handy

£199

Dual Band Performance
At an Amazing Price

Ni-cads & Charger

Includes
Wideband Receive
AM Airband
Alphanumeric Memories
CTCSS & 1750Hz Tone
Ni-cads & Charger

AR-146 2M 50W Mobile

Complete with Microphone and mobile mount

£199

C-408 70cms Handheld

Amazing Value
20 Memories CTCSS
350mW Output

£89

ICOM IC-706 1.8 - 146MHz

Includes DSP & CTCSS

Your Final Chance

£799

Yes, it's your final chance to purchase this great transceiver. Offering 100 Watts on all bands from 1.8MHz to 54MHz plus 20 Watts on 144MHz.

HORA C-150 2M Handheld

Our Best Seller!

This amazing handheld offers you all the features that some more expensive models offer. This key-pad entry design is ideal to take to the office or for use mobile. Connect 12V DC to it and you get a full 5 Watts output. 20 memories is more than enough for normal use and with wideband receive (Tx for export) you can rove anywhere between 130MHz and 174MHz

£99.95

ICOM IC-W32E

Clearance

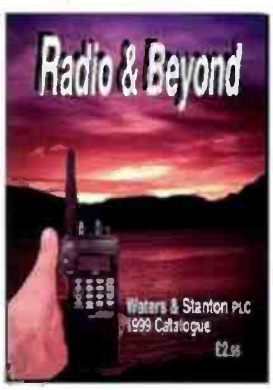
Save £130

£269

- Dual band 2m/70cm FM
- 144 - 146MHz
  430 - 440MHz
- 5W @ 13.5V DC
  100 memories per band
- 8 tuning steps
  Main & sub Rx bands
- Alphanumeric display
  Batt. & charger
- 4.5 - 16V DC
- 57 x 137 x 33mm
- 450g (approx)

Don't Forget

The Largest Catalogue of Ham Radio - 240 Pages in Colour!
£3.95 post paid



W&S

EXCLUSIVE 10 DAY APPROVAL - On All Mail Order Sales

YAESU FT-847 it's Here!

~~£1599~~

1.8MHz to 432MHz

+ FREE 25Amp PSU! Worth £214.99

Includes 70MHz Transceive

*100W 1.8 - 50MHz * 50W 2m/70cm * SSB - CW - FM - AM * CTCSS * Alphanumeric * 0.1Hz steps * Packet ready 1200 & 9600 * DSP filtering * Dual display * squelch * IF shift * Notch filter * Power control * Tx monitor * Electronic keyer * 12.5 / 25kHz switched FM filtering * Switchable pre-amp * Size 260 x 86 x 270mm * weight 7kg*

KENWOOD New VC-1H

£399

Video Terminal VHF & HF

Send and Receive Pictures
VHF & HF Transceivers
9 SSTV Modes works with any tcvr.
CCD Camera / LCD Monitor
Speaker & Microphone
Software built-in

YAESU FT-920 1.8 - 54MHz £1299

PRICE MATCH

+ Free FM board & AM Filters

*1.8 - 54MHz 100W * DSP filter * MOSFET PA * Internal ATU * Auto notch * Twin VFOs * Auto glow display * Shuttle jog * Digital voice memory * Electronic keyer * RS-232C converter * Quick memory bank + lots more phone or e-mail for colour leaflet*

YAESU FT-1000MPDC (AC £2199) £1899

~~£1899~~ PRICE MATCH

*1.8 - 30MHz 100W * SSB - CW - FM - AM * Rx 100kHz - 30MHz * Message memory * Dual in-band rx * EDSP filter * RF processor * RF pre-amp * Electronic keyer * IF shift width * Collins filters * omprehensive menu system * RS-232 interface and more - send for details*

KENWOOD New TH-D7E £319

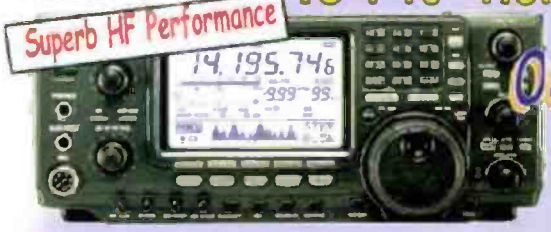
Dual bander
VHF / UHF
Built-in TNC
Data Display

Now enjoy the benefit of a built-in TNC and APRS (Automatic GPS Packet Reporting System). The handheld that takes you into the Year 2000!

Features: * 144/430MHz * Wide / Narrow Deviation * 1200/9600bps TNC * DX Cluster Monitor * Dual Rx Data/Voice on VHF * 12 digit 3-line display plus scroll function * 200 Memories * CTCSS plus 1750Hz tone * AIP (VHF) * APRS * Built-in 13.8V DC charger * 6W on 13.8V DC * AC charger & Ni-cad pack

ICOM IC-746 1.8MHz - 146MHz

Superb HF Performance



Our Best Seller!

Free PSU ~~£1595~~

Free Base Mic

YAESU FT-840 1.8 - 30MHz

~~£649~~

Phone for Crazy Price!

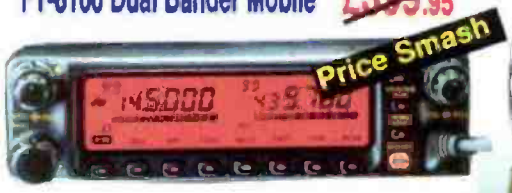
If you are looking for a good, reliable 100W transceiver, then this is just the job. Supplied with FREE Base Mic

Alinco DX-70 HF Base / Mobile

* 1.8 - 54MHz
* SSB CW FM AM
* 100W HF 10W 50MHz
* CTCSS Tone unit

£599.95

YAESU FT-8100 Dual Bander Mobile ~~£399.95~~



Price Smash

Yaesu's top selling dual band mobile transceiver, everything you could wish for including wideband receiver

ICOM IC-207H 2m/70cm Mobile

PRICE MATCH £339

* 2m & 70cm
* 50W / 30W
* Detachable head

Now £13.99

Rechargeable Alkaline Cells For Starter Kit

* *Rechargeable Alkaline*
* *1.5V cells*
* *No memory effects*
* *Charge mid cycle is OK*
* *5 year charge shelf life*
* *3 x capacity of ni-cads*
* *Very low cost*

In stock now! * Note: you must use the special charger supplied with Starter Kit.

Starter Kit: Comprise 4 x AA cells and dedicated AC wall charger **£13.99 + £2 p&p**

4 x AA cells (ready charged)	£5.99 (£1.00 post)
8 x AA cells (ready charged	£10.99 (£1.50 post)
4 x AAA cells (uses standard charger)	£6.25 (£1.00 post)

ICOM New IC-2100 2M Mobile £269

With Switched 12.5kHz & 25kHz Fi...

New Model

TheIC-2100 Mobile transceiver from ICOM features switched filtering, 55 Watts with 113 memories. And all this at a very competitive price. In stock NOW

email: sales@wsplc.demon.co.uk

YAESU FT-50R 2m/70cms Handy ~~£279~~

Price Smash

* *Wideband Rx (AM Airband)*
* *FM Broadcast receive*
* *CTCSS & 1750Hz*
* *112 Alphanumeric Memories*
* *Dual Watch - Military rated*
* *5W from 12v DC input*
* *Ni-cads and AC Charger*

This is a very solid rig that is proving one of the most popular dual band handhelds

ICOM IC-T8E Dual Band handy

6m 2m 70cms

PRICE MATCH £319

All in one small package.

* *5W output (13V)*
* *25 / 12.5kHz ready*
* *Wideband Rx*
* *Nickel Hydride batt*
* *Wide FM broadcast*
* *AM for airband*
* *Rapid scanning*
* *Alphanumeric*

UK's largest Catalogue £3.95 inc. post

Waters & Stanton PLC

22 Main Road, Hockley, Essex SS5 4QS

Order on Freephone

0500 73 73 88

Enquiries 01702 206835/204965
Fax 01702 205843
e-mail sales@wspic.demon.co.uk
web www.waters-and-stanton.co.uk

MFJ FREE 2 Year Warranty Offer

Simply send your Warranty card to us together with serial number and your warranty period will automatically be registered for two years, completely free of charge. Offer only available through ourselves and UK approved dealers.

We will PRICE-MATCH on any new item that is currently in stock elsewhere. PLUS - Give you an offical 2-year warranty, serial numbered stock, and the very latest versions with official warranty cards. EVERY MODEL STOCKED

Rotary Inductor ATU

£139.95

MFJ-969 NEW

- 1.8 - 54MHz 300 Watts
- Built-in 300W Load
- Wire - balanced or coax
- Roller Coaster Inductor
- Active PEP meter (PP9 Batt)
- 4-way Antenna Switch
- Cross Needle metering

UK's Top-Selling Linear

Ameritron AL-811X

£679.95

- *160 - 10 Metres*
- *600 W linear 7.5dB Gain*
- *Like a 3 element Monobander!*
- *Uses low cost 811A tubes*
- *Built-in rugged AC Supply*
- *Instant by-pass switch*
- *PA V/A meter + Gnd meter*
- *Over rated variable capacitors*
- *Fan cooled for long life*

4-Way Coax Switch

MFJ-1704

Rated at 1kW with a frequency range from DC - 1GHz. Fitted SO-239 sockets. Ideal for shack antenna switching.

Perfect CW Tutor

MFJ-418

"It's an Amazing Idea!"

- *Displays words, letters and numbers*
- *3 to 35WPM with natural CW note*
- *Various modes including Farnsworth*
- *Enormous vocabulary of words*
- *Actually sends QSOs as well!*
- *Individual characters or groups*
- *Headphone socket, Power from PP3*
- *Sends text just like an actual test.*
- *A tutor that displays what it sends.*

Nothing Compares **£58.95**

1.8 - 30MHz 3kW ATU

£269.95

MFJ-989C

- *1.8 - 30MHz with roller coaster*
- *Cross needle VSWR & PEP*
- *"T" network with 4:1 balun*
- *Long wire, coax and balanced feed*
- *By-pass and Antenna select switch*
- *270 x 375 x 115mm*

1.8-30MHz 300W ATU

MFJ-948

- *300 Watts PEP 150W CW*
- *1.8 - 30MHz - with ease!*
- *Wire, coax or balanced line*
- *Balun included for best match*
- *30 / 300W power meter - PEP / RMS*
- *Antenna selector, by-pass etc*

£99.95

The Famous Antenna Analyser

1.8 - 170MHz **£169.95**

MFJ-259

New Version MK II

Connect to aerial or coax and adjust it in seconds. Turns hours into minutes and ideas into antennas! Now includes Battery Saver and digital readout of impedance and Reactance values.

- *1.8MHz - 170MHz * Digital Readout*
- *Resonance * VSWR*
- *Impedance * AA batteries or*
- *12v external*

Price Down

Work DX on 50MHz

MFJ-9406

6M SSB Transceiver **£249.95**

10W Complete & Ready to Go!

Data Decoder

MFJ-462B

- *Decodes CW, RTTY, ASCII, AMTOR FEC*
- *LCD 2 x 16 characters*
- *8000 character RAM*
- *Key input for CW practice*
- *Epson compatible printer port*
- *Requires 12V at 300mA DC*

£149.95

MFJ-949 New Version

Same as MFJ-948 above but with internal dummy load.

£115.95

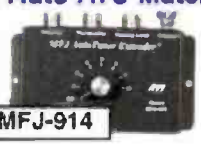
Vectronics VC-300DLP ATU

£129.95

- *1.8MHz - 30MHz 300W ATU*
- *Balanced, coax, long wire*
- *PEP, Average and VSWR*
- *3-way antenna selector*
- *Built-in dummy load*
- *Thru position * Size 257 x 85 x 197mm*

Auto ATU Matcher

£59.95



MFJ-914

Lets your Auto ATU match any coax aerial.

Auto-Tuner Extender

Connect between transceiver and antenna - no more problems with G5RVs and all those difficult antennas - 160 to 10 metres

New QRN Noise Blanker

MFJ-1026

- *Phases out noise at the antenna socket*
- *Kills local QRN - lets signals through*
- *No more electrical interference!*
- *Rf sensed for transceiver use (150W)*
- *Up to 20dB noise reduction*
- *Recovers signals below the noise!*
- *Adjust to suit local problems*
- *Kill that thermostat problem*

£129.95

MFJ- 901B HF Atu

Price Down!

£54.95

- *160 - 10 ATU 300W PEP*
- *Very easy to adjust and match*
- *Wires, Coax and Balanced Feeder*
- *Well rated components*
- *A really low cost winner from MFJ*

+ Discount Vouchers

There's another 225 pages like this advert in "Radio & Beyond" **£3.95** *post paid* **FREE Phone 0500 73 73 88**

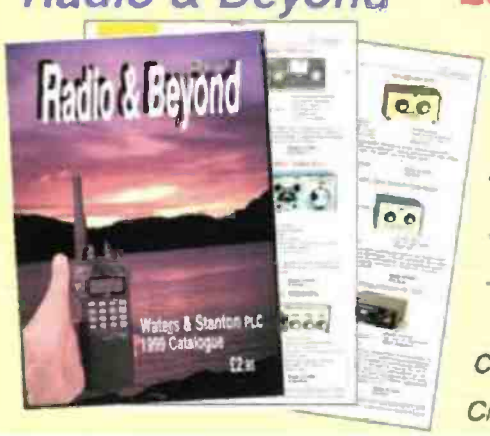


Photo copy or cut out and send to:
Waters & Stanton PLC 22, Main Road, Hockley, Essex. SS5 4QS

Please send me a copy of 240 page guide Radio & Beyond.

Name _____

Address _____

_____

_____

Signature _____

Cheque / Postal Order enclosed

Credit card No. *Expiry*

FEBRUARY 1999
(ON SALE JANUARY 14)
VOL. 75 NO 2 ISSUE 1103
NEXT ISSUE (MARCH 1999)
ON SALE FEBRUARY 11

EDITORIAL OFFICES
Practical Wireless
Arrowsmith Court, Station Approach
Broadstone, Dorset BH18 8PW

☎ (01202) 659910
(Out-of-hours service by answering machine)
FAX: (01202) 659950

Editor
Rob Mannion G3XFD
Technical Projects Sub-Editor
NG ("Tex") Swann G1TEX
News & Production Editor
Jo Williams

ADVERTISEMENT DEPARTMENT
ADVERT SALES & PRODUCTION
(General Enquiries to Broadstone Office)
Chris Steadman MBIM (Sales)
Steve Hunt (Art Director)
John Kitching (Art Editor)
Peter Eldrett (Typesetting/Production)

☎ (01202) 659920
(9.30am - 5.30pm)
FAX: (01202) 659950

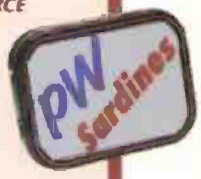
ADVERTISING MANAGER
Roger Hall G4TNT
PO Box 948, London SW6 2DS

☎ 0171-731 6222
FAX: 0171-384 1031
Mobile: (0585) 851385

BOOKS & SUBSCRIPTIONS
Michael Hurst
CREDIT CARD ORDERS
☎ (01202) 659930
(Out-of-hours service by answering machine)
FAX: (01202) 659950

E-MAIL
PW's Internet address is:
pwpublishing.ltd.uk
You can send mail to anyone at *PW*, just insert their name at the beginning of the address,
e.g. **rob@pwpublishing.ltd.uk**

FEBRUARY 1999 CONTENTS



REGULARS

The TA-12 Transmitter made by Bendix... Page 52

Carrying On The Practical Way... Page 40

68 RadioScene

The Alinco Review has had to be held over. Our apologies. Editor.

Published on the second Thursday of each month by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: (01202) 659910. Printed in England by Southernprint (Web Offset) Ltd. Distributed by Seymour, 86 Newman Street, London, W1P 3LD. Tel: 0171-396 8000. Fax: 0171-306 8002. Web: http://www.seymour.co.uk. Sole Agents for Australia and New Zealand - Gordon and Gotch (Asia) Ltd.; South Africa - Central News Agency. Subscriptions INLAND £25, EUROPE £30, REST OF WORLD £37 (Airmail), REST OF WORLD £37 (Airmail, payable to PRACTICAL WIRELESS, Subscription Department, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: (01202) 659930. PRACTICAL WIRELESS is sold subject to the following conditions, namely that it shall not, without written consent of the publishers first having been given, be lent, re-sold, hired out or otherwise disposed of by way of trade at more than the recommended selling price shown on the cover, and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever. *Practical Wireless* is Published monthly for $50 per year by PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW, Royal Mail International, c/o Yellowstone International, 87 Burlews Court, Hackensack, NJ 07601. UK Second Class Postage paid at South Hackensack. Send USA address changes to Royal Mail International, c/oYellowstone International, 2375 Pratt Boulevard, Elk Grove Village, IL 60007-5937. The USPS (United States Postal Service) number for *Practical Wireless* is 007675.

The Sale of the Mi

SMC invites YOU to the JANUARY MILLIC

This week I've unearthed a
Henry 3002A 2m Linear
50 in 1600W PEP out
worth £2895
make me a sensible offer
and it's yours, but...
you have to come and collect it

IC 706M11G

£10 Deposit will secure
an early delivery

January Sale

You can't afford to miss this
and don't forget we will be open all
day Saturday 16th and 30th January

£1 MILLION POUNDS

OPEN STORES

Hundreds of Bargains

Don't confuse this with other sales, this is different
you are invited to browse around our newly
refurbished warehouse to find
the bargain you want

Mail Order - Spend over £100 on new stock items
get a CD ROM with 640 Mb of Shareware
amateur radio programs worth £10 - FREE

FT 100

FREE DELIVERY
Mainland UK only during January

£10 Deposit will secure
an early delivery

SMC

HQ. S.M. House . School Close . Chandlers Ford Ind Est .
REG WARD . 1 Westminster House . West Street . Axm

HQ **01703 246222**

AXMINSTER

South Midlands Commu

STRICTLY NO TRADERS - THIS IS FOR OUR RETAIL CUSTOMERS ONLY

illennium

ON POUND stock sale

FINANCE ? callers only

O DEPOSIT -REQUIRED 12 / 24 / 36 MONTHS
UY NOW - PAY LATER SCHEMES
ITEREST FREE ON SOME PRODUCTS

VOUCHERS callers only

RY TIME YOU SPEND YOU SAVE
VERY £100 SPENT - £10 VOUCHER AGAINST
T PURCHASE

FREE COAX callers only

PURCHASE ANY NEW HF TRANSCEIVER
GET 25mtrs UR67 FREE + 2 x PL259 PLUGS

FREE AERIAL callers only

PURCHASE ANY NEW VHF / UHF TRANSCEIVER
GET AN AERIAL FREE

Up to an incredible 80% discount

callers only

A TASTER

HALF PRICE Morse Keys from £15

Get on Packet with
TNC24MK11 - GIVE AWAY PRICE - £50

We have made up bags of Standard accessories that includes chargers, nicads, and cases incredible value at £5 per bag

Auto Printer Switch boxes
control up to 4 printers from one computer
Kit includes 1 Transmit module and 2 Receive modules - worth £30 just £15

AR8000 Scanner
Just a few left including FREE case
worth £19 - LOW PRICE - £275

FT726R 70cms module
only one though at - £25

Valves at just 50p each

MVT7100 Scanner
How about £179 ?
(only a couple left)

FC767 internal ATU
just 3 left - £35 ?

FT767 2m Module
worth lots - only £25
but ... only 1 left

ICFPRO80 Cost us £204
Sell to you at £75

Mirage 80w 2mtr linear amp
£50 off normal price - 3 only

Workshop manuals / operating manuals
for various older Yaesu radios
incredible value at just £1 each

MORE ?

COME AND SEE

Eastleigh . Hamts . SO53 4BY
inster . Devon . EX13 5NX

Reg Ward

01297 34918

nications Ltd

keylines

ROB EXPLAINS THE RECENT DISTRIBUTION PROBLEM, AND OFFERS SOME ADVICE. A HAPPY NEW YEAR TO EVERYONE!

The distribution problem has raised its ugly head again - this time it affected our December issue very badly and many readers had great difficulty in finding a copy of *PW*. The apparent lack of availability caused them (and us here at PW Publishing) great frustration.

Unfortunately, specialist magazines such as *PW* really are fighting for shelf space on a dwindling number of bookshelves as major multiple stores amalgamate or rationalise (close!) their shops in our high streets. This fact alone has caused problems for specialist titles because, whereas perhaps one store might have stocked *PW*, the store which escaped closure and now stands alone in the town centre may not stock the magazine.

As there are well over 2000 specialist magazines published each month (I'm only considering magazines available 'off the shelf', if all magazines published in the UK were considered the figure would rise to over 3500!) to which must be added 1500 or more that come in from abroad ... there's a very great problem for a 'special interest' publication such as *PW*.

Although I shudder at the very thought of being in a crowd of the numbers seen at football matches - such an analogy is useful because getting *PW* in and visible on a newsagent/book store shelf can be compared to trying to spot one individual person amongst the sea of faces! Substitute the crowded football terraces for newsagent's shelves, the sea of faces for literally hundreds of magazines and the one lonely individual you're looking for (*PW*!), and you can perhaps realise the problems we've got in trying to get the magazine to you!

Shop Save

The only way (apart from suggesting that readers opt for a subscription to the magazine) we can overcome the distribution problem is to suggest that readers ask for a '**Shop Save**'. In other words, you ask your newsagent or supplier to 'save' a magazine for you each month. Apart from the cover price of the magazine there's no extra charge and there should be no further problems.

Although I've mentioned buying a subscription for *PW* as one method of ensuring that you can get the magazine, I quite understand that 'paying up front' for a year doesn't appeal to everyone - and, although we very much appreciate those subscribers who do pay up front', perversely, if everyone opted for this choice and the magazine became 'subscription only' it would work against us!

Yes, it may seem strange but by becoming subscription only, the magazine would not be seen on the shelves by newcomers to the hobby and we would suffer from numerous other disadvantages. So, perhaps now I've explained that ... the reader who suggested (in apparent seriousness): "You only print a few copies of *PW*, making it difficult to buy and forcing us to subscribe" will realise that **we want you to be able to get the magazine from your local newsagents**.

My local Post Office stocks both *PW* and our sister publication *Short Wave Magazine* and what a delight it would be if one copy of each magazine was to be seen in every little corner shop! In that way, you the reader and the potential reader wishing to start off in our hobby would not be disadvantaged.

So, to help us help you, please do try a 'Shop Save' and it's always worthwhile asking the larger chains if they've got *PW* in stock. You'll be surprised at some of the answers - and you can assure those shops who tell you that *PW* is not available any more **just how wrong they are!**

Special interest magazines really do have to fight for shelf-space but there's no reason why newsagents/chain stores should assume that magazines such as *PW* "aren't available" just because we're not shown on their computers! **So, with your help and the 'Shop Save' we can work together to ensure you get your favourite magazine each month in the way you choose to buy it!**

Club Support

Recently, in a letter, I was taken to task by a reader who was questioning my 'Club Support' stance which often features in 'Keylines'. He wrote in to me (very politely) suggesting that if I was that keen in supporting clubs and the specialist organisations within the Amateur Radio hobby that surely I should belong to all of them?

Admittedly, although the letter-writer was 'chasing' me for my annual subscription to one of the specialist groups, he did have a point. In reply I had to confirm that although I morally support all efforts to ensure the continuation of our hobby I've come to the (albeit reluctant) decision that in future I cannot personally afford all the subscriptions required by the various groups.

I hope I don't seem mean, but several years ago my annual 'subscription list' totalled over £200 (including membership to the RSGB) and since then I've had to scale things down. However, recently I've come to the reluctant decision that the only way to be fair to all, is not to be a 'paid up' member of any **specialist group** - but instead to morally support all of you in every way I can through my work in *PW* and by the continuing 'club' visits. I hope you understand!

Ten-Tec Review

I'm sorry that we've not been able to bring you the long overdue review of the Ten-Tec 50MHz transceiver kit project. The delay has been due to reasons out of our control.

Hopefully, **all being well**, the review will appear in the March issue of *PW*. Again, I apologise for the delays in presenting the promised review.

Where Credit Is Due

As a matter of courtesy we always like to give credit where credit is due when it comes to photography. However, I'm afraid to say I forgot to credit last month's front cover photograph of the 'soldier' (**Ashley Hull**) demonstrating the 'Waterproof Wonder' Wireless Set 46 to **Ben Nock G4BXD**. My apologies Ben!

Ashley often appears in Ben's excellent photographs and as a member of the same family, the arrangement suits everyone. So, thank you both, Ashley and Ben for your efforts in presenting the equipment shown in as realistic a fashion as possible. I wonder if he'll ever send us a photograph featuring Ashley driving a Centurion tank?

Calling All Traders!

To finish off this month I'm 'Calling All Traders' to mention that we're planning to publish some special catalogues to be distributed with *PW* in the future.

So, if you are active in the wide field of Amateur Radio, whether it be providing equipment, components, accessories, etc., I'd like you to consider the idea. Together we can promote the hobby, keep *PW* readers informed and help take practical Amateur Radio into the new century. Give me a call...I'm looking forward to hearing from you!

G3XFD

letters

COMPILED BY ROB MANNION

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.

Virtually Free & Friendly!

Dear Sir

After reading the letter from GM0RMT in the November issue, I felt that I just had to reply to make a point.

I fully understand where he is coming from, but less we forget a few very important points here:

1. Amateur Radio is free (once licence and equipment is obtained) for communicating with people world-wide, for as long as you like without the need for paying a greedy telecom company and running up huge bills (like I did)!

2. Amateur Radio tends to breed (usually) a more polite and co-operative environment for people to communicate within, whereas the Internet tends to breed people who are often rude and abusive.

3. In times of crisis and the telephone lines are out, who do the civil emergency people/police, etc., rely on a lot of the time to help them out ... Amateur Radio operators!

One of the main reasons that youngsters would rather go on the Internet than have to study for the RAE is simple, to quote Don Walmesley's letter of the same issue. It takes minimal brain power and effort and is an 'easy fix' and an 'instant gratification scenario'.

I have been in computers for ten years and use them extensively as I have the net and this is one of the last E-mails I will be sending as I cancelled my Internet account this morning so that I will have more money to sit the RAE and buy equipment.

You can give me Amateur Radio as a hobby any day! No hobby (albeit in the way of monitoring for the last several years) has given me more pleasure and helped me in both my ability to concentrate, my understanding of how people in different countries live and communicate with each other. It has also provided me with something so educational and practical that I can pass on to my two children when they get a little older.

Ian Koenig
Bridport
Dorset

Collecting Old QSL Cards

Dear Sir

For many years I have collected antique and interesting Amateur Radio QSL cards - usually getting them from the relatives of deceased 'old timers'.

It had been the practice, in some countries, to make their Amateurs buy 'stamps' (labels) to put on their outgoing cards to help pay the QSL Bureau expenses. I, of course, have taken a great interest in cards with such 'stamps' affixed.

I entered a 64 sheet display of QSL cards and their 'stamps' quite recently into a philatelic competition held at Hove by the Association of British Philatelic Societies. My efforts were rewarded by good marks and a Vermeil (silver gilt) medal.

This is the first time QSL card stamps have appeared and been judged at a National Philatelic show.

I hope that it stimulates other Amateurs and collectors into the study of QSLs and their 'stamps'.

John D Heys G3BDQ
Hastings

Editor's comment: Congratulations John! Readers will also no doubt recognise G3BDQ as one of our special 'Antenna Workshop' authors. Having seen some of John's collection of 'heritage' QSL cards I can confirm that they are fascinating. It's a great shame that many are destroyed and disposed of when long established Radio Amateurs become 'Silent Keys'. However, now that John has drawn our attention to this subject many more may be saved in the future.

Ryall & Upper Thames Street Memories

Dear Sir

As a regular reader of *Practical Wireless* and its varied features, my added attention was drawn to the correspondence of **G3OHV** and **G3KPO**.

I personally visited Ryall Street for my parts and components and Leslie Dixon of Upper Thames Street for my valves which were ex-service type side contact and flying leads (no pins). It is not my intention to bore you, if possible.

I became interested in wireless via an article in the *Meccano Magazines* as to how to construct a crystal set in order to receive the spark signals from the then transmitters. The signals I received then were only those given by the 'cat's whisker'. This would be about 1921.

In 1923, with the aid of an Uncle, I constructed varied single valve sets - some reflex! The original 2LO was then operating.

I became employed in the Telephone and Domestic Wireless Equipment in 1924 with TMC, this was followed by the ITT Labs in 1928. At this point, I would say that I continued in the industry until my retirement.

Following the introduction of the Armstrong Super Heterodyne in 1926 using 1.2V valves, interest in the development of the then 'cold' valve existed.

In 1932 I became associated with a series of enthusiasts in opening a Wireless club in Burnt Oak Edgware. A mention of myself appeared in *Practical Wireless* 1932. Unfortunately, my shed contents were destroyed in London during the Second World War. So what might have been vintage today is lost.

I have never been an operating transmitting amateur but consider myself as having been associated with them yesterday and today. They are the enthusiasts whose dedication to wireless has placed technology where it is today.

W. C. Fulford
Gwynedd

Editor's comment: Who could be bored with that story Mr Fulford - it's fascinating and I'm pleased to tell you that the Edgware Radio Society (at Burnt Oak) is still going strong.

Hora Happy

Dear Sir

Thank you for sending the Hora C408 so promptly (Special Offer In December 1998 *PW*). Although I had not read the review published in the earlier issue I decided to order it on the grounds that any transceiver at that price must be good value for some use! You may be interested in my opinion of it.

Firstly, the size of it came as a nice surprise. Now that really is a portable 'portable'! The unit is well worth having, even if only as a portable receiver. The sensitivity, coupled with a freedom from the effects of **very local** commercial transmitters, puts my 'not very portable' Standard C78 rather in the shade.

As a transmitter, it would be quite suitable for across-a-rally communication. (The modulation needs to be increased to a more realistic level, though. I suspect that it is designed for this silly 12.5kHz 'channel' spacing).

But for use through repeaters, the operation is too much of a pain to be worth the trouble. The radio was obviously not designed for use in Britain, where repeaters operate below 439MHz. True, one

Here's More On Morse

Dear Sir

At the risk of continuing the Morse saga, there is one point which seems to be missing from the correspondence, but which I feel should not be overlooked. It is essential that all persons operating those bands should understand Morse. How else can you be informed that the frequency is currently in use?

I am not sure whether this reason is still valid, since I believe that the Morse requirement - for the marine bands at least - has now been dropped. If this is so, there appears to be no logical reason for retaining the Morse code as a requirement for operating those bands.

As a non-operating third class amateur (i.e., I have a class A license but am not a G3), I suppose my opinion isn't worth very much. As I am currently suffering in my attempts to teach Morse to my wife, who wants an A-class license before they become fourth class, I need to vent my frustrations to someone!

One benefit of this is that I may actually start to listen - and even transmit - on the amateur bands again!

Dave Beedan
West Midlands

And Even More!!!!

Dear Sir

I read Don Walmesley's letter in your November issue with interest, but also with growing frustration.

Whilst appreciating his dedication to the hobby in being a Morse tutor for 40 years, I believe that he has missed the point of the intended removal of the Morse requirement for access to the h.f. bands. It is not a step being taken to make things easier, but a change made necessary by the declining official use of Morse.

The inclusion of a Morse test was not put in place to make the acquisition of a radio licence harder, or to prove that the person had the required attitude or any of the other attributes that I have heard used to justify the retention of the test.

On shared bands, we could be required by the primary user to move or stop transmitting. The given mode of passing this information to us was to be Morse code. Therefore, it was then essential that we had to be proficient in its use. Hence the test to prove this.

Times have now changed, with most official and emergency communications now being done via computers and satellites, etc. We therefore do not now need this requirement as we had in the past.

I am sure that no one wishes to stop the use of Morse, but to try and bring some sort of logical test of competence to the issuing of the Amateur Radio Licence.

If we were starting from scratch to put a form of testing for competence in place, without referring to the past, I am sure that a Morse test would not figure in the methods used. There is a good case that can be made for incentive licensing but I have yet to hear a good case put forward for the inclusion of Morse, at any speed, in this testing.

Malcolm Pemberton G6DAY
Croydon

can set a repeater shift to be operational, but the shift is then applied to every frequency. So, changing between repeater and simplex operation requires one to plough through the menu system, trying to remember what all the abbreviations mean.

Repeater/Simplex really did need to be a front panel switch setting. I did hope that a route round this might be to store repeater frequencies in memory. The use of repeater shift (and the degree of shift) is stored. But unfortunately, if 'Repeater off' is then set for non-memorised frequencies, the transmission is disabled on the memorised frequencies, so that won't work.

In addition to this, repeater operation is only possible when someone has already accessed the repeater. There is a sub-tone facility (is this actually ever used in this country?), but no tone burst!

So, in summary - repeater operation is a big disappointment, but when one bears the special offer price in mind, the Hora C408 still has to be regarded as reasonable value for money.

Anthony Jaques G3PTD
Manchester

Editor: I think the main attraction of the Hora is the price and its physical size, Anthony. They are a deservedly popular little rig at the right price.

Picketts Lock Talk-In

Dear Sir,

I would like to offer my congratulations and thanks to John and the 'Talk-In' team at the Lea Valley (Picketts Lock) Centre for the extremely efficient and friendly service they provided to all of those of us unfamiliar with the territory around London when we attended the London Amateur Radio & Computer Show which was held on November 28 and 29. The Talk-In service was really splendid!

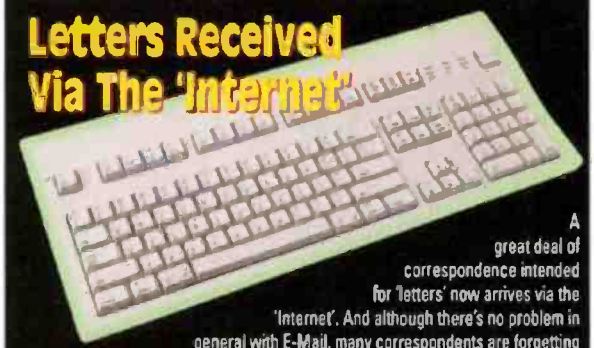
Once they had latched onto us, hearing my call for assistance, they kept each group's location under constant individual surveillance, regularly calling us to see if we were okay if nothing was heard from us for a few minutes. This individual monitoring was assiduously continued until they had us all safely 'docked' in the car park at Picketts Lock.

Thank you Picketts Lock 'Talk-In Team' for a difficult job so well done. Perhaps all 'Talk-In' teams should note just how well this arduous and demanding job can be done so as to take all the hassle out of finding your way to an unfamiliar site.

Noel Midworth G0TWA
Loughborough
Leicestershire

More letters over the page...

Letters Received Via The 'Internet'



A great deal of correspondence intended for 'letters' now arrives via the 'Internet'. And although there's no problem in general with E-Mail, many correspondents are forgetting to provide their postal address. I have to remind readers that although we will not publish a full postal address (unless we are asked to do so), we require it if the letter is to be considered. So, please don't forget to include your full postal address and callsign along with your E-Mail hieroglyphics! All letters intended for publication on this page must be clearly marked 'For Publication'.
Editor

Making More Waves?

Dear Sir

My congratulations to **Bryan Wells G3MND** on his article 'Making Waves', published in the December edition of *PW*. It is not often one finds an author brave enough to challenge the conventional wisdom, ask a number of highly pertinent questions and invite people to comment, critically if necessary. I would like to respond in the spirit of his invitation and perhaps throw some light on four particular aspects of the subject.

Firstly, the comments on the dipole which is considered as lumped inductance and capacitance and the radiation resistance (although I cannot reconcile the figures given with any formulae I know of). This approach is of limited value since the inductance and capacitance are in fact distributed and a much more accurate picture can be obtained by considering the dipole (or any antenna whose length is close to an integral number of quarter wavelengths) as a transmission line.

For a thin dipole, the characteristic impedance (the travelling wave impedance) is a function of the antenna's overall length and diameter and, as stated, is likely to be between 800 and 1000Ω for an 80m dipole. Here, the quarter wave resonant dipole can be thought of as 73.2Ω in series with the reactance of a quarter wave open circuit stub. My calculations for a dipole 39.45m long and 4mm in diameter and having zero reactance at 3.65MHz gives a Zo of 1067Ω, reactance at 3.8 and 3.5MHz of ±69Ω corresponding to a series tuned circuit of 36.6μH and 52pF each with a reactance of 837Ω at 3.5MHz. The *Q* can then be calculated from the radiation resistance, 73.2Ω and reactance values giving a value of 11.4Ω. (This topic is dealt with in depth by R A Smith in his book: *Aerials For Metre And Decimetre Wavelengths*, Cambridge University Press).

On the subject of the generation of a plane wave, I think that nobody has yet fully explained how the change in velocity of charged particles gives rise to radiation this being deep in the realms of quantum physics (of which more later). We do, however (fortunately for radio) know how to calculate what radiation will arise for a given set of circumstances.

It is also worth remembering that, in the feeder, the energy is not carried by the motion of electrons as is commonly thought, but is already a plane wave which conforms to Maxwell's equations. A number of experts, not the least - S. A. Schelkunoff, consider that radiation commences at the gap in the dipole which is effectively a transmission line transformer between the drive point and free space with the induction fields consuming no energy, but facilitating the transformer process. The plane wave therefore travels continuously from feeder to free space and the induction field does not affect it. The induction fields do exist and are more complex than the plane wave fields, decaying much more rapidly with distance. The important point is that the magnetic and electric components of the induction fields are in phase quadrature and, therefore, do not dissipate energy.

The nearest analogy I can think of to the plane wave travelling through the induction field is a resistive load fed via an L-C matching network such as a pi or L section. All the power will be dissipated in the load resistor and whilst there are voltages across the reactances which can be very high these do not affect the power transferred to the load which is the same as if it were connected to the generator via a loss less transformer.

The third point raised is, to my mind, of the greatest importance - that of reconciling the classical 'explanation' (it is no such thing) of radiation with modern quantum theory and photon radiation. This is currently the subject of correspondence in the *IEE Review*, in which I am involved. A radio wave is indeed "a well organised shower of photons" as G3MND suggests and many other radio phenomena can be explained by quantum physics. For instance, the radiation pattern of an antenna is a measure of the probability of photons being emitted in a particular direction. I feel that any further development in radiation theory must lie in the development of quantum theory to reconcile it with classical theory as epitomised by Maxwell's equations since this is probably the only way in which the actual relationship between the generation of photons by the acceleration of charged particles will be explained. Well done G3MND for daring to raise the issue.

Finally, I must comment on the antenna system and feed arrangements referred to in the article. Although it is some ten years since I studied the Hately system for consideration as a compact m.f. system for the local radio broadcast stations my recollection is that it aims to synthesise the radiated wave by generating separate electric and magnetic components using discrete capacitive and inductive elements and arranging for these to be of the correct phase to produce radiation. I do not think G3MND has done this since he is in effect simply feeding two normal antennas, which each have distributed capacity and inductance, in phase quadrature.

Such a system is not uncommon in normal antenna practice - for instance, feeding two orthogonal dipoles in phase quadrature is a method of producing a circularly polarised wave. I suspect any improvement G3MND may have realised is possibly due to the generation of mixed polarisation which can give rise to a more rugged transmission system.

What an interesting topic antenna theory is!

Tony Harwood G4HHZ
Chandlers Ford
Hampshire

Making Waves - Part 2

Dear Sir

I read with interest, the article: 'Making Waves - In More Senses Than One' by **Bryan Wells G3MND** in your December issue of *PW*. I am very pleased to see that someone is questioning conventional wisdom and that the interesting ideas of **Maurice Hately** are being explored.

However, I remain to be convinced that the two antenna systems proposed by Mr Wells are in any way unique. It seems to me that the ±45° phasing is equivalent to 0 and 90° phasing and that the two antennas are a phased pair. Any gain could be directivity gain and the 3dB gain that Bryan reports is, of course, the gain that would be expected. The doublets, Fig. 3, in the article are particularly likely to constitute a phased pair with a spacing of little under λ/8.

I hope that I am wrong, but I do believe that some consideration should be given to the possibility of directivity gain. I look forward to reading more on this intriguing subject.

L. V. Mayhead G3AQC
Chichester

Editor's comment: The article in question generated a great deal of interest. No doubt we'll hear more soon on this fascinating subject from other authors.

news

COMPILED BY JO WILLIAMS

HEADLINE NEWS

History In The Making For NTL

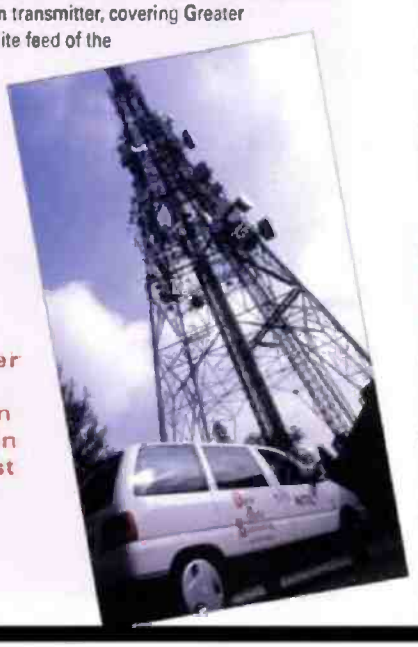
On the 1 November 1998, broadcasting history was made when **NTL** launched the world's first digital terrestrial television network for the new **FilmFour** channel. They say that the 'Digital 3 &4' multiplex will also deliver digital versions of ITV and Channel 4 plus the all-new ITV2 service via the conventional rooftop antenna.

In their press release, NTL say they have been at the forefront of the digital revolution since it all began. In October 1998, we were told by NTL that they were to build the national transmitter network for digital radio as well as providing interactive services and music content.

According to NTL, they have a one third stake in the **Digital One** consortium along with other companies and they say that their long experience as a transmission and network operator make them the ideal people for the design, provision and operation of the national distribution and transmission network.

Additionally, NTL state that they will be providing all encoding, multiplexing, distribution and transmission for Digital One and the "... first phase of 29 transmitters will provide 70% coverage of Great Britain in time for a launch of the national commercial multiplex in October 1999".

In a bid to illustrate the fruits of their labour, at the 'Sound Broadcasting Equipment Show' NTL staged what was, according to them, "an impressive technology demonstration" with a broadcast of live pictures as part of the digital radio multiplex. They say that the end-to-end digital radio system which was set up for the show, included the ability to originate pictures on the stand and transfer them (via ISDN line) to the multiplexing equipment at NTL's Croydon transmitter, covering Greater London. A satellite feed of the same multiplex was received at the NEC and the audio plus pictures were available at the NTL stand.



One of NTL's transmitter masts, situated in Croydon in South East London.

Palstar's New PS50 PSU

According to Nevada, this new addition to the Palstar range of power supply units (p.s.u.), the PS50, delivers 40A continuous output (50A peak) with high stability. It apparently features both short circuit and overload protection and has a thermostatically controlled fan cooling system.

Nevada say that the precision voltage and current meters allow accurate voltage and current monitoring and it's priced at **£144.63 plus VAT**. For more information about this or any other Nevada products, you can contact them at **189 London Road, North End, Portsmouth PO2 9AE or Tel: (01705) 662145**.

Oundle School Takes To The Air Waves

Oundle School near Peterborough has been in touch with the *PW* Newsdesk to tell us that it is "re-affirming its reputation as a pioneer in radio transmission by becoming one of only a few schools in Britain to operate a commercial radio station".

The launch of **Oscar Radio** on **87.7 f.m.** took place on **14 November 1998** and the station plans to transmit its own programmes between 6 and 10pm each day and re-transmit material, including news broadcasts, from a local commercial station at other times.

According to Oundle School, the students have already compiled a stock of recorded interviews with former Foreign Secretary Douglas Hurd, former Head of MI5 Stella Rimington, film critic Barry Norman and Director of Kosovo Information Centre, Isa Zymberi. With such an interesting content, it will definitely be worth a listen!

Sponsor A Special Event!

Practical Wireless have got wind of a Special Event which will be taking place on the **30/31 January 1999** in aid of **Raunds Windmill Primary School**. They need funds quickly to carry out repairs to their swimming pool which has consequently been closed down.

Mr and Mrs Evans, as parents, have decided that they should pitch in and help and because Mr Evans is a keen Radio Amateur, they have arranged a 36 hour sponsored Amateur Radio Marathon.

Mr Evans will spend the whole time, with breaks for nourishment, communicating around the world with as many countries and citizens as possible - the station callsign will be **GB0RWS**. It will be held at Raunds Windmill Primary School, with the support and encouragement of the school and its pupils and the main hall will be open throughout the day for people who want to drop in and see what it's all about.

They are seeking sponsors from people, but mainly, they would like some sponsors from some of the bigger businesses from the world of Amateur Radio. **If you would like to know more about the event, or perhaps you'd like to sponsor Mr Evans, you can contact him on Tel: (01933) 460552.**

Amateur Radio Takes To The Rails!

Luc Danneels ON1DHR of Belgium has been in touch with *PW* to tell us about their new Amateur Radio Club - especially for Tram-bus and Metro drivers!

They have 25 members at present but would very much like more. So, if you are interested you can write to **Luc Danneels ON1DHR at De Klerckstraat 49, 8300 Knokke, Belgium. PACKET: BBS ON1DHR@ON1CED,#WVL,BEL EU.** The award shown in **Fig. 1** can be obtained by senders and listeners by making a QSO with: ON4PTA (club station); ON4CBK; ON4CCI; ON4CEP; ON4CDN; ON4LEC; ON1DHR; ON1BNR; ON1CIQ; ON1DHN; PD0OQD; PE1RGV; PD0NON; OZ1GKJ; GM6HGW; IW2MVW; G6HGW; IW2MVW; G6GVS; G4ZST; S56PRS; S56ILR; S56FVH; S56SGF; S57BPY. For more information, contact Luc Danneels (details as shown).

Fig.1: The award you get when you contact one of the stations mentioned.

continued on page 12

FOR A FREE MENTION ON THESE PAGES SEND YOUR NEWS & PRODUCT INFORMATION TO THE NEWSDESK TODAY!

news

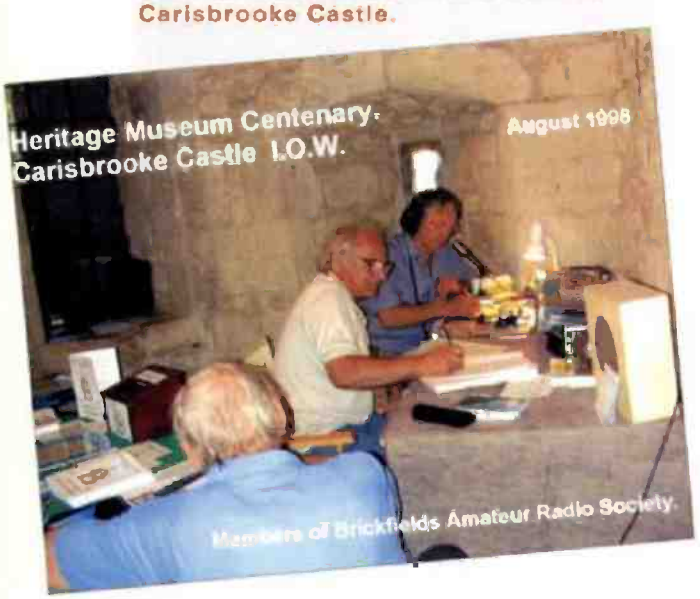
The Royal Seal Of Approval For Brickfields!

The Chairman of the **Brickfield's ARS**, **Alan Gardner G0NTH**, contacted *Practical Wireless* with some interesting news concerning a Special Event which took place back in August 1998. This Special Event - which took place to mark Carisbrooke Castle Museum's centenary - was 'special' for one very good reason - it received the Royal seal of approval from HRH Prince Phillip, Duke of Edinburgh!

The 100W station carried the callsign GX0BAR/P and used a 30m long wire antenna which was erected on the castle ramparts. Because the Brickfield's ARS had posted digital messages about the event across the world, they received many contacts over the Special Event weekend.

Altogether, they managed to make 70 contacts with various countries across Europe, despite imperfect weather conditions and hence made people aware of the museum and its centenary.

Members of the Brickfield's ARC hard 'at work' in the drum room of Carisbrooke Castle.



Spa's Special 'Steam' Event

Chris Margetts M0BQE/G7VJM of the **Droitwich Spa Amateur Radio Society (DSARS)** has written to *Practical Wireless* to tell us of a Special Event Station which they were involved with on the 19 and 20 September 1998 at the Hanbury Steam Rally in north Worcestershire.

The event was put together to raise money for the Hanbury Parish Church, which needs some restoration to the roof - the village of Hanbury and its Church are said to be the model for the village of 'Ambridge' in the long runnig BBC radio series: 'The Archers'.

DSARS used the callsign GB2HSR and used a G5RV antenna at 12m supported by two home constructed portable masts. Two of the club's members: Geoff G0WIS and Derek G4RCB were responsible for erecting the antenna together with a 144MHz collinear antenna. They used a Trio TR-130S on h.f. and a Yaesu FT-290 on v.h.f.

Club Chairman Eddie Cotton G4PQZ (on the right of the photo), guest operator, Geoff Woodford G0KNM (on the left of the photo) with Kath - the all important supplier of refreshments.

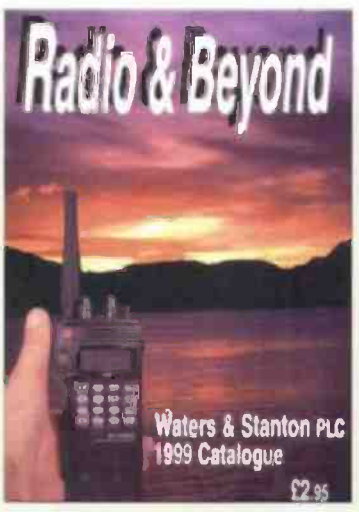
Operating mainly on 40m (7MHz) with some contacts on 2m (144MHz). A total of 150 QSOs were made and QSL cards sent to contacts. The Club operators included John G4OPV, Geoff G0WIS, Derek G4RCB, Chris M0BQE/G7VJM with guest operator Geoff Woodford G0KNM - with the Chairman, Eddie G4PQZ supervising the whole operation.

One of the many steam engines at the Rally.

New Catalogue For 1999

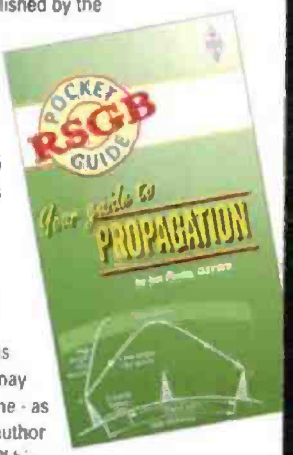
Waters & Stanton have produced their new catalogue for 1999. This new 240 page colour catalogue was actually published in October of 1998 and Waters & Stanton claim that it is the most comprehensive guide of its type in Europe! In fact, in the introduction, **Peter Waters** G3OJV/G0PEP boldly claims that it is "the largest of its kind ... possibly in the world".

It claims to have 1500 items listed with illustrations, many new models along with some editorial matter and some useful technical information. It costs **£2.95 plus £1 P&P** but W&S say that there are some discount vouchers included in the catalogue which should make up for any initial outlay. For more information, or to order a catalogue you can contact Waters & Stanton at **Spa House, 22 Main Road, Hockley, Essex SS5 4QS or Tel: (01702) 206835/204965**.



Poole's Propagation Pocket Guide!

Ian Poole G3YWX has been in touch with *Practical Wireless* to tell us all about his new book: ***Your Guide To Propagation***. Published by the RSGB, the book is the latest in their Pocket Guide series and costs **£6.99**.



Your Guide To Propagation claims to "help the non-scientists get the most out of their radios" and is "an ideal choice for beginners as well as enthusiasts". You may recognise Ian's name - as of course he's the author of our 'What Is A...?' bi-monthly series. If an understanding of propagation is what you crave for, then this could be of help to you.

It is important for Radio Amateurs to know not only the characteristics of each band, but also how other influences such as the time of day and the state of the sun can affect it, according to the book. It claims to cover from h.f up to v.h.f. and u.h.f. bands - and meteor scatter and transequatorial propagation.

Stolen Car Radio Equipment - Exported To Eastern Europe?

At a recent meeting in Kent, attended by Neighbourhood Watch Scheme Co-ordinators - the West Kent Constabulary revealed that they were urgently seeking information on any aspect of car crime - with particular emphasis on thefts involving car radio/stereo systems. The Police authority went on to further explain that they were especially interested in knowing where the stolen equipment actually ends up.

