REVIEWED

THE ALBRECHT AE 550
Mobile on a Budget

GOOD VIBRATIONS
A New Key From Vibroplex

CRUISE THE CARIBBEAN
Afloat with Yaesu

ANTENNAS
A Vertical Wind-Up for Top Band!

NEW SERIES
Ian Poole G3YWX Provides The Answers

Plus All Your Regular Favourites
PRO 2042 BASE SCANNER
(1000 CHANNEL WITH HYPERSCAN) JUST £359.99 INC P&P* + 2 FREE GIFTS!

- 1000 memory channels (100 channels x 10 banks)
- 10 limit search banks
- 50 channels/sec & 50 steps/sec scanning speeds
- Large orange backlit LCD display
- Rotary or keypad frequency control.

Size: 232mm W x 210mm D x 90mm H.
Modes: AM, FM and WFM.
Step sizes: 5kHz, 12.5kHz and 50kHz (WFM).
Comes with Telescopic antenna and owners manual.

Until January 31st we are offering with each purchase of the PRO 2042 at a cost of £359.99 inc P&P*, both a FREE copy of the 5th Edition UK Scanning Directory (RRP £18.50) and a choice of either our Skyscan DX VI 300 discone antenna (RRP £49.95) or our Skyscan Desk 1300 discone antenna (RRP £49.00) FREE.

To take advantage of this special offer or for more information, call either Rod, Richard or Mary on:

0121-460 1581 or 0121-457 7788

Demand is likely to be high, and orders will be fulfilled strictly on a first come first served basis (subject to stock availability).

Specs apply to mainland UK deliveries only.

Frequency Coverage

<table>
<thead>
<tr>
<th>Freq (MHz)</th>
<th>Step</th>
<th>Mode</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.000-29.995</td>
<td>5.0kHz</td>
<td>AM</td>
<td>137.00-224.995</td>
</tr>
<tr>
<td>30.000-87.495</td>
<td>5.0kHz</td>
<td>FM</td>
<td>225.000-400.000</td>
</tr>
<tr>
<td>87.500-107.995</td>
<td>50kHz</td>
<td>WFM</td>
<td>400.005-520.000</td>
</tr>
<tr>
<td>108.00-136.995</td>
<td>12.5kHz</td>
<td>AM</td>
<td>760.000-1300.000</td>
</tr>
</tbody>
</table>

QUANTEK FC2000 FREQUENCY COUNTER

This sensitive “nearfield” counter is ideal for on-air frequency checking. Simply hold the counter near to the transmitter to get an accurate frequency reading.

Comes complete with nicads, AC charger and aerial. An ideal frequency counter for service engineers or surveillance personnel who need an accurate handheld counter.

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range:</td>
<td>1MHz to 2.4GHz</td>
</tr>
<tr>
<td>Sensitivity (Typical):</td>
<td>800µV @ 10MHz</td>
</tr>
<tr>
<td></td>
<td>500µV @ 30MHz</td>
</tr>
<tr>
<td></td>
<td>225µV @ 150MHz</td>
</tr>
<tr>
<td></td>
<td>64µV @ 450MHz</td>
</tr>
<tr>
<td></td>
<td>1mV @ 850MHz</td>
</tr>
<tr>
<td></td>
<td>&lt;1mV @ 1.3GHz</td>
</tr>
<tr>
<td></td>
<td>&lt;20mV @ 2.4GHz</td>
</tr>
<tr>
<td>Maximum Input Power:</td>
<td>+15dB (50mW), 1.26V RMS</td>
</tr>
<tr>
<td>Input impedance:</td>
<td>500Ohm</td>
</tr>
<tr>
<td>Timebase stability:</td>
<td>+/-1 ppm 25-35°C</td>
</tr>
<tr>
<td>Timebase ageing:</td>
<td>1ppm per year typical</td>
</tr>
<tr>
<td>Timebase accuracy:</td>
<td>+/- 1 count in LSD</td>
</tr>
<tr>
<td>Gate time:</td>
<td>Fast 0.25 seconds for 1kHz resolution. Slow 2.5 seconds for 100Hz resolution</td>
</tr>
<tr>
<td>Power:</td>
<td>Internal nicad batteries 4 x AA, 700mAh or mains adaptor/charger, 240VAC input</td>
</tr>
<tr>
<td></td>
<td>12VDC output, centre positive</td>
</tr>
<tr>
<td>Size:</td>
<td>100 x 87 x 28mm</td>
</tr>
</tbody>
</table>

Specifications subject to change without notice.

RRP £135.95

SRP PRICE £89.95
£5 P&P
### South Midlands Coop

**This Month’s Special Offers**

#### 70cm Mobiles/Portables

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yaesu FT-7200 FM Mobile</td>
<td>£359</td>
<td>DTMF mic not included as standard</td>
</tr>
<tr>
<td>Yaesu FT-790R2 Multimode Portable</td>
<td>£549</td>
<td></td>
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</table>

### Comet New Products

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>CA-HV</td>
<td>£99.95</td>
<td>HF/VHF Mobile Whip 7.14-21-28-50-144 IDEAL FOR IC-706!!</td>
</tr>
<tr>
<td>CF-706</td>
<td>£44.00</td>
<td>1.35-6 MHz/75-320 MHz duplexer for CA-HV or similar</td>
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</table>

### Comet Antennas

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
<th>Description</th>
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<tbody>
<tr>
<td>CBL-30</td>
<td>£23.50</td>
<td>HF 1-1.5 Balun 1kW PEP</td>
</tr>
<tr>
<td>CBL-200</td>
<td>£29.50</td>
<td>HF 1-1.5 Balun 2kW PEP</td>
</tr>
<tr>
<td>CF-30M-R</td>
<td>£43.95</td>
<td>HF Low Pass Filter 1kW PEP</td>
</tr>
<tr>
<td>CF-30M-R</td>
<td>£43.95</td>
<td>HF Low Pass Filter 1.5kW PEP</td>
</tr>
<tr>
<td>CF-30S</td>
<td>£60.00</td>
<td>HF Low Pass Filter 2kW PEP</td>
</tr>
<tr>
<td>CF-30S</td>
<td>£60.00</td>
<td>HF Low Pass Filter 2.5kW PEP</td>
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<tr>
<td>CF-60S</td>
<td>£25.00</td>
<td>6MHz Low Pass Filter 150W PEP</td>
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<tr>
<td>CF-60S</td>
<td>£25.00</td>
<td>6MHz Low Pass Filter 150W PEP</td>
</tr>
<tr>
<td>CF-BFP2</td>
<td>£49.95</td>
<td>2M Band Pass Filter 150W PEP</td>
</tr>
<tr>
<td>CD-180S</td>
<td>£99.00</td>
<td>PWR 1.5-60MHz 20200/20200W</td>
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### Comet Station Accessories

<table>
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<tr>
<th>Model</th>
<th>Price</th>
<th>Description</th>
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<tbody>
<tr>
<td>CA-THR</td>
<td>£49.95</td>
<td>7MHz Mobile Whip</td>
</tr>
<tr>
<td>CA-14HR</td>
<td>£49.95</td>
<td>14MHz Mobile Whip</td>
</tr>
<tr>
<td>CA-21HR</td>
<td>£46.00</td>
<td>21MHz Mobile Whip</td>
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<tr>
<td>CH72S</td>
<td>£18.50</td>
<td>2M/10CM Whip BNC</td>
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<tr>
<td>CH75</td>
<td>£18.00</td>
<td>2M/10CM BNC Whip</td>
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<tr>
<td>CH060MX</td>
<td>£29.50</td>
<td>2M/10CM Whip BNC</td>
</tr>
<tr>
<td>HR-50</td>
<td>£49.95</td>
<td>6M MOBILE Whip</td>
</tr>
<tr>
<td>CA2X4KG</td>
<td>£49.95</td>
<td>2M/70CM Mobile Whip</td>
</tr>
<tr>
<td>Z4</td>
<td>£35.00</td>
<td>2/70CM M. Whip w/locking collar</td>
</tr>
<tr>
<td>B-10</td>
<td>£21.50</td>
<td>2M/70CM Mobile Whip</td>
</tr>
<tr>
<td>B-22M</td>
<td>£44.95</td>
<td>2M/70CM Mobile Whip BNC</td>
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<tr>
<td>CHL2J</td>
<td>£21.50</td>
<td>2M/70CM Mobile Whip 0.92M</td>
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<tr>
<td>CA-268</td>
<td>£29.00</td>
<td>2M/70CM Mobile Whip</td>
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<tr>
<td>CA-3508B</td>
<td>£148.00</td>
<td>6/10M Base Collinear</td>
</tr>
<tr>
<td>ABC2C</td>
<td>£55.00</td>
<td>3 X 3% Base Collinear</td>
</tr>
<tr>
<td>G2PSN</td>
<td>£135.00</td>
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<tr>
<td>G2PS15</td>
<td>£115.00</td>
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</tr>
<tr>
<td>G2PS15</td>
<td>£115.00</td>
<td>2M/10CM Base Collinear</td>
</tr>
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### All Discounts are Based on RRPs. Carriage: Rotators/PSUs £13.50 Base Antennas £9.50. TNCs £8.50. MOBIL Showroom/Mail Order 9:30-5pm, 1-1pm Sat Tel: (01703) 251549 Service Dept Tel: 0113-235 0606**9.5 Mon-Fri SMC Sisk SMC Ltd HQ Southampton: S M House, School Close Chandlers Ford Ind Estate, Eastleigh, ARE Communications: 6 Royal Parade Hanger Lane, Ealing, London W5A JET Tel. 0811-997 4474 9.30am - 5.30pm Monday-Friday 9.30am - SMC (Northern): Nowell Lane Ind. Estate, Nowell Lane Leeds. Tel. (0532) Practical Wireless, February 1997 |
**DATA PRODUCTS**

We now have the widest range of data products in the UK, and with our specialist knowledge of the products we must be by far the number one choice for packet equipment.

**PacComm**
Tiny 1200 baud TNC £139
PicoPacket 12 baud portable TNC £119
Spirit 2 9600 baud TNC £219

**Kantronics**
KPC3 1200 baud TNC £139
KPC96/12 1200/9600 dual port TNC £275
Kam+ Multimode data modem £395

**AEA**
PK12 1200 baud TNC £129
PK96 9600 baud TNC £219
PK232/MBX Multimode data modem £319
*DSP232 Multimode data modem £479
*PK900 Multimode data modem £479
*Free Pack - Win software

**Symek**
TN/2CH 9600 baud TNC £179

**BayComMods**
USCC 4 port plug in card WGO Mods £107

**Modems**
1200 baud Plug in for USCC £39
HF Plug in for USCC £59
9600 baud Plug in for USCC £79
Mini-Pak 1200 baud 9 pin 'D' plug £69.95

Custom-made leads available for most leading brands of transceivers. £14.95. Only £7.50 if purchased with a TNC.

