VHF/UHF SPECIAL

Featuring
WOODING'S WORLD
OLYMPICS ON SIX
QUICK QUAGI ANTENNA
SIMPLE 6M LINEAR

plus
CHESTER TO CHINA
GAINING POWER

Reviewed
AT-200 & AT-400
ALINCO DJ-G5

THE 'HANDY' FOR THE NOT-SO-HANDY!
The new FT-51R Dual Band HT is state-of-the-art and easy to use! So easy, you won't need an operating manual. Its exclusive, scrolling instruction menu located in the large, backlit display "window", guides you through total operation while simultaneously viewing the main display window. You'll like some of the other new, exclusive features, too. Like Spectrascope™. This unique feature displays real-time, continuous scanning of activity on adjacent frequencies in VFO mode. memories. A cloning feature duplicates favourite channels to another FT-51R. A digital battery voltage display, five power output levels, the largest backlit dual band HT keypad made: Smart Mute™, two VFOs on both VHF and UHF as well as available 2 Watt and 5 Watt versions, round out the exciting FT-51R. Plus, the optional MH-2922B Display Microphone allows you to control volume and also access Memory, VFO, Call Channel, Band Selection and scanning functions. All of this in the world's smallest dual band HT radio!

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

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

"Scrolling instructions tell me what to do next!"

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

"Yaesu did it again!"

Specifications

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

Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.
EDITOR'S KEYLINES
The Editor warns of the dangers of illegal operating.

SPECIAL PRIZE COMPETITION CORNER
Your chance to win a 144MHz Cushcraft Antenna.

RECEIVING YOU
Pw readers express their views on the amateur radio world.

NEWS '95
New products, reports and RAE course news.

NOVICE NATTER
Elaine Richards G4LFM shares some of the 'natterings' received from novices of all ages.

CLUB SPOTLIGHT
Is your club 'spotlighted' this month?

SUBS CLUB
This month we offer you a copy of All About VHF Amateur Radio for a very special price.

SPECIAL OFFER
Short wave Communications discounted to half price.

RADIO DIARY
A bumper issue of radio rally dates.

VHF/UHF SPECIAL
David Butler G4ASR looks at Sp-E propagation and recent 144MHz openings.

WOODING'S WORLD
Join Mike Wooding G61OM as he explores the fascinating world of v.h.f. operating.

OLYMPICS ON 6
Ken Glenn G3MND shows you how to modify a 'P' Band Pye Olympic for use on 50MHz.

A QUICK QUAGI
Kevin James G6VNT combines a 5-element quad and a Yagi to make a Quagi.

SIMPLY LINEAR ON 6
Derek Holmes G4JLV gets more from the 50MHz band using junkbox bits & pieces.

CHESTER TO CHINA
Chris Seward G0PXJ recalls how he took his hobby 5000 miles away around the world.

REVIEW - THE ALINCO DJ-G5 DUAL-BAND TRANSCEIVER
Rob Mannion G3XFX carries out a single-handed review on a hand-held that's considered ideal for one handed operation.

ANTENNA WORKSHOP
Ray Fautley G4SAG explains how it's possible to get two h.f. beam antennas into your attic.

REVIEW - ADI AT-200/400 144/430MHz HAND-HELD TRANSCEIVERS
Newly licensed Donna Vincent G77ZB shares her experiences of first time operating.

GAINING POWER
Patrick Allee GW5KX gives an insight into the c.r.p. you may be unknowingly creating.

EQUIPMENT SPECIFICATIONS
Ian Poole G3WX advises on what you should look for when buying a second-hand radio.

PRACTICAL WIRELESS GOES DUTCH!
In June, G3XFX visited Holland, here he tells you how he got on and what Dutch amateur radio is like.

VALVE & VINTAGE
The PW vintage 'wireless shop' opens under new management, this month it's Phil Cadman G4/JP's turn to 'man' the shop.

BROADCAST ROUND-UP
Peter Shore rounds-up the International broadcast band news.

BROADCAST ROUND-UP
Rogor Cooke G5LDO brings you the latest Packet news and views.

BARGAIN BASEMENT
Readers' advertisements.

BOOK SERVICE
Looking for a radio-related publication? - this is the place to find it.

ENDNOTES
Look what's on offer in next month's best selling UK magazine for the radio amateur.

76 ADVERTISER'S INDEX
THIS MONTHS SPECIALS

KENWOOD TS850S only £149.95

KENWOOD TS850SAT only £1589.95

* LIMITED STOCKS OF BOTH ITEMS *

YAESU

FT-11R list £2324 our price £229
FT-41R list £239 our price £229
FT-51R list £2329 our price £239
FT-416 list £239 our price £249
FT-290R2 list £425 our price £425
FT-690R2 list £649 our price £649
FT-790R2 list £749 our price £749

KENWOOD

TS-790E list £1995 our price £1959
TM-255E list £949 our price £929
TM-455E list £1050 our price £925
TM-733E list £729 our price £645
TM-251E list £419 our price £399
TM-702E list £579 our price £499

YAESU

FT-736R list £1999 our price £1549
FT-8500 list £2749 our price £659
FT-5200 list £2729 our price £595
FT-5100 list £579 our price £515
FT-2500M list £399 our price £295
FT-2200 list £419 our price £329

STANDARD TRANSCIEVERS

C558 sale offer price £289
C468 sale offer price £169
C188 sale offer price £169

On some items supplies are limited at our offer prices
NEW PRODUCTS

**YAESU FT8500**

Yaesu's latest dual band mobile with FS10 smart controller.

**OUR PRICE £659**

Save £90.00

**ICOM IC-706**

NEW

HF & 6m + 2m mobile transceiver with remote mount capability. 100w on HF & 6m 10w out on 2m. Rx coverage 30kHz-200MHz + FM W

**FOR LATEST PRICE**

ALINCO DX-70

NEW

HF & 6m remote mountable mobile transceiver. 100w output HF 10w on 6m. Rx coverage 150kHz-30MHz, 50-54MHz all mode including FM.

**£1035**

IN STOCK

**ANTENNA ROTATORS**

- G-400 Medium duty rotator £199.00
- G-400RC R/C version of G-400 £239.00
- G-400S 120° Duty cycle £239.00
- G-400LX New medium duty model £269.00
- G-400SX New/H/D version of G-450XL £269.00
- G-450SX 450° Deluxe model £419.00
- G-1000SX Vertical version of G-850SX £479.00
- G-27000SX H/D rotator 450° £399.00

**£27.00**

**FT-901/01 series**

- G-500A Elevator rotator £229.00
- G-5400B EZ/AL rotator £219.00
- G-5600B AZ/EL rotator £199.00
- RCS-1 Medium duty £249.00
- RCS-2 Medium duty + preset £349.00
- RCS-3 Medium duty + preset £349.00
- RCS-5 Medium duty + preset £389.00
- SSTV8 Loves clamp G-400, 800, 1000 £23.00
- SSTV9 Loves clamp £19.00
- MC/2 Loves clamp £25.00
- GS-050 Rotary bearing up to 1/4 mast £29.00
- GS-055 Rotary bearing 2" mast £45.00
- CK4A Create rotary bearing 2" mast £37.00

**ACCESSORY BARGAINS**

- 144TV 2m module TV series £59.00 B
- 430/720 70cm module for FT720 £69.00 B
- 12M Mobile mount £119.00 B
- DC720 DC lead for FT720 £59.00 A
- BC Charger FT200 £15.75 A
- OI0802 soar telescop cantenna FT920R £16.00 A
- YHF15 Rubber duck FT200R £16.00
- NT15 Desk charger FT200, 203, 207 etc £59.00 B
- FKB4 Nickel FT200, 203, 207 £129.00 A
- CSC10 Vinyl case FT209 + FNB3 £26.22 A
- CSC17 Vinyl case FT271 + FNB3 £26.22 A
- CSC5 Vinyl case FT470 + FNB3 £26.22 A
- CSC7 Vinyl case FT304 + FNB4 £10.22 A
- CSC4 Vinyl case FT470 + FNB 17 £12.95 A
- CSC44 Vinyl case FT470 + FNB21 £12.95 A
- CSC45 Vinyl case FT470 + FNB12/14 £12.95 A
- CSC46 Vinyl case FT470 + FNB111 £12.95 A
- NF2 Mobile mount FT209/709 £32.00 A
- FVC5 Vinyl case FT140RI £6.75 A
- NC7C Desk charger FT208/708 £35.00 B
- AM777 FM unit FT77A £10.77 A
- MBB15 Mobile bracket for FT270 £14.86 A
- MBB16 Mobile mount FT470 £17.88 A
- MBB21 Mobile bracket for FT203/209 etc £16.22 A
- MBB33 Mobile bracket for FT211/711 £20.56 A
- MBB44 Mobile bracket for FT470 £19.95 A
- BMF1891 FM unit FT710/2 £16.22 A
- DC791 DC inverter FT391 £12.99 B
- MBM1 Mobile mount FT710/1 series £10.22 B
- XFS04 GM filter FT9001 £101, 107, 107 £26.22 A
- XFS92 GM filter FT9001 £41.41 A
- XF1260 GM filter FT9001 £15.32 A
- XF150 GM filter FT9001 £12.95 A
- XF155CN 270cm Mobile filter FT102 £22.50 A
- BNF07 FM filter FT140 £5.75 A
- CR990 Remote ATU suitable for conversion for fm use £99.00 B
- NDH518 50 channel memory unit for NRD515 £199.00 D
- FR390 Active antenna £26.00 A
- FR7706 Antenna tuner/switch £79.25 B
- FRWVFM Module for widescreen radio £5.00 A
- DCM4980 12v DC kit complete with DC lead £10.72 A
- MBB3 Mobile mount FT747 £15.00 B
- MBB4 Mobile cases FT747 £15.00 B
- D300016 RF kit FT902 £3.00 A
- D300025 NB kit FT902 £2.50 A
- SET ONE Extender board kit for FT902 £34.00 A
- D052007 Counter unit FT902 (Improved type) £25.00 A
- PA1 DC power adapter FT207 £34.00 B
- BFA Battery adapter for PA1, NC1, NC3 £5.00 A
- FRA01 Charging device NC1, PA1 £10.00 A
- NC3 to charge FT208, 708 £8.90 A

**NEW PRODUCTS**

- FT411 2m handy 1 only £199.00
- FT811 70cm handy 1 only £209.00
- FT911 2m handy 1 only £239.00
- FT146G 2m handy 5 watts £249.00
- TH79E Dual band handy £39.00
- TM411E 70cm mobile £34.90
- TH29E 2m handy 1 only £199.00
- IC735 HF transceiver £39.00
- IC229E 2m mobile 1 only £279.00
- IC229H mobile 2 only £319.00
- IC235E 2m handy wideband RX £34.90
- IC320/30 Dual band mobile £49.00
- IC449E 70cm mobile £59.00
- IC729 HF transceiver + 6m £109.00
- IC737 HF transceiver £1269.00
- ICWF SW760 Sony receiver £149.00
- AR2000 AOR AM/FM scanner £259.00
- AR2006A AOR all mode scanner £269.00

**NEW PRODUCTS**

Most items are brand new some may have had some shelf life all carry 12 months warranty.

**STOCK CLEARANCE BARGAINS**

- FKE111 2m handy 1 only £199.00
- FT811 70cm handy 1 only £209.00
- FT911 2m handy 1 only £239.00
- FT146G 2m handy 5 watts £249.00
- TH79E Dual band handy £39.00
- TM411E 70cm mobile £34.90
- TH29E 2m handy 1 only £199.00
- IC735 HF transceiver £39.00
- IC229E 2m mobile 1 only £279.00
- IC229H mobile 2 only £319.00
- IC235E 2m handy wideband RX £34.90
- IC320/30 Dual band mobile £49.00
- IC449E 70cm mobile £59.00
- ICWF SW760 Sony receiver £149.00
- AR2000 AOR AM/FM scanner £259.00
- AR2006A AOR all mode scanner £269.00

**NEW PRODUCTS**

Most items are brand new some may have had some shelf life all carry 12 months warranty.
The United Guild of International Photographers

Even if you are a person who only takes photographs on holidays abroad or just occasionally for fun — you will benefit by joining us. We have special offers FREE NEWSLETTERS and discounts to both ensure you increase your enjoyment and improve your photographic art. Nobody is too old to join us and few are too young. If you love life and people or simply want to save money and develop your interests, please join us today. We can even help you to become an award winning photographer.

Join us and ENJOY LIFE.

AMATEURS – JOIN US TODAY & SAVE ON EVERYDAY COSTS

THE COST OF JOINING US IS LESS THAN THE PRICE OF THE FREE GIFTS YOU RECEIVE

Each new member will receive free of charge:

- 10 x FREE 35mm films RRP £29.90
- 10 x FREE enlargements up to size 12" x 8" RRP £40.00
- 2 x FREE membership window stickers RRP £6.00
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Total value of FREE gifts . . . £83.90. Plus £25,000?

£25,000? PLUS £25,000?

As a member you will have low cost access to our laboratory services, which use the most modern equipment available in the world today. We are currently offering TO MEMBERS ONLY:

- Developing and printing each film up to 39 exposures. Prints size 6" x 4". Price just £2.00 x 2.5 'X' rated
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- Printing 6" x 4" reprints price just 20p each x 2.5 'X' rated.

Application form – please complete and send FREEPOST today together with your cheque for £44 to cover 2 years membership. Cheque to be made payable to: THE UNITED GUILD OF INTERNATIONAL PHOTOGRAPHERS

You may photocopy this application form.

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Address ..............................................................................................................................................

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For a full members only price list, photographic help line and further details, offers and discounts available only to members, telephone number for members and non-members is

01839-393 001

Calls cost 39p per minute for a good rate and 49p per minute at all other times.

Practical Wireless, September 1995
Kenwood's TH-79E marks a new high in user-friendly handheld tranceivers. This slim-line FM dual-bander features a dot matrix LCD menu, which helps you to access the many class-leading features of this stylish unit.

Features that include an FET power module for longer battery life, 82 memory channels with ID, DTSS and pager functions, Automatic Band Change and DTMF memory function for auto-dial operation. Confused? You won't be. Just call up the menu. Or ring 0923 816444 for a full information pack.
Europe's Largest Amateur Radio Showroom

"Mosley.... a better antenna!"

Choosing an H.F. Beam can be a difficult process. Mosley makes it so much easier.

Look at the trap assemblies for instance. Mosley's advanced designs mean only 1 trap assembly for 2 bands. A 3 element Mosley beam for 10/15/20m only has 6 trap assemblies. Others have as much as 12! A Mosley beam is therefore stronger, with less wind loading.

Mosley USA uses aircraft grade drawn aluminium. Others use extruded tube. Mosley's tubing is therefore closer tolerances, enabling pre-drilling and simple screw fixing. Others need hose clamps to take up the slack.

Mosley USA is the only manufacturer to offer a range of beams which include the WARC bands.

Wouldn't you rather have the MOSLEY edge?

**VIBROPLEX®**

A Vibropex Key is a beautifully crafted piece of history renowned world-wide for its design and engineering. If you take pride in your Morse code, don't you deserve a Vibropex Key?

**VIBROPLEX KEYS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRO-96</td>
<td>225.00</td>
</tr>
<tr>
<td>ORIGINAL PRESENTATION</td>
<td>225.00</td>
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<tr>
<td>ORIGINAL DELUXE</td>
<td>145.00</td>
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<tr>
<td>IMBIC PRESENTATION</td>
<td>125.00</td>
</tr>
<tr>
<td>IMBIC DELUXE</td>
<td>125.00</td>
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<tr>
<td>ORIGINAL STANDARD</td>
<td>115.00</td>
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<tr>
<td>IMFIC STANDARD</td>
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<tr>
<td>SINGLE PADDLE DELUXE</td>
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<tr>
<td>SINGLE PADDLE STANDARD</td>
<td>139.50</td>
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<tr>
<td>TWIN PADDLE</td>
<td>164.00</td>
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<tr>
<td>TWIN PADDLE STANDARD</td>
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<tr>
<td>THUMB PIECE</td>
<td>5.50</td>
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<td>THUMB PIECE</td>
<td>5.50</td>
</tr>
<tr>
<td>DASH CONTACT SLIDE ASSEMBLY</td>
<td>10.50</td>
</tr>
<tr>
<td>DOT SLIDE CONTACT ASSEMBLY</td>
<td>10.50</td>
</tr>
</tbody>
</table>

**FULL VIBROPLEX REPAIR SERVICE AVAILABLE**

**DELTA**

Coax Switches

A New Standard In Lightning Surge Protection

**RF1 ANTENNA ANALYSER**

The pocket-sized RF Analyser has revolutionised antenna checking. Connected to any antenna it instantly reads out impedance/SW/R/inductance/Capacitance from 1.2 to 35 MHz.

**PROFESSIONAL WIRE ANTENNAS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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</thead>
<tbody>
<tr>
<td>BALUNS</td>
<td>£</td>
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<tr>
<td>SBP-1</td>
<td>3-5V, 5W, 100 ohm</td>
</tr>
<tr>
<td>SBP-2</td>
<td>3-5V, 5W, 100 ohm</td>
</tr>
<tr>
<td>SBP-2</td>
<td>3-5V, 5W, 100 ohm</td>
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<tr>
<td>SBP-4</td>
<td>41V, 125W, 50 ohm</td>
</tr>
<tr>
<td>TRAPS</td>
<td>£ (needed for dipole, 1 for sloper)</td>
</tr>
<tr>
<td>ST-10</td>
<td>2MHz, 50W</td>
</tr>
<tr>
<td>ST-12</td>
<td>24MHz, 60W</td>
</tr>
<tr>
<td>ST-15</td>
<td>15MHz, 60W</td>
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<tr>
<td>ST-17</td>
<td>17MHz, 60W</td>
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<td>ST-20</td>
<td>14MHz, 60W</td>
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<td>ST-30</td>
<td>30MHz, 60W</td>
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<tr>
<td>ST-40</td>
<td>7MHz, 60W</td>
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<tr>
<td>ST-50</td>
<td>5MHz, 60W</td>
</tr>
<tr>
<td>SHORTERS (2 needed for dipole, 1 for sloper)</td>
<td></td>
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<tr>
<td>SLC-40</td>
<td>40m (makes 38ft dipole)</td>
</tr>
<tr>
<td>SLC-60</td>
<td>60m (makes 60ft dipole)</td>
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<tr>
<td>SLC-80</td>
<td>80m (makes 100ft dipole)</td>
</tr>
<tr>
<td>MONO-BAND DIPOLES</td>
<td>£</td>
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<tr>
<td>6m Dipole 10ft</td>
<td>20.95</td>
</tr>
<tr>
<td>10m Dipole 10ft</td>
<td>21.95</td>
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<tr>
<td>12m Dipole 20ft</td>
<td>22.95</td>
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<tr>
<td>15m Dipole 22ft</td>
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<tr>
<td>17m Dipole 28ft</td>
<td>23.95</td>
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<tr>
<td>20m Dipole 34ft</td>
<td>25.95</td>
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<tr>
<td>30m Dipole 48ft</td>
<td>27.95</td>
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<tr>
<td>40m Dipole 67ft</td>
<td>31.95</td>
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<tr>
<td>80m Dipole 134ft</td>
<td>48.95</td>
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<tr>
<td>160m Dipole 260ft</td>
<td>72.95</td>
</tr>
<tr>
<td>TRAP DIPOLES</td>
<td>£</td>
</tr>
<tr>
<td>SD-20</td>
<td>20m Dipole, 1 trap, 279</td>
</tr>
<tr>
<td>SD-22</td>
<td>20m Dipole, 2 traps, 359</td>
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<tr>
<td>SD-52</td>
<td>50m, 5 traps, 1039</td>
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<tr>
<td>SD-62</td>
<td>60m, 6 traps, 1255</td>
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<td>SD-34</td>
<td>30m, 4 traps, 249</td>
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<td>SD-44</td>
<td>40m, 4 traps, 479</td>
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<td>SD-54</td>
<td>50m, 4 traps, 544</td>
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<td>SD-64</td>
<td>60m, 4 traps, 629</td>
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<tr>
<td>SD-74</td>
<td>70m, 4 traps, 714</td>
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<tr>
<td>SD-84</td>
<td>80m, 4 traps, 804</td>
</tr>
<tr>
<td>MULTIBAND AERIALS</td>
<td>£</td>
</tr>
<tr>
<td>SA-15</td>
<td>15m, 3 elements (241)</td>
</tr>
<tr>
<td>SA-2</td>
<td>Shortened Version</td>
</tr>
<tr>
<td>GSE-2</td>
<td>30m, 2 elements (241)</td>
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<tr>
<td>GSE-2</td>
<td>30m, 2 elements (301)</td>
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<tr>
<td>OCF-1</td>
<td>Off Centre Fed, 1 trap, 699</td>
</tr>
<tr>
<td>OCF-1</td>
<td>Off Centre Fed, 1 trap, 699</td>
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<tr>
<td>SRO</td>
<td>Shortwave Receiving Dipole, 49.95</td>
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**SHORTENED DIPOLES**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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<tbody>
<tr>
<td>SLS-60</td>
<td>60m, 49ft</td>
</tr>
<tr>
<td>SLS-60</td>
<td>60m, 49ft</td>
</tr>
<tr>
<td>SLS-160</td>
<td>100m, 149ft</td>
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**TRAP VERTICAL SLOPERS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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<tbody>
<tr>
<td>SVS-20</td>
<td>20m, 1 trap, 194</td>
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<tr>
<td>SVS-41</td>
<td>40m, 2 traps, 219</td>
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<tr>
<td>SVS-51</td>
<td>50m, 3 traps, 359</td>
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<tr>
<td>SVS-161</td>
<td>160m, 5 traps, 1059</td>
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<tr>
<td>SVS-32</td>
<td>30m, 2 traps, 279</td>
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<tr>
<td>SVS-42</td>
<td>40m, 2 traps, 479</td>
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<tr>
<td>SVS-52</td>
<td>50m, 2 traps, 544</td>
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<tr>
<td>SVS-64</td>
<td>60m, 2 traps, 629</td>
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<tr>
<td>SVS-74</td>
<td>70m, 2 traps, 714</td>
</tr>
<tr>
<td>SVS-84</td>
<td>80m, 2 traps, 804</td>
</tr>
</tbody>
</table>

For more information on the full range of Sigma aerials, send a Stamped Addressed Envelope marked "SIGMA".
WE ARE UK APPOINTED DEALERS FOR ALL MAJOR BRANDS INCLUDING

**YAESU, KENWOOD, ICOM, AOR, ALINCO**

Phone us now with your requirements for the best deal possible

**MICROWAVE MODULES**

<table>
<thead>
<tr>
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<td>MML 432-30LS</td>
<td>25-30w</td>
<td>O/P 1 or 3w I/P</td>
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<td>O/P 10/15w I/P</td>
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<td>MML 144-100LS</td>
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<td>O/P 10w I/P</td>
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<td>MML 50-100LS</td>
<td>100w</td>
<td>O/P 1 or 3w I/P</td>
<td>£199.95</td>
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**TRANSVERTERS**

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<tr>
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<tr>
<td>MMT 70-28</td>
<td>10MTR to 4MTR 10w</td>
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<tr>
<td>MMT 144-28</td>
<td>10MTR to 2MTR 10w</td>
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<td>MMT 432-28</td>
<td>10MTR to 70CM 10w</td>
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**AKD TRANSCEIVERS**

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<td>2MTRS</td>
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<tr>
<td>4MTRS</td>
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</tr>
<tr>
<td>6MTRS</td>
<td>10w</td>
<td>£193</td>
</tr>
</tbody>
</table>

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**AR300XL ROTATOR**

45KG VERTICAL LOAD

**ONLY £49 + £6P&P**

**ABSORPTION WAVEMETERS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Frequency Range</th>
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<tr>
<td>WA1</td>
<td>120MHz-450MHz</td>
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<tr>
<td>WA2</td>
<td>50MHz-210MHz</td>
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<tr>
<td>WA3</td>
<td>1.8MHz-92MHz</td>
<td>£54.95</td>
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**ALTAI REGULATED DC POWER SUPPLY**

<table>
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<tr>
<th>Model</th>
<th>Characteristics</th>
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</thead>
<tbody>
<tr>
<td>Over Voltage</td>
<td>Over Load, Short Circuit Protected</td>
<td>£24.99 + £5.50 P&amp;P</td>
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<tr>
<td>10-14 AMP</td>
<td>£39.99 + £5.50 P&amp;P</td>
<td></td>
</tr>
</tbody>
</table>

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- G5RV HALF SIZE: £16.95 + £4 P&P
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Printed Monitor 95

Practical Wireless, September 1995
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ACTIVE ANTENNA KITS

<table>
<thead>
<tr>
<th>Kit</th>
<th>Frequency Range</th>
<th>Price</th>
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</thead>
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<tr>
<td>M3D</td>
<td>150MHz to 100MHz</td>
<td>£8.90</td>
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<tr>
<td>M4A</td>
<td>25 to 1300MHz Compact</td>
<td>£19.00</td>
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<tr>
<td>M4A8</td>
<td>High Performance VHF Backfed</td>
<td>£19.00</td>
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<tr>
<td>264</td>
<td>Scanner Pre-amp, 4 to 1300MHz</td>
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RECEIVER KITS

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<tr>
<td>HR11</td>
<td>Medium Wave + 1620 inc. UK</td>
<td>£25.90</td>
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<tr>
<td>Qbba</td>
<td>Single-band 60, 40 or 80m</td>
<td>£16.90</td>
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<tr>
<td>DERS11</td>
<td>16, 12, 6 SWB/ CW</td>
<td>£27.50</td>
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<tr>
<td>TRB1</td>
<td>5.7 to 171MHz TRF</td>
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TRANSMITTER KITS

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<th>Kit</th>
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<td>TC24</td>
<td>4.8 WPM CW inc. crystal</td>
<td>£15.50</td>
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<td>TC28</td>
<td>80M 28W CW inc. crystal</td>
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<tr>
<td>ATD0</td>
<td>80 &amp; 160M AM/DSB/CW</td>
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<td>XY29</td>
<td>20W 10W CW inc. crystal</td>
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</tr>
<tr>
<td>T20H</td>
<td>16.5 &amp; 25MHz</td>
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<td>FR4Q</td>
<td>10 &amp; 15MHz Power 50Vh</td>
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TX TYPE ATV KITS

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<tr>
<th>Kit</th>
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<tbody>
<tr>
<td>CB10</td>
<td>30W HF &amp; 6P with Baldwin</td>
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<tr>
<td>CTU16</td>
<td>150W 1.2 to 120MHz</td>
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ACCESSORY KITS

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<thead>
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<th>Kit</th>
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<tbody>
<tr>
<td>APAF</td>
<td>Audio Speech Processor</td>
<td>£16.50</td>
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<tr>
<td>MAA</td>
<td>Mic Adapter with filter</td>
<td>£6.25</td>
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<tr>
<td>OK2</td>
<td>20W 2A with Baldwin</td>
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</tr>
<tr>
<td>CSK4</td>
<td>20W 4C 2.5W</td>
<td>£30.50</td>
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<tr>
<td>SV22</td>
<td>80W 2A 60W 20W 16W</td>
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</tr>
<tr>
<td>DD12</td>
<td>80W 2A 60W 20W 16W</td>
<td>£49.90</td>
</tr>
</tbody>
</table>

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The DXR20 covers 20, 40 & 80 bands plus any other HF frequency with optional plug-in modules. The photo shows the receiver built with DXR20 and DC55 ("meters") kits and HA20R hardware pack (case etc.). Excellent performance and compatible with many of our transmitter and accessory kits. Optional bands include 160, 30, 15 & 10 Meters.