The police believe that some stolen equipment somehow manages to find its way to Eastern Europe. However, as there's such a high volume of equipment disappearing, the authorities believe it's being disposed of in a very highly organised manner.

So, if any reader knows of, or hears about any such arrangements through their contacts in the radio and electronics world - here's a chance to help fight against crime and perhaps put the thief out of business by writing or contacting (in the strictest confidence) to : **The Detective Chief Inspector, West Kent Police, Tonbridge Police Station, 1 Pembury Road, Tonbridge, Kent TN9 2HS. Telephone (01732) 740055.**

Sykes, Syon and Sycom!

Robin Sykes G3NFV has written to the *PW* Offices to say that the mention of himself and Sycom in 'Radio Basics' (January 1999) may have caused some confusion for readers. On page 20 of that particular issue, Rob G3XFD stated that he got his ferrite cores from Robin Sykes of Sycom and then pointed the reader to his advert. Robin's advert which was on p.71 is actually listed under the 'Syon Trading' name.

In order to clear up any confusion: **Sycom components is a division of Syon Trading.** Syon Trading has been around the radio rallies for nearly 17 years and Sycom Components was formed to concentrate on the components aspect although both divisions are interlinked. **You can reach Syon Trading/Sycom Components on 16 The Ridgeway, Fetcham, Leatherhead, Surrey KT22 9AZ. Tel: (01372) 372587, FAX: (01372) 361421. (Callers by appointment only).**

International Marconi Day

From 0000 to 2359UTC on the Saturday 24 April 1999, the **Cornish ARC** will be holding their 13th annual **International Marconi Day (IMD)** in celebration of Guglielmo Marconi's birthday. They state that, as in other years, the event will run for a full 24 hours and will take place on all bands from 160-2m (1.8-144MHz), on all modes: c.w.; s.s.b.; and digital (including SSTV).

There will be the usual high profile **authorised** Participating Stations representing former Marconi operating locations for you all to log/work to enable the Special Award to be claimed, say the Cornish ARC. This special **Award Certificate**, based on an original Marconi Stock Certificate circa 1901 (**Fig. 1**) will be awarded for working authorised IMD Participating Stations.

Fig. 1: The Special Award Certificate awarded by the Cornish ARC for taking part in International Marconi Day (see text).

Your Award claim should state the Award Category claimed and must be made **in writing**, giving a FULL extract of your log together with your callsign and address. You must send your claim to **Sue Thomas G0GPX, Awards Manager, Cornish ARC, PO Box 100, Truro, Cornwall TR1 1RX, England.**

The cost of the Award will be the same for all classes at **£4 Sterling, US$10 or 12 IRCs.** (The Cornish ARC state that only **one** contact with each IMD Special Event Station will count towards the award, the award is NOT cumulative, i.e. contacts made prior to or after the 24 April 1999 will NOT count towards the Award).

Different categories for the award include: Transmitting Amateur - Fixed Station; Transmitting Amateur - Mobile; Transmitting Amateur - c.w.; Transmitting Amateur - Digital Modes; Transmitting Amateur - Multi-operator; shortwave listener and shortwave listener - c.w. **If you have any questions or would like more information, you can contact Robin G0MYR on Tel: (01209) 820118.** There is also a **Web site** about this Special Event at: **http://www.users.globalnet.co.uk/~straff** Other Web sites supporting the event include The Radio Society Of Great Britain (RSGB), Society Of Newfoundland Radio Amateurs (SONRA) and the South Dorset Radio Society (SDRS).

The Cornish ARC's callsign and logo.

New President!

The World Association of Christian Radio Amateurs and Listeners (WACRAL) have appointed a new President - only the third President in 40 years!

John Corbett G3TWS is well known for his pioneering work in relief communications in Africa and is also the author of the book; ***Where There Is No Telephone***. He was appointed as President of WACRAL at their '40th Year Celebration and Conference' which was held back in October 1998.

Stourbridge & District ARS Celebrates 60 Years

Celebrations to mark the 60th anniversary of the Stourbridge & District Amateur Radio Society (S&DARS) took place in a magnificent setting of the Great Hall of Old Swinford Hospital in the West Midland's town on Friday 30th of October 1998.

Originally formed in 1938, the Society has had a remarkable history and, along with making recent tremendous strides into the future, also made it possible for **Alec Higgins G8GF** - one of the original three founder members - to attend the celebrations from his home in Eastbourne on the South Coast.

Various Venues

During the past 60 years the S&DARS has met at various venues in Stourbridge, including King Edward's Grammar School, the Robin Woods Centre and various pubs! During the 1998 60th year a magnificent new venue was established with the opportunity of providing much betters prospects for Amateur Radio in Stourbridge.

The new venue is the Old Swinford Hospital - which, despite its name, is a very large school with a long and distinguished history and its own radio club for students. The celebration year was also highlighted by the amalgamation of the S&DARS and the Old Swinford Hospital Amateur Radio Club to form a new society in attractive surroundings, with a well equipped shack and new training facilities for prospective Radio Amateurs.

Training for the Novice RAE is provided for anyone who may be interested and the Society welcomes new members of all ages.

Memorable Occasion

The 60th Anniversary dinner - completing a special week long reunion celebration - was attended by many past and present members of both original societies. Amongst the guest speakers was *PW* Editor Rob Mannion G3XFD who shared the story of his own experiences of helping out at a school radio club - at Clayesmore School between Blandford Forum and Shaftesbury. Rob amused the assembled guests when he mentioned how he became 'Persona non grata' with various school boarding house-masters as the keen young club members strung wire everywhere for home-made telephones and 'breadboard radios'!

Altogether, it was a wonderful evening for those who attended - and the newly united society is now looking forward to the next 60 years. As previously mentioned, new members of all ages are welcome to join and further information can be obtained directly from **Gordon Bryant G0TEV on (01384) 395206.**

Fig. 1: Alec Higgins G8GF, one of the founder members of the Stourbridge & DARS recalls the early days. Alex lived in nearby Kingswinford for 26 years, but now lives at Eastbourne on the south coast.

Fig. 2: The formal photographs before the anniversary meal began! Alex G8GF with *PW* Editor Rob G3XFD and Dr. Bob Derricott G4VPE, President of the newly combined S&DARS and the Old Swinford Hospital School Radio Club.

Fig. 3: James French G7HEZ, youngest member of the society, presents Daisy Higgins (wife of Alex G8GF) with a bouquet of flowers. Daisy and her husband had been able to attend the celebrations thanks to the kind efforts of the organisers who had arranged to collect them from and then return them to their home in Eastbourne.

COURSES

Adrian Dening G4JBH has a practical weekend course on "A Scientific Approach To Global Communication taking place on 9 to 11 April 1999. It will be covering such things as: 'The History Of Radio'; 'What Are Radio Waves and How Do They Travel?'; 'Satellites - Communication, Television and Weather' and 'Computers and Their Use In The Radio Environment'. It costs **£89 (includes full-board accommodation)** and if you are interested, **you can contact the Course Director (Adrian Dening) on Tel: (01288) 341454 or E-mail: 106471.620@compuserve.com**

news

more news on page 55

1999

January 17: The Oldham ARC Mobile Rally is to be held at the Queen Elizabeth Hall, Civic Centre, West Street, Oldham, Lancs. Doors open at 1100 (1030 for disabled visitors). The event features the usual traders and a Bring & Buy stall. Morse tests are available on demand. Talk-in on S22 via GB4ORC commencing at 0730. There will be refreshments and free parking. **(01706) 846143** or **0161-652 4164**.

February 7: The Harwell Amateur Radio Society are holding their Radio & Computing Rally at the Harwell Science and Engineering Centre, one mile west of the A34, between Oxford and Newbury. Talk-in on S22. Doors open from 1000. There will be trade stands, Bring & Buy, bar, light refreshments, and craft exhibitors. Admission is just £1, children free. **G8NVI** on **(01235) 816379** or **http://www.hamradio.harwell.com**

February 7: The 14th South Essex Amateur Radio Society Radio Rally is to be held at the Paddocks, Long Road, Canvey Island, Essex. The Paddocks is situated at the end of the A130. Doors open at 1030. Features include Amateur Radio, computer and electronic component exhibitors, Bring & Buy, RSGB Morse testing on demand (two passport photos required), home-made refreshments, free car parking with space outside main doors for disabled visitors. **David G4UVJ** on **(01268) 697978**.

February 14: The 14th Northern Cross Rally is to be held at Thornes Park Athletics Stadium, Wakefield. There is one large hall, just out of town on the Horbury Road. Easy access from M1 juncts 39 & 40 - well signposted and with a talk-in on 2m and 70cm. Doors open 1100 (1030 for disabled visitors and Bring & Buy). **Roy G0TBY** on **(01924) 893321** or packet **G0TBY@GB7WRG**. E-mail **rally@waveg.demon.co.uk** or visit the web page at **http://www.waveg.demon.co.uk/rally/**

February 21: The Barry Amateur Radio Society Radio & Computer Fair has changed its venue. **The new and improved venue** is the Holmview Leisure Centre, Skomer Road, Barry. Facilities include lounge bar, catering and parking. Admission is £1.50 and doors open at 1000 for disabled visitors and 1030 for general public. **Brian GW0PUP** on **(01222) 832253** combined telephone and FAX number.

March 7: The Wythall Radio Club are holding their 14th Annual Radio & Computer Rally at Wythall Park, Silver Street, Wythall, near Birmingham on the A435, just two miles from junction 3 of the M42. Doors open from 1000 to 1600 and admission is £1.50. There will be the usual traders in three halls and a large marquee, Bring & Buy, bar and refreshment facilities are also on site. Talk-in on S22. There will also be a unique park and ride for easy and comfortable parking. Contact **Chris G0EYO** on **0121-246 7267** evenings and weekends for more details, FAX on **0121-246 7268** or E-mail **g0eyo@compuserve.com**

March 13: The 6th West Wales Amateur Radio & Computer Rally will be held at Penparcau School, Aberystwth. Doors open 1030 till 1600 (with disabled access from 1000). Admission is £1 per person. There are good parking facilities, with easy access for disabled and traders to all stalls. There will be a demonstration area and catering facilities. Features also include Amateur Radio, Bring & Buy, computers (software and hardware), electronics, h.f. and v.h.f. on the air, and much more. **Katy GW0SFO** on **(01545) 580675**.

March 21: The Tiverton South West Amateur Radio Club will be sponsoring and running their rally in the Tiverton Panner Market. Doors open at 1000. There will be a wide selection of traders, catering for all aspects of the hobby. There will be the usual excellent food and catering facilities around and in the Panner Market. More information from **Alan Sedgbeer G0MAS** on **(01884) 252259**.

March 21: The Bournemouth Radio Society are holding their 12th Annual Sale at Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth. Doors open at 1030 and close at 1630. Talk-in from G1BRS on 2m S22. There will be Amateur Radio and Computer Traders, clubs and specialised groups, excellent refreshments and a Bring & Buy. Admission is just £1. More details from **Olive** or **Frank Goodger, 66 Selkirk Close, Merley, Wimborne, Dorset BH21 1TP** or telephone on **(01202) 887721**.

***March 21:** The Norbreck Amateur Radio, Computing & Electronics Exhibition is being held in the Norbreck Castle Hotel, Queens Promedade, Blackpool, Lancashire. Doors open 1100 (with disabled access at 1045). There will be over 100 trade stands, club stands, Bring & Buy stand, RSGB stand and book stall, amateur computer stands, construction competition, free car parking at hotel, a bus from an extra car park and wheelchair access to all the exhibitors. Admission is £2, OAPs £1 and under 14s go free. **Peter Denton G6CGF** on **0151-630 5790**.

March 28: The 10th Magnum Radio & Computer Rally will be held at the Magnum Leisure Centre, Harbourside, Irvine. Doors open 1100. This rally is organised by the Cunninghame & DARC. More information from **William Gebbie** on **(01560) 321009**.

April 18: The Cambridgeshire Repeater Group are holding their annual rally at Bottisham Village College, Bottisham, which is six miles east of Cambridge. Access is via A14 and A1303. There is a large hall with a car boot sale, Bring & Buy and the Group's renowned auction of radio and electronic equipment. Doors open 1030 and admission is just £1. Refreshments will be available. Talk-in on S22. **Paul Dyke G0LUC** on **(01462) 683574**.

April 19: The Yeovil Amateur Radio Club are holding their 15th QRP Convention at Digby Hall, Hound Street, Sherborne, Dorset from 0900 to 1700. There will be interesting lectures, trade stands, a Bring & Buy and refreshments. Talk-in will be on S22. Entrance fee is £2. Further details from **Mike G7SDD** on **(01963) 250594**.

May 9: The Drayton Manor Radio & Computer Rally is to be held at Drayton Manor Park, Fazeley, Tamworth, Staffs on the A4091. The main traders will be in four marquees with a large outside traders flea market. There will also be a Bring & Buy stall, local clubs and special interest stands. Open from 1000 onwards. Trader information from **Norman** on **0121-422 9787**, other information from **Peter G6DRN** on **0121-443 1189** evenings please.

May 16: The Ripon & DARS are pleased to announce that the Northern Mobile Rally will take place at the Great Yorkshire Showground. There will be all the usual stalls, talk-in, Bring & Buy, free car park, disabled access, etc. Details on **(01765) 640229** or E-mail **gerald@bronco.co.uk**

May 30: The 1999 Plymouth Amateur Radio Society are holding their rally at the usual venue, which is at the Plymouth College of Further Education, Kings Road, Devonport, Plymouth. Doors open 1030 till 1430 and admission is just £1. There will be the usual traders, plus Morse testing on demand. The venue is large and spacious with ample free car parking. The display halls have plenty of room for visitors to mingle and browse. There is also a large canteen serving freshly cooked light meals and snacks at reasonable prices. Plymouth City Centre, the Hoe and many major attractions are close by for the family. Signposting will be from the Manadon Junction on the A38 Devon Expressway and there will also be a talk-in on S22. More information on **(01752) 662051** during office hours.

June 20: The Newbury & District Amateur Radio Society will be holding their 13th Annual Amateur Radio Car Boot Sale at Cold Ash playing field, near Newbury. Sellers/Traders should arrive by 0800. Sale open from 0900 till 1500. **Ian Trusson**, Secretary, on **(01635) 826019**, E-mail **G3RVM@compuserve.com**

If you're travelling a long distance to a rally, it could be worth 'phoning the contact number to check all is well, before setting off.
The Editorial Staff of *PW* cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers. If you have any queries about a particular event, please contact the organisers direct. - Editor

HAYDON COMMUNICATIONS

★ ★ MAIL ORDER: 0181-951 5781/2 ★ ★

London showroom & Mail Order
132 High St. Edgware, Middx HA8 7EL.
Tel: 0181-951 5781/2. Fax: 0181-951 5782
Open Mon-Fri 9.30-5.30pm. Sat 9.30-2pm

W. Midlands showroom
Unit 1, Canal View Ind. Est., Brierley Hill, W. Mids.
Open Mon-Fri 9.30-5pm. Sat 9.30-2pm
ALL ENQUIRIES BY PHONE TO 0181-951-5782

(Next day delivery £10 to most areas)

RECOMMENDATION AND PRICE ARE TWO GOOD REASONS WHY YOU SHOULD BUY FROM US!

BASE COLINEARS P&P £9.00

GF = Glass Fibre

QT-S2 GF 144MHz 4.5dB (86")	£54.95
QT-S70 GF 70cm 5dB (60")	£54.95
TSB-3608 GF 50/144/70, 2.15/6.2/8.4dBi gain	£69.95
TSB-3315 GF 144/70, 8.5/11dB (5.4m)	£125.95
TSB-3301 GF 144/70,6.5/9dB (3m)	£64.95
TSB-3302 GF 144/70, 4.5/7.2dB (1.7m)	£49.95
TSB-3303 GF 144/70, 3/6dB (1.1m)	£39.95

ACCESSORIES *P&P £2.50 on the following*

TSA-6001N Duplexer (4Coax) 2/70 (N/N259)	£24.95
TSA-6003 Duplexer (Coax) 2/70 (PL/259's)	£19.95
CFX-514 Triplexer (6/2/70) (Coax)	£56.95

MOBILE ANTENNAS *£6.50 delivery*

TSM-1612	6/2/70 (2.15/6/8.4dB) 2.1M	£54.95
DB-7900	144/70 cms, (5/7.6dB) 1.5m	£29.99
DB-770M	144/70 cms, (3/5.5dB) 1m	£24.95
DB-1304	144/70 cms, (2.15/3.8dB) .41cms	£19.95
DB-EL2E	144MHz, ⅝ths, 4.5dB (1.8m)	£29.95
DB-285	144MHz, ⅝ths, 3.4dB (1.3m)	£15.95

ACCESSORIES *P&P £2.50 on the following*

MT-1301	H/Duty Mag Mnt + Coax	Top Quality £24.95
MT-3302	H/Duty Hatch/Trunk Mnt.	Top Quality £24.95
CF-BPF2	2m band pass filter	£49.95
Q-Tek	6m band pass filter	£42.95

Q-TEK ANTENNAS P&P £8.50

SEND SAE FOR REVIEW

3 X the durability of "Tonna".

Q-TEK ZL SPECIALS

2m	5ele (boom 45"/9dBd)	£36.95
2m	7ele (boom 60"/11dBd)	£45.95
2m	12ele (boom 126"/13.8dBd)	£69.95
70cm	7ele (boom 28"/11dBd)	£24.95
70cm	12ele (boom 48"/13.8dBd)	£44.95

Q-TEK YAGIS FOR 2/4/6m + 70cm

2m	5ele (boom 63"/9dBd)	£36.95
2m	8ele (boom 125"/11dBd)	£46.95
2m	11ele (boom 156"/12.7dBd)	£65.95
2m	5ele crossed (boom 64"/9dBd)	£69.95
2m	8ele crossed (boom 126"/11dBd)	£85.95
4m	3ele (boom 45"/7dBd)	£39.95
4m	5ele (boom 128"/9dBd)	£59.95
6m	3ele (boom 72"/7dBd)	£49.95
6m	5ele (boom 142"/9dBd)	£69.95
70cm	13ele (boom 76"/12dBd)	£36.95
70cm	13ele crossed (boom 83"/12dBd)	£55.95

Phasing harness for 2 x 2m yagis 'N' types
£25.00 P&P £4.50

Q-TEK HB9-CV

70cm	HB9CV (boom 12")	£16.95
2mtr	HB9CV (boom 20")	£19.95
4mtr	HB9CV (boom 22.5")	£29.95
6mtr	HB9CV (boom 32.5")	£36.95
10mtr	HB9CV (boom 52")	£65.95

NEW HF MOBILE WHIPS (PL-259)

Easy to mount HF mobile whips ready to go with PL-259 fitting.

PL-80	80m whip (approx 1.5m long)	£21.95
PL-40	40m whip (approx 1.5m long)	£19.95
PL-20	20m whip (approx 1.5m long)	£19.95
PL-6m	6m whip (approx 1.2m long)	£16.95

END FED HALF WAVES Ground plane free

4m	Length 92" (SO239)	£39.95
6m	Length 126" (SO239)	£49.95

Q-TEK ACCESSORIES

Q-TEK PENETRATOR

"We've sold 100s in Europe"

★ 1.8 - 60MHz HF vertical ★ 15 foot high
★ No ATU or ground radials required
★ (200W PEP). ONLY £150.00 delivery £10

SEND SAE FOR LEAFLET

Wire version now available 35ft long end fed. (1.8-60MHz) spec as above.

BULK PURCHASE

100m roll of RG-213 coax
ONLY £60.00 P&P £10

DELUXE G5RV

Multi-stranded plastic coated heavy duty antenna wire. All parts reusable. Stainless steel and galvanised fittings. Full size - 102ft. Only £39.95
Half size 51ft. Only £34.95
Carriage £6.00.

STANDARD G5RV

Full size	102ft	£24.00 P&P £6
Half size	51ft	£21.00 P&P £6

NEW Q-TEK INDUCTORS

80mtr inductors. Add them to your ½ size G5RV and convert it to a full size. £22.95 P&P £2

COPPER ANTENNA WIRE (All 50mtr rolls)

Enamelled	£11.00 P&P £5
Hard drawn	£12.00 P&P £5
Multi-Stranded (Grey PVC)	£8.95 P&P £5
Extra H/duty (Clear coated)	£22.00 P&P £5
Flexweave (H/duty)	£30.00 P&P £5
Flexweave H/duty (20 mtrs)	£13.00 P&P £5
Flexweave (PVC coated 20 mtrs)	£16.00 P&P £5

Q-TEK BALUNS

Wound on ferrite rod and encapsulated into a dipole centre with an SO239 socket. Brass terminals form the balun output and stainless steel screw eyes offer an anchor point for the ends of the antenna. Ratio power rating is 1000 watts.

1:1 Balun	£24.95 P&P £2
4:1 Balun	£24.95 P&P £2
6:1 Balun	£24.95 P&P £2

Q-TEK TRAPS

Low Handling

40 mtrs	Traps	(a pair) £25.00 P&P £4
80 mtrs	Traps	(a pair) £25.00 P&P £4
10 mtrs	Traps	(a pair) £25.00 P&P £4
15 mtrs	Traps	(a pair) £25.00 P&P £4
20 mtrs	Traps	(a pair) £25.00 P&P £4

MEGA MAG-MOUNT

WHY BUY 3 MAG-MOUNTS WHEN ONE WILL DO?

This amazingly strong mag-mount will hold most HF antennas (¾ fitting). Fitted for protection with a rubber skirt along with 5m of coax with a PL-259 fitted.
Bulk purchase ..... £15.00 P&P £3.50

DESK MICS & HEADSETS

OUR BEST SELLING MIC!

D-308B BLACK DELUXE DESK MIC (with up/down).

Super quality. (Supplied with 8 pin pre-wired Yaesu lead) £49.95 P&P £5.00

OPTIONAL LEADS (P&P £1.50)

A-08	8 pin "Alinco" round	£9.95
K-08	8 pin "Kenwood" round	£9.95
I-08	8 pin "Icom" round	£9.95
AM-08	Modular phone "Alinco"	£9.95
YM-08	Modular phone "Yaesu"	£9.95
IM-08	Modular phone "Icom"	£9.95

U-120 headset

A high quality headset that will fit most hand portable and most HF & VHF/UHF tcvrs via optional interface.

£24.95 P&P £3.50

Supplied with two pin molded plug- will fit Alinco/Yaesu/Standard/ADI/Icom hand helds).

Optional leads (P&P £1.50).

F-3035	8 pin "Standard" round	£16.95
F-303Y	8 pin "Yaesu" round	£16.95
F-303K	8 pin "Kenwood" round	£16.95
F-303I	8 pin "Icom" round	£16.95
F-303YP	Modular "Yaesu" phone	£16.95
F-303KP	Modular "Kenwood" phone	£16.95
F-303IP	Modular "Icom" phone	£16.95

TELESCOPIC MASTS

5 section telescopic mats. Starting at 2"2" in diameter and finishing with a top section of 114" diameter we offer a 8 metre and a 12 metre version. Each mast is supplied with guy rings and stainless steel pins for locking the sections when erected. The closed height of the 8 metre mast is just 5 feet and the 12 metre version at 10 feet. All sections are extruded aluminium tube with a 16 gauge wall thickness.

8 mtrs £69.95 12 mtrs £99.95 *Carriage £10.00.*

Free standing tripod for the above telescopic masts £84.95 P&P£10

GUY WIRE KITS ..... P&P £6

Standard kits (complete with wire)	£22.95
Heavy duty kits (complete with wire)	£25.95

MAST HEAD PULLEY Easy to fit pulley with mast clamp (up to 2") ..... £7.50 P&P £1.50

SECTIONAL MASTS *Carriage £9.00*

4 x 5 foot aluminium sections each swaged at one end.

1¼" dia	£19.95
1½" dia	£29.95
1¾" dia	£36.95
2" dia	£45.95

WALL BRACKETS + MAST BASE PLATES

2"	Mast base plate	£12.00 P&P £5
6"	Stand off	£6.95 P&P £5
9"	Stand off	£8.95 P&P £5
12"	T&K Brackets	£12.00 P&P £8
18"	T&K Brackets	£18.00 P&P £8
24"	T&K Brackets	£20.00 P&P £8

HAYDON COMMUNICATIONS

★ ★ MAIL ORDER: 0181-951 5781/2 ★ ★

London showroom & Mail Order
132 High St. Edgware, Middx HA8 7EL
Tel: 0181-951 5781/2. Fax: 0181-951 5782
Open Mon-Fri 9.30-5.30pm. Sat 9.30-2pm

W. Midlands showroom
Unit 1, Canal View Ind. Est., Brierley Hill, W. Mids.
Open Mon-Fri 9.30-5pm. Sat 9.30-2pm
ALL ENQUIRIES BY PHONE TO 0181-951-5782

(Next day delivery £10 to most areas)

LOW RATE FINANCE AVAILABLE 19.9% APR

HF TRANSCEIVERS AND ACCESSORIES

KENWOOD TS-870

Still seen by most to be the best "IF-DSP" DX transceiver available!

AT ONLY **£1495.00** *IT'S A BARGAIN*

KENWOOD TS-570DG MkII

New upgraded version to replace the popular TS-570D.

ONLY **£869.00**

TS-870S One piece only £1495.00

ALINCO DX-70TH

HF + 6m transceiver with CTCSS + CW filter. (100W all bands)

ONLY **£639.00**

P-2512 'M'

25-30 amp power supply with variable volts (3-15). Dual meters (Volts + amps). The UKs best selling power supply.

RRP ~~£99.95~~ OUR PRICE **£89.95**

Watson W-25 30 amp PSU ..... our price £94.95
PS-200 Portable PSU ..... to clear £59.95

ICOM IC-756

The best HF + 6m transceiver on the market.

ONLY **£1495.00**

IC-706II To clear £749.00
IC-746 ..... Phone for UK's best price
SM-20 Desk mic £99.95
SP-21 Ext speaker £65.00

YAESU FT-920

ONLY **£999.00**

FT-847 HF + 6, 4, 2m +70cm £1399.00
FC-20 Auto ATU £219.95
FT-1000MP ..... Phone for UK's best price

SGC-230

Superb ATU will work with any HF transceiver. ~~£349.~~

SALE PRICE **£259.00**

SGC-231 HF + 6m Smartuner £299.00

RANGER 811

Easy to tune HF linear amplifier. (Up to 800 watts).

ONLY **£895.00**

(Interest free credit available)

VHF/UHF TRANSCEIVERS

ICOM IC-821

Superb 2m/70cm base transceiver (all mode). We have one only brand new sealed box going for a crazy price.

ONLY **£999.95**

KENWOOD TM-G707E

Our best selling dual-band mobile with detachable head.

(Optional extra RX available)

OUR PRICE **£295.00**

YAESU FT-8100R

True dual-band mobile with detachable head + wide-band Rx.

£349.00

FT-290RII 2m all mode £299.00
FL-2035 25W linear for above £159.00
Alinco DR-140 2m FM mobile (50W) £189.00
Alinco DR-M06 6m FM mobile (20W) £209.00
Alinco DR-430 70cm FM mobile (35W) £215.00
Alinco DR-150 2m FM mobile (50W) £245.00

ICOM IC-Q7E

Miniature dual-band transceiver with wide-band Rx: 30-1300MHz (no gaps) NF/AM WFM.

STOCKTAKING CLEARANCE

~~£215.00~~ HENCE **£149.95** 50 PIECES ONLY!

IC-T8E ..... Our price only £299.00

KENWOOD TH-G71E

Dual-band transceiver with optional wide-band receive. One of the only "M.I.L." spec Dual-banders with...

1. Repeater function. 2. Cross band facility. 3. Die-cast chassis. 4. Full size illuminated key-pad (unlike FT-50R). 5. Large "backlit" LCD. 6. Slimmer in size than FT-50R. 7. Higher output power than FT-50R. 8. Standard ext. mic. connection. 9. Cheaper in price. 10. Optional extended RX: (110-950MHz with gaps).

WHICH WOULD YOU PREFER?

TEN PIECES ONLY **£215.00**

ALINCO DJ-G5E

Our best selling true dual-band hand-held transceiver with optional wide-band receive.

SIX PIECES ONLY

£219.95

T-22 2m hand-held + airband Rx £149.00
DJ-190 2m hand-held £129.00
Alinco C4 70cm hand-held (1 only) £69.00
Hora C-408 70cm hand-held £69.95

ICOM IC-22E

2m FM hand-held transceiver with airband Rx.

BULK PURCHASE, HENCE:-

£149.00

COMMUNICATION RECEIVERS

AOR AR5000

Next generation wideband communication receiver covers 0.1-2GHz (all mode).

ONE PIECE ONLY **£1149.95**

IC-8500 ..... Phone for UK's best price

PCR-1000

Computer receiver. 100kHz-1300MHz (all mode). ~~£349.00.~~

£249.00 WHILST STOCKS LAST

AR3000A

Wide-band receiver covers 100kHz-2GHz (all mode)

SALE PRICE **£629.00**

UBC-9000XLT Desktop scanner £249.00

AR7030 plus

ANNIVERSARY SPECIAL

With free notch filter & noise blanker & telescopic antenna.

ONLY **£879.00**

Last few remaining

ICOM IC-R2

Minature wideband hand-held scanner covers 0.5-1300MHz (AM, FM/WFM).

ONLY **£129.00**

Soft case for IC-R2 ..... £14.95
IC-R10 One piece only £249.00

AR8200

The latest all mode innovation in handies. There's too many features to list.

OUR PRICE **£Censored**

AR8000 Our price £269.00
Soft case for 8200/8000 ..... £17.95

MVT-7100

Wide-band hand-held scanner 0.5-1650MHz (all mode).

ONLY **£199.00**

MVT-9000 (5 pieces only) £299.95
Soft case for MVT-9000/7100 ..... £19.99

YAESU FRG-100

Award winning SW receiver.

OUR PRICE **£399.00** incl's PSU

NEW YEAR SALE NOW ON!

SALE SALE SALE SALE SALE SALE SALE SALE SALE SALE SALE SALE SALE SALE

SW PORTABLES

SONY SW-100E

Award winning miniature portable SW receiver. Its performance is brilliant for its size. The best short wave receiver for under £250. RRP ~~£280~~.

SALE PRICE **£149.95**

Sony SW-55E	Short wave portable	£235.00
ATS-818	Short wave portable	£99.00
R-861	Short wave portable with RDS	£169.00
R-828	Short wave portable + cassette	£199.00

OPTOELECTRONICS PRODUCTS

Tectoyz micro counter	£89.95
TNC-100 Optional antenna	£6.99
Opto Cub	our price £99.95
Opto Scout	our price £349.95
R-11 Intercepter	our price £199.95
Opto Xplorer	our price £649.00
Opto Lynx computer interface	£129.95
Micro DTMF decoder	£89.95
New Mini Scout	our price £169.00
Opto Trakker	£249.00

MFJ PRODUCTS

MFJ-259 MkII

HF digital SWR analyser + 1.8-170MHz counter/resistance meter.

ONLY **£169.00** P&P £5

MFJ-949	300W ATU + dummy load	£115.00
MFJ-969	HF + 6m ATU	£139.00
MFJ-962D	1.5kW versa tuna	£239.00
MFJ-784B	DSP filter	£176.00
MFJ-418	CW tutor	£58.00

CUSHCRAFT SALE

R-6000	6-20 meters	£259.00
R-7000	10-40 meters	£319.00
X-7	10, 15, 20 meters 7 ele yagi	£449.00
X-9	10, 15, 20 meters 9 ele yagi	£649.00
A-35	10, 15, 20 meters 3 ele yagi	£329.00

SP-350V

Be protected this summer! In-line lightning surge protector.

INTRO PRICE **£19.99** P&P £1

COAX SWITCHES (P&P £3.00)

CX-401	4 way (SO-239)	£49.95
CX-401 'N'	4 way (N TYPE)	£54.95
CX-201	2 way (SO-239)	£18.95
CX-201 'N'	2 way (N-type)	£24.95

GARMIN GPS-III

Latest UK version complete with moving map of UK & Europe. ~~£449.00~~.

SALE PRICE **£319.95**

GPS-12	Navigator	£129.95
Cigar power lead		£20.00
Active magmount antenna		£39.95

★★★★ STAR BUY ★★★★

★ A 30ft six section 2" dia aircraft grade aluminium swagged set. A very lightweight but extremely strong mast set.

~~£70.00~~ ONLY **£35.00** P&P £10

NISSEI METERS

SALE NOW ON

RS-502	1.8-525MHz (200W) £99.95	NOW £69.95 p&p £5
RS-102	1.8-150MHz (200W) £59.95	£49.95 p&p £5
RS-402	125-525MHz (200W) £59.95	£49.95 p&p £5
RS-101	1.8-60MHz (3kW) £79.95	£69.95 p&p £5
RS-40	144/430MHz Pocket PWR/SWR Meter (200W) (SO239)	£34.95 p&p £1
RS-40N	As above with N-type	£39.95 p&p £1

DL-60 ★ Dummy load ★ DC-500MHz ★ 60W max ★ PL-259 fitting **£16.99** P&P £1 THE IDEAL SHACK ACCESSORY

VECTRONICS VC-300DLP

UK's most popular 300W ATU with built-in dummy load.

SPECIAL OFFER **£99.95**

RECHARGEABLE ALKALINE CELLS

Starter kit includes charger & 4 x AA cells. **£13.49** + £2 P&P.

Please note that only the special cells can be recharged with this charger.

Extra cells available

8 x AA pack £10.99
4 x AA pack £5.99
4 x AAA £6.25

Rechargeable Alkaline. No memory effects. 1.5V cells. 3 x capacity of nicads.

NO QUIBBLE WARRANTY

INTERFENCE – STOP IT

Rectangular snap-fixing ferrite cores suitable for :- Radio coax/TV/mains/telephone/PC & data cables.

Plastic teeth prevent it from sliding on cable. Simply snap close onto cable and job is done! (Will fit large coax).

BULK PURCHASE hence **2 for £5**

(P&P £2.50). HURRY – LIMITED STOCK

QUALITY USED EQUIPMENT

TS-850SAT	Immaculate condition	£699.95
FT-920	As new Incls FM+AM	£899.95
FT-900AT	VGC	£599.95
IC-725	VGC	£299.95
IC-706	As new	£549.95
TS-570D	As new	£649.95
FT-1000MP	Demo model never used	£1799.95
SGC 2000 Power Talk - Bargain		£999.95
FT-102	Boxed + book	£299.95
VX1R	Demo model	£159.95
TS-711E	2m all mode base	£449.95
TS-440S	VGC	£399.95

HANDHELD ACCESSORIES

Nissei EP-320

Hanging type earphone with boom mic & PTT. Fits Kenwood, Alinco, Yaesu or Icom.

£24.95 P&P1

Nissei EP–300T

Over the ear earpiece with lapel mic & PTT. Fits Kenwood, Alinco, Yaesu or Icom. New low price **£19.95** P&P £1

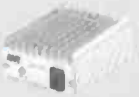
Please specify brand of radio when ordering

This Ear/Mic comes with an "over the ear" earpiece as EP-300

MS-107 Fist microphone to fit Kenwood, Yaesu, Icom & Alinco.

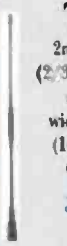
£16.95 + £1 P&P

(PLEASE SPECIFY MAKE OF RADIO WHEN ORDERING)



NB–30W 2M FM handheld amplifier 2-5W input. 30W output (for 5W ip). Turn your handheld into a mobile for under £50

TEN PIECES ONLY **£29.95** P&P £4.00



T-2602

2m/70cm/23cm (2/3/5.5dB) flexible antenna with wideband receive (14" long BNC).

OUR PRICE **£22.95** P&P £1

DB-770H

High gain 2m + 70cm telescopic antenna with wideband receive.

OUR PRICE **£24.95** P&P £1

POLICE STYLE HOLSTER HHC-2

Matches all hand helds. Can be worn on the belt or attached to the quick release body holster. **£19.95** + P&P £1

Waterproof case for handheld ..... £10.00 P&P £1

MA-339

Mobile holder for handhelds

15 PIECES ONLY **£4.99** + P&P £2

QS-200 ..... Air vent holder ..... £9.99 P&P £2

QS-300

A fully adjustable desk top stand for use with all handhelds. Fitted coaxial fly (FAI) with BNC & SO239 connectors

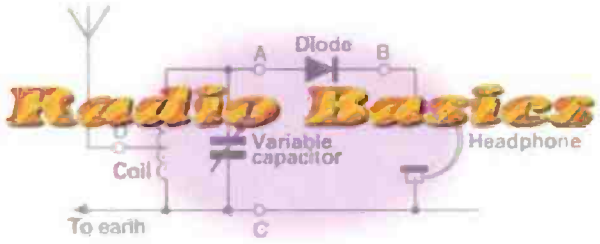
20 PIECES ONLY **£9.99** P&P £3

EP-300

Deluxe over the ear earpiece.

100 PIECES ONLY **£9.99** + P&P £1

The 'Tinny Dipper' - Part 2



Well, here we are at last! I'm sorry that the project has been delayed for the reasons mentioned last month ... but perhaps it's a case of better late than never' and for myself I can tell you that I've really enjoyed the work that has gone into providing a unit which should prove very useful indeed to anyone that builds it.

So, without further ado ... let's get on with it and start by looking at the circuit, **Fig. 1**. This, as I mentioned in the first part of the project, is based on the work of the late **Doug DeMaw W1FB** and dates back to before 1970 and was first published (as far as I can confirm) in the ARRL's *QST* magazine, subsequently appearing in many other ARRL publications.

The Circuit

The circuit, Fig. 1, as originally published, used two terminal coils but various different approaches with W1FB's project have resulted in two and three terminal coils being used. My version of the circuit takes advantage of both forms of coil to ensure wide coverage and reliable operation.

I've prepared the project so as to provide reasonably accurate coverage so that anyone building it will have the minimum of frequency calibration to carry out. However, you should bear in mind the 'Tinny Dipper' **is not a precision laboratory instrument** and it's best used in connection with a calibrated receiver or frequency counter.

Based around the versatile MPF102 field effect transistor (f.e.t.) the 'Tinny Dipper' dip meter uses a standard polyvaricon tuning capacitor for tuning in conjunction with a selection of coils to provide coverage from 172kHz to 30MHz. Eleven coils are used to provide the necessary coverage and I've arranged enough tuning 'overlap' on each coil to ensure there are no gaps in the coverage.

Although, of course, I strongly recommend that you use the same wire gauge as I've used in the project, you can (if you're prepared to experiment with frequency coverage, etc.) use any wire between 24 and 32s.w.g., such as that recovered from old mains transformers, for example.

The original circuit suggested the use of a 100µA full scale deflection (f.s.d.) moving coil meter. However, over the years I've used meters ranging from 50 to 500µA f.s.d. with success.

My prototype 'Tinny Dipper' meters (I've built three units) have all used the same basic 200µA f.s.d. unit that can often be seen on sale at rallies and which also appears in many different catalogues. But if you don't have one in your 'junk box' don't worry because **Dick Pascoe G0BPS of Kanga Products** has some on special offer! (see 'Suppliers' panel on page 23).

If you take a look at the circuit in Fig. 1, you'll see that R1 is marked with an asterisk and is accompanied by the instruction 'see text'. This is because the value of the resistor will have to be varied to suit the meter. My prototypes (using the 200µA f.s.d. movement) have used values between 2.5 and 10kΩ. This is because the various surplus meters around (those I've used were obviously intended for indicating recording levels on tape recorders/hi-fi units) have differing internal resistances.

If you use one of the meters available from the supplier sources I've provided at the end of the article - I think you'll probably end up using a value between 4.7 and 6.8kΩ. (the 'Tinny Dipper' illustrated uses a 4.7kΩ resistor for R1).

The rest of the circuit, including the coil winding, is quite straightforward. However, you should be prepared to spend quite some time winding the coils!

The radio frequency choke (r.f.c.) RFC1 can either be a home wound type (see *PW* January if you've not tried winding one for yourself yet) or one purchased from one of the suppliers listed in the article or advertising within *PW* itself.

The heading photograph showing the external aspects of one of the prototype 'Tinny Dippers' illustrates the simple tuning dial I used because my version are used in conjunction with the receiver section of an Alinco DX-70 transceiver (it covers from approximately 160kHz to 30MHz without a break).

It's very simple to make the tuning dial - and of course it's made from SRPB material (didn't you guess that anyway?). The largest disc of the material that can be accommodated is 45mm in diameter and **Tex Swann G1TEX** has kindly produced a 'stick on' scale (below fig. 1) that you can either photocopy and cut out or cut out directly from the magazine.

To cut the disc, all you have to do is to drill a hole (slightly

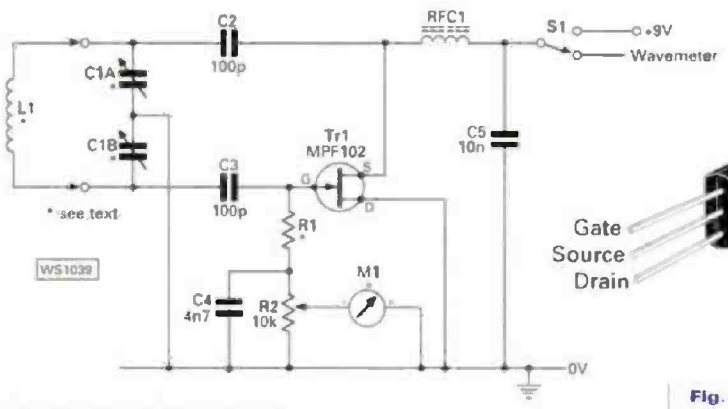


Fig. 1: The circuit, the value of R1 depends on the particular meter used (see text).

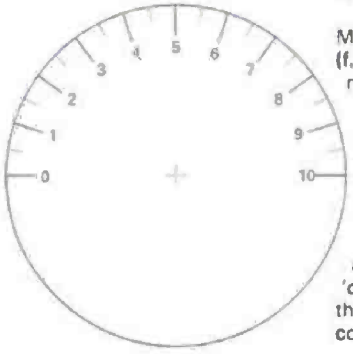


Fig. 2: Illustrating the template (recommended) to be used for cutting the shape of the main p.c.b., along with a tuning dial disc 'scribed' from SRPB material (see text).

smaller than that required to take the dial-to-spindle fixing screw) and make a short radius arm - again from SRPB material long enough to make a disc of 45mm diameter with a little left over to leave room for holes to be drilled for fixing points. Then drill holes at either end.

When you've drilled the holes, place one end of the radius arm above a hole you've prepared in the SRPB sheet which is to provide the disc. Then provide a central pivot (a nail, gently forced through and into the wood below will do the job) and you can start the process of scribing the disc itself.

Using a needle file or some very hard pointed tool, you can scribe a circle to form the disc by just rotating the file (held in 'orbit' by the radius arm) around the pivot. It's a little time-consuming but I've made many discs in this way - varying in size from 20 to 100mm - in about ten minutes (one of the discs I made, along with the cardboard template required for the p.c.b. is shown in **Fig. 2**, along with the cut-out scale for your use).

Once the material gets really thin you can use side cutters to crack the surrounding SRPB material away. **But - don't do this until you can almost see daylight around the whole disc when you hold it up to the light otherwise the disc will crack and you'll have to start again. Patience is a virtue on this job but the final result is attractive and rewarding.**

The photograph in **Fig. 3** shows the underside of the prototype featured in the article heading shot. **Note that the SRPB 'saddle' (Swung aside for photography) has to be etched to remove the copper cladding. This is important because the copper would effect the tuning and calibration otherwise.**

Take note also, that the bolt to the left of the coil (next to the soldering point) has to be provided with an 'earth return' (via a short jumper) to provide a connection for coil centre taps.

The diagram in **Fig. 4**, shows the p.c.b. for the project prepared for etching. The annotation illustrates the placing of large components and where you should provide mounting holes for the 10kΩ potentiometer, on/off switch and meter. The meter hole has to be cut carefully and the meter should be orientated as shown (so that when the unit is switched on the indicating pointer needle goes 'up' the scale.

A 'Dalo' type etch resist filled pen is used for the main p.c.b. track markings and *pvc* tape is used to 'mask' the larger areas. If you follow the design in **Fig. 5**, there will be enough room for the PP3 battery which is used to power the unit. But make sure that when you are assembling the board that you don't place any component too near the edge where it will make it difficult to mount the project in the tin when the work is finished.

My method of fixing the unit into the empty fish tin 'case' owes much to the BBC's 'Blue Peter' programme as I use the famous double-sided sticky tape that's featured on the programme over the years. Cut into small sections and laid around the lip of the tin, where the edge of the p.c.b. 'sits' - the tape holds the container and the board together but also allows it to be removed easily by applying sustained (but gentle) pressure with a small screwdriver tip. Alternatively, you can use small nuts and bolts, but be careful that the soft aluminium is not disorted as you tighten them.

So, after the preliminaries ... it's on to the main job ... preparing and winding the coils. And although it is a time-consuming job I've no doubt when you finish you'll be proud of your 'Tinny Dipper' which will provide a far wider coverage than is usually possible. Such are the advantages of home-brewing your own!

Coil Formers

The coil formers are made from synthetic resin paper board (SRPB) copper clad material and I described the preparation and fabrication of the cruciform type formers on pages 22 and 23 of the December 1998 issue of *PW*. If you've not already prepared the formers...you'd better get cracking on that job so you can start the actual coil winding process itself.

To be quite honest, I've become quite fascinated with the concept of these cruciform formers. They're so simple and effective. You start off with a sheet of board and after a few hours, there in front of you are a complete set of formers. All for the price of a few hours of your time!

In the course of the project development I have made well over 40 of these coil units. The job was made easier by preparing a little 'jig' made from a small off-cut of pine flooring board. If you're anything like me you won't be able to pass a road-side skip (don't forget to ask before you take though!) when houses are being built or modernised. Invariably you'll find off-cuts of wood, peculiarly shaped perhaps ... but still useful.

Fig. 3: Underside view of one of the prototype 'Tinny Dippers'. See text for important instructions regarding the coil mounting 'saddle' and earthing technique.

If you don't have access to offcuts of wood your local timber merchant or DIY store will sell you some and it's worth having it to hand because the 'drawing pin and board' method (discussed in earlier 'Radio Basics' columns) is useful in prototyping. I often use it myself.

The jig I used is so simple it doesn't really deserve the term - but that's the job it does. In essence the jig is a small length of off-cut floor boarding with the outline of the longest section of the SRPB material coil drawn on it. I then marked the length of the required saw cut on the jig and cut the slot to length with the saw. Next I placed the cut and prepared material on the jig, holding it in place with 'Mole Grips' (a 'self gripping' wrench). With a scrap piece of SRPB between the job itself and the wrench, I mounted the assembly at the edge of my desk, attaching it to the desk itself with the versatile wrench.

With careful adjustment of the 'grip' gap on the wrench it's possible for the whole assembly to be attached to the edge of the bench/table quite firmly without damaging anything. I also arrange the end which is to be sawn to be jutting out from the desk. Once this is done it's a very simple job to cut the necessary slots on the SRPB material which is to provide the cruciform style formers.

Another area of the jig is marked with the outline of the main SRPB board section which is to make the 'plug in' section of the former. You can then hold the material down with the wrench (even people with two arms will find this useful!) and having provided marking points you can drill the two terminal holes on the boards.

I strongly recommend that you make 12 or 14 formers so that you have some spare. It's also a good idea to cement the cruciform units in place with rapid setting epoxy resin adhesive (I used 'Araldite Rapid'). Keep the adhesive handy because it will be used again later.

Incidentally, to illustrate how versatile the SRPB material is - I even made myself a pair of 'tweezers' to help in the ferric chloride etching process. I temporality mislaid the photographic tweezers I normally used, but it only took me a few minutes to cut two narrow strips of SRPB material from a board, etch off the copper cladding, wash and dry them and using a narrow section of wood to separate the tweezers before using the adhesive to fix them together. Very useful ... and when I found the main pair of tweezers I had a spare pair!

Winding The Coils

Now let's get on with the winding of the coils themselves! Eleven coils are used to provide complete coverage from 172kHz to 30MHz, but of course - **although I strongly recommend that you do make the complete set of 11 coils** - you can if you wish only wind those that you think you need (let's say from Coil 5 upwards).

The coils are of two types and the first form, the 'centre-tapped', are shown in Fig. 5. The first group comprise Coils 1, 2, 3, 4, 5, 6 and 7. Centre-tapping a large coil may seem

Rob Mannion G3XFD describes the circuitry, winding the coils and building the 'Tinny Dipper' project.

rather daunting but I can assure you they're easy to make.

To help, I'll describe the winding of Coil 1 first and then you should refer to **Fig. 5** for further details on the rest of the centre tapped group. All the coils used in the project use 32s.w.g. or metric equivalent enamelled copper wire.

Firstly, you should start by making sure you are comfortable and unlikely to be disturbed. Take the telephone off the hook so that you won't lose count if it rings when you're winding the coils!

Wind the coils in the direction that suits your 'handedness' (I'm obviously left-handed) but you must (when winding the centre tapped coils) remember to keep the two halves of the coil windings in the same direction.

Solder the start of the coil at the lower terminal hole (the one nearest the plug-in p.c.b. section) and then start winding slowly, towards the centre. Incidentally, most modern enamels on copper wire will 'melt through' for soldering - but makes sure you have good ventilation in the workshop in case toxic fumes are emitted during the process.

Wind slowly (as I've said) keeping count as your hand passes the start point each time. The coil (Coil 1 for this example) needs a massive 340 turns, a centre tap and another 340 turns. So, when you reach 340 turns, pass a loop down through the first half of the coil. Temporarily fix it with soft wax and continue winding the second half (leave a small gap between windings) with the same wire (it's all one length of course).

When you finished the second 340 turns winding, solder the end to the top terminal. Then return to the centre tap, twist it into a tight little 'pigtail' and solder a flexible length of insulated wire to it with a small crocodile clip which will provide the centre tap connection to the bolt emerging from the main p.c.b.

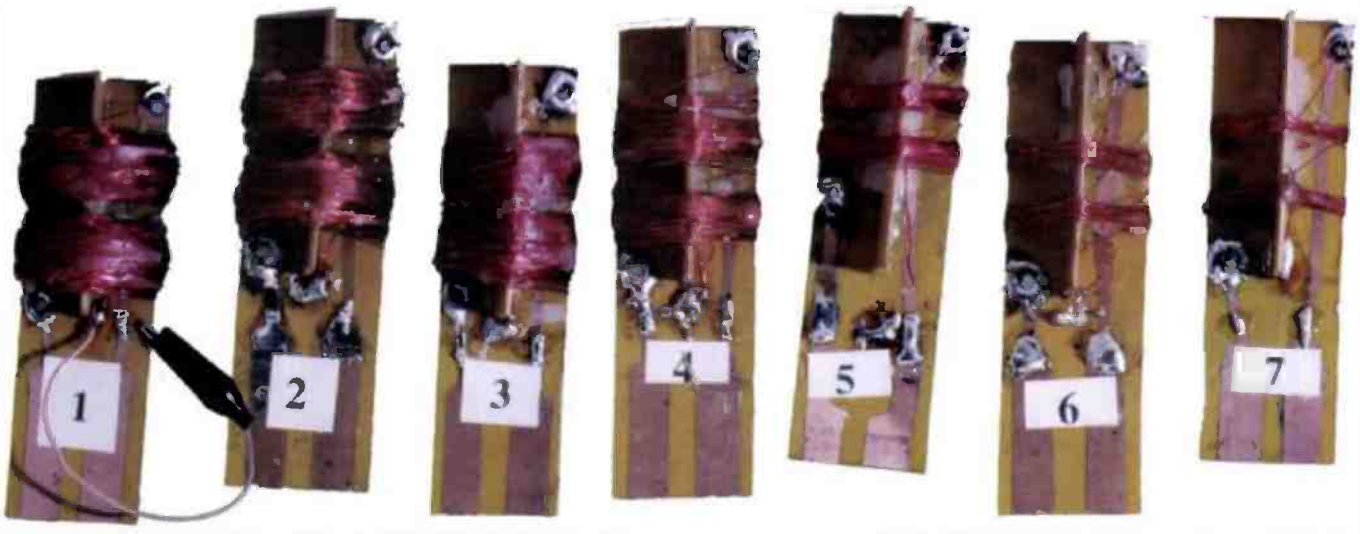
The 'flying lead' joint (between the wire tapping and 'crocodile lead' only shown on coil 1 for clarity) can be secured in place by using some of the rapid setting epoxy resin adhesive, in the right-angled corner of the lower end of the cruciform coil former. However, do not at this stage seal the winding with wax ... just in case you have an 'open circuit' or you have gone wildly wrong with the winding process.