**Siskin Multi Cat**
Computer interface suitable for most HF & VHF Transceivers with CAT interface socket. £69.95
(Now includes beacon software)

---

**COMMUNICATIONS LTD**

**IMMUNICATIONS LTD**

**SPECIAL OFFER LIST**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>C6206</td>
<td>2m 6/8 mobile whip</td>
<td>£13.50</td>
</tr>
<tr>
<td>12SE</td>
<td>12m mobile whip</td>
<td>£12.50</td>
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<tr>
<td>15SE</td>
<td>15m mobile whip</td>
<td>£12.50</td>
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<tr>
<td>17SE</td>
<td>17m mobile whip</td>
<td>£12.50</td>
</tr>
<tr>
<td>GP32</td>
<td>2m base colinear</td>
<td>£35.00</td>
</tr>
<tr>
<td>SQ14</td>
<td>2m Swiss Quad</td>
<td>£35.00</td>
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**HOKOKAN ANTENNAS**

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<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>HS-702S</td>
<td>2M/70CM Whip BNC</td>
<td>£12.50</td>
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<td>HS-430</td>
<td>5/8 Wave Whip BNC</td>
<td>£8.50</td>
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<tr>
<td>HS-320</td>
<td>2M 2 Wave Whip</td>
<td>£6.50</td>
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<tr>
<td>2NE</td>
<td>2M 2 Wave Whip</td>
<td>£19.00</td>
</tr>
<tr>
<td>HS-727SS</td>
<td>2M/70CM Mini Whip</td>
<td>£17.00</td>
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<tr>
<td>EX-104</td>
<td>2M/70CM Mini Mobile Whip</td>
<td>£22.50</td>
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<tr>
<td>EX-601B</td>
<td>6 M Whip</td>
<td>£37.00</td>
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<tr>
<td>SMC125E</td>
<td>12M Mobile Whip</td>
<td>£16.50</td>
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<tr>
<td>SMC155E</td>
<td>15M Mobile Whip</td>
<td>£16.50</td>
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<tr>
<td>SMC175E</td>
<td>17M Mobile Whip</td>
<td>£16.50</td>
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<tr>
<td>WXC4</td>
<td>2M 2/3 Base Colinear</td>
<td>£199.00</td>
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<tr>
<td>WXC3</td>
<td>2M 2/3 Base Colinear</td>
<td>£399.00</td>
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<tr>
<td>SQ144</td>
<td>MQ SWISS QUAD</td>
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<tr>
<td>WXX3</td>
<td>2M/70CM Base Colinear</td>
<td>£49.00</td>
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<tr>
<td>WXX4</td>
<td>2M/70CM Base Colinear</td>
<td>£129.00</td>
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<tr>
<td>WXX5</td>
<td>2M/70CM Base Colinear</td>
<td>£189.00</td>
</tr>
<tr>
<td>NEW XD30</td>
<td>Discene 100 150MHz</td>
<td>£40.00</td>
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**TOKYO HY-POWER Amplifiers**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
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<tbody>
<tr>
<td>HL 1008B/102</td>
<td>21-28MHz 100W out</td>
<td>£210</td>
</tr>
<tr>
<td>HL 1008B/202</td>
<td>14MHz 100W out</td>
<td>£210</td>
</tr>
<tr>
<td>HL 1008/80</td>
<td>7MHz 100W out</td>
<td>£210</td>
</tr>
<tr>
<td>HL 66V</td>
<td>20MHz 110W out</td>
<td>£169</td>
</tr>
<tr>
<td>HLZ2VSX</td>
<td>2m 5-25W in 150W</td>
<td>£155</td>
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<tr>
<td>HL 110V</td>
<td>2m 5-25W in 170W</td>
<td>£399</td>
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<tr>
<td>HL 36U</td>
<td>70cm 5-10W in 30W</td>
<td>£155</td>
</tr>
<tr>
<td>HL 130U</td>
<td>70cm 10-25W in 50W</td>
<td>£259</td>
</tr>
<tr>
<td>HL 120U</td>
<td>70cm 3-25W in 120W</td>
<td>£405</td>
</tr>
</tbody>
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**MODEMS £15.50**

**TRAN/BASE/MOBILES £13.50**

**HANDLES £19.50**

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**SPECIAL ACCESSORIES £5.00**

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**TAIWAN SERENE**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>TSM-100S</td>
<td>2M 7/8 1.89m</td>
<td>£29.50</td>
</tr>
<tr>
<td>TSM-1316</td>
<td>2M 5/0 0.44m</td>
<td>£18.00</td>
</tr>
<tr>
<td>TSM-1320</td>
<td>2M 7/0 0.89m</td>
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<tr>
<td>TSM-1339</td>
<td>2M 8/0 0.89m</td>
<td>£129.00</td>
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**BASE ANTENNAS**

<table>
<thead>
<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>TSB-3301</td>
<td>2m 7/0 G/6Fibre 3.18m</td>
<td>£68.00</td>
</tr>
<tr>
<td>TSB-3302</td>
<td>2m 7/0 G/6Fibre 1.79m</td>
<td>£99.50</td>
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<tr>
<td>TSB-3303</td>
<td>2m 7/0 G/6Fibre 1.15m</td>
<td>£42.50</td>
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<tr>
<td>TSB-3603</td>
<td>2m 7/0 G/6Fibre 3.07m</td>
<td>£25.00</td>
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**HAND/HELO/SCANNER ANTENNAS**

<table>
<thead>
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<th>Item</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>TSC2601</td>
<td>BNC Whip 144/430/900MHz</td>
<td>£15.95</td>
</tr>
<tr>
<td>TSC2602</td>
<td>BNC Whip 144/430/1200MHz 2/3.5dB</td>
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<tr>
<td>TSC2603</td>
<td>BNC Whip 144/430/1200MHz 4/3.5dB</td>
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**Antenna Bargains**

<table>
<thead>
<tr>
<th>Item</th>
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<tbody>
<tr>
<td>BIF</td>
<td>2m 6/8 mobile whip</td>
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<tr>
<td>12SE</td>
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<td>17SE</td>
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<tr>
<td>GP23</td>
<td>2m base colinear</td>
<td>£35.00</td>
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**COMMUNICATIONS LTD**

**SERENE • HOKUSHIN • ICOM • JRC • TELEX • AEA • TOKYO HY-POWER • MFJ • MIRAGE • KLM • HENRY • MANSON • REXON**

**Practical Wireless, February 1997**
ALINCO's new marketing policy allows us to now sell to you direct. This means we can give you the lowest prices available. You get GREAT prices, 10 years of ALINCO servicing experience plus honest advice - TRY US!!

**DJ-G5 2m & 70cm**

- **Price Down**
- Full CTCSS Encode
- 1760Hz Tone-burst
- 1.6MHz Shift
- Program Steps
- 340mW FM
- DJ-G5 Features
  - 'Up to 5 Watts output
  - '100 memories
  - "CTCSS"DTMF
  - "1750Hz tone
  - "11 step Channel Scope
  - "Electronic volume and squelch controls
  - "Am armitage coverager
  - "Extended receiver both AM & FM
  - "Cross Band Repeat
  - "Large LCD Readout
  - "Channel Readout Option
  - "AC charger and ni-cad pack included.
  - Receives 108.00 - 174.95MHz
  - 400.00 - 512.95MHz
  - 800.00 - 1000.00MHz

**Price Down**

**£249**

**DJ-S41**

**70cms Handy**

**Price Down**

**£129**

**AR-146 Features**

- 50W output
- "Low power 100/5W
- "144-146MHz transmit
- "40 memories
- "Call channel
- "Programmable steps
- "1750Hz tone
- "DTMF
- "Keypad microphone
- "Programmable scanning
- "Reverse repeater
- "Channel number display
- "Paging feature.

**Price Down**

**£249**

**AR-446 70cm FM Mobile**

**35 Watts of UHF performance**

This is ADI's new 70cm mobile at a really superb price. The specification is similar to the AR-146 above.

**Price Down**

**£269**

**AT-400 70cms Handy**

**AT-400 Features**

- 70cm Transceive
- "5W from external 13.5V supply
- "20 memories
- "CTCSS Option
- "1750Hz tone
- "Illuminated display

**Price Down**

**SPECIAL OFFER**

AC charger and ni-cad pack kit £29.95

Until 31/1/97

**£24.95**

**AT-200 2m**

**£149.95**

**£169**

**YAESU FT-50R**

**Latest Dual bander**

- Two VFOs
- 100 memories
- CTCSS, DCS
- 4 power levels
- Voice recorder option, ni-cads
- AC charger and antenna.

**Price Down**

**£295**

**With all orders placed before end Jan. 1997**

**+ FREE Speaker Mic**

**GOT YOUR COPY OF EUROPE'S BIGGEST HAM RADIO CATALOGUE?**
1997 Catalogue
Out Now
144 Pages
Largest in Europe!
Plus 12 page price list and 4 page Watson catalogue
Send £2.50 by cheque or in stamps - or PHONE your credit card number?

Price Match Promise
We will match or beat our competitors’ prices on current UK sourced items. Just quote this price and the advert. Our service is second to none and our prices are the best.

MFJ-259 Aerial Analyser
1.8-170MHz
Self contained, it measures VSWR, resonance, impedance, bandwidth etc. Saves hours of work. Great for dipoles, beams, mobile whips and even VHIF helical. Adjusts aerials on site in seconds.

MFJ-784 DSP Filter
Perfect use with its pre-programmed settings, or enjoy and save the settings that suit your ear. Ignore the other pre-programmed settings, or enjoy and save the settings that suit your ear.

 MFJ-948 HF Aerial Tuner
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**Magellan GPS**

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<td>Skyblazer</td>
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Full range of Magellan GPS in stock (new only).

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**Garmin GPS**

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<td>GPS-MAP 220</td>
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<td>Yupiteru VT-225</td>
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In the January issue of PW we published an item in ‘News 1997’ which was prepared from a press release issued by the Department of Trade & Industry’s Radiocommunications Agency. And just in case you didn’t read the news story...I’ll reproduce it here:

“The Radiocommunications Agency have informed PW’s Newsdesk that two Radio Amateurs have had their licences revoked for undisclosed reasons.

In her Press Release statement dated 5th November 1996, Mrs Karen Scott, Head of Amateur Radio & Citizens’ Band Radio Unit announced that the licence of Mr D. Randles G0WNG and that of Mrs M. Faint G0UGN had been revoked. No further details have been provided and nobody from the RA was available for further comment".

No Point!

I took the decision to publish the news item because the Radiocommunications Agency are finally beginning to realise that there’s absolutely no point in issuing statements such as “A Radio Amateur in the Midlands (or wherever) has had their licence revoked”. However, the RA are now at least indicating who the offenders are, and because of this I have dropped the Editorial ban I placed on the ‘no information’ press statements of some two years ago.

I’ve dropped my ban on the press statements because I feel that the RA are now realising how greatly Radio Amateurs appreciate the publicity on what they do on our behalf to enforce and protect the hobby by efficient ‘policing’. And I feel that more details of the offenders, etc. will be forthcoming in future press notices.

But please don’t misunderstand my motives. It is NOT a question of shaming offenders (loss of the licence is enough in this respect). However, IT IS a case of ensuring that everyone knows how seriously certain offences are regarded and publicly showing that the RA is acting positively on our behalf to guard the integrity of our ever-threatened hobby.

Good Relations

I’ve very pleased to say that we have very good working relations with the RA in all of the various Departments of the RA. Despite this I feel that for the RA to expect (and to get) the full support of Radio Amateurs in general, they have to drop the ‘Thou shalt only know what we wish to conceal’ curtain of secrecy entirely.

The curtain of secrecy is slowly dropping and it will soon reveal an open door. It’s through this opening that information, advice and co-operation will freely flow in both directions.

And in further evidence to back up my thoughts on the matter, I’m very pleased to see that both the RA (complete with senior staff) had a presence at last year’s Longleat Rally. They were also at the Leicester show where many of our readers (the RA’s stand was right opposite the PW & SWM stands) found help and advice available from both the RA and representatives from the licence handling sub-contractor Subscription Services Ltd.

So, when you see that the RA are present at a major show or rally...please go and talk to them. You’ll find the senior staff on the stand will be pleased to see you and help in any way they can. And from their point of view they’ll be pleased to show that the RA is not an ‘invisible’ government department run by anonymous civil servants. Like us...they are human souls who need support and encouragement as much as we do!

Microwavers Mourning

I’ve no doubt that ‘microwavers’ will be in ‘mourning’ for the loss of part of the 10GHz band. More importantly (even though it’s a serious loss in my mind)...is this encouragement the leading edge of the ‘wedge’ I mentioned in a brief comment answering a reader’s (‘Receiving You’ December) letter?

It’s a long time since I’ve operated on 10GHz using my PW ‘Exe’ transmitter-receiver. I thoroughly enjoyed working on microwaves. Doing so took me back to my days in the Royal Navy...although my home-brewed equipment was simpler than that used in the service and it wasn’t mounted on an aeroplane!