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73 from Dave G4KQH, Technical Manager.
For the last few years, apart from the brief periods when I have had modern high-power transceivers to review, I have been busy on QRP e.w. using my Trio TS-120V. But recently, thanks to my newly-acquired KW2000B transceiver, I have re-discovered the delights and dangers of 'ragchewing' with friends old and new on h.f.

You may think I’m over-dramatising by using the word ‘danger’ but I think the behaviour I discovered poses a threat to our hobby. And in fact, I think the actions of the radio amateurs involved certainly ‘over the top’.

Unfortunately, it all started when I (quite innocently) got into QSO with a pirate operator using the callsign GWOJUJ. The illegal operator said he was in Anglesey and seemed to be a perfect gentleman, and then the trouble started!

I really began to wonder what I had stepped into when various stations broke in, talked over our QSO and generally made a nuisance of themselves calling (or so I thought at the time) both our QSO and generally made a nuisance of themselves calling (or so I thought at the time) both myself and the supposed GWOJUJ ‘Pirates’. Quite frankly, I thought by their behaviour that they were the ‘Pirates’!

Eventually, the illegal operator was forced to break off the QSO, but even then one persistent station kept breaking in, saying there were ‘pirates’! And, from personal experience I can tell you that’s unfortunate. Several years ago, someone (using my callsign) was heard offering ‘Free Subscriptions to PW’ to anyone working G3XFD. Needless to say, it wasn’t me!

So, you’ll realise that I agree that ‘pirating’ a legitimate callsign is not just illegal, it’s abhorrent behaviour. It could bring repercussions to the innocent radio amateur whose callsign is used.

But despite the actions of the illegal station, surely his behaviour does not warrant a child-like reaction from the legitimate amateur community? Personally, I don’t think we should encourage any feedback at all to ‘pirates’ or the unfortunate individuals who often plague repeaters.

Our hobby is often considered by the media (or wrongly in my opinion) to be inhabited by ‘cranks’. If we react in an un-disciplined way to illegal operators or the ‘funny voices’ on repeaters (or other frequencies), we could tarnish our public images ourselves.

I can tell you that the unfortunate people providing ‘funny noises and voices’ will never be acknowledged over the air by me. I hope you do the same. Deprived of nourishment in the form of feedback, they’ll drop off and disappear just like the parasitic Ticks we often find on our dogs and cats!

Rob Mannion G3XFD

---

**SPECIAL PRIZE COMPETITION CORNER**

Win a 144MHz Cushcraft Antenna

**Words to Find:**

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

**First Prize:** A Cushcraft AR-X2B 144MHz Vertical Antenna kindly donated by Waters & Stanton Electronics and a year’s subscription to Practical Wireless or a £20 book voucher.

**Second Prize:** A six month subscription to Practical Wireless or a £10 book voucher.

---

Practical Wireless, September 1995
Dear Sir

Radio amateurs fight a constant battle protecting the image of the hobby and the good name of genuine enthusiasts. From time to time this involves denouncing illegal operation in our bands and convincing the press that people who listen into cell phone conversations are not true 'radio amateurs'.

For that reason, I was quite disappointed to see on sale at many recent rallies, including Bletchley Park, a rally with RSGB in its title - an abundance of 'pirate' cards and software for stealing satellite television programmes, such as the Adult Channel and Sky. Now it happens that stealing satellite signals is theft - full stop!

The law is clear on the subject and a judge will treat theft of television signals just as he would removing a mobile rig from an amateur's car. Whether we as individuals think this kind of theft is fair game is another matter entirely, but I believe that clubs, which organise rallies, should be seen to be acting within the law and not aiding and abetting any activity that could bring the name of amateurs into disrepute.

Just imagine if a Sunday newspaper journalist had been there ....the headlines would read 'Radio Amateurs tune into pirate porno TV'. Not very edifying is it?

It would be nice to have an unconditional assurance that from now on the RSGB and all other rally organisers will not countenance the sale of items intended for theft and that they will summarily eject any trader found to be offering these? If not, a clarification of which illegal activities these clubs consider acceptable would be helpful.

Andrew Emmerson G8PTH

Northampton

Editorial comment: As Andy Emmerson (our 'Focal Point' ATV author) has a valid point, we asked the RSGB to comment. Their reply, from Peter Kirby GOTWW the General Manager follows:

Dear Sir

The RSGB and RadioSport Ltd, co-sponsors of the Bletchley Park Mobile Rally were dismayed to find this type of material on sale at the rally. Neither organisation condones the sale of such items and steps have been taken to ensure that such items will not appear at future co-sponsored events.

Peter Kirby GOTWW

General Manager

RSGB

Theory & Construction

Dear Sir

Could you please write an article on synchronous a.m. detection, both theory and a constructional project?

Although I know the 'P' in PW stands for 'Practical', I would also be interested in more advanced radio theory, not avoiding mathematics. For subscribers also wishing to constantly enlarge their theoretical knowledge, PW may become less interesting when only the basic radio principles are repeatedly dealt with.

Peter Wessels

The Netherlands

Editor's reply: The content of PW reflects (as best as we can) what our readers ask for in surveys and when the Editorial team meet them at shows, rallies and club meetings. However, I know that Ian Pole G3YWX will be discussing your topic in 'Equipment Specifications'. The Editorial team would also like feed-back on the inclusion of more 'advanced' theory in the magazine, as Peter suggests.

EMC Regulations & Kits

Dear Sir

The UK has several small firms supplying electronic kits for amateur radio use. Despite most of these being run as part-time businesses, we are more active in this sector than anywhere else in Europe, and maybe also the USA. The many benefits which arise (technical education, exports, low cost of entry into the hobby, pleasure of operating home-built gear, etc.) may be completely lost if the EMC regulations governing all electronic products are implemented with vigour when they come into effect on 1 January 1996.

The problem is NOT technical - it is the bureaucratic burden that compliance with regulations will imply. Most of the kits involved probably meet the technical requirements, or could be made to do so relatively easily, but the burden of complying, even by the simplest self-certification procedure, will be greater than most of these businesses will be prepared to tolerate.

Most kits have a short life of about 2-3 years, sell in relatively small numbers, seldom remain unchanged for long periods and often are not even sold with cases! The selling price is often way below the true cost of development as all time is not costed properly.

The effort involved in getting a product registered, and maybe re-registered, will add much time and cost to their development which cannot be reclaimed in higher prices because they would become uncompetitive compared to mass produced gear. There are also potential problems with designed published in technical magazines, such as VW, RadCom, etc.

The situation is not confined to amateur radio kits. What is needed is a general exemption scheme for small quantity production run items - say under 200 off. Since this should not be viewed as an opportunity to flout the technical provisions, all suppliers should undertake and be required to clear up technical infringements, or refund the purchaser's money if it cannot be cured within six months of purchase; perhaps with the additional backing of some form of public liability insurance.

If this approach is adopted, there is hope that small electronics firms will still be able to start up in business and provide a service wanted by the public and most sections of Government. I hope you will be able to pursue such a scheme with the relevant officials and not be put off by talk of it being a requirement emanating from Brussels.

I have made similar proposals to the RSGB. In the meantime, I pray that somebody will recognise the significance of this problem before we all decide that we are not in business to push around yet more paper.

Tim Walford G3PCJ

Walford Electronics

Somerset

Editor's comment: For the sake of our hobby's future you can be assured I will try my best to get the EEC to take note of our concerns. Tim I also ask readers to contact their 'Euro MPs' to draw their attention to this important matter. If you are not sure who your 'local' representative is they usually cover much larger areas than Westminster MPs) contact your local council. We must act together on this matter.

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

Dear Sir

I am just writing to tell you how much I have enjoyed the July issue of PW. The articles on antennas are particularly interesting as I am grappling with the problems of a very small garden.

Anything for 3.5MHz is a real problem as my garden is very small and overlooked on three sides. The only clear take off I have is to the east.

So, I'm interested in ways of getting a good signal out in other directions. A future article on half-wave verticals would be most welcome, as these don't seem to need radials. Can you use a half-wave loaded vertical with a matching quarter-wave stub so that it can go high up on the back wall?

Another useful article would be a kind of comparison 'road test' for a number of different types of antenna for say 14MHz. It needs someone who can switch between say a quarter-wave vertical, a half-wave vertical, a half-wave dipole, trap dipole, trap vertical, loop, delta loop and beam, etc. on the same signal. By concentrating on one band, useful results could be obtained. I could imagine such an article taking a year to research.

How about sending an 'expert' to an ordinary QTH, like mine, to see what could be done with antennas, rather like gardening experts go to an ordinary suburban garden and turn it into a park!

There could then be a follow up article from the proud owner of the antenna after a year to see how it is performing. I do find it amusing that antenna articles often begin by saying that gardens these days are very small, but then go on to say that most people can put up 100ft of wire or something!

So, that's it. Thanks again for a great magazine.

If you keep this standard up, I may have to take out a subscription!

Peter Halls G4CRY
York

Editor's comment: Some interesting ideas and suggestion there Peter, which will be passed on to our 'Antenna Workshop' author John Heys G3BDQ. Watch this space! The Editorial team are pleased you enjoyed the July antennas, and hope you enjoy the August 'Antenna Special' even more.

Magnetic Loop Antennas

Dear Sir,

You have now told us how to control a magnetic loop (PW August, page 26, 'Controlling That Magnetic Loop' by Gordon Lumley G3DJE), so how about telling us how to make one?

I have looked through back copies of PW but cannot find an article on magnetic loops.

Charles Morris
Cardiff

Editor's reply: Gordon Lumley G3DJE's article was aimed at helping the large numbers of readers who have already built 'magnetic loop' antennas. However, as there seems to be a great deal of interest, we hope to produce something suitable soon. Any other feed-back from readers on this subject would be appreciated.

Buying On A Budget

Dear Sir

Thank you for the article in the July issue 'Buying On A Budget' by Ben Nock G4BZJ. I enjoyed it very much, I am on a very tight budget and I have had a licence for two years but do not own my own rig. The problem is that I cannot afford, or really want, a 'black box' straight off the shelf. As I see it, there is nothing particularly 'amateur' about plugging in one of the latest rigs and chatting away.

I would welcome an article on ex-p.m.r. gear that can be converted for 70/144/430MHz, Where can it be bought (besides at rallies), where can the parts be found for conversion, how much, how is it done and so on. That is the reason that I took the exam, so that I could tinker about to my heart's content, without the worry of destroying hundreds of pounds of radio or invalidating a warranty.

This is what attracted me to the hobby and I don't think that I will ever be excited by the state-of-the-art plug-in and play wonders as I am by the likes of the Pye Cambridge and earlier models.

So, please lets have an article for the poorer v.h.f./u.h.f. fans amongst us, maybe then I could buy something to be tinkering with whilst I am at University this year!!

Thanks for a great magazine, been reading you since 1981. Keep up the good work!

Chris Marsden G7RCI
Lancashire

Editor's reply: Articles on converting surplus equipment cause problems Chris. As soon as the article appears, the equipment sources dry up due to the demand! However, we occasionally publish a 'conversion' article (the 49 to 50MHz conversion we featured in 'The Handy From Tandy' in April seems to have been very popular) which gets over that problem. We hope you enjoy the p.m.r. conversion we're publishing this month.

Radio Amateurs in the Press

Dear Sir

The Sunday Times recently carried an article entitled 'Scramblers drive hackers off information superhighway encryption', from the 'Business Section', page 10, June 11 1995. It refers to 'any amateur radio ham' being able to intercept mobile 'phone calls. I have written to them complaining about it.

In my opinion, it should be illegal to possess radio scanners. At present it is just illegal to use them, which is totally un-enforceable. The second-hand market was flooded with cheap scanners when the police changed to a scrambled radio system. Nobody uses them legally.

I have a few other points I'd like to mention, now I've finally got round to writing. You sometimes refer to 'linear amplifiers' being used (illegally) on CB radios.

The amplifiers used on CB are in general, badly filtered, overrated, Class C and totally non-linear. This includes the ones with 'linear amplifier a.m./s.s.b.' printed on the front.

Just listen to all the strong distorted s.s.b. signals on 27.4-27.5MHz. A better description would be 'power amplifier'.

In editorials, a few years ago, you moaned about radio amateurs not being allowed to convert illegal multi-mode CBs for legal 28MHz use. Your argument being that it would get them out of circulation. This does not hold water. These things are still being smuggled into the country, it would just increase the demand.

Adam Page
Tyne & Wear

Editor's comment: Our attempts to 'educate' the media on Amateur Radio continues. The widely read UK Press Gazette (journalism's own weekly 'trade' paper) recently published a letter from me appealing to journalists to contact the RSGB, the Radiocommunications Agency or PW to get accurate information, so as to avoid misrepresenting the Amateur Radio hobby. If you feel strongly on this topic, copies of my original letter to the UKPG are available (for individual readers to send to the local media) on request from the Broadstone office.
Part Exchange Paddles

Gordon Crowhurst G4ZPY, proprietor of G4ZPY Paddle Keys International has recently notified the "Newsdesk" of a very special offer he is running for a trial period of one year, from September 1 this year.

With the exception of Morse keys that are sold as kits, G4ZPY will accept pump keys which have been purchased from them within the previous 12 months in part exchange for paddle keys. Following an inspection of your key G4ZPY will allow up to 40% of the purchase price paid for a pump key. This offer will enable customers to buy refurbished pump keys at lower prices than new models.

For more information contact G4ZPY Paddle Keys International, 41 Mill Dam Lane, Burscough, Ormskirk, Lancashire L40 7TG. Tel/FAX: (01704) 894299.

Virtual Museum

Bournemouth University's virtual museum on the Internet, part of Bournemouth University's Conservation Sciences Department, the Centre For The History Of Defence Electronics (CHIDE) opened to the 'general public' with Internet access, from August 1.

Several 'museums' are to be found on The Internet. But Bournemouth University believe that their new project will be the first dealing with the history of defence electronics.

The official launch of the project was on June 26 1995, by the Chancellor, Baroness Caroline Cox of Queensbury and the Vice Chancellor Professor Gillian Slater. On a hot cloudless day they welcomed about 50 guests, many of whom were pioneers in the world of radar and electronics.

Sir Bernard Lovell FRS, their patron, was unable to attend on the day, but sent a message of support. Several 'museums' are to be found on The Internet. But Bournemouth University believe that their new project will be the first dealing with the history of defence electronics.

Although supported by the Imperial War Museum and its archives, the centre is looking for personal memories and recollections. These personal stories will be used to add depth and feeling to the history provided, giving a unique insight into the social impact radio and electronics of the industry over the period.

Initially the virtual museum will have only a skeleton set of pages to view, but it is hoped these will increase on a weekly basis. To wander around the 'museum' the Home Page address for those of you with Internet access is: http://chide.bournemouth.ac.uk/welcome.html

If you would like to contribute to this worthwhile project, please contact Dr John Beavis (E-mail jbeavis@bournemouth.ac.uk) or Brian James (E-mail bjames@bournemouth.ac.uk) at The Department Of Conservation Services, Bournemouth University, Poole, Dorset BH12 5BB. Tel: (01202) 659169.

Flexible Putty

Due to recent press coverage of Coax-Seal, Waters & Stanton Electronics of Essex have decided to import this product direct from the USA.

Coax-Seal is a flexible putty type substance designed to be moulded around antenna connectors to give protection from corrosion and act as a water-proofing agent. The manufacturers describe it as "a hand mouldable plastic which stays flexible at any temperature, is non-contaminating, non-conductive and helps to ensure low s.w.r." It can also be used on baluns, beam antenna parts, dipole and connections to help prolong the life of your antenna.

Coax-Seal is supplied in a roll measuring 60in x 1/2in wide providing enough protection for nine coaxial fittings and costs £3.95 plus 50p P&P. More information can be obtained from Waters & Stanton Electronics, 22 Main Road, Hoddesdon, Essex SS5 4QS. Tel: (01702) 206835/204965.

Callsigns In Space

Would you like your name or callsign to fly on the Phase 3D (P3D) Spacecraft when it's launched in 1996? Well, owing to requests made by members of AMSAT world-wide, this has been made possible by the AMSAT-UK Phase 3D Project Team.

Anyone who donates £150 or more to the P3D fund will be able to have their name or callsign placed on the Spacecraft prior to its flight. This will be in the form of a small engraved plate, which will be photographed and then sent to the donor together with a small engraved certificate or plaque.

Commercial or trade organisations can also have their names 'flown' on P3D Spacecraft on receipt of a donation of £5000 or more. This is also open to government organisations and universities who would like to give cash instead of just supporting the hobby.

If you'd like to make a donation to the Phase 3D Spacecraft Fund all methods of payment and currency are accepted and should be sent to Ron Broadbent G3AAJ, MBE, VP RSGB, 94 Herongate Road, Wanstead Park, London E12 3EQ, England. Tel: +44 0181-989 6741, FAX: +44 0181-989 34340. Technical information sheets on the P3D Spacecraft are available from Ron G3AAJ on receipt of 3 IRCs.
Radio Amateurs Examination Courses

Grenlothes & District Amateur Radio Club, Balwearie High School, Kirkcaldy.
RAE course, Mondays 7 - 9pm, starts late September. Contact: Ken Horne GM3BYQ on (01592) 265789 (evenings) or T. McGill at Balwearie High School on (01592) 640335 (mid September).
Morse class, Tuesdays 7 - 9pm, starts late September. Contact: Ken Horne GM3BYQ on (01592) 265789 (evenings) or T. McGill at Balwearie High School on (01592) 640335 (mid September).

Hillesdon Adult Education Centre, Hillesdon High School, Middletons Lane, Hillesdon, Norwich NR6 5SB.
RAE course, Tuesdays 7 - 9pm, starts week commencing 18 September. Tutor G3IOR. Fees: £50 approx. Contact: (01603) 41156.

Hilderstone Radio Amateurs, Kent.
RAE course, Tuesdays 7.30pm, starts 3 October. Tutor: Ken Smith G3JXJ. Contact: Ron Marchant G3TAT or Ken G3JIX, QTHR on (01304) 812723.

Hull College, Queen's Gardens, Hull HU1 3DG.
RAE course, 2 years (exam Dec 1996), Tuesdays 7 - 9pm (1st year), Mondays 7 - 9pm (2nd year). starts 12 September (1st year), 11 September (2nd year). Fees: £2.50 registration plus £52 (1st year), £19 (2nd year). Enrolment by phone from mid-July or in person from 4 September. Contact: Steve Brett G4COT on (01482) 329943.
Morse class. Wednesdays 7 - 9pm, starts September 13. Fees: £2.50 registration plus £52. Contact: Steve Brett G4COT on (01482) 329943.

Newbury Technical College.
RAE course, Wednesdays 7 - 9pm, starts 13 September. Tutor G3NDS. Contact: Newbury College on (01635) 35353 or Ray Oliver G3NDS on (01672) 870892.
Morse class, Fridays 6 - 7.30pm, starts 15 September. Contact: Newbury College on (01635) 35353 or Ray Oliver G3NDS on (01672) 870892.

North Trafford College, Talbot Road, Stretford, Manchester M32 0XH. RAE Theory course, Monday evenings or Wednesday mornings.
Electronics Servicing/Construction course, Tuesday afternoons.
Computing course, Tuesdays mornings.
Morse class (beginners), Wednesday afternoons. Enrolment September 4, 5th and 6th. Contact: John Beaumont G3NGD on 0161-872 3731 Ext. 347.

Ormesby Middle School, North Road, Ormesby, Great Yarmouth, Norfolk. RAE course, Thursdays 7.30pm, starts week commencing 18 September. Tutor G3JOR. Fees: £50 approx. Contact: (01603) 35857.

Rugley Adult Education Centre, Twyford Lane, Rugley.
RAE course, Tuesdays, starts 20 September. Tutor G4COT. Contact: Mr. B. Golemboski on (01889) 578738.
Morse class. Wednesdays 7 - 9pm, starts September 13. Fees: £2.50 registration plus £52.

RAE course, Thursdays 7.30 - 9pm, starts early September. Tutor G0VLO. Fees: £1.50 per session inc. coffee, biscuits and club membership. Enrolment 7 September at 7.30pm. Contact: Clive Binnell G0TVR on 0121-429 6061, Archie Holyoake G40J on 0121-552 4619 (or Martin Prestidge G2BXP on 0121 552 4902. Novice RAE course running concurrently with above. Tutor: G2BXP. Contact: Clive Binnell G0TVR on 0121-429 6061, Archie Holyoake G40J on 0121-552 4619 (or Martin Prestidge G2BXP on 0121 552 4902.

Sevenoaks Adult Education Centre, Bradbourne Road, Sevenoaks Kent TN13 3QN.
RAE course. Tutor G3OYU. Contact: (01732) 451618.

Swindon Technical College.
RAE course, Mondays 7 - 9pm, starts 18 September. Contact: G0L0J. Fees: £5 registration plus £63.60. Contact Liz on 0117-968 3112 (office hours) or Chris on (01454) 616267 (evenings & weekends).

Wombourne Youth & Community Centre, Church Road, Wombourne, Wolverhampton WV5 9EZ.
RAE Course, Mondays 7 - 9pm, starts 18 September. Contact: Brian Fereday on (01902) 820826.
Morse class, Thursdays 7 - 9pm, starts 21 September. Contact: Brian Fereday on (01902) 820826.

Mid-Warwickshire Open Day
The Mid-Warwickshire Amateur Radio Society is holding an Open Day on September 12 at their club house at the St. John Ambulance HQ Building, 61 Emscote Road, Warwick. The event will start at 6pm and run until 9pm.
During the event, the Mid-Warwickshire ARS will run on-air demonstrations, packet radio, home-brew and kit construction, a working short wave station, and a display showing the work of RAYNET. Everyone is welcome to attend the Open Day and are invited to ask questions about the club and learn more about amateur radio.
The Mid-Warwickshire ARS was founded in 1961 and now meets regularly at various locations throughout Warwick and Leamington Spa. Membership for the club is drawn from Leamington Spa, Warwick and Kenilworth with meetings being held on the second and fourth Thursday of each month. The club pride themselves on encouraging all members to get involved no matter what their level on knowledge, experience or expertise. If you would like to find out more about the Mid-Warwickshire ARS activities or their Open Day please contact Don on (01926) 424465.
The new dual bander from ALINCO has been released. What a specification! Don't consider anything else until you have received the full story!

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Includes a host of exciting features. You get CTCSS built-in, 200 memories as standard and a wideband receiver covering 108-174 / 420-470 / 800-950MHz. You'll love its compact size and its electronic vol./squelch controls. Send today for full details of tomorrow's handheld.

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- 1020A Indoor sw active ant... £89.95 £69.00
- 1272 THC fmic. switch... £39.95 £32.00
- 704 Low pass filter... £46.95 £35.00
- 1701 6 way coax switch... £44.95 £35.00
- 912 Remote balun... £49.95 £38.00
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- SX 1000 1.6-1300MHz... £239.95 £189.00
- SX 2000 Auto 1.6-200MHz... £149.95 £115.00
- SX 9000 1.8-160/340-1300MHz... £279.95 £219.00

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New Newsletter

The PW Editorial Staff were very helpful on their recent trip to the Dayton Hamvention. They brought back the first copy of the new 59(9) DX Report which is a newsletter for the contest or DX enthusiast. The newsletter contains details of various DXpeditions (eight in this newsletter), the different exotic islands that are being activated (six of them) and various bits of DX news.

It’s all very current stuff and the April edition I had only gave information until the end of May. They obviously haven’t got any news of the 599rpt@aol.com internet, you can send your messages to the599rpt@aol.com

Report newsletter is Bob Nadolny WB2YOH. Bob is at the top of the Honor Roll in the USA - he reached that spot when he was just 22, the youngest person to get there! Apparently, he’s been into contesting and DXing since he got his licence.

The other thing I thought was great for those who want to know where the unusual callsigns are possibly to be found, is ‘The Listening Post’ section.

Other information available in the newsletter was QSL addresses and any news the author thinks other DXers ought to know. This newsletter comes out almost every week!

To subscribe to the 59(9) DX Report here in the UK will cost you $30 for 25 issues or $53 for the full 50 issues. You can get out almost every week!

Readers’ Letters

I’ve heard from Eileen Mainwarine 2W1BPS again recently. Despite looking after Wyn her husband, caring for an orphaned lamb and a clutch of chicks, she’s managing to learn Welsh and get on the air once or twice!

Eileen 2W1BPS was on the air during a recent contest on 50MHz. She reckons that most of the contest operators couldn’t have come from the ranks of the Novice Licensees as their operating habits were much too bad. She did work one really expert operator, he had nearly 200 QSOs worked when he got his first Novice YL - Eileen. Other than that she’s managed to go as far as Snowdon and Cornwall from her Llandeilo site.

She did have one moan and I expect it has affected others too. Novice students in her area who took their exam in March ended up by having their results late so anyone who needed to book a re-sit for the June sitting couldn’t.

Sounds as if there could be some disgruntled Novices in Wales at the moment. Hopefully they can arrange a September exam and let’s hope for a full pass this time.

Some while back, John Percival G7DDU wrote to nominate Charles Austin G4MEW for the 1995 Novice Natter PW/Elmer Award. Well, recently he was honoured with the presentation of a decanter by his services to the Bedford Net.

You can see Charles on the left of the picture receiving the present from John Bennet G3FWA for his services to the Bedford Net.

Charles G4MEW being presented with a decanter by John Bennett G3FWA for his services to the Bedford Net.

Novice DIY

Having developed some constructional skills as part of the Novice course I’m sure many of you are looking for interesting projects to build. The answer may well be found in the latest RSGB book release called Practical Transmitters For Novices.