If you do find you have to reduce the turns on a centre tapped coil - remember to remove the same number of turns from each half of the coil! There should be no need to do anything more to the centre tap itself, so it's quite safe to solder and seal it down with epoxy resin adhesive. Use the same technique for all the centre tapped coils (1 - 7).

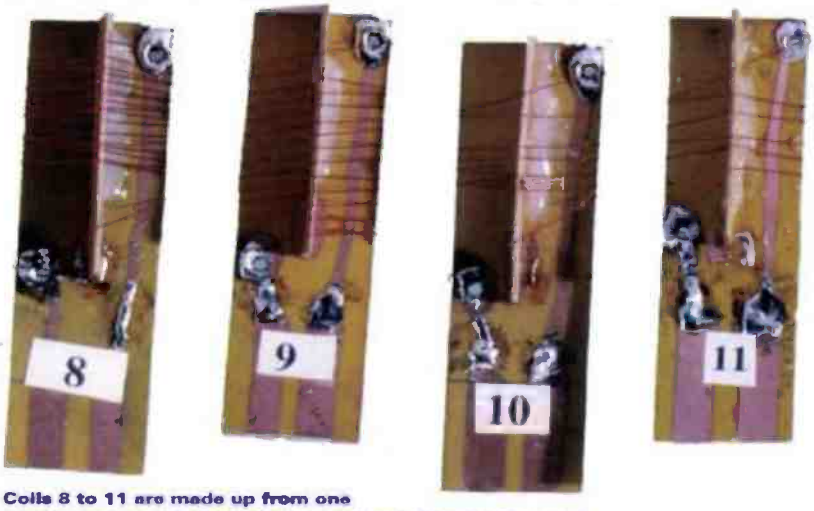
Coils 8 to 11, lower half of Fig. 5, are easier to prepare as there's no centre tap involved. However, you should wherever possible space the winding in the same way as I've done in lower Fig. 5. Incidentally, coils 10 and 11 are very similar in the number of turns used because there's quite a bit of 'overlap', paradoxically though it's proved useful because the coverage of coil 11 - 20.5 to 30MHz - is very useful.

The numerical indicators stuck onto the coil formers can stay in that position (we put them there for photography) or they can be placed on the rear of the assembly. However, you should not place coloured tape for identification on each coils unless you are prepared to re-check frequency coverage!

Fig. 5: Main tuning coil details.
All coils are wound on the formers described in Part 1 of the project. All coils use 32s.w.g. or metric equivalent enamelled copper wire. Enough 'overlap' of frequency coverage has been allowed to cover small differences in winding techniques but coverage will vary a few kilohertz depending on the setting of the 'sensitivity/gain' control and the polyvaricon's built-in trimmers. Don't forget to allow for the frequency lowering effect of wax sealing or pvc tape covering before finally checking the 'calibration' of your meter and preparing tuning scale dials/check charts.



Coils 1 to 7 are centre tapped (see text for full winding details).



Coils 8 to 11 are made up from one winding but care is needed with spacing of turns (see text).

Coil 1: Wind 340 plus 340 turns (centre tapped) 172-267kHz

Coil 2: Wind 210 plus 210 turns (centre tapped) 263-422kHz

Coil 3: Wind 130 plus 130 turns (centre tapped 400 - 684kHz

Coil 4: Wind 75 plus 75 turns (centre tapped) 656 - 1180kHz

Coil 5: Wind 39 plus 39 turns (centre tapped) 1173 - 2.095MHz

Coil 6: Wind 20 plus 20 turns (centre tapped) 2.079 - 4.068MHz

Coil 7: Wind 10 plus 10 turns (centre tapped) 3.96 - 8.145MHz

Coil 8: Wind 17 turns (this coil is not centre-tapped) 7.8 - 12MHz

Coil 9: Wind 12 turns (this coil is not centre-tapped) 11.9 - 18MHz

Coil 10: Wind 6 turns (this coil is not centre-tapped) 17.9 - 27.3MHz

Coil 11: Wind 5 turns (this coil is not centre tapped) 20.5 - 30MHz

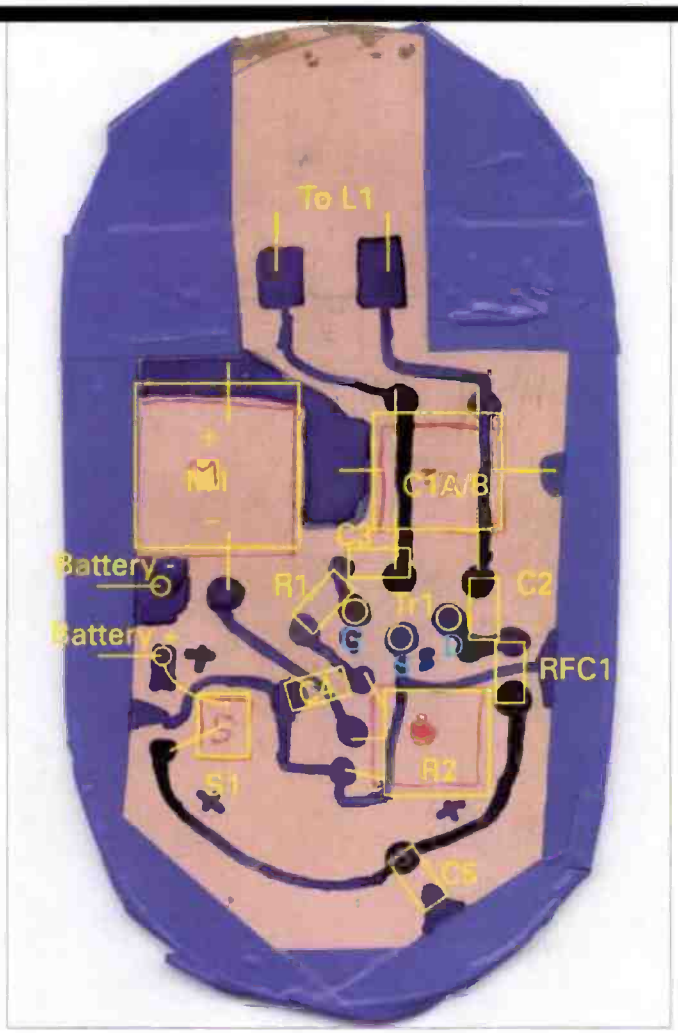


Fig. 4: The p.c.b. prepared and 'masked' with pvc tape ready for etching. The positions of switch, meter and potentiometer holes are also marked (these should be done prior to masking and marking out).

Building The Dipper

Once you've drawn and masked the p.c.b. and etched it - the assembly stage is much quicker. I actually assembled three 'Tinny Dipper's in one afternoon and that was after making forty or so coil components (that took some time!).

When soldering, ensure you don't cause shorts circuits with solder splashes and check to see that the p.c.b. coil 'contact' areas make good electrical connections with the slightly raised copper contact 'pads' on the main board. Only use just enough solder to slightly run the tiniest 'humps' of solder. Check for shorts - especially between the coil p.c.b. tracks and the edge of the guides.

Make sure the etched (copper removed) SRPB 'bridge' which holds the coil in place is not too tight. Use very thin washers to raise the 'bridge' if necessary so that it makes a good sliding fit for the coil whilst providing good contact for the p.c.b. coil connectors.

When complete, do a last check, plug in a coil (I suggest coil 1) and switch on. The meter needle should immediately, move upwards and it should be adjusted (to stay at the top of the scale) by careful movement of the 10kΩ potentiometer, R2.

Incidentally, the R2 control (I've not bothered to use a knob as it takes up room and it's not strictly necessary in my opinion) will have to be adjusted occasionally as the instrument is moved from one end of a coil's coverage to the other. This is normal ... so don't worry!

Heard on a radio, the 'Dipper' signal will cause a heterodyne (whistling) to appear as it crosses the frequency of another transmission (particularly evident on amplitude modulation (a.m.) signals.

Occasionally, when using coils 8, 9, 10 and 11, depending on the individual MPF102, your coil winding, state of the battery, or if the meter is placed near some large metal objects, wires or coils, the oscillator can stop or refuse to start. If this happens, just tune the meter up in frequency and then return it to the point you require, adjusting the sensitivity/gain control as necessary for needle positioning.

Using The Meter

Next month we'll be using the 'Tinny Dipper' to modify the 'Radio Basics' 3.5MHz to medium wave converter to cover 7MHz. I'll also describe how you can use this versatile little instrument to find out the intermediate frequency (i.f.) of the car radio you're using and improve the beat frequency oscillator (b.f.o.) operation.

In the meantime - practice a little by winding some coils (preferably roughly the same as have been sued in the series so far) connect them to capacitors and then find out where they resonate by gently placing the 'Dipper' coil close to the 'unknown' coil and capacitor combination. Find the 'dip' on the 'Dipper', check where the instrument is tuned to on a receiver - and that's it - you've used your 'Tinny Dipper' successfully!

So, get busy and next time I'll explain how to get the best out of your 'Tinny Dipper' Cheerio for now! *PW*

Interested? Want to join in and 'have a go yourself? You can....by just sending a large s.a.e. (with 50p stamp) asking for the free 'Radio Basics' Guide - issue 1, 2 & newly available 3.

Shopping list

Resistors

Metal film miniature 0.25%

R1	between 4.7 and 10kΩ	(see text)

Variable

Miniature carbon track potentiometer

10kΩ	1	R2

Capacitors

Miniature disk ceramic

100pF	2	C2, 3

Miniature polyester

4.7nF	1	C4
10nF	1	C5

Variable

125pF		C1a, C1b Polyvaricon (see 'miscellaneous' panel)
Inductors	L1 - 11	(See text and **Table 1**)
Radio frequency choke	RFC 1	(see text)

Semiconductor

MPF102	1	Tr1 (See below)

Miscellaneous

Coil formers for L1 to L11 are made as described in Part 1 of 'The Tinny Dipper' published on pages 22 and 23 of the December 1998 issue of *PW*. The coils are all wound using the metric equivalent of 32s.w.g. enamelled copper wire. The variable capacitor is a polyvaricon (125+125pF) type available from JAB (address below) catalogue ref. PVC-01. Various full scale deflection (f.s.d.) microammeters can be used in the circuit ranging from 100μA to 300μA (see text) but a suitable meter is available from **Kanga Products** (see below). Suitable wire is available from the Scientific Wire Company (see below).

Supplier Details

Variable capacitor: JAB Electronic Components: PO Box 5774, Birmingham B44 8PJ, Tel: 0121-682 5774. FAX: (0121) 681 1329.

Suitable meter: A 200μA f.s.d. meter is available from Kanga Products for a special (including postage) price of £3.95. Orders to: Seaview House, Crete Road East, Folkestone, Kent CT18 7EG. Tel/FAX: (01303) 891106.

Wire, 10kΩ potentiometer, r.f. chokes, MPF102, variable capacitor, switches, *pvc* tape (suitable for p.c.b. masking), crocodile clips etc., available from Syon Trading. Orders to 16 The Ridgeway, Fetcham, Leatherhead, Surrey KT22 9AZ. Tel: (01372) 372587, FAX: (01372) 361421.

Specialised wire suppliers:

The Scientific Wire Company (Atten. Mr Ray) carry huge stocks of wire and a 500g spool of 32s.w.g. metric equivalent is available for £8.88 including P&P. Orders to 18 Raven Road, London E18 1HV, Tel: 0181-505 0002.

Cooke's Choice!

The Yaesu FT-1000MP

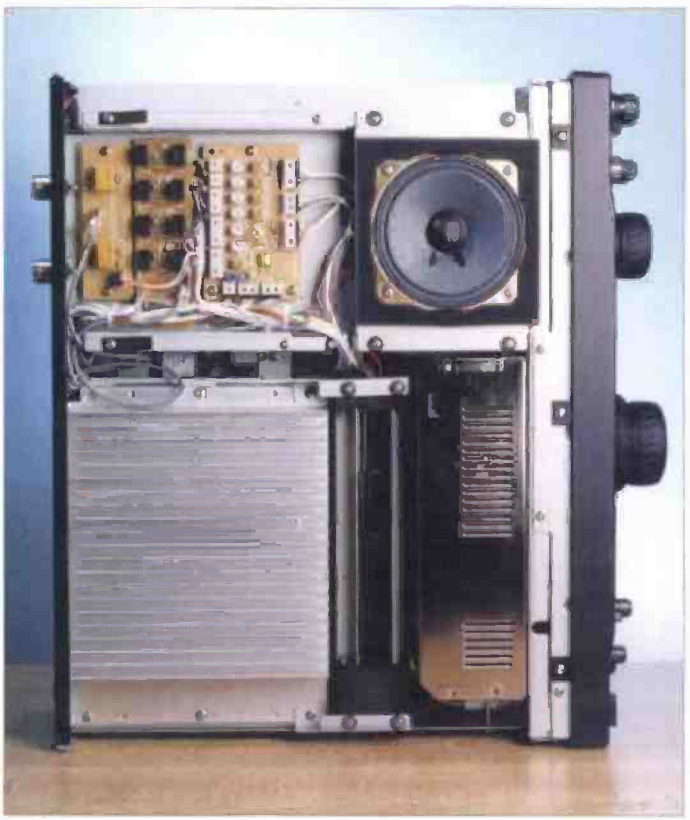
Up until now, PW has not been able to obtain a Yaesu FT-1000MP to review on behalf of readers. However, the problem was solved when regular PW author and keen DXer Roger Cooke G3LDI bought one for himself. So, at long last we can present the considered opinion of one very happy reviewer!

The purchase of a rig such as the FT-1000MP has taken this particular G3 a long time to ponder. However, I have taken the plunge at last and so far I have few regrets! In the past in *PW* I have reviewed and looked at several different h.f. transceivers, including the hi-tech Kachina, computer based transceiver. However, at the end of the day, I am still convinced that lots of h.f. operators, including myself, enjoy the tactile feel of a tuning dial. This, plus all the other controls, together with a multi-function display, all sitting in one box on the desk, make for a comfortable ergonomic satisfaction that's difficult to replace.

Cooke's choice! Roger G3LDI's 'dream machine', the Yaesu FT-1000MP transceiver.

Armed with my convincing opinion (I'd convinced myself!), I visited the new Leicester Show at Castle Donington in September and flashed my plastic at **Martin Lynch's** stand and sat back and waited for delivery. A slight problem here, in that they misunderstood my order and were waiting for me to collect! However, the transceiver did eventually arrive and I set out to climb yet another steep learning curve.

Fig. 1: Inside (top chassis) view showing extensive heat-sinking.



The new generation of amateur transceivers from the major manufacturers all utilise built-in digital signal processing (DSP). It's one of the main selling points of a modern transceiver.

The flexibility of control offered by DSP is far greater than previous generations of transceivers, using analogue techniques. This, coupled with the ability to control most of the operating parameters of the transceiver from a menu, displayed on the front panel display, provides a very powerful and versatile arrangement.

Feel Good Factor

In my opinion, a transceiver has to have a 'feel good' factor for the operator, which is governed by the ergonomics of the design. I think the FT-1000MP possesses this important factor.

The lay-out of the transceiver's front panel plus the clear multi-

coloured fluorescent display is designed to present the operator with control over just about any operating scenario. It caters for everything from contests and DX working, through to 28MHz narrow band f.m. (n.b.f.m.) repeater working and general coverage listening to broadcast transmissions.

The FT-1000MP is a real 'hands on' transceiver. Altogether there are 95 operator controls on the front panel, counting the concentric controls as two!

A menu system is also utilised in this transceiver, as in most modern transceivers. Access to the menu is via the pushing of two buttons, with the display showing the various parameters.

The menu functions are selectable using a click-step rotary control. The parameters appear on the

fluorescent display and it does take a while to become accustomed to the way it's presented.

The various levels of a particular parameter are adjusted by turning the main tuning knob. Obviously, this is explained in the handbook and operating parameters should be set before using the transceiver on the air.

Items such as the s.s.b. transmit audio, utilising the Enhanced Digital Signal Processing (EDSP) settings, in particular will need to be set, depending on which microphone you will be using. However, the transceiver comes with default settings and if you make a mistake and want to start again, you can return easily to these original settings quite easily.

Tuning Extremely Versatile

The main tuning of the FT-1000MP transceiver is extremely versatile and possibly one of the main attractions of using the rig on the air. I've not possessed a transceiver with such a sophisticated tuning arrangement before, so it took a little learning here!

So, first of all I'd better explain that in the FT-1000MP package there are two receivers, with two tuning controls. Both controls are programmable, tuning in a selection of six steps from 0.625Hz up to 20Hz per step on c.w. and s.s.b., with 1000 steps per revolution on the tuning knob.

The rate of tuning can be selected from the parameters at x2 or x4 without upsetting the step settings. This is accomplished by pushing a **Fast** key on the front panel.

There are also **Up/Down** keys to provide steps in 100kHz, or by again pushing the **Fast** key, 1MHz increments can be selected. The rotary click-step switch provides for the selection of programmable steps from 1kHz to 100kHz.

Individual keys select the different bands and double band stacking registers are used. Bands or frequencies may be set separately for the main and sub receivers and frequencies for both can be entered from the numeric keypad.

The main tuning knob on the FT-1000MP is rather different from the majority of transceivers I've come across. It has an outer spring-loaded ring around the circumference. Moving this ring in either direction away from its resting position, results in instant tuning, the rate of which depends on the movement of the ring.

There are 13 pre-set steps, from 10Hz to 100kHz and these increase the more the ring is turned. This enables the operator to make large frequency excursions with ease plus, with a little practice, even small moves. It requires a little dexterity and practice to operate, but greatly imposed ease of operation.

Each band switch can also be assumed to have two variable frequency oscillators (v.f.o.s). Pushing the band switch button to go to 14MHz (for example) you can set up the transceiver for s.s.b. operation at around 14.250MHz with 2.4kHz filtering.

Push the control again and you can set the transceiver up to operate on 14.020kHz c.w. with 250Hz filtering. These parameters will be memorised so it's possible to set each band position with two types of emission with filtering to match. There's a 'clarifier' for both receive and transmit, which is adjustable to ±9.99kHz

The **Sub v.f.o.** works in a similar manner to the **Main v.f.o.** and will provide split operation using a **Split** control button. It will also give the dual-receive function, which is very useful for monitoring another frequency while operating with the main v.f.o.

It's also possible to transfer the data from the **Main v.f.o** to the **Sub v.f.o.** Additionally, if the **Sub v.f.o.** is on a different band or frequency, it's also possible to transfer the two sets of data, A-B and B-A.

The **Sub v.f.o.** receiver uses dual-conversion circuitry whereas the main receiver uses triple conversion. (About the only things that cannot be done on the **Sub v.f.o.** is the storage of parameters directly into memory and the settings of the clarifier).

Interestingly, the dual receive function is able to be set so that the operator can have balanced audio in

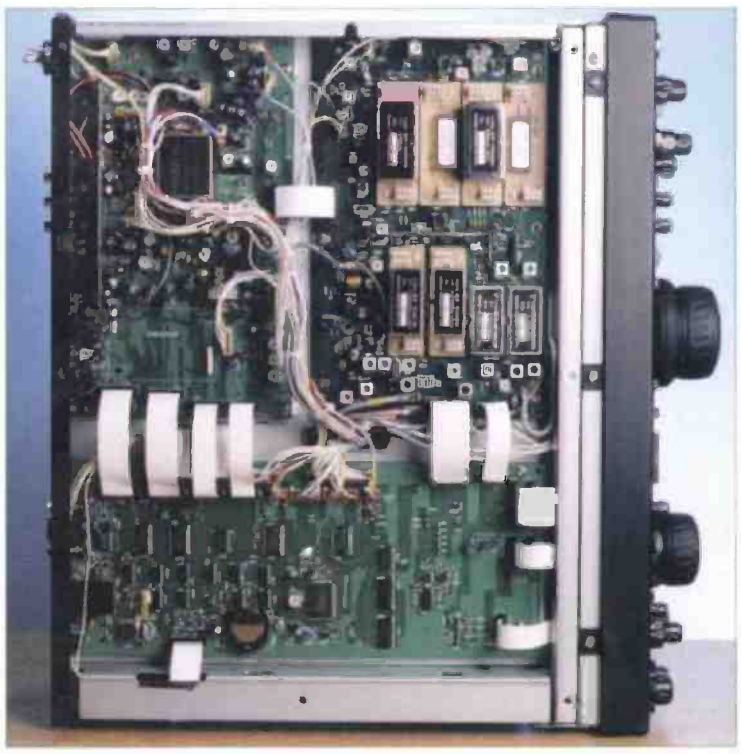


Fig. 2: Inside view (lower chassis) clearly showing the extensive filtering.

"The FT-1000MP has the all important 'feel good' factor" says Roger G3LDI.

both ears (on headphones) or **Main v.f.o.** in the left ear and the **Sub v.f.o.** in the right ear! Audio levels for each are adjustable to provide the best balance.

Transceiver Memories

The transceiver has 99 memories, which can be arranged in one group, or five separate groups. Each memory location stores the usual parameters, both v.f.o. frequencies, modes, filtering and so on. Memory selection is by means of the click-step switch and it's fast!

Various memory management features are provided, copying between memories, memory tuning - emulation of v.f.o. tuning on a memory channel whilst retaining the memory checking feature - and more. This makes operation on memories just about as flexible as the v.f.o.s.

There are also five independent memories known as the Quick Memory Bank. These are useful for temporary storage where you don't want to overwrite your regular or permanent memory bank.

Another feature - **Programmed Memory Scanning** - can be used when limited frequency-range scanning is required. Nine special purpose memories are provided for this purpose.

Mechanical Filter

The Yaesu FT-1000MP is provided with a built-in Collins mechanical filter at a centre frequency of 455kHz with a bandwidth of 2.75kHz. There's also an optional extra Collins mechanical filter available for the 500Hz position.

In my opinion, with all five optional filters fitted (as in my rig) coupled with the EDSP capabilities make this transceiver's performance difficult to match. I say this because Collins mechanical filters have a textbook response curve, with excellent skirt selectivity and low intermodulation distortion (IMD).

In operation, the filters can be cascaded - using the front panel controls - to combat interference from strong adjacent channel transmissions and tailor the received audio. Normal s.s.b. communications use the 2.4kHz filtering, providing good quality recovered audio. However, the 2kHz filtering is very acceptable and it's possible to mix the two.

For c.w. use, the 500 and 250Hz filters narrow the passband without introducing any 'ringing', enabling the weakest of Morse signals to be hauled out of the QRM and noise.

Digital Signal Processing

The third intermediate frequency (i.f.) output is applied to a 10.24kHz enhanced digital Signal processing (EDSP) i.f. for demodulation and processing. The contours of the EDSP bandpass filtering are selectable and offer low, mid and high range roll-off responses.

The EDSP facilities also have a multiple notch capability within the audio frequency (a.f.) passband, providing an automatic notch filter. In use, the digital notch circuitry continually analyses the a.f. passband and the correlation of signals within it and notch out heterodynes as they appear.

The shift and width controls can be used to further process the bandpass skirt, within the limit of the selected filter. The width control shapes the response from one side only, either upper or lower, thus you can narrow the response according to which side of the signal the QRM is. The shift control tunes the relative position of the receiver i.f. passband with respect to the displayed frequency.

Two Antenna Connectors

There are two antenna connections, making it possible to use a separate antenna for receive. Again, selection is from the front panel. These selections can be put into memory (I think this is a very useful feature for DX working on 1.8 and 3.5MHz).

An input attenuator is provided and it has three steps: 6, 12, or 18dB of r.f. attenuation. It's also possible to select between two tuned amplifiers or a flat wide-band amplifier.

The r.f. amplifiers can be bypassed by pressing the Intercept Point Optimisation (IPO) button. (All these features have proved to be a real bonus on the crowded l.f. bands).

On The Key

When you wish to operate 'on the key' ... all you'll require is a paddle. The built-in electronic keyer provides two iambic modes and a mechanical 'bug' type operation, if you require it. It has variable weighting and Automatic Character Spacing (ACS). Semi break-in and full break-in (QSK) is also available.

All keying parameters and timing are programmable from the menu. A spot control activates the c.w. side-tone, allowing the operator to tune a station to the same pitch as the side-tone. (This tone is adjustable for operator preference, something I have always wanted!).

A 'straight' key can also be used as can an external keyer. (I prefer to use my MM3 keyer, but this is a personal choice).

If you like working contests, it's also possible to have a four digit number and a six message memory feature as well, using an external remote control keypad. This can be the FH1 from Yaesu, or a home-built version. It would be easy to make one (details are given in the manual) and it consists of merely twelve resistors and twelve switches or pads.

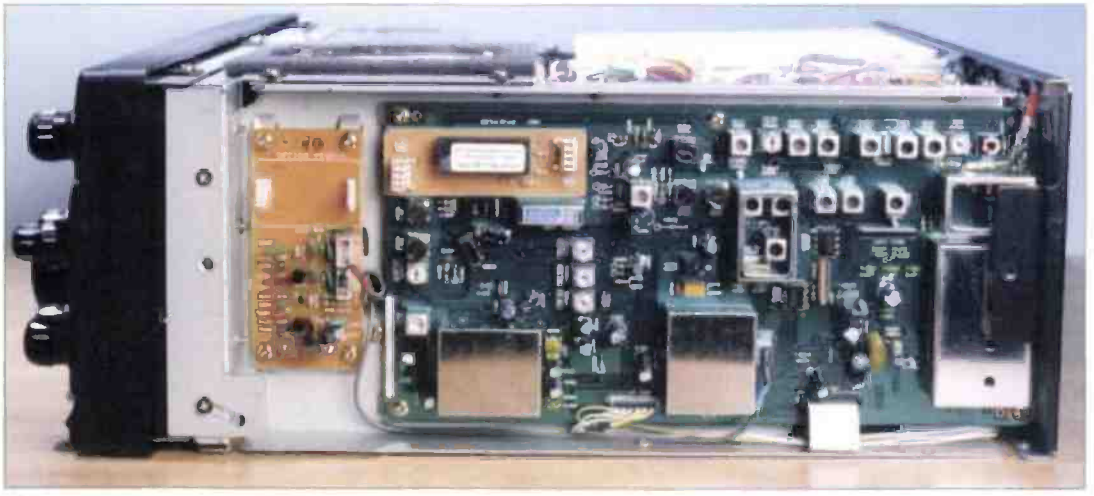


Fig. 3: Right-hand side inside panel view of the FT-1000MP.

Narrow Band FM

The 28MHz band is now 'open' on many days and owners of the FT-1000MP can take advantage of the narrow band frequency modulation (n.b.f.m.) facilities. With the better

Manufacturer's Specifications

General

Receiver frequency range:	100kHz - 30MHz
Transmitter frequency ranges:	1.8 to 28MHz amateur bands only
Frequency stability:	<±10ppm (-10 +50°C) <±2ppm (0 +50°C) with TCXO-4 <± 0.5ppm (0 +50°C) with TCXO-6
Frequency accuracy:	<±7ppm (n.b.f.m. <±500Hz) <±2ppm (n.b.f.m. <±460Hz) with TCXO-4 <±0.5ppm (n.b.f.m.<±500Hz) with TCXO-6
Operating temperature Range:	(-10 to +50°C)
Emission Modes:	c.w., a.m., l.s.b., u.s.b., f.s.k., n.b.f.m.
Frequency steps:	0.625/1.25/2.5/5/10Hz for c.w., s.s.b, RTTY and packet, 100Hz for a.m. and n.b.f.m.
Antenna impedance:	50Ω unbalanced.

Power consumption:

Input	Receive (no signal)	Receive (signal)	Transceive (100W)
100-125V a.c.	70VA	80 VA	550 VA
200-240 VA	80 VA	90 VA	600 VA
13.8V d.c.	2.4A	2.8A	19A

Supply Voltage:	100-125, 200-234V a.c., 50/60Hz
Dimensions:	410 x 135 x 347mm (w, h, d)
Weight (approx):	15kg. (33 lbs)

Transmitter

Power output:	Adjustable up to 100W (25W a.m. carrier)
Duty cycle:	100% @ 50W, 50% @ 100W (n.b.f.m. & RTTY, three minute transmission)
Modulation types:	s.s.b.: J3E balanced, filtered carrier a.m.: A3E Low-level (early stage) modulation n.b.f.m.: F3E variable reactance AFSK: J1D, J2D audio frequency-shift keying
Maximum n.b.f.m. deviation:	±2.5kHz
Shift frequencies AFSK :	170, 425, and 850Hz
Packet shift frequencies:	200, 1000Hz
Harmonic radiation:	at least 50dB below peak output
Carrier suppression s.s.b.:	at least 40dB below peak output
Undesired sideband suppression:	at least 50dB below peak output
Audio response (s.s.b.):	not more than -6dB from 400 to 2600Hz
3rd order IMD:	-31dB @ 100W PEP, or better
Microphone impedance:	500 to 600Ω

Receiver

Circuit type:	quadruple conversion superheterodyne (triple conversion on n.b.f.m.)

Intermediate frequencies:

Main receiver:	70.455MHz; 8.215MHz and 455kHz
Sub receiver:	7.21MHz and 455kHz

Sensitivity (with pre-amplifier on, for 10dB S/N, 0dBμ - 1μV):

Frequency Mode (bandwidth)	150-250kHz	250-500kHz	0.5-1.8MHz	1.8-30MHz
s.s.b., c.w. (2.4kHz)	5μV	4μV	2μV	0.25μV
a.m. (6kHz)	40μV	32μV	16μV	2μV
29MHz n.b.f.m. (12dB SINAD):				0.5 μV

Selectivity (-6/-60dB):

Button	Modes	Minimum (-6dB bandwidth)	Maximum (-60dB bandwidth)
2.4kHz	All except n.b.f.m	2.2kHz	4.2kHz
2kHz	All except a.m.&f.m.	2kHz	3.6kHz
500Hz	c.w., RTTY, packet	500Hz	1.8kHz
250Hz	c.w., RTTY	250Hz	700Hz
	a.m. (Wide)	4kHz	14kHz
	n.b.f.m.	8kHz	19kHz

Dynamic Range:	108dB (@ 50kHz, 500Hz bandwidth, r.f. amp off)
Squelch sensitivity:	1.8 - 30MHz (c.w., s.s.b., a.m.): <2.0μV 28 - 30MHz (n.b.f.m.): < 0.32μV
Intermediate freq. rejection:	(1.8 - 30MHz): 80dB or better (Main Rx) 60dB or better (Sub Receiver)
Image rejection (1.8 - 30MHZ):	80dB or better (Main RX) 50dB or better (Sub RX)
Freq. shift range (f.f.):	±1.12 kHz
Max. audio output:	1.5W into 4Ω with <10% THD
Audio output impedance:	4 to 8Ω

DX conditions it's possible to use the repeaters that are on the band.

A low-level 88.5Hz sub-audible tone is transmitted to access 'closed' repeaters and a standard 100kHz offset is available. Again this can be changed if necessary from the menu.

Digital Modes

Operation on all h.f. digital modes is possible with the FT-1000MP and there's a built-in digitally-synthesised audio frequency shift keying (AFSK) generator for radio teletype (RTTY) and Amtor terminal units.

The transmit to receive turn-around time is 18 milliseconds (ms). Either Main or Sub receive audio can be used, selectable by a switch on the rear panel. Audio level is adjustable by a potentiometer also on the rear apron.

Audio level from both outlets is 100mV but the RTTY level is fixed. There is also a packet audio level control. All conventional RTTY shifts are catered for, selectable on frequency shift keying (FSK) with normal or reversed polarity.

For the normal h.f. 170Hz shift, the 250Hz filtering can be used to effect, but remember to limit the power output to 50W, or keep the transmit time below three minutes! Personally, I think it's best to lower the power and drive a linear, also running low power for RTTY operation. (The other digital modes do not have a 100% duty cycle so the full 100W can be used).

If you are contemplating using Pactor II with the SCS PTC II unit, the power level will be controlled by the link results anyway. The PTC II will decrease the power level of the transmitter according to 'retries'. Incidentally, I've found that for packet operation, the 500Hz filtering is ideal.

Main Fluorescent Display

The FT-1000MP's main fluorescent display is complex, with so many functions being catered for and a number of others can also be selected! I don't think I have seen so many functions on a display before!

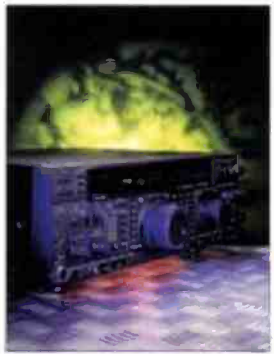
Included on the main fluorescent display are: Main, Sub and clarifier frequencies (these are read simultaneously down to 10Hz resolution). Bargraph displays provided include S-meters for both **Main** and **Sub v.f.o.s**, the peak reading segment of which can be held for a user-defined amount of time.

Another display (above the **Main v.f.o.**) displays clarifier offsets. Alternatively, you can select to have the segments expand outwardly as you tune in either direction from the displayed frequency, viewing tuning increments smaller than 10Hz.

When tuning on the FT-1000MP for RTTY c.w. or Packet, maximum signal indication on the S-meter should correspond with an indication on the tuning meter as follows. For c.w., the end and centre segments should light and for RTTY and Packet there should be an even amount of segments lit, either side of centre.

Metering Positions

There are six metering positions to monitor transmit functions, two automatic level control (ALC) voltage and r.f. speech compressor levels and three final amplifier collector voltage and



Cooke's Choice! The Yaesu FT-1000MP

"Operating an FT-1000MP must come a close second to being in Heaven"

Fig. 4: Rear panel of the transceiver.

All PW Reviews Will Now Provide A 'Reviewer's Rating' and Roger Cooke G3LDI says: "Ten out of Ten" for the Yaesu FT-1000MP.

microphone gain levels.

Various other indications of control settings appear on the display. Even the display brightness can be adjusted to suit the operator.

Specialised Operation

For a specialised operation (let's say SSTV or non-standard RTTY shift operation) there's a **User control button**. This can be programmed with a set of parameters to cater for the 'specialised operation' at the push of the button.

Certain settings can upset transceiver operation here however, so care has to be taken. In the event that this happens, panic not! Default parameters can be selected by performing a Central Processor Unit (CPU) reset ... fully explained in the user manual!

Automatic Antenna Tuning

An automatic antenna tuning unit (a.a.t.u.) is fitted as standard and operates between about 20 and 150Ω impedance. The a.a.t.u. system includes 39 memories for instant recall. (I've found that usually only a couple per band is all that's needed).

Broadcast Bands

For those short wave listeners who like to listen on the broadcast bands, amplitude modulation (a.m.) differential sideband fading (often referred to as 'phase distortion') can be a problem. The problem is caused by one sideband's propagation pathway differing from the other's pathway.

'Differential fading' can be reduced by using the synchronous tuning facility. In this mode the a.m. transmission is received using the lower sideband (l.s.b.) and a carrier is injected. This is accomplished by pushing the **AM** button twice and tuning across the signal until the centre segment lights.

Alternatively, good results can also be achieved by using sideband diversity reception. This is carried out by using both **Main** and **Sub v.f.o.s**, one in upper and the other in lower sideband, while listening on stereo headphones will produce an acceptable result.

Linear Operation

Instantaneous band-switching can be achieved by using the FT-1000MP in conjunction with the FL-7000 linear. All the necessary band-switching data is output from the transceiver on the rear apron and QSK operation can be used.

There's also an ALC input socket. For switching a conventional linear amplifier (like my 20 year old home-brew!) a **TX-to-ground** socket is available to close the linear relay.

Computer Control

Computer control of the transceiver is possible via the serial port on the rear. The transceiver has a built-in level converter and serial data is at 4800 bits/sec. There are 29 instruction opcodes for the FT-1000MP, usually duplicating menu programming.

Optional Extras

Optional extras include the SP-8 speaker. This includes audio filtering and tailoring from the front of the speaker, plus a phone-patch facility at the back.

A digital voice recorder is also available and can be connected to the rear of the transceiver. Various options are available with this unit, and I suspect many will be in use at contest stations and the like. Transverter operation is also possible, although I think this is a dying mode these days.

The transceiver comes with a fist microphone, a 104 page manual, complete with circuit. The manual, by the way, is extremely well written - clear, concise and with no 'Japanese English'. A transceiver of this calibre needs a good manual - and I wasn't disappointed. Also included in the package is a map of the world and a handout giving information about the Islands On The Air (IOTA) programme.

On The Air

Although I've had the transceiver for several months, I'm still not using it in the 'second nature' mode. In other words ... I'm still learning! Mind you, the new transceiver does make me realise just how old my Icom IC-751 is now and it clearly demonstrates how much technology has advanced in those 16 years.

However, my Icom IC-751 is still 'going strong' and it spends most of every day of the year operating on h.f. packet and will continue to do so. I shall be keeping the FT-1000MP for my own 'personal' use!

On the air I have found the automatic notch facility on the FT-1000MP to be a real boon and the tuning arrangement makes the rig a real pleasure to use. Audio quality on receive is superb, and although I'm only using the supplied hand-held microphone, the reports received so far (and once I'd set up the menu properly) have been good.

The transceiver's r.f processor has to be adjusted very carefully though. (It's easy to 'over process'). However, monitoring of the transmitted audio is available by the simple push of a button and the response can then be tailored to suit. I shall be adding a Heil microphone soon and will have to go through the procedure once again!

I've used the FT-1000MP on its own, running 10W and still managed my contacts with Australia and Canada with no problem. Admittedly though, I do have a TH7 beam antenna mounted 37m (yes 37 metres!) up on my tower and propagation has been good recently.

Incidentally, there is also a QSL card from the late **Sako JA1MP** (the founder of Yaesu) from his new QTH which is given as Heaven! And I think operating an FT-1000MP must come a close second! *PW*

WHAT IS A... Thyristor?

Ian Poole G3YWX takes a closer look at the thyristor - a device which is often called the 'workhorse of high power electronics'.

Thyristors, often called silicon-controlled rectifiers (s.c.r.), are widely used in power related applications. Indeed they have been called the workhorse of high power electronics. Thyristors are able to switch large levels of power are used in a wide variety of different applications.

Thyristors even find uses in smaller electronic modules including providing an easy method of giving over-voltage protection. They're also commonly used in such applications as light dimmers and so forth.

Four Layers

The thyristor consists of a four-layer *pnpn* structure. Shockley

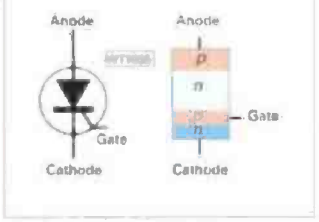


Fig. 1: The four layers pnpn material making up an s.c.r., alongside its circuit symbol.

first described this device in 1950 as a bipolar transistor with a *pn* 'hook-collector'.

The mechanism of its operation was then analysed further in 1952 by Ebers and then later, in 1956, Moll investigated the switching mechanism. Further investigations were again made by a number of people in 1958, but during the 1960s the device gained significant popularity in the power sector of the semiconductor industry.

The Structure

The structure of an s.c.r. has four layers as shown in **Fig. 1**. The outer layers are referred to as the anode (*p*-type) and cathode (*n*-type). The control terminal, or gate, is connected to the *p*-type layer located next to the cathode.

Doping levels in the device varies between the different layers, the cathode being the most heavily doped. The gate and

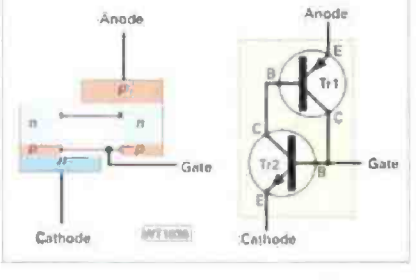


Fig. 2: The four layers may be considered as two inverse connected transistors (see text).

anode layers are less heavily doped, with the lowest doping level within the central *n*-type layer, which is also thicker than the other layers.

It's the light doping and thickness which enables a large blocking voltage to be supported. A thinner central layer would mean that the device would break down at lower voltages.

The devices themselves have to be carefully packaged in view of the large currents they can carry. The anode is usually bonded to the metal part of the package since the gate terminal is near the cathode and needs to be connected separately.

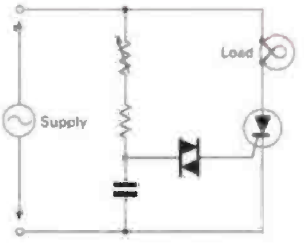


Fig. 3: The bare circuit details of a light dimmer circuit (see text).

Good Heatsinking

Good heatsinking is a necessity, both in bonding the device to the package and the package to the heatsink on which it's mounted. As a result these devices generally come in their own style of package. The heading photograph shows a few common options.

Normally thyristors are manufactured from Silicon, for which there are a number of reasons. Firstly, Silicon technology is more mature than many other materials. Secondly, it has advantages in terms of its voltage and current handling capacities as well as its thermal conductivity.

The device can be considered as two back-to-back transistors as shown in **Fig. 2**. The device Tr2 with its emitter connected to the cathode is an *npn* device, whereas Tr1 with its emitter connected to the anode is a *pnp* one. The gate connection is the base of the *npn* device.

These two devices form a positive feedback loop, with the output of each transistor fed to the input of the other. The output of any transistor, is in turn fed back to the input of the other. So, any current flowing into the gate, quickly builds up until both transistors are fully turned on, or saturated.

In Operation

Let's consider the s.c.r. in operation. Initially, when a voltage is applied across the device, both transistors are in their 'off' state (non-conducting) so, no current will flow because there is no complete path across the device.

If a small current is passed through the gate electrode, this will turn 'on' transistor Tr2, causing current to flow in the collector of Tr2. This current then causes current to flow through the base of Tr1 turning this transistor 'on'. Again this causes collector current to flow in Tr1.

The new current from Tr1 reinforces the gate (Tr2 base) current, causing its 'on' state to be maintained. In other words, once a small pulse has been applied to the gate, the device will hold itself on The only way to turn the s.c.r. off is to remove the voltage from the anode of the whole device, or to reverse the voltage polarity.

Variety Of Applications

The s.c.r. finds use in a very wide variety of power control applications, the most common is in a light dimmer shown in simplified form in **Fig. 3**. A portion of the input a.c. waveform is fed through a CR network that delays the waveform applied to the gate (eventually) by a variable amount.

Only when the gate goes

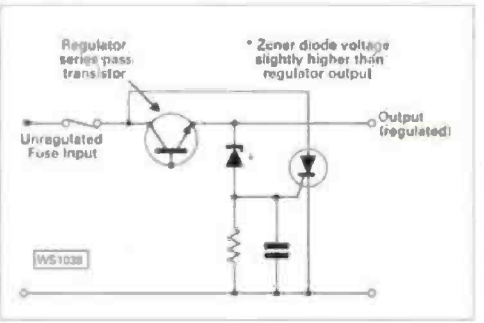


Fig. 4: A 'bare-bones' over-voltage protection circuit (see text).

sufficiently positive to conduct does the s.c.r.turn on. The more delay in the waveform, the later in the cycle is the s.c.r. is turned on, hence less of the waveform appears across the load as shown in **Fig. 3**. Note that current can only flow in the load during the positive going half cycle of the supply.

Thyristors also find use in crowbar (over-voltage protection) circuits in power supplies. Part of a simplified power supply is shown in **Fig. 4**. If the series pass transistor fails and becomes a short circuit the full output from the rectifier would be placed onto the output line, which could cause considerable damage to expensive equipment .

To prevent over-voltage, a simple thyristor circuit can be added as shown. The Zener diode voltage is chosen to be a little higher than the nominal output so, that when the output voltage exceeds the zener voltage, allowing current to flow into the gate of the thyristor, causing it to 'fire', shorting the supply to ground and blowing the fuse. This happens fast enough for the voltage not to rise to a level where it will cause damage. It's a very simple but effective circuit. PW

Radio Amateur Caught Broadcasting!

"Calling CQ 1500 metres . . . . "

Next time you're listening to the Shipping Forecast or catching up on the latest in the Archers you could be listening to Jim Lee G4AEH, a BBC Radio 4 Announcer who was recently interviewed by Rob Mannion G3XFD.

The following interview is the result of catching Jim Lee during one of his quieter periods and make my notes interesting reading. He begins "I made my first nervous CQ call on 'Top Band' in April 1971 twiddling a 10W Codar AT5 and little did I realise that one day I would be 'twiddling' the controls of one of the most respected radio networks in the World - the BBC.

"Although I'm unlikely ever to actually call "CQ 1500 metres" (despite the badgering of the Editor of a certain best selling radio magazine!), as one of the respected team of BBC Radio 4 announcers, I nevertheless have the power (500kW on 198kHz!) to do so!

"The thought of calling 'CQ' when reading the news had never occurred to me until I met my old friend Rob Mannion G3XFD at the Leicester Show in 1997 and he first suggested this article. Now every time I 'opt out' of the f.m. service to read the news and shipping forecast on long wave, Rob's suggestion does come to mind fleetingly"!

Jim Lee G4AEH - professional broadcaster and perhaps the only Radio Amateur allowed to regularly use 500kW and transmitters sited all over the UK at the same time!

Working On Radio Four

"I've been working at Radio 4 since May 1997. When I explain the varied duties of an announcer you'll soon realise that it's a very responsible job and that actually 'announcing' the programmes is just the tip of the iceberg so to speak.

"The full title of the job I do is **Continuity Announcer**. That means that my colleagues and I are there to maintain the continuity of Radio 4's output. To explain further it means that you have to be constantly aware of problems that might spoil the smooth flow of the output. You also have to be ready to jump in and as calmly and warmly as possible to make sure the listener's enjoyment isn't impaired!

"The demands of continuity also means that the announcer's word is law. A programme producer, who wants extra time or indeed wants to finish early, only does so after they have consulted the announcer. I always try to oblige ... but if it doesn't suit the timings or the output, they have to accept my refusal".

Promoting The Network

"My colleagues and I are also partly responsible for promoting the network. There is a team who make all the pre-recorded trails - you'll sometimes hear me on some of those, but the announcers write many of the 'verbal' programme trails.

"Where it all comes together, for instance, is when you know that a recorded programme duration is short and you need to fill the time before the next one begins. As the continuity announcer, you have to decide how to fill that gap - with a written or a pre-recorded trail - you may even ad-lib something.

"Whatever you do, it has to be to the split second because you know that every hour you have to make everything stop in time for the Greenwich Time Signal. That signal waits for no-one"!

Attention All Shipping

Jim went on to explain that "Even for people who don't understand it, there is something poetic and romantic about the Shipping Forecast with the famous words 'attention all shipping' which is broadcast several times a day on BBC Radio 4.

"Of course, I'm very aware of the responsibility of getting the forecast right! The first few times I was so scared I could hardly keep the script still. In practical terms it's one of the longest, straight 'live-reads' on the radio. (The late night version runs for something like 11 minutes).

"The shipping forecast also has to be done to time to meet various programme 'junctions'. But the main pressure to get it right is because the lives of so many people on the high seas depend on your every word!

"As a freelance, my Radio 4 duties are only a part of my busy broadcaster's professional life. It all began in commercial radio nearly 20 years ago with Mercia Sound in Coventry, from where I moved to the BBC as a senior producer in 1989".

I also learned from Jim that listeners can also hear his voice presenting programmes and reading or reporting news on regional and local radio in the Midlands. He's also heard on stations like BBC Hereford and Worcester, Radio WM and the BBC's regional TV news programme *Midlands Today*.

Jim went on to explain that "I've also worked on the regional documentary TV series, *Midlands Report* and for two years produced an accompanying radio 'phone-in programme *Reportback*. Early in 1998 I presented a TV documentary, *Shot At Dawn*, which told the story of a group of British soldiers shot for desertion during the First World War. My latest work has seen me making a series of programmes for BBC Education, which will be heard in the spring". Quite a busy schedule there Jim!

Enjoys Amateur Radio

Writing on radio has also been a pleasure for Jim Lee and he's also written for *PW* on the subject of Restricted Service Licences broadcasting (November 1996) and he tells me that he still enjoys Amateur Radio when he gets the opportunity!

"Although, unfortunately, I rarely get the time to operate, I did buy my callsign number plate in the recent auction! I thought

the price was a bit of a rip-off but it was **my** callsign so I took a deep breath and went for it"!

Licensed as a 17-year-old schoolboy in 1971, Jim says he's a keen *PW* subscriber and member of the RSGB. "I spend what time I have at the moment mostly listening but occasionally I operate mobile with an Icom IC-706. I'm looking forward to increased sun spot activity and working some DX on 29MHz narrow band f.m. which is fascinating"!

In 1996 G4AEH was one of the operators of GB60BBC celebrating 60 years of BBC Television, running stations from Shepherds Bush and Nuneaton. "That kept me busy" he says modestly.

What Of The Future?

So, what's in store for the future Jim? I asked. "Well, I'm having a lot of fun being freelance because of the variety of radio and TV work that comes my way. To be part of one of the most respected broadcasting teams in the world is such a great honour. Radio 4 has a unique place in broadcasting and I intend to be there as long as they'll have me - so you won't actually hear me calling CQ 1500 metres!

At the moment I'm involved in talks with several people, which may lead to me being heard on other radio networks and there's a chance I may be doing more television. It's hard working as a freelance but it would be nice to slow down and use my licence a bit more. I worked hard to get it and even if I don't use it very much, I'll never let it go"! *PW*

Never miss a broadcasting opportunity! While producing the 'CWR Afloat" programme from a narrow boat on the Coventry canal in 1992 Jim G4AEH spotted G3XFD pass by on a canal holiday with his wife and friends and faithful Labrador Mandy. They were promptly incorporated into the outside broadcast before they headed up the Ashby Canal - making sure Rob ducked his head at low bridges!