However, we can only enjoy operating privileges on microwaves if our representation is strong. That’s why I will follow the RSGB’s attempts on my behalf with interest.

‘Other Users’ have their radio ‘eyes’ on many of our allocations.

The loss of the 934MHz CB band, loss of part of 10GHz and increasing use of the 430MHz allocation (by ‘other users’) are but a few examples. So, we’ve got to stand together and make our feelings known. I’ve chosen my way, your choice is up to you...but don’t forget that PW is read very widely (and often confusing) terms used by manufacturers. So, with that in mind I’ll end on this subject with a reminder: We do our best to respond to what you the PW reader wants. However, to help us to respond to your needs, YOUR suggestions, ideas and tips are needed and are always very welcome!

Happy New Year

As this issue is the first on the shelves during 1997, everyone on the PW Editorial team would like to wish all our readers a happy new year. We hope you’ll carry on enjoying the hobby and PW (of course), and look forward to seeing you at rallies, shows and during clubs visits. May God bless you all in 1997.

Rob Mannion

Poole G3YWX. Enlisted ‘What Is A...?’ Ian plans to use the new series of articles to describe and discuss various components in his informal but informative way. They’re planned to provide “bite sized chunks” of theoretical reading, in the same style and approach used in his very popular ‘Specifications’ articles.

Ian has chosen to start the new series by taking a look at semiconductors. And personally (remembering my own struggles with semiconductor basics years ago) I think his choice is excellent. I say this because many people still have “holes” (grrrr...my jokes don’t improve do they?) in their knowledge of semiconductors basics.

At this point I’d like to remind readers that Ian’s ‘Specifications’ series was introduced directly because readers asked us to introduce articles on the subject. The request originally arose during a PW ‘club talk’ that Tex Swann G1TEX and I were providing at the North Ferriby club in North Humberside (now thankfully back in Yorkshire where it belongs?).

Readers present at the North Ferriby club and the Rochdale QRP Convention the next day made their feelings clear. They wanted a series of articles to help understand the mass of ever-growing (and often confusing) terms used by manufacturers. So, with that in mind I’ll end on this subject with a reminder: We do our best to respond to what you the PW reader wants. However, to help us to respond to your needs, YOUR suggestions, ideas and tips are needed and are always very welcome!

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January 19: The Oldham ARC Mobile Rally will be held at the Queen Elizabeth Hall, Civic Centre, West Street, Oldham, Lancs. Doors open at 11am (10.30am for disabled visitors). This event will feature all the usual traders and a Bring & Buy stall. Morse tests are available on demand. Talk-in on S22 via GB4ORC, commencing at 10.30am. More details from Martin BAAK on 0161 365 9850 at any reasonable time.

February 2: The 12th South Essex Amateur Radio Society Rally is being held at the Paddocks, Long Road, Canvey Island, Essex. Doors open at 11am. There will also be a Bring & Buy, RSGB Morse testing on demand (two passport photos required). Home made refreshments, free car parking with space outside doors for disabled visitors. Admission is £1. Further information from David GAUJ on (01268) 675797.

February 3: The Harwell Amateur Radio Society are holding their indoor Radio & Computing Rally at the Harwell Science & Engineering Centre, 1 mile west of the A34 between Oxford and Newbury. Talk-in on S20. Doors open at 10am. There will be trade stands, a Bring & Buy, craft exhibitors, bar and light refreshments. Admission is £1. Further information from Peter GOMM on 01924 2672169.

February 16: The 16th Northern Cross Rally is to be held at Thamee Park Athletics Stadium, Wexford - one large hall just out of town on the Horbury road. Easy access from M1 juncts. 39 & 40 - well signposted and with talk-in on 2m and 70cm. Doors open from 10am to 4pm. Admission is £1 and children are free. Inquiries to John Reid Road, approached from A194 to 522 from Sam. There is ample car parking with space outside doors for disabled visitors. Admission is £1. Further information from Martin BAAK on 01924 2672169.

March 9-10: The London Amateur Radio & Computer Show is to be held at the Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London, N9. Doors open 10am to 5pm each day (disabled visitors from 9.30am). There will be a tripe show, with visit to 522, visit to 1012681846143 or 0161-652 4164.

March 30: The Weyhall Radio Club are holding their 12th Annual Radio Club Rally on Sunday at Weyhall Park, Silver Street, Weyhall, near Birmingham on the A435, just two miles from junction 3 of the M42. Doors open from 10am to 4pm. Admission is just £1. The usual traders in three halls and a large marquee. Bar and refreshment facilities on site, big Bring & Buy stand and talk-in on S22. More information from Rally Organiser, Chris G6EY on 0121-430 7878 evenings, weekends for details.

March 16: The Mid-Devon Rally, sponsored and arranged by the Tiverton South West Radio Club is a permanent fixture, set for the 3rd Sunday in March, so no need to watch the magazines for the date in future! There will be a wide selection of traders to the rally, no matter what your interest, you will be able to find something useful to take home to the shack. There will also be all the usual, excellent catering facilities. More details from Alan GIMMA on (0984) 252259.

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

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

So, what are you waiting for? Fill in the Order Form on page 78 of this issue or call Michael Hurst on the Subs Hotline on (01202) 659930 TODAY

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Reader's Letters

Dear Sir

You said in a recent 'Keylines' editorial that you aimed to print letters expressing all points of view on any radio subject, but surely there is a limit for any self-respecting magazine? Several of the letters in 'Receiving You' of recent issues appear to have been written by children who look upon the RSGB as a schoolmaster.

Do they want to change the RSGB or abolish it altogether, but they don't say what it has done wrong? But of course, the Morse test should be abolished, the RAE made easier, everyone should be free to use any band with any power, and the RSGB subscription should be reduced to a nominal amount.

Maybe it is the fault of the RSGB that these things are not happening? Real schoolboy stuff! (Apologies to those more mature types of schoolboy.)

Amateur radio may be a hobby, but it does rub shoulders with the real world and if we are to common any respect from the professionals and retain our privileges, then we must have serious and capable people looking after our interests. If some people dislike being in an organisation which looks more towards a learned society than a youth club, then they would probably be happier in the CB world.

We are supposed to be engaged on self training and experimentation, not using amateur radio for saving money on telephone bills or playing 'cops and robbers'.

John A. Gaukroder
G0STP
Devon

Non Profit-Making

Dear Sir

I cannot allow some of Dick Raiton GW4RXX's (PW 'Receiving You' November issue) comments to go unchallenged. The RSGB is a non-profit making Amateur Radio Society where the majority of its activities are conducted by some 500 volunteers who, in most uses, do not claim their full entitlement to expenses. The headquarters staff are principally concerned with providing the administrative back-up needed by any sizable organisation.

Contrast the fees imposed by the RAE quoted in the article on Broadcasting (page 25 November PW). Here the costs of running a service with full time employees are reflected in the charges when the taxpayer is not expected to help.

Many of us may regret the level of commercialism now present in the hobby. Fortunately, most amateurs join clubs and societies not for what they can get out, but for what they may be able to contribute.

Several of the committee members of the Milton Keynes & District Amateur Radio Society (my local club) were pupils of the RAE classes 1 run, and one is now a senior Novice instructor. The club has set up GB2BP and a 'V' station as its contribution to the Bletchley Park Museum, which members man on open days.

As Keeper and with the help of other members I maintain GB2MX, our 70cm repeater, and GB3TG, our 10GHz amateur TV repeater. This is at a combined school where the 'rent' is covered by some of us helping with the teaching of electronics for the National Curriculum, one morning per week for a term.

This becomes a Novice course for the children who volunteer to continue for a further term. The Headmaster found that when he attended a head teachers' meeting, all the other were complaining of their problems with the subject, "But I have no problem thanks to you chaps".

Here is a hint for those who have the drive to offer their free services to their local school and hopefully bring more new blood into the hobby.

Dave McGuire G4JMU
Special Projects Manager
RMG
Milton Keynes

Helping Others

Dear Sir

It was most interesting to read 'Keylines' November PW, and the very commendable suggestion on helping other radio hobbyists in developing countries and hope the RSGB or abolish it altogether, but they don't say what it has done wrong? But of course, the Morse test should be abolished, the RAE made easier, everyone should be free to use any band with any power, and the RSGB subscription should be reduced to a nominal amount.

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Dave McGuire G4JMU
Special Projects Manager
RMG
Milton Keynes

Listening & Calling CQ

Dear Sir

I read the 'Receiving You' pages every month. Some letters I agree with, some I do not. Mr Tim Cattley's letter in 'Receiving You' (PW November 1996) is one I don't agree with.

Looking at his mail call, it is obvious that he has not been licensed for very long. My elders always told me that a good operator spends more time listening than he does transmitting.

Has Mr Cattley never listened on 144MHz and heard 'CQ 2 CQ 2 G4XXX calling CQ on 2 and listening for a call'? This is a pretty standard way of calling.

It is also used on all the h.f. bands. I fail to see why he calls it 'Pirate Lingo'. If he cares to copy Slowscan TV, he will receive pictures bearing the text 'CQ SSTV'. Of course everybody knows its SSTV, but it is just a way to accentuate a CQ call.

The writer whose letter was criticized by Mr Cattley did provide his full name and address. If he had not, then his letter would not have been published. So, Mr Cattley, did he have his head above the trenches! Perhaps Mr Cattley, when the ink has dried on your licence, you will be more charitable and tolerant.

George Galloway G4KSC
Essex

A Mere Distraction

Dear Sir

David H. Wright and Tim Cattley's letters (PW September and November 1996) may refer to illegal two way radio, but this doesn't have a real impact on our hobby. It is a mere distraction, well away from our band edges. We should be looking much further up the dial for the real threat.

I refer to the 10m band. Over the past couple of years, with diminished solar activity, this band has all but been forgotten by most Hams, it seems. But the 27MHz operators don't have the option of 14 or 21MHz and the many other bands we have. So, if the channels get jammed, they 'go up a block'.

Just recently, whilst having a go at the RSGB 21/28MHz c.w. contest, I was having a job trying to pick out weak c.w. stations amongst 59 a.m., f.m. and s.s.b. signals at the bottom of 28MHz. And, only last month, the band was solid from 28 to 29MHz!...and there was not a Radio Amateur to be heard!

It might be just that my location favours skip from Asia, where I suspect these signals come from. But if an inexpensive 'Chocolate Biscuit' radio can make it on 28MHz, then why won't the armies of expensive Black Boxes work?

This Month's Star Letter

Editor's reply: Richard's point is of course a major concern to everyone willing to send 'bits & pieces' abroad. It's this aspect of the idea which is causing the major problems...but we're working on it and hope to have news soon.
We are all too aware of the constant demand for spectrum allocations and the threat it places on our valuable bands. Having them invaded by pirates only worsens matters. So, get QRV on '10' before we lose it.

Paddy O'Reilly S79AD Seychelles

Important Qualities of PW

Dear Sir

For me, one of the most important qualities of PW is the wide range of topics that it covers. For example, I found 'Broadcasting on a Shoestring' by Jim Lee G4AEH in the November issue most interesting. However, I was disappointed to find that having given Radio Caroline credit among other stations for influencing his interest in radio, the writer Jim Lee failed to acknowledge that the station is a regular broadcaster using the Restricted Service Licence (RSL) facilities. The latest operation being recently this year (1996) from the River Medway.

The latest edition of The Caroline Newsletter carried the results of a survey commissioned by that station among other RSL operators covering a variety of issues that this type of broadcasting involves. I know I am not the only amateur who is a fan of this station, which others may be pleased to know is still around.

On a different note, despite being an amateur for many years (ex GB), I am a long way from "knowing it all" and particularly find 'Novice Natter' informative.

John Sones MOAAO Essex

Editor's reply: With the restricted number of pages we can allow for 'associated interest' features John, we're bound to lose out somewhere I'm afraid. However, Jim G4AEH (a professional broadcaster) acknowledged the station that played a part in changing the face of radio broadcasting in the UK and mainland Europe.