Practical Transmitters For Novices is written by John Case GW4HWR and is devoted to constructional projects for the Novice bands. The book starts with a quick overview of commonly used constructional techniques such as prototype board, Veroboard and the use of islands on copper laminate board. This provides a handy reminder that’s particularly useful for the small add-on’s or modifications to existing kit.

The next three chapters cover some of the basic circuitry that form the building blocks of the complete projects described later on. There were a few good basic projects in this section including an r.f. probe, absorption wavemeter (very useful to comply with your full licence) and a simple signal generator. All the projects included full constructional details, including the mechanics.

The first transmitter described in Practical Transmitters For Novices is a compact 1W unit designed for operation in the 3.5MHz band. The project was very well described and covered circuit operation, constructional notes, full mechanical details and a step-by-step test and alignment section. If you’re not too sure about doing all the work yourself, all the components are available from Cirkit Distribution.
First Steps - Computing

If you look in the shack of most radio amateurs these days you will find a computer somewhere in the system. While some stations keep a computer just for occasional use others seem to be totally dependent with the computer controlling just about everything.

Maybe one day the computer will generate all the contacts, print and E-mail the QSL cards leaving the operator free to pop into the shack once a week to see what's been worked! Seriously though, there is a real place for computing in a modern shack, but where do you start?

For most the first problem is cost. With home computers costing anything up to £3000 how do you know what to buy?

The answer really depends on what you want to do with the computer. If you're looking for the ultimate computerised station and want to run all the latest software you will end up spending a lot of money - but it doesn't have to be like that.

If, like many Novices and newcomers, you would like to experiment and build much of your own equipment, a computer can come in really handy. A classic example is antenna construction.

Building your own antennas is one of the cheapest and possibly most rewarding constructional areas, but you need to make quite a lot of calculations. This can be easier considerably with the aid of a very simple and cheap computer.

There have been lots of BASIC language programs produced that automate most of the calculations associated with antenna construction. These cover everything from simple dipole through to all the spacing details for v.h.f. and u.h.f. multi-element arrays. One of the great things about the BASIC language is that these programs can usually be exported to any computer that runs basic with only minor modifications.

Another area that's very popular with amateur constructors is filter design. While r.f. filters often play a vital role in the elimination of interference, audio filters can be used to overcome some of the shortcomings of cheaper receivers. Whilst these filters are usually very easy to build the hard part is calculating the component values and then adjusting the result to use standard components.

As with all the preceding sections the coverage was very thorough and included test equipment as well as a selection of transmitters.

The final sections of Practical Transmitters for Novices provided useful reference material plus a handy list of component suppliers. I was very impressed with the overall standard of the book and am sure it will prove invaluable for many new to the world of radio construction. Practical Transmitters for Novices is available from the PW Book Service for £9 plus £1 P&P UK, £1.75 P&P overseas.

The computer makes light work of this and can carry out many iterations of the calculations to give the best result with standard component values. As with the antenna design, most of these programs are available in BASIC language.

Electronic Logbook

After use for calculations, probably one of the most common uses of the computer is to provide an electronic logbook. By using an electronic logbook you are able to use the power of the computer to search for details of previous contacts.

With an electronic logbook facility all you have to do is type in the call and the computer will show whether or not you have worked the station before and if so it gives the operator's name and will list the details including equipment.

As you can see this is a particularly useful facility that can really help sharpen up your operating technique. The very latest logbook programs include a wealth of facilities and can control your rig, provide beam headings and even operate packet stations to hear the latest DX news.

What To Buy?

All this is very well but you're still probably wondering what to buy and how much will it cost. If you're just looking for a computer to help with calculations and maybe run a logbook you should be able to get by with an older second-hand computer.

A good place to look is in the local free advertising papers that abound in most areas, looking through my local paper I've seen the following typical prices: Amiga 1200 (£500), Amiga 500 (£400), Atari ST (£600), BBC B + disk drives (£100), 286 PCs (£100), 386 PCs (£200-400), 486SX PCs (£500) and 486DX PCs (£600+). You will also need some form of printer and the popular dot matrix types seem to sell for around £30 each.

You could be forgiven for being confused about the IBM PC because there have been so many different processors used over the years. To help sort this out here's a simple listing starting with the slowest and oldest moving up to the fastest: 8086, 286, 386SX, 386DX, 486DX, 486DX2, 486DX4 and Pentium. With the 386 and 486 machines you will usually find a second number quoted after the DX or SX this is the processor speed in MHz so the faster the better.

Before you go out and buy your computer I would suggest you find someone locally you can talk to about the pros and cons of the different systems. Ideally you should try out the software yourself. There are bound to be several people at your local radio club who will be more than happy to make sure you don't waste your money.

Next month, in 'First Steps' I'll take a Novices look at the dreaded DX news - why has it got everyone so excited (at least until they see their phone bills)!

Until next month cheerio. Please keep sending me your suggestions for this column, I'm especially interested in hearing what you'd like featured in 'First Steps', so get writing.

Elaine GALFM
THE BANDIT*

LOWE'S MAD SUMMER SALE OF ALL

For Example...

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<tr>
<th>Model</th>
<th>RRP (£)</th>
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*Who the heck, you may ask, is the Bandit? Just ask anybody who remembers vintage radios like the FT-101 and they will enlighten you!
RIDES AGAIN
KENWOOD AND YAESU TRANSCEIVERS

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Reactivation Of GX3JDY

East Riding RAF RS held a special VE Day event on Sunday 7 May 1995 and the callsign GX3JDY had its first appearance on the air. As Leconfield is now a combined base RAF and Army, security is top priority. The club did hope to receive permission to run a 24 hour station, but due to Leconfield being a 24 hour operational station, this was not possible.

With the valuable help and loan of three telescopic radio masts from the Royal Signals Station based at Leconfield, Warrant Officer Gary Collier and members very speedily erected a full-size G5RV h.f. antenna, Diamond 500 dual-band vertical v.h.f. and a 9-element Tona horizontal beam for s.s.b. 144MHz.

The club managed to work 215 stations during the ten hour period of operation, 155 on h.f. 3.5MHz and 60 on v.h.f./u.h.f. The furthest station on v.h.f. was F6HPP France and ON4BBW in Belgium in JO 10 SS square.

Unfortunately, in the afternoon a large Aurora borealis created atmospheric conditions and blacked out the DX bands. But overall, the club did well, even though they did have difficulty in hearing all the stations who were trying to work them.

The triple mode station was operated by G3UYV Les Navier 2629, Gordon Rutherford G7SCT 3830, James Bradley G1OSD 2845, Allan Wilson G4CZV 986, Jack Handley G0EAA 1646, David Boughton G7PER 3749, Jim Holbrook G6VWF 3737, Derek Green G7DKX 3439 and Bernard Atkinson GOSWO 2912.

The club also enjoyed the company of Keith Ford G4ZKF 1817, 51 Squadron Historian and Bob Boyes, ex 51 Squadron, who both served at Leconfield.

Follow-up Bedford Net

Do you remember reading in the July PW about Charles Austin G4MEW and the Bedford Net? Well, just recently 'Club Spotlight' received a follow-up letter from John Percival G7DDU with some photos, where Charles G4MEW was presented with a decanter, suitably engraved for his service to the Bedford Net.

Charles Austin G4MEW (left) being presented with a decanter by John G3FWA.

Some of the Bedford Net members at the ‘breakfast’ where the presentation was made.

New PR Officer

Peter Brindley GOHEV has recently been appointed Public Relations Officer for the Bury St Edmunds Amateur Radio Society. Meetings are held at Suffolk School, 7.30 for 8pm on the third Tuesday of the month.

Further details can be obtained from Kevin Waterson G1VGI, 20 Cadogan Road, Bury St. Edmunds, Suffolk IP33 3QJ or Tel: (01284) 764804.

Liverpool & District Amateur Radio Society

The Liverpool & District Amateur Radio Society meet at 8pm every Tuesday evening at the Churchill Club, Church Road, Wavertree, Liverpool. A couple of up and coming events are: August 15 - Projector Demonstration by GOMSO, 22nd - RA Discussion, 29th - Surplus Sale, September 5 - Quiz and on the 12th the club is ‘on the air’.

If you would like to know more about the Liverpool & DARS, you can reach Ian Mant G4WWX on 0151-722 1178 or write to him at 28 Welbourne Road, Childwall, Liverpool L16 6AJ.

Liverpool & District Amateur Radio Society is also involved in JOTA weekends, charity events and much more. For more details, contact Michael GOSMJ (Secretary) who will be happy to tell you more about the club.

Michael can be contacted on (01255) 815207 or you can write to him at 44 Dulwich Road, Holland-on-Sea, Essex CO15 5NA.

Clacton’s Field Day

Back in May on the 6 and 7th the Clacton Radio Club held their annual field day from Saturday to Sunday where local amateurs had the chance to see most modes of transmission. The club’s station was up and running, refreshments were available and a BBQ was also laid on.

Lots of equipment was used and a few DX stations were worked as well as local British stations on both h.f., v.h.f. s.s.b. and Digi modes. A total of 70 stations were worked, including 14 answers to a Packet CQ!

Clacton Radio Club is also involved in JOTA weekends, charity events and much more. For more details, contact Michael GOSMJ (Secretary) who will be happy to tell you more about the club.

Michael can be contacted on (01255) 815207 or you can write to him at 44 Dulwich Road, Holland-on-Sea, Essex CO15 5NA.

(L to R) Allan Wilson G4CZV, Jim Holbrook G6VWF, Les Navier G3UYV, David Boughton G7PER.
Leading Ladies

Pauline G7SPT at the microphone, with Jean G7SNH log keeping.

Pauline Moldon G7SPT talks about the Crowborough Amateur Radio Society.

Last year, the Crowborough ARS entered the Practical Wireless QRP Contest for the first time. We only decided two days prior to the contest to have a bash and as I was not licensed at the time, I was the log keeper.

I am now licensed and there are four ladies belonging to our club, three are already licensed and one is already on her way to taking the RAE. So, we all decided that we would take the men on at their own game!

Unfortunately, the OM’s FT-736R decided to pack up the previous Sunday, so we were all in a mad panic as to whether we would have a transceiver to use. Fortunately, another member of the club came to the rescue with his FT-726R. So, we now had a team with exactly the same equipment as the Crowborough Amateur Radio Society Boys Team, each of us using a 17-element Yagi.

The match was on! The boys were up at 7.30am putting up our antenna for us and so we were all ready to start at 9am. The boys’ team G0CRW/P were our first contact, but we went onto work one GM (the boys never got one of these!), several GWs, ONs and PEs, and we even worked a French station.

Our final score was 85 contacts with 16 different locators, as we did miss quite a few contacts, probably due to lack of experience (we don’t get much chance to operate normally in contests). We won’t come last, but next year, now that we have our club, three are already licensed and one is already on the way to getting licensed at the time, I was the log keeper.

Unfortunately, that was not quite true of our station, as we did miss quite a few contacts, probably due to lack of experience (we don’t get much chance to operate normally in contests). We won’t come first by a long shot and we know we won’t come last, but next year, now that we have had some experience behind us, we will do better!

The day itself was once again ideal for such an event. The sun was extremely hot and we were fortunate to have a small tent to shade us.

The operators were myself, Pauline G7SPT, May (Jenny) Clark 2E0ALR, Jean Hodgson G7SNH and Margaret Clark, s.w.l. as the log keeper and our club mascot, my four month old daughter, Georgina.

Perhaps next year there will be a few more ‘all ladies’ teams, as quite a few we spoke to thought it was an excellent idea, as normally in contests we don’t get a look in. If anyone would like to join in with us next year, we only have one entry rule - You must be female!”

For further information on the Crowborough ARS, contact Pauline G7SPT on (01892) 653782 or on G7SPT@GB7ZZZ.

Nottingham Experiment

Perhaps some of the spirit of the legendary Robin Hood, possibly one of the earliest supporters of equal opportunities, was still abroad in his adopted Nottingham in the Autumn of last year. This was when the senior novice instructor for that County was faced with the prospect of three totally blind students wanting to undertake the Novice RAE course, something which had never been attempted.

Julian Mayfield G0LXX did not throw up his arms in horror, as might have been expected. Instead, he set himself the task of discovering how this might be achieved, bearing in mind the firm emphasis on practical tasks in the course syllabus.

Julian confirmed that the policy of the RSGB was that as far as possible, persons should not be excluded from the course by virtue of disability. So, having received the blessing of the RSGB, Julian set about modifications to the course, so that it became tailor made for blind students.

As much as possible, the course became a ‘hands on’ experience. And, although the use of a soldering iron does not come highly recommended for blind students, it is possible to learn how to solder in theory and by the same method, what components, valves and layout are required to build, for example an audio amplifier.

Obviously a multimeter cannot be read, other than by sight. But knowledge of its functions and modes can be acquired without visually accessing the dial or read-out.

Special paper is available to blind students, whereby with the use of a stylus (or for that matter a ballpoint pen), lines can be raised on the paper, and this provided useful for circuit diagrams and symbols.

City & Guilds have, for some time, had special arrangements for blind students taking the RAE and the same facilities were made available for the Novice course.

Regrettably, two of the students were unable to complete the course, but one survived, and has since become 2E1EAE, located near Leicester. The experience may be just the beginning, and only time will tell as with the RAE, whether the door will be opened elsewhere for blind students wanting to undertake the Novice course.

Town & County Festival

During the August bank holiday, (26-29th August) a special event station will be operating at the Town & County Festival, Stoneleigh, Warwickshire. The Town & County Festival is a hobbies and crafts fair, along with a motoring festival display, held every August bank holiday weekend. During the weekend, some 100,000 plus people visit the showground.

The callsign to listen out for is GB4TCF. Operation will be on the usual h.f. bands, 144MHz, possibly 430MHz ‘phone, packet on 144/430MHz and there will be a RAYNET stand. All of these stations will be on display to the general public to promote amateur radio and show an open door for those who wish to participate.

If you wish to find out more, contact the organiser, Mike Beaumont G4VCX.
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**Practical Wireless, September 1995**
## Taiwan Serene Base Antennas

<table>
<thead>
<tr>
<th>Model</th>
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<th>Gain</th>
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<td>TSB-3315</td>
<td>144/70, 8.5/11dB</td>
<td>5.4m</td>
<td>£129.95</td>
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<td>TSB-3301</td>
<td>144/70, 5.9dB</td>
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<td>TSB-3302</td>
<td>144/70, 4.5/7.2dB</td>
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## High Quality Mobile Antennas

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<td>144/70, (5/7.6dB)</td>
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<tr>
<td>DB-770M</td>
<td>144/70, (3/5.5dB)</td>
<td>1m</td>
<td>£22.95</td>
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<tr>
<td>DB-1304</td>
<td>144/70, (2.15/3.8dB)</td>
<td>41cm</td>
<td>£19.95</td>
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<tr>
<td>DB-EL2E</td>
<td>144MHz, 5/8s, 4.5dB</td>
<td>1.8m</td>
<td>£29.95</td>
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<td>DB-285</td>
<td>144MHz, 4.8s, 3.4dB</td>
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## Accessories P&P £1.00 on the following

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<td>2/70</td>
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<tr>
<td>TSA-6003 Duplexer (Sockets)</td>
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## Prices Down on All Antennas

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<td>144MHz, 4.8s, 3.4dB</td>
<td>1.3m</td>
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## Accessory Products Audio Filters

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<td>Timewave DSP9 Plus</td>
<td>£299.95</td>
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<tr>
<td>PK-900 Deluxe</td>
<td>Timewave DSP-59 Plus</td>
<td>£289.95</td>
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<td>PK-12</td>
<td>Datong FL-3</td>
<td>£139.95</td>
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<tr>
<td>MFJ-784B</td>
<td>£239.95</td>
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## New Products

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<tr>
<td>VHF/UHF</td>
<td>£34.95 + £2 P&amp;P</td>
<td>£14.99 + £1 P&amp;P</td>
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## Practical Wireless, September 1995
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SUBS CLUB

"The book All About VHF Amateur Radio seems to be an ideal choice for our PW Subscribers' Club this month...so that's why I chose it for our 'VHF Special' issue"! says G3XFD.

Although it's by no means a new publication, there's something about William Orr W6SAI's book which has always appealed to me. I don't know whether it's Bill's approach to explaining complex subjects or his common sense ideas on 'getting over' difficult theories which helps me. But help me it does, and I feel sure that it could help you too!

All About VHF Amateur Radio may be thoroughly American in approach, and perhaps a little dated in some respects, but for anyone interested in the practical approach to v.h.f. and above...I suggest they start with this book. If I have trouble in preparing coaxial plugs and socket...I turn to my copy. And, if I'm at a loose end, I often find myself turning to any of W6SAI's books...because they're written in a very down-to-earth way with a sound practical basis (They're not many technical books that can be picked up and 'browsed' through!).

With subjects such as DX propagation, Yagi beam antennas, v.h.f. quad beams, mobile antennas that work, moonbounce, satellites (how to use them), curing interference problems and using s.w.r. meters on v.h.f., there's certainly a lot packed into its 172 pages. In my opinion the book is worth having just for the coaxial plug wiring and v.h.f. cubical quad antenna designs alone!

Thoroughly recommended.

Rob Mannion G3XFD.

By becoming a Subscriber, you can get your copy of All About VHF Amateur Radio for £8 plus £1 P&P (UK), £8 plus £1.75 P&P (overseas) (normal price £9.50 plus £1 P&P UK, £9.50 plus £1.75 P&P overseas) and get PW delivered right to your door!

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NOW ONLY £4.50 + £1.00 P&P UK, £4.75 overseas.
August 18: Cockenzie & Port Seton Amateur Radio Club in Scotland are holding a radio jamb night. Bring your own junk and sell it yourself. Tables will be provided on a first come, first served basis (no charge for the tables), 6 to 9pm. Raffle at approximately 8.30pm. Entrance fee is £1 and refreshments will be available. All money raised is being donated to the British Heart Foundation.

August 20: The Kings Lynn Amateur Radio Club will be holding their open day at the Great Eastern Rally at The Cattle Market, Hardwick Narrows, Nks. Kings Lynn. Doors open at 10am (9.45am for disabled visitors). Talk-in will be held at the large beer area and behind the food Village. There will be free parking, bars and catering. Free stands available to radio/computer clubs and societies! (01494) 683929.

August 20: The Galashiels Club are holding their rally at the Watford Leisure Centre, Vista Road, Clacton-on-Sea, Essex. Doors open at 11am till 4.30pm. There will be two halls and a car boot sale and field talks. Talk-in on S22. Further details on this event from Bob GM4UZY on (01875) 811723 or via GB7EDN.

August 27: The East Coast Amateur Radio & Computer Rally is to be held at the Clacton Convention Centre, 100 Beach Road, Clacton-on-Sea, Essex. Doors open at 10.30am to 4pm. There will be major suppliers and manufacturers of radio equipment, software, accessories, antennas and second-hand gear. There will also be a Bring & Buy, plus a bar and catering available. John Campbell G6MOAB. Tel/FAX: (01835) 822686.

August 27: The Trowby Rally is being held at the Clenon Valley Leisure Centre, Paignton, Devon - where there’s room to stop and chat! Doors open at 9am, but there will be breakfast, a Bring & Buy, special interest displays, the use of leisure facilities, a restaurant and bar. For the family, only a four minute walk away, is a beach, boating lake, steam railway and a flume water park. Further details can be obtained from John G3YCH, QTHR. (01803) 842178.

August 28: The Huntingdonshire Amateur Radio Society are holding their Rally at St. Peter’s School, St. Peter’s Road, Huntingdon. Cambridgehire. Doors open at 10am and admission is £1. Refreshments available. There will be two halls and a car boot sale. Talk-in on S22. David Leech G7DUD. (01480) 431333.

September 3: The 18th Telford Radio Rally is being held at the usual venue, Telford Exhibition Centre, Telford. Free parking and easy access from M54 and M6. There will be major national exhibitors, and easy access for disabled people. Refreshments and free parking too. Further information from Ian Cooper S226 and SU22 (GB1ECR). Further information can be obtained from Sharward Promotions on (01745) 591704.

September 3: The Bristol S22 14 OE (or (01275) 834224 (24hr answering phone).

September 10: The BARTG Rally is being held at Sandwell Exhibition Centre, Sandwell District, West Bromwich. (0121) 840030. Further information from Muriel Baker G4YZR. 62 Court Farm Road, Whitchurch, Bristol BS14 1OE or (01275) 834224 (24hr answering phone).

September 12: The Mid-Warwickshire Amateur Radio Society are holding their Open Day from 6-9pm at the club's rooms in the St. John's Ambulance HQ Building, 61 Emscote Road, Warwick. There will be amateur stations on the air together with displays of packet radio, homebrew, kit and construction. All are welcome to come and see the club in action, ask questions and learn about amateur radio. Don on (01926) 424465.

September 17: Peterborough Radio & Electronics Society East of England Rally is to be held at the Peterborough Showground, easy access from A1, A605, A47. There will be trade stands, radio car boot and other local attractions. Full catering and bars. Access for free park, doors open at 10.30am to 1.30pm for disabled visitors. Admission fee of £1, accompanied by an adult. Further information from Colin G0DOW. General enquiries to Ted GOREM on (01733) 664711, QTHR.

September 17: The Central Lancaster Radio Club rally is to be held at the Central Lancaster High School, Craig Road, Lancaster (five minutes from Jcn 34 M6). Doors open at 10.30am and the entrance fee is £1. There will be the usual trade stands, radio car boot and all other local attractions. Further information can be obtained from Sharrard Promotions on (01253) 277177.

September 23: A Radio Amateur Table Top Sale is to be held at St Mary's Hall, Reddish, Stockport. More details from John G4ILA on 0161-477 6702.

September 24: The Droitwich Amateur Radio Club are holding their Three Counties Radio Rally at The Three Counties Showground, Moseley. For further details you can contact Eddie G4POZ on (01905) 773181.

October 1: Blackwood & DARS rally is to be held at the Community Centre, Bridgeview Way, Blackwood, Gwent. Doors open at 10.30am. There will be traders, a Bring & Buy and a raffle. Further details from Norman GWOMAW on (01495) 227550.

October 1: The Great Lumley Amateur Radio & Electronics Society will take place in the Community Centre, Gt. Lumley, Chester-le-Street. Doors open at 10.30am for disabled visitors and 11am for others. There will be stand a, Bring & Buy and much more. Barry G1JD on 0191-3869393.

October 15: The North Monaghan Hobby Radio & Computer Exhibition will be held at Cramond Nightclub and Dance in the centre of the town, Smithborough, County Monaghan. Proceedings start at 11.30am and continue until 5.30pm. All the usual retailers will be in attendance along with a large display of computer equipment and a Bring & Buy. Refreshments will be available all day in the adjoining restaurant. There will be plenty of facilities for OSLing via the brewery! Admission is £2 and half price for all under fourteen. Talk-in will be on S22 from 10.30am. Facilities will be provided for disabled access. Stephen Hand G4OK on (08) (01357) 579755 or Ken O'Reilly G7UIJP on (08) (01357) 579855.

November 4-5: The Eighth North Wales Radio & Electronics Show is being held at the Aberconwy Conference & The Bew Theatre, Abergele. The show will be open from 9am to 5pm on both days. B. Mee GW7EXH on (01745) 917904.

November 19: The Bishop Auckland Radio Club's Club will be holding its annual radio rally at the Newton Aycliffe Leisure Centre. Doors open at 10.30am for disabled visitors and 11am for everyone else. Further info, from Mike Shield. (01388) 766264.

November 26: The Bridgend & District Amateur Radio Club are holding their radio rally and Bridgend Recreation Centre, Bridgend. Further information from Mike GW7NIS on (01656) 722119.

December 3: The SDX Cluster Support Group will be holding a Radio, Electronics & Computer Rally in the Maryhill Community Centre, Glasgow, which is located just along from junction 17 of the M8 motorway and is located on major public transport routes. Doors open at 10.30am for disabled visitors and 11am for everyone else. Entrance fee is £2 for disabled, UB40 holders and £2.50 for all other visitors (children under 14 accompanies by a parent free of charge). There will be many traders, club stands, lectures and demonstrations. Further information can be obtained from John Dundas GDMOPS, Rally Organiser, on 0141-638 7670.

December 3: The Verulam Amateur Radio Club are holding their rally at the Watford Leisure Centre, which is approximately five minutes drive from the Junction of the M1 and M25 motorways. Trading will be from 10am to 4pm. (01923) 222284.

December 3: The Thames Valley Electronics Rally is being held at Kempton Park, Racecourse, Sunbury-on-Thames, Middlesex. Doors open at 10.30am to 4.30pm (10am free entry to the Buyer & Buy), major manufacturers, accessory suppliers, antenna supplies, Scratch bar stalls, antenna supplies, sales stands, radios and computer and a raffle. Admission for adults £1.50, OAPs £1 and children under 14rs free. (01494) 450504.
A nyone active on the 50 and 144MHz bands (and 28MHz for that matter!) can hardly fail to have noticed that this summer's Sporadic-E (Sp-E) season has been particularly strong. It usually starts in late April and continues through until early September with (sometimes) a brief winter peak between mid-December and mid-January. Sporadic-E is quite a spectacular mode of propagation. And a previously 'dead' v.h.f. band can suddenly become alive with extremely strong signals.

With 50MHz the distances range from 500km to perhaps 8000km on occasions. On the 144MHz band contacts between 1000 to 3000km can often be made. As a generalisation the more normal single-hop distance of around 1500 to 2000km is usually encountered on either band. Sporadic-E is very common on the 50 and 70MHz bands but fairly rare on 144MHz. This is because this band is approaching the highest frequency affected by Sp-E.

Some keen DXers have reported seeing TV signals, via Sp-E, on Band III around 190MHz. On a very few occasions contacts have even been made within the USA on the 220MHz band.

**Investigation Probes**

Investigation by ionosondes and other probes have shown that Sp-E layers contain a high concentration of ionised metals such as iron and magnesium (unlike the regular E and F layers which consists of atmospheric gases). The Sp-E layers, about 1km thick, are generally accepted to form at heights of around 100-130km above the earth's surface. Quite often two or more thin layers will be present at particular heights. It's important to note that the ionisation within the layers is not uniform. If you could look at the E-layer at a particular frequency you would see a number of discrete 'clouds'. The 'clouds' will then appear to get smaller as the frequency is increased. So, by the time you reach the 144MHz band only the highest concentration of ionised material would be seen.