STOP PRESS: Since this article was prepared, Jim Lee G4AEH has also begun working freelance as a news reader and announcer with the BBC World Service. When doing so he's the envy of us all ... being heard all over the World at S9 plus on short wave and satellite services! And I take the opportunity of thanking Jim for making time in his busy schedule so that I could interview him! G3XFD

Hi-Band UP-DATE

The data used in making up the Beacon chart on the Hi-Bands Data Card published in the December 1998 issue of *PW* was not as accurate as might have been. We have also taken this opportunity to add more beacons to the list. The listing here is more comprehensive, albeit reduced in the number of bands. So, if you would like a more complete listing of the beacons, send a stamped s.a.e. (marked 'Beacon Listings') to the editorial offices. My apologies for these errors. ***G1TEX.***

Freq.	Callsign	Locator	Freq.	Callsign	Locator	Freq.	Callsign	Locator	Freq.	Callsign	Locator
144.400	Transatlantic beacon		144.444	DB0KI	JO50WC	144.478	S55ZRS	JN76MC	432.900	DB0YI	JO42XC
144.403	EI2WRB	IO62IG	144.445	GB3LER	IP90JD	144.478	OM0MVA	JN88NE	432.905	PI7QHN	JO22KH
144.404	EA1VHF	IN53UG	144.446	OK0EB	JN78DU	144.478	LA3VHF	JO38RA	432.905	SK4UHF	JO79LK
144.405	F5XAR	IN87KW	144.447	SK1VHF	JO97CJ	144.479	IT9S	JM77NO	432.910	GB3MLY	IO93EO
144.409	F5XSF	IN88GS	144.448	HB9HB	JN37OE	144.479	F6KJD	JN26QE	432.918	FX3UHB	IN78VC
144.410	DB0SI	JO53QP	144.449	I0A	JN62IG	144.479	SR5VHF	KO02OF	432.918	EA6UHF	JM08PV
144.411	I1G	JN44VC	144.450	F5XAV	JN23GX	144.482	GB3NGI	IO65VB	432.920	DB0UBI	JO42GE
144.412	SK4MPI	JP70NJ	144.450	DL0UB	JO62KK	144.486	DL0PR	JO44JH	432.920	SK7UHF	JO77BQ
144.413	3A2B	JN33RR	144.451	LA7VHF	JP99LO	144.490	DB0FAI	JN58IC	432.925	I1M	JN33UT
144.414	DB0JW	JO30DU	144.452	OK0EC	JO60CF	432.128	S55ZNG	JN65UU	432.925	DB0JG	JO31GT
144.415	I1M	JN33UT	144.453	GB3ANG	IO86MN	432.800	OE3XMB	JN77TX	432.925	SK6UHF	JO67EH
144.416	PI7CIS	JO22DC	144.454	IS0A	JN40QW	432.800	DB0GD	JO50AL	432.930	OZ7IGY	JO55VO
144.417	OH9VHF	KP36OI	144.455	OH5ADB	KP30NN	432.810	DB0OB	JN69EQ	432.930	OK0EA	JO70UP
144.418	ON4VHF	JO20FP	144.456	DB0GD	JO50AL	432.820	LA8UHF	JO59DD	432.934	GB3BSL	IO81QJ
144.419	I2M	JN55AD	144.457	SK2VHF	JP94TF	432.830	FX1UHF	JN18KF	432.940	DL0UH	JO41RD
144.420	DB0RTL	JN48OM	144.458	F1XAT	JN05VE	432.830	LA7UHF	JP20LG	432.940	SK7MHH	JO86GP
144.421	OZ7IGY	JO55VO	144.458	I0G	JN63IB	432.835	ES0UHF	KO18CW	432.945	DB0OS	JO40CW
144.422	DB0TAU	JO40HG	144.459	LA5VHF	JP77KI	432.840	DB0KI	JO50WC	432.945	OH9UHF	KP36OI
144.423	PI7FHY	JO33WW	144.460	HG1BVA	JN86CW	432.840	OH6UHF	KP13GM	432.950	DB0IH	JN39ML
144.424	IN3A	JN56NB	144.461	SK7VHF	JO65KJ	432.845	DB0LBV	JO61EH	432.950	S55ZRS	JN76MC
144.425	F5XAM	JO10EQ	144.463	LA2VHF	JP53EG	432.845	LA9UHF	JP40CM	432.950	SK1UHF	JO97CJ
144.426	EA6VHF	JM08PV	144.464	I7A	JN81EC	432.850	I5B	JN53KN	432.955	OZ1UHF	JO57FJ
144.427	OK0EJ	JN99FN	144.465	DF0ANN	JN59PL	432.850	DL0UB	JO62KK	432.965	GB3LER	IP90JD
144.427	PI7PRO	JO22NA	144.466	OZ4UHF	JO75KC	432.852	OH2UHF	KP10VJ	432.965	DF0ANN	JN59PL
144.428	DB0JT	JN67JT	144.467	I8A	JM78WD	432.855	LA5UHF	JP66WX	432.966	OK0EO	JN89QQ
144.429	IV3A	JN65RW	144.467	HB9RR	JN47FI	432.855	SK3UHF	JP92FW	432.970	GB3MCB	IO70OJ
144.430	GB3VHF	JO01DH	144.467	OK0ED	JN99DQ	432.860	LA1UHF	JO59IX	432.970	OK0EB	JN78DU
144.432	9H1A	JM75FV	144.468	F1XAW	JN26IX	432.863	F5XAG	IN93WC	432.975	DL0SG	JN69KA
144.434	DB0LBV	JO61EH	144.468	LA6VHF	KP59AL	432.870	EI2WRB	IO62IJ	432.975	HG1BUA	JN87GG
144.435	HB9H	JN46KE	144.469	GB3MCB	IO70OJ	432.873	PI7HVN	JO22WW	432.975	DB0JW	JO30DU
144.435	SK2VHG	KP07MV	144.469	IT9A	JM67LX	432.875	DB0FAI	JN58IC	432.978	F5XAS	JN12JK
144.436	PI7NYV	JO32EH	144.470	OK0EZ	JO70VB	432.875	SK2UHF	JP94WG	432.980	GB3ANG	IO86MN
144.437	LA1VHF	JO49GT	144.470	OH2VAN	KP20	432.875	OH7UHF	KP32TW	432.980	S55ZCE	JN76OH
144.438	3A2B	JN33RR	144.472	IT9G	JM68QE	432.880	LA3UHF	JO38RA	432.982	OZ2ALS	JO44WX
144.438	OK0EO	JN89QQ	144.473	SK2VHH	JP94	432.885	OY6UHF	IP62OA	432.982	SR5UHF	KO02OF
144.439	SK3VHF	JP73HF	144.474	OK0EL	JO70SQ	432.885	OK0EP	JO80OC	432.984	HB9F	JN36XN
144.440	DL0UH	JO41RD	144.475	DL0SG	JN69KA	432.888	FX4UHB	JN06KN	432.990	ON4UHF	JO20ET
144.441	LA4VHF	JP20LG	144.475	YU1VHF	KN04OO	432.888	OM0MUA	JN88NE	432.990	DB0VC	JO54IF
144.442	I4A	JN54	144.475	LY2WN	KO25GC	432.890	GB3SUT	IO92CO	432.995	DL0IGI	JN67KQ
144.443	OH2VHF	KP10VJ	144.476	F5XAL	JN12LL	432.890	LA4UHF	JO29PJ			
144.444	I5A	JN53GW	144.477	DB0ABG	JN59WI	432.895	OZ4UHF	JO75KC			

My Antenna?

It's A 'Longish Wire'

'Longish Wire' is the description that Ed Chicken G3BIK applies to his end-fed antenna which is longer than his garden. Read on to find out more!

For use as a short-wave radio antenna, *pvc*-covered copper wire is readily available. It's cheap, flexible, easy to install and most important of all, can perform very effectively over the entire h.f. range. And that's more than can be said about any h.f. beam antenna! Furthermore, although not so readily controllable as a beam, a wire antenna can (under certain conditions) give useful directional gain.

But why, you may ask, do I refer to it as a 'longish-wire' rather than the more usual title of long-wire? Well, in answer, antenna text books will tell you that for an end-fed wire antenna to be called a 'long-wire', it has to be a length of at least two wavelengths at the frequency of use. And even then, the published radiation patterns are valid only for an ideally installed long-wire antenna, that is to say, horizontal, straight, high and in clear space.

So let's face it if, like the majority of radio enthusiasts, you do not have the ground space and supports to hoist a wire 320m or more in length for use through the h.f. range from say 1.8MHz to 30MHz, then you cannot really have an end-fed wire that can truly be classified as a 'long-wire antenna'.

Space Restrictions

Such restrictions on space shouldn't dissuade anyone from suspending as much wire as can be accommodated within whatever space and height they have available. The golden rules are: make it as long, put it as high up and as much in the clear as possible.

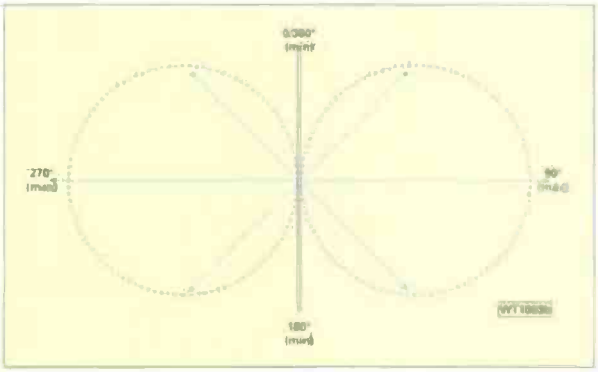


Fig. 1: A cross-section of the imagined radiation pattern of a horizontally mounted half-wave antenna looking from above (or any other location at right angles to the 'run' of the antenna.

Keep the antenna away from obstructions such as buildings and trees which gobble up or shield radio waves and well away from electricity and telephone wires for safety reasons.

Even the loft space can be used in the absence of a garden. But again you should be aiming to keep the wire as in the clear as possible, that is, suspended centrally mid-way between ceiling and ridge and avoiding as far as possible any metal roof-supports or water tanks.

In my own home location, which is typical of most from the antenna installation stand-point, I have what I prefer to call a longish-wire end-fed antenna. The wire I've used is 24/0.2mm *pvc*-covered tinned copper, but 12/0.2mm would probably have been strong enough.

The wire has a length of approximately 50m, which was dictated by the garden space available and its height is governed by whatever high supporting points I could conveniently access. These points include the lower branches of a pine-tree at about 10m above ground level, the TV antenna bracket at perhaps six metres and the washing-line pole at only two metres.

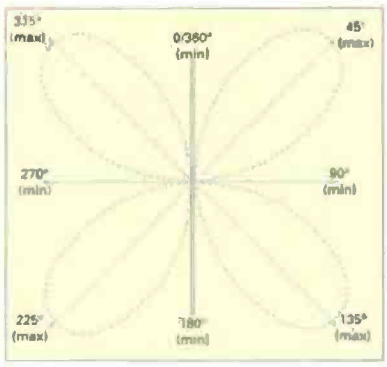


Fig. 2: Making an antenna a full-wavelength long gives four narrow lobes of maximum radiation and four distinct null-points, two of which occur at what was the maximum radiation direction of the half-wavelength antenna.

I did consider wiring up the whirley-gig (rotary) washing dryer as part of the antenna, but my wife rebelled at that notion. Instead the wire run is far from being the ideal, in that it wends a zig-zag path up, down, sideways and back upon itself until it eventually finds an entrance route into my shack in the loft-room.

Insulators as such, are not used because the covering of the wire itself provides effective insulation. Thin polyvinyl clothes line (not the metal-reinforced variety) is used as a halyard where needed. The line itself provides further insulation, which is enhanced at each point of suspension by tying a few knots in the cord. The knots also serve as a drip point for rain water running down the antenna wire.

Be assured however, that the basic G3BIK antenna described does work extremely well as a short-wave receiving antenna over the entire h.f. band and on transmission in all of the amateur h.f. bands from 1.8MHz to 30MHz. Granted, it does have the help of an antenna tuning unit (a.t.u.) to optimise performance on the frequency in use at the time, but more on the a.t.u. later.

Earlier Claim

Regarding my earlier claim for directivity from a longish-wire antenna, **Fig. 1** illustrates the radiation patterns of a half-wavelength long antenna. This pattern can best be understood by imagining that you are located high above the horizontal wire antenna and looking down upon it.

Consider first the radiation pattern of the half-wavelength wire antenna suspended horizontally in clear

space. This antenna exhibits preferential reception, or transmission, broadside on, to either side of the wire. Such preference must of course be at the expense of directional performance in other directions, which, in the case of the half-wave antenna, appears as more or less zero response at either end, in the direction of the wire's length.

The 'figure-of-eight' directivity pattern changes dramatically when the halfwave wire is suspended vertically rather than horizontally. In this case, the same antenna performs equally well all round, with no preferred direction or directions.

Taking the topic of directivity one stage further, an interesting effect takes place if a second half-wave wire is connected end to end with the original to form a full wavelength of wire, again horizontal in free space. The two directional lobes from each of the half-wave antennas then interact with each other, to create a totally different pattern of preferred reception or transmission from the full-wave antenna as shown in **Fig. 2**.

Preferential Performance

The preferential performance of a full-wave antenna is now in four directions rather than the two of an half-wave antenna. But there will also be four nulls (minimal response) in between the four lobes. As with the single half-wave antenna, there is again a null of zero response from each end of the full-wave wire, but now there is a zero response broadside on at each side.

Similarly, if a horizontal wire antenna in free space is shortened as opposed to lengthened, yet again it exhibits a different directional pattern. It follows therefore, that simply by changing the frequency in use the directional response pattern of any length of wire antenna will be dramatically altered as the wire is acting as different fractions of a wavelength, sometimes electrically longer and sometimes shorter.

Now, the performance of any random length of antenna wire suspended in less than ideal conditions, will behave in a directional manner entirely of its own devising. This is due to the interaction of directivity lobes from the different sections of the wire whether they be from the horizontal or vertical sections, or from any other slope angle.

Furthermore, the wire's response patterns will vary tremendously with change of frequency, both for reception and transmission. It's exactly this almost magical unpredictable behaviour that makes the longish-wire antenna so appealing in its performance and then there's the pleasure to be derived from exploring its favoured directions at the different frequencies of use!

Better Understanding

For a better understanding of how best to connect the antenna to your receiver or transmitter, it is useful to have some basic knowledge of antenna impedance. There's nothing mysterious or frightening about this, as you don't need to know the actual value of impedance. It's really just another example of Ohm's Law in practice.

When an incoming electromagnetic radio wave meets an antenna, it induces an (a.c.) current into the elements and a corresponding signal voltage (and so power). At radio frequencies, power in an antenna gives levels of voltage and current that do not remain constant along the length of the wire.

Currents and voltages are distributed along the length of the antenna wire with levels varying in a sinusoidal form. This effect is known as a standing wave, because the peaks and troughs, of voltage and current, occur at definite but different locations according to frequency.

The variations in signal levels are dependent upon the frequency of the radio wave and the physical length of the wire. At any given frequency, for any power in the antenna, whether it be microwatts on receive or hundreds of watts on transmit, any one location along the wire will exhibit the same ratio of voltage to current. And of course, with voltage and current, Ohm's Law says there must also be an impedance (expressed in Ohms).

Resultant Variations

The resultant variations in voltage and current along the antenna element, implies that the impedance must also be changing along the wire's length. What this means in practice, is that the impedance at the end of the wire which connects to the radio can, and does, vary significantly in use (which we refer to as the feed-point impedance).

The feed-point impedance depends upon the frequency of interest and upon the length and physical disposition of the longish-wire antenna. The ohmic value of this feed-point impedance can range from a few ohms to several thousand ohms.

However, you will be relieved to know that its actual value is not of any practical importance and does not need to be known. All you need be aware of, is the fact that the feed-point impedance of an end-fed wire varies with frequency.

The impedance at the antenna connector on most modern items of radio equipment however, is typically specified as 50Ω. Even though the radio itself may have a frequency range spanning the entire h.f. band of say 1.5-30MHz.

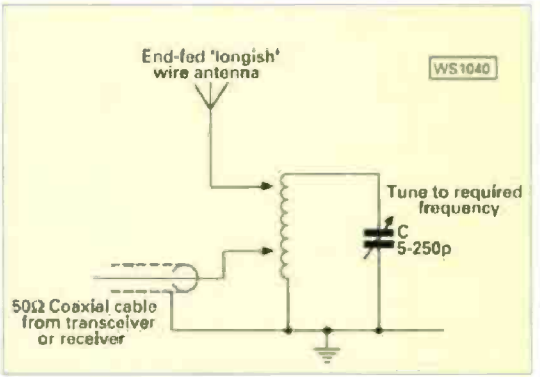


Fig. 3: A simple antenna tuning unit, if built as described in text, will be useful over a range of about 2-11MHz.

Now there is a fundamental law of physics (Maximum Transfer Theorem) which states that for maximum transfer of energy from a generator to a load, the impedance of the load must equal that of the generator.

In the reception case, the antenna must be considered as the energy generator and the receiver as the load into which that energy must be totally transferred. While for a transmission, the transmitter is now the generator and the antenna its load. So, here we have a situation that clearly poses a serious impedance matching problem if the radio is to be used in conjunction with and end-fed longish-wire antenna.

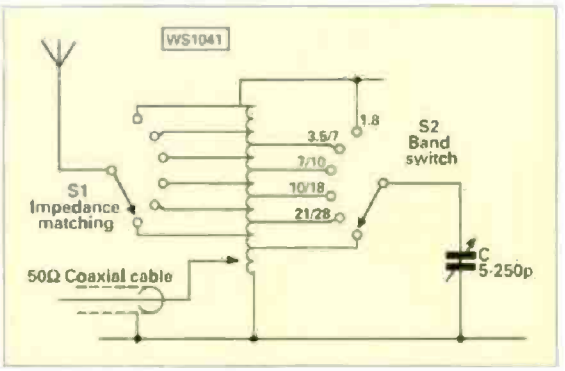


Fig. 4: Adding two multi-pole switches makes choosing the best tapping and tuning points easy.

Antenna Tuning Unit

That is where the antenna tuning unit (a.t.u.) comes into play, unless the particular short-wave receiver or transmitter was designed to accommodate an end-fed

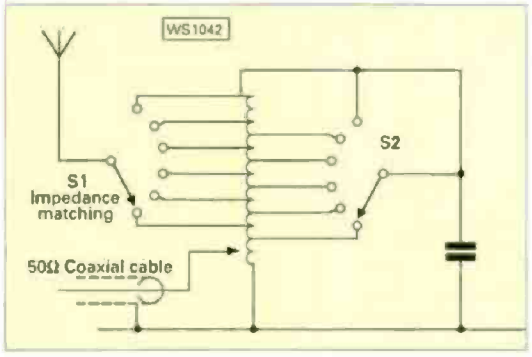


Fig. 5: A slight modification the the a.t.u. of Fig. 4, can sometimes improve the range covered.

antenna as well as a coaxial socket for the antenna. In this case the radio probably already has an inbuilt a.t.u. of sorts.

The various a.t.u.s come under a variety of titles such as 'Antenna Impedance Matching Unit', or 'Z-Matching Unit'*. But all units serve much the same purpose: To match the impedance of the antenna to that of the radio equipment. (* *antenna matching unit is a better general term* **G1TEX**).

All matching, or tuning units set out to optimise the performance of the antenna at the frequency of interest, by providing maximum transfer of radio signal between antenna and radio, or vice-versa.

Many units are available commercially, either ready for use or in kit form. Some are intended for short-wave reception, but in spite of its supposed use, this type is also suitable for low-power (QRP) transmission.

Those a.t.u.s designed for use with high power transmitters are more expensive, because of the need to use components of a higher electrical rating (although the units are no more complex in design). An effective receive/QRP a.t.u. is easy to construct at low cost, with a simple design and can compare favourably in performance with a commercial equivalent.

Basic ATU

A basic but very effective a.t.u. need be no more than a parallel tuned circuit as in **Fig. 3**, comprising nothing more than a coil and a variable capacitor, not even needing to be housed in a container at the experimental stage! The two components are connected in parallel, with one end grounded and tuned to the frequency-band of interest (for example 3.5MHz).

For best antenna performance, the ground connection should preferably be a good radio frequency earth. The 250pF variable capacitor and the coil shown in **Fig. 3**, actually allow a frequency span of about 2-11MHz. The coil is made up of some 22 turns on a 35mm film canister.

When this combination is tuned to 3.5MHz, the top end of the coil would present a high value of impedance to any applied 3.5MHz signal. This impedance would be in the order of a few thousand ohms.

The lower end of the coil being connected to ground, would, of course, represent zero impedance. And the impedance at different tappings would yield impedances ranging from about zero ohms to some thousands of ohms (from the grounded end towards the top).

The task of the tuned circuit is two-fold. First, it acts as a frequency-selective filter, which, when used for reception, selects the frequency of interest from the plethora of signals incident upon the antenna. When used for transmission, it selects the wanted frequency only and rejects any unwanted harmonics that might be present at the transmitter's output connector.

Its second and perhaps most important role is that of impedance matching. The impedance of the radio and that of the antenna are individually matched via the tuned circuit, so to allow the maximum transfer of the wanted signal between the antenna and radio. This is a two stage impedance matching process, with the coil itself being used as an impedance matching auto-transformer. Although I shall be discussing the receiving impedance-matching role, the following description applies equally for transmission, although in reverse.

The end-fed antenna acts as the energy source or signal generator and the tuned-circuit as its load. When the antenna impedance is matched to that of that of its load by being tapped onto the appropriate turn of the coil, there is maximum transfer of signal (at the frequency to which that is tuned) from antenna into the tuned-circuit.

The signal in the tuned circuit must now be transferred to the receiver, with the tuned-circuit then acting as the signal generator and the receiver as its load. Again, that transfer will be maximised when the impedance at the free end of the receiver's antenna coaxial cable is matched to that of the tuned-circuit by being tapped onto the appropriate tapping on the coil.

The antenna's feed-point impedance can be anything between a few tens of ohms to a few thousand ohms, hence it will need to be tapped onto the coil at a point matching it's value of impedance. The actual tapping point on the coil will depend upon the individual antenna (and on the frequency in use if used for other than the 3.5MHz band).

On the other hand, the impedance seen at the transceiver's socket, is assumed to be an unvarying 50Ω - for both input and output. So, the connecting coaxial cable will always find the matching low value of impedance, to be found at a tap on the coil near to the grounded end.

Typically, the feed point for a receiver or transceiver is about the second turn from ground and being independent of frequency. When it is established, the tapping point can be made permanent.

The a.t.u. is easy to use. First connect the radio's antenna-connection coaxial cable to the a.t.u., with the inner conductor soldered to the coil say at its second turn up from ground and the braid to the a.t.u.'s ground connection.

Connect the free end of the antenna initially to the top end of the coil and tune the receiver to a steady signal on the 3.5MHz band. Adjust the a.t.u. tuning capacitor for maximum signal strength, then move the antenna feed-wire further down the coil, listening for any change in signal strength.

At each change of tapping point, the tuning capacitor will need to be readjusted for maximum signal at each different tapping point. This is because attaching the antenna wire to the coil slightly affects the tuning.

Having experimentally determined the tapping which produces the maximum signal, solder the antenna wire to that position and the a.t.u. is now giving of its best with your antenna and receiver combination.

Although 'designed' for 3.5MHz the unit is really multi-band workable over the range 2-11MHz (approximately). This is achieved, simply by retuning the variable capacitor and of course relocating the antenna feed-wire on the coil, again for maximum signal.

Can Be Modified

The simple a.t.u. can be modified to give an easier method of attaching different tapping points for the antenna and to the tuning capacitor. The inclusion of two multipole switches can make the unit, shown in **Fig. 4** and **5**, useful over several bands as shown in Fig. 4 and 5. These modifications will improve the ease-of-use of this otherwise simple a.t.u. and make it quicker to use and more versatile.

As an improvement the a.t.u. could be made to cover the full h.f. range in a 'user friendly' way. Such a method was described in full constructional detail by **Ben Nock G4BXD** in his excellent article 'Antenna Tuning-The Simple Way', in *Practical Wireless* of January 1995. *PW*

A BIG THANKYOU - FOR 30 SU

During the year we'll bring you a host of very special birthday offers as a BIG THANKYOU for making us become one of the UK's most respected Reta

ICOM PCR 100 computer radio

NEW!

£199

YAESU VX-1R

£239

YAESU FT1000MP (AC)

£2,159

YAESU VL-1000 linear amp

£3,995

YAESU FT-41R

£239 £149

YAESU FT-847

£1,599

YAESU FT-920 HF Transceiver

£1,239

ICOM T8

£319

YAESU FT-100

ECALL

YAESU FRG100

£399

AOR 8200

£369

ICOM IC-706 Mk II

ECALL

ICOM IC-746

£1,525

ICOM R8500 Shortwave Receiver

£1,548

ICOM PCR 1000 COMPUTER RADIO SYSTEM

£249

NEW LOW PRICE!

Palstar KH-6

6 metre Handheld

£99

JRC NRD 345

£499

JRC NRD 545

ECALL

PALSTAR PS50

50 Amp 13.8V supply

£169.95

PK-12 Low cost TNC

£99.95

PALSTAR P30M

30 Amp variable voltage

£99.00

PALSTAR PS15

15 Amp 13.8V supply

£59.95

SGC 2020 Portable HF Transceiver

£599

HF-VHF SmartTuner SG-230

£299

PALSTAR PS06

6 Amp supply

INCLUDES 12V CIGAR SOCKET

£29.95

PALSTAR PS04

4 Amp supply

INCLUDES 12V CIGAR SOCKET

£19.95

USED EQUIPMENT

ALL SAFETY TESTED & GUARANTEED FOR 3 MONTHS

ADI AT-18	2MTR HANDHELD TRANSCEIVER	59.00
AKD 2001	2MTR MOBILE TRANSCEIVER	115.00
ALAN CT145	2MTR HANDHELD TRANSCEIVER	99.00
ALAN CT145	2MTR HANDHELD TRANSCEIVER	99.00
ALINCO ALM-203E	2M/70CMS HANDHELD TRANSCEIVER	129.00
ALINCO DJ-160 + EDC46 Q	2MTR HANDHELD TRANSCEIVER	129.00
ALINCO DJ-180 + EDC46 Q	2MTR HANDHELD TRANSCEIVER	129.00
ALINCO DR610	2M/70CMS MOBILE TRANSCEIVER	299.00
BELCOM LINER 2	2MTR SSB TRANSCEIVER	99.00
DENPA M-72	2MTR MOBILE TRANSCEIVER	129.00
ICOM IC-240	2MTR MOBILE TRANSCEIVER	140.00
ICOM IC-551	6MTR BASE TRANSCEIVER	295.00
ICOM IC-W21E	2M/70CMS HANDHELD TRANSCEIVER	169.00
ICOM IC228H	2M 45W MOBILE	185.00
ICOM IC2350H	2M/70CMS MOBILE TRANSCEIVER	309.00
KENPRO 202	2MTR HANDHELD TRANSCEIVER	68.00
KENPRO KT-44	70CMS HANDHELD TRANSCEIVER	85.00
KENWOOD TH-21E	2MTR HANDHELD TRANSCEIVER	89.00
KENWOOD TH-26	2MTR HANDHELD TRANSCEIVER	95.00
KENWOOD TH-28E	2MTR HANDHELD TX=70CM RX	169.00
KENWOOD TH 45E	70CMS HANDHELD TRANSCEIVER	139.00
KENWOOD TM201A	KENWOOD 2M FM MOBILE 25W	189.00
KENWOOD TW4000A	2M/70CMS MOBILE TRANSCEIVER	389.00
PALSTAR IDM + ACC	6 METRE HANDI	85.00
REXON RL-102	2MTR HANDHELD TRANSCEIVER	69.00
SHAKESPEAR SE2500S	MARINE TRANSCEIVER	249.00
SMC 34SL1	70 CM TRANSCEIVER	69.00
STANDARD C-500	2M/70CMS HANDHELD TRANSCEIVER	139.00
STANDARD C-5200	2MTR/70CMS MOBILE TRANSCEIVER	299.00
STANDARD C-7	70CMS MOBILE TX= 10W AMP	199.00
STANDARD C-8900	2MTR MOBILE TRANSCEIVER	185.00
TRIO TR-2200	2MTR MOBILE TRANSCEIVER	79.00
TRIO TR-2200GX	2MTR MOBILE TRANSCEIVER	79.00
YAESU FT-208R	2MTR HANDHELD TRANSCEIVER + ACCS	179.00
YAESU FT-23R	2MTR HANDHELD TRANSCEIVER	99.00
YAESU FT-290 MK2	2MTR MULTIMODE TRANSCEIVER	348.00
YAESU FT-5100	2MTR/70CMS MOBILE TRANSCEIVER	289.00
YAESU FT-530	2M/70CMS HANDHELD TRANSCEIVER	199.00
YAESU FT-708	2MTR HANDHELD TRANSCEIVER	89.00
YAESU FT-726R	2/70CMS+HF BASE TR ALL MODE	599.00
YAESU FT-726R	2/70CMS+HF BASE TR ALL MODE	599.00
YAESU FT202M + CHARGER	MARINE HANDI	50.00
YAESU FT290R	2M MULTIMODE TRANSCEIVER	199.00
YAESU FT290R+FL2025	2 METRE MULTIMODE	375.00
YAESU FT290R+ACC	2M MULTIMODE TRANSCEIVER	249.00
YAESU FT50R	2M/70CM HANDHELD TRANSCEIVER	199.00
YAESU FT690R+FL6020	6 METRE MULTIMODE	375.00
YAESU FT726R	2M/70CM/HF ALL MODE TRANSCEIVER	549.00
YAESU FT990R+FL7010	70CM MULTIMODE TRANSCEIVER	749.00
YAESU FTL2014	VHF PMR TRANSCEIVER	75.00
ALINCO DJ-X	HANDHELD SCANNER	145.00
ALINCO DJ-X10E	HANDHELD SCANNER	199.00
AOR AR-900	HANDHELD SCANNER	99.00
BEARCAT UBC200XLT	HANDHELD SCANNER	125.00
BEARCAT UBC3001T	BASE SCANNER	99.00
COMMTEL COM101	BASE SCANNER	75.00
FAIRMATE HP2000	HANDHELD SCANNER	139.00
ICOM ICR10	HANDHELD SCANNER	199.00
NETSET PRO 46	HANDHELD SCANNER	59.00
REALISTIC PRO 2BL	HANDHELD SCANNER	45.00
REALISTIC PRO-2030	BASE SCANNER	99.00
YAESU FRG9600	BASE SCANNER	299.00
YUPITERU MVT7000	HANDHELD SCANNER	145.00
YUPITERU MVT7100	HANDHELD SCANNER	169.00
YUPITERU MVT9000	HANDHELD SCANNER	225.00
AKD TARGET HF3	HF RECEIVER	115.00
AKD TARGET HF3	HF RECEIVER	115.00
AOR AR-7030	HF RECEIVER	499.00
AOR AR3000	BASE SCANNER	475.00
DRAKE R8E	HF RECEIVER	499.00
DRAKE R8E	HF RECEIVER	599.00
ICOM ICR7000	GHz/VHF RECEIVER	599.00
ICOM ICR7100	HF RECEIVER	525.00
ICOM R-72	HF RECEIVER + BATTERY PACK & PETERS	499.00
JRC NRD-535	HF RECEIVER	1199.00
JRC NRD535	HF RECEIVER	899.00
LOWE HF225	HF RECEIVER	599.00
SANGEAN ATS-818	SHORTWAVE RECEIVER - PORTABLE	105.00
SONY ICF5W100	SHORTWAVE RECEIVER	129.00
YAESU FRG7700	HF RECEIVER	349.00
DRAKE TR7	HF 100 WATT TRANSCEIVER	599.00
ICOM IC725	HF 100 WATT TRANSCEIVER	599.00
ICOM IC765	HF 100 WATT TRANSCEIVER	999.00
KENWOOD TS-50S	HF 100 WATT TRANSCEIVER - MOBILE	625.00
KENWOOD TS-680	HF 100 WATT TRANSCEIVER	599.00
KENWOOD TS-850SAT	HF 100 WATT TRANSCEIVER INC ATU	999.00
KENWOOD TS-930S	HF 100 WATT TRANSCEIVER	699.00
MIDLAND 2001 FM	10 M FM TRANSCEIVER	49.00
TRIO TS120S	HF 100 WATT TRANSCEIVER	275.00
YAESU FT 757GX	HF 100WATT TRANSCEIVER	399.00
YAESU FT707	HF 100 WATT TRANSCEIVER	599.00
YAESU FT757GX	HF 100 WATT TRANSCEIVER	425.00
YAESU FT840	HF 100 WATT TRANSCEIVER	525.00
YAESU FT890	HF 100 WATT TRANSCEIVER	565.00
2 METRE	TRANSVERTER	55.00
2/70CMS PRE AMPS	QTY 3 PRE-AMPLIFIERS	65.00
70 CMS	TRANSVERTER	65.00
AEA AMT2	DATA TERMINAL	49.00
AKD WM-1	WAVE METER	25.00
AMDAT 60	TERMINAL	195.00
BNOS 12/20E	POWER SUPPLY (20 AMPS)	85.00
CODE MASTER	CW/RTTY DECODER INC MONITOR	75.00
COMET DPL-1E	ANTENNA COUPLER	20.00
COMMTEL	AD1 PRE AMP	9.00
CTE BS-25E	VHF AMPLIFIER/DODGING BOOSTER	59.00
DATONG FL2	AUDIO FILTER	39.00
DATONG FL3	AUDIO FILTER	39.00
DATONG IFC1	FILTER/PROCESSER	65.00
DIAMOND SX-100	SWR METER	69.00
DUMMY LOAD	0-7 GHz DUMMY LOAD	25.00
DUMMY LOAD	0-7 GHz DUMMY LOAD	25.00
EASY READER DM-1000	DATA DECODER	299.00
GLOBAL AT1000	ANTENNA TUNER	75.00
GOLDLINE ANT MATCHER	ANTENNA MATCHER	19.00
HANSEN 602M	70CMS METER	35.00
HANSEN METER	SWR METER	39.00
ICOM PS-15	POWER SUPPLY (20AMP)	149.00
ICOM PS-55	POWER SUPPLY (20AMP)	125.00
ICOM SP-3	EXTERNAL SPEAKER	45.00
ICS AMT-2	RTTY/CW/AMTOR UNIT	9.00
IRAM	KANTRONICS MULTIMODE DATA TERMINAL	175.00

Hotline

01705 662145

fax: 01705 690626

email: info@nevada.co.uk

website:http://www.nevada.co.uk

• 189 London Rd • North End • Portsmouth • Hants • PO2 9AE

CCESSFUL YEARS

lers, Importers & Distributors. Remember we are always here to help you - call today!

NEVADA®

THIS MONTHS BIRTHDAY SPECIALS

ML 170 LOOP ANTENNA
3 - 10.3MHz
1.7 metres dia
2 ONLY
£135

VHR JR 5 BAND VERTICAL
HIGH QUALITY JAPANESE MANUFACTURE
Covers: 80,40,20,15,10m
Length: 8.05 metre
Power: 500W PEP, 200W 60mtrs
For roof or ground mounting
£149
3 ONLY

AEA SWR 121 V/U
120-175, 200-225, 400-475MHz
£245
5 ONLY

MORSE TUTOR
with practice osc
£39.95
without practice osc
£29.95

OPTOELECTRONICS OPTO SSB220A
SIDEBAND FREQUENCY COUNTER
£179

SmartPowerCube
2 ONLY
£799

SKYLOG ASL 2020
2 ONLY
£599
Log Periodic Beam
13.5 - 30MHz
6dB gain

OPTOELECTRONICS OPTO 3000A
10Hz - 3GHz COUNTER
£179

BIG THUNDER X9 ANTENNA
£645
1 ONLY

PRO-AM ANTENNAS
PHF-160 - TOP BAND mobile whip. £54.95 £39.95
PHF-12 - 24MHz mobile whip £19.95 £9.95
PHF-30 - 10MHz mobile whip £19.95 £9.95

GAP VOYAGER VERTICAL ANTENNA
Covers: 20, 40, 80, 160
Length: 45ft high
1 ONLY
£299

SCANMASTER HF2
Remote 2 Way Antenna Switch
(0 - 475MHz)
1kW PEP
PL259 £39.95
'N' Type £40.00

PALSTAR AT300 EN 150W ANTENNA TUNER
1.8 - 30MHz
£79.95

AKO 6001
2 ONLY
6 METRE FM TRANSCEIVER
£159

SGC HF-VHF SmarTuner SG-231
£349
save £150!

Outbacker Antennas
OB8 - 80 - 10 mobile antenna
£199.95 £149.95
JUNIOR PLUS - Mobile antenna
HF-2+6 ..... £225 £165
JUNIOR - Mobile antenna
£179.95 £129

VERY LIMITED STOCKS
1st FIRST COME - FIRST SERVED!

WE ARE CELEBRATING 30 YEARS

NEW ITEMS
SELECTED CLEARANCE STOCK
MANY ARE 'ONE-OFFS' SO ITS 1st COME 1st SERVED!

GAP VOYAGER	HF VERTICAL	399.00 299.00
TONNA 20618	2EL 144MHZ	85.95 69.00
TONNA 20638	2EL 435MHZ	69.95 49.00
OUTBACKER OB8	80-10 MOBILE ANTENNA	199.95 149.95
OUTBACKER JUNIOR PLUS	MOBILE ANT HF + 2+6	225.00 165.00
OUTBACKER JUNIOR	MOBILE ANTENNA	179.95 129.00
MALDOL HS-VICSUR	MULTIBAND HF VERTICAL	220.00 149.00
ALINCO WC-6	6 METRE V DIPOLE	69.96 39.00
PRO AM PHF-160	TOP BAND MOBILE WHIP	54.95 39.95
PRO AM PHF-12	24MHZ MOBILE WHIP	19.95 9.95
PRO AM PHF-30	10MHZ MOBILE WHIP	19.95 9.95
PRO AM MINITOR	TWINBAND MICRO-MAG	29.95 16.95
VECTRONICS VC300M	COMPACT TUNER	124.95 79.95
VECTRONICS LP30	1500W LOW PASS FILTER	59.95 39.95
VECTRONICS DL2500	2500W DUMMY LOAD	179.95 99.00
COMET CA420B	70CM 5/8 WAVE BIG VERTICAL	
NEVADA	900MHZ SWR METERS	34.72 19.00
DRAW ML170	3-10MHZ MAGNETIC LOOP	169.00 135.00
VECTRONICS HPT1500	COMPACT ATU HI-POWER	349.95 299.00
OPTO SSB220A	SIDEBAND FREQUENCY COUNTER	349.95 199.00
OPTO 3000A	10HZ-3GHZ COUNTER	349.95 179.00
STARTEK AFM30	1MHZ-2.8GHZ COUNTER	299.00 149.00
OPTO RD	30MHZ-2GHZ INTERCEPTOR	339.00 179.00
OPTO CB AF	CO-INVERTERS (SCOUT TO ARB000)	39.00 26.00
VECTRONICS CK200	ELECTRONIC KEYER	59.95 39.00
MFJ 207	HF ANALYSER (NEW)	79.95 49.00
1KW BALUN 1:1		34.95 17.00
DRAE MORSE TUTORS WITH OSC		59.95 39.95
TSA-6601	40W DUAL BAND PHONE SWR METER	39.95 39.95
MFJ-4018	COMPACT KEYER	69.95 39.95
WISE WP273U	10W DUAL BAND BOOSTER	199.00 129.00
WISE WP270DU	50W POWER DUAL BOOSTER	219.00 149.00
NB50R	BOOSTING BOOSTER 2 M.	99.95 69.95
DRAE MORSE TUTORS		39.95 29.95
AEA SWR121	V/U ANALYSER	399.00 348.00
SGC SMARTCUBE	100W S/S AMP	995.00 799.00

NEW EX SHOWROOM STOCK
FULLY GUARANTEED (MAY HAVE TATTY BOX)

AOR-245	HF RECEIVER	699.00 495.00
PALSTAR HP-1	6M HANDY	129.00 79.00
YUPITERU MVT-9000	SCANNER	349.00 299.00
YUPITERU MVT-7100	SCANNER	199.00 179.00
BEARCAT UBC3000XLT	HANDY SCANNER	189.00 159.00
ALINCO EDX-2	SMARTUNER	289.95 229.00
ALINCO DJ-X10	SCANNER WIDE BAND	295.00 225.00
ALINCO DRM-06	6M FM MOBILE	249.95 199.00
ALINCO DJ-G5D	TWINBAND 2/70 HANDY	269.00 219.00
ALINCO DR-140	50W FM 2M MOBILE	219.95 169.00
ALINCO DJ-C5	MICRO TWINBANDER	189.95 139.00
KENWOOD MB-13	MOBILE BRACKET	39.95 32.95
KENWOOD PG-5A	DATA CABLES	11.95 8.95
KENWOOD BT-9	BATTERY CASE	14.95 10.00
KENWOOD MB-430	MOBILE BRACKETS	39.95 12.95
SCANMASTER SP-55	PRE-AMPS	59.95 39.95
SDU-5000	D UNIT SPECTRUM DISPLAY	599.00 450.00
DRAKE SW2	HF RECEIVER	499.00 399.00
ALINCO DJ-S41	70CMS MICRO	99.95 79.95

PX WELCOME! we'll help you buy your rig with a GENEROUS PX OFFER!

IT'S EASY TO PAY!
- by three post dated cheques

- Simply divide the price into 3 equal payments.
- Write 3 cheques dated in consecutive months starting with today's date.
- Write your telephone number, cheque card No & expiry date on the back of each cheque.
- Post them to us, enclosing your name & address & we will (subject to status) send your goods immediately.

After his usual appropriate quotation the Rev. George Dobbs G3RJV has an interesting little project this month - in the shape of the 2222 7MHz transmitter. So ... get those soldering irons warmed up!

Carrying on the Practical Way

For the last several years, QRP fans in the United States of America have grafted an extra day on to the annual **Dayton HamVention** in Ohio. The Dayton HamVention begins on Friday and the QRPers gather in a nearby hotel on the Thursday for what they called FDIM: "Four Days in May".

The four days being the QRP day on the Thursday followed by the HamVention. The QRP day is built around a symposium with a series of lectures, which are published in a proceedings document. I have attended FDIM since it began and it's a truly worthwhile event.

The QRP component is not restricted to the Thursday, there are also events on each evening of the HamVention. One of the popular events has been a construction competition sponsored by NorCal (the Northern California QRP Club).

"....I know a trick worth two of that"
William Shakespeare (Henry IV, Part 1)

The NorCal challenge for 1998 was to build a transceiver using 2N2222 transistors as the only active devices. Constructors were allowed to use as many of these devices as they wished, but not to use integrated circuits, although passive diode mixers were allowed. The judges at the HamVention included **Dick Pascoe G0BPS** who is of course well known to *PW* readers as an 'Antenna Workshop' author and reviewer.

The winner of the 1998 competition was **Jim Kortge K8IQY**, with a very sophisticated 14MHz transceiver. Each section of the transceiver was modelled in software and the construction used non-printed circuit board, direct wiring techniques.

Roger Traylor WB4TPW, won second prize with a 7MHz transceiver. The third prize went to **Jim Roberts NC9H**, for a 14MHz c.w., a.m. and s.s.b. transceiver.

One of the problems for the designers of the 2N2222 transceivers was to get enough r.f. power output from what is a small signal transistor. One entrant - **N7RI** - used eight 2N2222 transistors in parallel in a double sideband suppressed carrier (d.s.b.s.c.) transceiver.

Another entrant - **N6CM** - went even further and built a 5W amplifier using **ten** 2N2222s complete with a cooling fan! Most of the entrants used the paralleling of the transistors, with emitter ballasting, to obtain a reasonable power output.

The various circuits drew my mind back to a little circuit idea by the late **Doug DeMaw W1FB**, for using paralleled 2N2222 transistors in power amplifiers. And it was the Dayton competition amplifiers which inspired me to try the simple arrangement used by W1FB.

The Circuit

The circuit of my trial transmitter for 7MHz is shown in **Fig.1**. The section of the circuit after L2 shows the DeMaw circuit. This Class C amplifier uses only a pair of the 2N2222 transistors in parallel.

Emitter ballasting is achieved with two 2.2Ω resistors. This prevents any single transistor from hogging the current, with a risk of self-destruction. It also alleviates the need to use a matched pair of transistors. The resistors also allow relatively equal transistor currents. (This is a common practice in transistor construction).

As W1FB pointed out in his original notes, many Motorola high power radio frequency (r.f.) transistors (BETs) contain several small signal devices on a common substrate. Each of their emitters is returned to the package emitter terminal via an internal 1Ω resistor. So in effect this idea is imitating a high power r.f. device!

Each 2N2222 transistor is capable of about a quarter of a watt of r.f. output. So the total output of this little transmitter is in the order of 500mW.

Slightly Novel!

The output circuit is slightly novel! The collector tuned circuit is not the usual common low pass filter found in so many simple QRP transmitter designs. Instead it's a

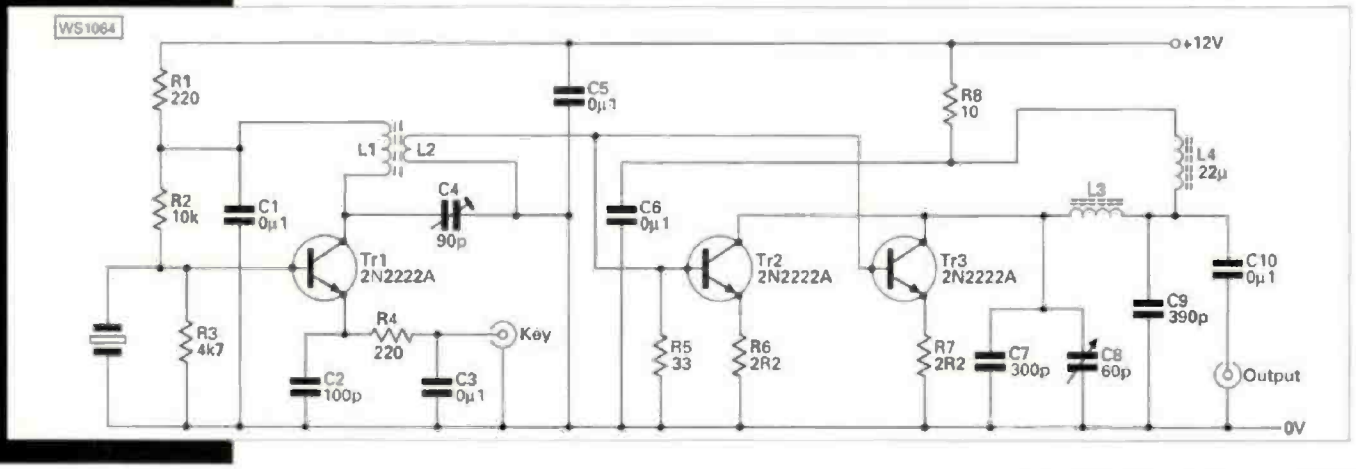
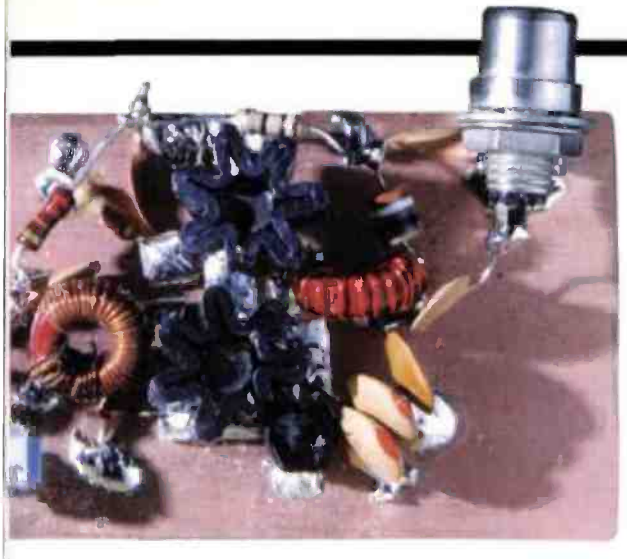


Fig. 1: Circuit of the 2N2222 transmitter, designed by the late Doug DeMaw which has been the cause of considerable interest (and some intriguing variations) ever since! (see text).



This month's project (or should it be challenge?) - features the 'mighty' 2N2222 transistor in a QRP 7MHz transmitter.

7MHz pi-network, with a *Q* of around eight, designed to match 1440 to 50Ω. A trimmer capacitor is added to allow tuning to resonance. In the original, Doug DeMaw suggests that this arrangement is an improvement on the more common, lower Q, low pass filter.

The signal generating and driver section of the circuit is to the left of L2. Looking around for a suitable circuit to drive the mini-PA, I returned to the circuit I used for the Utility Transmitter in 'Carrying on the Practical Way', *PW* April 1998. This is a circuit with a good pedigree which I have used several times, always with success.

A fundamental 7MHz crystal is used for the oscillator. Feedback to maintain oscillation is provided by the stray capacitance between the emitter and the collector.

At frequencies lower than 7MHz, additional capacitance may have to be added to maintain oscillation. (This could be inserted between the emitter and the base).

In this circuit the oscillator is keyed. Oscillator keying can sometimes result in a poor note as the oscillator dies and then picks up again. However, in this application the note sounds fine.

The collector output is tuned for the 7MHz band. A trimmer allows the tuned circuit to be 'peaked'. The output from the oscillator is picked off the tuned circuit by means of a link winding. (This provides the required low impedance input to the power amplifier circuit).

Toroidal Cores

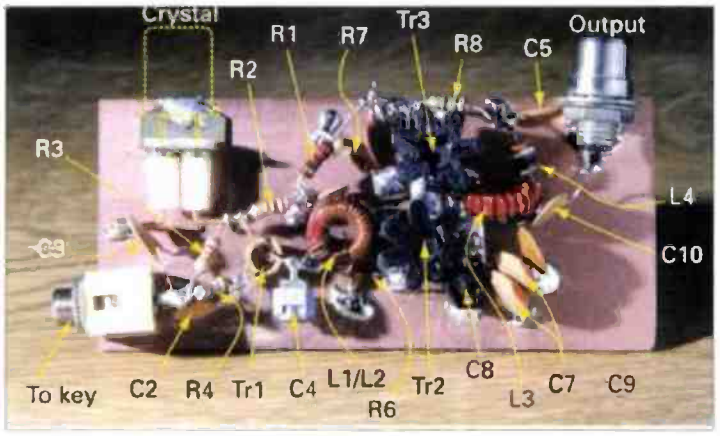
Both of the inductors, L1/2 (44/10 turns) and L3 (16 turns) are wound on T37-2 toroidal cores. The inductance value for L1 is 6μH and this resonates on 7.030MHz (the QRP Calling Frequency) with a capacitor of about 85pF. I used a trimmer I found in the junk box.

The Murata 5mm MTC-BLK trimmer (C4), which has range of 10-120pF, is ideal to resonate the inductor. This is a conveniently small component but the constructor could use a smaller value trimmer with addition parallel capacitance to make up the total value. The link coupling, L2, is wound over L1. I found it easy to solder L1 into place and then add L2.

My prototype was built 'ugly' style, on a scrap piece of blank printed circuit board material (see photograph). The grounded components provide the anchor points for the other parts.

The oscillator, 2N2222A, is mounted 'ugly-bug' style (legs up like a dead insect!) with L1/2 and the trimmer soldered directly to the collector lead. A crystal holder and key jack are added to the oscillator circuit.

Fig. 3: Annotated photograph of the 2N2222 transmitter as built by G3RJV (note heatsinking).



Power Amplifier

The power amplifier uses a different form of construction. The pair of 2N222A transistors is soldered to small pads made from p.c.b. material. Two pads are used for the emitters, one for both bases and one for both collectors. (I also added small heatsinks to the output transistors).

Another method could be to make a small heatsink from a strip of copper and soldering this to both transistor cases. The case is connected to the collector and this would provide a common collector connection as well as acting as a heatsink.

Incidentally, the 22μH (L4) choke is a standard moulded inductor. (It's always a good idea to keep a stock of chokes to hand!).

I think it's best to build the oscillator first and check the output from L2 using an oscilloscope or simple diode probe connected to a meter. The trimmer can be adjusted for maximum output. The power amplifier section may then be added knowing that it will receive a signal from the oscillator.

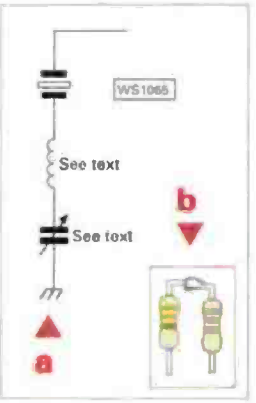


Fig. 2a and 2b: Circuit of a suitable Variable Crystal Oscillator (VXO) suggested for this month's project (see text), together with Fig. 2b, showing the arrangement for the radio frequency chokes (r.f.c.s) for the VXO.

Shifting The Frequency

The basic circuit in Fig. 1 is, of course, a fixed frequency crystal oscillator but it is possible, as I've often mentioned in this column, to shift the frequency of a quartz crystal by adding capacitance and inductance. The circuit for a Variable Crystal Oscillator (VXO) is shown in **Fig. 2a and 2b**.

Adding the capacitance raises the frequency and the inductance lowers the frequency. Therefore the VXO circuit will allow frequency swing either side of the crystal fixed frequency.

Following the design of the Universal Transmitter mentioned earlier, Fig. 2b, shows how two moulded axial inductors can be mounted side by side to increase the inductance value. This method is attributed to **Ha-Jo Brandt DJ1ZB**.

Values which give a generous frequency shift of several kHz at 7MHz would be 60pF for the variable capacitor and two 33μH moulded chokes. In practice the variable capacitor can be a trimmer.

Not the most powerful transmitter in the world....but it is interesting to see what can be done with three common small signal bipolar devices. Perhaps in a later column I will try one of the power amplifiers using a larger number of transistors and perhaps a cooling fan too! *PW*

ML&S PRICE MATCH PROMISE

In the past there may have been the occasion where you wanted to buy from ML&S but we weren't always the cheapest. We understand the situation and make you a firm commitment for the New Year.

*"FIND THE SAME DEAL ADVERTISED CHEAPER ELSEWHERE IN THE MAGAZINE BY ANOTHER DEALER AND NOT ONLY WILL ML&S MATCH IT - WE'LL BEAT IT *!"*

And remember! "Peace of mind" comes as standard from ML&S - not only do we service equipment on site but we only supply correct U.K. stock - (no "grey imports" offering inferior specifications and NO back-up from the appointed distributors). Before you buy, ask for the serial number of the equipment to be supplied and check with the U.K. representatives. Yaesu, Icom and Kenwood list their telephone numbers in this magazine.

"ML&S MAKING OUR COMMITMENT TO LOWER COST AMATEUR RADIO TOWARDS THE MILLENNIUM".

* ML&S will beat any advertised price from a competitor provided the goods are in stock at both parties and the goods offered are exactly the same specification.