Suggested Improvement

Dear Sir

I would like to suggest an improvement in Great Britain's Amateur Radio scene, one that is a benefit to the everyday user, rather than those who are only interested in contests. Or those who are single mode or single band users, for whatever reason.

At present, there is little enough scope or encouragement for both classes of Novices and 'B' Class Licences, in the field of on-air and upward self-training. This is due to the restrictions on mode usage, as well as band usage.

What I would like to propose is that Novice 'A' be expanded to all Amateur Bands and modes, and limited to 50W maximum output. For Novice 'B' use of all Band and Modes above 30MHz and limited to 50W maximum output. For 'B' Class Licences all mode and all band usage from 28MHz and up with maximum power output as is normal for these bands.

Controversial yes it is! But, the benefits to the Licence holders, to the band usage, and to the UK's Amateur scene, it is great, so is the self-training and what is most important of all, the self-training is on air practical training.

At present, the greater majority of Amateurs in the UK are invisible due to the fact that they are either using RTTY or Packet as all times, or they lay back and await the next contest. If we therefore change the playing field areas, there's a challenge to everyone from Novice 'B' to Class 'A' Licences.

Publicise one the abolishment of the 12w.p.m. Morse test, that's a subject for all licence amateurs to discuss, suggest alternatives, disagree with. Arguing the pros and cons of any subject that will effect every licence amateur, on a world-wide basis, will be stimulating and boring at one and the same time. Whilst it is an acceptable fact of life that the RA can or should act arbitrarily.

So far they have done nothing other than give their support to a proposal, and since then, as is only right and proper, they are asking us amateurs for our input. If we do not take part in what has been asked of us, we have no right to criticise those who have done so, nor will we have the right to refuse to accept the decision of the majority.

Amateur radio, at least here in the UK, is supposed to be a democratic society, that includes every licensed amateur, be he or she a Novice A or Novice B, or full Class A or Class B.

J. Davies-Bolton G4XPP County Durham

Free PW Blueprints

Dear Sir

Turning the clock back some tens of years ago, in occasional issues of Practical Wireless, free copies of 'blueprints' were enclosed. Many of these single or double-sided sheets featured designs for a variety of radio receivers, transmitters, test gear, etc.

For many years also, PW ran a 'Blueprint Service', which was usually advertised inside the cover of each month's issue. I used to have quite a collection of these sheets, but where they disappeared to over the years is anyone's guess. I would dearly love to own some of these again, even if they were only photocopies.

I was wondering if you know of any present day source of these Blueprints? Perhaps some are lurking somewhere I'm afraid, but I would dearly love to own some of these again, even if they were only photocopies.

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I received with the service I have received with would have no hesitation in buying or recommending R N Electronics products to anyone.

Peter Garde G6MCE Cheshire

Excellent Service

Dear Sir

I would like to compliment through your columns the excellent service I have received from R N Electronics. I bought a second-hand 144 to 50MHz transverter plus attenuator recently, there was no information regarding the units given to me, so I decided to ask R N Electronics if they could send me the relevant information.

Whilst speaking to Alan Semark, the Services Manager for R N on the 'phone, requesting paperwork I asked if they would service the units for me. He assured me that it would be no problem to check everything and replace the 'iffy bits'.

I sent the units to R N. had a 'phone call off them to tell me what minor bits needed replacing plus adjusting the output to my requirements, plus a good natter where my probably stupid questions were explained. A price was quoted which included postage, and, dare I say it, 'it was a pleasure to pay', so a cheque was sent by return.

All this activity took one week door to door. so now I am the proud possessor of a 144 to 50MHz transverter. If I can find suitable antennas at the Horwich Rally this Sunday, look out 'Six' here I come!

Peter Garde G6MCE Cheshire

The RAE 'On Demand'

Dear Sir

I am taking the RAE this December, which I hope I

only have to do once! The point I'd like to raise is I was talking to a friend of mine who has lived in Australia and he tells me over there the amateur radio examination is 'by demand' and that you get the results the same day. Is this true and if so, why couldn't we have the same over here? In place of the twice yearly event, with all this technology rammed down our throats it wouldn't be that difficult surely?

I do enjoy the magazine and look forward to it dropping through the letterbox every month.

Paul Collins Peterborough

Editor's comment: I don't know if the full RAE is available 'on demand' Paul...but I've no doubt our Australian readers will soon put us right on the situation. However, I think an 'On demand' RAE is an excellent idea. Let's face it...something has to be done about the ludicrous (and ever worsening) exam situation (with regards to costs and availability).

Personally I'd like to see the RAE fully under Amateur Radio control. It DOES work for the Morse test...so why not the RAE? In my opinion it would then be cheaper and much more available.

Reader's letters intended for publication in 'Receiving You' must be typed and should be duplicated. Letters are accepted on the understanding that they have only been collected by Practical Wireless. Please ensure that your letter is clearly marked for publication in 'Receiving You' letterbox every month. We reserve the right to edit or shorten any letters. The views expressed in letters are not necessarily those of Practical Wireless. Send your letters to the PW Offices, marking it clearly for 'Receiving You'.

Practical Wireless, February 1997
Badger Boards - Still Going Strong!

The PW team have heard that some of you have been experiencing problems in contacting John Badger G4YZO of Badger Boards to order PCBs for PW projects. John, as previously reported, has scaled down his business and has been using a mobile telephone for his business calls.

Unfortunately, John's mobile phone has broken down and he is currently having it repaired, which explains why he has appeared to be uncontactable and no longer trading. For the time being John will be available on (01737) 296356 and for those of you with Internet access at jbadger591@AOL.com.

John expresses his apologies to all those who have been trying to get in touch with him and would like to assure PW readers that Badger Boards is still going strong and very much in business.

Skyview Site

Skyview Systems of Suffolk, East Anglia, have recently launched an Internet site which carries information on their off-the-shelf and commercial weather monitoring systems. In addition to this, Skyview also offers a mail order service for specialist meteorological tools and air sports equipment.

Future plans for the site at www.actual.co.uk/skyview/ include demonstration software which will be directly downloadable. The site also offers the user 'links' to many related aviation, weather and short wave radio sites, so why not take a look?

Power Increase

The sister station to World Wide Christian Radio, WNQM 1300AM has been granted a construction permit by the Federal Communications Commission (FCC) in Washington DC for increased power to 50kW. The station, which has been on-air since 1947, uses the medium wave frequency of 1300kHz in Nashville, Tennessee and broadcasts to over 100 churches, teachers and ministries based in middle Tennessee and other parts of the US.

Owing to the fact that the power increase requires major engineering work, no completion date has been given for the work. However, by the time you read this work should be well under way and it's expected that progression will be determined by local weather conditions and equipment availability.

Tandy Unlimited

Tandy, the high street electrical retailer, has launched a new initiative in the form of a service which allows customers to order unique and often hard to find items from a new catalogue called Tandy Unlimited. This new initiative forms part of Tandy's pledge to offer the most diverse range of electrical products, parts and accessories throughout its 348 store network.

Tandy Unlimited is available in all Tandy stores and all customers have to do is fill in a form selecting their goods from the catalogue, which will then be sent to their homes direct. As well as being able to order goods using the form in-store, customers can also order by post, FAX or 'phone. All orders placed in this way will be fulfilled within seven days and will be subject to a £1.50 P&P charge.

Back On Air

After almost a year of being off air GB3SW the South Wiltshire 430 MHz repeater is once again operational. The new 'box' was installed on 21 November 1996 by Graeme Miller G3JIP who put it all together for the repeater group.

The GB3SW repeater is based on a Storno Commercial unit and very much in business. Badger Boards is still going strong and very much in business. If you'd like to know more or would like to be involved in renewing GB3SW's mast you can contact David Lempriere G4RXQ on (01722) 30778 or Peter Smith G3YWT, QTHR.

Yaesu At Bletchley Park

Late last year Barry Cooper G4MKO the General Manager of Yaesu UK visited Bletchley Park to present the Milton Keynes & District Amateur Radio Club with a FT-790 430MHz transceiver complete with a 25W linear amplifier. Barry also gave the club a talk on Yaesu Munsen, its origin and progress to date.

New For '97

By the time you read this, two new products will have been added to the Waters & Stanton range.

The first of these is the Yupiteru MVT 9000 hand-held scanner which covers from 530kHz to 2039MHz on all modes and features a dual frequency display and 1000 alphanumeric memories. The MVT 9000 is also capable of monitoring both sides of duplex contacts and offer the users 18 different frequency steps. At the time of going to press, the price of the MVT 9000 was unconfirmed, contact Waters & Stanton direct for further details.

The second new product is the ADI AT-600 which is described as the first dual-band hand-held transceiver priced at less than £300! The AT-600 features dual frequency display, extended receive, DTMF with CTCSS as an option. The priced is expected to be in the region of £290 which includes antenna, NiCad pack and charger.

To find out more on either product mentioned here contact Waters & Stanton on (01702) 206835.
Shown in the photograph are (left) Matthew, Des G3LCS, Martin, Helen, Nigel G8HFF, Tom, Francis, Tom G3LMX, Linda, Barry GURKO and George GORDG. ('novices' are shown in bold). The Milton Keynes club would like to express their sincere thanks to Barry for making the trip, especially as it was blowing a 90mph gale at the time!

The latest CD-ROM to come from Practical Wireless, February 1997 Webmaster's Toolkit is the Webmasters Toolkit. This is a collection of utilities, graphics and documentation designed to help you maintain and improve your Web pages.

Webmaster's Toolkit includes tutorials and Frequently Asked Questions (FAQs) to help the user learn about programming and Web design. The disc files include home page templates, 380 animated GIF's, 400 backgrounds, 425 icons, 59 buttons, 209 lines and 127 arrows, editors, ImageMap utilities and conversion utilities and link validators for site maintenance.

For the experienced Web user the Toolkit contains files of Perl cgi-bin source code, Java applets and Active X as well as servers for Windows, Macintosh and Unix. The Webmaster's Toolkit CD-ROM is accessible from any operating system that has a Web browser.

For further information on the Webmaster's Toolkit contact the PDSL at Winscombe House.

Beacon Road, Crowborough TN6 1UL. Tel: (01892) 662298.

New Alinco Distributor

Nevada Communications of Portsmouth are pleased to announce their appointment as distributors for Alinco products. In addition to this appointment, Nevada are in the process of setting-up a comprehensive dealer network to ensure that customers will be able to purchase Alinco equipment at a dealer near to them.

One of the latest products to come from the Alinco stables is the EDX-1 h.f. antenna tuner. The EDX-1 is a coaxial tuner with a built-in power and s.w.r. meter with a power rating of 120W and covering 1.8 - 28MHz including the WARC bands.

The retail price of the EDX-1 is £159.95 and more details can be obtained from Nevada Communications of 189 London Road, North End, Portsmouth PO2 9AE. Tel: (01705) 662145.

Year Planner

If you place a book order this month you will receive a Free Practical Wireless 1997 Year Planner while stocks last. The Year Planner can be used in the shack, office or study and is designed to keep you up-to-date with the latest in amateur radio.

From time to time we'll publicise dates from the amateur radio calendar for you to add to your planner and the 1st of these is a change to the Jamboree on the Air (JOTA) date. Unfortunately the information printed on the Year Planner is incorrect. The JOTA date should in fact be October 18 & 19th 1997 not the 25 & 26th. Apologies to all concerned for this error.

Happy New Year!

You can make my new year a 'happy one' by sending me all your new product, radio station, club, Internet news, etc. for inclusion on these pages. If appropriate don't forget to include photographs too.

Send all your news to me Donna Vincent G7TZZB at the Editorial Offices or via the Internet to donna@g7pub.demon.co.uk

A happy and prosperous New Year to one and all, 73, Donna G7TZZB

Low Power Calendar

Gerald Stancey G3MCK the Contests and Communications Manager for the G-QRP club has sent the 'Newsdesk' the following calendar of G-QRP club events for the coming year. Unfortunately, there isn't room here to publicise the full list of contest rules, to obtain these details please contact the PW Editorial Offices for a copy or Gerald Stancey G3MCK. The GDY at 14 Cherry Orchard, Staines TW18 2DF direct.