Unfortunately for the DXer the intense clouds are not stable and often move and disperse very rapidly. So, one moment you may be contacting a station in Hungary and the next second the band could be open to Romania. The mechanism that produces the necessary ionisation is not clearly understood and several theories exist. Some people suggest that because the annual variation of sporadic meteor rate peaks during the same period as Sp-E, that there might be a connection between the two.

The correlation between meteor activity and incidence of Sp-E is very tenuous however. In the southern hemisphere, the Sp-E season is also in the summer but that period is also six months out of phase with the peak in the world-wide meteor rate.

**Another Theory**

Another theory states that openings are related to certain violent weather activity. Intense thunderstorm activity, for example, contains mechanisms that produce ionisation and strong electric charges which may influence the lower levels of the ionosphere. Interestingly scientists at NASA's Marshall Space Flight Centre have recently been observing rare gamma ray flashes above thunderstorms. The high occurrence rate of these events suggests the presence of a little understood, but significant phenomenon, that could have an impact in many scientific fields.

It's suspected that the gamma ray flashes come from a rare type of powerful electrical discharge above large thunderstorm regions. However, whether these 'sprites' have any material effect on the formation of Sp-E remains to be seen.

One of the most popular theories at the present time is that Sp-E is caused by atmospheric wind shears. Charged ions, from meteoric material, can easily be carried along by winds at E-layer heights. The charged ions can then be concentrated into irregular thin layers by a combination of high altitude wind shears and the earth's magnetic field. The mechanism seems to operate best under stable geomagnetic conditions and will get disrupted by auroral activity.

**Making Contacts**

Normally it's the keen v.h.f. DXer who specialises in making contacts via Sp-E. Generally speaking therefore most QSOs are made with s.s.b. or c.w. although f.m. works equally as well. When an opening is in progress one-hop signals can be particularly strong. And it's actually possible to tune through a DX signal thinking it's a local station! Certainly on the 50MHz band signals from Italy, for example, can be 'end stopping' on the S-meter. Unfortunately, the inexperienced operator will incorrectly think that all Italian stations run at least 2kW output!

The usual 'Tropo' signals on a 'normal' day are at the mercy of the prevailing weather and are therefore relatively weak. The Sp-E propagated signals on the other hand could almost be compared to a free-space path with little loss between stations. Although this isn't true it almost appears to be so at times.

**Extreme Selectivity**

Another characteristic of Sp-E is its extreme geographical selectivity. Because of this it's quite common to work stations with S9 signals all in one or two locator squares.

However, at the same time a local operator a few kilometres away may hear nothing at all. This can be extremely frustrating when the 50MHz band opens up to North America!

If all the Sp-E activity sounds like good news for everyone then I'm afraid you're wrong! To satellite and e.m.e. operators the onset of Sp-E propagation has a negative side.

To access a satellite (be it a man-made OSCAR or the Moon) your signal must get up through the ionosphere. Then on the return...
journey your signal must again pass through the ionosphere. At 29, 145 and, to a lesser extent, at 435MHz, Sp-E can make the ionospheric transit very difficult. At times it can even be impossible! Mode K satellites, such as RS12 using a 21MHz uplink and 28MHz downlink, can be completely lost if a Sp-E cloud is between you and the satellite. Although the Sp-E clouds may only extend for a few tens of kilometres, the shadow they cast both on earth and in the orbital path of the satellite may extend to several hundred kilometres. The ‘moonbouncer’ has similar problems especially when working on low elevation paths. The increased ionisation makes the E-layer less transparent much to the detriment of the transmitted e.m. signal.

The effect is rather like that of fog! On a clear night the lights of a car are sharply focused. When fog is encountered the lights become broadened and diffused blurs. So, when you are listening for signals on the threshold of audibility Sp-E may extend to several kilometres, the shadow they cast both on earth and in the orbital path of the satellite may extend to several hundred kilometres.

The Season

However, for many operators the onset of the Sp-E season is a godsend. Because received signals can be so strong it provides a great leveller of station equipment. Several watts and a dipole antenna will produce many good and interesting contacts on the 50MHz band.

On higher frequencies the geographical selectivity can help you. It can mean that your 3W and a 4-element Yagi may give better results than that 400W station with four 17-element Yagis on the other side of town!

As I mentioned earlier the process by which Sp-E is caused is not fully understood to enable accurate predictions to be made. However, in the June issue of PW I stated that the Tuesday after the first weekend in June almost always produces an opening on the 144MHz band.

Was I right this time? You bet I was! And not only that, also I predicted it would be a good day to work 444BS on the 50MHz band.

Elusive Openings

So when did those elusive openings occur on the 144MHz band during June? Well actually the first one occurred a little earlier on May 20. This was a brief event, between 0945-0955UTC extending into Italy. Stations in DL, HA, I, OE, VU, S5 and EA worked the Sp-E opening on June 2.

Another opening also occurred later in the month on June 25. So that’s seven openings in the UK on the 144MHz band during the first half of this summer’s Sp-E season.

Now I’ll take a closer look at those 144MHz openings during June. And the first one, on June 2, actually consisted of two openings.

The first brief event at 1230UTC was to the islands of Greece. Propagation from SV was mainly to central and northern France. A small extension allowed a few favourably sited stations in south-east England to work SV3BTR (KM17). The station of KintzendenSpiros SV2BXC (KN10) was also active at this time.

In his report SV2BXC mentions having a local chat with SV2DWW on 145.525MHz when French stations suddenly broke in. A number of stations in France and Switzerland were contacted on fm, the signals being strong enough to hear them on his handheld transceiver.

The second opening on June 2 was an even bigger event lasting nearly two hours. Commencing around 1415UTC stations in LZ, YO and YU were worked from many areas of the UK. By 1450UTC the propagation had moved further south enabling stations in G, OI, OM and GW to work into Italy and Sicily.

Three days later on June 5 the next opening on the 144MHz band took place. This time the propagation path from the UK was to the Mediterranean area, Spain and Portugal.

The event was quite lengthy, starting around 1450UTC and continuing through to 1820. Many operators in G, GW and DM reported making contacts with stations in CT, EA, IS0, I7 and 9H. The Balearic Islands were well represented with EA6BF, EA6SA, EA6XQ, EB8YY and EB8/D5JS appearing in many logs.

The Prediction

And now to the day of my prediction. Tuesday June 6! And one of the first DX signals heard was at 1014UTC when G4UFU spotted the Maltese station 9H5L.

The main event really got going though from 1120UTC and continued through to 2255. Stations in southern, eastern and central England, Wales and Scotland made QSOs into CT, EA, EA6 and 1. The station of EA9AI (LM75) in Ceuta, North Africa was reported by G4UFU (J001), G4VPD (I002), G7HUEU (I003) and GM4CXM (I075).

For the majority of operators who miss most daytime events because of work commitments the opening on June 9 was a bonus. This Sp-E event started at 1620UTC lasting for over two hours.

It should be noted of course that the start and finish times depend very much upon your geographical location. The locator map, Fig. 1, shows some of the propagation paths available.

At my QTH (I081) the 144MHz band was open from 1624-1639UTC. Contacts on s.s.b. were made with stations in DL, HA, I, OE, YU, S5 (Slovenia), T9 (Bosnia) and 9A (Croatia). My best DX was with YZMON (KN04) at 1952km.

Noel Moore GI7CMC (I074) reports that the band was open with him between 1630-1800UTC. He made contacts into DL, SP, OE, OK and OM with the best DX being at 1842 UTC.

Nick Gregory G6HMK (I084) mentions that in Cumbria the band stayed open until 1840UTC. He worked OK2VVB and SP9DHO using a Yaesu FT-221 with replacement muTek front-end, a muTek mast-head lna., and 70W into a 10-element Yagi.

Best Of Month

What was probably the best opening of the month occurred on June 12 and I’ve shown some of the paths on the locator map, Fig. 2. During the day a number of separate events were recorded.

The first started around 0840UTC when G7YLD (J001) heard 9H1GB (LM75). At 0845UTC the band opened up again allowing contacts to be made with stations in CT, EA, EA6, EA9, I, IS0, I79, 9H.

It was particularly pleasing to note that three African stations, EA9AI, EA9IB and EA9MH were being worked by many UK operators. This opening was very intense and lasted well over two hours. Between 1415-1445UTC a shorter but no less interesting opening occurred to CT and EA.

Ralph Sachs G2CZS (J001) caught the main event working EA6XQ, EA6AI and a number of mainland Spanish stations between 1000-1230UTC. He also mentions hearing ER5AA in Moldavia during the Sp-E event on June 9. Unfortunately signals were in and out too quickly to make a QSO.

Finally from the sunny island of Malta GC comes a report from Marco G9PCC equipment was used for a very brief event on June 25 between 1630-1715UTC. Best propagation was between DL and CT, EA and 1T9 and GW. G9PCC reports catching 1T9PD (LM78) and 4GACLA (I092) heard SV3KH.

Deadline Time

It’s deadline time again! Sorry there’s no room to give you details of activity on the 50MHz band or of the seven transatlantic openings during June. I plan to cover these and further 144MHz Sp-E openings next month.

In the meantime if you’ve made an interesting QSO or just wish to pass on any news please let me know about it. As usual send details to reach me by the end of the month to: Yew Tree Cottage,Lower Maescoed, Herefordshire HR2 0HP or via packet radio @ GB7MAD or the DX Cluster system. Alternatively you can telephone me on (01873) 800679. Please note the new number!
VHF/UHF SPECIAL

Wooding's World

Mike Wooding G6IQM, the Editor of VHF Communications magazine provides an insight to his approach to the fascinating world of v.h.f. Mike invites you to join him and the other dedicated 'VHFers' as they explore ever higher frequency bands.

There are as many proponents of v.h.f.-and-up as there are those operating the 'd.c. bands'. There's also much to be said for both areas of amateur radio, h.f. and v.h.f.

Many a heated argument can be heard about whether or not h.f. or v.h.f. is better and who is the 'proper' amateur. Especially if the v.h.f. enthusiasts is 'only' a class B!

I intend to enter neither argument. However, I hope to instil you with a little of my enthusiasm for operating in the v.h.f., u.h.f., s.h.f. and microwave areas.

I have always maintained that there's still much experimenting to be done in the various fields of radio communication. But not being an expert in h.f. modes of communication, I cannot say if there is much yet to be done there.

However, in the milli and micro-metric bands there is a great deal yet to be explored. Whether you are into construction, specialist modes, or just simply operating, then the multivarious areas of v.h.f.-and-up can offer a great deal of instruction, satisfaction and pleasure.

Many people look at 144MHz and some of its attendant problems and consider that this band is v.h.f'. But in my opinion that's not the case! Those of us who attempt more serious work and experimentation on the upper bands are more often found using 430MHz (70cm) as the base 'natter band'. The higher bands, 1296MHz (23cm), 2.4GHz (13cm) and 10GHz (3cm), etc., are where the real experimentation and construction takes place. It must also be said that there are a few amateurs dabbling with the bands much higher than these.

The Requirements

The requirements of a good v.h.f. station are essentially the same as for h.f. But perhaps greater attention must be given to detail.

I've found from my own experiences that many amateurs are not initially aware of the implications of poor antenna feeder connections, for example. I also feel that far too much attention is given to getting the v.s.w.r. down to virtually 1:1.

Too much concern with the v.s.w.r. is something of a nonsense. This becomes obvious when you're operating the higher bands, as antennas and feeders are expected to work over much greater bandwidths in many cases than on h.f.

The greater bandwidth means that the v.s.w.r. may vary over quite a large amount over the band. Consequently, a compromise is the only solution.

Important Antennas

As with all radio communications, one of the most important aspects of a v.h.f. station is the antenna. Incidentally, I hate the word antenna when applied to aerials! And as I often say on our local repeater, GB3WK, insects use antennas, we use aerials!

However, the worthy Editor of PW says it's antenna in the magazine. So antenna it shall be! (Thank you Mike! Editor.)

The most common type of antenna for v.h.f. and u.h.f. is the Yagi-Uda, commonly known as the Yagi. These antennas are generally tuned by manufacturers and further tuning is not possible by the user. Although some versions utilise Gamma tuning stubs, which allow you to fine tune the antenna match to suit the frequency slot in the band where you operate most.
**Higher Bands**

The higher bands, 23 and 13cm, require antenna systems with high gains. And although the Yagi can be constructed with gains in the region of 10 to 15dBi without much difficulty, they tend to become somewhat narrow-band.

A variation of the basic Yagi design is the quad loop Yagi. This type of antenna employs loops instead of straight elements. The loops are of specific diameter for the frequency band required. And, as with straight Yagis, the gain is increased with more loops.

Gains of the order of 18 to 22dBi are not uncommon with the quad loop type of antenna. Gains such as this can be achieved with straight Yagis, but at the expense of bandwidth and size.

Straight Yagis of high gain are generally long Yagis, with wide element spacings. They can easily be anything up to (and over) 10m long!

The quad loop Yagis with similar performance on the other hand are not so daunting. They tend to be around a mere 3 to 4m boom length.

**Broad Band**

Another advantage of the quad loop Yagi is, that by comparison to the straight Yagi, it’s very much more broad-band. Take the 23cm band as an example, where in order to cover the entire band from 1240 to 1320MHz (as ATVers need to do) with straight Yagis, two antennas are required to maintain a reasonable gain across the band.

However, if a quad Loop Yagi antenna is used, then only one antenna is required to cover the whole 23cm band, with less than a couple of dB variation across the band. But one disadvantage with the quad loop Yagi is that it has a wider beam width than the straight variety.

In some instances the wider beam width can be more useful. But for the avid DXer, the requirement is to concentrate all the forward gain into as tight a beam as possible. My personal choice is the quad Loop, and for 23cm I currently run a 48-element JVL for receive and a 28-element MicroMax for transmit.

A point to note here is that I use two separate antennas, one for transmit and one for receive. This is the recommendation of many stations and one that I fully endorse.

**Separate Antennas**

The practicalities of separate antennas for transmitting and receiving is that lossy and expensive antenna changeover relay systems are not required. This may not be a problem if you are using proprietary equipment, but the majority of us on these bands use homebrewed systems, and so this is a very important consideration.

Another financial consideration is that on the higher bands it is almost mandatory to use mast-head preamplifiers. This means that not only does the transceiver need an antenna changeover system, but so does the pre-amp, thus doubling the loss and expense. However, there can be a trade off!

If, for example, you’re using quite high transmitting powers, and a twin antenna system, you’ll have to give some consideration to the signal strength available at the receive antenna and consequently at the input of the pre-amplifier or receiver.

But all is not lost! This is because there are ways to protect for these conditions, and most modern circuit designs allow for high signal condition handling without disaster.

**Keen Constructor**

As I said earlier, I’m an avid constructor. In fact it should be said that of the time I have available for the hobby, I spend more time wielding the soldering iron than the microphone!

Once a unit has been built, aligned, tested and proved on air, I just seem to move onto the next one. Currently I am working on a new 13cm transverter.

There are commercial transceivers around today that operate multi-mode on 23cm. However, I am not aware of anything commercially available for the amateur on the bands above 23cm.

So, most operators on the higher v.h.f. bands build their own equipment. But don’t worry, this is not as daunting as it sounds although you do need to be fairly proficient in the use of basic hand tools. You also need a good soldering station, preferably temperature controllable and with a variety of bit sizes.

It has to be said that as the frequency gets higher then the components get smaller. But this does not particularly require any specialist skills or tools.

Good eyesight is a definite advantage though, as we are now into the realms of surface-mount devices. They are not at all difficult to solder into place, but they can sometimes be well nigh impossible to see!

So, having said that most equipment used on the upper bands is home built, where does the v.h.f. enthusiast get the necessary circuit designs, printed circuit boards, components, etc., from? Fortunately, there are a few excellent component suppliers, some of whom also supply p.c.b.s and complete kits for receivers, transmitters, transceivers and more usually transverters.

**Transverters**

Just in case you’re not fully conversant with what a transverter is, it’s in fact simply a transmitter or receiver without an exciter stage. In other words, a transverter needs a radio to ‘drive it’.

Actually, to be really exact, a transverter is a transmit-converter, hence its name. But in practice, radio amateurs usually use the name to refer to transceivers as well as just transmit only units. Conversely, receive only converters are usually called just that.

Most transverter designs for the upper bands transvert from 144MHz, or occasionally 430MHz, although designs are to be found which transmit from 10m for example. This means that your shack 144 or 430MHz multi-mode transceiver can be used to work 23 and 13cm.

I have also seen details of a soon-to-be-available transverter for 3cm that uses 144MHz as the driver. However, when it comes to 3cm, there are some very good designs already available for complete units that do not transvert but have their own exciters. In fact 3cm is often used as the base for transverting to even higher bands.

Building a transverter should not be regarded as a task only for the expert. Although as I said earlier, the higher the frequency then often the smaller the components, meaning large populations of surface mount devices (s.m.d.s).

But actually fitting surface mount devices need not be considered difficult. Essentially, the main points to consider are as follows.

1: Careful handling, as s.m.d.s are usually more fragile than discrete types.
2: Awareness of static protection, connecting yourself, your soldering iron and the p.c.b. being worked on together to a common earth point.
3: Careful soldering and paying particular attention to the temperature of the soldering bit.

If these simple points are followed then successful use of surface mount components can be achieved.
Test Gear

Another question that's often asked is, how can I build equipment for the very high frequencies when I haven't got loads of test gear? Fear not, many designs for transverters for microwave applications are so designed that no test equipment other than a simple multimeter is required.

Without going into specifics, the utilisation of on-board stripline filters, rat-race mixers, fixed frequency multiplication stages and Microwave Monolithic Integrated Circuit (MMIC) 50Ω building blocks, means that virtually no tuning-up is required. Even a frequency counter may not be required, as the setting of the local oscillator can be achieved by using a 144 or 430MHz receiver to monitor the harmonics.

I hope you can see now that home-brewing equipment for v.h.f., u.h.f. and microwaves is not a totally black art!

Also, as with all aspects of amateur radio, there's always a friendly, knowledgeable station. They will help you out with advice and practical help, both over the air and in the shack.

Never be afraid to ask! We all are still learning, even those of us who are supposed to know what we are talking about!

Also, just because you haven't got a 400W 23cm transmit capability do not be discouraged. I came back to 23cm narrow-band working last year using a home-built Down East Microwave transverter with 10W of r.f. output, and managed to work (quite successfully) Gil G0GIL and George GBAIR, both stations approximately 30km away from me and neither of them direct line-of-site paths.

Also, during the good conditions prevalent during last autumn, quite a few stations to calibrate their equipment. It's quite probable that more air time is spent doing this than just making contacts for a matter.

Another point that is worth mentioning is that the upper bands are quiet. Not necessarily electrically quiet, but often totally devoid of human 'occupation'.

I have spent a lot of time calling on the various bands above (and sometimes including) 430MHz to no avail. However, the temptation to rip your gear apart should be resisted!

The problem is two-fold. Firstly, as I said above, propagation is such that your wonderful signal, having traversed your feeder and launched much of itself successfully from the antenna, simply nose dives into the ground at the end of the street. Nothing you can do about that!

Secondly, the higher bands are far less occupied than 144MHz and those below. It's not unusual for stations to ring other active stations just to ascertain that they are both on the band and beaming at each other! Keep trying and your attempts will be rewarded.

Equipment

I've already mentioned one or two pieces of equipment that I use and/or recommend. And although there are other sources of equipment and components, the following are those that I use and have found to be helpful and usually able to satisfy my requirements.

I'll start off with antennas:

The JVL range of antennas for 23cm and 13cm are available from Mike Walters G3JVL, 26 Fernhurst Close, Hayling Island, Hampshire PO11 0DT.

Unfortunately MicroMax antennas are no longer available.

Next, transverter kits/p.c.b.s: Available from Mainline Electronics, PO Box 235, Leicester LE2 9SH.

Specialist (Subscription only) magazines:

VHF Communications Magazine, 5 Ware Orchard, Barby, Near Rugby, Warwickshire CV23 8UF.

Components: Mainline Electronics, PO Box 235, Leicester LE2 9SH
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Practical Wireless, September 1995 31
Ken Ginn G8NDL describes his modifications to ‘P’ Band Pye Olympic p.m.r. transceivers enabling them to work on 50MHz.

As I had already modified a number of surplus ‘P’ Band Pye Olympic transceivers to work on 70MHz, the question was later posed to me about converting the same rig to 50MHz. However, at first I was very reluctant to take on such a task, knowing the initial problems when I undertook the 70MHz modifications!

I thought that the 50MHz conversion would be a harder project to perform...and I was proved right. The job should only be undertaken by the experienced!

Whereas the ‘P’ band Olympic needed only a relatively small deviation from the original operating frequency, the 50MHz modification needed an extra 20MHz squeezed out of the rig. It would end up operating some 18MHz out of its original operating frequency band.

Much the same modifications are performed on the 50MHz rig, as were undertaken in the 70MHz conversion. However, there are a few additions which I’ll explain section-by-section, and to help I’ve provided a block diagram, Fig. 1.

The Transmitter

Considering the parts, which needed modification, I’ll look at each part separately and will start with the transmitter. So, by looking at Fig. 1, you’ll see that the oscillator is a design which will work from 6 to 14MHz quite comfortably.

The broadband oscillator is common for A through to E band models. This is quite fortunate, as the oscillator transmit frequency adopted in this rig is now of the order of 8.4MHz.

The transmit multiplier stages in the original transceiver have multiplication ratios of x2, x3 and lastly x2 (total x12). This provides an output frequency at the 84MHz for a crystal frequency of 7MHz.

In the 50MHz design, the multiplier stages are adjusted to give a different overall multiplication ratio of x6. This is mainly accomplished with the first stage now having a ratio of x3, the second x2 and the third x1. This gives a healthy output to drive the p.a. to about 500mW at 50MHz.

The p.a. ‘brick’ in the ‘P’ band model (BCY32) is designed to run from 68 to 88MHz at an output power of 17W for an input power of 100mW. And as I ended up running this broadband module some 18MHz lower than specified, I expected that the transmitted r.f. power out was going to be less, and it turned out to be only 3W.

The drop in power prompted me to buy a Pye A200 70MHz p.a. It was ripe for modification and would provide a little more power, approximately 15W. Unfortunately, to replace the ‘brick’ with another was found to be an expensive exercise, so I thought it was best to obtain the A200 p.a. to keep the cost down.

During the conversion, the low pass filter (l.p.f.) in the final module will need some adjustment. To do this all the capacitors and inductors are removed and replaced to adjust the filter’s response to attenuate the second and third harmonics, as these may be present at 100 and 150MHz.

The Receiver

In the 50MHz conversion, the receiver is modified in the same way as the 70MHz Olympic, to bring the operating frequency down to below specification of the original design. The local oscillator injection will be running at 61MHz into the front-end module’s mixer.

The receive crystal oscillator will then be

![Fig. 1: Block diagram of the Pye Olympic transceiver.](image1)

![Fig. 2: Diagram showing the transmitter multiplier chain with notations indicating the components requiring modification (see text).](image2)
at 10.3MHz and into the following multiplier stage, which runs at x 2 and x 3 (total x 6). The last stage has a multiplication ratio of x 1, i.e. tuned at 61MHz.

A considerable amount of work is required on the front-end module. Some of this work is borrowed from the modification to the 70MHz module.

Most of the coils have to be rewound. And some of the capacitors have to be replaced to make the circuit run efficiently at the new frequency.

Multiplier Stages

As I've mentioned above, the multiplication ratios of all the multiplier stages have changed, and they are now:

- Transmitter crystal frequency = TX freq/6MHz
- Receive crystal frequency = (RX freq +10.7) /6MHz

Both transmitter and receiver crystals are to the Pye specifications 75410. All crystal manufacturers will be aware of this specification and will produce them to your requirements. It's time to tackle the transmitter multiplier stage prior to alignment.

Low Pass Filter

Next, it's time to carry out the l.p.f. modifications. Incidentally, the original coils (on the un-modified transceiver) are in the form of printed circuit inductors. See Fig. 3 for guidance, and to start, the screening can which is soldered to the top of the p.c.b. has to be removed.

Some care is needed when carrying out the modifications. There are a number of tags which are soldered through to the bottom of the board and these have to be eased gently to ensure the board is not damaged in any way.

Once the screening can is removed, the removal of all the components of the l.p.f. section follows. This means all the associated capacitors and the printed circuit inductors. These are removed as shown in the photograph.

Firstly the track is cut with a sharp knife. A tinned soldering iron is then applied to the track side, (which needs lifting) and this will weaken the joint between the track and the board, the track will then start to lift.

At this point, the track can be removed with the aid of the sharp knife. It's then just pulled away to a point indicated in the photograph in Fig. 3.

The same procedure is adopted for the remaining coils. The following capacitances now make adequate points to which the three new coils can be mounted to the board.

The three coils, Fig. 4, are all air wound on a 5.5mm former with 20s.w.g. enamelled copper wire, and they're closely wound and formed to fit on the board. Finally, they are then soldered onto the top track side of the board.

The first coil (L1), has five complete turns, the second (L2), has four turns and the third (L3), also has five turns. Coils L2 and L3 are both wound clockwise and L1 is wound anti-clockwise (this facilitates the mounting of the coils to the p.c.b. better). Refer to Fig. 3, the l.p.f. section for more detail.

When finished, the poles of the second and third harmonics of the new circuit should be in the region of 100 and 150MHz and have 45 and 25dB attenuation respectively. This provides adequate attenuation of any spurious generated from the transmitter side.

This stage concludes the modification to the transmitter side. However, the following section is rather more involved and is by far the most difficult of the modification to perform!

Receiver Modifications

To start the next stage, remove the receiver front-end, Fig. 5, and its multiplier modules from the transceiver. Next, you should pay attention to the front-end, where the lid of the screening can is removed by unscrewing the four self-tapping screws.

There are six air wound coils in the module and ALL six are to be removed (that's L1 through to L6). The remaining coils are to stay. Clear all the holes of any excess solder, including those for the coil taps, if any, as this will make the re-assembly easier.

Now remove the following capacitors from the front-end module: C2 (associated with L1) and replace with a 5.6pF ceramic, C4 and C6 (associated with L2) and replace C4 with a 5.6pF ceramic and replace C6 with a 2.2nF ceramic.

Next, remove C8 and C10 (associated with L3) and replace C8 with a 2.2nF ceramic and replace C10 with a 5.6pF ceramic, C12 and C14 (associated with L4) and replace C14 with a 2.2nF ceramic, note that C12 is no longer required.

Continue, by removing C16 and C18 (associated with L5) and replace C16 with a 2.2nF ceramic and replace C18 with a 15pF ceramic. Then remove C20 (associated with L6) and replace C20 with a 5.6pF ceramic type. You should now add a 33pF ceramic across C23 on the track side of the p.c.b.