Yaesu FT-100

Yaesu's answer to the IC-706mk11G. Small enough for mobile, big enough on specification. HF/6m/2m/70cm. Available March 1999.

RRP £1195 ML&S £Phone

Yaesu VX-1R

Two of these tiny handies would almost fit into ONE fag packet! Scanner & Dual Bander in one

£189 incl lithium Battery & Charger

Icom I

The smallest chunki BAND 2/6/70 Hand it won't get a

RRP ML&S

NEW! Kenwood TH-D7E

If you think Kenwood have been dragging their heals with respect to H.F. radio's, you'd be right on that one. The reason? Kenwood are one of the worlds leading VHF/UHF manufacturers as well. Enter the amazing new Dual Band Handie with APRS & a built in modem. Want to know what this marvel can do for you? Call Chris our sales manager who's been talking to the originator of the APRS system.

RRP £319.99 or £19.99 deposit & 12 x £25 INTEREST FREE.

Yaesu FT-920AF

As used by Barry Southwell (my former Quality Director at Racal-BCC), if it meets the exacting standards demanded by Mr Southwell, it's probably going to be good enough for you. (Or anyone for that matter!) HF+6M

RRP £1499
ML&S Price only £1299 with Matching PSU!

Or buy on our special finance package: £18.56 deposit, then 57 x £35 p/m. After 60 days receive £100 back to spend with ML&S!

Kenwood

Many of you forget the very best full DS money can buy. mentioned that 40/8 improvement, Kenwo did it. Shame they di like it so much it's the use at

RRP £1999 M

Or £29.15 deposit, t After 60 days receiv Desk Microphon

Kenwood TS-570DGE

Official U.K. stock offering superb performance on H.F with DSP and excellent CW operation.

RRP £999
ML&S Price only £899 with free matching SP-21 Base speaker. (Whilst stocks last)

Or buy on our special finance package: £5 deposit, then 55 x £25 p/m. After 60 days receive either an SSB or CW filter worth £65 free of charge!

Yaesu FT-1000MP/AC

Reigning champion after 3 years. Want the best on H.F then this is it. As used by the super DX'er's at CDXC. (You know, Neville, Keith, Bob, Roger & that lot...)

RRP £2499, ML&S Price only £2099 with FREE MD-100 Desk Mic.

Or buy on our special finance package: £213.35 deposit, then 60 x £50 p/m. After 60 days we send you the SP-8 matching speaker, FH-1 keypad and the TCX-04 Temp. Cont. Osc. Worth over £200! YIKES!!

tea

Buy on the famous ML&S BUDGET PLAN & receive up to £250 worth of matching accessories FREE

Icom PW-1

Like the Yaesu VL-1000, (1kW out on all bands 160-6), the new PW-1 is also a fascinating piece of kit. Price wise it's an absolute bargain too. (That's If you compare to the VL). Once again we have stock and would love to see at least one in your shack. Call us now for more information.

Old Alpha's taken in part-chop.

Icom IC-746

It could be you. The next person who rings up and asks, "do I buy the FT-847 or the IC-746?" will receive £10 worth of WINNING Lottery tickets. They may all be used but don't complain. If H.F is your priority then buy the IC-746. If VHF/UHF is your "habit" then stick with the FT-847. Simple.

RRP £1699. ML&S Price £1595 with FREE PS-85 light weight PSU.

Or £90.48 deposit, then 60 x £40 p/m. After 60 days receive a free matching SP-21 Base speaker & SM-8 Desk Microphone worth £174!

Yaesu F

It landed from Mar aliens. Actually it's bu & flogged by the Lyn apparently). You'v HF/6/4/2/70. In one n that the wife w

RRP £1699 M

Or £29.04 deposit, p/m. After 60 days around and shoot yo bring gifts in the matching PSU wor FC20 Auto Tuner wo 'em which y

Yaesu FT-3000M

The only 70 Watt 2M mobile available. I wonder why? Works well and is actually very very reliable.

RRP £449 ML&S only £299.95

MARTIN LYNCH & SONS

140-142 NORTHFIELD AVENUE, EALING, LONDON W13 9SB

TEL: 0181-566 1120 FAX: 0181 - 566 1207 CUSTOMER CARE: 0181 - 566 0 566

WEB SITE: MLandS.co.uk E-MAIL: sales@MLandS.co.uk

FINANCE EXAM

All examples do not inclu

Cash Price £349	Deposit £1	Nothing to pay for 6 months	Pay within 6 months at ZERO APR	Or 16 payment of £28

Written quotations available on

Martin Lynch can also offer finance terms up to 60 months. Deposits from a minimum of £25 (or used!) product, provided its clean and in good working order. Call the Sales Desk today to 36 months. All units are brand new and boxed and offered with full manufacturers RTB w Switch/Delta card. No additional charges for credit cards. **Martin Lynch is a licensed available on request. Finance is subject to status. E&OE. £10 p&p on all m**

READ THIS ADVERTISEMENT

it could save you serious money!

-T8E
st coolest TRIPLE
e. Buy it today -
y cheaper.
349
289

TS-870S
hat this is actually
P H.F. transceiver
After Peter Hart
Dm could do with
od went away and
dn't tell anybody. I
machine I prefer to
ome.
L&S £1799.
en 54 x £50 p/m.
an MC-90 DSP
worth £187!

Icom IC-775DSPmk11

Built like a Mercedes "S Klass", the 775 has the power to match its looks too. Over 200W output on all H.F. bands together with a High Speed Auto ATU, DSP and a hefty PSU to run the whole shooting match. Is it cheap? Don't be daft. Is a Mercedes S Klass?

RRP £2999. ML&S £2599.

Or £69.99 deposit then 50 x £75 p/m. After 60 days we'll send you £250 towards any holiday of your choice (just send us a copy of the receipt) or an SP-20 Desk Speaker and SM-8 Desk microphone worth over £240.

Yaesu FT-8100

A dual band mobile transceiver. You plug your microphone in one end, 13.8V DC in the other and don't ask where you stick the antenna. They work very well and we have sold crate loads. (Honest)

RRP £449 ML&S £369

Or £1.64 deposit (don't ring if you can't afford the deposit PLEASE), then 17 x £25 p/m

Kenwood TM-G707E

If you can live without the full dual receive function of the FT-8100 but prefer to operate on one band at a time then choose this one. Very clear display, remote head and most of the "features" you'll never use. Probably.

RRP £349.99 ML&S £299
Or £9.01 deposit & 13 x £25 p/m.

Icom PS-85 Compact PSU

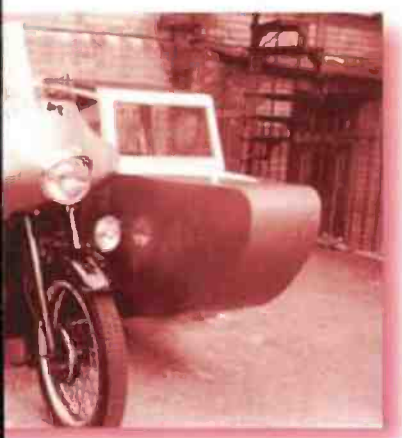
If you need a lightweight PSU that doesn't require the services of a body builder to carry around for you, send me a cheque for this one. Ideal for any of the 100W rigs operating on SSB, this very small compact PSU from Icom is the first choice for use in the shack or your holiday location.

RRP £245 ML&S £199.95

Yaesu VL-1000

When Yaesu first told me about the new VL-1000 amplifier and discussed the specification I was amazed. Over 1kW on all H.F. with Auto ATU, no tune up, matching PSU, fully computerised control of all parameters - I was even more excited. Then they told me the price. Three months later I came round and now only suffer from a slight twitch. Like the IC-775DSP you invest in the VL-1000 for life. (Just as well - you'll be paying for the rest of it). However. We have a small quantity in stock that you won't have to part-ex the house for. Seriously interested? Give Chris or myself a call.

time teaser



If you think you can name the Motorcycle and sidecar together with the approximate year, jot it down on a QSL card and send it to ML&S. The first to get it right will win a 2m Handie. If you can name the driver as well you'll get another bonus prize!

Icom PCR-1000

Take one little black box. Connect it to your Windows 95/98 PC, connect an antenna and presto! You have just installed a full 100kHz-1300MHz all mode quality receiver. Clever you. A certain Government body just bought a load from us too. Must be good then.

RRP £399 with DSP. ML&S £299.95 with DSP.
Or £9.01 deposit & 13 x £25 p/m.

Full range of Tonna Available 10% off this month!

T-847
& was built by
it by the Japanese
ch mob (& Others
read the spec,
ce sized package
on't notice.
L&S £1349.
then £60 x £35
e Martians come
. Not really. They
hape of a free
h £229 or a free
th £219. You tell
u prefer.

Icom IC-706mkIIG

The third generation of this remarkable HF/6m/2m/70cm mobile/base transceiver. A boost in 2m output to 50W TX/RX on 70cm, this really is the rig of the decade. Buy a piece of modern art today! Finally, we have found some brand new mkII's lying around at Herne Bay. Give us a call to check stock, still only £799.00.

RRP £1195,
offered with FREE DSP unit, SSB & CW filters. Deposit £63.60 & NOTHING until July '99 then 60 x £30 p/m.

Yaesu FRG-100

A perfect shack receiver to compliment your H.F line up. Ideal for monitoring your own transmission so no waiting on ten different opinions from ten different amateurs. (We get it all the time!)

RRP £499. ML&S £419
Or £14.83 deposit then 19 x £25 p/m.

Icom IC-Q7E

The Icom competitor to the VX-1R. Small & tiny (like Graeme's brain) I have a few going cheap. 30MHz-1300MHz & 2/70 transceive.

RRP £219 ML&S £139

JOIN WAB NOW

The Worked All Britain Awards Group offers a comprehensive programme of awards based on the Ordanance Survey maps of the UK. Awards are open to all licensed amateurs and short wave listeners. No QSL cards required. For further details visit the WAB Website at http://www.users.znet.co.uk/gintw/web.htm Or contact Brian Morris G4KSO, QTHR.

PLE
e P&P.

Total credit price of £449	APR 21.9%

equest
We welcome your part exchange against any
APR 21.9%. Payment protection is also available
arranty. All prices quoted for cash/cheque or
credit broker. Full written details are
ajor items.

Call now 0181-566 1120

ML&S

Cost-Cutting Experiment

The DSV Simple Loop

Ron G3SDV suggests that you try experimenting with his simple loop and work the DX!

Ron Wilson G3DSV describes his 'Simple Loop' coaxial cable antenna which had its origins in the early 1990s but can still provide the basis for experimentation - particularly as 28MHz is really 'warming up' nowadays!

The DSV 'Simple Loop' started life because I thought that the cost of commercially made loops, back in the early 1990s, was rather high. So I decided to try 'home brewing' one for myself and the aim of this article is to encourage you to experiment and build one for yourself ... using the details I'm providing as the 'base line' so to speak.

The results I obtained exceeded all expectations and comparing my loop antenna with a commercially made vertical antenna, all the signals I received were at least two S-points better. Incidentally, the bandwidth I set for my antenna was 10.1 to 28.7MHz so you'll realise that with the improvement of 'Ten Metre' propagation the antenna could prove useful for your own operations on this fascinating band.

Coaxial Cable

The material I used for the loop was HW100 coaxial cable because it's cheaper, with the added advantage that it was more rigid than UR67. The resulting diameter loop (internal dimensions) ended up as 990mm, as in **Fig. 1**.

The necessary frequency range was achieved by using a variable capacitor with widely spaced vanes (surplus from a Second World War TU5 tuning unit). These capacitors are still frequently seen on sale at rallies and mine coast £1 and has a nominal capacity of 100pF but when measured proved to have a value of 5 to 105pF.

The minimum value of the variable capacitor governs the upper frequency limit of the loop. A smaller loop was tried and successfully covered up to 28.9MHz but at the expense of the loss of coverage of the 10MHz allocation.

In practice, the braiding of the coaxial cable is treated as the loop. (A very solid connection must be made from the ends of the loop to the tuning capacitor).

The Loop

The cable for the loop is cut 100mm, too long. The ends of the loop are then stripped back approximately 50mm from each end of the outer *pvc* covering. Next, the braid is pulled back and the inner polythene is cut off and the braiding is squeezed down and one end is connected to the capacitor rotor and the other to the stator.

Next, strip approximately 20mm off the loop's outer covering 240mm **from the exact middle**. Then attach the Gamma section to the centre spigot of the SO239 and bind the other ends to the copper braid of the loop with 24/26s.w.g. copper wire.

Then, with the aid of a large soldering iron, solder the spigot of the SO239 first and then solder tinned copper wire to the other end of the matching section and then tinned copper wire to the other end of the matching section, finally soldering the tinned copper wire to the braiding of the loop.

(Attempting to solder the matching section direct to the braid would need a disproportionate amount of heat and distort the loop section).

When complete, I recommend that you cover the binding with pvc insulating tape. Or better still ... by using self-amalgamating tape.

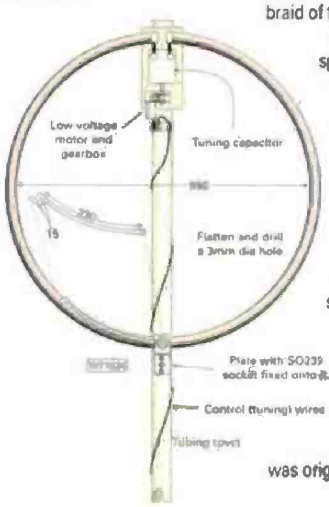


Fig. 1: The DSV 'Simple Loop' experimental antenna constructional diagram. (See text for details and suggestions).

Gamma Match

I adopted the use of a Gamma Match feed after several experiments as this form proved to be relatively non-critical and reasonably easy to construct. My prototype was originally constructed from 14s.w.g. copper wire but eventually I opted for 6mm (outside diameter) copper tubing of the type used for Liquid Petroleum Gas (LPG) cookers, etc. This is available from caravan accessory shops or Calor Gas dealers, alternatively, copper brake piping (available from motor accessory shops) could be used.

One end of the tube is flattened for approximately 12mm and drilled to take the spigot of a SO239 socket. The opposite end is also flatted for the same length but at 90° relative to the first 'flat' section. It's then bent at 15mm to make an 'L' shape. This is the end which is connected to the coaxial cable braid (see Fig. 1)

The assembly should be coated with varnish after assembly. Self-amalgamating tape can then be used to provide a fully waterproof seal.

Insulated Shaft Coupler

An insulated shaft coupler must be used between the drive of the motorised gear train (necessary for remote tuning control) and the tuning capacitor. This is because the voltage across the capacitor will be around 2 to 4kV depending on the band and the transmitter power.

The motor and necessary gearing train is not the problem you may think it to be! They're available - in kit form - from almost any model shop and the supplied gear train provides you with an option to the final drive ratio.

As supplied, the kits come with 3mm diameter drive spindle, therefore a 3 to 6mm adapter bush is required and these are also available at model shops.

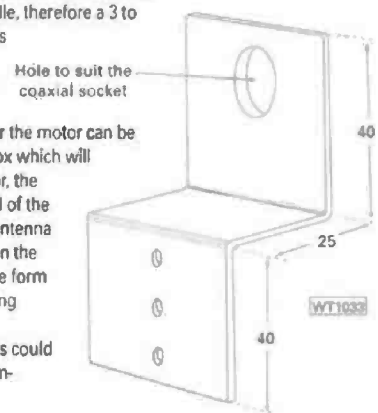


Fig. 2: Diagram illustrating the shape of the bracket needed for the SO239 antenna socket (see text).

The d.c. feed for the motor can be fed up to a plastic box which will also house the motor, the gearing and one end of the drive shaft and the antenna socket. Depending on the capacitor used, some form of 'end stop' switching would have to be incorporated and this could be in the form of cam-operated microswitches or even Hall effect devices operated by magnets.

There will be some radio frequency interference (RFI) but this is not a problem because it only occurs during tuning up.

Tuning Up Simple

Tuning up the loop is straightforward and simple. It's achieved by using your s.w.r. bridge connected in series with the coaxial feed from the transmitter and you just tune for the minimum - usually 1:1.

Please note that the bandwidth of the loop is relatively narrow. Retuning will be necessary if you move more than a few kilohertz.

In practice I found that by using your receiver S-meter to tune the loop to the station you want you call works well; enough on receive. The RFI, as previously mentioned will be present but won't be enough to cause any problems.

So, that's the DSV 'Simple Loop' - it's a long time since I made the original version which worked very well indeed - but there's nothing to stop you trying. Try it and see - and enjoy the DX! PW

ELECTRONICS IN ACTION

Welcome to the first Electronic-in-Action (E-i-A) of 1999 - even though Christmas is some distance in the future as I write this! This month I have a look at two power supplies, three books, a ten-CDROM data set and a few of your letters.

I've had a press release from **Feedback Instruments Limited** about some new dual or triple output power supplies. The two new p.s.u.s mentioned have the model numbers of **EX354D** and **EX354T** and have a great output power capability. The dual output model can supply up to 280W of output with its two regulated output voltages of 0-35V at up to 4A, which may be combined to give either 0-35V at 0-8A or 0-70V at up to 4A. The EX354T has an additional 3.5-5V supply with up to 5A capability, giving a total output capacity of 305W.

Both the EX354D and EX354T feature digital indicators of the set voltage and the output current in each supply. For more information and availability contact the **Marketing Department** of **Feedback Instruments Limited, Park Road, Crowborough, East Sussex TN6 2QR. Tel: +44(0)1892 653322**, or **FAX +44(0)1892 663719.**

Some time ago I took a 'phone call from **Richard Walker G4PRI** who was trying to contact **The Scientific Wire Company** who used to advertise in *Practical Wireless*. The Scientific Wire Company, although only a small company, was often able to supply wire types that were otherwise difficult to obtain (such as Litz wire that was used for many r.f. coils in early radio sets). Since then I've had an E-mail from Richard telling me of the company's new contact details. The Scientific Wire Company **18 Raven Road, London E18 1HW, Tel: 0181-505 0002.** So, if you have a specialist requirement why not try them because they traditionally provide excellent service.

Imagine a shelf full of data sheets for semiconductor manufacturer's products and you have some idea of the vast quantity of data to be found on the ten CDROMs available from **Danell Electronics Limited.** I've had the opportunity to try them out, and you'll find my mini-review later in E-I-A. *Tex.*

Fig. 1: The EX354T, three output p.s.u. available from Feedback Instruments Ltd.

It's about this time of year that many new books become available and it's to three new books that I start first, with a book from McGraw-Hill *How Electronic Things Work And What To Do When They Don't.* Written by **Robert Goodman**, this 370+ page book is well titled. It describes a good course of action to take in the case of problems occurring with many every-day things. Throughout the ten chapters, illustrations are used copiously to get over the logically simple tasks that can get a piece of equipment going again, or at least identify the problem after it has all gone wrong.

The first chapter takes those who are unsure, through a swift, but fairly thorough course on 'Basic Electronics' and various type of components to be found in circuit diagrams. Then the 'course' starts with resistors, their measurement and problems, before dealing with capacitors their problems and faults.

The final passive component to be dealt with, coils and transformers, aren't forgotten either as their types, faults and problems are described. Also to be found in this chapter are transistors, diodes and integrated circuit descriptions (although due to space limitations - these are not in great detail). And the final part of the first chapter is on test equipment and how it may be used in the repair.

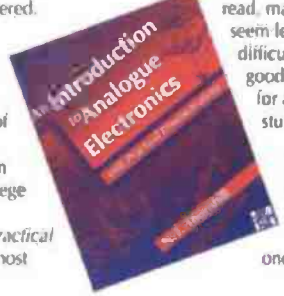
Real Chapter

Moving on to chapter two, the first 'real' chapter in the rather thick book, which deals with 'Radios/ Audio/ Stereo/ Speakers/ Music Systems and Cassette Player Operations'. This chapter begins with a description of how a broadcast station works, finishing up at the recording of information for later pleasure. Each link in the chain is dealt with and its strengths and weaknesses described.

Chapter three deals with audio/ video/ CD players and remote control operations in a similar manner to the previous chapter. Similarly through chapter four dealing with colour TVs and PC colour monitors, then Chapter Five (video recorders and operations), Chapter Six (direct broadcasting by satellite (DSB)), Chapter Seven (video cameras and camcorders), Eight (all things telephonic) and Chapter Nine (computers and how they work/fail) before finally arriving at Chapter Ten which covers (printers photocopiers and FAX machinery). In fact, to detail what is in each of the ten chapters takes four and a half pages.

To finish off this comprehensive book is a 'well-stocked' glossary of the many terms that 'litter' technical documentation. If I had to find fault with this book, about the only minus point is that it deals with American systems and the readers must bear this in mind when reading it. But otherwise a good book that prove excellent to 'fill-in' on other technologies not yet encountered.

Second out of the McGraw-Hill stable this month is a book published on this side of the 'pond'. Written by **N. F. Thornhill**, (a senior lecturer in electronics at University College London). *An Introduction to Analogue Electronics With Practical Demonstrations*, contains almost 340 pages of a more technical nature. This book also has ten chapters, but its more technical content is aimed at readers after a more 'in-depth' understanding of how circuits work and the reasons for the design of them.



The ten chapters to be found in the this book are: Basic concepts, analysis of linear circuits, practical (operational amplifier circuits), semiconductor components and transistor circuits. Practical (transistor amplifier circuits), analysis of non-linear circuit, practical oscillators, circuit simulation using SPICE, instrumentation and data analysis.

The final chapter is another practical one dealing with an electronic measuring instrument, which is more a discussion of measuring techniques for analogue values, rather than of any particular instrument. To complete the book there are three appendices of circuit elements, terms and methods used throughout the book.

The book seems to have been written to accompany a variety of electronics courses at 'further education' level. It's also somewhat academic, in spite of the practical demonstrations, which seem more to illustrate the topic under discussion rather than a particular circuit. The subject is clearly dealt with and the book was, I found, well laid out and easy to read, making the subject seem less imposing and difficult - and I think it's a good bookshelf purchase for any electronics student.

Well Known

The name **Joseph J. Carr K4IPV**, is one that is well known

Fig. 2: The inside of John Shaw's shack showing the wealth of home-brew project, many of them from *PW*'s pages, in evidence.

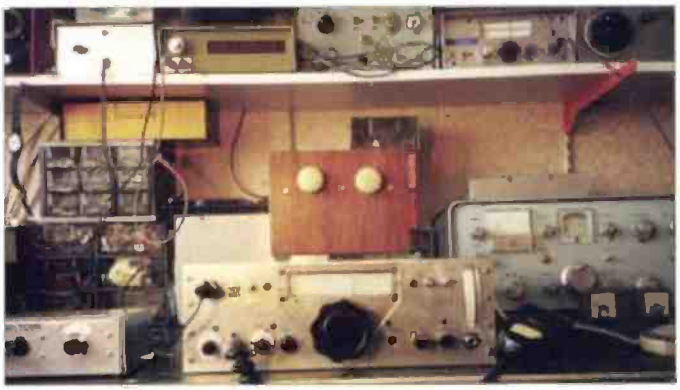


Fig. 3: The single valved radio sitting on top of a PW Jubilee transceiver. To their right a *PW* 'Tiny Tim' can just be seen.

to readers of our sister magazine *Short Wave Magazine* as an author of definitive books on radio and related topics. Under the Newnes label his latest book *Microwave & Wireless Communications Technology* is all about the techniques and components to be found in equipment for our higher bands.

With over 425 pages, this book gives a strong grounding in techniques that make microwaves seem more of a black art than it really should be. With 20 chapters making up the book, each component has a chapter to itself. Technology, propagation, transmission lines and waveguides, filters and amplifying devices, detectors and transmitters are all dealt with in an easy to understand way.

It's possible to work your way through this book and feel that you have learned something each time you read it, although sometimes (as with many new concepts) you have to accept many ideas and statements 'on-trust'. This is an ideal book to gather a considerable insight into the microwave bands, bands that are playing a greater and greater part in our hobby and everyday life.

Two decades ago, a simple wide-band f.m. system with only a few milliwatts of radiated power was considered fairly advanced, we now have solid state units pushing out several watts of power on 10GHz, using the same s.s.b. and other narrow-band techniques to be found on the h.f. bands. Distances worked are going up almost daily, microwaves are no longer considered the 'line-of-sight' mode that they had been labelled. In my opinion this book may be considered as a valued addition to any amateur's book shelf.

Good Response

I've had a good, amazing even, response to my last conundrum in the December 1998 issue of *PW*. The 'resistor cube' problem was posed on page 69 of that issue and was originally posed by **Frank Whitehead G4MLL**. I have to say that with the exception of one reader all the answers were correct so, perhaps it's 'fiendish' ones that stimulate you. I'll have look out for some more! Or if you know of one - perhaps you'd like to share it with the readers. The deadline for that conundrum is still first post 6 January 1999 - and a little clue to working it out is to look at it from a current flow point of view. There's a pictorial conundrum at the end of this column this month for your consideration.

Along with his (correct) entry for the cube conundrum **Chris Meadows G4KWH**, sent me in the following little bit of text:

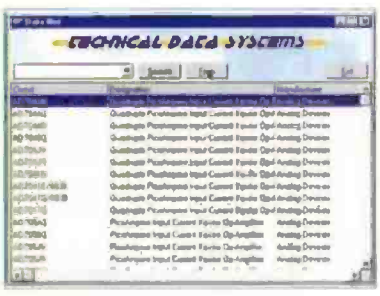
"**Wanted**: A reward is offered for information leading to the arrest of Eddy Current. He is charged with the induction of an 18-year-old coil named Milli Henry, who was found induced, half choked and robbed of valuable joules. This unrectified criminal, armed with a ferrite rod, escaped from a Weston cell where he had been clapped in ions since Faraday. With an erg to be free, his escape was carefully planned in three phases. First, he fused the electrolyte, then climbed through the grid despite the impedance of the warders whose reactance was too slow. Finally, he went to ground in a local magnetic field. Watt seemed most likely is that he stole an ac motor. As this is of low capacity, he is expected to change it for a megacycle and return by a short circuit to ohm. He may offer resistance, which Hertz and is a potential killer, A.C. Mains-Hum (Sheriff)".

Chris said in his E-mail "Your readers may be interested in finding out how many technical terms are to be found in the above text. Well, I'm going to throw this one back to you Chris to act as arbiter. Answers please, to **cmeadows@globalnet.co.uk** under a plain brown E-mail cover.

ELECTRONICS-IN-ACTION REVIEW! ELECTRONICS-IN-ACTION REVIEW! ELECTRONICS-IN-ACTION REVIEW!

Data Feast

I've had the opportunity recently to have a look at a real 'data feast' on CDROM for an IBM PC. The feast came in the form of a series of ten CDROMs called **DATA-NET** available from **Dannell Electronics Ltd.** The CDs are the latest compilation of manufacturer's data for their semiconductor products and a linking database of the reference numbers.



Installation of the database search 'engine' is quick and simple. The only real decision to be made is which of the three languages (English, French or German) to use. On running the search engine, a simple windows opens with just three button operations to use: **Search**, **Form** and **Exit**. It could hardly be simpler!

So, as I initially wanted some data on an amplifier i.c. I

started with that number and the series of 'screen-grabs' illustrate the three basic steps. To initiate an inquiry, type the full or part number you would like information about in the 'letterbox' window. Then 'press' Search, press the carriage return key, or [Alt]+'S' combination to set it going. I tried it on both a 133MHz Pentium equivalent and on a 266MHz equivalent machine and searching was reasonably fast.

The speed of return from a search, depends on many variables, but mainly on the number of positive results returned. If only a partial number is typed in then there may be several 'screens' full of matches. Say for instance, that you looked for the number '123' then instance where '123' occurred within the number would have been returned. This is a common 'problem' with computers and database search engines. They cannot understand that you meant i.c. such as MC123 LM123 etc. So, bear this in mind.

On a successful search, highlight the device you would like to get the datasheet and you will be prompted to put one of the ten CDs in the drive and the document (in *Adobe Acrobat* '.PDF' format) is presented on screen and may be printed to any printer that

Fig. 4: Inside the 'One Valve Midget Portable' receiver from the October 1945 issue of *PW*. It gives a good account of itself, in spite of having only one active device.

Fig. 5: And today's mystery object is.....? Your answers invited. (See text for more details).

Fig. 6: Another 'on-top' view should make the mystery object's purpose clearer.

Single-Valve radio

Some time ago I was able to identify which, of the many single-valve radio circuits produced in *PW* during the period just after the last war, that **John Shaw G3ZKZ** was looking to recreate. Since receiving the reprints of the original article, John has been busy with his soldering iron and taken himself on "a most enjoyable trip down memory lane". The photographs of **Fig. 2, 3** and **4**, show the little radio amongst friends, as much of the equipment John uses started life as projects in *PW*.

The radio originally had a frame 'aerial', which John has modified to use a long wire antenna. He has also said that "If you make this set (*John was kind enough to send me a 1C5/GT valve to do so.* Tex) the connections from the reaction coil need to be reversed for the feedback to work". I think that must rank as the longest delay between project and 'Kindly Note' or 'Errors & Updates' appearing John.

John says that "... as Woolworths had sold out of grid-bias batteries, I used a U2 for the 1.5V supply and an 8xAA pack for h.t. It draws 3.5mA so, I will have to remember to change the batteries every 'toffee-apple day'...". John then went on to mention that the set has a good volume, in spite of only being a single valve and a very quiet noise level. More surprisingly he says it has a very good selectivity, pulling in many, mainly continental, stations at 59+ after dark. Who needs thousands of transistors for a radio to work well?

Mystery Object

And "The next mystery object is .....", how long is it since I've heard that on the radio or TV? Now this is where you get the chance to play, have a look at the object shown in **Fig. 5** and **6** and see if you know, or can guess, what it is. This is in lieu of a conundrum this month. My thanks go to **Walter Farrar G3ESP** for the mystery object, which he gave, as a 'mystery gift', to **Rob Mannion G3XFD** at the Rochdale QRP Convention in October 1998.

Send in your guesses (Marked 'Tex's Mystery Object') to me at the editorial address (or by E-mail to **tex@pwpublishing.ltd.uk**) by Monday February 1 1999. The first correct answer out of the editorial hat on that day, will win a *PW* Bookstore Voucher for the sender. I shall also award another voucher for the most humorous answer (even though I may not be able to print your reply). Get your thinking caps on.

That's all I have for you this month, but don't forget we need your electronics related ideas and tips to share. Next issue I shall be describing a small valve audio amplifier to accompany a battery receiver. So look out for that one.

Tex

ELECTRONICS-IN-ACTION REVIEW! ■ ELECTRONICS-IN-ACTION REVIEW! ■ ELECTRONICS-IN-ACTION REVIEW!

Windows uses. The '.PDF' type of documentation a user to print out a layout accurate version of the original whatever, the printer or computer. An IBM PC version of the *Adobe Acrobat Reader* program is supplied on CD-10 and may be installed if needed.

With over 16 000 'PDF' files on the ten CDROMs, data on a very large number of i.c.s will be found. Although I don't have a complete list of entries, it seems that at present only current devices are to be found. As the names of the 'PDF' files bears no resemblance to the actual database device numbers, I cannot be sure without trying every combination of number I know.

The Price

The price of this veritable goldmine of data is a miserly **£39.00**, which according to my calculations means that you get over four 'PDF' files for each penny you spend. And a 'PDF' file can contain many pages - so excellent value for money. This would be an ideal candidate for the next generation of DVD CDROMs to reduce the number of CD swaps sometimes needed.

Another RAW 'Fishy' Idea!

The PW Sardine Signal Source

We seem to a have a real 'fishy' theme with this month's projects in PW don't we? Rising to the bait, Steve Ortmayer G4RAW casts his keen constructor's eye on an empty sardine tin and with his typical 'saucy' humour caught the idea of a signal source to be fitted in the ready made receptacle!

As a keen constructor I've often found that a good, clean, stable radio frequency signal tuned to the frequency (or frequencies) where the receiver is to operate can be an invaluable aid. Good quality signal generators are available but they tend to be expensive, especially if they incorporate an adjustable attenuated output.

I've got a budget-priced signal generator here in my shack, but it drifts badly and I often think that the receiver under test has developed a fault until that is - I discover the signal generator has drifted out of the receiver's pass-band!

It has often been said that the case for a project can cost more than the electronics inside ... so why not recycle a humble 'tin'? To get your case for the project all you have to do is to eat the contents and remember to wash out the aluminium 'tin' properly afterwards!

My inspiration for the project came from the late great **Doug DeMaw W1FB** who designed a transmitter in an empty tin and called it the 'Sardine Sender'! I much admired the man ... he had immense technical knowledge and was a citizen of the richest country in the world but despite that was not averse to making use of the humble sardine tin!

Simple Crystal Oscillator

A simple crystal oscillator provides a good 'home brew' project. That's where the 'Sardine Signal' source comes in. Perhaps you'll forgive my 'saucy' humour which matches *PW*'s mini 'fish theme' this month particularly well as the project can fit into an aluminium sardine tin!

Why in an empty sardine tin? Well, in reply, it

The Circuit

The circuit is shown in **Fig. 1** and, as you can see ... it's very simple. Two transistors, both are of the readily available BC108 type, are used as oscillator

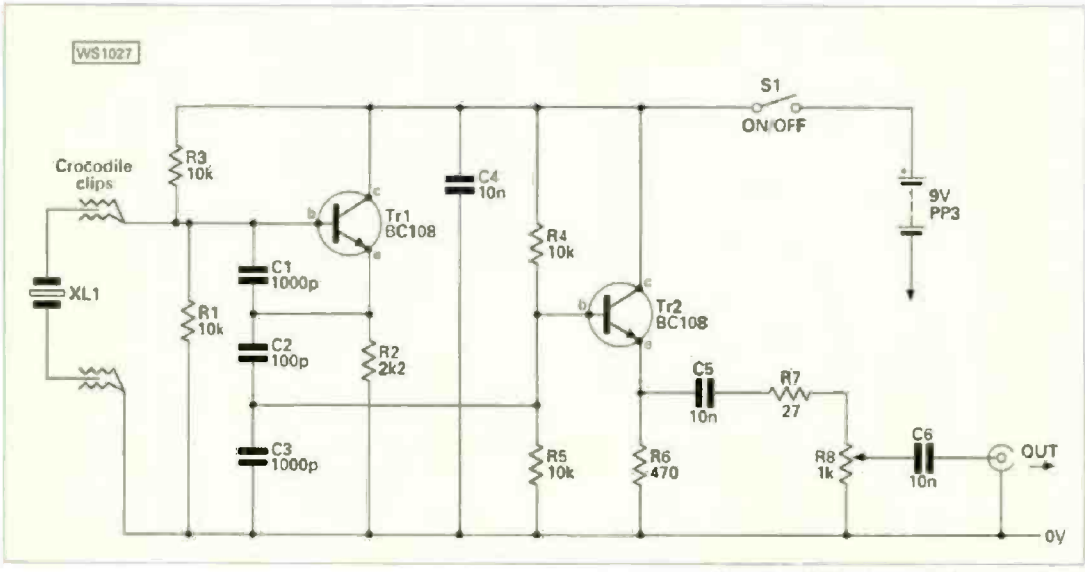


Fig. 1: Circuit of G4RAW's 'Sardine Signal Source' crystal oscillator unit. A suitable 'sauce' for the workshop table!

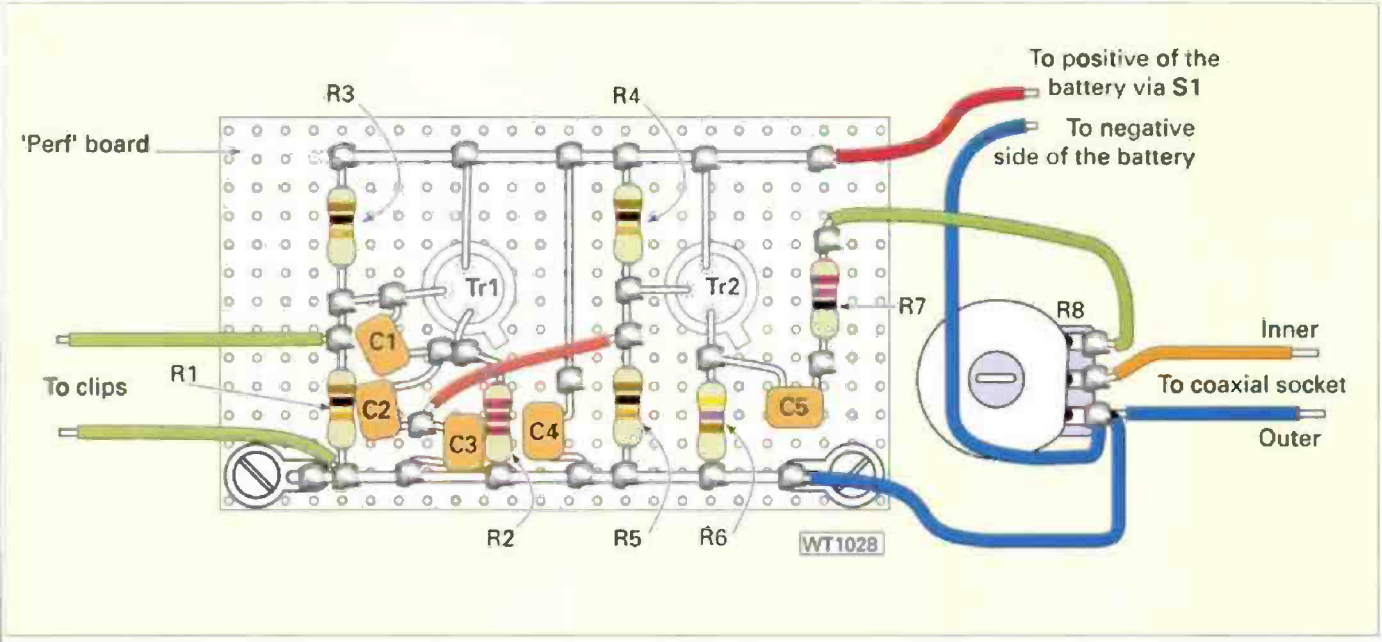


Fig. 2: Suitable lay-out for the project using perforated matrix board (Perfboard). Normally, the components would be on the far side of the board with the leads poked through convenient holes. Then all solder connections would be on the other (far) side of the board.

and buffer amplifier.

The crystal (XL1) to provide the frequency 'standard' is connected via 'crocodile' clips, as shown in the diagram. The transistor, Tr1, then acts as the oscillator 'take off 'point is between capacitors C2 and 3.

The oscillator's signal is isolated and amplified by the second transistor, Tr2. The term 'buffer' is used with this form of amplifier because, in effect, it acts as a 'buffer' between the oscillator and the output circuit. By doing so it reduces the tendency of the oscillator frequency to change under the output load and also reduces 'start up 'problems when the crystal may be reluctant to oscillate.

The output is then taken from the emitter of Tr2 and fed to the output via the potentiometer R8. This variable control provides a simple but effective output attenuator. Power is provided by a PP3 battery.

Shopping List

Resistors

Resistors 0.25W carbon film

27Ω	1	R7
470Ω	1	R6
2.2kΩ	1	R2
10kΩ	4	R1, 3, 4, 5

Miniature potentiometer

1kΩ	1	R8

Capacitors

Capacitors miniature polyester

100pF	1	C2
1000pF	2	C1, 3
10nF	3	C4, 5, 6

Semiconductors

BC108	2	Tr1, 2

Miscellaneous

Two crocodile clips, PP3 battery and snap-on connector, Perfboard (60 x 35mm), phono plug or similar for output, empty sardine tin, suitable crystal (see text), on/off switch.

Building The Project

Building the project certainly comes under the 'weekend' or even 'Saturday' category. I assembled my version on 'Perfboard', and the diagram in **Fig. 2**, shows the general lay-out I adopted.

Of course, there's no reason why you can't make yourself a full printed circuit board design for the project. Another method would be to adopt the same techniques as are suggested for the 'Radio Basics' printed circuit lay-out designs where G3XFD suggests the 'components on the same side as the printed circuit track' technique.

Whatever method you decide to use - it should all easily fit into a standard size empty sardine tin. However, when fitting the project into the tin, don't forget to provide some form of insulation (*pvc* tape will do the job) on the rear of the Perfboard so that it won't be shorted as it's mounted.

Alternatively, the completed Perfboard assembly can be mounted on simple 'stand-off' mountings, You can then make a lid from a scrap pieces of p.c.b. material or plastic.

Using The Source

Using the signal source is not difficult ... and it will prove useful in the workshop. The oscillator requires a fundamental crystal of any frequency up to about 15MHz, although a 7MHz crystal (available from many of the component suppliers advertising in *PW*) will be particularly useful as its harmonics will be heard on 14, 21 and 28MHz.

In use, the signal source - with a suitable crystal connected by the crocodile clips - can be connected to the receiver under test via a small value capacitor (let's says 10pF). Although, in most cases, a short length of wire will act as a small antenna enabling the receiver to detect it at short distances.

So there it is - a 'Sardine Signal Source' ... I think Doug DeMaw would have approved of the idea! *PW*

MULTICOMM 2000

★ FINANCE AVAILABLE ★
LARGE SHOWROOM ★ BEST PRICES

YAESU ★ YAESU ★ YAESU

Choice of the top DXer's

NO DEPOSIT FINANCING AVAILABLE NO DEPOSIT FINANCING AVAILABLE NO DEPOSIT FINANCING AVAILABLE

YAESU FT-1000MP AC
Yaesu's flagship 1.8 - 30MHz 100W all mode. DSP filter, auto ATU. Collin's filters. The ultimate HF transceiver.
OUR PRICE £2199.00 or NO DEPOSIT, 36 mths @ £79.49

YAESU FT-847
The most remarkable HF/VHF/UHF transceiver available today. Remarkable performance. Fabulous price.
CALL NOW FOR OUR *"BEST"* PRICE or NO DEPOSIT, 36 mths @ £47.90

YAESU FT-920
Despite competition from Icom & Kenwood, the 920 clearly remains our most popular tranceiver ever sold. Full HF + 6m coverage. Now supplied with AM & FM.
CALL FOR *"BEST"* PRICE or NO DEPOSIT, 36 mths @ £40.67

YAESU FT-8100
This great value for money dual band mobile transceiver features detachable front panel, 50W on 2m, 35W on 70cms, wide band receive & easy to read display.
OUR PRICE £375.00 or NO DEPOSIT, 36 mths @ £13.56

YAESU FT-840
Yaesu's entry model HF transceiver. General coverage receive. Full 100W output. Great value for money and fabulous performance for its price.
OUR "SPECIAL" PRICE £599.00 or NO DEPOSIT, 36 mths @ £21.65

YAESU VX-1R
What a SUPERB dual band hand-held transceiver and scanner. ALL IN ONE complete package. Alpha numeric display, CTCSS, dual watch & 16 hours receive compatability.
OUR PRICE £225.00

ICOM ICOM ICOM ICOM

ICOM IC-746
Latest HF + 6 + 2mtr transceiver. Extremely high spec and great value for money at
£1349.00 or NO DEPOSIT, 36 mths @ £48.77

ICOM IC-207H
Dual band transceiver. Detachable front panel. 50W on 2mtrs & 35W on 70cms. Super wide band receive with AM airband.
OUR PRICE £289.00

ICOM IC-R8500
Professional quality all mode receiver. 0.1 - 2GHz.
OUR PRICE £1199.00 or NO DEPOSIT, 36mths @ £43.34

ICOM IC-706MkII
How much more can they "CRAM" into such a small transceiver? (DSP optional) HF + 6 + 2m
OUR PRICE £739.00 or NO DEPOSIT, 36mths @ £26.71

ICOM IC PW-1
NEW 1kW HF + 6m linear. Remote control head. Auto ATU.
PHONE FOR OUR PRICE
Financing can be arranged!

ICOM ACCESSORIES

AT-180 auto ATU	£299.00
AH-4 Auto tuner	£249.00
SP-7 Speaker	£36.00
SP-21 Speaker	£60.00
SM-8 Desk mic	£99.00
SM-20 Desk mic	£110.00

Filters always available

ICOM IC-T8E
Tri-band hand-held. Great performance for it's size.
OUR PRICE £299.00

ICOM IC-756
Still a few available.
OUR SPECIAL PRICE £1469.00
Financing can be arranged!
NO DEPOSIT REQUIRED

ICOM PCR-1000
Computer controlled receiver. Big reception from this little unit. 500kHz-1300MHz. All mode.
OUR PRICE £259.00
Standard version.

SALES HOTLINE 01480 406770

★ USED EQUIPMENT ALWAYS WANTED ★
★ GUARANTEED TOP PRICES PAID ★
★ 12 MONTH GUARANTEE ★

ALINCO

ALINCO DX-70T (H)
HF + 6. 100W CTCSS & CW filter.
OUR PRICE £629.00 or NO DEPOSIT, 36mths @ £22.74

NEW

ALINCO DX-77
Interesting HF transceiver. Great Alinco value. Great Alinco quality.
OUR PRICE £599.00

NEW

ALINCO DJ-G5 EY
Brilliant value for money. Dual band transceiver. Wide band Rx.
New low price £225.00

DR-M06T (H)	20W, 6m	£210.00
DR-150	2mtr, 50W	£249.00
DR-605	Dual band	£329.00
R-140	2m 50W	£215.00

DR-610 Ultimate dual-band mobile £399.00

EDX-1	HF ATU	£149.00
EDX-2	Auto HF ATU	£269.00
DJ-191	2mtr hand-held	£149.00
DR-430	70cms, 35W	£219.00

JRC

JRC NRD-545 DSP
A remarkable receiver at a remarkable price.
SPECIAL OFFER PRICE £1190.00
or NO DEPOSIT, 36mths @ £43.54

JRC JST-245
HF + 6m transceiver, 150W. Remarkable reviews.
SPECIAL OFFER PRICE £1795.00
or NO DEPOSIT, 36mths @ £64.89

RECEIVERS

ALL PRICES INCLUDE VAT

PRICES DO NOT INCLUDE P&P

AOR AR7030
CASH PRICE £679.00

FAIRHAVEN RD-500
This is the most incredible receiver that we have ever seen. Phone to find out why.

OUR PRICE £679.00

NO DEPOSIT REQUIRED
A.P.R. 19.5%

BEARCAT 9000XLT
Fantastic value for money. AM/FM switchable.
OUR SPECIAL PRICE £229.00

AOR AR8200
CASH PRICE £369.00
or 36 mths @ £12.05

ALINCO DJX-10
CASH PRICE £259.00

WE HAVE AN EXTENSIVE RANGE OF NEW AND PREVIOUSLY OWNED EQUIPMENT.

FOR THE MOST ACCURATE AND UP-TO-DATE LIST, PLEASE VISIT OUR NEW WEBSITE AT:
http//www.multicomm2000.com

MOST OF OUR USED EQUIPMENT CARRIES A FULL 12 MONTH WARRANTY

AOR AR5000
CASH PRICE £1125.00

YAESU FRG-100
CASH PRICE £389.00

UNITS 5-7, 86 CAMBRIDGE STREET, ST. NEOTS, CAMBS PE19 1PJ FAX: 01480 356192
E-mail: sales@multicomm2000.com Website: http//www.multicomm2000.com

Valve Vintage

For his first session 'on duty' in the vintage 'wireless shop' in 1999, Ben Nock G4BXD replaces his normal 'tin hat' with a flying helmet as he looks at aircraft equipment and also asks for help in solving some mysteries!

A very happy New Year to you all! I hope your festive season went well and Santa did indeed bring you all the toys you asked for. I'm still waiting for mine to arrive!

Greetings over ... so let's start up - and speaking of new toys, a recent set in my shack here in Kidderminster is a very nice Canadian built aircraft transmitter, the TA-12, **Fig. 1**, made by Bendix. This transmitter is superbly built, the construction is really first class and its appearance and looks are doubly so.

The transmitter has seven valves inside, including four as separate oscillators, a buffer stage and a pair of 807s in the power amplifier (p.a.) stage. The aircraft installation used a separate power supply unit/modulator unit so on its own, the TA-12 is for telegraphy (c.w.) only.

With 570V h.t. feeding the entire transmitter, a radio frequency (r.f.) output of nearly 50W is achieved. One point worth noting though, is that both the p.a. control grid and the cathode are easily accessible, so either control grid or cathode modulation can be applied without too much trouble.

Fig. 1: The TA-12 transmitter, the four oscillators are situated down the left side, with the p.a. controls on the right and band changing controls in the centre (see text).

Several Versions

There are several versions of the transmitter, that in Fig. 1 being a TA-12C covering 300 to 600kHz (not much use to the Radio Amateur) and 3 to 12MHz in a total of four ranges. Each range has its own oscillator, a 12SK7 and a motorised switch which is used to change bands. The buffer stage uses an 807 and another pair of 807s in parallel form the p.a. stage. The modulator ran a further pair of 807 valves in a push-pull configuration.

Frequency setting on the TA-12 is a bit involved as each variable frequency oscillator (v.f.o.) has a counter type dial (visible through a small window next to the knob). As the knob is rotated, the counter 'clocks up' a reference figure.

Likewise, the p.a. controls, four separate sets for each band, also use counter dials. In military use the operator would have been supplied with charts which would have listed the frequency against number allowing the operator to quickly 'dial' up the frequency settings.

Having used the TA-12 over the past few weeks I can report that it's a real joy to operate. The c.w. note is very good and quite clean and sharp and QSOs on 3.5MHz were made with **Ray G3IFF**, **Gerald G3MCK** and **PA0CC**.

I attempted both grid and cathode modulation and received encouraging reports from **Howard G3RXH** and **Gerry G3LEO**. But after the tests, I've decided to postpone further tests until I either find the original modulator or build a proper plate and screen unit.

Aircraft Receiver

While on the subject of aircraft sets, how about the BC-312 receiver in **Fig. 2**? Very similar to the more commonly seen BC-348, the BC-312 and the BC-324 cover 1.5 to 18MHz and are both single conversion superhets of very rugged construction. The BC-342 was 115V a.c. powered and the BC-312 was powered by the usual rotary generator, which is mounted inside.

Fig. 2: The BC-312 receiver, main tuning lower centre right with the receiver fine tuning above it. There is a name plate missing from just below the dial (See text).

Another difference between the BC-348/342 and the BC-312 is the omission of the crystal filter unit on later models of the 312. The valve line up uses the black metal-tubed type American valves including 6K7, 6C5, 6L7, 6R7, 6F6 types and a 5W4 as rectifier in the a.c. versions.

Whilst fairly good receivers as they stand, the BC-312 is ideally suited for the military use of the time, various modifications will improve them considerably for Amateur Radio and short wave listening use. For example, the r.f. stages can be modified to increase the gain, and the crystal filter improved. Additionally, reducing the audio hum on the a.c. versions helps a lot and an improved audio

section will make the BC-312 range quite good general coverage receivers.

Japanese Puzzle

An interesting Japanese item came along recently and provides rather a puzzle! (See **Fig. 3**). It looks like a crystal calibrator or crystal checker. Although I'm awaiting formal translation of the characters, it's reasonable to guess that there's an on/off switch, and perhaps a modulation switch (inducing some sort of tone onto the carrier) and the necessary antenna connection.

Inside the mystery unit there are two valves, a 6C5 and a 6K7 and, with power applied, there is indeed a nice carrier on 8.680MHz, the frequency of the crystal inserted into the front of the set. The Japanese crystals of the period came in either pin form or (like the example illustrated) had metal plates on the side of the crystal case to which contact is made. The unit is dated around 1943. Perhaps you can help identify it?

Unknown Meter

A small, unknown type of meter in a very nice wooden box was found recently and is dated 1943. On the meter face, **Fig. 4**, is the inscription "Detector Q & I, MK I, (W.B.0273)". On the rear of the wood box is a further inscription: "The insulated 'Q' terminal must not be used for testing electric firing circuits which include firing heads or detonators".

Interestingly, while watching one of the many excellent documentaries on the Second World War last November, I noticed a box in one section of archive film which had a very similar meter fitted.

The wooden box and construction provide me with the impression that the little meter in Fig. 3 is a design left over from the First World War days, just as many things were at the beginning of the Second. So the question is, what was it used for? Answers on a post card please.

Letter From America

I've received a letter from America and it came from **Harry Weber** who lives in Illinois. I'm glad you like the material I produce Harry ... and thank you for the comments. After reading about the German book I reviewed on page 63 of the August 1998 issue of *PW*.

Although published in German, the book carried the sub-title "How it weakened the radio command of U-boats during the 'Battle of the Atlantic'" and costs £25 from the publishers in Rheinberg in Germany) Harry went and bought a copy which he finds fascinating.