Date Contest

February

1 1600-1900 AGCW Straight Key Party (1)
7 Last day for Winter Sports Log to G3MC
15 Last day for Chelmsley Logs to G3MCK
28-2 March 1600z CZEBRIS/2359z (Rules Sprat 89)

March

22 Somerset Contest (Rules in Sprat 90)
31 1500-2000z Slovak ARA Contest (1)

May

11 300-1900z AGCW-DL QRP Party (1)
6-9 Yeovil Fun Run (Rules Sprat 90)
18 Yeovil QRP Convention

June

2 17 1000-1900z Sprat 90
17 29
July

2 17
September

10 19 - 20
November

10 16
December

10 25
15 1300-1600 AGCW Straight Key Party (1)
December

10 26 - 1 Jan 98

0900-1500z WAB 144MHz (2)
25 Last day for International QRP Day logs to G3MCK
1500z AGCW DL QRP Contest (1)
1500z AGCW DL QRP Contest (1)
1300-1600 AGCW Straight Key Party (1)
Rochdale QRP Convention
1300-1500z AGCW - DL Hot Party (1)

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- **Sigmas 70-300 DL**
  - £139
- **Kallmar Mirror Lenses (18)**
  - £89
- **Jessop 2x Converter (P/M)**
  - £59

**MINOLTA S1 & XI MEGA DEALS**

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  - £129
- **Minolta 70-210 BCG SPECIAL**
  - £89
- **Sigmas 24-70**
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- **Sigmas 70-300 APO**
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- **Sigmas 70-300 DL**
  - £169
- **Tokinas 100-300**
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- **Tokinas 20-35**
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  - £59
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- **Sigmas 70-300 DL**
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Special Event Station GB0HJC

Members of the Saltash & District Amateur Radio Club had a busy time at the end of August last year in running a special event station to mark the Centenary of Sir Henry Jackson's historic radio achievements in Saltash on the river Lynher. Captain Jackson RN as he was in 1896 carried out his radio experiments from HMS Defiance based in a number of wooden hulks moored in the river. He was the first person to send radio transmissions (Morse) between ships afloat.

G3BRN, the RNARS HQ station at HMS Collingwood, there was also a later QSO with G2GRN HMS Belfast.

On the Saturday morning, the club was honoured by a visit from the Saltash town Mayor Mrs Sue Hooper, accompanied by her husband and consort John. The mayor was welcomed by club chairman Kevin G7HNW and introduced to the club president and NOV holder Rolland G3XLU. The chairman of the RNARS Trev Day G3ZYY who was also present was introduced to the civic party and the local press.

Following introductions to club members, the Mayor exchanged a greeting message over the air with Mike G3IZJ in Farnborough. Mike had spent his early training in the Royal Navy in HMS Defiance at Devonport. The main h.f. rig was the club FT-77 which fed via a KW107 a.t.u. to a set of half-wave nested dipoles, supported between two portable masts. Most of the contacts on 3.5MHz were made using this rig.

The club were also very impressed with the performance of the TS-50 transceiver and matching a.t.u. feeding an 18 AVT triband vertical antenna loaned by a member. Some interesting contacts were made on 14MHz with this rig including the Ukraine, Sweden, Poland W, Siberia, Austria, Italy and the USA.

Contacts on h.f. were worked on the club FT-290R with 30W power amplifier to a 13-element crossed Yagi antenna mounted on a rotor. A few local contacts including some Novices were also made via the local u.h.f. repeater with a low power transceiver and mobile vertical antenna.

At the subsequent club meeting, Rolland G3XLU congratulated the members on setting-up and running the special event station. New licence holders Tony M1APB and Gordon M1AGO were commended for their enthusiasm and operating standard.

The special event station demonstrated what can be achieved by the club members working together as a group and allowed new class 'B' licence holders to work the world under supervision.

The club would also like to express their thanks to the RNARS, Bill Legg, the curator of the HMS Collingwood radio museum, Mike Matthews and Colin Squires for their help and assistance.

Lasting Memorial

A group of wartime airmen and airwomen together with members of the newly formed Thornaby Town Council have launched an appeal. It's for a lasting memorial to the former RAF Thornaby aerodrome and to all personnel who served there. Royal Air Force Thornaby was the home of 608 Squadron, formed in 1930 and disbanded in 1957 and the airfield closed in 1958.

The site of the airfield is now a shopping complex and large housing estate and nothing to show that an aerodrome existed on the site. The memorial is to be a statue of an airman in flying gear.

The Stockton Amateur Radio Group as part of this appeal are going to operate a Special Event Station, callsign GB2TB from the club station at The Community Centre, The Causeway, Billingham, from January 13 to February 9th 1997, on a sponsored contact basis.

Further details on the above are available from the Chairman, J. H. Saynor G4GIG, 28 Lune Road, Norton, Stockton-on-Tees TS20 1AZ, Tel: (01642) 658772.
**We're In Locator 1088 Too!**

Following the 'Club Spotlight' mention of the Sutherland & District ARC's activities under the 'Only Another 1400 Miles To Go' headline, Mr G. M. Christie GM7GMC, the RSGB's Regional Liaison Officer (RLO) for Orkney FAXed the PW office.

Mr Christie was anxious to remind everyone that 1088 covers 'a good bit' of Sutherland, Caithness, with its northern boundary cutting across Orkney. In his FAX he reminds us that there are some 90 Radio Amateurs in the area and there's a lot going on just across the Pentland Firth.

Now we've had the reminder from GM7GMC we replied to him asking for photographs and regular stories from the Northern Isles because it's been some time since we carried a major news item from over that short (but very rough!) bit of water.

So we're looking forward to hearing from all you keen types in Mainland Orkney and Shetland and the other Islands!

---

**Plymouth Radio Club**

At its recent AGM, the Plymouth Radio Club elected a new committee and Mike Byatt M1AHF as Chairman. The committee is looking forward to the challenges of the coming year and is working hard to compile a series of interesting club nights that will be of interest to all, especially those who are new to radio or who are recently licensed.

Ideas for the coming year include talks on construction, test equipment, packet radio, shack design and safety, plus a series of 'how to evenings' where members will share ideas and skills with the club. There will also be occasional club debates on current issues including whether the Morse should be retained and the role/membership of the RSGB.

A lot of hard work is going into the planning of the 1997 Rally, that will be held on 25 May 1997 at the College of Further Education, Kings Road, Devonport, Plymouth.

Club meetings are held every Tuesday evening at the Royal Fleet Club, 12 Morice Square, Devonport, Plymouth at 8pm. New members and visitors are always made welcome and further information can be obtained from Stephen Ramsden G7UNL on (01752) 662051 during office hours or by e-mail: lawspear@cbm.co.uk

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**Ynys Mon Radio Users Group**

The Ynys Mon Radio Users Group operated a JOTA station at the Scout Hall in Llangefni from 0800 Saturday through to 1700 Sunday. The event was well attended by members and visitors and the local clubs and scouts were there and participated in the event.

Many greetings were sent to different groups around the UK and worldwide. Conditions were not that good, but over 100 contacts were made.

The station callsign was GB4LSG and it operated equipment that was donated by the members. An FT-840, TS-430, IC-735 plus a KW1000 linear. The antennas were a trapped dipole and a GSRV, 144/430MHz and a CB station were also in operation.

The operators were well fed and watered by the Scous over the whole 33 hours the stations were in operation. Also, the group would like to thank all who attended the event.

---

**Echelford’s Events**

The Echelford Amateur Radio Society meet on the 2nd and 4th Thursdays of each month at The Hall, St Martins Court, Kingstone Crescent, Ashford, Middlesex at 7.30pm. Up and coming events are: January 9 - Natter Nite, 23rd - Test Gear by R. F. Burns G3OUU and on February 13 - Getting To Grips With Morse by Geoff Cox. Further information is available from the Secretary Robin Hewes G3TDR, QTHR on (01784) 456513.

---

**Change Of Venue**

Following a difficult nine months, during which the Moorlands & District Amateur Radio Society was without premises, the Club Officers are pleased to report that the Society now has its own dedicated shack and clubroom. For a number of years, the Society has been privileged to occupy rooms in the Creda-Cannon Company Complex in Blythe Bridge.

However, due to a re-structuring within the Company, the Society had to vacate these rooms by Christmas 1995. Nevertheless, the Society still enjoys the hospitality of the same Company as the new shack, etc. occupies a nice and secluded part of the Company's grounds.

Furthermore, to everyone’s pleasure, the Company Chairman Brian Wolfe G3MTK not only officially opened the new premises accompanied by a Director of Personnel, but has also kindly agreed to be the Honorary President of the Society. The new premises use a Portakabin as the basic structure (see photo), but members have done much work refurbishing it to the necessary high standard.

Members also have the pleasure of being affiliated to the Creda Social Club. It is anticipated that the highly successful RAE and Morse tuition courses will re-commence in the near future. Meetings are held at 8.30pm on Thursdays at the Creda Works, Blythe Bridge, Stoke-On-Trent, Staffordshire ST11 9LJ.

The new shack undergoing refurbishment, with the Chairman Mr C. F. Bessey G4OUG setting a fine example!

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**The Spotlight’s On Again!**

Yes, it’s true, this is the 2nd year of the Spotlight Trophy, awarded to the Radio Club magazine of the year by Practical Wireless and Kenwood (UK). Last year, the Huddersford Club won, but who will have their club name engraved on the cup this year?

How did it all start I hear you ask? Well, David Barlow G3PLE, a retired Marketing professional and former member of the Birmingham Press Club, who now lives in Cornwall, wrote to Rob Mannion G3XFD, Editor of PW, and myself, suggesting a special trophy for the best radio club magazine or newsletter.

Both Rob and I thought David’s idea was an excellent way of encouraging the often (hard-pressed) magazine and newsletter editors. David Wilkins G5HY of Kenwood (UK) thought so too! So, a new competition was born!

So, let’s see your magazine, whether it be weekly, fortnightly or monthly, glossy, duplicated A4, PC produced or whatever. They’re all of interest and yours could win!

To enter your club magazine for the award, all you have to do is to send in two of your most recent club magazines and details of how they’re published to the PW Editorial Offices. Most importantly, remember to mark your envelope ‘Spotlight Club Magazine Competition’.

The panel of judges (as last year) are: Dave Wilkins G5HY, myself, (Zoe Crabbs), Jim Bacon G3YLA, David Barlow G3PLE and last, but certainly not least, Rob Mannion G3XFD. We’re all looking forward to receiving and reading your club magazines, and as we want to receive more than last year’s ten entries, you’d best get busy, the spotlight’s now on!

---

**Practical Wireless In A Pot!**

Elaine GW9WTO tackles her first transmitter construction effort. She’s building a one watt ‘Oner’ rig into a soap box, aided by G3LRQ who won the 1996 WACRAL Conference Competition, featuring 1W ‘Oner’ transmitters in unusual containers, with his TX in a Marmite jar!
It is almost 50 years since the first transistor was invented. Since then semiconductor technology has grown by an enormous degree, affecting the lives of virtually everyone on the planet.

Computers, portable radios, cellular phones, satellites, electronic watches and a host of other items in daily use have all been made possible by semiconductor technology. In the field of radio, semiconductors have revolutionised the components and techniques used.

In this series I hope to uncover some of the mysteries of how some of the common devices work, and what some of the more unusual devices do. I will be looking at Gunn diodes, GaAsFETs as well devices like HEMTs and PHEMTs. However, to start I want to take a look at the foundation of this revolution, and look at the semiconductor materials themselves.

**Conductors And Non Conductors**

There are two main classes of material as far as electrical theory is concerned, conductors and non-conductors. From their names it can be gathered that conductors will conduct electricity freely, whereas non-conductors act as insulators preventing the flow of an electric current.