Winding the major front-end coils now follows. These are all wound using 0.56mm diameter enamelled copper wire wound around a 6mm former. The coils are finished close air wound and completed with epoxy resin adhesive (Araldite is suitable) coated on the inside of the coil to make the coil more rigid.

The coils are made as follows overleaf:
Remove the rest of the punted circuit cods from these locations.

Fig. 4: Detailed view of new i.p.f. components. The original inductors are printed circuit types on the p.c.b. and have to be removed (see text).

Transmitter Tuning
You should now be ready to set up the transmitter tuning. This is carried out by adjusting the tuned circuits and watching the resulting points of resonance on the test points on the board.

Before you start though, make sure that there is a crystal in the correct socket! You'll also need a dummy load and some form of power indicator on the antenna socket and a 13.8V 4A power supply.

When you’re ready, set the rig to transmit, but be careful as some microphones have a 40 second timer in the casing. (The ‘shaver’ shaped microphone does, and this will tend to make the tuning up a little difficult, having to de-key and key-up again throughout the tune up procedure).

Then (while referring to the lay-out drawing, Fig. 2), keep the transmitter keyed during the whole transmitter alignment. Next, while looking at the transmitter multiplier, connect the multimeter positive lead to TP1, adjust L1 and L2 for a minimum, then adjust L3 for a maximum of around 8V.

Then transfer the multimeter probe to TP2 and adjust L4 for a minimum. Now re-tune L3 for a minimum and lastly adjust L5 for a maximum of about 9V.

Next, transfer the probe to TP3 and adjust L6 for a minimum. Re-tune L5 for a minimum. Adjust L7 for a maximum of about 8V.

Transfer the probe to TP4 and adjust L8 and L7 for a minimum. Then adjust L9 for a maximum of about 12V.

Connect an ammeter in series with the power supply (10A range). Re-tune L9 for maximum supply current. Adjust L10 for maximum supply current, which is approximately 3A. Now Check (if possible) the output power and this should be over 2.5W, with about 3A being drawn from the power supply at 13.8V.

The maximum deviation level is set with the preset on the transmit board by adjusting the preset control RV1. It should be set at about 3kHz.

Receiver Alignment
The next procedure is to carry out the receiver alignment. This is accomplished in the usual way with the typical set-up using a signal generator and a means of reading SINAD if possible.

However, carrying out the alignment ‘by ear’ can work almost as well as listening with a modulated carrier and continuous tone of 1.0kHz with a speaker!

To start (while referring to the lay-out diagram, Fig. 2), set the transceiver up with a crystal in the appropriate channel and select that channel. Measure the voltage on TP1 (on the receiver multiplier board) with the aid of a multimeter (negative on the multimeter to the

Continued on page 36
A Quick Quagi

Keen antenna constructor Kevin James G6VNT has come up with another quick and simple idea. This time it’s a combined 5-element quad and Yagi which he’s named the ‘Quagi’.

This time I’ve been experimenting with a high gain quagi beam design for the 144MHz band. But strictly speaking, the antenna is not a true quagi, but a mixture of a quad, a slot and a single Yagi!

My antenna has the driven element of a quad, the rear reflectors of a slot and the front-end of a Yagi! And having an overall length of only 1.4m, it’s quite small when hoisted aloft and an impressive gain normally only achieved with much larger antennas.

The theoretical gain of an array such as the ‘Quagi’, is around 11dB. But you never attain this figure in actual practice, due to losses in the feeder and matching arrangements.

**Circular Element**

As you can see from Fig. 1, the antenna has a circular driven element. In theory, this shape has the greatest gain and capture area of all the various loop shapes, i.e. squares, rectangles and triangles, etc.

A loop has a gain of 1.4dB over a straight half wave dipole. This is backed up with a twin reflector arrangement, with elements spaced vertically, at approximately quarter of a wavelength.

A couple of directors added to the front-end adds approximately another 3dB. By careful spacing of the parasitic elements from the driven element, a 50Ω 1:2 match is achieved into the feeder.

Because the loop is balanced, it’s necessary to add a balun to match it properly into the unbalanced feeder. I achieved this by simply making a two-turn tapped coil of 50mm inside diameter out of the coaxial cable, just before it connects to the loop, as in Fig. 1.

**Mechanical Details**

The mechanical details are straightforward, as the boom consists of 15mm square tube. This is typical as that used on TV antennas, and the reflectors, were made of 8mm tube.

The driven element was made of 8 swg galvanised wire bent into a loop. The diagram in Fig. 1, shows that the ends bent up into a contact or terminal block.

The wire is typical of that used for threading through concrete posts for fencing around modern houses (but I suggest you go and buy some rather than ‘borrow’ it!). I did try to use 10swg, but it was not really rigid enough.

The RG58 coaxial cable had its screen and centre core tinned before insertion into the contact block and tightening the screws. When you do this, make sure that you weatherproof the connections well before hoisting the antenna aloft. I use bathroom silicon sealant to keep the water out.

The coaxial cable leaves the contact block vertically, going into the two turn taped coaxial loop balun as already mentioned. The coaxial then goes up to the boom where it’s taped in position and finally down the mast. I use the commonly used electrician’s type black plastic insulating tape, as it seems to do the job satisfactorily.

**Wooden Batten**

A 670mm length of 20 x 10mm cross section wooden batten is mounted inside the loop. This holds the loop open and in shape with the complete assembly being bolted in place at the centre of the boom.

A small 15mm wide x 10mm deep notch cut out in the wooden batten, stops the loop...
support moving out of alignment when it's mounted on the boom. Small aluminium clamps at each end of the wooden batten, holds the galvanised wire loop in position.

At the rear of the antenna, a T-piece holds a vertical section of 15mm square tube to the end of the boom. At each end of this bar is bolted a 8mm diameter x 1050mm tube reflector element.

Two directors are mounted in front of the loop driven element. One director 875mm long is mounted 375mm in front of the driven element. A second (shorter) 850mm long director is mounted some 750mm in front of the first director (1.125m from driven element).

A standard right angle clamp, holds the boom to the mast. The bracket I chose allowed a wide variation in mast sizes to be used.

Finally, make sure you paint the wooden loop support with a coat of yacht varnish (particularly the ends) to stop water absorption into the wood when it's exposed to the weather.

Shopping List

You will need a the following lengths of 15mm square aluminium tube: One of 1.4m long, and one 400mm long.

Also required are the following lengths of 8mm diameter tube: Two 1.05m lengths, one 875mm and one of 850mm. Also needed is one 670mm length of 20x10mm wooden batten.

For the loop a single 2.1m length of galvanised fencing wire or copper wire (note that if copper wire is used, the v.s.w.r. is likely to change) about three to four millimetres on diameter, various narrow strips of aluminium to make clips for driven element loop securing. Also needed is one two-hole piece of 'chocolate-block' electrical connector and a 25-37mm diameter mast and mounting clamps.

Impressive Performance

During testing, the ‘Quick Quagi’ proved itself and gave an impressive performance. For example, using my standard HB9CV antenna, giving an 53 signal on the front from a constant signal source at 10m, switching over to the Quagi provided an 55 signal. Received measurement readings were taken on the my Kenwood 751E.

I achieved a 1:2 v.s.w.r. with the prototype. A small lobe was present at the back of the antenna, but I considered it nothing to worry about.

With an S9 signal on the front, rotating the antenna 180° gave an S2 on the rear. I estimated that a gain of around 9.5dB should be achieved - not bad for an antenna only 1.4m long!

Although I haven’t tried my prototype on high power, there seems no logical reason why high power should not be employed. So, have a go yourself, build a ‘Quick Quagi’ and see what it can do!

Olympics On Six

Continued from page 34

negative supply to the rig and the positive on the meter to the various test points and adjust L3 and L4 for a maximum reading of around 100mV d.c.

Now, with the multiplier probe to TP2, adjust L6 and L7 for a peak. Now re-tune L3 and L4 for a maximum reading on the meter, around 500mV with the probe still connected to TP2.

Next, by using an i.f. signal generator (set to give some 10mV of r.f.) connect it to the antenna socket on the rig at the test frequency. And with the modulation set at a 1kHz tone at 2/3 system deviation (3kHz for a 5kHz system, 1.6kHz for a 2.5kHz system), tune L9 on the receiver multiplier for best S/N (if test equipment is available. If you don’t have test equipment, adjust for best ‘quieting’ while progressively reducing the signal).

You should now (while referring to the lay-out drawing, Fig. 5) adjust C1, C5, C9, C13, C17, C21, C25 and L7 on the front-end module for best quieting. The presets on this module can be adjusted with a screwdriver.

The coil L7 however, needs a non-metallic tool to make the adjustments. A small knitting needle filed to the appropriate shape for the slug’s slot. (It’s the best alternative for the job if a plastic tool is not available).

Be careful with L7 as it’s very fragile, and the trimmer C26 also has quite an effect on the overall performance of the receiver.

Output Power

The major problem with the conversion is the fact that the output power is a little on the low side, at only 2.5W. This is due to the fact that the BGY32 is designed to run within a limited band and does not work efficiently outside its bandwidth.

The p.a. module can actually be put to one side and replaced with another unit. Alternatively, an adequate module can be placed externally to the radio to bring the output power up to a respectable 15W from the 500mW drive from the transmitter multiplier board. (One such module is available from Garex Electronics, Tel: (01364) 72770 at a very reasonable price).

Another alternative would be to make a small p.a. module to replace the original unit in the radio (There’s a suitable project in this issue. Ed). Or you could convert any one of a number of surplus boards on the second-hand market to use as an external p.a.

So, get busy...first find your Olympic and then carry out the conversion. I’m looking forward to meeting you on ‘Six f.m.’!

Photograph taken by Ken Ginn G8NDL, showing close-up view of the modified Pye Olympic ‘P’ band transceiver receiver front-end with newly wound coils in place (see text).
Simply Linear On 6

To try out 50MHz, I bought an FT-690. It’s an interesting little rig, and the day it arrived coincided with a very good tropo opening. I heard Ws and VEs just like I was on 14MHz and I was only using a dipole about three metres off the ground. The DX, of course, whetted my appetite, so a beam was constructed and mounted on my little tower at about 12m high. I had some very satisfying results, but then wanted better!

The obvious answer was to construct some form of linear amplifier. So, my ‘junk box’ ‘store cupboard’ seemed the best place to start.

I had no solid state device to hand, so I turned towards the valves that were available. The circuit, shown in Fig. 1, follows conventional techniques and it’s pretty basic. Out of the ‘bottles’ to hand, I chose the trusted 6146B. A check with the ARRL Handbook showed that this valve works to 60MHz at full ratings. Further examination showed that in class AB1, the drive power was minimal. So the 6146B seemed the perfect choice.

The junk box produced a suitable power transformer, capacitors and other bits to complete the job. The workshop yielded up an aluminium chassis, a front panel and - a case.

Words Of Caution

A cautionary word of warning for those bought up on solid state amplifiers. You will be dealing with elevated voltages (several hundred volts) and if you integrate the power supply on the same chassis, you’ll have mains under your hands. Please take the necessary precautions.

When constructing an amplifier of this sort, the wiring associated with the r.f. circuits should be as short and direct as possible. Also these connections should be made from using a heavy gauge wire. I use a minimum of 1.2mm (16s.w.g.), silver plated or tinned copper. This allows good sturdy point to point wiring of good mechanical strength.

The d.c. circuits should be adequately r.f. decoupled close as possible to the point of common connection. The d.c. wiring should be routed well away from the signal wiring and be of suitably insulated wire for the circuit voltage.

To minimise hum pick-up from heater wiring, run these circuits in ‘twisted pair’ kept as near as possible at right angles to any signal wiring. It’s handy to devise a colour code for this type of wiring because it allows you to trace through the circuits visually without resource to a continuity check.

Last but not least, every effort should be made to prevent the grid circuit from ‘seeing’ the anode circuits except via the electron stream inside the valve. This requirement can result in a lot of mechanical engineering to provide adequate screening. Therefore, it pays to take time in laying out the various
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e. It has all modes as standard
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f. It has Gen Cov, RX, 30KHz-200MHz
g. It has 101 memories
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    (including Alpha Tag)
h. It employs a Spectrum Scope
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components on paper, before cutting and drilling metal chassis.

**Grid Circuit**

It's also a good idea to contain the input or grid circuit components in a screened compartment, so components around the input socket are in a metal box. In this case, I found it was unnecessary to include the grid connection of the valve base in the screened area, so a feed through bushing (a simple rubber grommet) was provided. Do not use a feedthrough capacitor as signal feedthrougths. No signals would get through.

By loosening the coupling between L1 and L2 and with C2 adjustable, the grid drive could be peaked across the band. But as my 50MHz activity is all in the bottom 500kHz portion of the band the input circuit is adequate when centred on 50.150MHz.

Having dealt with the c.f. side of the grid circuit, let's turn to the d.c. biasing. Because the 6146 is being operated in class AB, a stable grid bias supply will be required.

The bias voltage for a 6146 operating in linear mode is -50V (referred to the cathode). This voltage is obtained from a dedicated bias supply will be required.

The bias potentiometer, R2, is a wire wound resistor, Ri.

The measured output into a 50Ω load is the order of 15W on s.s.b. and about 20W on c.w. This gives a gain figure for my installation of 1400;2 and the Pi tank circuit has to transform this to the 50 or 75Ω level required for the antenna system. The components values for the Pi network in the diagram meet the general rule of thumb calculation set out in the ‘HF Transmitters’ chapter in the 5th edition of Radio Communications Handbook, published by the RSGB.

The power supply is on the same chassis as the amplifier. The chassis measures 230mm x 165mm x 75mm deep and the various components are laid out as indicated in Fig. 4. I think I was lucky in having a power transformer of a size which fitted in very well. Anybody building this unit will have to experiment with what they have to hand.

I've used a 350-0-350V transformer with a bi-phase rectifier and capacitor filter as shown, this gives an anode voltage of 380V at current of 130mA peak. The filter capacitors are arranged in series because I intend uprating of the power supply to 800V. The capacitors are each 100μF 450V working and shunted by high power equalising resistors.

**Control**

The control of both the amplifier and the exciter is effected from a switch located on the

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Fig. 2: (Left) The coil RFC1 is made by winding about 80-100 turns of 0.3mm e.c.w. on a wooden mandrel former.

Fig. 3: (Below) The coil RFC2 is made by winding double silk covered 22s.w.g (0.75mm) copper wire on a 15mm ceramic former. If using enamelled copper wire space each turn so as not to touch its neighbour (80-85%).

Fig. 4: (Below) The choke RFC3 is made from three turns of brass strip about 4-6mm wide wound around a 6mm internal diameter. Keep the ends as short as possible.
operating desk console. A change over relay is incorporated within the amplifier, which performs all of the transmit/receive change over functions.

The relay has a 12 volt operating coil. It takes its power from a six volt winding through a voltage doubler circuit.

The FT-690 provides a d.c. voltage at the antenna socket. This voltage can be used, via a transistor switch to a control relay, retaining the full p.t.f. facility of the FT-690.

A suitable control circuit was published in PW in February 1991, page 32. This appeared in the review of a solid state 50MHz p.a. stage.

Neutralising
Neutralising an amplifier is an unloved subject, and luckily in the original model, it proved to be unnecessary. Other amplifiers may not behave as well. The system shown is well tried and tested in this circuit configuration and is easy to adjust.

The requirement is to balance the valve's internal capacitances with an external capacitance. The capacitor, C3, is a 5pF preset type with wide spaced plates. This is to withstand the full h.t. voltages. I modified a preset capacitor to two vanes (one fixed and one moving) making sure I had a spacing between the vanes of at least 1.5mm.

To adjust the neutralising capacitor, apply h.t. and grid drive. Resonate the anode circuit and observe the output into a dummy load on a wattmeter. Adjust C3 while keeping the anode circuit at resonance until maximum output occurs at minimum anode current.

Once set-up, it should never require attention unless you change the valve or replace some circuit component. Do be careful when carrying out this adjustment.

I know designers all say "since I built this, I've had no end of fun." Well, I have. This little amplifier has put my signal into nearly 100 countries.

One day I might get the cards to prove it. This linear didn't cost me anything, and that has to be a plus!

**Shopping List**

**Resistors**
- 2.5W wirewound 5%
  - 2.5W wirewound 5%
  - 10 Ohm 1R
  - 100 Ohm 1R
  - 2K 1 R
  - 3K Ohm 1 R
  - 25K Ohm 2 R
  - 5K Ohm 1 R

**Capacitors**
- High voltage disc ceramic 500V working (minimum)
  - 1nF 4 C2, 5, 6, 9
  - High voltage disc ceramic 1kV working (minimum)
  - 1nF 1 C8
  - Electrolytic 425V working
  - 100µF 1 C15, 16
  - Electrolytic 450V working
  - 8µF 2 C7, 10
  - 100µF 2 C13, 14
  - Variable (high voltage)
  - 5pF 1 C3 (see text)
  - 15pF 1 C1
  - 50pF 1 C11
  - 180pF 1 C12 (or a 200-250pF air spaced type)

**Valve**
- 6L46B 1 V1

**Semiconductors**
- 1N4001 2 D4, 5
- 1N4007 7 D1, 2, 3, 6-9

**Inductors**
- L1 1 turn 1mm enamelled copper wire (e.c.w.) over the 'earthy' end of L2
- L2 6 turns 0.8mm e.c.w. 15mm diameter 20mm long
- L3 4 turns 2mm e.c.w. 25mm diameter 20mm long
- RFC1 5.6µH (approx) See Fig 2 for details
- RFC2 See Fig. 3 for details
- RFC3 See Fig. 4 for details

**Miscellaneous**
- Metal chassis for the unit, one 350-0-350 150mA transformer, one 90V (100mA) + 6.3V (2.5A) transformer, one 200-250mA f.s.d. current meter, two s.p. switches, one 4-pole changeover relay, plugs sockets, coaxial cable, interconnecting wire.
When my employers informed me that I would have to work in VS6 during the first two weeks of November, my main reaction was, well somebody has to do it and two weeks without amateur radio could give me severe withdrawal symptoms. But the former had to be borne with fortitude the latter had to be addressed!

The nature of my work meant that the evenings and weekends were my own time and as such, could be devoted to sightseeing and immingling the local ale! The remaining free time could be devoted to general short wave listening with an emphasis on eavesdropping on the local amateur bands.

Borrowing Equipment

My home station does not lend itself to transportation by air over a distance of 6000 miles. So, I set about borrowing a good quality short wave receiver that met the following criteria: robust, small, ran off its own power supply, good selectivity and provided most modes.

As a member of the Chester Amateur Radio Club, I had attended a lecture given by John Wilson of Lowe Electronics. so, it was natural that my thoughts should turn to borrowing a local HF-150. A quick telephone call to John brought an offer of the loan of an HF-150 with transportation by air over a distance of 6000 miles. I was very wise to accept this offer, as it was not the only one that was offered. The club represents amateur radio interests with the local Authorities and international bodies. The subjects discussed ranged from repeater abuse (heard that before somewhere!), grants to DXpeditions, AMSAT and licensing matters.

The meeting was conducted in a bilingual format, translations between English and Cantonese following speaker's comments. After the meeting, I joined the President and his colleagues for a most enjoyable dinner. Phil kindly invited me to his station, but due to pressure of work I was unable to make it.

Typhoon Fringe

During my stay, the Colony endured the fringe of a Typhoon. Typhoons, I was assured by locals, never happen in November! Whilst the rain was lashing down and the wind was blowing, a China Airlines Boeing 747 overshot the runway at Kia Tak. It gave a rather poor impression of a Shorts Sunderland flying boat that had forgotten how to float!

Fortunately all were rescued. The plane could be clearly seen from where I was staying, becoming a local attraction for those tourists having a将oon.

Farewell Feelings

It was, therefore, with mixed feelings that I boarded the aircraft to leave VS6. Sad that I was leaving a lot of new friends, glad I was going home to my family and anxious that our pilot knew the overall stopping distance of a 747!

My thanks go to the Members of HARTS for their welcome and John Wilson of Lowe Electronics for the loan of the HF-150.

Made Welcome

On November 9 1993 I attended the meeting of the HARTS at the Hong Kong Mariners Club, Kowloon, a short ferry ride away and I was made welcome by Bret V66BG, President, Bob V66EY, IARU, VR2BG Bill, (Treasurer) and Phil V66CT, (Members' Communications).

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Packet Message

In anticipation of my visit, I sent a packet message to the local VS6XMT BBS asking for details of local radio club activities. Sure enough, in a couple of days, replies were received from two amateurs.

The Sysop V66XMT Charlie and V66XPL John both gave me details of the local clubs available. The club that met whilst I intended to be in VS6 was the Hong Kong Amateur Radio Transmitting Society, (HARTS) and I made a note in my diary to visit.

Temporary Home

Having arrived at Kia Tak airport, temperature 29° Centigrade, I was escorted to what would be my temporary home for two weeks, a very nice building currently in use by Her Majesties Forces, next to the Star Ferry on Hong Kong Island. The views over the harbour were magnificent and I soon settled in.

I did reflect, however, that I was very wise not to bring a transmitter, as any unauthorised signals from my temporary QTH would have no doubt bring a most unwelcome response from my hosts! After unpacking my toothbrush, I set up the temporary random wire antenna within my room that was on the 21st floor.

Local Amateur

Tuning into 3.5MHz band brought a 59 signal from a local amateur V66WO. This was my first and last signal heard on this band during my stay. I soon found out that '80' was under used by the local amateurs. However, broadcast and amateur stations, both local and DX, were easily copied by the HF-150 on all bands and there appeared to be no difference between the wire antenna and the whip supplied by Lowes. I kept a log during my stay and the following is a brief extract.

<table>
<thead>
<tr>
<th>Broadcast</th>
<th>11945, Radio Japan 9750, Moscow 6190 &amp; 9845, Deutsche Welle 9765, Swiss 7480, China 15400, 7480, China 15400, 7480, China 15400,</th>
<th>11945, Radio Japan 9750, Moscow 6190 &amp; 9845, Deutsche Welle 9765, Swiss 7480, China 15400, 7480, China 15400, 7480, China 15400,</th>
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<tr>
<td>Beacon</td>
<td>8542</td>
<td>8542</td>
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<tr>
<td>Amateur c.w.</td>
<td>JEU5Owen - 7MHz, J44WFO - 18MHz, J50BQR - 21MHz</td>
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</tr>
<tr>
<td>Amateur s.s.b.</td>
<td>V66WO - 3.5MHz, D0URG, V66WO, OISAY, JH5ZJS, JAIYXJ, JH4XGW - 7MHz, H51BVR, DURRG, UN66WQ, V66WW, BV2XJ, V66WQ - 14MHz, V66CT, J66ETO, V6SX4Q, EA3CVA, DURRG - 21MHz, V66WQO - 28MHz</td>
<td>V66WO - 3.5MHz, D0URG, V66WO, OISAY, JH5ZJS, JAIYXJ, JH4XGW - 7MHz, H51BVR, DURRG, UN66WQ, V66WW, BV2XJ, V66WQ - 14MHz, V66CT, J66ETO, V6SX4Q, EA3CVA, DURRG - 21MHz, V66WQO - 28MHz</td>
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- CT-17: CV LVL CONVERTER
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    - Less than -50 dB (10-29 MHz)
    - Less than -40 dB (30-144 MHz)
  - Carrier suppression
    - Less than -40 dB
  - Unwanted sideband
    - Less than -50 dB

- **RECEIVER**
  - **SSB/RTTY/AM/FM**
  - Double conversion superheterodyne
  - Sensitivity pre-amp On
    - 0.5 µV

SPECIFICATIONS

<table>
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<tr>
<th>GENERAL</th>
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| +Frequency coverage: Receive: 30 kHz-200,000 MHz
  Guaranteed range: 500 kHz-29,995 MHz
  Transmit: 1.800-1.9995 MHz
  Guaranteed range: 500 kHz-29,995 MHz |
| - Sensitivity (SSB/RTTY/AM/FM) |
| - Bandwidth (SSB/RTTY/AM/FM) |
| - Spurious and image rejection |
| - Audio output power |

<table>
<thead>
<tr>
<th>TRANSMITTER</th>
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<tr>
<td>- Output power</td>
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A Single-Handed Review

Rob Mannion G3XFD seemed very well qualified to try a dual-band hand-held that's considered to be easier to use with one hand. So, our 'digitally-deprived' Editor tried out the Alinco DJ-G5 on behalf of other operators in the same boat!

I'm known to have a sense of humour, and whenever I meet anyone at rallies and shows who have their arms in a plaster-cast, I have a stock comment. It's: "Don't worry, you're only a part time member of the 'One Armed Bandit's Club...but I'm a full-time member". It usually breaks the ice and we usually have a laugh!

Actually, joking apart, I can really sympathise with anyone who is effectively 'one armed' temporarily due to their injury because by the time they've got used to it, the injury's healed and they're back to 'normal'.

However, there are a great number of radio enthusiasts who like me, cope with every day life permanently with less than the usual ten digits. And in fact I've got a few friends who manage extremely well with none at all!

But, this review is aimed at helping those who may have lost an arm, have limited use of one arm because of arthritis or from a 'stroke' or other problem. I was asked, as I seemed to be the ideal candidate to try out the DJ-G5.

I've also no doubt at all that those of you with the full complement of 'digits' will find the review of interest. After all, there's many a situation where you'll have your other hand fully occupied!

Complex Problems

As modern miniature hand-held transceivers get even smaller and complex, anyone with less manual dexterity has got problems! And, when you bear in mind how the individual manufacturers vie with each in miniaturising equipment, it's bound to get worse!

So, when Jeff Stanton of Waters & Stanton Electronics asked if I'd like to try a hand-held transceiver which (in his opinion) could help people 'in the same' boat as me, I readily agreed. In doing so the Editorial team broke the rule "the Editor shall not review hand-helds", but as I've mentioned...there are special reasons.

Small And Neat

The Alinco DJ-G5 is relatively small and neat, but it's certainly not the smallest dual-band hand-held I've seen. However, when the package arrived in the PW office I quickly realised that Jeff Stanton had a good point...it was easy for me to handle with one hand.

I was immediately impressed by the way I could operate all the controls (including the top-mounted rotary switch) with little effort with my left hand. In fact, it seemed perfect for someone who only has the use of their left hand.

It was difficult for me to imagine (after almost 35 years of single-handed operation!) what the transceiver would handle like in the grip of someone using their right hand only. So, to help, I wandered into Dick Ganderton G8VFH's office (Editor Short Wave Magazine) and asked him to try the transceiver, using only his right hand.