In his letter Harry asked if there was a similar book around that details the historical and current very low frequency (v.l.f.) transmitters of the UK, such as GBR (Rugby). In answering Harry, I don't know of one but, **if you do** dear reader, let me know and I'll pass the information on to Harry.

After mentioning the MCR1 receiver last time around a **Mr Youard** from London wrote enquiring about a set he had. He was told when he bought it was an MCR1, but in fact it is an R302. This is a much smaller set using five valves but with a single coil pack that can be inserted in any of four ways. As for the MCR1 not having a beat frequency oscillator (b.f.o.), as the set has a reaction control, this is advanced until oscillation within the i.f. takes place and thus enables c.w. to be resolved.

A note from **David GM1FPD**, was also received enquiring after the GEC BRT-400 I mentioned last time and wondering what a BRT-402K was. To recap, the 400D is a standard model, table cabinet. 402D standard model, 19in rack mount. The 400E is a 400D with a 500kHz calibrator. The 402E is a 400D with a 500kHz calibrator, rack mounting. The 400K is a tropicalised version of a 400D. The 402K is a tropicalised version of a 400D, rack mounted and the 400EN is a 400E version with 9kHz notch/low-pass filter added and 1kHz (c.w.) peak filter removed.

Fig. 3: The Japanese 'puzzle' (crystal checker?). The crystal plugs in just below the meter (see text).

David comments that the scale is breaking up on his set and he wants to get a replacement. All I can say is that on my receivers the dial markings are on the glass of the dial with a simple white backing of paint on frosted glass behind. The backing on my receivers was in poor shape, but the rear glass is easily removed and cleaned, then repainted with a white or cream colour.

David also wanted to know what constitutes a good second-hand receiver to replace his ageing CR-100. Unfortunately David, my reply to that would take far more space than allowed here but there are many "reviews" of second-hand receivers both in *PW* and our sister publication *Short Wave Magazine* back issues which can be obtained as photocopies from the Book Service.

Fig. 4: The wooden wonder meter, the box is in remarkable condition after 55 years but Ben is wondering ... can you tell him what it is?

Bletchley Park

Watch out for a TV program, which I understand is due in January, on **Channel Four** about **Bletchley Park** and the code breakers. You might see a few radios!

Finally, I've a personal request as I'm looking for the circuit of the Mk XV transmitter and receiver built around 1938. Can you help please?

That's all for now then - and as always, I can be contacted at **62 Cobden St, Kidderminster, DY11 6RP**, or E-mail on **G4BXD@compuserve.com** or via the *PW* offices. Best regards till the next time I'm 'on duty'. *PW*

Trader's Table

Disclaimer

Advertisements from traders for equipment that is illegal to possess, use or which cannot be licensed in the U.K. will not be accepted. While the publishers will give whatever assistance they can to readers or buyers having complaints, under no circumstance will the magazine accept liability for non-receipt of goods ordered, late delivery or faults in manufacture.

WATERS & STANTON

01702 206835

WATERS AND STANTON PLC SECONDHAND STOCK LIST AS AT 16th DECEMBER 1998
PLEASE NOTE SECONDHAND ITEMS COME WITH FULL 3 MONTH PARTS & LABOUR GUARANTEE
FOR MORE INFORMATION PHONE STEVE DAVIES ON 01702-206835 OR FAX 01702-205843

HF TRANSCEIVERS

Alinco DX-70T HF/6m All Mode Mobile/Base with Gen Cov £459
Icom IC-706 HF/6m/2m All Mode Mobile/Base with Gen Cov £899
Icom IC-735 c2 Base Trans with Gen Cov 12V £525
Icom IC-737 s2 Base Trans with Gen Cov 12V £699
Icom IC-738 Base Transceiver with Gen Cov and ATU 12V £749
Icom IC-751A Base Trans with Gen Cov 12V £549
Kenwood TS-440S s2 Base Transceiver with Gen Cov 12V £649
MFJ MFJ-9020 s2 20m CW QRP Transceiver £125
SGC SG-2020 Base/Mobile with Gen Cov and Remote Head £899
SGC SG-2020 QRP Trans SSB,CW 20W 12V £695
Trio TS-570S Base Trans Mains £525
Trio TS-950S Base Trans Mains £525
Yaesu FT-747 Base Trans with Gen Cov 12V £425
Yaesu FT-757GX Base Trans with Gen Cov 12V £649
Yaesu FT-920 HF/6m All Mode Base with Gen Cov 12v £1099
Yaesu FT-990AC Base Transceiver with Gen Cov £799

VHF/UHF BASE/MOBILE TRANSCEIVER

Alinco DR-590 2m FM Mobile 25W 10Ch £150
Kenwood TM-V7E s2 2m, 70cm FM Mobile 50W,35W £549
Remote Head £349
Yaesu FT-2130M 2m FM Mobile 45W £145
Yaesu FT-3000M 2m FM Mobile 70W £275
Yaesu FT-5200 2m,70cm FM Mobile 50W, 35W £349

VHF/UHF HAND HELD TRANSCEIVER

ADI AT-400 70cm FM Battery Inc 420-469MHz RX £115
Alinco DJ-580 2m/70cm FM H/Held £169
Alinco DJ-580 2m/70cm FM H/Held £175
Icom IC-3E 2m FM Mini H/Held £125
Icom IC-25E 2m FM Mini H/Held with Battery Inc, Case £199
Icom IC-25ET 2m FM H/Held £149
Icom IC-04E 70cm FM H/Held £349
Icom IC-W2E 2m/70cm FM H/Held (with ip-mite) £499
Icom IC-W32E 2m/70cm FM H/H & Mtrcle, Case £229
Kenwood TH-22E 2m FM H/Held £125
Kenwood TH-26E 2m FM H/Held £199
Standard C-520 2m/70cm FM Handheld £295
Yaesu FT-11R 2m FM H/Held £125
Yaesu FT-411 70cm FM H/Held with DC adapter £189

SHORTWAVE RECEIVERS

AKD HF-3 s2 Target 0-30MHz 12V Receiver £169
AOR AR-7030 0-32MHz All Mode Receiver 12V £640
Drake R-8E 150kHz-30MHz All Mode Receiver Mains £625
Grundig YB-206 Portable Receiver with FM £69
Grundig YB-400 s2 Portable Receiver with SSB £130
Icom IC-R7000 30MHz-2GHz AM,SSB,CW Multim. £425
Icom IC-R72 s3 Base Station Receiver £449
Lowe HF-150 30kHz-30MHz All Mode Receiver 12V £399
Lowe HF-225 s3 30kHz-30MHz Receiver 12V PC Compatable £399
Roberts R-827 Portable 0-30MHz with BFO £115
Roberts R-861 Portable 150kHz-30MHz SSB, FM mpx RDS £349
Trio R-600 150kHz-30MHz AM,SSB,CW Receiver Mains £195
Trio JR-2000 150kHz-30MHz All Mode Mains £299
Yaesu FRG-7 0.5-30MHz AM,SSB,CW Mains/12V £349

Scanners Mobile/Base

AOR AR-2002 25-950,800-1300MHz AM,FM,WFM 20Ch 12V £389
Uniden UBC-9000XLT 25-550,760-1300MHz AM,FM,WFM 500Ch 12V £225
Yaesu FRG-9600 60-905MHz All Mode Receiver 12V £595

SCANNERS HAND HELD

Alinco DJ-X1 100kHz-1300MHz AM,FM,WFM 40Ch £330
Alinco DJ-X10 100kHz-2000MHz All Mode 1200Ch £225
AOR AR-8000 500kHz-1300MHz All Mode 1000Ch £499
Icom IC-R3 0.1 - 1300MHz AM/FM/WFM 100Ch £399
Icom IC-R10 0.1 - 1300MHz AM/FM/WFM 100Ch £285
Realistic Pro-43 66-905MHz (with gaps) AM,FM 200Ch £129
Welz WS-1000 500kHz-1300MHz AM,FM,WFM 400Ch £135
Yupiteru MVT-3300 66-905MHz (with gaps) AM,FM 200Ch £129
Yupiteru MVT-7000 s2 500kHz-1300MHz AM,FM,WFM 200Ch £120
Yupiteru MVT-7100 s3 100kHz-1650MHz All Mode 1000Ch £389
Yupiteru MVT-7200 100kHz-1650MHz All Mode 1000Ch £389
Yupiteru MVT-9000 0.5-2039MHz All Mode 9000Ch £719
Yupiteru VT-225 108-142,150-161,220-380 MHz AM,FM 100Ch £169

NEVADA

01705 662145

TRANSCEIVERS HF

DRAKE TR-7 COMPLETE LINE UP - REALLY NICE ..... £POA
TEN TEC CORSAIR II HF 100W TX/RX ..... £POA
ICOM IC725 HF 100W TX ..... £POA
KENWOOD TS-450 SAT HF 100W TX ..... £POA
KENWOOD TS-930S HF 100W TX ..... £POA
KENWOOD TS-680S 6M HF + 10W 6M ..... £POA
MIDLAND 2001 FM 10M FM TRANSCEIVER ..... £POA
TRIO TS 130S 100W HF MOBILE/BASE £250
YAESU FT-757GX HF 100W TX/RX £395
YAESU FT-757GX + FP757HD TRANSCEIVER & POWER SUPPLY £625
YAESU FT-707 C/W MATCHING PSU, 100W HF £399
YAESU FT-77 HF 100W TX £375
YAESU FT-840 HF 100W TX/RX ..... £POA

TRANSCEIVERS VHF/UHF

DENPA M-22 2MTR MOBILE TX £129
ICOM IC 2200H 2M 65W MOBILE £185
ICOM IC-2350H DUAL BAND MOBILE £339
ICOM IC-551 10W 6M BASE £795
KENWOOD TM-201 2MTR MOBILE £189
KENWOOD TM-255E 2M MULTIMODE MOBILE TX £499
KENWOOD TW-4000A 2M/.70CM MOBILE £849
PALSTAR KH6 + ACCS 6MTR HANDIE ..... £POA
SHAKESPEAR SE2500S 25W MARINE TX £229
STANDARD C-78 70CMS PORT + 10W AMP £299
STANDARD C-5200 TWINBAND 50W MOBILE £280
STANDARD C-8900 2MTR MOBILE TX £175
STANDARD C-8900 2M MOBILE £165
TRIO TR-2200 2MTR MOBILE TX ..... £POA
TRIO TR-2500 GX 2MTR MOBILE TX ..... £POA
YAESU FT-290R 2MTR M/MODE TX £199
YAESU FT-290 R II 2MTR M/MODE £259
YAESU FT-290 R II + FL2025 AMP 2MTR M/MODE ..... £POA
YAESU FT-690R II + FL6020 6MTR MULTIMODE & AMP £395
YAESU FT-790R + FL7010 70CMS MULTIMODE & AMP £349
YAESU FT-726R HF/2M/70CMS BASE TX £599
YAESU FT-8400 DUAL BAND MOBILE £389

RECEIVERS

AKD TARGET HF3 RECEIVER £115
AOR AR-3000 HF/VHF/UHF RECEIVER £489
AOR AR-7030 HF RECEIVER £499
DRAKE - R8E HF RECEIVER £695
ICOM IC-R1000 VHF/UHF RECEIVER £399
ICOM IC-R71E HF RECEIVER £499
ICOM R-72 HF RX + ACC ..... £POA
ICOM R-10 HANDHELD SCANNER £199
JRC NRD-535 HF RECEIVER £899
LOWE 225 FM/AM + NICAD PACK £392
REALISTIC DX-394 HF RECEIVER £129
SANGEAN ATS-803A S/WAVE RX £99
SONY SW-1S S/WAVE RX KIT £99
YAESU FRG-9600 SCANNING RECEIVER £799
YAESU FRG-7000 HF RECEIVER £349

HANDHELDS

ADI AT-10 2MTR H/HELD TX £59
ALAN CT-145 2MTR H/HELD TX £99
ALINCO ALM-203E 2M H/HELD TX £129
ALINCO DJ-190EB 2M HANDIE - EX DEMO £129
ALINCO DJ-180 2MTR H/HELD + EBOOK £129
ALINCO CS TWINBD MICRO EX DEMO £149
ALINCO DJ-S41C 70CM HANDIE - EX DEMO £79
ICOM IC-02E 70CMS + EX DEMO £155
ICOM IC-W2E 2M/70CM HANDIE £169
KENPRO 202 2MTR H/HELD TX £59
KENPRO KT-44 70CMS H/HELD TX £85
KENWOOD TH-205E 2M HANDIE £169
KENWOOD TH-215E 2MTR H/HELD TX £189
KENWOOD TH-21E 2MTR H/H TX+RX/CM RX £149
KENWOOD TH-45E 70CMS H/HELD TX £139
REXON RL-102 2MTR H/HELD TX £69
STANDARD C-501 2M/70CMS H/HELD TX £139
YAESU FT-23R 2M HANDIE £99
YAESU FT-208R + BASE UNIT/ACCS £139
YAESU FT-70R 2M/70CMS HANDIE £199
YAESU FT-530 2M/70CMS 10W TX £169
YAESU FT-708 70CM HANDIE £85
YAESU FT-41R 70CM HANDIE - EX DEMO £249

MISCELLANEOUS EQUIPMENT

VECTRONICS HFT 1500 COASTER ATU £269
ICOM PS-55 20 AMP PSU - BOXED £189
JPS NTR-1 NOISE REDUCTION UNIT £155
KENWOOD AT250 ANTENNA TUNER £225
KENWOOD DFC-230 FREQ CONTROLLER £65
KENWOOD PS-20 13A POWER SUPPLY £80
KENWOOD TL-120 100W HF AMP £195

news EXTRA

continued from page 14

"This Is Your Life"!

Practical Wireless received some interesting news from **Chris Carrington G0IYZ**, a member of the **Nunsfield House Amateur Radio Group** based in Alvaston, Derbyshire. Together, the members of the Nunsfield House ARG arranged a surprise for their President, **Les Jackson G3OZ**, who was instrumental in bringing about the now famous **Elvaston Castle National Radio Rally**.

Les was under the impression that he was attending a junk sale on the 6 November 1998 but everybody else were turning up to see Les' very own "This Is Your Life". Chris tells us that it took quite a lot of organising - months of planning, research and photographing. He says that it was also very difficult keeping it a secret as they had to have several visits to Les' home in order to interview his wife, Renee, on the events that made up his life.

From what Chris says, it seems that there was a fair amount of work done in order to insure that the mock "This Is Your Life" went as smoothly as the one that you see on TV. There were a few mistakes, Chris tells us, but otherwise it was very successful with photographs, music and videos from people who couldn't make it on the night!

You can see Les in the photo holding a vintage copy of *Amateur Wireless* which was kindly donated by *PW*'s very own Rob Mannion G3XFD, which was framed especially for Les by the members of the Nunsfield House ARG. They say that special thanks must go to Brian Reid G1CUH, Kevin Davison M1AFB and Chris Carrington G0IYZ for their hard work in gathering and collating all the information.

Les Jackson G3OZ, President of the Nunsfield House ARG receives an original vintage copy of *Amateur Wireless* magazine on the evening of his "This Is Your Life"!

Weather Watching With Timestep

Timestep, well-known manufacturers of equipment for receiving live images from weather satellites, have been in touch with *Practical Wireless* about their latest Windows product - ***HRPT for Windows***. (*HRPT* stands for High Resolution Picture Transmission and is digital data from the *NOAA* polar orbiting satellites).

According to Timestep, this new product is a powerful new system for resolving the high resolution(1.1km) digital images from *NOAA 12, 14* and *15* and is completely *Windows 95, 98* and *NT* compatible. They also tell us that its automatic scheduling eliminates the need to predict start times and its automatic channel switching allows continuous unattended reception of the three satellites.

The new software saves all five band, ten bit data, say Timestep and provides real time 30 bit MultiSpectral colour reception and manipulation. There are many other outstanding features which combine to produce "stunningly clear images showing even very small towns and rivers"(**see fig. 1 and 2**).

Dave Cawley of Timestep says that "... this is by far the best *HRPT* software there is"!

Fig. 1: Italy - as seen from one of the NOAA satellites and which you could see on your own computer with the help of the new HRPT software.

If you would like some more information on this new software, you can write to **PO Box 2001, Newmarket CB8 8XB, or you can Tel: (01440) 820040, FAX: (01440) 820181. You could also visit their Web site: http://www.Time-step.com or send an E-mail: sales@Time-step.com**

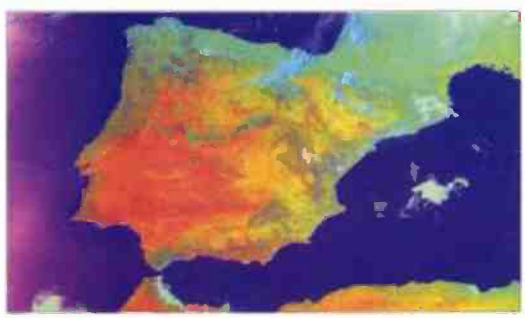


Fig. 2: Spain - also as seen from one of the *NOAA* satellites.

Members Needed!

The **Wessex Repeater Group** recently formed in order to set up a new 6m (50MHz) Repeater and will be located at Wincanton in Somerset.

Being a new group, they currently only have six members and would really like some more as, without additional support, it will become increasingly hard to raise the funds with which they can purchase their equipment.

If you are interested in joining, or would like to know more, then you can look up their **Web site** at: **http://www.twxrg.freeserve.co.uk** which will have all the information that you need. You could also **E-mail them: gb3wx@twxrg.freeserve.co.uk**

Put your feet up and soothe away those winter blues by the fire - and while you're at it, why not glance through just a handful of the books which we recommend that you purchase from our Book Store here at Practical Wireless ?

Telephone (01202) 659930

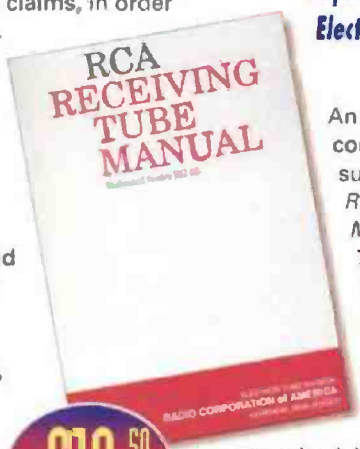
OR USE THE ORDER FORM ON PAGE 82

Please note: *Cash not accepted with mail orders.*

Book PROFILES

RCA Receiving Tube Manual Reprinted by the Antique Electronic Supply

This popular re-print, put together by the **Radio Corporation of America (RCA)**, comes in a well-presented paperback format and is essentially a designer's handbook. Prepared, it claims, in order to assist "... those who work or experiment with electron tubes and circuits. It will be found valuable by engineers, service technicians, experimenters, students, Radio Amateurs and all others technically interested in tubes".



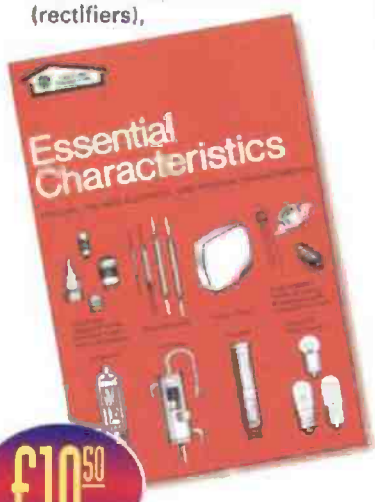
£10.50

Not only a valve listing, the *RCA Receiving Tube Manual* comes complete with 'thumbnail' design data for the RCA's receiving 'tubes' (the American term for 'valves'). Not only this, but it covers application notes, theory, practical circuits, base pin-outs, internal circuitry and much, much more.

Its 384 pages explains a lot about valve theory and their applications and some of the chapters include: 'Electrons: Electrodes and Electron Tubes'; 'Electron Tube Characteristics'; 'Electron Tube Applications' and 'Electron Tube Installation'. **Very Highly Recommended.**

Tubes & Transistors - Essential Characteristics Reprinted by Antique Electronic Supply

An excellent companion book to support the *RCA Receiving Tube Manual*, the ***Tubes & Transistors - Essential Characteristics*** is a compact 474 page paperback book packed to the covers with essential information on valves, cathode ray tubes, thyratrons, ignitrons (rectifiers), vidicons, special bulbs, reed switches and semiconductors.

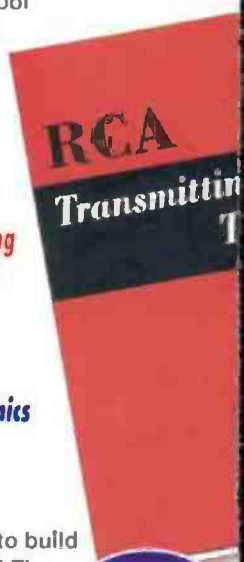


£10.50

Prepared by a number of individuals on behalf of the Tube Products Department of **General Electric Company** based in Owensboro, Kentucky, this book claims to have been prepared to "... provide the Service Technician with a single source of reference containing data on every tube likely to be found in any home receiver - a.m., f.m., Hi-Fi or television. It also claims to contain data which includes those characteristics and ratings "... essential to fast, efficient trouble shooting".

It has a comprehensive physical characteristics section and a valve-base pin-out section and contains such chapters as: 'Special-Purpose Types'; 'Thyratrons'; 'Planar and Ceramic Types'; 'X-Radiation Rated Recommended Replacements For High Voltage Rectifier and Shunt Regulator Tubes' and 'X-Radiation Symbol Definition' this title really is **Highly Recommended.**

RCA Transmitting Tubes - To 4kW Plate Input Reprinted by Antique Electronics Supply



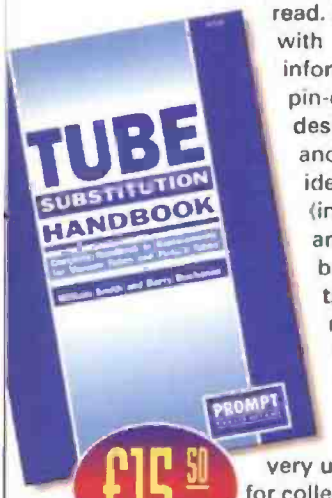
£10.50

Are you trying to build a valved linear? The ***RCA Transmitting Tubes - To 4kW Plate Input*** will point you in the right direction. It is a 316 page book covering valves from the 955 'acorn' type (yes, it was a transmitting valve!) to

er form in this issue or telephone Michael or Shelagh on (01202) 659930.

Now that Christmas and the New Year are well and truly over and we are getting closer to the ever present Year 2000, let the Editorial Team at *Practical Wireless* take your mind off those New Year blues by giving you something else to think about - VALVES!

The books that appear in the 'Book Profiles' this month will all, in some way, help Radio Amateurs to find that valve (or its replacement) that they just haven't been able to get their hands on! All the books featured this month are from across the pond in America.

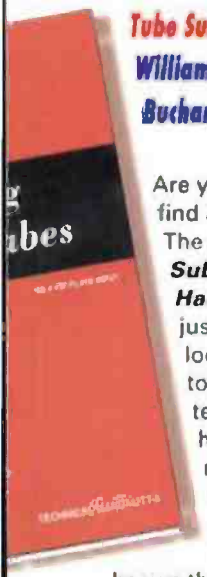


£15.50

well known favourites such as the 833 and 5763.

Apart from anything else, this book is an interesting read. Packed with information, pin-outs, design data and circuit ideas (including amateur band trans-mitters) this book will prove very useful for collectors and constructors alike.

Again, such chapters include: 'Power-Tube Fundamentals'; 'Construction and Materials'; 'Power-Tube Applications'; 'Power-Tube Installation' and much, much more. **Highly Recommended.**



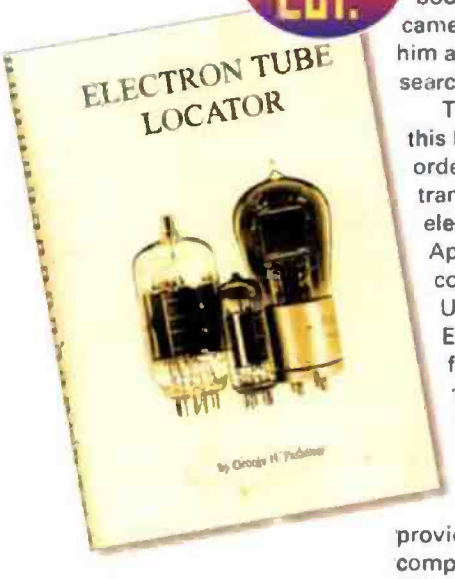
Tube Substitution Handbook
William Smith and Barry Buchanan

Are you struggling to find a valve equivalent? The ***Tube Substitution Handbook*** could be just what you are looking for! It claims to cater for the many technicians and hobbyists who still repair and use valve-based equipment. *Practical Wireless* knows that there are many of you who do still use valves and would therefore find this book very helpful.

The book also claims that valve substitution is one of the only feasible methods to repair or restore original valve equipment, but that it should not be performed haphazardly. "This handbook itemises all known vacuum 'tubes' that have been or are still being manufactured, along with their replacements, will make substitution not only possible, but relatively straight-forward and efficient".

Broken down into three sections, this book looks at: 'Vacuum Tube Substitution'; 'Picture Tube Substitution' and 'Base Diagrams' and includes such things as a listing of all known vacuum valves in numeric-alphabetic order, all known picture valves and 900 pin arrangements which detail each of the valves listed in the handbook. This book is a handy reference source and therefore comes as **Recommended.**

£21.95



Electron Tube Locator
By George H. Fathauer

The ***Electron Tube Locator***, published by Antique Electronic Supply, is ideal for the vintage collector, military historian and anyone generally interested in valves.

The author, **George H. Fathauer**, says that his reason for compiling this book was that, whilst working with Antique Electronic Supply, he took many queries on valves which weren't to be found in the common data books and that his book came about in order to save him a lot of time in searching.

The author claims that this book "... provides an orderly listing of receiving, transmitting and industrial electron tubes". Apparently, all commercially marketed US and Western European valve types - from the first antique types to the latest types produced before transistorisation.

The *Electron Tube Locator* basically provides references to more complete data sources where needed but, where possible, it does cover the basic function of each valve type along with the filament/heater characteristics. Broken down into five parts which cover from data sources and over 11 000 valve types to a listing of major references and data sources for additional information. Clearly laid out and easy to use, this book comes **Recommended.**

OR USE THE ORDER FORM ON PAGE 82

Please note: *Cash not accepted with mail orders*

Telephone (01202) 659930

Antenna Workshop

UP THE LADDER

Professional TV and Radio Antenna Engineer Allan Wightman has found time to get off his ladder to explain how he came to the rescue of a Radio Amateur who was thought to be causing Television Interference.

This time I've got a rather different story to tell and it's rather funny in a way because it all started when one of my Radio 'Ham' customers contacted me to ask for help. He'd had complaints from neighbours who thought his transmissions were causing interference to TV reception. But in an odd 'turn round' I found it was a TV antenna system - in transmission mode - that was the culprit!

My customer contacted me for help because I've often done work for him in the past - erecting his Ham antennas and other erecting work because he suffers from arthritis and is not able to climb ladders, etc. I enjoy doing the work because it's rather different - and I usually learn something too!

Television interference (TVI) is a big problem for Radio Hams and even though modern equipment is getting better and can stand far higher 'out of band' signals from relatively powerful transmissions...modern housing doesn't help. Developers really 'pack them in' and I often come across new houses built on the site of previous much larger properties. Where one house with a large garden once stood, there's often 20 or even 30 homes with minuscule gardens and frontages.

New Homes

My Radio Ham customer had one of the new 'high density' building developments built very close to his home. And although he'd been operating his shortwave transmitter (he rarely operated on the v.h.f. bands) successfully for many years...trouble started as soon as the new development - virtually overlooking my customer's bungalow and large garden - was occupied by its new residents.

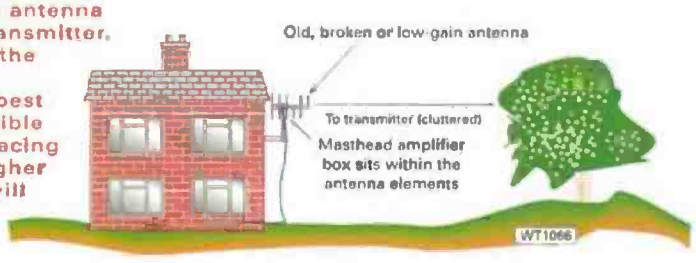


Fig. 1: With a high gain mast head amplifier fitted this close to the antenna feeding it (the amplifier is actually mounted on the antenna elements) there's a high risk of the system going into self-oscillation. The inadequate antenna is also poorly sited because the tree screens the antenna from the transmitter. Relocating the antenna to obtain the best signal possible and/or replacing it with a higher gain type will improve matters (see text).

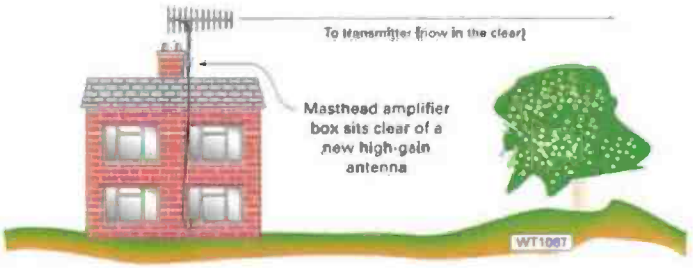


Fig. 2: An amplifier placed correctly, as illustrated, will optimise the incoming signal and introduce the least possible degradation to the outgoing signal to the TV receiver. Taken note that 'wideband' amplifiers in mast head applications should always be avoided because of poor EMC problems and 'channelised' amplifiers, suitable for the channel grouping being received must always be the preferred choice (see text).

Of course, the Radio Ham's extensive antennas drew attention when the new residents noticed interference of their television reception. It wasn't long before a deputation came knocking at my customer's front door. But they were rather surprised to find that he too was suffering from interference and had not been on the air! That was when I was called in to help.

When I arrived, I looked at my customer's own set and saw the typical 'patterning' of radio frequency interference on his TV picture. It was on all four channels (no Channel 5 in his area) but was worse on one particular channel. Already suspicious of the possible cause, I pumped up the ten metre pneumatic mast on the back of my van and took a look at the picture on my portable monitor.

The old 'Antiference' u.h.f. log periodic I use for signal evaluation had to 'look' at the transmitter (Rowridge on the Isle of Wight) through the new development. I too was getting interference on all four channels. Switching to a field strength meter video monitor to look at the signals, I could see the problem transmission 'wandering' in and around one channel. My suspicions were confirmed - I'd found a 'hooter'!

Howling Hooter

A 'howling hooter' can be a real nuisance and can be difficult to find because unless you know that the culprit can be the common mast-head TV amplifier (commonly but inaccurately known as 'boosters') you won't know where to start. However, I quickly traced the current problem to the community based amplifier system on a block of newly erected 'sheltered' housing on the development. It was radiating like mad!

In fact, I could see the problem immediately because the cheap 'contractor's' Band IV antenna had a mast head amplifier mounted literally amongst the antenna elements, similar to that shown in **Fig. 1**. This was causing radio frequency 'feedback' in the same way audio feedback develops when a microphone is placed to near a loudspeaker on public address systems. There aren't many people about who have not heard the end results of that problem!

Obviously, I could not get involved with the problem system but I learned later that the 'hooting' mast head amplifier had been feeding into a wide-band distribution system which fed 20 flats. So, in addition to radiating the signal in all directions (the cheaper 'contractor' type of antenna has little directivity) the problem caused mayhem within the building, although the pictures on most channels were still 'watchable', so I've been informed.

Correctly Installed

If the offending mast head amplifier had been correctly installed, as in **Fig. 2**, the problems would not have arisen. Unfortunately though, as happens with many new

Continued on page 60...

.....continued from page 58

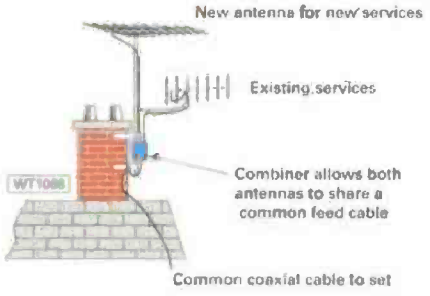


Fig. 3: Using an extra 'high gain' antenna to receive 'out' of area' TV programme can remove any necessity to use a mast-head amplifier, reducing the chances of TVI. In this case, the original service was from a vertically polarised relay station and the 'out of area' service required a horizontally polarised high gain antenna mounted on a longer mast with the original antenna attached on a 'stand off' mounting or by using an 'end mounting type of antenna (such as the 'Antiference' XG8). For best results it is essential to use an inductive combiner/splitter unit to combine the different signals, and these are available in mast mountable waterproof enclosures.

buildings ... the installation of the TV distribution system fell on the electrician and although many electricians can and do cope very well with radio frequency techniques - this one obviously didn't!

Looking back at the problem (which took place in the summer) I think it need not have occurred in the first place if a decent antenna had been used. The extra antenna gain and efficient transfer of energy from antenna to the coaxial cable would have made the use of an amplifier unnecessary.

My rule has always been - get as much r.f. from the incoming transmissions as possible and only then use an amplifier if it's really necessary. You can cause yourself more problems by installing an amplifier that's not really needed because they amplify everything (yes ... noise, interference and everything else) appearing at their inputs.

Judging by the number of 'hooting' mast-head amplifiers that radiate and cause interference to aircraft radio communications (yes...it is quite a problem) as the aeroplanes fly over the offender - there are a lot of poor installations around. Hopefully yours won't be one of them!

Out Of Area Reception

Since the advent of the Channel 5 service which utilises channels in the previously un-used (for broadcasting purposes) 'gap' between u.h.f. Bands IV and V (Channels 35 to 38), some TV viewers have been experiencing problems trying to receive 'out of area' transmissions to get the new service.

'Off Air' Channel 5 is not available in many parts of my working area, but reception problems that need sorting out have been coming my way. Some of these problems may well be of interest to 'Ham' radio operators, as the antenna systems are vulnerable to strong localised transmissions which lead to TVI.

I feel rather sorry for 'Ham' radio operators who have been active on the short wave bands not bothering anybody, only to find they are suddenly causing TVI to a neighbour who has decided to try for 'out of area' reception. Fortunately though it's not such a common problem nowadays because many more urban viewers are able to receive many 'out of area' channels thanks to cable TV or satellite services.

Not everyone is able to get cable TV though and I jokingly mention to customers when I arrive at their homes in tree-lined avenues that the cable companies haven't been in their area yet. I can say this quite confidently because the trees aren't dying off because of damaged and severed roots caused by the cable-laying gangs!

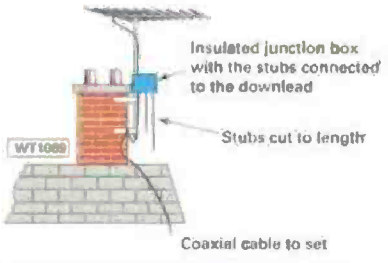


Fig. 4: Coaxial 'stub' filters are very easy to make and although they can take a little time to set up - can provide useful reduction of strong adjacent channel and 'out of band' transmissions such as those from the 144 and 430MHz amateur bands. The 'stubs' are shown cut to length and before the cut ends are sealed before being rolled up and secured under the junction box (see text).

When Channel 5 isn't available directly in a particular coverage area I've seen many different methods that have been tried in order to get the service. The most common approach is to add a broad band u.h.f. mast-head amplifier at the antenna.

The amplifier-added-to-existing antenna technique usually reasonably successful with a 'watchable' picture when the main station being used is transmitting at the top end of Band IV on channels between 28 and 34. (complete Band IV comprises channels 21 to 34, 471.25 to 581.25MHz) Group 'A' red coding on antennas). It can also be successful when the main service is from a transmitter using the lower end of Band V, between 39 and 45. (The full u.h.f. Band V channels are from 39 to 68, 615.25 to 853.25MHz).

Prone To Interference

Problems arise for 'Ham' radio operators when a nearby TV viewer opts for 'out of area' programmes because of several factors. The major problem is caused by the fact that the television receiver itself may well have its automatic gain (a.g.c.) 'turned right up' - making the set more likely to be prone to interference. This happens in the same way with a radio receiver - try listening to a distant station on Band II v.h.f. f.m. radio and it's very likely a local station will be heard in the background or cause the received (wanted) station to 'hiss and warble'.

The likelihood of inadvertent interference being caused by a local 'Ham' is increased when an amplifier is used in conjunction with the viewer's antenna system. This is because the mast-head amplifier which is of course 'looking for' possibly much weaker transmissions can be easily overloaded by relatively strong localised transmissions which are actually located on frequencies well away from Band IV and V, particularly if a wideband mast-head amplifier is used.

One method I've often used for helping customers with 'out of area' reception is shown in **Fig. 3**. Providing a good quality 'high gain' antenna (I very much prefer the Antiference XG-8 for this work as it's relatively small and can be easily accommodated on the existing mast) is used with an inductive combiner/splitter ... the use of an amplifier to 'boost' the required 'out of area' transmissions won't be required.

There's also an additional bonus for those viewers who normally get their normal service from a vertically polarised transmitter - (usually a 'relay') - because it will enable them to overcome the loss of signal brought about by the differing antenna polarisations as it's most probable the 'out of area' main transmitter will be transmitting horizontally polarised signals.

Stub Filters

'Stub' filters, formed from open-ended lengths of coaxial cable can be used to provide really deep 'notches' to reject 'out of band' interference to TV reception. I've used them myself many times but they do introduce problems of their own.

You don't get 'something for nothing' in physics! So, the introduction of any form of filter will affect the system as a whole and there's usually a drop in the incoming signal level. However, the advantages can outweigh the disadvantages.

Most 'stub' filters I've used have been incredibly simple to assemble and make. They have to be when you're on the top of a roof! This is where practicality takes over from theory and rather than sit down and work out the mathematics I've found it best to make the stub and continue to trim it (cutting tiny sections off) until the interference disappears.

The diagram, **Fig. 4**, shows an application for a coaxial stub filter. They're ideal for single frequency transmitters (it was a Taxi service transmitter in one case) but they do provide some reduction over a range of frequencies and this includes the frequencies used on your 'two metre' and 'seventy centimetre' bands.

All you need is a waterproof junction box and a metre or so of cable. Arrange to have the offending transmitter on (having made sure it is the offender of course!) and with one end of the length of coaxial cable connected across the antenna downlead and antenna lead, snip off 5mm 'slugs' of cable. Very deep 'nulls' can be achieved ... and if you think you've 'missed the 'trough' of the null', just carry on snipping until the next null! And if you run out of cable stub (unlikely), just start again.

When the interference is reduced, or removed, just coil up the cable neatly, seal off the open end of the stub to stop the ingress of water and the job is done. Just hope that another transmitter doesn't open up on another frequency nearby!

Cheerio for now, and I hope to be joining you 'Up The Ladder' again soon! PW

Back Issues Sale!

Just **£1 each** including P&P!

Order now.

There are a **limited amount** of back issues available from the *PW* Bookstore. This could be **your chance to ensure** that your collection is complete!

January 1994

February 1994

March 1994

April 1994

May 1994

April 1995

May 1995

June 1995

July 1995

August 1995

January	1994
February	1994
March	1994
April	1994
May	1994
June	1994
July	1994
August	1994
September	1994
October	1994
November	1994
December	1994
January	1995
February	1995
March	1995
April	1995
May	1995
June	1995
July	1995
August	1995
September	1995
October	1995
November	1995
December	1995
January	1996
February	1996
March	1996
April	1996
May	1996
June	1996
July	1996
August	1996
September	1996
October	1996
November	1996
December	1996

SEND TO MICHAEL HURST, PW PUBLISHING, ARROWSMITH COURT, BROADSTONE, DORSET BH188PW

Please send me the following Back Issues:

.....

.....

.....

.....

.....

Payment Details:

Name:.....

Address:.....

.....

.....

Postcode.....

Telephone Number:.....

I enclose a cheque/postal order (payable to PW Publishing Ltd.): £.....

Charge to my Access/Visa card the sum of: £.....

Card No:.....

Valid from:.....To.....

Signature:.....

Date:.....

If you do not want to cut your copy of *PW*, a photocopy of this form is acceptable.

Back Issues Sale ONLY £1 inc P&P

Recruitment

GATWICK AVIONICS LTD

As the UK's largest independent avionics company, we are looking for a trainee avionics engineer to work at our Stapleford Essex facility. Primarily working in our well equipped radio workshop, you will need to demonstrate good RF and Digital techniques. A current driving license would be a distinct advantage. Salary commensurate with experience. We have a no smoking policy at this site. For further details, please write to us outlining your relevant experience for this position.

Please quote GAL(PW), FAO Mr S Newbury, c/o Gatwick Avionics Ltd., Hanger One, Stapleford Aerodrome, Nr Romford, Essex RM4 1RL.

Looking for staff?

P.W. will now be running a recruitment section every month.
Let us help you fill your vacancies.
For further information telephone Chris Steadman on

(01202) 659920

RF/GSM ENGINEERS

We specialise in the supply of:-

- Systems Design
- Circuit Design
- Development/Test
- Production
- Commissioning

Offices at Birmingham, Manchester, Bristol and London

CLIVEDEN
Cliveden Recruitment plc

We have hundreds of permanent and contract opportunities across the UK and Europe. For a *fast* positive reponse phone:

01344 489489

92 Broadway, Bracknell, Berks RG12 1AR.
Fax: 01344 489505

161 Bittern Road West, Southampton, Hants SO18 1BH.
Tel: 01703 229094 Fax: 01703 220326
E-mail: cliveden@cliveden.co.uk Vacancies: http://www.cliveden.co.uk

UK wide vacancies

Kelly Technical Services deals with vacancies for RF and Electronics Engineers nationwide. We would be happy to discuss with you your short and long term career objectives and assist you to find the vacancy most suited to your requirements.
A selection from our current vacancy list is detailed below.

RF Development Engineers - Hampshire

For the development of low power RF circuitry up to 1GHz. Experience of LNA, oscillators, mixers and IF design. Knowledge of antenna design and synthesisers would be useful. To £25K.

Senior Test Development Engineer - Hampshire

Design experience of test jigs and fixtures for the manufacture of lower power radio products and knowledge of analogue and digital circuit design with RF test procedures is essential. Familiarity with software development in C, C++ or Visual C++ would be ideal. To 29K.

Test & Repair Engineer - Hampshire

Minimum of HNC with at least 2 years experience of fault daignosis of analogue and digital circuits to component level. Computer literate, familiarity with Windows packages and able to work under pressure. £Negotiable.

Project Manager - West Yorks

R/F Microwave

To ensure a development project is delivered in line with customer prototype commitments and that the product is developed to enable cost effective manufacture in volume. To £35K.

Test Design Engineer - Hampshire

Minimum of HND and knowledge of Visual Basic and/or C in a Windows environment to design, maintain and document test procedures, systems and software using Pcs and telecommunications test equipment. Familiarity with telecommunications protocols and report writing ability would be helpful. £Negotiable.

Senior RF Development Engineer - Hampshire

Development of low power RF circuitry up to 1GHz and experience of LNA, oscillator, mixer and IF design. Experience of synthesiser design and low power transmitter work would also be useful. Supervision of junior engineers and project management is also envisaged as part of the role. Salary to £32K.

Software Development Engineer - Hampshire

For low power embedded systems using C and assembly languages. Knowledge of NEC 75X, 75XL, 75XL 4 bit and 78K/0 8 bit microprocessors and digital or analogue hardware design ability would be useful. To £28K.

Electronics Design Engineer - Cheshire

Development of high frequency analogue circuits (to 500MHz). Degree qualified with a minimum of 2 years experience of analogue circuit design. Exposure to DFM issues and PCB design using Cadstar. £Negotiable.

For details of these and other electronics vacancies, telephone Roy Parrick on

01703 237200 or fax 01703 634207

Alternatively e-mail to southtech@kellyservices.co.uk

KELLY TECHNICAL
WORKing together

RECRUITMENT CONSULTANTS – AN EQUAL OPPORTUNITIES EMPLOYER

FREE ADVERTS

Now's your chance to send in a photograph of your equipment (a good idea if it's really unusual) to accompany your advert. Please note that **all photos** will only be **published at our discretion** and are **non-returnable.**

When sending in your advert, please write **clearly** in **BLOCK CAPITALS** up to a maximum of 30 words, plus state your contact details. Please use the order form provided.

Bargain Basement

Advertisements from traders or for equipment that is illegal to possess, use or which cannot be licensed in the UK, will not be accepted. **No responsibility will be taken for errors.**
You should state clearly in your advert whether the equipment is professionally built, home-brewed or modified.
The Publishers of *Practical Wireless* also wish to point out that it is the responsibility of the buyer to ascertain the suitability of goods offered for purchase.

For Sale

486SX25 lap top PC, 8MbRAM, 170Mb HD Compaq with p.s.u. and plug-in floppy drive, internal NiCad for portable operation, DOS 6.22 installed, *JVFAX 7.0, HAMCOMM 3.1*, ideal Packet station, £150 o.n.o. Tel: Dave M1BPQ (01538) 381324 or via GB3VT @ GB3SM.

Alinco DJ-X10E 0.1-2000MHz, all modes, a.m./f.m./c.w./s.s.b./w.b.f.m., complete with charger and spare battery case, bought August 1998, boxed, mint condition, £200. Realistic PRO-26, 25-1300MHz, a.m./f.m./w.b.f.m., boxed, hardly used, £125. SP-55 v.h.f./u.h.f. GaAs-f.e.t., pre-amplifier, three bands, 25-1500MHz, £30. Discone antenna with ground planes, not used, £25. **Health** reasons force sale, Tel: Harry on Central London (0956) 657087.

AOR-2800 base scanner, 100kHz-1300MHz, a.m./f.m./s.s.b with b.f.o., £180. Microwave Modules MML144/100S, 144MHz, 100W linear, 10W input, switched pre-amplifier, £80. Yaesu FRV-7700A, 118-150MHz receive converter, 18-30MHz, i.f., new, will deliver locally, £30. Tel: David G8PPR, Bradford, West Yorkshire, (01274) 651486, anytime – day or evening.

British and American valve amplifiers, also many valves. Tel: 0113-240 3496.

Copies of *PW* 1990-1993 inclusive, *Radcom* 1989-1993 inclusive, any reasonable offer accepted, buyer collects. Tel: Derek G0OEW on Nantwich (01270) 668111.

Decca Decalian - sound of the sixties, fully working 1965 mono model, stereo convertible, Derram stereo/mono pick up head, Garrard AT6 manually operated four speed turntable, deluxe walnut cabinet, superb Christmas present, £100 o.n.o. Tel: (01883) 623575.

Free to a good home - old *Practical Electronics* magazines, some 1974-1978, all of 1979-1981, all of 1983, some **HE??** 1979/80, some **ET??** 1978/82, ***Electronics It's Easy*** 1-3. Tel: Derek (01935) 426524, evenings.

FT-290R Mkl, all accessories, £100. IC-207H, one year old, £200. PRO-2026 mobile scanner, £100. Diamond SX40C, 2m/70cm (144/430MHz) power s.w.r. meter, £40. Buyers to collect. Tel: GM4DHJ on Glasgow 0141-885 2022.

Grundig Satellit 3000, s.s.b., digital, excellent, sound, s.w. reception, like new, £250. Nordmende multi-band, world-wide reception, a.m. filter, mains/battery, £110. AOR-7030, new, excellent radio, £450. JRC NRD-345, new, first class radio, £475. Sony 320 classic radio, £350. Tel: West London 0181-813 9193.

Hammerlund SP-600, first class condition, £250. HG-18A matching speaker, manual clock timer works, excellent condition and another complete but b.f.o. needs attention, both £300. Eddystone 958/7 digital, manual, v.g.c., £250. HF-225 Europa keypad, antenna whip, new, £275. Trio 9R-59, £60. Sony 2001, £50. Tel: 0181-813 9193.

Icom FL-223 1.9kHz s.s.b. filter for IC-706 and IC-746, cost £55, will accept £35. Tel: (01740) 661938.

Icom IC-2350H dual band transceiver, all manuals and boxed, as new, 12 months old, £360. Also Kenwood 79E hand-held, 144/433MHz, boxed including long-life NiCads, a bargain at £160. Tel: North Wales (01745) 730148.

Icom IC-706 h.f./v.h.f. transceiver, unmarked, boxed with microphone and manual, £525. Tel: GW3WSU on Barry (01446) 738756.

Icom IC-706Mkl, immaculate condition, with filter, £595 o.n.o. Computer complete DX4, 100MHz DOS *Windows*, etc., £275 o.n.o. Alinco DJ5E 2m/70cm (144/430MHz), batteries, case, £180 o.n.o. Tel: Mike 0181-423 0576, after 6pm.

Icom IC-706MkII, mint condition, little used, £500. EP925, 30A p.s.u., £50. Bencher iambic Key, £25. Carriage extra on each. Tel: Chris 0151-342 2612.

Icom IC-706MkII, new OPC581 cable, £790. Yaesu VX1R, new, £185. Kenwood AT-230 tuner, £140. Tel: Essex (01245) 495230.

Icom IC-706MkII, OPC581, MB63, MB62, new, £790. Yaesu VX1R, new, £185. Kenwood AT-230 tuner, £140. Sony ICFSW 1600G, new, £100. Tel: Essex on (01245) 495230.

Icom IC-720A h.f. transceiver, 100W IC-PS15 p.s.u., IC-SP3 speaker, boxes, flood damage, any sensible offer. Rotator EMR-400, including battery bracket, £50. Yaesu FT-211 2m (144MHz) 5-45W mobile, boxed, manual, excellent condition, £145. Tel: John G0FIK on Potters Bar (01707) 872772, answerphone and FAX.

Icom IC-735 in v.g.c., with manuals, £375 o.n.o. Tel: Jim 0181-355 6143.

Icom R-7000 receiver, mint condition, including infra-red remote control, external speaker IC-SP3, £550. Tel: (01843) 231512.

Kenwood TH-79E dual band hand-held, extended receive, speaker, microphone, soft case, book box, £200 o.n.o. Kenwood MC-50 base microphone, wired for TS-830, £30 o.n.o. Tel: Brian G0LPX QTHR, York (01423) 358190.

Kenwood TS-440S h.f transceiver/receiver plus Hanson EP925 twin meter, 30A power supply, excellent working order, £520. Tel: G3VRE on Chippenham (01249) 653548.

Kenwood TS-530SP h.f. transceiver, 1.8-30MHz, built-in WARC filters, p.s.u. and manuals, excellent condition, Diamond SX-600 s.w.r., all as new, £350 for all. Tel: (01246) 236496.

Kenwood TS-950S, immaculate, boxed, £1350 o.v.n.o. Tel: (01962) 878108, anytime.

Kenwood u.h.f. rig, TM441E receiver, complete with handbook and microphone, £200. Tel: Peter G3UXH QTHR, (01639) 250562.

Micronta bench digital multi-meter, £50. *Wireless World* Valve Data Manuals, editions seven and eight, also *Wireless World* Radio Data Charts (ABACS) circa 1928, offers. Tel: Sussex (01323) 505297.

Nova 242 4m (70MHz) transceiver (2) ten crystal channels, a.m./f.m., 25W fitted, 70.425MHz, 13.8V, 12.5kHz spacing, £45 each with circuits and information. Tel: G8ETD on Camborne (01209) 713126.

Oscilloscope by Nicolet, digital storage type 206, two channels, has problem with time base generator but complete with identical set for spares and repair, £45 for both. Tel: Bob (01305) 832387 or (0374) 424272 (mobile).

QRT sale, all items mint, Icom IC-756, £1250. Kenwood TM-733, £275. FT-101ZD MkII, £295. SB200 linear, £225. Alinco DJG5, £175. AOR-3000A, £375. hygain DX77 vertical antenna, £250 plus many other items. Tel: G0UZE (01257) 249185.

R1155 unmod, £30. Zetagi 10m (144MHz) linear amplifier, £50. Samlex six amp 13.5V regulate, power supply, £20. Valves, octals mainly 12.6V, (American) box unused, some 25/35/50V, s.a.e. please for lists. Tel: A E Jeffrey on Cornwall (01841) 532723, 1 Alan Road, Padstow, Cornwall PL28 8DS.

RA117 in black cabinet, as supplied by Racal, complete with trimming tools, superb performer, must be one of the best examples of this marque, £350. Tel: Northants (01604) 763663.

Rexon 144MHz hand-held, NiCads, charger, speaker, microphone, £60. Watson multi-mode modem, Icom lead software, £35. Tel: (01767) 682549.