An electric current is made up of the flow of electrons. This means that for a current to flow, the electrons must be able to move freely within the material.

In some materials, electrons are moving freely from one atom to the next. And by placing a battery or other source of potential difference across a conductor the electrons can be made to drift in one direction or the other.

Metals are all conductors of electricity, and a number of other substances also conduct it to varying degrees. However, there are many other materials which do not allow electrons to move and these non-conductors include most plastics, ceramics and many naturally occurring substances like wood.

**Semiconductors**

As the name suggests a semiconductor is neither a true conductor nor an insulator, but half-way between. A number of materials exhibit this property, and they include germanium and gallium arsenide, but the most widely used is silicon.

Pure silicon is a good insulator, but when a very small amount of impurity is added its electrical properties change. To see what happens it's necessary to look at an atom of silicon. It can be seen from Fig. 1 that the atom consists of a nucleus with three rings or orbits containing electrons, each of which has a negative charge.

The nucleus consists of neutrons which are neutral and have no charge and protons which have a positive charge. In the atom there are the same number of protons and electrons so the whole atom has no overall charge.

The electrons are arranged in rings with strict numbers of electrons. The first ring can only contain two, and the second has eight. The third and outer ring has four.

The electrons in the outer shell are shared with those from adjacent atoms to make up a crystal lattice. When this happens there are no free electrons in the lattice, making silicon a good insulator.

Germanium has a similar structure. It has two electrons in the innermost orbit, eight in the next, 18 in the third, and four in the outer one. Again it shares its electrons with those from adjacent atoms to make a crystal lattice without any free electrons.

**Dramatically Changed**

The properties of silicon and germanium are dramatically changed if very small amounts of impurity are added. If atoms having five electrons in the outer ring are added to the matrix they enter the crystal lattice sharing electrons with the silicon.

However, as they have one extra electron in the outer ring, one electron becomes free to move around the lattice. This enables the current to flow if a potential difference is applied across the material. As this type of material has a surplus of electrons in the lattice it is known as an N-type semiconductor. Typical impurities which are often used are phosphorous and arsenic.

It's also possible to place elements with only three electrons in their outer shell into the crystal lattice. When this happens the silicon wants to share its four electrons with another atom with four atoms.

However, as the impurity only has three, there is a space or a hole for another electron. As this type of material has electrons missing it's known as P-type material. Typical impurities used for P-type material are boron, and aluminium.

It is easy to see how electrons can move around the lattice and carry a current. However, it is not quite so obvious for 'holes'.

Movement occurs when an electron from a complete orbit moves to fill a hole, leaving a hole where it came from. Another electron from another orbit can then move in to fill the new hole and so forth as shown in Fig. 3.

The movement of the holes in one direction corresponds to a movement of electrons in the other. Hence an electric current is produced.

The level of doping governs the number of holes or electrons which are available. In certain applications these high levels of doping are required, and they are often referred to as P++ or N++ semiconductors.

Next Time

That's all for this month. Next time I will move on to describe the basis of many semiconductor devices, the PN junction.
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Modern technology is moving rapidly towards a totally digital age for most radio communication methods. So, it's rewarding to see a new 'mechanical' item of radio hardware appear on the scene for the keen Morse buff...like me!

Straight Morse keys have been around since the good old days of Samuel Morse himself. The old pump handle is still the trusty friend of many a radio operator, both amateur and professional.

Traditional keys come in a host of shapes and sizes. Some cheap, some not so cheap, some even home-made. In whatever form they appear, they are none the less the true friend of their owners.

And although Horace Martin is not a name that readily springs to mind in connection with Morse Code, somehow I feel it should. Way back in 1890 he sought a way to relieve telegraph operators of a stress syndrome of its day...namely 'Glass arm'.

'Glass arm' or 'Glass elbow' was a condition suffered by many operators and it arose through constant pounding of the good old pump handled key. To overcome the problem Horace Martin developed the Vibroplex 'Bug' which became an instant hit.

**Highly Engineered**

Since the early days, Vibroplex have produced some of the finest, highly engineered Morse hardware ever seen. However, never before have they stepped out of line with their own tradition, until now.

Vibroplex have now produced a good old pump handle, a straight hand key. But this is no ordinary straight key, it bears all the finest qualities of the Vibroplex stable.

**The Hand Key Deluxe**, the model I've had the chance to review, has the appearance of the rest of the Vibroplex Deluxe family. Heavy chrome being the first thing to strike the eye.

The familiar heavily chromed brass jewelled bridge, the bright red synthetic knob and shoulder are all there. Not forgetting the most identifiable part of the company, the identification plate bearing the red 'Bug' which is both hall and trademark.

The chromed heavy metal base measures 88 x 114 x 12mm. Towards the rear edge are placed the two chromed brass screw terminals.

Forward from the terminals is the familiar 'bridge', with its single red jewel midway on the upper surface. Beneath this imitation jewel, which serves no real purpose, is placed the tension adjustment for the key.

The arm of the key is some 150mm in length, 10mm in width and 4mm in depth. It's cranked downwards towards the front of the arm, much in the manner as another well known straight key manufacturer.

Disappointingly the pivots for the arm are not jewelled, but consist of a simple 23mm long pin through the width of the arm. The pin having tapered ends to fit snugly into the adjustable pivot mounts. Those being supported from the 'bridge', and having adjustment screws with locking collars. At the rear end of the arm is found the gap adjustment screw and locking collar.

On the underside of the arm, the precious metal coated contact can be found. This is usefully located on an adjustable mounting, making the contact between this and the base fixed contact, highly positive.

The knob and shoulder are surprisingly comfortable and once the gap and tension have been set, the key operated very smoothly on air. However, the single adjustment screw did prove to be a small problem when adjusting the operating gap, but once set, was fine.

I found that the key had a little more bounce than most, probably due to the shape and thickness of the arm. This in no way detracted from the superb way it performed on air, and the tireless feeling when used over a long period.

**Excellent Key**

Altogether, I think that it's a thoroughly excellent quality key from a well known stable. And the Vibroplex Hand Key Deluxe would be an asset to any amateur or professional shack.

The review model was priced at £199 plus £7.95 P&P and there's a lower priced standard model. The lower priced model has a 'crackle finish' base, instead of heavy chrome and sells at £169 plus £7.95 P&P.

My thanks go to Eastern Communications for the loan of the review model. For further details on this and other Vibroplex products contact Eastern Communications at Cavendish House, Happisburgh, Norfolk NR12 0RU. Tel: (01692) 650077.

PW
A Transformerless Chatterbox

By Doug Gibson G4RGN

Six years after the original publication of George Dobbs G3RJY's 'Chatterbox' in PW in August 1991, it's still proving very popular among a.m. 'Top Banders' and always performs well.

A few would-be constructors however, have been put off by the need to manufacture the modulation transformer. While others have been horrified by the use of a ferrite-cored component, which was designed for use at 20kHz plus in switch-mode p.s.u.s!

The new version of the transmitter I'm describing has been designed to overcome the problems mentioned. At the same time the best features of the original Chatterbox are retained.

**Eliminating The Transformer**

By eliminating the modulation transformer, the audio response has been made level at all audio frequencies. This is so that the builder can incorporate any necessary 'tailoring' in the microphone circuitry.

Some builders of the original circuit have experienced audio instability and distortion when operating the 741 at high gain with low output microphones. To overcome this, the new version has an in-built pre-amplifier, enabling the 741 to be run at a low gain setting.

In my modification the p.a. drain supply is derived directly from the output pin of the modulator chip. This is of op-amp design, and so has its output voltage set at half supply volts in the static condition. Therefore, to deliver the required 12V to the p.a. supply to the modulator chip has to be 24V.

The modulator voltage will swing from +2 to +22 on 100% modulation, giving the required 8-9W carrier and 30W p.e.p., with good linearity. And fear not - 24V p.s.u.s can be had at rallies much more cheaply than 12V versions!

**Modulator Up-Rated**

The modulator chip has been up-rated from a 2030 type to a 2040 and needs to be mounted on a 4 x 2in finned heatsink, as it now dissipates some 15W. Additionally some of the original component values have been changed in order to optimise the conditions of the new circuit.

**Spare Space**

The elimination of the transformer has left some spare space on the p.c.b. so that anyone who has an original board could modify it with a little hard wiring to the new design. Although care would be needed in keeping the microphone amplifier input circuit out of harm's way!

On air tests have brought good signal reports, comparing favourably with the original design. And apart from an increase in power consumption, the new version appears not to have any disadvantages.

---

**Fig. 1: Circuit diagram of the 'Chatterbox'. The areas of circuitry highlighted in white indicate the modifications for the modulator section. Note that the modified transmitter requires a 24V power supply.**
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Carrying On - The Practical Way

By Rev. George Dobbs G3RJV

The Rev. George Dobbs G3RJV has obviously enjoyed working with 'bargraph' type of i.e.d. indicators. And this month he describes a novel bi-directional tuning meter with a bargraph display for monitoring forward and reverse transmitter power.

I don't want to lecture you this month! And without going into the complex arguments of the purposes and validity of standing wave ratio meters in amateur radio, all I need to say is that some form of meter which measures forward and reverse current when tuning an antenna is more than useful!

Like many radio amateurs of the period, my original method of tuning an antenna to a transmitter was to use a series bulb. It was a case of tune for 'maximum smoke' and go!

The first time I laid my hands on a cross needle voltage measurement. Such indicators are ideal for quick relative readings and added to a bi-directional wattmeter head, the result is a simple and convenient way of tuning a transmitter.

The Circuit

The circuit shown in Fig. 1, is the complete i.e.d. tuning meter. The portion of the circuit around T1 and T2 is the Stockton Bridge, with the right side of the circuit, around the forward voltage drop. (The BAR28 type is easy to obtain).

In practice you can use 50Ω load resistors made up from two 10Ω resistors in parallel. For QRP applications 2W resistors will serve this purpose.

The r.f. sensing portion of the unit is built in a screened box. Feed-through capacitors (1000pF types) then take the d.c signals to the indicator section. (a suitable layout for the r.f. sensing part of the unit is shown in Fig. 2). The symmetry of the layout is achieved by using the input and output sockets for the coaxial cable link on one side of the circuit and insulated stand-off terminals for the other coaxial link.

Bar Driver Chips

The indicators are built around two LM3914 10-segment bar i.e.d. driver chips. The LM3914 lights up to 10 i.e.d's (in bar mode) or one of 10 i.e.d's (dot mode) in response to an input voltage. The chip contains a voltage divider and 10 comparators that turn on in sequence as the input voltage rises. Potentiometers, R5 and 6 set the maximum reading of the segments. They could be single units or dual-gang potentiometers, perhaps from panel mounted, to give easy adjustment. My prototype just used two pre-set potentiometers to adjust for individual applications.

The fixed resistors R8 and 9 sets the voltage range of the chip. The value of 47kΩ suits measurements in about the 2 to 20W range in conjunction with R5 and 6. Should higher ranges be required replace R8 or 9 with a preset, say 10kΩ, and adjust to requirements. The ideal is to set the value of R8/9 such that R5 and 6 can give the required power range.

In this application the LM3914 is used in the bar mode by connecting pin 9 to the positive line. The resistors R6 and 7 control the i.e.d. current and could be altered to give a brighter or dimmer display. The 4.7μF capacitor C3, on the power line is included to prevent i.e.d. flicker but may not be needed.

The G3RJV prototype forward and reflected power indicator unit.

The Circuit

The circuit shown in Fig. 1, is the complete i.e.d. tuning meter. The portion of the circuit around T1 and T2 is the Stockton Bridge, with the right side of the circuit, around the forward voltage drop. (The BAR28 type is easy to obtain).

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Finally, individual LEDs could be used as indicators but the purpose made 10-segment displays look better in my opinion.

Using Veroboard

I built my version of the indicator circuits using Veroboard. The final layout of my prototype is shown in the photograph, Fig 3.