Dick handled it and after a little experimentation adopted a technique he recalled from his chemistry days at school (where he had to hold and adjust something in one hand, while holding a test-tube in the other. However, the technique made him look uncomfortable using and operating it one-handed.

To be as fair as possible, I also asked Tex Swann G1TEX, the PW Technical Projects Sub-editor to try the rig, using the same one-handed approach employing the right hand. Tex, who admits to being a 'forced right-hander' (from the dreadful days when left-handers were literally pushed to the limit when using the French approach employing the right hand. Tex, who admits to being a 'forced right-hander' (from the dreadful days when left-handers were literally forced to use their right hands when they first went to school) seemed to be less than comfortable holding the transceiver.

However, on the other hand (sorry about the pun!) Kevin Nice G7TZC the Assistant Editor of Short Wave Magazine, tried the transceiver using only his right hand. He looked perfectly comfortable and said it felt well balanced, and promptly operated the rig very effectively. His opinion "very well balanced" and he also said he'd be perfectly happy using the transceiver using only the right hand.

On The Air

So, having got the opinion of other amateur radio operators to get a 'right' view, I'll now report on how the transceiver worked on the air. And to start off, I've got to say I have good and critical comments in this area!

I don't often work on 430MHz and it was good to join the 'Gentleman's Band' as Dick G8VFH calls it. On 70' this rig performed well and seems to be very sensitive indeed. The reported audio (from the tiny microphone tucked down right at the bottom of the transceiver) was surprisingly good.

All my QSOs on 430MHz were via repeaters, as I didn't hear anyone on the simplex channels using the 'rubber duck' antenna. (I don't have any u.h.f. antennas at my home). But, despite this I enjoyed using the transceiver on the band, finding it to be very easy to handle and operate from my left handed point of view.

On 144MHz my time on air coincided with the spell of very hot and sunny weather we experienced in early July. The rig provided me with plenty of simplex and repeater QSOs and I heard quite a bit of DX.

Unfortunately though, as the weather and tropo conditions were so good for v.h.f. activity, the band was very busy. This showed up some shortcomings in the DJ-G5's 'front-end'.

I took the rig out to a local hilly spot and found that with the 144MHz band being so busy (it was on a weekend) the DJ-G5's front-end selectivity was being pushed to the limit. I felt that if I had connected the rig to a portable beam antenna, an approach which provides many enjoyable QSOs for hand-held users, the various other QSOs on adjacent channels would have caused real problems.

But, having criticised the selectivity on the hand-held, I must praise its sensitivity (which is excellent). And, bearing in mind the 'wide band' techniques used by manufacturers providing dual-band transceivers (also incorporating the non-amateur radio coverage which is so often widely promoted nowadays) I should not be so surprised that the receiver front end is a little 'wider' than perhaps it should be.

While on the subject of selectivity, Tex G1TEX commented on the DJ-G5's performance when he had it at his photographic studio. Tex noticed that the transceiver responded to 'wide area paging' transmissions, which could pose problems to anyone living close to a transmitter.

The transceiver with associated NICed recharging Unit.
Display & Controls

Personally, I found that the DJ-G5T handled extremely well, the display and controls were excellent and it was generally speaking, a delight to use. I've also got to say that it's the first modern hand-held which I've truly been 'at home with'.

In use, the clear I.C.D. enunciators and the neat (but very easy to operate) general controls were a pleasure to use as was the backlit (useful in the dark) keypad. I never had to fumble once!

In particular, I should mention the main rotary tuning control (top right hand of the transceiver) which I found (as a left-handed person of course) exceptionally easy to use. It proved to be so good that if I were to be looking for a dual-band hand-held transceiver, the DJ-G5T would be foremost in my thoughts.

Everything on the transceiver's control panel seemed to be laid out just right for me. And (for someone who rarely tries the 'frilly bits') I found myself using the 'scan' facility on both v.h.f. and u.h.f.

The Alinco DJ-G5T is also provided with the now familiar 'Channelscope' facility (11 channels in this model). It's also fitted with CTCSS tone encode and decode as standard.

Not being a regular dual-band transceiver user, I was a little confused by the 'squelching' at first. However, I soon got the hang of the control panel and ensured I was adjusting the squelch control (top right hand of the control panel) and the facility to be useful on a hand-held. And once you've made the decision that it's the first modern hand-held which I've truly been 'at home with'.

To quote Kevin G7TZC once again "It's very well balanced". And for my part I think that the DJ-G5 dual-band transceiver is well balanced and very comfortable to use.

I suggest that if you're in the 'same boat' as myself, you try a DJ-G5T for yourself so you too can discover the freedom of operating a modern small hand-held.

My thanks for the loan of the DJ-G5T go to Jeff Stanton G6XYU of Waters & Stanton Electronics sent us the following comments:

Thanks for letting me see a copy of Rob Mannion's review on the DJ-G5 transceiver and providing the opportunity to comment. I'm pleased he liked it overall, and I faxed the factory in Japan about the criticism of the front-end selectivity. They pointed out that the rig tested was a pre-production model and provided the opportunity to comment.

I would also like to mention the wideband receive facilities between 108 and 137MHz for Airband, and 130 and 174MHz for n.b.f.m. and 420 to 470MHz for n.b.f.m.
It’s Ray Fautley G3ASG’s turn in the workshop this month and he says it’s possible to get two 3-element h.f. beams in the attic.

You don’t really mean two beams in the attic? Yes, I do! But no, you can’t rotate them because they’re fixed wire beams. However, they’re still 3-element beam antennas. So, how can this be possible?

Let’s start by defining the classic 3-element beam antenna. It has a driven element, a reflector and a director with a spacing of between 0.1 and 0.3 wavelength between the elements.

The most critical dimension is 9m. If you can get 9m in one direction, that is to accommodate the antennas with 0.1 wavelength spacing, you’re there!

The various elements can be bent so their ends drop vertically without much loss if you can’t get the whole element in a straight line. The important bit is to get the centre of all the elements on the centre line of the attic space.

The antennas must point in exactly opposite directions. That’s the gloomy bit over! And if the limitations haven’t put you off, I’ll get on with the description of the whole set-up.

The method used to reduce space is to use a common reflector for both beams, as in Fig. 1. Folded dipoles made from 300Ω twin feeder are used for the two driven elements as shown in Fig. 3.

Cutting one of the two wires in the exact centre of the twin feeder element allows connection of the random length feeder to the shack. This feeder should ideally also be 300Ω twin. I’ve shown an enlargement of the centre connection in Fig. 4.

Practically any type of copper wire, single, stranded, bare, enamelled or insulated can be used for the common reflector and the two directors. A suitable source of copper wire is that rescued from flat cable designed for mains wiring.

The wire elements are simply stretched taught across the attic space, and fixed to the roof supporting timbers. I find furniture staples or even drawing pins convenient for pinning the elements up. Find the exact centre of all the element lengths and ensure that they are on the line of the attic.

The antenna measurements might be a bit bigger than the average loft space. But fear not! The antennas must point in exactly opposite directions. That’s the gloomy bit over! And if the limitations haven’t put you off, I’ll get on with the description of the whole set-up.

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Your attic may not be wide enough to accommodate the whole length of the elements, but do try to keep them as far away from other objects as possible. Especially if that object is made of metal.

**Construction stages**

To help, I’ll list the construction details in stages below:

1. Measure the attic area available where roof timbers could be used to support the antennas. Remember that all the elements must be in the same horizontal plane.

2. On a piece of paper, draw this rectangular area. This will be the plane for the elements of the two beams.

3. Draw a nominal centre line in each direction of the rectangle.

4. Whatever dimension ‘X’ happens to be (as long as it’s not too much shorter than 9m) divide it into four and draw in the five elements.

5. Cut two 10.01m lengths of copper wire for the two directors and mark (with tape) the centre of each.

---

**Full Area**

I’ll assume, for simplicity of design, that you have the full area of 12x9m available. But if, for instance you can get the width of the elements in the attic space, but the front-to-back distance is a little short, then just space the elements as shown in Fig. 2.

In the diagram of Fig. 2 the maximum front-to-back distance is x metres. As a compromise the element spacing is x/4. While not ideal it will allow a fair amount of signal out and back in again.

The one drawback of the whole scheme may well be that as the orientation of the attic is fixed (unless you are able to rotate the building!). So also are the direction of maximum radiation of the two antennas. Another limitation is
6. Fix the two directors along roof timbers (if available) at the attic ends, ensuring that the centre of each director is on the attic centre line. If there are no timbers available just where you want them, fix the centre of one wire to the centre of the wall or whatever is available. Stretch each side from the centre and fix the two ends. Don’t worry about insulating from the wall or from timbers, as if it’s dry (and it ought to be in the attic!) there should be no problems. Repeat for the other end of the attic with the second directors.

7. Cut two 10.236m lengths of 300Ω twin feeder for the two driven elements.

8. Bare the wires at the ends of each of the driven element lengths as in Fig. 3, twist them together and solder.

9. At the centre of the driven element cut through one wire only and strip off the polythene from each exposed end for 6mm, as in Fig. 4.

10. Repeat 8 and 9 for the other driven element.

11. Fix the two driven elements to the timbers where possible, using small nails or pins described (see Fig. 3 for the position of any nails or pins). If the timber supports are beyond the element ends, simply tie string to the loops formed at the ends by the twisted and soldered wires to extend the physical lengths as required.

12. Again using 300Ω twin feeder, cut two lengths long enough to reach from each of the driven elements well into the shack.

13. At one end of one of the feeders, strip off the polythene insulation from both wires for about 10mm.

14. Twist one of the bare ends to one of the centre connections of the driven element, and solder.

15. Twist the other bare end of the feeder to the other centre connection, and solder.

16. Repeat 13, 14 and 15 to connect the other feeder to the centre of the other driven element.

17. Position the two antenna feeders in the attic so that they can be taken together into the shack.

18. That completes the attic part of the job, so you can put the ladder back and shut the trap door.

19. The directions that my antennas fire are to north west and ‘to the south east, but you will have to note your own for your particular orientation.

20. Finally connect one of the feeders to the balanced output of your a.t.u. (you’ve just got to have an a.t.u. to ensure that the impedance at the end of the feeder is transformed to a resistive 50Ω load for your transmitter) and then tune and match for zero reflected power. That’s all!

To transmit to the opposite direction, just remove the feeder from the a.t.u. and replace by the other one. A refinement, and it’s a useful tip, is to wire in a two pole changeover switch between the two feeders and the a.t.u. The general idea is shown in Fig. 5.

You can label the two switch positions with the directions (of hopefully!) maximum radiation. It is important to remember that either high voltage or high current can appear at the switch contacts, therefore only the large ceramic transmitting type switches should be used for this purpose.

Finally, if you’re a tinkerer, you can adjust the lengths of the reflector and directors by using a field strength meter. With help from fellow enthusiasts you’ll be able to get forward gain and front-to-back ratio to maximized for the two beams.

I’ve been using two such indoor beams for some eight years now with excellent results, particularly to North America (firing NW) and to the middle east (SE). With loss of directivity, they are usable on 18, 21, 24 and 28MHz providing an a.t.u. is used!

Even 7MHz operation is possible, although it’s not at its best on this band. Of course, the same principle can be used to optimise operation on any of the other bands, providing the element lengths and spacings are scaled accordingly. And don’t forget, you should always use an a.t.u. to get reasonable results!

PW

Fig. 3: If you have enough space for the width, but not the front-to-back dimension, just divide the distance (x) by four.

All mounting pins or nails should be along this line

0.04m

Trim back the insulation and make the connections at these points

Fig. 4: Details of the connection of the feeder to the centre of each driven element.

Fig. 5: Using this simple switch arrangement allows easy choice of transmitting direction. The switch used must be a good quality type though because of high r.f. voltages.
REVIEW

Seeing Double

Reviewing the ADI AT-200/400
144/430MHz
Hand-Held Transceivers

Newly licensed Donna Vincent G7TZB shares her experiences of first-time operating and tells you what she thinks of the ADI AT-200/400 144/430MHz hand-held transceivers.

After finally passing my RAE I was keen to get on the air using G7TZB. However, I wanted to make my first QSOs using a radio that was uncomplicated and friendly towards the beginner like myself.

So, when I was offered the chance of taking a look at a pair of budget priced hand-helds in the shape of the ADI AT-200 transceivers, I jumped at the chance. The AT-200 is the 144MHz version with the AT-400 covering the 430MHz band.

After unpacking the AT-200 the first thing that struck me was its size. Many of the hand-helds that pass through the PVOffice are incredibly small and although not exactly huge in size the AT-200 to me seemed larger than most. It measures 83.5 x 55 x 31mm, fits comfortably in the hand, is very robust in appearance and weighs in at 185g.

The AT-200 is supplied with dry cell battery case, belt clip, hand strap, antenna and an A5 sized 57-page user manual. A NiCad battery pack, charger and speaker microphone are offered as optional accessories and for the purpose of this review I was loaned them as well.

Positioning Of Controls

Before I tell you how I got on as a 'novice' putting the AT-200 through its paces let me firstly run through the positioning of the controls.

The top panel consists of the Power/volume switch, Squelch control and the Rotary channel selector. Also situated on the top are the External Speaker Jack 'S,' which is designed for connection of a microphone/speaker or a head set with a push-to-talk (p.t.t.).

There's also an External Microphone Jack 'M' for connecting a microphone speaker head set with p.t.t. Finally, there's the all important antenna jack and the transmission/battery indicator light.

The front panel houses the function controls in the form of a 16 push-button keypad. Each of the buttons are dual function and can be operated in conjunction with using the function button which is situated on the left-hand side panel of the unit.

Also on the front panel are the Lamp, Call and Squelch defeat controls. These are placed to the left of the display panel and the built-in condenser microphone.

Once I had familiarised myself with the basic functions, charged the NiCad pack and installed the antenna, it was time to attempt my first QSO.

Limited Experience

As I had a limited experience of QSOs being conducted, I was fairly nervous and apprehensive about putting out my first CQ call. I'd already had a 'staged' contact with Kevin G7TZE in the PW Office car park upon receiving the AT-200. However, this was really just to make sure that I didn't 'chicken-out' and to ensure that I had at least one entry in my logbook!

Prior to taking G7TZB on air I spent some time listening to other amateurs in order to familiarise myself on the correct operating procedures. It's all very well reading about how to do it, but actually going on air is another thing.

I'd been advised to make my initial contacts using either the local repeater, in my case GB3SC, or if that failed the calling channel, 145.50MHz. This I was told was a guaranteed way of ensuring I'd make a contact, thus enabling me to then move onto a full QSO.

The Call button when depressed displays the calling channel frequency. When supplied, the AT-200 has the calling channel set to a factory default, so before I could continue I had to re-program this.

Changing the stored frequency in the call memory is easily done by carrying out four simple steps. First you need to change the displayed frequency to the desired one, in this case 145.50MHz, using either the numeral buttons on the keypad or the Rotary channel selector.

Once I had familiarised myself with the basic functions, charged the NiCad pack and installed the antenna, it was time to attempt my first QSO.
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setting the call frequency as you have to remember to set the repeater shift direction of the transmit frequency. However, after several attempts of reading and re-reading the manual I managed it.

**Initial Problems**

With all the preparations done I was now truly ready to call CQ. I did and... nothing happened! Not one to be disheartened I tried again and again but still nobody came back to me.

I sought advice and the verdict I got was that either the supplied antenna was not very effective and could in fact be 'dead' on transmit or that the location of my QTH could be the problem. This was puzzling to me as certain signals I'd been listening to were very strong indeed, according to the AT-200's built-in S-meter and r.f. output indicator.

 Tex GTEX came to my rescue and kindly built me an end-fed 1/2 wave antenna to try out. With my new antenna installed I arranged a QSO with G7TZC on the calling channel to see if I could now make a contact.

I tried numerous times to return G7TZC's calls without success. Again I sought help and without too much difficulty the problem was soon identified.

I had inadvertently set a shift direction on the calling channel which meant that every time I pressed the p.t.t. I was transmitting to a beacon (luckily not outside my licence conditions). It was no wonder none of my CQ calls were being answered. With the problem identified it wasn't long before I was up and running and on the air.

**To The Test**

With the initial problems solved I was now in a position to really put the AT-200 to the test. So I did!

The AT-200 is capable of operating at three different power levels. These are defined as low, middle and high. Low power gives the user an output of 350mW, middle 2.5W and high 5W.

Selecting the power level required is easy and the level selected is indicated by a L, M or H on the display.

During the time that I was using the AT-200 I found that I received the best signal reports when operating in high power. Anything less and I was being told that I was very faint.

However, on several occasions I was being told that my signal was not very readable and that a considerable amount of noise was being heard often wiping my voice out completely. I was asked during several QSOs if I was using a speaker microphone to which the answer was yes. Waters & Stanton had loaned me a CMP145 speaker microphone to use with the AT-200 and this it seemed was causing the noise problem.

The CMP145 microphone was swapped for a different model, the QSO110 which improved things considerably. The only complaint I was getting now was that I needed to shout into microphone a bit more as I was still 'distant'.

**Memory Banks**

The ADI-200 boasts 20 memory channels which are split into two banks of ten. These can be used to store frequencies of your choice.

I decided to store, in addition to the G835C frequency previously mentioned, the 1.m.r. simplex channel frequencies. The procedure for programming frequencies into memory is fairly straightforward as the manual illustrates the procedure with diagrams, which I found to be very helpful.

My reason for storing the simplex frequencies was simple. I had soon discovered it was easier to go direct to the stored frequency memory channel when moving from repeater operation to simplex working than it was to dial or direct entry the new frequency. However, doing this did mean that I had to remember which frequencies were in which memory channels!

The scanning facility on the AT-200 has two purposes. The first is to scan the whole frequency range and this is done by simply pressing the C/SCAN button. You can alter the direction of scanning by pressing either the 8/REV/t button or the 9/SHIFT/s button.

One thing to watch out for when using the AT-200 in scanning mode is that once the rig reaches the bottom end of the frequency range the display starts to flash. This caught me out the first time and was a little unnerving, as I had seen no mention of it anywhere in the manual.

It's also possible to instruct the rig to pause during the scanning procedure. This means that when a signal is received scanning will stop for five seconds or until the signal disappears, whichever happens first.

There's also a busy scan function which means scanning stops when a signal is received but resumes four or five seconds after the signal disappears. To use these functions you should press the 7/+/-/BS button on the keypad.

The second way of scanning frequencies with the AT-200 is to scan through the memory channels. This is done using the D/MSCAN button.

**Other Functions**

As well as the normal functions of being able to change channel step size, battery save functions, muting the buzzer, p.t.t. lock, etc., the AT-200 has some other interesting features. These include dual-watch operation, optional tone squelch control and pager and code squelch.

The dual-watch operation enables the user to monitor two different frequencies and the AT-200 is capable of three types of dual-watch. The function works by switching between the two previously selected frequencies every three seconds.

I found the dual-watch function to be particularly useful once I'd worked out which frequencies were the most occupied. It turned out on several occasions that these were usually the repeater channel and the calling channel. By setting the dual-watch for these it meant that I very rarely missed a chance of hearing a CQ call and thus having a QSO.

The tone squelch operation is not available as standard on the AT-200 but can be installed should you wish to use the unit in this way. Although I didn't actually use the pager and code squelch feature after reading the description of how to use it in the manual I can see that it could prove very useful. The pager and code squelch feature is designed to be used to either page one specific station or to page several stations in a group.

**The AT-400**

By now you're probably wondering when the AT-400 is to get a mention in this article, well here it is! The AT-400 is identical to the AT-200 in every way other than the model number printed on the front and of course the fact that the AT-400 covers the 430MHz band.

As I had spent a considerable length of time using the AT-200 it was less daunting for me when I ventured into operation on the 430MHz band with the AT-400. Owing to the fact that I had experienced initial problems with the antenna and with making contacts using the AT-200 I was very surprised when I managed to raise my local 430MHz repeater and hold a successful QSO on my first attempt with no problems at all!

Upon talking to fellow amateurs it transpired that although my QTH may not be in the best location for amateur operation, the 430MHz repeater close to me is often easier to work through and gives good results. This could explain why when using the AT-400 making contacts was easier.

The only problem I experienced when using the AT-400 was that it's identical in appearance to the AT-200 when I had both transceivers scanning for signals at the same time it became difficult to determine which radio was receiving which signals. I guess that's the price you pay for being over enthusiastic and trying to listen to two things at once!

**Three Criticisms**

There are only three criticisms that I have of the AT-200/400 and these are as follows. Firstly I thought that the display window was a bit on small side and very dark.

In fact I found that unless I was using the radio in extremely good lighting conditions I was forever having to switch the lamp on. And actually at one stage I had the lamp switched on permanently. I found out how to do this by accident, you need to depress the Function button whilst pressing the Lamp button!).

Secondly I found that in several areas the manual supplied was not clear in its approach. I think this maybe is a result of the difficulties of the translation into English from Taiwanese.

As I've already mentioned, I experienced problems in programming the repeater shifts and reading the manual got me even more confused. However, my confusion may have been caused by my limited experience and in defence of the manual, the diagrams when used did help a lot.

And finally the third criticism I have is about the fact that both the AT-200 and 400 come without a NiCad battery pack and charger.
supplied as standard. Personally I think this is wrong when you consider that both are advertised as being budget priced transceivers and a NiCad charger eliminates the need to continually buy batteries which could work out very expensive if you’re an enthusiastic operator.

**Overall Impressions**

Overall I was very impressed with the AT-200/400. As a newly licensed amateur I felt that it suited my needs very well and I thoroughly enjoyed operating with it.

Once I got to grips with the AT-200/400 and all the various functions it was very easy to use and I could see that over a period of time as I became a more experienced operator it would still suit my needs.

You could say it would grow with me. The AT-400 would I think be very appealing and good investment for a Novice licensee to consider, mainly due to its simplicity.

I think that the fact that the AT-200/400 are priced at £179 and £199 respectively is very favourable. I am sure that for a beginner these prices are very reasonable making the transceivers well within reach.

Certainly, I would consider paying the prices for the rigs. The only thing that does concern me about the cost is the fact that the NiCad pack is an extra £19.95, the NiCad charger an extra £9.95 and the speaker microphones an extra £12 - £15.

I would like to see ADI launch a dual-band budget hand-held transceiver based on the same lines as the AT-200 and 400. This is because it could get expensive if you’re keen to operate on both the 144 and 430MHz bands.

My thanks go to Waters & Stanton Electronics of 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835, FAX: (01702) 205843 for the loan of the radios and to all those who helped me get on the air and into the fascinating world of amateur radio.

The only regret I have now is that I have to give the transceivers back just as I’ve got used to using them!

PW

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**Manufacturer’s Specifications**

**Specifications For AT-200 and AT-400. (AT-400 specifications listed separately in brackets only when different from AT-200).**

<table>
<thead>
<tr>
<th><strong>AT-200 &amp; AT-400</strong></th>
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<td><strong>General</strong></td>
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<tr>
<td>Frequency range:</td>
<td>144 to 145.995MHz (AT-200) to 439.995MHz (AT-400)</td>
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<td>Modulation type</td>
<td>F3 (AT-200) to 439.995MHz (AT-400)</td>
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<tr>
<td>Microphone input impedance</td>
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<td>Operating voltage range</td>
<td>5 to 16V d.c. (AT-200) to 439.995MHz (AT-400)</td>
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<td>Nominal input voltage</td>
<td>7.2V (AT-200) to 439.995MHz (AT-400)</td>
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<td>Current consumption transmit at 13.8V</td>
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<td>Mid approx. 650mA for 2.5W (AT-200 approx. 950mA for 2.5W)</td>
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<td>(Low) approx. 650mA for 2W</td>
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<td>(AT-400 approx. 1.3A for 2W)</td>
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<td>Weight</td>
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<td>Spurious signal ratio</td>
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**Inside view of the compact ADI transceiver, in this case it’s the ADI AT-400, but both units look identical inside.**

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<td></td>
<td>Mid 2.5W with SBC145 (AT-200) to 439.995MHz (AT-400) 2W with SBC145</td>
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<td></td>
<td>(Mid) 2.5W with SBC145</td>
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<td></td>
<td>Low 350mW</td>
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<td></td>
<td>5W with RBP120</td>
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<tr>
<td>Maximum deviation</td>
<td>±5kHz</td>
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<tr>
<td>Spurious signal ratio</td>
<td>better than -60dB</td>
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</tbody>
</table>
**The UK amateur licence no longer imposes any conditions concerning effective radiated power (e.r.p.) within the 50MHz band. This article was written when restrictions were in force, but I hope to show that your e.r.p. may be much higher than you think.

Very often, whilst talking to fellow amateurs on 144MHz, the question of 50MHz arose. Unfortunately I have no equipment to operate on 50MHz, but I am always interested in what happens on all amateur bands. This interest invariably led to the discussion of the pros and cons of 50MHz.

Back in the days of effective radiated power limitations, I was often told 'Oh I run about 25W to a four element beam. It works around.'

After a little mental arithmetic I might have concluded 'No, I have very lossy coaxial feed.'

At this point I'd usually drop the subject, but I wouldn't recommend buying his 50MHz station. With his poor coaxial cable his voltage standing wave ratio (v.s.w.r.) must be horrible and his p.a. stage (transistor or valve) must be suspect.

There is a problem with many enthusiasts, in that they do not understand the concepts of e.r.p. peak envelope power (p.e.p.) and in deciBel form (dBW). These are terms so beloved by the Radiocommunications Agency that they do not understand the concepts of e.r.p.

Another requirement of our licence is that our power is recorded in dB relative to 1W. Here the assumption can be calculated before some

<table>
<thead>
<tr>
<th>dBW</th>
<th>p.e.p.</th>
<th>dBW</th>
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<tbody>
<tr>
<td>0</td>
<td>1.000</td>
<td>10</td>
</tr>
<tr>
<td>1</td>
<td>1.000</td>
<td>10.000</td>
</tr>
<tr>
<td>2</td>
<td>3.010</td>
<td>13.01</td>
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<tr>
<td>3</td>
<td>4.771</td>
<td>14.771</td>
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<tr>
<td>4</td>
<td>6.021</td>
<td>16.021</td>
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<tr>
<td>5</td>
<td>6.990</td>
<td>16.990</td>
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<tr>
<td>6</td>
<td>7.782</td>
<td>17.782</td>
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<tr>
<td>7</td>
<td>8.451</td>
<td>18.451</td>
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<tr>
<td>8</td>
<td>9.031</td>
<td>19.031</td>
</tr>
<tr>
<td>9</td>
<td>9.542</td>
<td>19.543</td>
</tr>
</tbody>
</table>

The pattern displayed on the oscilloscope corresponds to 2*2*200W (400 watts). A short time later at (B) the total voltage is 0 and so the power is 0. The transmitter is capable of delivering four times its carrier power, this is known as p.e.p. and in s.s.b. mode is being transmitted on one sideband only.