Sharp Desktop word processor, floppy disk drive, thesaurus, dictionary, etc., little used, £70. Trio R1000 receiver, good condition, boxed, manual, £140. Yupiteru VT125 MkII air band hand-held, new NiCads, manual, charger, £70. Tel: (01608) 662488.

ShortWave Listeners Handbook, new fifth edition, unwanted gift, £10. Two-way coaxial switch, never used, £10, s.w.l. balun , £10. Tel: (01902) 785150.

Tear drop microphone, power, new, cost £48 will sell for £25. Scanner MVT-8000, 8-1300MHz no gaps, £150 o.v.n.o. Tel: (01283) 221870.

Tektronix 466 dual channel storage oscilloscope, excellent condition, £295. Tektronix 'scope cart, £50. Tel: East London 0181-556 4054.

Tektronix 7403N 50MHz oscilloscope with 7A18 dual trace amplifier and 7B50 timebase, 122x98mm display, g.w.o., original manuals, also full set of spares including spare tube, £250 o.n.o. Tel: Hants (01703) 454586, evenings.

Ten-Tec Century 22 c.w. transceiver, with handbook, as new, in box, £120. Tel: Portishead (01275) 845409.

Ten-Tec Corsair Mkl, s.s.b., c.w. including filters, Ten-Tec p.s.u. including loudspeaker, all h.f. bands, bargain £350 o.n.o., excellent condition, boxed. Tel: G4EMC QTHR (01732) 843497 (not after 10pm please).

TET HB 34D, 20/15/10m (14/21/28MHz) 4-element Yagi, superb h.f. beam, v.g.c., in storage for three years, £190. Buyer collects or pays postage. Tel: Don G4PLE QTHR, Stroud, Gloucester (01453) 758311.

Trio 7730 2m (144MHz) f.m., 25/5W, multi-colour readout, 12Vd.c., ideal base mobile, fist microphone, very good rig, £135. Desk microphone with input socket for SSTV, £15. Tel: Harold G0EZW on Nottingham (01773) 781290, 97 Nottingham Road, Selston, Nottingham NE16 6BU.

Trio g.c. valve radio 9R59DS, £50. Hallicrafter S38D valve radio, £50. Both in v.g.c. Tel: Staines (01784) 740373.

Trio R1000 communications receiver, good condition, box and manual, only £160. Yupiteru VT-125II, hand-held scanner, receives civil airband, NiCads, charger, £80. Palstar AA30 active antenna, great for those with no garden, £40. Tel: (01608) 662488.

Trio TR-7800 transceiver, good condition, £140. BC221 mains p.s.u., £25. KW dummy load 50Ω. Silent key sale, prefer buyer to collect from Fareham, Hants. Tel: (01489) 577351.

Trio TS-120S transceiver, reasonable condition, boxed, manual, no c.w., microphone, £225. Vectronic a.t.u., 200W, £70. Home built p.s.u. £35. Tel: Royston GW4PCX QTHR, (01437) 781265.

Trio TS-780, 144/432MHz multi-mode base station, £380. Trio TR-9000 144MHz, 10W, multi-mode mobile/base, £180. Mutek TVVF50C, 50MHz, 10W transverter, 144MHz, i.f., £80. Icom R70 h.f. receiver, may deliver locally, £280. Tel: David G8PAR, Bradford, West Yorkshire, (01274) 651488, anytime - day or evening.

TS430S 100W h.f., mint, £275 o.n.o. IC-551 10W, 6m (50MHz), multi-mode, v.g.c., with microphone, £175 o.n.o. Tel: Ken G3KIP QTHR, Tunbridge Wells (01892) 547643.

Two Akai 4000DS tape decks, damaged (one MkII), cheap for spares or repair due to circumstances here, £25 each or both for £40. Prefer buyer to inspect and collect. No 'phone here so leave message on pensioners answer phone - Tel: Keith Burrows 0161-477 5303, evenings and weekends only.

VHF converter to suit FRG-8800, frequency range: 118-174MHz, g.w.o., £50 o.n.o. Tel: (01542) 841043, anytime.

Vintage Wireless Sets for sale, approx. 25 sets, e.g. DAC90 to Philips 2511 via Pye T19D s.w. multi-band, all excellent to mint condition. Tel: Geoff Hanham Hawick (01835) 830545.

Yaesu FT-101B c.w. filter, WARC bands, h.f. transceiver, £125. Tel: Ron on Worcester (01905) 355381, after 6pm.

Yaesu FT-290R plus linear (offers on) £220. Realistic DX-302 h.f. receiver, digital readout, £130. Butternut h.f. vertical, 160-10m (1.8-28MHz), approx. 8.5m, £120. Tel/FAX: (01647) 281631.

Yaesu FT-290R, NiCads, charger, soft case plus BNOS, v.h.f., s.s.p., amplifier, 3-50 out, £200. Tel: G1LWE on Manchester 0161-865 9082.

Yaesu FT-726R v.h.f./u.h.f. transceiver, you will not find one in better condition, a collection of circumstances result in reluctant sale, £595. Please inspect and collect or carriage at your risk. No

'phone here so leave message on pensioner's answer phone - Tel: 0161-477 5303, evenings and weekends only.

Yaesu FT-77 h.f. transceiver with f.m. board, including FP-707 20A power supply, excellent working order, £295 o.n.o., prefer not to split. Tel: Ralph G3VRX (01274) 585845.

Yaesu FT-77 transceiver, 80-10m (3.5-28MHz), manual, microphone, f.m. board, £200 plus P&P. 15 years of *Radcom*, *SWM*, etc., offers, buyer to collect. Tel: G4OII QTHR, Grimsby (01472) 813450.

Yaesu FT-847 h.f./v.h.f./u.h.f. multi-mode (plus satellite) transceiver, as new, boxed, bargain £1450. Tel: (01294) 607232.

Yaesu FT-890 with internal a.t.u. and c.w. filter, £670. Vibroplex Bug Key, £65, VSI, £20. Tel: M0BNA (01752) 217587.

Yaesu FT-900CAT, built-in a.a.t.u., latest Collins filter model, removable front panel, microphone and handbook, unused, in box, genuine bargain, £649 no offers. Tel: Carl G4GTW QTHR, near Southampton, (01489) 789960.

Your ex-p.m.r. PFX put on frequency of your choice, tone boards removed and setting up/repairs done, EPROMS for your frequency for sale, 145/70/433MHz, etc. (Don't lose this advert). Tel: G4XIV (01904) 330502 (answer phone).

Yupiteru MVT-7100, all modes, 12 steps, 1000 memories, superb s.s.b. and short wave plus civil and military airbands, 530kHz-1650MHz, no gaps, manual, NiCads, like new, £140. Tel: (01608) 662488.

Yupiteru VT125II civil airband hand-held, memories, etc., with manual, charger, new NiCads, only £70. Sharp desktop word processor with dictionary, thesaurus, floppy disk drive, manual, little used, £70. Tel: (01608) 662488.

£175 for quick sale, multi-media PC 486, mini tower, 10 CDROM 28.8 plug-and-play, internet modem, astounding sound with twin speakers, 12MbRAM, 540Mb hard disk, new SVGA monitor NEC, P6 printer, keyboard, etc. Tel: Tom (01536) 522007 or (07887) 934341.

Your Attention Please!

As the volume of adverts in 'Bargain Basement' increases we are receiving many more badly written, poorly prepared and confusingly worded entries that cause problems for everyone. **Because it is a free service** we are unable to verify whether or not each advert's details are correct and although all adverts are read by **Jo**, **Tex G1TEX** and myself, we rely on your entry being prepared correctly so the best service can be offered. So, to help us to help you, please type or write clearly **(in block capitals please)** the full information using the standard style adopted in 'Bargain Basement' adverts (which is easily done by reading a published advert!). Please use full wording or standard abbreviations - RX or rec. for receivers, etc., or terms (**please use frequencies** rather than bands ie: 1.8 to 30MHz, 144MHz and 430MHz rather than 160m to 10m, 2m and 70cm, etc.) and equipment references as used by the manufacturer (Kenwood TS-870, not TS 870 for example) to avoid confusion. Two **??** marks in bold within an advert will indicate that the Editorial staff were unable to determine the original wording/meaning and it has been published in good faith and with the best intentions. **Editor**

Wanted

Charger and batteries for a Motorola MT-700 hand-held u.h.f. radio. Tel: Pontypool (01495) 762260.

Disabled person wishes to purchase receiver for Amateur bands and shipping, must be cheap, home-brew or ex-government OK. Tel: (01509) 814422.

Drake WH7 wattmeter, Shure 444 microphone, SG-230 smartuner. Tel: Geoff G4DED QTHR (01295) 259766.

Film scale for R210 communications receiver. Tel: Donald (01349) 863952.

Front panel for Kenwood TS-430S in v.g.c. to replace tired looking one, may take whole u/s rig if panel OK. Tel: Andy on Derbyshire 0115-930 8096.

Information regarding p.s.u. for Air Ministry receiver Type R1147, have bought receiver but failed to find any info, on p.s.u. and working voltages, Tel: (0956) 657087 and I will call you back. Or write to H Richardson, 75 Gt Peter Street, London SW1P 4BN.

Jack plug PJ068, USA military spec., similar to stereo jack but approx. 5mm diameter sleeve. Tel: Dave G3WQG QTHR, (01628) 522973.

Kenwood SM230 'scope. Tel: Harry on Chesire (01606) 883355.

Lafayette HA-500 service information. WHY? Good price paid. Contact Mr Kennedy, 7 Wyatt Street, Kettering, Northants NN16 0DT.

Lafayette HE30 valve receiver circuit diagram or service manual. Tel: Rod on Somerset (01643) 707551.

Microphone MC60, Kenwood a.t.u., Vektronics VC300DLC headphones for Kenwood 570D. Tel: (01283) 221870.

Nordmende Galaxy s.w. radio, 17 wave bands, model MESA-7000 and Grundig Satellit, model 2400 or 1400. Tel: Mr H. McCallion on Northern Ireland (01265) 43793, 8 Strathard Close, Coleraine, Co. Londonderry, Northern Ireland BT51 3ES.

Power supply for WWII transceiver TCS-12, 440V at 1A, 220V at 1A, home-brew, surplus, WHY? No problem will pay P&P. Tel: Peter (01287) 634197, 9-5pm - works QTH.

Pye Westminster f.m. dash mount, 8 band, will also consider E or T band set, must be working as this will be my first conversion, cheap please. Contact Brad, 22 Myatt Avenue, Parkfields, Wolverhampton WV2 2ED.

Racal RA-121, RA-218, MA-168B, MA-350, MA-1350, Eddystone 880/2, 850/2, Marconi Atlanta and Marconi Apollo receiver. Tel: Rob (01636) 886392.

Realistic receiver DX150A or DX160, g.w.o. Tel: Bournemouth (01202) 397698.

Service information/circuit diagram, etc. for AVO valve, characteristic meters Mkl or II. Tel: (01803) 326284.

Stereo Betamax VCR, domestic/industrial model, PAL/NTSC, faulty considered, also need Sony PCM 601. Tel: Graham (01604) 843536.

Thandar TF200 l.c.d. frequency meter, write or 'phone. Tel: Alan Cross G0HKG on Essex (01787) 223356, Brick Kiln Farm, Great Tey, Essex CO6 1AR.

Tired or scrap Yaesu FT-902DM for spares. Tel: (01904) 794680, most times.

Yaesu FT-101ZD MkIII working or not. FV-901DM/FV101DM scanning v.f.o. KW1000A p.s.u. plus rig. Valve receiver or transceiver. Cubical (h.f.) quad. Carriage paid. Please write to Ed Kelly, Cregganavar, Breaffy, Castlebar, Co. Mayo, Eire.

Yaesu FTV-901R, 6/2m/70cm (50/144/430MHz) transverter or Yaesu FTV-107 6/2m transverter with all leads. Tel: MW1BTA on Anglesey (01248) 421563.

Please use the Form provided to send your advert in or write it neatly on a postcard.

Exchange

25W mobile rig for 2.5W hand-held. Azden PCS-6000, 25/5W, 25/12.5kHz, a.m. air band plus two memory banks, sell for £150 or exchange for Yaesu FT-26R with FTS-17A tone squelch, no alternatives. No 'phone here so leave message on pensioner's answer phone - Tel: 0161-477 5303, evenings and weekends only.

C12 power supply for any ex-military v.h.f. equipment. Tel: Pontypool (01495) 762260.

Icom IC-8500 receiver still has 12 months warranty left, covers 100kHz-2GHz, in pristine condition, want an AOR-5000 or AOR-5000+3, must be in similar condition. Tel: John (01592) 203279, anytime.

Oscilloscope digital storage Nicolet 206, two channels, has problem with time base but complete with identical 'scope for spares. Exchange for hand-held 144MHz transceiver such as Yaesu FT-101R or equivalent. Tel: Bob (01305) 832387 or (0374) 424272 (mobile).

Roland DXY-1100A3 flatbed plotter, excellent condition with 30 colour pens, paper, manual and drivers for 2m or 70cm (144 or 430MHz) mobile. Tel: (01202) 820554.

BARGAIN BASEMENT ORDER FORM

Please insert this advertisement in the next available issue of *Practical Wireless*.

❑ FOR SALE ❑ WANTED ❑ EXCHANGE

Name .....

Address .....

.....

.....

Telephone Number .....

please write in block capitals

	(30)		

CONTACT DETAILS FOR ADVERT.

Please only write in the contact details you wish to be published with your advert,

ie. do you want your name & address, or just your telephone number?

Your advert, you decide!

			(12)

DAVID BUTLER G4ASR BRINGS YOU THE MOST UP-TO-DATE NEWS ON THE RECENT LEONIDS METEOR SHOWER

RadioScene

VHF REPORT

REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

DAVID BUTLER G4ASR
YEW TREE COTTAGE
LOWER MAESCOED
HEREFORDSHIRE
HR2 0HP

TEL: (01873) 860679

E-MAIL: david.j.butler@bt.com

Packet Radio @ GB7MAD

UK DX Cluster @ GB7DXC

THIS MONTH DAVID BUTLER G4ASR TAKES AN IN-DEPTH LOOK AT THE RECENT LEONIDS METEOR SHOWER.

We thought we had seen everything on the 144MHz band during 1998: marine ducting over paths of 3000km to the Canary Islands; tropospheric openings deep into Eastern Europe; auroral openings to the ex-Russian Republics and sporadic-E propagation into the Middle East!

However, words can't really begin to describe the event which occurred recently. Superlatives such as "brilliant", "exciting" and "once in a lifetime" still don't convey what really took place during the early hours of Tuesday November 17 1998. It was a meteor shower - but not any old meteor shower! This was the mother of all meteor showers. It was meteor scatter for the people. It was, well, anything you wanted it to be!

WHAT ARE THE LEONIDS?

Major meteor showers occur every month of the year with the exception of February. Some of the better known showers include the Quadrantids in January, the Perseids in August and the Geminids in December. The Leonids are a meteor shower that occurs every year in the period November 15-19.

Fig. 1: David Johnson G4DHF's eight 11-element Yagis - over 90 QSOs were made in a three hour period!

They are called the Leonids because they appear to radiate out of the constellation Leo. That's not too important to us because we are only interested in radio observations rather than visual sightings. This aspect is very important as there are considerable differences between the two, especially when it comes to calculating peaks in activity. Therefore, to avoid confusion, the following comment relates to radio propagation via meteor trails or meteor scatter (m.s.) as it is termed.

All meteor showers have different characteristics. These can include speed, brightness, shower duration and visibility above the horizon. The Leonids are very fast meteors entering the Earth's atmosphere at speeds of over 254 269km per hour. Besides being fast, the Leonids usually contain a large number of very bright meteors that produce highly ionised trails.

Although the Earth can take some days to pass through a shower stream, the peak in radio activity can be quite short. The Quadrantids, for example, might only be observed for a few hours - normally on January 4. The effectiveness of the Leonids meteor shower can last for 12 hours or so and usually occurs on November 17.

One characteristic that dictates the usefulness of a shower for radio propagation, is that it may only be 'visible' above the horizon at certain times of the day. The Leonids shower rises above the horizon (in Europe) around 2300UTC and sets around 1230UTC. Try to make an m.s. QSO at 1800UTC and you might as well be using a dummy load for the antenna! (Some showers, like the August Perseids are visible above the horizon 24 hours a day and are termed circumpolar showers).

Another point worth noting is that m.s. conditions are more effective in certain directions at different times. The Quadrantids are very good towards Scandinavia between 1200-1400UTC but not worth trying at 0900UTC.

Finally, it is important to realise that meteor showers are not uniform streams of debris and therefore calculating the specific period of maximum activity is rather difficult. However, in general terms, this is not impossible.

The Leonids shower is usually nothing to write home about. It's there, year in, year out, creating some minor activity for the m.s. enthusiasts. So what made the Leonids shower so different in 1998?

Recently it has been proved that there is a connection between annual meteor showers and comet orbits. Comets as you may know are composed of ice and dust and every time one approaches the Sun, the ice melts and material is released. Over the course of hundreds of years the dust spreads completely around a comet's orbit track. However, this spread is not even and much of the material stays close behind the comet.

In the case of the Leonids shower, the parent comet is called ***Tempel-Tuttle*** and it makes an appearance in our skies every 33 years, the last time being in 1966. As Tempel-Tuttle passed closest to the Sun in February 1998 it was expected that activity during November 1998 and 1999 would produce some very strong displays.

Indeed, if you are a regular reader of this column you may recall that I mentioned that activity has increased dramatically in the last two years. The scene was therefore set for some amazing radio fireworks.

BURSTS OF SIGNALS

To all intents and purposes, the propagation during the evening of the 16th was that which is normally expected for a mid-November evening. The tropo conditions were uninspiring and very little activity could be found on the v.h.f. bands.

Down on the 50MHz band some small bursts of signals could be heard but no DX was being worked. Interestingly, although m.s. propagation is theoretically better on this frequency, virtually all the DX activity is made on the 144MHz band and it's on that band that the following reports are based.

It wasn't until very late in the evening, when the shower radiant rose above the horizon, that conditions really started hotting up. From 2330UTC some very loud bursts of signals started to be heard from stations throughout Europe.

Over the next hour or so the m.s. conditions progressively got better as the radiant moved higher in the sky. Now bursts of signals were turning into continuous transmissions, first a few minutes in length and then up to five or six minutes in duration. It really was like a Sporadic-E (Sp-E) opening but this event was even more special.

Not only was the ionisation very intense but it was spread all over Europe at the same time. But better than that, you could also work stations via forward scatter, back scatter, side scatter, in fact in any direction you wanted!

As a consequence, it made very little difference in which direction you were beaming. Beam towards Finland (OH) and work into North Africa (EA9). Beam towards Hungary (HA) and work into Portugal (CT). It really was this crazy. If you did beam in the right direction then signals were 'end stopping' on the S-meter. So much so, that operators stopped using traditional m.s. reporting

techniques and operating practices and almost treated it as if it was a 'conventional' opening.

Signal reports of 59 were being exchanged with stations up to 2000km away and, in some cases, even further. This went on, hour after hour, right through the night until the shower disappeared below the horizon around 1200UTC on November 17.

Although a great deal of activity was concentrated around 144.200MHz (the m.s. calling frequency) it was not unusual to hear stations all over the entire s.s.b. sub-band. Because telephony (s.s.b.) was easy to use, very little c.w. activity was noted. Rumours had it that some well equipped stations made over 200 contacts that night and just as this went to press I received details of a 2036km contact on the 430MHz band!

STATION RESULTS

So, now it's time to turn to your reports and this time around I really do have a bumper post-bag and, from reading them, I note that it wasn't just the big stations that were working the DX. It was also the low power casual user of the band or other stations that had never tried to make a contact via meteor scatter before. This really was the peoples' shower!

Among the post was a letter from **Roger Ward GW5NF** (IO81) who contacted the stations of HG1DLZ, SP2FAX and S54AA on the 144MHz band. His power? Only 20W into a 9-element Yagi! Also active from south Wales was **Jamie Ashford GW7SMV** (IO81) who made his first ever contacts via the meteor trails. In total he worked 17 stations located in DL, HA, I, SP, S5 and YU. Jamie mentioned that this event was the best he had encountered since being licensed in 1994. (I can tell you Jamie that this was one of the best events that I have participated in since being licensed, as G8ASR, in 1965!).

Another first timer was the station of **Geoff Bowden G3YVR** (IO91) who reports his delight in contacting 16 stations and three new countries on the 144MHz band. Geoff used a Yaesu FT-736R transceiver, a 200W amplifier and a pair of OZ5HF 9-element Yagis to make these contacts - the best of which included the stations of ES2RI, LY2SA, OH1XT, S57S and 9A1CCY.

Tremendous bursts of signals were heard between 2330-0330UTC by which time Geoff regretfully left the band. (At 71-years old and recovering from two operations something has to give - and it had to be the 'off-switch!). On the following evening Geoff listened intently to the band but activity was much reduced compared to events of 24-hours earlier.

Mike Tubby G8TIC (IO82) reports making 15 complete contacts with stations in DL, F, I, LY, PA, SP, S5, 9A. Running an FT-847 and a 3CX800 amplifier into a 10-element DJ9BV Yagi. Mike reckoned his best s.s.b. contact was with the station of LY2SA (KO14).

Well known microwave operators were also active. Among them was **Roy Emery G3FYX** (IO81) who is usually to be found on the 5.7GHz and 10GHz bands. He heard some bursts late in the evening of November 16 but didn't think reflections were that good to attempt any contacts. However, around 0830UTC on the following morning Roy was surprised to hear many long bursts of signals on the 144MHz band.

Running 100W and a 7-element Yagi, Roy then made s.s.b. contacts with DF9RG, DG8NKO, HG1DLZ, IZ5EME and SP8UFT. Roy mentioned that he had to get these QSOs in the log book as he doesn't think he'll be around in 33-years time to witness the next peak in activity. (Please note, Roy, that conditions may be as good if not better in November 1999).

John Eaton GM4LBV is another microwave operator, usually found on the 1.3GHz band where he runs 250W into an array of four 23-element Yagis. On the 144MHz band however he runs 50W into a battered 15-element Cushcraft Yagi - and when I mean battered, I mean four director elements missing from the front and three triagonal reflectors elements missing from the rear. This was an 8-element Yagi of undetermined performance, stuck on a pole with no rotator at three metres above the ground.

It will probably not surprise you that some very interesting contacts were made with John's antenna set up. Among them were s.s.b. QSOs with RW1AW at 1938km and RX1AS at 1980km. He also worked stations in ES, HA, HB, I, LY, SP, YU and 9A.

John Quarmby G3XDY (JO02) can normally be found on the 430MHz, 1.3GHz and 2.3GHz bands. He decided to monitor the Packet radio DX Cluster for signs of activity and just before midnight saw several spots for DX stations on the 144MHz band. His first contact was with the station of LY2MW (KO24).

Further QSOs were then made with operators in CT, EA, F, HA, I, SP, S5 and 9A before closing the station down at 0100UTC. Probably John's best DX of this session was that with EW1RZ (KO33) in Belarus Republic. At 0600UTC he made another brief foray onto the band working LZ2FO (KN13) at 1835km and further stations in F, HA, HB9, I, OK, S5, YU and 9A.

HOW DID THE EXPERIENCED FARE?

For those that were all geared up for meteor scatter operation and run high power, this event really was a once in a lifetime experience. **Ray James GM4CXM** (IO75), using 400W and a pair of 16-element Yagis, made 87 QSOs throughout the night before having to close down at 0930UTC. Stations in 19 European countries were worked, some of the DX including LY2IC, LY2WR, OH8HDL, OH8UV, RU1AA, S57TW and 9A1RKV. Ray mentions that this was the best shower he had operated in during almost 20 years of m.s. operation.

Alec Trusler G0FIG (IO90) made similar comments and reckons that this event will be talked about for many years to come. He was active between 0200-1000UTC making 31 contacts with stations in 14 countries. Alec said he was really looking for new locator squares and was pleased to work four new squares to bring his total up to 351. His best DX of the event was with OH6KSR at 2018km.

Erik Gedvilas G8XVJ (IO83) uses a Yaesu TS-930S transceiver, an LT2S transverter and an 8877 amplifier running 400W into a 17-element Yagi. His first contact was made at 2345UTC working the station of YU7EW. At the time Erik was running 50W whilst waiting for the amplifier to warm up! A total of 107 contacts were made with stations in 21 countries throughout Europe.

Eric's most memorable contacts came at 0222UTC when, in a burst lasting nearly three minutes, he worked the stations of EA9AI (59 both ways into North Africa!), SM4EJY, SM4VQP and I3ZNI - and all this with the beam pointing to eastern Europe! He said it was really fantastic after 16 years of m.s. operation.

Another station to note the excellent conditions around 0200UTC was **David Johnson G4DHF** (IO92). Whilst beaming north-east towards Scandinavia, he worked EA6NQ and EA6FB, both situated in the Balearic Islands! David runs 400W into eight 11-element Yagis, (shown in the photograph, **Fig.1**) a bit sharp for m.s. work maybe, but nevertheless over 90 QSOs were made in a three hour period. Six contacts were over 2000km, OH8HDL, OH8UV, RU1AA, RW1AW, RX1AS and LZ3UF (KN12) for his best DX at 2084km. David reports that he worked IW0UIQ (JM49) on Sardinia and was later called by a UA1 station but he lost him in the pile-up!

From the Isle of Wight (IO90), **Dave Edwards G7RAU** managed to work 72 stations situated in 20 countries. He was active between 2242-1222UTC and was very pleased to find 22 new locator squares. Dave runs a Yaesu FT-757 transceiver, a Mutek transverter and 80W solid-state amplifier into a pair of 9-element OZ5HF Yagis. His best contacts included LZ2FO (KN13) at 1958km, OH5LK (KP30) at 2077km and OH6KSR (KP22) at 2078km.

All did not run smoothly at my QTH (IO81). At 2230UTC I fired up the Henry amplifier (2 x 8874) which promptly tripped its main circuit breaker. The problem turned out to be a very high standing wave ratio (s.w.r.) on the antenna feeder.

So, at 2300UTC I was out in the garden, tower huffed over, trying to find the problem aided by car headlights. It took nearly an hour to discover that the matching stub on the driven element of the antenna had broken away within the moulding of the assembly. I had noticed this crack some months before but had failed to take action at the time!

By the time the element was replaced it was after midnight and I'd had enough! However I did set the alarm for 0300UTC to make sure I didn't miss all the fun.

My first contact was a c.w. schedule with OH1XT (KP01) over a path of 1822km. Within seconds of the start of the QSO

PW's REGULAR REPORT SECTION - FULL OF TIPS, IDEAS AND INFO ON THE VERY LATEST IN THE AMATEUR RADIO SCENE

RadioScene

I heard his high speed c.w. signals (500 w.p.m.) which went on and on for over two minutes. Then it was my turn to transmit but instead of using high speed Morse from my purpose built keyer I just wound up the electronic keyer and made a quick transmission "OH1XT ur 599 de G4ASR bk". He came back instantly and the contact was completed.

Although we were operating in the c.w. sub-band (144.122MHz) I quickly swapped to s.s.b. to make another QSO via that mode. Then it was time to QSY up the band to join in the more frenetic action.

In total I made 54 contacts with stations in 20 countries, CT, DL, EA, F, HA, HB, I, LA, LY, OE, OH, OM, OK, OZ, SM, SP, S5, UA, YU and 9A. Some of my longest distance contacts included the stations of I8TWK (1827km), I8MPO (1829km) and LY2WR on slow speed c.w. (1884km). Best DX of the event, however, came with my final contact of the morning at 1138UTC when I exchanged 59 reports with the station of RW1AW (KP50) over a path of 2231km. I wonder if anyone worked further than this?

GREAT EXPECTATIONS

So, what will happen during the Leonids shower later this year? Last year the Earth encountered the Leonid stream some 257 days behind Tempel-Tuttle. On November 17 we will pass about 622 days behind the comet. You may be thinking that this is not ideal but some of the best (visual) showers have occurred in similar circumstances.

The large event in 1833 was 350 days behind and the more famous 1966 event (with 144 000 visual meteors an hour recorded at one site) was 561 days behind the comet. All looks set for yet another exciting night of amazing meteor scatter propagation.

But now an important word of advise. Please take no notice of the media hype that will exist on television and radio channels. The so called 'experts' got the dates wrong last year and I have no confidence that they will get it right this time around. Astronomers use visual data which is of no relevance to our pursuit. I predicted the exact times last year in this column and I'm doing exactly the same this year.

Stay at home during the evening of Tuesday 16 November1999. At 2300UTC, go into the shack, turn on the transceiver and warm up the amplifier. At 2330UTC start working some of the most amazing DX you've ever heard on the 144MHz band. Continue this until 1200UTC on Wednesday 17 November. It's as simple as that. Bookmark these dates now!

DEADLINES

Sorry, but there's no more space to cover the multitude of reports received from stations in eleven European countries, South Africa and USA. I'll cover these next time around and give details of what happened on the 50MHz and 430MHz band.

THANKS FOR YOUR LETTERS AND GOOD DX. SEE YOU AGAIN NEXT MONTH.

73 David G4ASR.

HF FAR & WIDE

LEIGHTON SMART GW0LBI
33 NANT GWYN
TRELEWIS
MID GLAMORGAN
CF46 6DB

TEL: (01443) 411459

LEIGHTON SAYS - WHEW! WHAT A MONTH IT'S BEEN! THE BANDS HAVE CERTAINLY COME INTO THEIR OWN RECENTLY, WITH ALL PARTS OF THE GLOBE BEING HEARD AND WORKED BY OUR REPORTERS - WITH GOOD SIGNAL STRENGTHS.

Conditions on the 28MHz band have been the subject of much conversation of late, with many amateurs having a great time hooking up with rare DX stations, often with extremely simple and basic antennas. One of these is **Peter Downey G3WDK**, who told me over the telephone that he'd contacted China on 28MHz s.s.b. using nothing more than a wire-cored clothes line tacked under the weather board of his house on the edge of Dartmoor!

Peter says: "I used the clothes line end-fed, in conjunction with an MFJ 'Artificial Ground' and a roller-coaster Versatuner. The s.w.r. was absolutely minimal and I was amazed at how well it worked. I also hooked up with a string of Russian stations using the same set up, all at 100W output. It made me realise just what you can get away with as far as antennas are concerned"! (I say "hear - hear" to that, Peter!).

Fig. 1: Tomasz SP3WYL likes to work /P from Bismarck Tower on Wielka Sowa Mountain in Poland.

All our reporters have concentrated their activities on the higher frequency bands this month as their reports show, thus making good the old saying 'you have to make hay while the sun shines'!

YOUR REPORTS

I'll delve straight into your reports now, as space is limited this time around, starting with the 7MHz log from **Sean Gilbert G4UCJ** in Milton Keynes.

Operating mainly during the early hours, Sean used c.w. on the 7MHz band with a half-sized G5RV antenna to work CO8ZZ (Cuba), FM5FI (Martinique Island), VE3FU/NP2 (US Virgin Islands), DL4JAN/HI8 (Dominican Republic), 8Q7IO (Maldives Islands), ZF2NT (Cayman Islands), and C56A (Gambia), all between midnight and 0200UTC.

Meanwhile, down in Yeovil, **Don McLean G3NOF** used s.s.b. and a trapped dipole antenna on 7MHz to contact FM5DP (Martinique Island), OX3SA (Greenland), VY2SS (Prince Edward Island), and 9K2UB (Kuwait), all after 2300UTC.

THE 14MHZ BAND

Up to '20' now and the 14MHz band log from **Steve Locke GW0SGL** of Mountain Ash, Mid Glamorgan. Using a Yaesu FT-1000D and a HyGain TH-7DXX antenna, Steve reports s.s.b. contacts with 3W6DXI (Vietnam) at 1600, DS5ARL (Republic of Korea) at 1745, BV7GA (Taiwan) at 1549, VK3FIX (Australia) at 1805, VU3RSB (India) at 1700, XX9TZ (Macao) at 1700, and E31AA (Eritrea) at 1450UTC.

Although he concentrated on the higher bands this month, **Ted Trowell G2HKU** on the Isle of Sheppey in Kent offers a couple of c.w. contacts on 14MHz in the form of VQ9IC (Chagos Island) at 1600, and TF8SM (Iceland) at 1800, while Don G3NOF throws in HS1AFN (Thailand), W0W (USA) - genuine call! (QSL to Box 501, Carmel, NY 10512, USA), and KL7EGO (Alaska).

THE 21MHZ BAND

This month, **Carl Mason GW0VSW** of Skewen in West Glamorgan used higher power and s.s.b. for a change, as opposed to his usual QRP operations. With 70W and a vertical antenna, he lists 21MHz contacts with HV5PUL (Vatican State) - QSL via PUL 00120, Vatican State and FM5BH (Martinique Island) both at around 1130, while later operating brought in 3V8BB (Tunisia) at 1714 and HB0/HB9AON (Liechtenstein) at 1442UTC.

Also using s.s.b. on 21MHz although this time at QRP power levels was Sean G4UCJ, who snagged J3A (Grenada) at 1400, 9J2A (Zambia) at 1640, V26B (Antigua Island) and VE2CSI (Canada) both around 1530, plus PJ9B (Netherlands Antilles Islands) at 1100UTC.

THE 24 & 28MHZ BANDS

The 24MHz band was 'where it

was all happening' for Ted G2HKU this month, judging by his log. Ted lists c.w. contacts at around 70W and a G5RV dipole with VP5/WA2VYA (Turks and Caicos Islands), HF0POL (Antarctica), S92YN (Sao Tome & Principe), TL5A (Central African Republic), FG/G3TXF (Guadeloupe), 7Q7HB (Malawi) and V26A (Antigua and Barbuda Islands), all at around 1500, while VE2FU/NP2 (US Virgin Islands) and DK8YY/HI8 (Dominican Republic) were worked at 1600UTC.

After a spell in hospital, **Eric Masters G0KRT** of Worcester Park in Surrey says he's had little time for the radio, however, he did manage to try out his new 100W rig on the 29MHz band. Operating in the 'all-mode slot' between 29.000 and 29.200MHz using 25W of amplitude modulation (a.m.) and a sloping 28/29MHz dipole, Eric lists contacts with RW1ZQ (Russia) at 1300, with KA1JBA and K1UTI (USA) at around 1530, and W1ZZZ (USA) at 1600. Switching to 100W s.s.b., he hooked up with 9K2ZZ (Kuwait) at 1300, as well as CX6FP (Uruguay) at 1635UTC. (Hope you're feeling better now Eric. Keep well and enjoy the 10m a.m.!)

"The 28MHz band was the best band this month" are the words of Steve GW0SGL, who lists his s.s.b. contacts with 5R8FL (Madagascar) at 1330, BV5BG (Taiwan) at 1450, VK5MS (Australia) at 1400, S21J (Bangladesh) at 1500, 6D2X (Mexico) at 1355 and ZS6VAN (South Africa) at 1400UTC.

Yours truly GW0LBI had a go at 28MHz this month too. Using 5W from a converted Ham International Concorde II transceiver and a simple vertical antenna I hooked up with PY5ACN (Brazil) at 1532 using 5W of c.w., while switching to 5W s.s.b. gave me contacts with 9K2ZZ (Kuwait) at 1158, KA3CAI (USA) at 1220, ER4OT (Republic of Moldova) at 1300, SV2AL (Greece) at 1500, 5A1A (Libya) at 1200 and D44BC (Cape Verde Islands) at 1120, as well as working a series of European stations. *Well done Leighton!* ***Editor.***

Finally, the log of Don G3NOF shows his 24MHz contacts with EK6CG (Armenia), JD1BIA (Minami Torishima Island), V26AK (Antigua and Barbuda Islands) and 9Y4/DL4MDO (Trinidad and Tobago Islands), while 28MHz s.s.b. gave him contacts with A45ZN (Oman), C56A (Gambia), E30HA (Eritrea), K6RO/FG (Guadeloupe), VK9NTL (Norfolk Island), HL1CG (Republic of Korea) and finally 5V7FA (Togo) although Don didn't provide any times for the contacts.

SIGNING OFF

So it looks like our reporters are getting their claws stuck into some really decent DX these days doesn't it? It also certainly looks like things are going to get even better over the coming months, so now is the time to get out on the bands and see what you can work!

THANKS AGAIN TO ALL MY REPORTERS FOR THEIR TIME AND EFFORT IN PUTTING TOGETHER THEIR REPORTS AND LOGS FOR THE COLUMN. AS USUAL, REPORTS AND INFORMATION (AND PHOTOGRAPHS - PLEASE!) BY THE 15TH OF EACH MONTH. CHEERIO FOR NOW AND GOOD DX!

73 Leighton GW0LBI

DATA SCAPE

ROGER J COOKE G3LDI

TEL: (01508) 570278

E-MAIL:
rcooke@g3ldi.freeserve.co.uk

PACKET:
G3LDI @ GB7LDI.#35.GBR.EU

THIS MONTH ROGER G3LDI GIVES HIS OPINION ON A FEW OF THE GAMES THAT CAN BE FOUND ON THE INTERNET AND ALSO TELLS YOU ABOUT THE NEW APPLE 'iMAC'.

GAMES ONLINE

First of all, let me say that I have no interest whatsoever in playing games, either on the Internet or Packet radio. However, at risk of being labelled a 'kill-joy', please let it also be known that I am far from that. I merely think that they're not suitable for me.

Having said that, I do carry some humour and puzzles on my BBS in a humour directory. I just do not see the point in wasting time and money on the Internet in this way. Other people think differently and if it appeals to them, great! (I mention this because I have had some information sent to me regarding games on the Internet).

A large Web site has just been established called: **Jamba.co.uk** On this site, you can play games and win prizes and could possibly relieve some of the stress of modern life!

Jamba brings together a host of interactive games and quizzes. These range from 'Jumbo Jamba', with its major game-shows, such as catch-phrase, through to pub quizzes and darts in 'Bar Jamba' and finally a range of diverse challenges and puzzles in 'Jamba Dips'.

The first of three major new Web sites, Jamba.co.uk, is being launched by **Carlton Online** this month. Targeted at a mixed audience aged 18 to 25 years - this is the reason why it does not appeal to me - being 135 now! - the target audience are the sort of people likely to be interested in clubbing, pubs, TV, cinema, fashion, football and music.

Also, there are competitive multi-player games that can be played by office teams, competing to win prizes. Some major big-name advertisers are sponsoring the site, including **Microsoft, Nationwide Building Society, Orange** and more. If you want further information, then you can E-mail **Emma Crowe at:**
ecrowe@carltononline.com

Stealth Productions Inc from Beverly Hills, California, have announced the release of their new 3D Internet game called 'Pretzel Pete'. This game is designed for the PC and can be downloaded from their site for **$24.99**. It has an 'E' rating and is a clean, fun product suitable for all ages.

The soundtrack is also available separately on audio CD for **$12.99**. If you are interested in this one, then you can E-mail:
sales@stealthprd.com
Alternatively, you can look on their Web site at
www.stealthprd.com

EDUCATION

Microsoft wanted to publish the *Encyclopaedia Britannica* on CDROM but was snubbed by them. Therefore, they commissioned their own reference work and now Microsoft's *Encarta* is the world's best selling encyclopaedia. (However, *Britannica* has also bowed to the inevitable and published all its volumes on CDROM.

Microsoft's *Encarta* is geared to the British market and is updated by a 60 strong UK team at **Websters Multimedia** in London. With it comes the *Encarta World Atlas, Chambers English Dictionary* and the *Bloomsbury Treasury of Quotations*. Not only that, but Microsoft have a very large slice of the market and can promote and sell their products well.

For even greater depth, the *Britannica 99* edition includes articles, photos, video clips and animated sequences, plus links to 125 000 selected Internet sites. This could be too much for some children to take. Even the written version is awesome, with the pro-paedia, micro-paedia and macro-paedia, all cross referenced.

The encyclopaedia is a superb tome to possess, but children do not find it easy to use. I speak from experience. I bought this for my children when they were at school and unless I used it with the children, it was rarely used by them alone!

The *Hutchinson Educational Encyclopaedia* is specially tailored to the National Curriculum and could be a wise choice for youngsters.

APPLE-MAC

Apple Computers have announced their latest desktop computer, the **'iMac'**, at **£999.** It is designed for Internet access and network use. The sleek unusual looking translucent two-tone casing combines a processor, integral 15in Sony colour monitor and a 56Kbps modem.

The machine's processor is a powerful G3 233MHz PowerPC chip with 512k of Level 2 cache, 32Mb of SDRAM, expandable to 128Mb, a 4Gb IDE hard drive and a 24 speed CD-ROM. It can accept information from hand-held PCs via an IrDA standard infrared port. For connecting to the network, it has a 10/100Base-T

Fig. 1: Screen grab from the HTML User Group Packet site at: Michael 2E1FDD @ GB7MRU

PW's REGULAR REPORT SECTION - FULL OF TIPS, IDEAS AND INFO ON THE VERY LATEST IN THE AMATEUR RADIO

RadioScene

Fig. 2: The Software Warehouse Web site at: www.software-warehouse.co.uk

Ethernet port. *Clarisworks* software is bundled as standard.

Instead of using the standard serial and parallel ports for connection to external devices, the 'iMac' uses two USB (Universal Serial Bus) sockets, common on new *Windows* based PCs. USB is more versatile than the simple serial ports, capable of connecting up to 127 pieces of hardware, including keyboard and mouse.

Over the next year, scanners, digital cameras, storage devices and printers will support the USB standard. This will solve lots of problems as far as the amateur is concerned. Adding external hardware has presented problems for a long time now and adding a USB port to a PC will be most welcome.

The only disadvantage (apart from the shape, which, personally, I do not like) is the lack of a floppy drive. This still remains the easiest way of transferring data from one machine to another and I think the omission of a floppy drive is a bad mistake and will detract from sales.

FREESERVE IMPROVED

I have been using **Freeserve** for a few weeks now and have started the steep learning curve of trying to write a Web page. I have managed this, albeit cheating, using *Word 7*. This enables you to write a Web page using the template provided.

You can also access the HTML code direct to add on other graphics and so on and Freeserve were offering a 5Mb free Web site. Well, this has now increased to 15Mb, so that is a very welcome increase. I shall have to find some time to increase my ability with HTML. To that end a user group has been set up by **Michael 2E1FDD @ GB7MRU**. The result, when viewed with an HTML viewer sent over the packet network, is shown in **Fig. 1**.

There is some controversy on whether HTML should be sent over the Packet network, but I see it as all part of the 'experimentation' part of BR 68. It's all very well providing a network and a service, but not at the expense of diversification and experimentation.

Like lots of other amateurs, I am now using the Internet, E-mail et al and, although it will never replace the Amateur Radio network as far as I am concerned, there are certain tasks that Packet - with its limited protocol - just cannot do. There is also the business aspect too ... the Internet is ideal for this purpose and some knowledge of HTML is definitely an asset.

MORE ON NETSCAPE.

Next, from a local, **Paddy G7KZZ**, here comes some news on these latest gems! (The subject is **Multiple Navigator Windows**).

"While surfing the net, I often find a large page of information that I don't want to

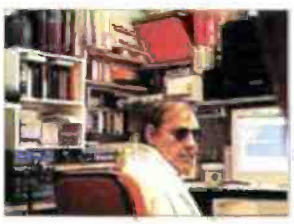


Fig. 3: Peter Hunter G0GSZ, Editor of *Radial*, the quarterly magazine of the RAIBC, in his shack.

save or read while on-line. So, I just open a new window: (File > New > Navigator Window) and up pops the same page (usually) in a new window. I then continue surfing from that window. (Just remember not to close the windows when you go off-line). Sometimes, when a site is slow and you have somewhere else to look at, it's worth while opening another Navigator window and downloading from another site at the same time. Been anywhere recently but can't remember the address? Why not try '**CONTROL H**'?

Another subject he spoke about was **Bookmarks in Netscape**.

"Netscape can hold a list known as bookmarks. Start Netscape and do a CTRL B and up pops a window with a load of default bookmarks you'll probably never use, except 'Search'. Right click on the

Fig. 4: Peter G0GSZ's new antenna system

bottom of this 'tree' and choose 'New Bookmark', then type in a name to identify it, a URL in the obvious place and a description if you wish. Close the bookmark window and then with the Navigator window active, click on 'Bookmarks' (left of the Location box) and up pops the bookmarks including the one you added. Click on the bookmark and if you are connected to the net it will go there.

You can type in a load of URLs as bookmarks while you're off line, saving time when you are on line as they'll be a couple of mouse clicks away".

MORE FREE INTERNET ACCESS

Looks like the Internet wars are warming up! Freeserve are now offering 15Mb Web space as standard, with unlimited E-mail addresses. So, you could, in theory, have several E-mail addresses and allocate 15Mb of Web space to each, with links between them.

If you want even more, another free provider has come along. Try this for a massive 100Mb Web site! **www.free-online.net** There is a slight catch to this one. Apparently, you are not allowed to access E-mail servers of other ISPs, plus your mail might have adverts on it.

Peter G0GSZ has let me know of yet another new Internet provider. This one is **Software Warehouse**. I have just taken a look and it looks really good.

With the standard package, you can have 10Mb of Web space and with the Gold version - also free - you can have 50Mb of Web space. The URL for this one is: **www.software-warehouse.co.uk** When you go there you'll see an icon on the right that will let you go to the softnetFREE site. Look under frequently asked questions (FQAs) and you'll find all the details.

The site appears as in **Fig. 2**. I am now waiting for the first one to pay me say, £1000 per annum for using their site! Seriously though, this will put lots of pressure on other providers, like AOL, who still charge a lot of money per month! I can't see many users staying with them! I am still waiting to be told which telephone company is allowing Internet access for 1p for the whole weekend.

QUARTERLY RAIBC MAGAZINE

The **Radio Amateur Invalid and Blind Club (RAIBC)** produce a very nice quarterly magazine called ***RADIAL***. The editor is **Peter Hunter G0GSZ**. Peter used to write the 'Bits and Bytes' computer column in *PW* several years ago. He is very active on Packet and also the Internet and the RAIBC have their own Web site, also written and produced by Peter. You are most welcome to visit the site at **www.gurney.co.uk/raibc**

Peter is shown in his shack in **Fig. 3** - and his new antenna system, for access to GB7LDI is shown in **Fig. 4**. If you would like to join and new members are always welcome, please send Peter an E-mail to: **peter@g0gsz.freeserve.co.uk**

THAT'S ALL FOR THIS MONTH. INCIDENTALLY, FREESERVE HAPPENS TO BE MY ISP NOW! I HAVE CHANGED AND MY NEW E-MAIL ADDRESS IS: rcooke@g3ldi.freeserve.co.uk I KNOW I SHALL BE INUNDATED WITH OFFERINGS FOR THE COLUMN - SO, KEEP 'EM COMING!

73 Roger G3LDI

FOCAL POINT

REPORTS & INFORMATION TO:

GRAHAM HANKINS G8EMX
11 COTTESBROOK ROAD
ACOCKS GREEN
BIRMINGHAM
B27 6LE

E-MAIL:
graham@ghank.demon.co.uk

PACKET: G8EMX@GB7SOL

THIS MONTH GRAHAM HANKINS G8EMX ILLUSTRATES THE ADVANTAGES OF DIGITAL TV WHICH HE SAYS "... BRINGS BETTER PICTURE AND SOUND QUALITY ..." AND DISCUSSES THE QUESTIONS IT RAISES IN THE WORLD OF AMATEUR TV.

Digital Television has arrived! The recent launches of broadcast satellite and terrestrial channels signalled the biggest advance for professional television since the arrival of colour TV.

Achieving broadcast digital TV systems has not been easy. Substantial compression techniques are used – based on the fact that a TV picture contains lots of redundant information anyway. This, together with the power, speed and price of current computing electronics – particularly at the viewer's end – have made digital TV not just possible, but viable.

BETTER QUALITY VIEWING

Digital TV brings better picture and sound quality, interactivity and more channels within the available radio spectrum - and it is this latter capability which is particularly relevant within the world of Amateur TV.

So, can Amateur TV 'go digital'? This question is particularly pertinent for ATV on 70cm (432–440MHz), where amplitude-modulation continues, producing a vision transmission generally of around 6MHz total bandwidth (ATV stations are encouraged not to use colour on 70cm).

A possible way of achieving a digital ATV transmission, at a price that may be within the amateur's budget, is mentioned in the **November 1998** edition of ***CQ-TV***, the magazine of the **British Amateur TV Club (BATC)**.

Headed "MPEG2 Encoder for Home Video Storage", the *CQ-TV* article describes a new chip from **Philips Semiconductors** - the **SAA6750H**. This integrated circuit (i.c.) has been designed to digitise and compress the output from analogue home videotape for storage on a computer hard disc, or the various forms of compact disc, so it would certainly appear to offer possible uses in ATV.

At the end of the article, **Ian Pawson**, editor of *CQ-TV* writes: "If any members have tried this device, then please share your experiences through *CQ-TV*". Well, you will also hear of any users in 'Focal Point' too! Incidentally, 'MPEG' stands for 'Moving Picture Experts Group', the people who formulated the data compression standards now used for broadcast DTV.

Maybe digital ATV will be displayed at the BATC's 50th Anniversary celebrations and Biennial General Meeting later this year. Plans are already being made for this important occasion, but E-mails from the BATC committee members show that a date and venue have not yet been finalised, although the period between August – September is most likely. Watch for firm details in the June or August 'Focal Point'.

TALKS AROUND THE 'ROUNDTABLE'!

In November, I enjoyed a fascinating trip to **BT Research Laboratories** near Ipswich, at the invitation of **Sam Jewell G4DDK**. The occasion was the Microwave Roundtable and Sam had responded to my offer of ATV talks and asked if I could contribute to the lecture programme.

My 'slot' was the first hour - I normally talk to clubs for around two hours, so had to do some compression of my own! Towards the end of the day, 'door prizes' were being given – I managed to go home with a very nice 24cm (1270MHz) inter-digital ATV filter, just right for the Birmingham 1.3GHz ATV repeater project being built by the **Beacons Repeater Group**.

WHO DARES WINS!

During the month of October the United Kingdom suffered probably the worst bout of wind and heavy rain for many years. However, this did not deter stalwart members of the Beacons Repeater Group in the West Midlands from making serious efforts to raise the antenna for their 1.3GHz Amateur TV repeater up to a practicable height to hopefully give adequate coverage for tests to begin.

Alan Kendall G6WJJ and myself had already transported two, three metre length, triangular galvanised-steel mast sections onto the site, together with a 20m telescopic pole and a continuous ten metre length of aluminium masting.

So, on one very windy Friday afternoon, Alan and myself were determined to erect both of the heavy triangular sections, we then intended to use the other lengths of mast to take the dual Alford-Slot antenna up to around ten metres above ground level and clear of a nearby tall structure.

The first three metre mast was easily secured at ground level and to the radio hut which would house the electronics. The tricky bit was to lift the other heavy mast onto the top of the first one, in weather that was now worsening towards a near-gale. Could we, should we, dare we attempt it?

Who dares, wins - well, sometimes! Would we win? The decision was to 'go for it' - this was much more exciting than in the calm of high summer and it was Alan who would be doing the lifting!

So, with me providing vertical support from the top platform of a scaffold tower, Alan was on the roof of the hut, lifting and sliding. The moment that bolt-hole matched with bolt-hole, the masts were clamped together and this part of the job was done.

With six metres of sturdy mast now secure, foot-holds built into the sections enabled Alan to climb up the outside of the mast and raise the antenna, which was attached to the ten metre pole. The antenna was now held as far aloft as was considered prudent until guy wires were available. The next stage is to go up to the site with a transmitter and receiver and carry out r.f. tests. Hopefully, the results of this will appear in the next 'Focal Point'.

MAST PARTY!

The **Kent Television Group (KTG)** has also been climbing up high masts! The Group has sent me a newsletter which carries pictures of chairman **Andy Parnell G8SUY** and secretary **Chris Gibbs G8GHH** during the Mast Party which gave a greater height to the antennas for Isle of Sheppey 1.3GHz ATV repeater GB3KT.

Chris was working at the top of the ten metre triangular mast section securing the antenna pole, with Andy working at ground level.

The operation has raised the receive Alford-Slot antenna to approximately 18m above ground (this is converting the newsletter's imperial measurement into metric), with the transmit slot "slightly higher than it was", says the newsletter report.

CHEERIO FOR NOW AND THANKS FOR THE CONTINUING INVITES TO GIVE CLUB TALKS. MY CONTACT DETAILS REMAIN AS AT THE TOP OF THIS COLUMN.