The only sections of the track that need to be cut are those between the pins of the LM3914. Use a spot cutter or small twist drill.

Observe the usual precautions when working with Veroboard. It's very easy to 'bridge' the copper tracks with solder. The tracks should be cleaned before soldering begins.

When building the project, I soldered the cathode pins of the LM3914 direct to the edge of the Veroboard at right angles to the board. The anode connections are made by linking all the anode pins and bringing a lead down on each side of the display as can be seen in Fig 3. (I used a green display unit for the forward reading and a red display for the reverse indication).

George Cheats!

My prototype, using separate resistors R5 and R6 was somewhat of a cheat. I already had a version of the Stockton bridge which used two small edgewise meters. So I removed the meters, enlarged the holes in the box and used the 10 segment displays in their place. It looks more tidy outside than it does inside!

To set-up the meter when you've built it, connect a dummy load to the output and apply an r.f. signal at the level required for full scale reading. Next, adjust the preset R5 to light all the green LEDs on the indicator.

Then reverse the meter. Connect the r.f. signal to the output and put the dummy load on the input connector. This time adjust the preset R6 to light all the red LEDs indicators.

Although using the 10-segment display is hardly accurate, it's very simple to tune up a transmitter with the unit. Remember that the response is logarithmic.

In practice the logarithmic response is no problem, in fact it's an advantage. This is because the reverse reading can be seen rather better at the open (low) end of the scale. The fastidious constructor could even put calibration points above each LED if the preset is to remain at one point for a particular application. And although I'm not planning to provide 'shopping lists' for this column, I've done so this time to encourage you to have a go. Try one...it's a really versatile little instrument!

Shopping List

The r.f. sensing Circuit:

- T1 and T2 = FT50-61 Ferrite Toroid. Primary coaxial link, Secondary 12 turns 22s.w.g. enamelled (or pvc covered) wire.
- D1 and D2 = BAR28 Schottky diodes, C1 and C2 = 1000pF Feed-through Capacitors, 4 x 100Ω 2W (R1 - 4) resistors

Indicator Circuit:

- Uses 2 x LM3914 Bar LED. Driver (IC1 and IC2) x 10 Segment Displays (Kingbright Bargraph) Maplin order code: BY60V (Red) YG33L (Green).
- R5 and 6 = 47kΩ or 100kΩ dual linear, R6 and 7 = 3.3kΩ R8 and 9 = 47kΩ Optional: 4.7µF tantalum capacitor (see text).

Practical Wireless, February 1997
Practical Makes Perfect...

By Richard Pigg G4MHW

Richard Pigg G4MHW, as a keen c.w. operator and surrounded by his collection of keys, shares a few thoughts on Morse code and his valiant attempts to achieve higher operating speeds and asks for your expert help!

Heading Photo: You’ll rarely hear Richard Pigg G4MHW on the microphone (he’s a ‘Morse Man’). But when you visit his shack he does it in a big way and it’s usually plugged into a 3.5kW medium wave broadcast transmitter with the benefit of 200 foot high masts! (On this occasion Richard was broadcasting a commentary during the arrival of HM The Queen at Newcastle Quayside in 1986 for the ‘Tall Ships’ event in 1986).

Look around my shack and you’ll see more Morse keys than microphones. There’s a Hi-Mound straight key and from the same stable...a mechanical bug.

I bought the mechanical ‘bug’ quite cheaply in poor condition and gave it new life with a bit of ‘tender loving care’ (TLC). You can’t get that in aerosol cans like WD40, but it’s just as useful!

Sitting in a grey metallic box like the battleship it came from, is an excellent Navy key. From the other two services are a tough but ‘fiddley’ key from an Army tank and a useful stand-by straight from the RAF.

Pride & Joy

My pride and joy is a Vibroplex Original, a present from my wife. But if you visited my shack, you’d find a large lump of ‘Blu-Tack’ stuck to the end of the dot arm to slow the key down below its minimum designed speed. And that’s what this article is all about.

You will gather that I am an enthusiast of the code, but I must admit it has been a long hard struggle to get to my present speed. The required 12w.p.m. for the test wasn’t too bad, but I’ve set my sights on 30w.p.m. and I’m now wondering if I’ll live long enough to get there!

At the moment, with a following wind and the sun shining, I can sometimes make 20w.p.m. This is after years of daily practice, or more accurately, nightly practice.

Even so, there are times when my brain seems to switch off for no apparent reason. Then I lose several words, finding it hard to pick-up the thread again.

Write Every Letter

Most people learning Morse will write down every letter they hear. And it’s possible to do this up to about 20w.p.m. without being conscious of what the message is about.

To find the meaning, the operator has to read back what he has just written down. But there comes a point, around 25w.p.m., when signals are coming in too fast to write them down. It’s then necessary to develop the ability to both translate the Morse and store in the brain a clear record of what the message is.

What’s involved in the higher speeds is some kind of mental change of gear and I’m sure that many of us need help in this department. However, if this problem has never bothered you, please stay with me, I need your help!

Over the years I have read a great deal about Morse code in books and magazines. But I have to say that I have never read one single thing that has helped me to receive the code without ‘mental drop out’ or to increase my speed.

Practice Makes Perfect?

‘Practice makes perfect’ say some, but unless you know exactly what to practice you’ll be unlikely to improve! The only useful advice I’ve ever had was from an army signals instructor whom I met all too briefly. He told me “Don’t write a letter down until you hear the next one”.

Now some questions: Why is it that some lucky people can, within a year of taking a 12w.p.m. test, rattle away at 25w.p.m. or more, while others who slave away practising every night seem to get nowhere?

And why do some operators have the ability to receive Morse all in their heads, while others are lost when printed in instruction manuals, these letters should have a bar printed above them thus: AR SK BT. This indicates that they should be transmitted as one symbol with no space between the letters. It really does have a different sound, and it is obvious that some operators have not been taught too well. Frequent errors that crop up are the sending of AR for ‘End of transmission’, SK for ‘End of work’ and BT or TV for the ‘Separation of Break sign’.

When printed in instruction manuals, these letters should have a bar printed above them thus: AR SK BT. This indicates that they should be transmitted as one symbol with no space between the letters. It really does have a different sound, and it is the sounds that people are trying to learn.

I mention the problems because they can cause confusion to someone who is receiving Morse when odd letters like TV and SK start appearing in their text. In any case, Morse is difficult enough for most of us, but well worthwhile. So if we’re doing it at all, let’s get it right!

Now, let’s look forward to some words of wisdom from the real experts. Come on keen c.w. types... give us the ‘nitty-gritty’ on the dits and dahs and show us the mental approach to crack the code. In the words of Peter Sarstead’s song, ‘I want to look inside your head’. It’s appropriate to end in Morse. So... Di dah di dah dit. Di di di dah di dah!
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Practical Wireless, February 1997
Winding-up Top-Band

By Denis Payne G3KCR

Denis Payne G3KCR has developed ways of shortening antennas using delta windings. Now, using those methods, he describes how to make a "Top-Band" vertical that will fit in a garden.

Fig. 1: Overall layout of the framework and windings (shown horizontally). See Fig. 2 for winding the loading coil.

After my previous article, "Multi-Delta Antennas" published in the August 1995 issue of PW, the question of Top Band (1.8MHz) antennas for small gardens was brought to mind. However, all my previous experiments had been with frequencies from 7MHz upwards. Could the principle I described then be applied for longer wavelengths?

After several experiments the answer was yes. It turned out that a quarter-wave vertical antenna is easy to build.

I described the basic principle of the delta antenna in the original article, but the challenge is to reduce an antenna's length by folding the element wire without cancelling out the radiation. This is achieved by forming a series of equilateral triangles, and was illustrated in the August 1995 issue of PW.

First Step

As the frequency is lower, the lengths involved are much longer so, the first step of course was to find a frame on which to build the antenna. And importantly I've also found that the size of the triangles is important, they need to be larger with longer wavelengths (lower frequencies).

So, I decided to build a wooden frame, for the antenna. But to be mechanically practical, the frame mustn't be too large and for the windings it had to be as large as practically possible. A compromise was decided upon, and the wooden frame I built was constructed from 16x38mm prepared wood.

I used a pine softwood for the framework, but a hardwood if available, is an alternative for long term weathering, although it would be more expensive. I used two lengths of wood, three metres long, for the frame sides, and a further two metre length was cut up to make cross bracing. The overall layout is shown in the illustration of Fig. 1.

As this isn't a woodworking exercise, there's no need for clever joints when making the frame. The bracing pieces were just nailed to one side (this I call 'the back') of the long sections, leaving the 'front' of the long parallel frame for the winding.

Winding Formed

The winding was formed using 60 metres of pvc insulated single core wire (0.6mm diameter), and is wound around 30 wire nails, 25mm long. There are 15 equally spaced along each side of the frame.

Starting at one end of the frame, the first nail is 50mm in from the end and 10mm in from the side of the frame. Maintaining the same distance in from the side, the others are spaced 207mm apart. This will leave a gap of 360mm between the rows of nails.

The method of winding the wire around the nails is important. Start at one end, which will be the 'top' of the winding. The bracing pieces were just nailed to one side (this I call 'the back') of the long sections, leaving the 'front' of the long parallel frame for the winding.

Don't be put off by the amount of
wire and the illustration. After following the method for the first section, and finding it to be simple, the remainder of the winding can be completed within twenty minutes.

There is a total of fourteen sections of the winding. The first eleven, from the top, have a triple cross-over as shown on Fig. 2, but the remaining three sections (at the 'bottom' of the winding) have four cross-overs.

On completing the winding, leave a 150mm or so length tail at this end. This end of the winding will be the bottom of the antenna, and the feed point for the 50Ω coaxial cable. You should note that almost any size of insulated wire can be used, but different sizes may change the resonant frequency. You would have to correct the different resonant point by the simple method of putting more or less wire on the lower sections.

For those interested, the reason for the resonant frequency change is the natural inductance of the wire changes, which in itself would change the frequency. But in addition the capacity to ground of the antenna would also be different which again alters the resonant frequency.

Top Section

To the top of the wooden frame I added a two metre length of 6mm diameter alloy tube. And in spite of the fact I've used a wooden frame, this element must be insulated from the frame, and connected to the top of the wire winding. Lengths of alloy or copper tube are available from most DIY stores in two metre lengths.

Almost any form of insulation will do to isolate the top element from the frame. One suggestion is to use a small plastic box. I used the type available from Maplin (stock number LL12N). Drill through the sides of the box to take the alloy tube, and two holes in the bottom for fixing.

The alloy tube can then be glued into the box, and the wire fed through a small hole in the box and connected to the tube. See Fig. 3 for details. The diameter and length of this tube is not critical, as any difference in length can be corrected by tuning, but that comes at a later stage.

The last item needed to complete the antenna is a two-way connector block, also fitted inside a plastic box, and fixed to the bottom of the frame. This is used for connecting the coaxial 50Ω feeder to the winding and the earth rod. See Fig. 4 for details. I used a one metre long earth rod close to the base of the antenna, but in general the longer the better.

Mounted Clear

The antenna should be mounted clear of any large metal structures. As most certainly not on the side of a metal mast. I used a pair of mast mounting brackets that have 400mm arms. These were fixed to the wall of the garage which allowed most of the antenna to be above the garage roof. This means drilling two holes in each bracket for the wood screws into the frame.

Tuning & Adjustment

The tuning and adjustment can be carried in several ways. The simplest way is to use a grid dip oscillator (g.d.o.), coupled to the terminal block by a two turn link. Check the accuracy of the g.d.o. using a receiver.

Another alternative is to use a Noise Bridge and a receiver, with the bridge connected directly to the terminal block and set to 50Ω. The enthusiast (like myself) who spends most of their time on antennas could use one of the various antenna analysers available.

Having found the resonant frequency of the antenna, it may require some correction to bring it into the part of the band you intend to use. To do this, all you need to do is to add wire to the lower section to lower the resonant frequency, or subtract wire to raise it.