The output power can be measured on an oscilloscope. Feed a two-tone frequency oscillator into a transmitter with the output of the transmitter set to produce some known power into a dummy load.

The load power should be measured by a thermo-couple meter giving an accurate mean power reading. A portion of the r.f. signal should be fed to the vertical plates of an oscilloscope, producing a pattern. The limits of the

The mean power produced is equivalent to a voltage of half the p.e.p. value. So, if you are measuring 25W into the dummy load, the p.e.p. is 100W. Remove the two-tone oscillator and replace it with a microphone and speak normally.

The patterns displayed on the oscilloscope will change with the speech, but the peaks should not be allowed to exceed the maximum deflection of the two-tone oscillator. Exceeding this will result in 'flat topping' and distortion. Now that we know the p.e.p., it's time to convert this into the dreaded decibels (dBW).

The decibel (dB) is the basic unit for measuring the difference between two sound or power levels. It's a non-linear measurement based on logarithms to the base 10. It compares with human hearing which cannot measure absolute sound levels but can detect differences in level.

Since there is no such thing as a zero signal level (despite having been given reports of 5 and 0), measurement is made compared with a known power. The power level of 1W is used as the reference. Any increase (or decrease) in power measured in dBW is relative to 1W, with 1W output being 0dBW. See Table 1 for a list of useful powers and their dBW figures. Each time the power output is doubled, the dBW figure increases by three. So 100W corresponds to 20dBW, then 200W is 23dBW and 400W is 26dBW. It's actually
“How on earth do I get the cat system working with my radio?”

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For the years the subject of CAT interfacing for most popular Transceivers and Receivers has been somewhat of a nightmare for most except for those “in the know”. At Siskin we've tried to come up with a solution that will make CAT interfacing painless and fun, it's aptly named the Siskin Multi-CAT. One simple, robust, stylish, compact unit that will work with most Kenwood, Icom and Yaesu Transceivers and Receivers.

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MVT 7001 BOXED
MVT 5000 BOXED
ALINOFT 2/70 BOXED
ICRI ICOM BOXED
AOR -1000 BOXED
AOR-1500E BOXED
26.026dBW, but who's arguing.

Working with powers below 1W gives negative, but just as valid (-dBW) readings: i.e. 0.5W is half the reference and is therefore 3dBW down. If you are using 0.5W p.e.p. the log book should record the power at -3dBW.

Using 100mW p.e.p. is ten times lower than the reference point and should be shown as -10dBW: it looks odd to see negative power levels, but it's just unfamiliarity with the system that causes alarm.

Using this dBW output values can make deciding which amplifier to buy easier. What are the merits of buying a 100W amplifier, or spending a lot more money to buy a 160W amplifier?

The relative difference between a 160W amplifier and a 100W one is just over: 2dBW (2.041dBW). An extra 2dB might get your signal heard over the others, but is it worth the outlay? An extra one or two elements on your antenna will give you similar gain at a fraction of the cost. And it works on receive as well.

Applied To Antennas

Logarithmic gain can also be applied to antennas. The term dBi means the gain of an antenna over an isotropic antenna. This is a little confusing, because an isotropic antenna exists only in theory. It's an antenna that radiates equally in all directions, does not have any losses and is totally unaffected by external factors such as buildings, trees, etc.

A more practical measurement is the function dBi.d. This term is the relative gain of an antenna relative to a dipole for the same frequency. The gain can be measured by taking field strength readings at fixed points.

The graph of Fig. 2 shows a graph of the theoretical maximum gain that can be expected from perfect Yagi antennas. Obviously the most dramatic gains are achieved by increasing a beam from two to four elements. Thereafter the gain is roughly proportional to the number of elements.

Very few commercial antennas have optimum spacing. So, your average 16-ele Yagi will be unlikely to achieve the theoretical gain of 16.25dBd, but it will probably be within 2dB of it.

The formula for calculating the real e.r.p. (in Watts) is to take the inverse-log of one tenth of (antenna gain - feeder loss) multiplied by the p.e.p. (in Watts). Using this method returns the logarithm to linear representation.

The decibel (dB) is the basic unit for measuring the ratio between two power levels. It is a non-linear measurement based on logarithms (using the base 10 as opposed to the base 'e'). The original unit (the Bel) is rarely used (1.06 is a ratio of 10:1, 2.0B is 100:1, etc.).

To make things 'easier' the Bel was multiplied by 10 to make the decibel (dB). Now we have 10.0dB = 101, 20.0dB = 1001, etc.

The easy way to calculate a power gain is to use the formula dB = 10log(P1/P2)

where P1 and P2 are the two levels of power, P1 being the larger. Incidentally when measuring voltage gain (in dB) the formula is dB = 20logV1/V2. Where V1 and V2 are the two measured levels.

Other values may be found by adding known dB values together. For example to find out what 27W is with reference to 1W (dBW) add the value for 9W and 3W together. This gives an answer of 9.542+4.771 = 14.31dBW (9'3=27).

The theoretical gains of Yagi antennas with various numbers of elements. In practice the gains will be a little lower than those shown here.

Receiving Overload

Overloading of the TV receiver is the bane of any amateur. More especially if the amateur knows his station has a clean signal, is operating within permitted power levels, and has done everything to avoid TVI and BCI.

The measurement of signal level at any particular spot is termed field strength, and the following formula is used to calculate this:

\[ e \text{ (V/m)} = 7.07 \times \frac{\text{e.r.p.}}{d} \]

where e denotes peak field strength in volts per metre (V/m), d denotes distance from transmitter in metres.

Playing with this formula brings forth some highly interesting if somewhat disconcerting results. For example my antenna is situated some 50m away from a neighbour's house. On 144MHz I can run 26dBW or 400W p.e.p. to an antenna array with an overall gain of 14dBd.

Under these conditions I would have an e.r.p. of approximately 10kW. From the formula I calculate that I would create a 144MHz signal of about 14V/m.

Now our local TV transmitter is situated 33km away and runs 3.5kW e.r.p. It's field strength at my neighbours house is, at best, a derisory 12mV/m. Or less than 0.1% of my signal. Not much comparison is there?

(Editorial note: Lower power TV transmitters usually have directive antennas, to serve specific areas and reduce 'out of area' interference. The actual signal strength could be even less than Patrick has indicated.)

I hope that this wander around the mathematical formulae demonstrates the usefulness of such things, and that they are not something nasty to be studied simply to pass the RAE and then forgotten for evermore.

PW
For a number of months I have been looking at the technical specifications of receivers. Before I move away from receivers onto transmitters and other pieces of equipment, I thought it would be worth taking a more practical look at buying a receiver. In particular those points to look for when buying a second-hand set.

First Decisions

One of the first decisions to be made when considering buying a receiver is whether to buy the set from a dealer or from one of the many advertisements in the magazines. This is a personal decision, but obviously with a dealer there is usually a guarantee.

For a private sale, when you have parted with your hard earned cash there won't be any after sales service. Having said this, most people are honest and comparatively few people experience major problems. However, small problems can be annoying. When you buy a set from a dealer he should fix them. The same is not true of a private sale. Whilst there is better after sales service from a dealer, it obviously costs more.

Take A While

When looking around for a second-hand set, it's worth taking a little while to see what is on the market and what the going prices are. Also make a list of the facilities which you need and the specification the set should meet: filter bandwidths, frequency coverage, image rejection and so forth.

Often, back issues of magazines will have useful reviews. It's also worth asking friends to see if they have ever used any of the pieces of gear you may be considering. They may be able to tell you of any pitfalls you may be considering. They may be able to tell you of any pitfalls.

When actually going to look at the set try to take someone else with you. This can sometimes help you not to make a rash decision, and the friend may help you to remember the right questions to ask.

The Specifications

You won't be able to give the set you are thinking of buying a complete test to ensure that it meets its specification in every way. You can apply much of the advice given in the car magazines about buying a second-hand car.

Look at all the tell-tale signs, and should you be able to see if you are taking a risk. For example, if the owner lives in a house that is obviously well maintained, it's likely that the set has been given a similar degree of care. Naturally the reverse is also usually true.

Another point to note is whether the set has been exposed to high levels of cigarette smoke. Over a long period of time, a residue can build up on the switches and controls from the cigarettes and this can lead to poor contacts on the switches and badly functioning volume controls.

Also look at whether the set has been kept in a damp atmosphere. This could also result in problems either now or later.

Trying It Out

It's well worth taking your time to try out the equipment. First of all see if you like the feel of the set. Make sure that you can fit it up to a good antenna and try out as many of the functions as possible.

Look for any tell-tale signs. Does it overload on strong signals or are there none at all? Do the controls feel right, and are any of them stiff?

Look for wear especially on the front panel around the tuning knob. Most sets will show some signs of wear but significant levels mean the set has been very well used.

It's always worth looking at the backlash in the tuning. To do this tune the set into a broadcast station with the beat frequency oscillator (b.f.o.) on (there are plenty at the top end of 40m band between 7.1 and 7.3MHz) and then tune it back the other way.

A perfect set should immediately tune back in line with the tuning control. In many cases a little mechanical slack has to be taken up before the tuning on the set changes and the beat note is heard to change. This type of problem is most pronounced on older non-synthesised sets because they have a mechanical tuning system.

All the controls should work properly. But switches are a particular problem.

Wave-change switches on older sets can give problems, but even the keypad switches on more modern sets can fail and they are not always easy to replace or clean. Try them all out.

Wave-change switches should be tried to make sure they operate correctly. Tune the set into a broadcast station then move the switch returning it to the original band. The station should remain in tune.

Drift can also be a problem, especially on the non-synthesised sets. Fortunately though this is quite easy to assess.

Not Perfect

No second-hand set is likely to be perfect. However, when assessing it, ensure you have enough time to fully get the feel of it.

Ask yourself if any of the problems are significant and are they likely to interfere with your enjoyment of the set. Are they the type of problems which would be annoying during a long time of listening?

If you like the feel of the set, and there are no major problems then it is probably right to buy it. However, do not be rushed into a decision by an over enthusiastic seller.

That's all for this month so, cheerio for now. Next month I'll start unravelling the mysteries surrounding transmitter specifications.
Tram mobile G3XFD. Fortunately for photography when his turn came!

Tram Driver-Instructor Hank van der Hoek, G3XFD, Frank PA3GDV and Fritz Smid PA3GKA. Both Frank and Rob drove Tram 832, but Fritz decided it was better to concentrate on photography when his turn came!

Practical Wireless has quite a following in Europe, particularly in Holland and Belgium. And it becomes fairly obvious how many of our friends from the Low Countries are interested in the British scene should you meet them at the Picketts Lock show (for just one example).

In fact, this year's show brought even more visitors from Holland and Belgium. They arrived by train having travelled via the Channel Tunnel.

It was one of our keenest readers and supporters in Holland who invited me to travel over to be a guest of the Amateur Radio community in the Rotterdam area. Peter Visser, a keen s.w.l. and supporter of both PW and Short Wave Magazine, spent weeks organising the trip and many hours telephoning the office to arrange the final details. Peter even went to the very generous extent of airmailing some Edam cheese to the PW office!

So, on Tuesday June 13 I headed for Kent, arriving at Cheriton (near Folkestone) for the Channel Tunnel at 5.45pm. Less than an hour later I was driving on the motorway heading out of Calais for the Belgian border and onwards to Holland.

The trip through the Tunnel by the way (if you're one of the many people who say they're not too keen on the idea) is very uncomplicated, quick and better than any ferry. You don't even realise you're in the tunnel! In fact, the average time in the tunnel itself is only 18 minutes.

Bands Quiet

I was surprised at how quiet 144MHz was in France, but my AKD2000 144MHz FM transceiver was busy once I got into Belgium and I had several QSOs. And, of course I didn't actually transmit on the band, I listened on 70MHz with my AKD4000 rig.

Near to Calais and onwards to Belgium, I heard activity on 70MHz (yes, you've guessed...it was Packet!). But I didn't hear anything else on 70MHz. I had several QSOs. And, of course I didn't actually transmit on the band, I listened on 70MHz with my AKD4000 rig.

My Dutch friends were listening out for me as I drove towards Rotterdam. Frank Brouwer PA3GDW, the VERON (the Dutch National Society) representative for Gouda, near where I was staying, was alerted by the other stations I worked on 144MHz. Frank sat on the mobile calling channel until I was close enough to Rotterdam to work him.

Once they had got me heading in the right direction, I followed my detailed maps (kindly sent by Peter Visser) and headed for a Hotel in the centre of Rotterdam. Here, I met Peter and Frank PA3GDW, for refreshments before heading to my Hotel in the attractive little town of Haarstraat.

My Dutch friends had given me a delightful welcome but I was fully aware that it was nearly 1am! I knew Frank had to drive back home and then be up for work later in the morning after guiding me to my hotel.

Needless to say, once installed in the Hotel, I slept extremely well. In the morning I found that it was next to a delightful canal, with a quaint (and very busy) lifting bridge. In fact, the hotel was called 'The Hotel Over de Brug' ('over the bridge').

I was told, over a delightful Dutch breakfast, that the bridge was raised over 9,000 times in 1994. And this is on a canal that only takes pleasure traffic!

Amsterdam Visit

During Wednesday afternoon, Peter Visser and I travelled by train to Amsterdam to visit Artur Bauer PAOAOB. Artur has a vast collection of fully operational Second World War German equipment (including airborne and submarine radar!).

Artur made us both very welcome, and amongst many other things I saw my first working demonstration of a German Hellecreiber machine. Artur sat down at the machine and transmitted a test signal for me, and I was also given a sample of received message tape.

It was fascinating to see the Hellecreiber working. This amazing example of German technology is (in my opinion) in a class of its own, and I think of them as being a hybrid somewhere between a FAX machine and teleprinter. (The final print-out is in the form a strip with a facsimile of the transmitted words).

During our afternoon's visit Artur also showed Peter and I his vast collection of vintage valves and other items. These included the airborne radar unit and some incredibly well engineered (in working condition of course) transmitters and receivers.

Visitors need at least two days to see everything in Artur's collection, but we saw a few examples. Among these was the famous German Kölne communications receiver, a wartime broadcast standard reel-to-reel tape recorder (with original acetate tape) and an amazing Morse training machine employing optical records.

The 'optical records' revolved on a variable speed turntable (the Morse elements were in white and a tracking 'playback' head carried the light source and photocell). It was an amazing
piece of equipment, looking somewhat like a high quality radiogram...complete with wooden roll-top shutter like a desk!

Unfortunately, we couldn't stay for long and soon, after thanking Artur for being a wonderful host it was time to head back to meet Frank PA3GDV again. I had a busy schedule and we were all heading for another amazing Dutch Amateur Radio experience...and this one is buried under the sand dunes at the Hook of Holland.

Underground Amateur Radio

Bearing in mind the wartime experiences of many Dutch radio operators, it's surprising that the term 'underground radio' brings a wry grin. But in the case of PI4CC, the Contest Group Vlaardingen, it does because they are underground!

If you ever travel into Holland by ferry via the Hook of Holland, take a close look at the wide expanse of sand dunes off the port side (left) as your ferry enters harbour. Buried there, are a series of Dutch and German (built before and during the Second World War) bunkers, control rooms and gun emplacements.

It's in part of the extraordinary complex that the PI4CC group have their station. They have room for a huge antenna system and even had a 7MHz cubical-quad erected at one time!

Like a miniature version of the famous Maginot Line, the complex had its own narrow gauge railway, hospital and intercommunication tunnels. Although it was nearly dark when I arrived with Peter, Frank and Fritz Smid PA3GKA, we had a really good look around.

I suggest that if you're ever in Holland, you visit PI4CC. It's quite an experience!

It was late again and reluctantly, we left for my temporary home, where I arrived back at 1am! But next day (later in the morning really) my Dutch hosts were to excite themselves in their hospitality by granting me a long held wish to drive a Dutch tram!

Tram Mobile

We went 'tram mobile' mainly thanks to Frank Brouwer PA3GDV. He arranged for family friend Fritz Zonneveld, the curator of the Rotterdam tramways museum, to open his 'personal' museum in the central depot as the main museum is only open on Saturdays.

After seeing round the museum, we were introduced to our tram 'instructor' Hank van der Hoek before being taken around the depot. It was during our tour we met our innocent 'victim' in the form of Tram 832. She was going to suffer at the hands of three radio amateurs!

Peter Visser (wisely perhaps) didn't join us in the tram training session, but took photographs instead. And Fritz PA3GKA decided not to actually risk driving the tram when it was his turn. But he managed to take a photograph of me driving which I shall be proud of for many years.

My expression in the photograph fully reflects my pleasure! I can assure you! I know I can never drive the Flying Scotman, but this was just as good, even at 30kph (indicated on the speedometer).

After safely travelling up and down a city centre route (with a section of private track for training) we left some puzzled (intending passengers behind) before heading back to the depot. Frank and I were truly grateful for Hank's help, and the tremendous goodwill of RET (Rotterdam Electric Tramways).

After a late lunch, we were to be the guests of the Nedlloyd Shipping Company, who Peter Visser worked for before his retirement. We were to visit the MV Nedloyd Africa, a giant new container ship of 266 metres length carrying 3000 full size containers, be given a grand tour, before being entertained to a marvellous buffet style evening meal.

Once on board the Nedloyd Africa (climbing the gangway up her side was like tackling a mountainside!) I was in for another surprise. This time it came from the Dutch Surplus Radio Society.

May 1945 issue

I met many new friends on the bridge of MV Nedloyd Africa. They presented me with a copy of May 1945 issue of Practical Wireless.

My new friends said the presentation was a fitting tribute to the magazine. Especially as it was also the first copy of PW to be available in Holland after the end of the Second World War, just over 50 years ago. Needless to say, their gift has joined the other tributes to PW, and is now mounted in my office.

The party continued and we didn't leave until almost midnight, but all the time the ship was being unloaded and re-loaded for her quick turn round for the Far East. Perhaps the most impressive thing about the ship was that she only had a crew of 16!

Friday Talk

Friday was the day I was due to give my final talk, as guest of the Dordrecht (Rotterdam) VERON district. The talk wasn't due to start until late, but many of the members were fascinated to see my AKD rigs and when I told them of the benefits of 70MHz for mobile working I think they were keen to get the band too!

After they welcomed me, and I had given the talk, The Dordrecht Chairman Tjakko Abee presented me with some Dutch cheeses to take home! The final part of the evening flashed by, but I didn't leave until after midnight when Frank PA3GDV and Peter guided me to the motorway before wishing me a good journey.

I was back at Calais in time to catch the 5.15am 'Le Shuttle' back through the Channel Tunnel to Folkestone and was home in Dorset by 8am. I was very tired from the journey, but delighted by the Dutch hospitality.

I can only suggest that if you can, you also visit Holland and try their legendary hospitality and explore the delightful scenery. The Dutch people live in a far more compact country than the UK, and it's interesting to see how they relate to neighbours. And it's not uncommon to see 4-element h.f. beams sprouting from the roof of terraced houses!

There's one final bonus too. Everyone in Holland seems to speak English (just as well for lazy British linguists!) although they're delighted if you try to speak their language! Thanks Peter, Frank and Fritz and other friends...I'm looking forward to my next trip!
As previously announced, the PW vintage 'wireless shop' opens under new management this month. Phil Cadman G4JCP is the first of our new team of three regular authors who will take it in turn to 'man' the shop on a quarterly basis, each presenting their own speciality and interests.

It all started when the Editor asked "So, how would you like to write 'Valve and Vintage' once a quarter then"? I only hesitated a little before agreeing and here I am, the youngest and least experienced of the new team.

You may be stuck with me for some time. So, I thought I'd better tell you a little about myself and answer the question on everyone's lips - 'who is this guy Cadman'?

Well, I was born in the mid 1950s and I first showed an interest in electricity when I was four years old. A man came to rewire our house and apparently I followed him around. I assume this was because I was attracted to the 'pretty coloured wire' he was using and not because I thought he was my father!

The attraction to bits of wire resurfaced a couple of years later when another man came to fix our ancient Pye console television. I still remember the brightly-coloured wires that snaked from the vertically mounted chassis and on to the scan coils.

On The Internet

Those of you with World Wide Web access can visit my home page. Its URL is http://www.worldserver.pipex.com/nc/caddo/index.htm

I'm intending to reserve part of my web page for 'Valve and Vintage' related topics. There I'll be able to cover items of more limited interest than I would normally be able to cover through the pages of PW.

What won't be there will be what appears here, in this column, so you'll still have to buy PW every month. Not that you need any additional reason to do that!

When I was old enough my parents gave me a 'Magnet-tricity' set. Batteries, bulbs, switches and the like. I learned quite a lot from that set, not least the price of 4.5V batteries.

First Magazine

The very first radio magazine I ever bought was not PW (sorry, Mr. Editor) but a copy of the now defunct Radio Constructor. The second magazine I bought was a copy of PW - the August 1968 issue. It cost 2/6d. Oops! Sorry, that's 12.5 new pence.

My interest in amateur radio began in 1970 when I attended a night-school radio and TV servicing class. The classes were free because I was at school and I'd found out that fixed radio and TV sets could do wonders for my financial situation.

The lecturer turned out to be a radio amateur. And fairly soon the radio and TV servicing class became an unofficial RAE class.

Eighteen months later I became a 'G8' (one of the 'Jates' as we were affectionately known). Then in 1979, after just scraping through the Morse Test, I became G4JCP.

Despite trying my best to keep up with new technology, my interest in valves and valve equipment has never waned. I often think back to a time when you could fix a radio - even a television set - with nothing more than a screwdriver, a multimeter and a bit of luck.

People in the servicing trade might conceivably say the same today. But I'll bet you need an awful lot more luck.

If you're serious about making things with valves then you'll need some ingredients. And you may have difficulty getting them down at your local supermarket.

Suitable Components

A big problem for valve home-brewers and radio restorers is the lack of suitable components. Fortunately though, most valve types are not difficult to get hold of and there are several valve suppliers who advertise regularly in electronics magazines, PW included.

Some traditional radio and TV shops still have a few valves lying around. Then there are the radio rallies where you'll find at least one stall with a box of valves.

MuCh more difficult to obtain, either in quantity or to a given specification, are components such as transformers and high voltage capacitors. Even suitable resistors can be a bit thin on the ground.

Today's tiny resistors are usually rated at no more than 250V. That can be too low, depending on where the resistor is used.

The same argument also applies to switches. Like resistors, miniature types intended for transistor designs can have insufficient voltage ratings for many valve designs.

Over the coming months when it's my turn to man the V&V 'shop' I hope to cover the selection and acquisition of valve-compatible components. I aim to concentrate on one major component type with each instalment.

The Topics

Now seems the best time to mention the topics I shall be dealing with. As mentioned in last month's Keylines, Ben Nock is dealing with military equipment and Charles Miller is looking after the 'vintage' aspect of this column. That leaves me to cover anything outside those subjects!

In particular, the Editor has asked me to cover several basic topics. First is the restoration of valve equipment with emphasis on domestic radios. Secondly, I shall be looking at updating old PW valve designs.

Over the years PW became well known for the various blueprints that used to accompany some constructional projects. The Editorial team still receive correspondence about these and I'll be discussing how to build the more popular designs with components that are generally available today.

Please bear in mind, however, I shall not be able to cover constructional topics in great detail. There simply won't be enough space for that.

Besides revamping old designs I'll be suggesting new constructional projects. These will be simple items which can be built in just a few hours. I'll be leaving it up to the constructor to choose exactly how to put the design together.

I'll try, wherever possible, to source components from either major component suppliers (such as Maplin) or from regular advertisers in PW.

If you have any suggestions, comments or questions then I'll be
glad to hear from you, my address is at the end of the column. One thing though, don't expect me to fix your dead radio for you - that's your job.
I shall also be covering incidental items relating to valves. For example, books, magazines, techniques, test equipment, events and the like.

Valve Books

On the subject of valve books, many years ago Bernard Babani (Publishing) produced a series of valve manuals. Each manual covered valves from a particular period and gave base connections and characteristic data for each valve type. I think they included just about every valve you were ever likely to find in domestic equipment.

The original books have been out of print for many years but they have now been reprinted (although out of print for many years but they are still available). Each manual covered valves from a particular period and gave base connections and characteristic data for each valve type. I think they included just about every valve you were ever likely to find in domestic equipment.

The original books have been out of print for many years but they have now been reprinted (although in a smaller form) in the UK. Entitled A Comprehensive Radio Valve Guide in five volumes they are published by G. C. Arnold Partners. If you haven't any information on valves or if your information is limited to one manufacturer then you should seriously consider getting copies of the Babani reprints.

Editorial note: The valve data books mentioned by Phil are now available from the PW Book Service.

Another useful reprint for those who like rummaging through boxes of valves at rallies is the Handbook of Radio, TV, Industrial & Transmitting Tube & Valve Equivalents. This was originally a Babani book too. Its 'CV' to commercial equivalents list is very useful. British Army, Navy and USA service equivalents also get a mention.

I'll mention more books in my next column. It will be just in time for Christmas!

New Old Stock?

By ‘new old-stock’ I mean valves that were made by the major valve manufacturers in their own factories. They should still be in the manufacturers' original packing and when examined will clearly look brand new. Most will be marked as being made either in the UK or in North America.

New old-stock valves are the best valves to buy. Be warned though, the popular valve types - particularly those associated with valve hi-fi - will be expensive.

Because of their cost, and because they are literally irreplaceable, I try to use new old-stock valves only in receiver front-ends, mixers and in low-noise audio stages. But increasingly there are times when I have to use them elsewhere because I simply cannot get modern alternatives.

Ex-military valves become available from time to time. These may be domestic valve types or they may be industrial or special quality types. By the way, ‘special quality’ means just that.

If you're lucky military valves will be marked with their CV number and their commercial number. More likely all you will have to go on is their CV number.

The CV designation stands for ‘Common Valve’. It was a notation created by the military and designed to bring some order to all the commercial and military valve designations in use at the time. I don't think it quite worked out as intended though. (I'll try and come back to the CV series sometime).

You do have to be more careful with ex-military valves though. They may not be individually boxed and so may have suffered physical damage. My advice is to look very carefully for cracks and bent pins, etc.

I cannot over stress the importance of carrying a valve equivalents book when visiting shows and rallies. I once missed the opportunity of buying several incredibly cheap transmitting valves simply because I did not recognise the CV number on their boxes. Someone else obviously did because a few minutes later everyone had gone. I dare say that someone had a 'Cheshire Cat' grin for the rest of the day.