73 AND PS UNTIL APRIL!

Graham G8EMX

BROADCAST

REPORTS AND INFORMATION TO ME PLEASE.

PETER SHORE
C/O PW EDITORIAL OFFICES
ARROWSMITH COURT
STATION APPROACH
BROADSTONE
DORSET
BH18 8PW

E-MAIL:
petershore@pwpublishing.ltd.uk

THIS MONTH, PETER SHORE REPORTS ON THE HFCC FREQUENCY SCHEDULE WHICH IS NOW PUBLISHED ON THE WORLD-WIDE WEB. HE ALSO BRINGS NEWS FROM A RETIRED BROADCASTING ENGINEER IN SOUTH WALES!

The Internet is growing almost daily in its role as an invaluable information source. The latest example is the publication of the entire **HFCC frequency schedule** at **http://europe.hfcc.org** The HFCC is the grouping of the world's short wave broadcasters who come together twice a year to plan the biannual frequency schedules.

The HFCC grew out of the regular frequency co-ordination meetings run by the **BBC, Radio France, VoA, RFE/RL, Radio Netherlands** and **Deutsche**

GRAHAM G8EMX ASKS: "CAN AMATEUR TV 'GO DIGITAL'?"

RadioScene

PETER SHORE BRINGS MORE NEWS AND VIEWS FROM THE HF BROADCAST BANDS

Welle which ensured a sensible approach to frequency use and sharing. The objective was to ensure that the western broadcasters did not transmit on the same frequencies at the same time and so unintentionally drown each other out.

Today the membership has increased to include a majority of the broadcasters in western Europe, plus all the former Soviet bloc countries and the US and Canada. In total, more than 40 countries are represented in the HFCC.

The next HFCC meeting takes place this month to discuss the summer schedule period. It is a tribute to the organisation - chaired by **Oldrich Cip** of **Radio Prague** - that we enjoy such easy listening compared to the days of Cold War broadcasting and jamming.

The HFCC Internet site is run by Nexus-IBA, the Milan-based transmitting station that operates **IRRS**. This carries programmes from a variety of smaller broadcasters to Europe, North Africa and the Middle East on short wave.

The current schedule for IRRS is: 0300-0600 on Saturday and Sunday on 7.12MHz in Russian and English; 0600-0730 daily on 3.985MHz in English and Italian; 0730-0830 on Saturday and Sunday on 3.958MHz in English and Russian; 0830-1300 on Saturday and Sunday on 7.12MHz in English, French, Spanish and German; 1800-2300 daily on 3.985MHz in English, Spanish, Italian, French, Russian and German. IRRS can be contacted by mail at **PO Box 11028, 20110 Milan, Italy**.

NEW ADDRESS FOR RVI

Radio Vlaanderen Internationaal has a brand new address - although their programme guide doesn't reflect this! To contact the station, simply write to **Brussels Calling, 1043 Brussels, Belgium**.

The RVI service is on the air with English to Europe at: 0830 on 9.925 and 9.94MHz plus 1512kHz; 1130 on 9.925 and 13.745MHz plus 1512kHz; 1730 on 5.91, 12.08 and 13.65MHz; 1830 on 13.745MHz plus 1512kHz; 2100 on 1512kHz; 2230 on 13.67MHz and 1512kHz.

Fig. 1; Frequency engineers at the last HFCC in Warsaw, September 1998.

THE WILD WALES!

Wyn Mainwaring GW8WNT in Carms, South Wales, wrote to me with greetings from "Wild Wales, where we are slowly drying out after our *El Niño* flooding - troops out, fire engines acting as taxies and sandbags by the thousand ... as monitored by us on 87.5MHz f.m. (our Sangean's broadcast bandwidth enabling us to 'listen-in' to the three semi-local depots of the Road Gangs. Most interesting"!

Wyn tells me that he is a former broadcasting engineer who has worked at both Rampisham (nowadays the Merlin Communications short wave site in Dorset) and another transmitter whose code letters of WA defeat me at the moment! Wyn bemoans the fact that Auntie Beeb has done away with so much of its past, "scrapping beautiful 100kW transmitters and putting Portakabins, crammed full of mainly solid state gear, at the foot of every mast". As a result, Wyn suggests, "standards have inevitably slid downwards".

Well, Wyn, I suppose that progress is impossible to stop. Having recently visited the Sutton Coldfield transmitting station - operated now by Castle Transmission - where there is traditional analogue radio and TV transmitting equipment as well as the new digital radio and digital terrestrial TV transmitters, I think all these advances are quite amazing. This is brought home when you realise that the digital terrestrial television transmitters can send out a multiplex of six TV channels using less than a quarter of the power of the analogue senders and yet achieve coverage on the same geographic scale.

Wyn is a long-standing listener to RVI on 1512kHz and perked up at my mention of the Belgian VT4 station trying to use the Orfordness medium wave transmitter on 1296kHz. He sees no problem here, considering that the Voice of America has, for years, commandeered the Ludlow transmitters (Woofferton is the station name) and that Japan has been hiring time on former BBC transceivers.

There is no more news about the potential use of the medium wave transmitter at Orfordness for foreign stations, so it may be that the transmitter's owner, Merlin Communications, has not gained permission from the UK Radiocommunications Agency to use this UK frequency for a Belgian-based station.

Concluding his letter, Wyn says that he and his wife Eileen enjoyed a lovely welcome at **Manx Radio** in April last year when they were shown around by the 'Chief' (presumably Chief Engineer) who was justifiably proud of their 24 hour operation with just 30 staff and four transmitters - three f.m. and one m.f. This proves that broadcasters do - even in this fiercely commercial world - like visits from enthusiasts. So, if you get the chance, ask nicely and maybe you'll get a similar opportunity to Wyn and Eileen's. Thanks for your letter, Wyn.

More changes at the top in international radio. Following Sam Younger's surprising and sudden departure from **BBC World Service** (Younger has now taken up a new post as Director-General of the British Red Cross), Carla Ferrari, Director of **Swiss Radio International**, has resigned. Mrs Ferrari took the top job at Switzerland's external broadcaster in January last year and is reported to have stepped down because of the Swiss Broadcasting Corporation's failure to provide additional funds for a new international television service.

NEW UNITED NATIONS SHORT WAVE SERVICE

The **United Nations (UN)** has been reported as about to launch a new short wave service for its international radio service. The Deutsche Telekom transmitters at Jülich had been identified for transmitting programmes to Europe and Africa and I understand that Merlin Communications in the UK and some Russian short wave stations were also to be used. The transmissions from Germany were scheduled to start in October, but did not appear on the broadcast bands.

I understand that the UN Media Division - which is in charge of radio, press, television and the Internet - has a new Director and he is re-evaluating the way the UN uses all these means of getting information around the world. He believes that the short wave options are too expensive for the results and listening audience they are likely to give, so for the time being, the plans for short wave are on hold. More news as I get it!

Finally, news of the latest US-sponsored super station. **Radio Free Iraq** opened for business on 30th October beaming programmes in Arabic from studios in Prague via transmitters in Russia, Germany and the UK.

The station is on the air at 0300UTC daily on 5.965, 7.11, 7.275 and 9.74MHz and then again at 1600UTC on 6.13, 9.54 and 11.915MHz. For the latest information about Radio Free Iraq, you can check out the Internet site at **www.rferl.org**

If the Web address looks as though it belongs to another station - you're right. Radio Free Iraq is part of **Radios Free Europe** and **Liberty**, originating in the same studios in Prague as RFE/RL. Because of this connection, Iran has recalled its envoy from the Czech Republic, as RFE/RL has now launched a Persian service targeting Iran.

WATCH OUT FOR LOTS OF DEVELOPMENTS AS THE YEAR PROGRESSES ON THIS AND OTHER FRONTS - AND OF COURSE, YOU'LL ALWAYS FIND THE LATEST AND MOST RELIABLE NEWS HERE IN PW. UNTIL NEXT MONTH, GOOD LISTENING!

73 Peter

DON'T MISS OUT

SUBSCRIBE TO PRACTICAL WIRELESS TODAY!

If you're an avid reader of the UK's only independent Amateur Radio magazine, you might like to consider taking out a subscription.

Take out a subscription this month and you can be sure that you will be one of the first to get the FREE *PW* INTERNATIONAL CALLSIGN PREFIX GUIDE sponsored by ICOM.

(Free with the March 1999 issue of Practical Wireless).

You would also get the extra benefits of :

- Seeing your copy before it gets to the Newsagents!
- Ensuring that you're right up-to-date with all the latest news and reviews!
- Making sure that you don't miss out on the best Amateur Radio features in print!
- Having *PW* delivered direct to your door every month!
- Protecting yourself against cover price rises for the duration of your subscription period!

So, what are you waiting for? - Don't delay, make sure you don't miss out on your radio reading - Order your subscription today!

Subscription Rates:	
1 Year	
£25	UK
£30	Europe
£32	Rest of World Airsaver
£37	Rest of World Airmail

PW

To order your subscription please use the Order form on page 82 of this issue or call the Credit Card Hotline on (01202) 659930 and quote Subs 2.

Classified Ads

To advertise on this page see booking form.

Whilst prices of goods shown in advertisements are correct at the time of going to press, readers are advised to check both prices and availability of goods with the advertiser before ordering from non-current issues of the magazine.

Valves

VALVES GALORE Most valves available from stock. Otherwise obtained quickly. Please send SAE stating requirements or telephone. **VALVE & ELECTRONIC SUPPLIES** Chevet Books, 157 Dickson Road, Blackpool FY1 2EU.
Tel: (01253) 751858 or Fax: (01253) 302979.

VALVES:- OVER 50000 STOCKED Ham, Vintage, Military, Audio. SAE for FREE list to: Wilson Valves, (Jim Fish G4MH), 28 Banks Ave., Golcar, Huddersfield, West Yorks HD7 4LZ.
Tel: 01484 654650. Fax: 01484 655699.
E-mail: wilsonvalves@surflink.co.uk
Visa etc. Fast & personal service.

CASH FOR VALVES. ECC32 £10. ECC33/35 £6. ECC83/EF86 £3.50. KT66 £35. KT88 £55. EL34 £20. EL37 £18. PX4 £70. PX25 £130. GZ34 £8. GZ32 £8. DA100 £150. 4212E £150. PT15 £10.
Ask for free wanted list.
Colomor (Electronics) Ltd, Unit 5, Huffwood Trading Estate, Bookers Road, Billinghurst, W. Sussex RH14 9RZ.
Tel: 01403 786559. Fax: 01403 786560.
E-mail: giacomelli@colomor.demon.co.uk

TOP PRICES PAID
for all your valves, tubes, semi-conductors and ICs.
Langrex Supplies Ltd.
1 Mayo Road, Croydon
Surrey CR0 2QP.
TEL: 0181-684 1166. FAX: 0181-684 3056.

DISCLAIMER
Some of the products offered for sale in advertisements in this magazine may have been obtained from abroad or from unauthorised sources. *Practical Wireless* advises readers contemplating mail order to enquire whether the products are suitable for use in the UK and have full after-sales back-up available. The publishers of *Practical Wireless* wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.

For Sale

QUARTZ CRYSTALS 4kH-300MHz FM £1.50. Ceramic, SAW filters. TTL oscillators FM £2.50. New 16 page list.
Q Electronic Design.
Tel: 0181-391 0545.
Fax: 0181-391 5258.

TECHNICAL MANUALS, AR88, CR100, R210, HRO. £5 each. Circuits £1.50. Hundreds available. SAE list. Bentley, 27 De Vere Gardens, Ilford, Essex IG1 3EB. Tel: 0181-554 6631.

THE UK's LARGEST SOURCE for Vintage Service data, circuits and manuals from 1900 to the 1970s. Free brochure from Tudor Gwilliam-Rees, Savoy Hill Publications, 50 Meddon St, Bideford, The Little White Town, North Devon, EX39 2EQ. Tel: 01237 424280.
E-mail: tudor.gwilliam-rees@virgin.net
Visa & Mastercard accepted.

WE BUY & SELL HAM GEAR New and used amateur equipment bought and sold, PX welcome. Ring Dave G3RCQ the gentleman dealer on: showroom (01708) 374043 or office 0956 854947.
Open 7 days 9am-10pm. 9 Troopers Drive, Harold Hill, Romford, Essex RM3 9DE.

THE RF-KIT CATALOGUE. send 2x 2nd class stamps or browse www.rf-kits.demon.co.uk
Hands Electronics, Tegryn, Llanfyrnach, Pembs SA35 OBL. Tel 01239 698427.

Computer Software & Hardware

PC-AMIGA SSTV-PACKET Tx/Rx interfaces from £28.50. SAE leaflets, demodisk £1. Peter Lockwood G8SLB, 36 Davington Road, Dagenham, RM8 2LR.
Tel: 0181-595 0823
http://www.angelfire.com/ok/g8slb

Wanted

WANTED FOR CASH Valve or solid state communication receivers Pre-1980. Preferably working and in good condition. Non working sets considered also domestic valve radios. Items of Government surplus wireless equipment and obsolete test equipment. Pre-1965 wireless and audio components and accessories. Pre-1975 wireless and TV books and magazines. Also, most valves wanted for cash. Must be unused and boxed. CBS, 157 Dickson Road, Blackpool, FY1 2EU. Tel: (01253) 751858 or Fax: (01253) 302979.

Miscellaneous

VALVE ENTHUSIASTS: Capacitors and other parts at attractive prices! Ring for free list. Geoff Davies (Radio), Tel: (01788) 574774.

HEATHKIT UK DISTRIBUTOR Heathkit spare, service and educational products. Cedar Electronics, 12 Isbourne Way, Broadway Road, Winchcombe, Cheltenham, Glos GL54 5NS. Tel: (01242) 602402.

SHORT WAVE BROADCASTERS you can monitor reception in the target area: **Government agencies** you can control MF/HF receivers or transceivers worldwide from your tone phone using **Radphone 200DX** from **www.pca.cc**
Tel: +61-2-98889777 Fax: +61-2-98050253.

Holidays

NORTH WALES HOLIDAYS – Caravan - bunkhouse - camping. Elevated rural site, two miles from beach, use of shack and antennas, open all year. Tynrhos, Mynytho, Pwllheli.
Tel: 01758 740712.
Packet address:
GW4VAG@GB7BAY#55.GBR.EU

ORDER FORM FOR CLASSIFIED ADS

Please photocopy this form if you prefer

PLEASE WRITE IN BLOCK CAPITALS

The prepaid rate for classified advertisements is 42 pence per word (minimum 12 words), box number 70p extra. Semi-display setting £13.90 per single column centimetre (minimum 3cm). Please add 17.5% VAT to the total. All cheques, postal orders, etc., to be made payable to PW Publishing Ltd. Advertisements, together with remittance, should be sent to the Classified Advertisement Dept., Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel: (01202) 659920, Fax: (01202) 659950

Please insert this advertisement in the ..... issue of Practical Wireless (If you do not specify an issue we will insert it in the next available issue of PW) for ..... insertion/s. I enclose Cheque/P.O. for £..... (42p per word, 12 minimum, please add 17.5% VAT to total).

Name: .....

Address: .....

.....

.....

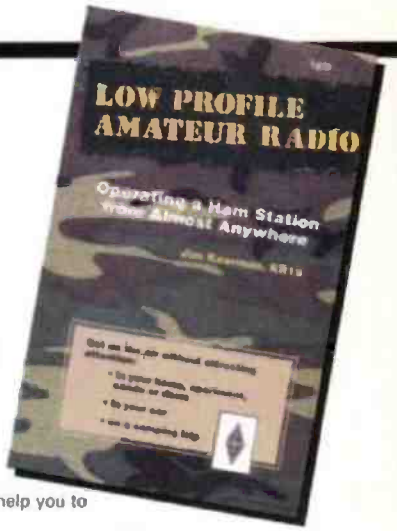
Telephone No.: .....

Box Number @ 70p: Tick if appropriate ☐

Category heading: .....

The books listed have been selected as being of special interest to our readers. They are supplied direct to your door. Many titles are overseas in origin.

Book Store



Low Profile Amateur Radio

Our 'Book Of The Month' this month will no doubt prove to be an invaluable book to most Amateur Radio enthusiasts. *Low Profile Amateur Radio* carries the sub-title: 'Operating a "Ham" Station From Almost Anywhere' and claims to help the Radio Amateur to get on the air "... without attracting attention: in your home, apartment, condo or dorm; in your car or on a camping trip".

Written by **Jim Kearman KR1S** the book is published by the **American Radio Relay League (ARRL)** which almost guarantees that it will have something of interest for all you Radio Amateurs. If you would like to be a less conspicuous operator, then this book claims to be able to help you to set up and operate an amateur station without attracting attention!

Normally, this book retails at £7.50, but our special offer this month is **£6 including P&P (UK), plus £1 P&P for overseas delivery**. So, why not order a copy today?

Offer closes 28th February.

To order please either use the form on page 82 or call the Credit Card Hotline on (01202) 659930 and quote PW2.

LISTENING GUIDES

Airband

	Pages	Price
AIR BAND RADIO HANDBOOK 6th Edition. David J. Smith.	192	£9.99
AIRCRAFT RADIO FREQUENCIES & GUIDE BOOK 2nd Edition	96	£5.99
AIR TRAFFIC CONTROL 7th Edition. Graham Duke.	112	£8.99
AIRWAVES 98.	134	£8.95
CALLSIGN 98.	156	£8.95
CIVIL AIRLINER RECOGNITION. 5th Edition. Peter R. March.	128	£8.99
FLIGHT ROUTINGS 1998. Williams	160	£8.95
INTERNATIONAL AIR BAND RADIO HANDBOOK. David J. Smith.	192	£9.99
UNDERSTANDING ACARS 3rd Edition. Aircraft Communications Addressing and Reporting System. Ed Flynn	80	£9.95
VHF/UHF AIRBAND FREQUENCY & CALLSIGN GUIDE. July 1998 Edition	288	£12.50
WORLDWIDE AERONAUTICAL COMMUNICATIONS FREQUENCY DIRECTORY 2nd Edition. Robert E. Evans	260	£19.95

Datamodes

	Pages	Price
FAX & RTTY WEATHER REPORTS. Philip Mitchell	88	£11.50
GUIDE TO UTILITY STATIONS 1999. 17th Edition. Joerg Klingenfuss	580	£30.00
GUIDE TO WORLDWIDE WEATHERFAX SERVICES. 16th Edition Joerg Klingenfuss	436	£23.00
WEATHER REPORTS FROM RADIO SOURCES. Philip Mitchell	32	£7.50
RADIO DATA CODE MANUAL. 16th Edition. Joerg Klingenfuss	788	£30.00

DXTV

	Pages	Price
DXTV FOR BEGINNERS. Simon Hamer	31	£3.95
GUIDE TO DX-TV. Keith Hamer & Garry Smith.	36	£3.95
GUIDE TO WORLDWIDE TV TEST CARDS	60	£4.95
MASTS - PRACTICAL IDEAS FOR THE DXER. Hamer/Smith	36	£4.95
THIS IS BBC TV - FIRST 30YRS OF TV GRAPHICS. Keith Hamer & Garry Smith.	38	£4.95
THE FIRST 30 YEARS OF BBC-2. Keith Hamer & Garry Smith	60	£4.95

Frequency Guides

	Pages	Price
1999 SHORTWAVE FREQUENCY GUIDE. Joerg Klingenfuss	584	23.00
1999 SUPER FREQUENCY LIST CD-ROM. Joerg Klingenfuss	n/a	£23.00
FERRELL'S CONFIDENTIAL FREQUENCY LIST NEW 11th Edition.	450	£19.95
GLOBAL RADIO GUIDE 1998	32	3.95
PASSPORT TO WORLD BAND RADIO 1999.	528	£15.50
RSGB IOTA DIRECTORY & YEARBOOK 1998/9 (A4 size)	112	£8.95
SHORTWAVE INTERNATIONAL FREQUENCY GUIDE	176	£12.95
VHF UHF SCANNING FREQUENCY GUIDE. Bill Laver	192	£12.95
WORLD RADIO TV HANDBOOK 1999	640	£19.50

General

	Pages	Price
BUYING A USED SHORT WAVE RECEIVER 3rd Edition (Booklet). F. Osterman	23	£2.95
GETTING ON TRACK WITH APRS. Stan Horzepa WA1LOU	165	£11.50
POP WENT THE PIRATES. Keith Skues	288	£15.95
RADIO SCIENCE OBSERVATION Volume 1 (inc. CD-Rom). Joe Carr	414	£26.95
SHORT WAVE COMMUNICATIONS. Peter Rouse GU1DKD.	187	£4.50
SHORT WAVE RADIO LISTENING FOR BEGINNERS	174	£13.95
SHORTWAVE RECEIVERS PAST & PRESENT (NEW 3rd Edition)	450	£25.95
SHORTWAVE LISTENER'S GUIDE. Ian Poole	192	£14.99
THE COMPLETE SHORT WAVE LISTENER'S HANDBOOK New 5th Edition Andrew Yoder	410	£19.95

Marine

	Pages	Price
DIARY OF A MARITIME RADIO OFFICER. Ross Bradshaw	230	£12.95
ELECTRONICS AFLOAT. Tim Bartlett	82	£11.95
GMDSS EDITIONS MARINE SSB OPERATION. Michael Gale	98	£11.95
GMDSS EDITIONS MARINE VHF OPERATION. Michael Gale	48	£7.95
GMDSS FOR SMALL CRAFT. Alan Clemmetsen	94	£11.95
SHORTWAVE MARITIME COMMUNICATIONS. B. E. Richardson	195	£16.50
SHIP TO SHORE RADIO FREQUENCIES. Ken Davies.	36	£5.99
SIMPLE ELECTRONIC NAVIGATION. 2nd Edition. Mike Chenery	64	£8.95
SIMPLE GPS NAVIGATION. Mik Chinery	96	£10.95
WATCHERS OF THE WAVES. Brian Faulkner	116	£13.50

Satellite

	Pages	Price
AN INTRODUCTION TO SATELLITE COMMUNICATIONS BP326 F. A. Wilson	200	£5.95
ARRL SATELLITE ANTHOLOGY 4th Edition.	150	£9.50
NEWNES GUIDE TO SATELLITE TV. Derek Stephenson	371	£18.95
SATELLITE HANDBOOK (ARRL) New Edition Martin Davidoff K2UBC	370	£15.50
SATELLITE PROJECTS HANDBOOK. Lawrence Harris	174	£14.99
SATELLITE TELEVISION. A layman's guide. Peter Pearson	73	£1.00
SATELLITE TELEVISION INSTALLATION GUIDE. 5th Edition. John Breeds	76	£15.00
WEATHER SATELLITE HANDBOOK. 5th Edition. Dr Ralph E. Taggart WB8DQT	192	£15.50

Scanning

	Pages	Price
AN INTRODUCTION TO SCANNERS AND SCANNING BP311. I. D. Poole.	152	£4.99
SCAN 98 (PWP)	48	£3.95
SCANNER BUSTERS 2. D.C. Poole.	100	£8.00
SCANNERS 2 INTERNATIONAL. Peter Rouse GU1DKD.	201	£10.95
SCANNERS 3 PUTTING SCANNERS INTO PRACTICE. 4th Revision. Peter Rouse.	271	£10.95
SCANNING SECRETS. Mark Francis	280	£16.95
UK SCANNING DIRECTORY 6th Edition.	540	£18.50

AMATEUR RADIO

Amateur Television

	Pages	Price
AN INTRODUCTION TO AMATEUR TELEVISION. Mike Wooding G6IQM & Trevor Brown G8CJS.	156	£5.00
SLOW SCAN TELEVISION EXPLAINED. Mike Wooding G6IQM.	156	£5.00
THE AMATEUR TV COMPENDIUM. Mike Wooding G6IQM	104	£3.50

Antennas & Transmission Lines

	Pages	Price
25 SIMPLE AMATEUR BAND AERIALS BP125. F.M. Noll.	83	£1.95
25 SIMPLE INDOOR AND WINDOW AERIALS BP136. F.M. Noll.	80	£1.75
25 SIMPLE SHORT WAVE BROADCAST BAND AERIALS BP132. F.M. Noll.	83	£1.95
25 SIMPLE TROPICAL AND MW BAND AERIALS BP148. F.M. Noll.	84	£1.75
ANTENNA EXPERIMENTERS GUIDE (RSGB). Peter Dodd G3LDO.	160	£15.00
ANTENNA IMPEDANCE MATCHING (ARRL). Wilfred N. Caron.	195	£15.50
ANTENNAS FOR VHF AND UHF BP301. I.D. Poole	104	£4.95
ANTENNAS & TECHNIQUES FOR LOW BAND DXING (ARRL)	394	£15.50
ANTENNA TOOLKIT (inc. CD-ROM). Joseph J. Carr.	214	£25.00
ARRL ANTENNA BOOK 18th Edition	732	£24.00
ARRL ANTENNA COMPENDIUM Volume One.	175	£10.50
ARRL ANTENNA COMPENDIUM Volume Two.	208	£10.50
ARRL ANTENNA COMPENDIUM Volume Three. Edited by Jerry Hall K1TD.	236	£11.50
ARRL ANTENNA COMPENDIUM Volume Four.	204	£16.50
ARRL ANTENNA COMPENDIUM Volume Five.	200	£16.50
BEAM ANTENNA HANDBOOK. W.I. Orr W6SAI & S.D. Cowan W2LX.	288	£8.95
BUILDING & USING BALUNS. Jerry Sevick.	125	£18.95
CUBICAL QUAD ANTENNAS 3rd Edition. William Orr W6SAI and Stuart Cowan W2LX.	110	£8.95
EXPERIMENTAL ANTENNA TOPICS BP278. H.C. Wright	70	£3.50
G-QRP CLUB ANTENNA HANDBOOK. Compiled and edited by P. Linsley G3PDL & T. Nicholson KA9WRL/GW0LNQ.	158	£7.25
HF ANTENNA COLLECTION (RSGB). Edited by Erwin David G4LQI.	233	£10.99
HF ANTENNAS FOR ALL LOCATIONS (RSGB). Les Moxon G6XN.	322	£14.85
MORE OUT OF THIN AIR (PWP)	112	£6.95
PRACTICAL ANTENNAS FOR NOVICES. John Heys G3BDQ	52	£6.30
PRACTICAL ANTENNA HANDBOOK 3rd Edition. (inc. software) Joseph J. Carr.	500	£32.45
PRACTICAL WIRE ANTENNAS RSGB. John Heys G3BDQ	100	£8.95
RADIO AMATEUR ANTENNA HANDBOOK. W.I. Orr W6SAI & S.D. Cowan W2LX.	188	£8.50
RECEIVING ANTENNA HANDBOOK. Joe Carr.	189	£17.50
SIMPLE, LOW-COST WIRE ANTENNAS FOR RADIO AMATEURS. W.I. Orr W6SAI & S.D. Cowan W2LX.	168	£8.95
VERTICAL ANTENNAS. W.I. Orr W6SAI & S.D. Cowan W2LX.	192	£8.95
W1FB'S ANTENNA NOTEBOOK (ARRL). Doug DeMaw W1FB	123	£8.00

Beginners (inc RAE)

	Pages	Price
AN INTRODUCTION TO AMATEUR RADIO - New Edition. Ian Poole G3YWX.	150	£4.99
BASIC RADIO PRINCIPLES & TECHNOLOGY. Ian Poole G3YWX	262	£14.99
BASIC RADIO & ELECTRONIC CALCULATIONS. Ray Petri G0OAT	160	£13.95
AN RAE STUDENTS NOTEBOOK. Bob Griffiths G7NHB	76	£6.95
HOW TO PASS THE RADIO AMATEURS' EXAMINATION (RSGB) Clive Smith G4FZH and George Benbow G3HB	88	£8.75
NOW WE'RE TALKING (ARRL)	144	£15.50
PRACTICAL RECEIVERS FOR BEGINNERS (RSGB). John Case GW4HWR	165	£12.50
THE NOVICE RADIO AMATEURS EXAMINATION HANDBOOK (BP375) Ian Poole G3YWX	150	£4.95
THE RADIO AMATEURS' QUESTION & ANSWER REFERENCE MANUAL. Fifth Edition. Ray Petri G0OAT.	208	£13.95
RADIO AMATEURS EXAMINATION END OF COURSE TEST PAPERS. Ray Petri G0OAT.	104	£13.95
RAE MANUAL (RSGB). New Revised Edition. G.L. Benbow G3HB	127	£12.75
RAE REVISION NOTES (RSGB). G.L. Benbow G3HB	92	£5.25
THE NOVICE LICENCE STUDENT'S NOTEBOOK. John Case GW4HWR	124	£5.00
SHORTWAVE RADIO LISTENING FOR BEGINNERS. Anita Louise McCormick KA8KGI	176	£13.95
TRAINING FOR THE NOVICE LICENCE A MANUAL FOR THE INSTRUCTOR (RSGB) John Case GW4HWR	101	£6.75
W1FB'S HELP FOR NEW HAMS (ARRL). Doug DeMaw W1FB	155	£8.95
YOUR FIRST AMATEUR STATION. (RSGB) Colin Redwood G6MXL	120	£9.75

	Pages	Price
Callbooks		
JOINT INT'N AMERICAN CALLBOOK CD-ROM	n/a	£40.00
RSGB CALLSEEKER CD-ROM 1999	n/a	£14.50
RSGB YEARBOOK 1999 EDITION	432	£14.50
Computing		
AN INTRODUCTION TO THE WORLDWIDE WEB FOR PC AND MAC USERS. (BP390) D.C & O. Bishop	148	£6.99
ELECTRONIC PROJECTS FOR YOUR PC BP320. R.A.Penfold.	102	£3.99
E-MAIL ON THE INTERNET. BP420	156	£6.99
GETTING THE MOST FROM YOUR PC HARD DISK BP280	80	£3.95
HOW TO EXPAND, MODERNISE AND REPAIR PCs AND COMPATIBLES BP271 R. A. Penfold	166	£ 5.99
INTERFACING PCs AND COMPATIBLES BP272. R. A. Penfold	86	£4.99
MS OFFICE ONE STEP AT A TIME (BP402)	77	£5.95
MS WORKS FOR WINDOWS 95 EXPLAINED BP405	175	£5.95
NEWNES COMPUTER ENGINEER'S POCKET BOOK Third Edition. Michael Tooley	256	£12.95
PERSONAL COMPUTERS IN THE HAM SHACK (ARRL)	284	£11.50
THE INTERNET AND WORLD WIDE WEB EXPLAINED. J. Shelley	130	£5.95
WINDOWS '98 ASSISTANT (BP454) I. Sinclair	160	£6.99
WINDOWS '98 EXPLAINED (BP456). N. Kantaris & P. Oliver	160	£6.99
WINDOWS '98 - HAND DISK & FILE MANAGEMENT. (BP455) J. Gatenby	160	£6.99
EMC		
INTERFERENCE HANDBOOK. William R. Nelson WA6FQG	250	£9.50
THE RADIO AMATEUR'S GUIDE TO EMC (RSGB). Robin Page-Jones G3JWI	117	£8.95
Historical		
1934 OFFICIAL SHORT WAVE RADIO MANUAL. Edited by Hugo Gernsback	260	£11.85
OLD TIME RADIOS - RESTORATION & REPAIR. J. Carr	256	£19.95
COMMUNICATIONS RECEIVERS - THE VACUUM TUBE ERA. R.S. Moore	141	£17.95
CRYSTAL SET BUILDING & MORE (Inc Newsletters Vol 6 & 7 of Xtal Set Society)	98	£11.00
CRYSTAL SET PROJECTS. Phil Anderson	160	£10.00
DOUBLE TESLA-OUDIN COIL	24	£3.95
EXPERIMENTAL TELEVISION (1932)	312	£11.75
HEATHKIT - A GUIDE TO AMATEUR RADIO PROJECTS. C. Penson	248	£21.95
HENLEYS 222 RADIO CIRCUIT DIAGRAMS (1924)	271	£9.45
HOW TO BUILD YOUR RADIO RECEIVER (A4) (Popular Radio Handbook No. 1)	100	£6.95
RADIO TESLA - THE SECRET'S OF TESLA'S RADIO AND WIRELESS POWER	56	£5.30
SECRETS OF HOMEBUILT REGENERATIVE RECEIVERS (Rockey)	127	£7.95
SEEING BY WIRELESS - THE STORY OF BAIRD TELEVISION. Ray Herbert	27	£4.95
TESLA COIL	24	£3.95
TESLA - THE LOST INVENTIONS	32	£4.75
THE XTAL SET SOCIETY NEWSLETTER. Volume 1 & 2 Combined. Phil Anderson W0XI	96	£14.00
THE CRYSTAL SET HANDBOOK & VOL. 3 XTAL NEWSLETTER. Phil Anderson W0XI	130	£8.00
THE XTAL SET SOCIETY NEWSLETTER. Volume 4. Phil Anderson W0XI	88	£7.00
THE CRYSTAL SET HANDBOOK & VOL. 5 XTAL NEWSLETTER. Phil Anderson W0XI	88	£7.00
THE TESLA HIGH FREQUENCY COIL (1910)	120	£6.95
CRYSTAL RADIO HISTORY, FUNDAMENTALS AND DESIGN, P.A. Kindle	122	£8.00
THOSE GREAT OLD HANDBOOK RECEIVERS (1929 + 1931)	94	£6.95
VISION BY RADIO (1925) (Jenkin)	140	£7.85
WIRELESS FOR THE WARRIOR VOL. 1 (Wireless Sets 1-88)	204	£27.50
WIRELESS FOR THE WARRIOR VOL. 2 (Hardback - Standard Sets of World War II)	430	£36.00
Maps & Log Books		
AMATEUR RADIO LOGBOOK (RSGB)	50	£3.75
AMATEUR RADIO WORLD ATLAS (A4 SIZE)	20	£8.00
NORTH ATLANTIC ROUTE CHART	740 x 520mm	£8.50
QTH LOCATOR MAP OF EUROPE. New Edition	1080 x 680mm	£7.00
RADIO AMATEURS MAP OF THE WORLD. New Edition	980 x 690mm	£7.00
RECEIVING STATION LOG BOOK (RSGB)	60	£3.75
RSGB 1998 PREFIX GUIDE	32	£6.25
Morse		
SECRETS OF LEARNING MORSE CODE Mark Francis	84	£6.95
Microwaves		
AN INTRODUCTION TO MICROWAVES (BP312). F.A. Wilson	134	£3.95
ARRL UHF/MICROWAVE EXPERIMENTER'S MANUAL. Various Authors.	448	£15.50
ARRL UHF/MICROWAVE PROJECT MANUAL VOL 2.	160	£9.50
ARRL UHF/MICROWAVES PROJECT MANUAL (ARRL)	352	£15.50
MICROWAVE HANDBOOK - COMPONENTS & OPERATING VOL 1 (RSGB)	110	£10.50
MICROWAVE HANDBOOK - CONSTRUCTION & TESTING VOL 2 (RSGB)	120	£15.75
MICROWAVE HANDBOOK - BANDS & EQUIPMENT VOL 3 (RSGB)	140	£15.75
OR BUY ALL 3 FOR		£34.00
Operating & Handbooks		
ALL ABOUT HAM RADIO. Harry Helms	290	£16.50
AMATEUR RADIO OPERATING MANUAL (RSGB). Ray Eckersley G4FTJ	249	£12.23
ARRL HANDBOOK 1999 76th Edition	380	£24.00
ARRL HANDBOOK 1998 ON CD-ROM	n/a	£30.00
ARRL OPERATING MANUAL NEW EDITION	420	£18.50
ARRL RADIO BUYERS SOURCEBOOK VOL1 1 (QST Reviews 1981-1991)	280	£11.50
ARRL RADIO BUYERS SOURCEBOOK VOL1 2 (QST Reviews 1991-1993)	240	£11.50
COMPLETE DXER. Bob Locher	204	£9.50
DISCOVERING DXING (2nd Edition). John Zondlo	80	£7.50
HAM RADIO MADE EASY (ARRL). Steve Ford	204	£11.50
HINTS AND KINKS FOR THE RADIO AMATEUR. Edited by Charles L. Hutchinson and David Newkirk	129	£9.50
LOW PROFILE AMATEUR RADIO (ARRL). Jim Kearman KR1S	124	£7.50
SETTING UP AN AMATEUR RADIO STATION BP300. I.D. Poole	81	£3.95
TRANSMITTER HUNTING - RADIO DIRECTION FINDING SIMPLIFIED. Joseph D. Moell & Thomas N. Curlee	325	£23.95
Packet		
HF DIGITAL COMPANION. Steve Ford	120	£7.50
NOS INTRO. TCP/IP OVER PACKET RADIO. Ian Wade G3NRW	356	£11.50
PACKET RADIO PRIMER (RSGB). Dave Comber G8UYZ & Martyn Cerfi G8NZU	286	£8.95
PACKET, SPEED & MORE SPEED APPLICATIONS (ARRL)	148	£10.50
PRACTICAL PACKET RADIO. Stan Horzepa	140	£10.50
YOUR PACKET COMPANION. Steve Ford WB8IMY	170	£7.50
Propagation		
AN INTRODUCTION TO RADIO WAVE PROPAGATION BP293. J.G. Lee	116	£3.95
QRP		
QRP POWER (ARRL)	188	£11.50
G QRP CLUB CIRCUIT HANDBOOK. Edited by Rev. G. Dobbs G3RJV	96	£9.00
INTRODUCING QRP. Dick Pascoe G0BPS	48	£6.95
W1FB's QRP NOTEBOOK (ARRL). 2nd Edition. Doug DeMaw W1FB	176	£8.00

	Pages	Price
Test Equipment		
GETTING THE MOST FROM YOUR MULTIMETER BP239. R.A. Penfold	102	£2.95
HANDS-ON GUIDE TO OSCILLOSCOPES. Barry Ross.	228	£19.95
HOW TO USE OSCILLOSCOPES & OTHER TEST EQUIPMENT BP267. R.A. Penfold	104	£3.50
MORE ADVANCED TEST EQUIPMENT CONSTRUCTION BP249. R.A. Penfold.	102	£3.50
MORE ADVANCED USES OF THE MULTIMETER BP265. R.A. Penfold.	88	£2.95
AN INTRODUCTION TO THE ELECTROMAGNETIC WAVE BP315. F.A. Wilson.	122	£4.95
PRACTICAL TRANSMITTERS FOR NOVICES. John Case GW4HWR.	126	£12.30
TEST EQUIPMENT FOR THE RADIO AMATEUR. Clive Smith G4FZH	170	£10.95
VHF		
ALL ABOUT VHF AMATEUR RADIO. W. I. Orr W6SAI	163	£8.85
VHF/UHF HANDBOOK (RSGB). Dick Biddulph G8PDS	180	£18.75
ELECTRONICS		
BEGINNERS GUIDE TO MODERN ELECTRONIC COMPONENTS BP285	166	£4.99
CIRCUIT SOURCE BOOK 1 - BP321. R.A. Penfold.	182	£4.95
CIRCUIT SOURCE BOOK 2 - BP322. R.A. Penfold.	214	£4.95
DIGITAL ELECTRONICS (CDROM). Mike Tooley	n/a	£45.00
ELECTRONIC PROJECT BUILDING FOR BEGINNERS. R. Penfold. (BP392)	110	£4.95
FAULT FINDING ELECTRONIC PROJECTS BP391	133	£4.99
GETTING STARTED IN PRACTICAL ELECTRONICS BP245. Owen Bishop.	198	£4.95
HOW TO TEST ALMOST EVERYTHING ELECTRONIC	326	£15.95
NEWNES AUDIO AND HI-FI ENGINEER'S POCKET BOOK 3rd Edition. Vivian Capel	210	£12.99
PARTS GALLERY & ELECTRONICS CIRCUITS & COMPONENTS (CDROM). Mike Tooley	n/a	£35.00
PICTUTOR (CDROM). John Decker	n/a	£45.00
POWER SUPPLY PROJECTS BP76. R.A. Penfold.	89	£3.99
PREAMPLIFIER & FILTER CIRCUITS BP309. R.A. Penfold.	92	£3.95
PRACTICAL ELECTRONIC FILTERS BP299. Owen Bishop	89	£4.95
PRACTICAL ELECTRONICS HANDBOOK. Ian Sinclair.	439	£13.95
PRACTICAL OSCILLATOR CIRCUITS BP393. A. Find	136	£4.99
RADIO ENGINEERS FACTFINDER FOR WINDOWS (Floppy Disk) John Davies	n/a	£18.00
SCROGGIES - FOUNDATIONS OF WIRELESS & ELECTRONICS. 11th Edition	292	£19.95
TEST EQUIPMENT CONSTRUCTION BP248. R.A. Penfold.	104	£3.99
THE ART OF SOLDERING BP324. R. Brewster.	84	£3.99
UNDERSTANDING BASIC ELECTRONICS (ARRL)	314	£15.50
UNDERSTANDING DIGITAL TECHNOLOGY. F. Wilson. (BP378)	110	£4.95
VALVE AMPLIFIERS. Morgan Jones	374	£25.00
VALVE & TRANSISTOR AUDIO AMPLIFIERS. John Lindsay Hood	310	19.95
W1FB's DESIGN NOTEBOOK (ARRL). Doug DeMAW W1FB.	195	£8.00
Data		
ARRL ELECTRONICS DATA BOOK. Doug DeMaw W1FB.	280	£8.95
ELECTRONIC HOBBYIST DATA BOOK BP396. R.A. Penfold.	242	£5.95
LF SOURCE BOOK (RSGB) 2nd Edition. Peter Dodd	130	£7.50
PRACTICAL ELECTRONICS CALCULATIONS AND FORMULAE BP53. F.A. Wilson.	249	£3.95
PRACTICAL ELECTRONIC DESIGN DATA BP316. Owen Bishop.	327	£5.99
PRACTICAL RF HANDBOOK (2nd Edition). Ian Hickman	302	£18.95
SECRETS OF RF CIRCUIT DESIGN. Joseph Carr	605	£23.95
SOLID STATE DESIGN FOR THE RADIO AMATEUR (ARRL) Les Hayward W7ZOI & Doug DeMaw W1FB	256	£11.50
SPREAD SPECTRUM SOURCE BOOK	320	£15.50
TOWERS INTERNATIONAL MOSPOWER & OTHER FET SELECTOR	140	£19.95
TOWERS INTERNATIONAL TRANSISTOR SELECTOR - UPDATE 5	476	£24.95
TRANSISTOR DATA TABLES (BP401)	178	£5.99
Projects		
35 OPTO-DISPLAY TERMINAL BLOCK PROJECTS BP140	104	£4.99
BUILD YOUR OWN INTELLIGENT AMATEUR RADIO TRANSCEIVER. Randy L. Henderson	350	£24.95
COIL DESIGN & CONSTRUCTION MANUAL BP160. B.B. Babani	106	£3.95
HOW TO DESIGN & MAKE YOUR OWN PCBs BP121. R.A. Penfold	66	£2.50
MORE ADVANCED POWER SUPPLY PROJECTS BP192. R.A. Penfold	92	£2.95
PROJECTS FOR RADIO AMATEURS & SWLs BP304. R.A. Penfold	92	£3.95
RADIO RECEIVER PROJECTS YOU CAN BUILD	312	£19.95
SIMPLE SHORT WAVE RECEIVER CONSTRUCTION BP275. R.A. Penfold	88	£3.95
Valves/Tubes		
ELECTRON TUBE LOCATOR. George H. Fathauer	350	£21.95
ESSENTIAL CHARACTERISTICS (TUBES & TRANSISTORS) (Original publishers General Electric) Re-published by Antique Electronic Supply (Arizona)	475	£10.50
HANDBOOK OF RADIO, TV, INDUSTRIAL & TRANSMITTING TUBE & VALVE EQUIVALENTS	50	£2.95
RADIO VALVE GUIDE BOOK VOL 1.	84	£2.95
RADIO VALVE GUIDE BOOK VOL 2.	42	£2.95
RADIO VALVE GUIDE BOOK VOL 3.	40	£2.95
RADIO VALVE GUIDE BOOK VOL 4.	48	£2.95
RADIO VALVE GUIDE BOOK VOL 5.	44	£2.95
RCA RECEIVING TUBE MANUAL (Original Publishers Radio Corporation Of America). Re-published by Antique Electronic Supply (Arizona)	384	£10.50
RCA TRANSMITTING TUBES (Original Publisher Radio Corporation of America) Re-published by Antique Electronic Supply (Arizona)	318	£10.50
TUBE SUBSTITUTION HANDBOOK	150	£15.50

Order Form

FOR ALL MAIL ORDER PURCHASES IN *PRACTICAL WIRELESS*

Photocopies of this page are acceptable

Check out our Web Page at:
http://www.pwpublishing.ltd.uk

SUBSCRIPTION RATES

Practical Wireless – 1 year.

- ❑ £25 (UK)
- ❑ £30 (Europe 1st class)
- ❑ £32 (Rest of World Airsaver)
- ❑ £37 (Rest of World Airmail)

Special joint subscription with *Short Wave Magazine* – 1 year.

- ❑ £50 (UK)
- ❑ £59 (Europe Airmail)
- ❑ £63 (Rest of World Airsaver)
- ❑ £74 (Rest of World Airmail)

PLEASE START MY SUBSCRIPTION WITH THE.....ISSUE.

Monitoring Times – 1 year (12 issues).

- ❑ £38 (UK)
- ❑ £43 (Europe Airmail)
- ❑ £49 (Rest of World Airmail)

SPECIAL OFFER

❑ Please send me ..... copies of ***Low Profile Amateur Radio*** **@ £6 including P&P (UK), plus £1 P&P for overseas delivery.**
(Offer open until 28th February 1999).

£.....

Books Please send me the following books

..... £.....

..... £.....

..... £.....

..... £.....

..... £.....

Postal charges:
£1 for one, **£2** for two or more (UK)
£2 per book **or £10** for five books or more items (overseas surface)
£2 per binder (overseas surface)

NEW FASTER NEXT DAY SERVICE (UK MAINLAND ONLY)
£4.50 per parcel (orders must be placed by 12 noon)

GRAND TOTAL ..... £.....

Thankyou for using PW for your purchases.

PAYMENT DETAILS

CREDIT CARD ORDERS TAKEN ON (01202) 659930
between the hours of 9.00am - 5.00pm. Outside these hours your order will be recorded on an answering machine.

FAX ORDERS TAKEN ON (01202) 659950
or please fill in the details ticking the relevant boxes, a photocopy will be acceptable to save you cutting your beloved copy!

To: PW Publishing Ltd., FREEPOST, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW

Name .....

Address .....

.....

..... **Postcode** .....

Telephone number .....

I enclose cheque/PO
Payable to PW Publishing Ltd.) £.....

Charge to my Access/Visa card the sum of £.....

Card number

Valid from ..... to .....

Signature .....

Telephone number .....

Orders are normally despatched by return of post but please allow 28 days for delivery.
Prices correct at time of going to press.

Please note:
ALL PAYMENTS MUST BE MADE IN STERLING. CASH NOT ACCEPTED WITH MAIL ORDER.

CREDIT CARD ORDERS TAKEN ON (01202) 659930
FAX ORDERS TAKEN ON (01202) 659950

Next Month in Practical Wireless, the magazine that brings you Amateur Radio & So Much More

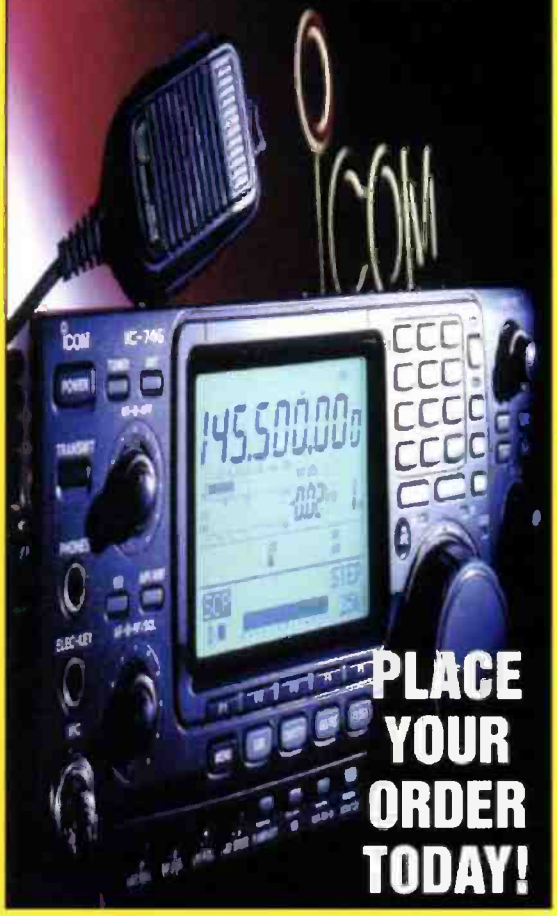
Coming Next Month in PRACTICAL WIRELESS

THE UK'S BEST SELLING INDEPENDENT AMATEUR RADIO MAGAZINE

A FREE GIFT!

Receive your free ***PW*** **International Callsign Prefix Guide!**

(Sponsored by ICOM)



RADIO BASICS

With the completion of the 'Tinny Dipper' project, Rob G3XFD shows you how to use it to modify the 'Radio Basics' converter for 7MHz operation and to improve the 'Quality' factor of home-brewed tuning coils.

REVIEWED!

Tex Swann G1TEX reviews the Super Searcher Frequency Counter.

ANTENNAS IN ACTION

More of Tex Swann G1TEX's antenna goodies: news, views and mini reviews!

CONSTRUCTIONAL

Catch the first part of the *Practical Wireless* 'Panther' Transceiver Project!

FEATURES

We have some interesting features for you in the March issue including articles on 'SWR and Radiation Efficiency', 'Looking At The RF Amplifier' and the 'KW201 Receiver' to name just a few.

Plus all your regular favourites including

Bargain Basement, Carrying on the Practical Way, Keylines, News, Radio Scene & Valve & Vintage

and much, much more!

* Contents subject to change

PW

CAN YOU AFFORD TO MISS IT? - MARCH ISSUE ON SALE 11 FEBRUARY 1999

YOUR LOCAL DEALERS

Index to Advertisers

ICOM

IC-706MKIIG

If you've got a G-Spot... the IC-706MKIIG will find it!

The IC-706MKIIG heralds the arrival of the successor to the '706' throne.

The new IC-706MKIIG... G, it's great!

- *Now includes 430MHz (70cm)!*
- *144MHz output power increased to 50 watts!*
- *Major function keys are illuminated!*
- *Plus all the usual fantastic benefits of owning a '706'!*

Improved operation for local and DX use, as a base or mobile.
Same compact body as IC-706 and IC-706MKII for flexible installation.
UT-106 DSP unit supplied as standard, providing noise reduction and auto-notch functions.
Narrow FM is available on ALL bands.
Separate call channels for 2m and 70cm.
More scan edge channel pairs.
and much, much more...

Icom (UK) Ltd. Sea Street Herne Bay Kent CT6 8LD. Telephone: 01227 741741. Fax: 01227 741742.
URL: http://www.icomuk.co.uk e-mail: info@icomuk.co.uk

Count on us!

EARTH STATION FT-847

HF/50/144/430 MHz All Mode Transceiver

"Compact, too--great for our next 'rover' operation."

"HF, VHF/UHF, and satellite, all-in-one!"

"Looks like Yaesu did it again!"

"And the DSP helped me hear my first moonbounce signal ever!"

The FT-847 changes base station operation forever. Now, three radios in one--HF, VHF/UHF, satellite; technology in its finest application, from the world leader in amateur communication.

With its unequaled combination of features, like DSP filters—notch, NR and BPF, built-in 6-meter, voice monitor, separate sub-band dial, Shuttle Jog dial, Smart Search, and digital meter, the FT-847 is the only radio of its kind! Exclusively for satellite work, 19 memories exceed any other radio. For performance, power-up with 100W for HF/6-meter, and 50W for 2-meter and 430 MHz. Additional "must-haves" include cross-band full duplex, normal/reverse tracking, CTCSS and DCS encode/decode, and direct keypad frequency entry. Plus, the FT-847 is 1200/9600 bps packet-ready.

Take the next step in all-band performance and take home the FT-847 today!

Only one transceiver gives you all mode operations on HF/50/144/430 MHz with full Satellite capability.

NEW Yaesu Patented Design

ATAS-100

Active Tuning Antenna System

Designed for the FT-847. Works on 7/14/21/28/50/144/430 MHz Amateur Bands for mobile operation.

YAESU

Choice of the World's top DX'ers

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