National Vintage Communications Fair

The fourth National Vintage Communications Fair was held at the National Exhibition Centre near Birmingham on the May 141995. It's the event for anyone interested in valve radios and their restoration.

It's not all radios though. There were telephones in abundance, 405-line television sets, lots of valve hi-fi and even wind-up gramophones.

I was pleased to see that prices were, in the main, quite reasonable. Unrestored domestic sets from the 1950s costing around £12 to £20. Larger sets from the 1940s and 50s were priced at £20 to £45, again in unrestored condition. Restored sets were anything from £30 to several hundred pounds.

There were a few crystal sets and vintage valve sets for sale. But they had price tags best suited to the more affluent collectors.

As usual there were plenty of valves around but this year I thought there were fewer decent 'new old-stock' valves on sale. (See ‘New Old Stock’ panel) I'm sure this trend will continue so if you've been planning to get a spare set of branded valves for your pride and joy then you'd better hurry.

Valve audio was as expensive as ever. Asking prices for restored Leak and Quad amplifiers ranged from £280 all the way up to £450. That being said it's interesting to realise that these asking prices are, in real terms, very close to their original retail prices.

Green Wireless

The moment I agreed to contribute to this column the Editor whipped out (from his car boot) a little green wireless and said something like, "here's something you can write about!".

The radio was a 'Lissen' battery valve portable, model 8409, from the late 1930s. It's quite small, just 11 inches wide by 10 inches high by 7 inches deep. Mr. (money no object) Editor had apparently parted with just £5 for it.

Actually the set is not in too bad a condition but it does have one rather nasty fault. The resistance wire on a wirewound potentiometer is completely broken.

Unusually, for such a set, it has four valves. There's an r.f. stage, detector, a.f. amplifier and a.f. output. I would imagine the batteries didn't last long!

On the mains radio front I'll be taking a look at a Cossor 'Melody Maker', model 500 A.C. This radio is typical of what can be purchased for £10 to £20. Indeed, similar radios may turn up next for nothing at jumble/car boot sales or even for free as 'gifts' from friends or neighbours.

Nowadays, many radio stations have migrated to Band II v.h.f. f.m. and so cannot be received on the majority of valve radios. Also there are older sets that may not take too kindly to daily use. So, in my next column I'll be showing you how, with the help of a modern transistorised radio, to give them a new lease of life. Until then, cheery for now.

Send your letters to me either via the PW editorial offices, via E-mail to phil@aldpark.demon.co.uk or direct to me at: 21 Scotts Green Close, Scotts Green, Dudley, West Midlands DY1 2DX.
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Mike Richards G4WNC rounds up the latest news from the world of Computing in Radio and starts off with a digital signal processing update.

As promised, this month I'm going to spend some time running through the digital signal processing (d.s.p.) software on my DSP Starter Disk. The object of the disk is to provide a cost effective way of using d.s.p. in an amateur radio environment. All the software on the disk has been written by Johan Forre KC7WW. It represents a considerable effort on his part, so please register!

The software on the disk requires specialist hardware to operate and the requirements can be divided into two distinct categories: AdSP soundcards and the Texas TMS320C26 DSP Starter Kit. Of these two systems, the most versatile is the AdSP sound board option.

The most popular version of an AdSP sound card is the Orchid SoundWave 32. This is a fully SoundBlaster compatible sound board, but features the vital ADSP soundcard is the Orchid SoundWave 32. This is a fully SoundBlaster compatible sound board, but features the vital ADSP soundcard, and the Texas DSP Starter Kit. Of these two systems, the most versatile is the AdSP sound board option.

The second program is a lullaby for infants. The Texas TMS320C26 starter kit also contains all the essentials for d.s.p. work, but the board is supplied as an unboxed unit. The audio input and output is via a microphone and a 9-pin D connector is used for the connection to the PC. There are two software packages on my starter disk that will work with the Texas DSK. The first (DSKMODEM) is a basic h.f. modem that can be set-up for use either with Johan's PC-TOR program or G4BMK's Multiscan decoding software. The use of a d.s.p. modem secures a level of performance that will rival almost any conventional analogue modem.

The second program is a full featured AMTOR program with the DSK code built-in. The program is easy to install and is very fast to use. There are all the usual options such as type ahead buffer, listen mode, and hot keys for sending prepared messages. If you have chosen the AdSP route, you will find three specialist programs on the disk.

Moving on to MSCAN 2.0, this is really an improved version of 1.3, but without the AMTOR, RTTY and NAVTEX receive options. This version has an even better user interface, but demands a 386 or better processor and VGA or SVGA graphics.

Thanks to AMDAT, I now have shareware versions of MSCAN 1.3 and 2.0 available for distribution to readers. However, if you would like to go for the full Multiscan package AMDAT will be pleased to help.

The contact details are AMDAT, 4 Northville Road, Bristol BS7 0RG. My thanks to AMDAT for the loan of the review versions.

Special Offers

Here's a summary of the latest special offers for 'Bits & Bytes' readers. I try to turn orders around in a week or two, but please allow up to two weeks for delivery.

- DSP Starter - AMTOR, PACTOR, and audio filtering software for ASP sound boards plus f.t. modems using Texas DSK,
- JVFAX 7.0 - FAX and SSTV transceiver for IBM compatible computers
- HAMCOMM 2.0 - RTTY, CW & AMTOR transceiver also for IBM compatible computers.
- NuMorse - Comprehensive Morse tutor for Windows 3.1 users.
- UltraPak 2.1 - TNC-2 driver for Windows 3.1 users.
- FactPack 1 Interference - Help with those difficult computer interference problems.
- JVFAX and HAMCOMM Primer - Receiving your first FAX and RTTY signals.
- FactPack 5 On The Air with JVFAX and HAMCOMM - preparing for that first transmission.
- FactPack 6 Internet Starter - Basic guidance to get you started on The Internet.

To receive any of the offers just send a self addressed sticky label plus 50p per item (£1.50 for four or all eight for £3.00). If you're ordering JVFAX/HAMCOMM/NuMorse/UltraPak/DSP Starter you will also need to send a blank, formatted 3.5in 1.44Mb high density disk.

That's all for this month so keep computing and don't forget to keep sending your computing questions to me Mike Richards G4WNC, 'Bits & Bytes', PO Box 1863, Ringwood, Hants BH24 3XD. CompuServe: 100411, 3444; Internet: mike.richards@bbcn.org.uk
Leighton Smart GWOLBI welcomes you once again to the column for h.f. operations where your input is very important.

Sunny June finally arrived and with it came the annual Special-E season. And already there are some spectacular openings on the 28MHz band, with signals received in the UK at tremendous strengths from all parts of Europe, even from stations running very low power in extremely basic antennas.

Eric Masters G0KRT in Worcester Park, Surrey, using a DRP Plus transceiver on a 26m long W3EDP antenna tried 1.8MHz for the first time and worked DK3KD Germany at 2041UTC, G3LKZ in Harwich at 1935, G3VMK at 2113 and GW0LSN/P at 2193UTC, all at 5W using c.w.

The 3.5MHz Band

Eric G0KRT has at last hooked his first Novice on the 3.5MHz band in the form of 2EQAP in Margate at 2109UTC. Eric also worked F5G1O in Paris at 2332, and G4ALEP on c.w. QRP.

Listener John Bigdod G20344, in Eastleigh, Hampshire using a Yaesu FRG-7700 receiver and a 6m wire antenna reports reception of G5BORN (HMS Belfast moored on the river Thames in London). They were working Mike G3Q0Q in Stratford upon Avon at 1900UTC.

The 7MHz Band

It’s up to the 7MHz band now and a welcome back to Ted G2HUK in Kent. Ted uses a Ten Tec Omni V rig and a HF6 vertical antenna on this band lists: ZL3NB New Zealand, VK9NS Norfolk Island, T12KYN Costa Rica, P21DV Surinam, and ZA1AB Albania, all on c.w., but doesn’t mention times.

Up in Aberdeen, s.w.l. David Henry has logged (amongst others) CJ2YX Nova Scotia, (QSL via VE1YY), P55UA Santa Caterina Island, BV1AD Singapore and ZD0JR Tristan da Cunha (QSL via PO Box 655 Gough Island), whilst using a Trio R-1000 receiver and an indoor 20m long wire antenna.

New reporter Carl Mason GW6WVS in Skewen, West Glamorgan uses an Icom 707A transceiver at 10W output into a half-sized 65RV antenna. Carl reports YS0GA El Salvador, CU2BD Azores, L0XITU Luxembourg on s.s.b. and FS1NB France on c.w. Eric G0KRT reported working CT1WN Portugal at 0108, DL3EBW Germany at 0630, and U5J at 0100UTC. All contacts were on c.w.

The 14MHz Bond

A propagation report starts off the 14MHz report this month and it comes from Den McLean G32NOF in Yeovil, whose antenna systems are shown in Fig. 2. Don says that on conditions on the h.f. bands have been very patchy, with very strong short skip on the higher bands with even UK stations very strong.

On 14MHz Don says that VK, ZL and Asian signals were heard from 0700 onwards, and on the short path. The Asian signals came in after 1500, with African stations a little later.

Don reports s.s.b. contacts with AT1A Qatar, BV5GU Taiwan, C000TA (NA - 204) Cuba, J28JJ Abu All, J4C1 Jordan, and 7O7AN Malawi. He was using a Kenwood, TS-950 SDX, and a TET 3-element beam antenna at 20m (see Fig. 2.).

Steve Locke GW6SSGL near Aberdeen found conditions on the 14MHz band variable. But he managed to work s.s.b. with KG4MN Guantanamo Bay at 2208UTC, Selim TA20S Istanbul at 2245, AK1L New Hampshire with 5W c.w. Steve then worked F5YFE French Guyana (QSL via F5JLLU) at 2232, Jimmy BV9P Pratias (QSL via KUSC), SN9MBN Victoria Island (QSL via Box 7488 Lagos, Nigeria), and John ZD7RWS St Helena (QSL via WA2JUN), all using his new TH7 beam antenna at 12m and 50W s.s.b.

Gary Heys G39BO near Hastings, using all wire antennas, found conditions not very exiting for him. With solar flux numbers falling to 66 or 67 on occasions, things are picking up a little every 27 days but not as good as he’d like it!

John reports just ID9I4RFZ Folke Island, and JA3PJ Japan both on c.w. He heard the BV5 DXpedition, but found them quite weak and the whole world was calling them!

Carl GW6VSV reports QRP contacts with V01NP Nova Scotia, 4U1TU Geneva, W1AW U.S.A., C07UC Cuba, and R100P Russia, again with 10W s.s.b. and a G5RV dipole antenna.

Eric G0KRT used QRP to snag VESST Canada, KA4RRI U.S.A. and R4XYN Asiatice Russia all around 2200UTC.

Gordon Foote G7NCR in Bristol using a Hovex DRX single band receiver and a loft mounted wire antenna reports reception of W6EZ in San Diego at 1800 UTC, EABAMT Canary Islands at 1807, and GM3PXR in Motherwell via short skip conditions at around 1800UTC plus a load of European stations (all during the evening).
Ted G2HKU in Kent found conditions to be pretty poor with lots of noise and GSB (fading) but managed c.w. contacts with 5J7FF Taiwan, VP8UJX/CB Turks & Caicos Islands, G2UX Cape Verde, YO19G Iraq, Y01G Faroe Islands, plus an s.s.b. contact with 9K2MU Kuwait.

Listener David Henry logged RO1R SLR the Polar base at Cape Chelyuskin (QSL via PO Box 32, Dickson Island 652241, Rep. of Russia), C679 Pago Pago, (QSL via CT1CQ). XU-44H the Royal Navy Club station operated by 429EJB on his 13th birthday, LX6SN Luxembourg, a special event station for the Small Nations' Games, 8R1WD Guyana, and ES2RWP/Y4 DXpedition to Windlock Island, QSL via ES2RJQ).

Finally for 14MHz, there's a report from Brian Russell G0NSL in Runcorn, Cheshire who lists SW s.s.b. contacts with 905TT Zaire, Runcorn, Cheshire who lists 5W s.s.b. contacts with 905TT Zaire, VS6WO Hong Kong, VP5A Turks and Caicos Islands, LUF4M Argentina, and F5SPL French Saint Martin using a Trio TS-130V transceiver and a single element horizontal wire loop at 10m.

The 18 & 24MHz Bands

John G3BDQ found the 18MHz band to be very poor during late May/early June. He reports only TA2/0X22W Turkey on c.w., and TK58F Corsica on s.s.b. Don G3NOF indicated that the short path on 18MHz to Asia has been opening at around 1000UTC, with some African stations heard at approximately 1600. He found that the best time on the band has been from 2000 onwards, mostly for North and South America, although some Japanese stations were also heard. Don lists A45ZZ Sultanate of Oman, DV5DVI Taiwan, TM5S Devil's Island, VP2MBO Montserrat, VP8COR S. Shetland Islands, 5N0YL Nigeria, J11TG Mongolia, XE3GWO Mexico, YB2ARW Indonesia, and 9X5/0N44WV Rwanda. His 24MHz log shows EA0/DL8JS Canary Islands, ET3BET Ethiopia, H1CJQ Equador, and 7X5JF Algeria, again with a TET 3-element Yagi antenna.

Don G2HKU worked QR on 18MHz with an Icom IC-721S transceiver into 65R9V and MFJ loop antennas. He worked EA7GQ/GQ Spain, EABCN Canary Islands, CT3/DL8RAI Madeira Island, and EA0/DJ8VGY/P Balearic Islands all on c.w.

Again on QR, Eric G0KRT worked DL5FEE Germany at 1529UTC on 5W s.s.b. HA8KV Hungary at 2043. The 24MHz band provided Eric with HB9CSEX Switzerland at 2022UTC, LABLA Norway at 1946, and OK1YR Czech Republic at 1923, all on c.w.

The 21MHz Band

Up to 'Fifteen' now, and with propagation conditions on the 21MHz band reported as being 'pretty ropey', Steve Locke GW0SSL reports a 100W s.s.b contact with George 9J2GA in Zambia at 1734UTC. (George operates around 213000MHz every Sunday at 1600UTC.)

Steve says 21MHz conditions have been quite poor for both short and longer distance working. But nevertheless, he says there have been times when the band has shown some signs of life.

Ted G2HKU has listed Z56KR South Africa, and 9X/0N44WV in Rwanda on 21MHz.

Don G3NOF contacted VP8CRS Falkland Islands, and 5N9WXO in Nigeria, both on s.s.b.

Eric G0KRT had QR contacts with G2XKP/P and G3GRS/P via very short skip (possibly Sporadic E?) and IK1/HPQ/P Italy, H8AJP/B.

Switzerland, and US31MZ Ukraine Republic using c.w. on the band.

Finally on 21MHz, John G3BDQ worked QR on PA2JZB Pakistan, DAAOTU Poz Island, and PPIPCZ Victoria Island, Brazil, on s.s.b. Just goes to show how a dead band throws up some surprises!

The 28MHz Band

The 28MHz band has come back to life, albeit just for the summer months with very intense sporadic 'E' openings taking place. It appears very often when it's not expected...hence the term 'sporadic'!

Steve GW0SSL disconnected his TH7 7-element beam and used an ex 11m vertical on this band at 5m, and using 100W s.s.b. worked Bert DH1PAH Germany at 1605UTC, SM7ATL Sweden at 1207, TH7PVL/20000V in the Netherlands, HD1DZV in Kanuza, Hungary at 1325, and Alois DL7RBL, Passau in Germany. (Alois who has visited Steve's local club, the Neilon and District ARS intends taking part in the Flatholm Island DXpedition this August with the Barry Radio Club.)

Eric G0KRT used c.w. to work HB9SM Hungary at 1004UTC, O3EAW Austria at 1902, SI50W Slovenia at 1004, and SQ5ALL Poland, at 1246. These were Eric's first QSOs on this band.

Sign Off

Well that's about all for this month, time to sign off. My thanks to all our correspondents for their help (and patience!) in getting the column going so well.

As usual I would appreciate your reports, and information (don't forget to let me know the times of your contacts, so we can help others to work the DX). And just as important, let's have some photographs of yourselves and your stations (please face the camera!) by the 15th of the month to: Leighton Smart (Marking your envelope 'HF Far & Wide') GW0SSLBI, 33 Nant Gwyn, Trelewis, Mid Glamorgan CF46 6DB, Wales. Tel: (01443) 411459.

Practical Wireless Listening & Operating Watch List

To join the PW 'Listening Watch', send your details direct to Leighton Smart GW0SSLBI.

Charlie Blake RS96G3Z lists: 0500-0700UTC 7.061MHz s.s.b. with N9D 525 RX/Sliping Wire.


Steve Locke GW0SSL operates: 2000-2100 (Sundays) 14.250MHz s.s.b. Yaeusu FT-757 and TH7 beam.

John & Tony Bigdow G20344/G20345 listen: 0800-1400 (Variable) 7.365MHz s.s.b. using a Yaesu FRG 7700/5m Long Wire & 28.367MHz s.s.b.

Leighton Smart GW0SSLB operates: 2100-2300, 1.949MHz s.s.b. Yaeusu FT-747J/70m Long Wire

Rob Mannion G3XFD listens and operates: (weekdays and weekends) 1800-1930, 3.7MHz (s.s.b. 100WV, 3.330/29 c.w. 5-15W) KW2000B & Trio TS-120V, trap dipole, and long wire. Also 2300UTC on either 3.530, 7.025MHz (c.w.) 5W, or 3.7MHz (s.s.b.) Occasionally on 7.025MHz between 0100-0200UTC.

END
F

First this month it's straight into news from the bands to help you find your way around international radio. Radio Ukraine International is on the air with English at 0000-0100 on 11.95, 11.78 and 9.75; 0300-0400 on 9.86, 9.835, 9.685 and 7.405 and at 2100-2200 on 11.95, 11.875, 11.825, 11.78, 11.61, 9.75, 9.56, 7.285, 7.24, 6.99, 6.02, 6.01, 5.905MHz.

A report of a newly heard station has recently come my way. Radio Pilipinas is on the air in English at 0230 for 90 minutes beaming subsequently to the Middle East. Try 22.37, 15.965, 15.205MHz on VoA. It has news transmitters.
In this latest bulletin Roger Cooke G3LDI brings you more from Australia, an up-date for Sinclair Spectrum owners and a Virus Alert with "BayCom v1.7".

One callsign which will obviously be familiar to digital communications fans, is VK2AGE belonging to Gordon Dowse in Goonellabah. I was chatting to Gordon whilst out in Australia last year and he promised to send me details of his activities. He was as good as his word and Gordon is shown sitting at his station terminal in Fig. 1.

Gordon's interest in digital communications began, like so many of us, (especially those with older call signs) in the good old days of RTTY. Having had his share of the mechanical method of operating RTTY, Gordon decided to move into what he calls "glass RTTY". I must say I like that term!

His first computer was an OSI Superboard with 4k (yes all four thousand bytes of it) RAM. He then upgraded it to 8k of RAM and used it as a receive only RTTY Mailbox. Gordon was then introduced to AMTOR by Allan G3RSP and became hooked. Along with with Syd VK2SG and Clive VK3BUS Gordon sent for a kit of parts. The famous three were the only Amtor stations on from Australia for some time and the only DX to be worked was with English and other European stations.

New Mode Problems

Operating a new mode brings its supply of problems, and G3RSP, VK2AGE and VK3BUS found themselves being reported to the authorities as intruders, illegal operators or just plain pirates! In fact, it became so bad that Syd had a tape made and played on the Wireless Institute of Australia (WIA) news broadcasts, along with appeals to give them a fair chance and not to be deliberately jammed.

In 1983, Gordon decided, with prompting from Chris HB9BDM, to set up a store and forward mailbox in VK. He obtained an Apple 2+ computer and Chris supplied the software. Initially it was set up on 14.075MHz with the beam pointing towards Europe. There really was no need to point anywhere else as there was no activity from other parts of the world. The mode was still illegal in the USA, although there were four stations operating under their Special Temporary Authority (STA). The STA tests proved a success and user numbers began to increase. By the end of the 1980's, it became evident that the system was now too small to handle the traffic.

Local packet networks were springing up and the next step was to interface AMTOR to Packet. Gordon was in touch with Craig WABDRZ, who suggested that he try APPLINK, a program written by W5SMM. The APPLINK programs duly arrived and another computer was needed, as APPLINK will only run on an IBM PC (or "clone"). With the addition of the PC, Gordon was now able to control the beam as well as run a BBS. The system is now in constant demand springing up and the next step was to implement over a period of time. Several upgrades have been implemented over a period of time and the whole system is shown in Table 1.

Several upgrades have been implemented over a period of time and the whole system is shown in Table 1.

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<thead>
<tr>
<th>Transceivers: Kenwood TS-450S HF Phillips 747 UHF</th>
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<tr>
<td>Antennas: TH6DXX 14/21/28MHz 1/4 wave verticals 10 and 14MHz</td>
</tr>
<tr>
<td>Computer: PC386DX40 with 4Mb RAM 80Mb HD with six serial ports</td>
</tr>
<tr>
<td>HF Beam pointing Kansas City Tracket Freqs: 7045, 10127, 10111, 14075, 14077, 21076kHz</td>
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<tr>
<td>440.050MHz into the Packet Network All frequencies are scanned at 3 seconds per frequency For Clover, add 2.1kHz for Clover centre frequency.</td>
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<tr>
<td>BBS Program is Aplink by W5SMM running under Windows for Workgroups 3.11</td>
</tr>
<tr>
<td>TNCs: Clover = HAL PCI-4000, Pactor = PK232MBX, Amtor = AMT1 Packet TAPR TNC2</td>
</tr>
</tbody>
</table>

By the end of the 1980's, it became evident that the system was now too small to handle the traffic. Local packet networks were springing up and the next step was to interface AMTOR to Packet. Gordon was in touch with Craig WABDRZ, who suggested that he try APPLINK, a program written by W5SMM. The APPLINK programs duly arrived and another computer was needed, as APPLINK will only run on an IBM PC (or "clone"). With the addition of the PC, Gordon was now able to control the beam as well as run a BBS. The system is now in constant demand springing up and the next step was to implement over a period of time and the whole system is shown in Table 1.

Several upgrades have been implemented over a period of time and the whole system is shown in Table 1.

<table>
<thead>
<tr>
<th>Transceivers: Kenwood TS-450S HF Phillips 747 UHF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antennas: TH6DXX 14/21/28MHz 1/4 wave verticals 10 and 14MHz</td>
</tr>
<tr>
<td>Computer: PC386DX40 with 4Mb RAM 80Mb HD with six serial ports</td>
</tr>
<tr>
<td>HF Beam pointing Kansas City Tracket Freqs: 7045, 10127, 10111, 14075, 14077, 21076kHz</td>
</tr>
<tr>
<td>440.050MHz into the Packet Network All frequencies are scanned at 3 seconds per frequency For Clover, add 2.1kHz for Clover centre frequency.</td>
</tr>
<tr>
<td>BBS Program is Aplink by W5SMM running under Windows for Workgroups 3.11</td>
</tr>
<tr>
<td>TNCs: Clover = HAL PCI-4000, Pactor = PK232MBX, Amtor = AMT1 Packet TAPR TNC2</td>
</tr>
</tbody>
</table>

Roger has to be congratulated for an excellent station and also for his dedication to providing such a superb support for the world-wide interest in the ever-increasing digital revolution. 'Good on ya Gordon', we need more like you!

Spectrum Users

I had an enquiry a while back from a Sinclair Spectrum user asking about a Spectrum Packet Modem. Mike GYVF (8GB7SUT) kindly sent me full details. The modem made by J & P Electronics Ltd., Unit 45, Meadowmill Est, Dixon St., Kidderminster DY13 1HH. Their phone number is (01562) 753893. It fits all versions of the Spectrum but if you want a PMS, you need to have the microdrive or a disk drive.

Software comes with the box (ask for tape or disk) and they may even supply leads to rig if asked. Some commands are strange, but it does work. I suggest that any Spectrum user interested should give them a ring and find out more.

Virus Alert

This is a virus alert for amateurs who use BayCom software. Shortly after the release of BayCom 1.6, a version of BayCom, called 1.7, started to appear on the Internet. It turns out that this version was not put out by Johannes and the team from Germany, but by some unscrupulous operator who planted a virus in the L2.EXE program of an earlier version of BayCom and then released it as 1.7.

Some unsuspecting amateurs have already been hit by the virus and word has got around so, it has been deleted from Internet sites. If you are offered BayCom 1.7, just say no, and your hard disk will be that much healthier for it!

The BayCom team have since announced that there will be no version 1.7. The next version will be 2.0 and it is due towards the end of 1995. (This warning was a snippet taken from the AAPRA bulletin, by Gerard VK2DA, many thanks to AAPRA).

As usual comments and photographs all welcome via "Snail-mail" to: The Old Nursery, The Old Drift, Swareston, Norwich NR14 8LQ, or packet messages to: G3LDI@GB7LDO. Happy packeting de Roger G3LDI.
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YOUR GATEWAY TO PACKET 1

Stuart Heron

What is packet radio good for and what does one have to do to get the 'average user'?
As usual, everyone on the PW Editorial team hope you’ve enjoyed reading this issue. In the ‘themed’ part of the magazine, there was certainly a lot to encourage people to use this part of the spectrum and enough information to get you going on 50MHz!

It’s also a pleasure to report that I’m now on the air on s.s.b. much more than I used to be, thanks to buying a KW2000B recently, to supplement my QRP Trio TS-120V. If you would like to join me on 3.5MHz, I’m often on at 7 or 10pm UK time, at a frequency of around 3.720MHz.

In fact, I’ve received a lot of feed-back from reader friends over the air who’ve tried some of the Delta Loop antenna ideas we published last month. Very successful from what I’ve heard!

I’d also like to ‘push’ a personal interest now, and mention my enthusiasm for railways. In my efforts to learn as much as I can about my surroundings, and those of fellow radio amateurs, I often chat about railways. If you’re interested in railways (anywhere in the world) how about a special Net? I would be delighted to hear from you on this point and to work you on the air, on c.w. or s.s.b.

Incidentally, a KW2000A was my first s.s.b. transceiver. What was your first rig? Drop us a line, with a photograph if possible, we’d be interested to hear from you.

I hope you enjoyed sharing the pleasure of my trip to Holland. And since that trip, it’s also occurred to me how little I know what it’s like to be a radio amateur abroad. So, if you live abroad, how about an article on amateur radio from your country and your point of view?

We’ve got our ‘Receiving Special’ coming next month, with some interesting ideas, so make sure you get your copy! Rob G3XFD

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