The length to be added or subtracted is approximately 320mm per 10kHz change. The final check of course is to connect it to your transceiver and measure the s.w.r. at various points across the band.

Results Pleasing

The results I had with this antenna were, considering the size of the antenna, pleasing. My best QSO during five evenings of tests was with Sweden, using 35W on s.s.b.

The s.w.r. readings I measured on my antenna across the band are shown in Fig. 5. The total inductance of the antenna winding was 156μH, measured on a low frequency bridge, and the radiation resistance in the centre of the band was very close to 50Ω.

It may be of interest to know that a quarter-wave vertical antenna, for 'Top Band' with the same overall size, would require a base loading coil of about 250μH, and the radiation resistance would be less than 1Ω.

The wire used in this antenna, when straight, would have a calculated inductance of 144μH.

A Bonus

There's a bonus for operators not interested in Top Band, it's possible to use the same size frame, top section, and null positions to construct an antenna for 3.5MHz. Although, at present, I don't have definitive winding details.

But never mind the band - get wound-up on it. See you there! PW

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Fig. 3: Details of the insulated box and connections to the 2m long top element.

Fig. 4: Details of the feedpoint connections. A good ground connection is important for this antenna.

Fig. 5: The s.w.r. figures for Denis G3KCR's prototype antenna.
Those Trying Transformers!

By Geoff Billington G3EAE

Geoff Billington G3EAE agrees that understanding the theory and techniques can be difficult, but goes on to explain just how you can successfully tackle those 'trying' transformers with a practical approach!

I agree that understanding transformers can be difficult. And to look into this subject in detail, you really need to work with mutual inductance and induced e.m.f.s and to be able to deal with equations using the 'j' notation.

If, however, you are prepared to restrict yourself to 'ideal' transformers, they can be dealt with much more simply. In a nutshell, this is the 'practical' approach I'm aiming for.

An 'ideal' transformer consists of a pair of tightly coupled windings with negligible resistance. They're usually wound on a core of suitable (usually iron based) material, designed to intensify and channel all the loops of magnetic flux (field lines) produced by the currents in the windings.

In an ideal transformer, it's assumed that no energy is wasted on the core itself. These topics are explained in text books, but are not examined in this article. It's also assumed that the coupling is perfect (all the magnetic flux passes through all the turns). The core provides a 'magnetic circuit' from which no flux should escape.

Practical Transformers

In fact, no transformer is perfect, but practical transformers can approach the ideal. And for this there are three simple formulas which are frequently used to describe the transforming action.

The formulae are based on alternating voltages, currents and on impedances, in terms of the 'turns' ratio (Ns/Np) where Ns and Np are the number of secondary and primary turns respectively.

For voltage transformation a source of alternating voltage (Vp volts r.m.s.) is connected across one winding (called the 'primary'). An alternating voltage of Vs volts r.m.s. then appears between the ends of the other winding (the 'secondary' winding).

The ratio of these voltages is equal to the turns ratio. \( V_s/V_p = N_p/N_s \). This is the most important of the three formulas because it is the only one which always holds for an ideal transformer. The other two rules can only be applied if the impedance of the secondary load is low as will be explained shortly.

A word of warning! Although, in theory, the roles of primary and secondary windings could be interchanged, in practice this might prove disastrous in some circumstances.

Current Transformation

The formula for current transformation is \( I_s/I_p = N_p/N_s \) where \( I_s \) and \( I_p \) are the (r.m.s.) secondary and primary currents. Note that the turns ratio is inverted when compared to the voltage formula.

If the voltage is stepped up, the current will be stepped down. This makes sense if you start thinking about power output and input.

It's clear however, that the current formula does not always work. For instance, if you leave the secondary of a transformer open circuit, \( I_s \) must be zero, but \( I_p \) is not - there will still be a primary current drawn from the supply. The simple current ratio formula certainly doesn't predict this happening!

In fact, when no current flows through the secondary, the primary winding simply behaves as a pure inductance. As a result, it draws a current which is one quarter of a cycle out of step (90° phase shifted) with the supply voltage and therefore dissipates no power.

Impedance Transformation

Now let's take a look at impedance transformation. And here the relation between \( Z_s \), the load connected across the secondary winding and \( Z_p \), the impedance presented to the supply is: \( Z_s/Z_p = (N_p/N_s)^2 \). Once again this breaks down completely if we try to apply it to the case of an open circuit secondary, when \( Z_s \) approaches infinity.

(In fact, neither the impedance nor the current formulas can be accurately applied unless \( Z_s \) is suitable small).

Equivalent Circuit

What's needed is an equivalent circuit to represent our transformer. Fortunately, a dedicated investigation of transformer action shows that an ideal transformer can be correctly represented by a 'black box' as in Fig. 1. (The lines show the apparent contents of the 'box' as they might be determined by external measurements.)
The output of the secondary winding may be pictured as being due to an internal 'generator' which always maintains a voltage of $V_p = (N_p/N_s)^2 \times V_s$. The input impedance, $Z_{in}$, can be represented by two parallel impedances as shown.

One impedance is $(N_p/N_s)^2 \times Z_s$ as given by the formula. This is often termed the 'reflected impedance' ($Z_r$) of the secondary load. The other is $X_p$, the reactance of the primary winding.

As the two impedances act in parallel, it's the smaller impedance which is the more significant. And it's the larger impedance which has the least effect of the resultant value.

If the secondary is left open circuit, $Z_s$ is effectively infinite. This means that the reflected impedance $(N_p/N_s)^2 \times Z_s$ is also infinite and so $Z_{in} = X_p$ (the input impedance is equal to the inductive reactance of the primary winding).

Conversely, if $(N_p/N_s)^2 \times Z_s$ is much less than $X_p$. The primary impedance, $X_p$, can be neglected and $Z_{in}$ will be very nearly equal to the reflected impedance $(N_p/N_s)^2 \times Z_s$, as predicted by the formula.

**Combining Formulas**

Also, it's not difficult to show that by combining the voltage and impedance formulas, the transformation formulas for currents can be obtained. Thus, if a transformer is to obey the simple transformation rules, there must be sufficient turns on the primary to ensure that $X_p$ and $Z_s$ will be considerably larger than any possible value of the reflected impedance.

The 'sufficient turns' condition may alternatively be contained by restricting $Z_s$ to values which are small compared to the reactance of the secondary winding. However, in designing a transformer, either of these conditions could be used as a guide to determine the actual minimum number of turns required.

It's also true (though not so obvious) that if $Z_s$ is a complex impedance with both resistive and reactive components, each of these will be scaled by the factor $(N_p/N_s)^2$ to give the components of the reflected impedance.

**The Hard Part!**

The hard part of the article is an attempt to give a brief justification of the black box diagram starting from first principles. So let me begin in an easy fashion!

A flowing electric current always produces a magnetic field (magnetic flux). In normal transformer use, currents usually flow in both the primary and secondary windings and both contribute to the magnetic flux in the core. If the transformer is well designed, nearly all the flux will be contained in the core and the flux will pass through all the turns of both windings.

It is a basic fact of electromagnetism that if the flux passing through a loop of wire alternates (or changes) it produces an alternating (or varying) voltage between the ends of the wire*. If we apply this to a transformer with an open circuit secondary, an alternating current flows through the primary winding, producing an alternating flux in the core.

*Readers who have some familiarity with mutual inductance and induced e.m.f.s should refer to the final section of the article.

The alternating flux in turn produces an alternating voltage in each turn of both windings. The voltage generated in either winding is simply the voltage per single turn multiplied by the number of turns in each winding.

**Load Connected**

Now, suppose that a load is connected across the secondary, giving a current flow. This would change the magnetic flux... if it were not for the fact that the primary current instantaneously 'adjusts itself'.

The primary current 'instantly adjusts' so that the combined effect of primary and secondary currents keep the amplitude and phase of the alternating flux unchanged. It thus keeps the volts-per-turn unchanged and ensures that the voltage across the primary remains identical to the supply voltage.

The volts-per-turn are always equal to $V_s/N_p$. This holds for any turn of wire around the core. It follows that $V_p$, the voltage appearing across the secondary is obtained by multiplying the volts per turn by the number of turns on the secondary. $V_p = N_s/V_p/N_s$ or $V_p/V_p = N_s/N_p$. And this holds, whatever the load.

To summarise the argument: If the secondary load is changed, both primary and secondary currents adjust their amplitudes and phases to maintain the amplitude and phase of the flux alternations unchanged. (So that the primary voltage is always identical to the supply voltage).

The current which is drawn by the primary (when the secondary is open circuit) is sometimes the 'magneting current'. The statement may then be expressed as: The combined magnetic flux due to $I_p$ and $I_s$ is always identical to the flux produced by the magnetising current.

**Component Current**

The component current is the current in the primary winding. It is connected across the primary. The component current flows through an equivalent resistance $Z_{in}$. It is connected to the 'magnetising current'.

Let's have a look at the components of the primary current. And I'll assume that the secondary is initially open circuit and then a load is connected across it.

To begin with, only the magnetising current $I_p$ flows from the primary. When the load is connected, a current $I_s$ flows through the load and secondary winding.

The a.c. source continues to supply $I_p$ unchanged. But in addition it supplies a new component current $I_s$ the 'balancing current'. This flows in the opposite sense to $I_p$ and completely neutralises its field, so that the flux in the core continues its alternations unchanged in amplitude or phase, exactly as when there was only the magnetising current $I_p$ flowing.

You should bear in mind that if $Z_s$

**Fig. 2: Looking at a transformer with multiple secondary windings with the 'black box' approach (see text).**
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Those Trying Transformers!

Continued from page 35

is very much smaller than \( I_p \) (in which case \( I_p \) and \( I_s \) are almost identical). So \( I_p \) may replace \( I_s \) in the above equation and \( N_p \times I_p = N_s \times I_s \) to a good approximation. This justifies the relationship \( I_p/I_s = (N_p/N_s)^2 \) - providing the inductance of the windings is large enough.

Reflected Impedance

Let’s now look at the reflected impedance. As we know \( V_p/N_p = V_s/N_s \) and \( I_p \times N_p = I_s \times N_s \), it’s easy to show that \( V_p/I_p = (N_p/N_s)^2 \times V_s/I_s \), i.e. the numerical value of the reflected impedance = \((N_p/N_s)^2 \times Z_s\) ohms. Knowing the numerical value of the reflected impedance is not often sufficient, and the resistive and reactive components are usually required.

I stated earlier that when \( Z_s \) is a complex impedance, it can be shown that both the resistive and reactive components will be scaled by \((N_p/N_s)^2 \) to obtain the resistive and reactive components of \( Z_p \). The reason for this is that \( V_p \) and \( V_s \) must be in phase as the volts per turn are identical in both windings.

The currents \( I_p \) and \( I_s \) are also in phase (see later). The phase angle between \( V_p \) and \( I_p \) is therefore the same as the phase angle between \( V_s \) and \( I_s \). This means that their resistive and reactive components must be in the same ratio in both cases: both must be scaled by the same factor.

A word of explanation here. In the transformer windings, \( I_p \) and \( I_s \) must flow in opposite directions in order to cancel. However, when flowing through the secondary load, the direction of \( I_s \) relative to \( V_s \) is reversed compared to what it’s flowing in the secondary winding, so the phase relation between \( V_s \) and \( I_s \) are identical to that between \( V_p \) and \( I_p \). In the case of transformers with multiple secondaries, the ‘black box’ approach is illustrated in Fig. 2) the a.c. source will supply a balancing current for each secondary winding. The supply will ‘see’ all the separate reflected impedances in parallel with \( X_p \).

Imperfect Coupling

If the coupling between primary and secondary is less than perfect, i.e. if there is some ‘leakage flux’, a more formal approach involving mutual inductance is required. There’s no longer a simple relation between \( V_p \) and \( V_s \) and the turns ratio. Also there’s an inductive component to \( Z_p \), the ‘leakage inductance’, which remains as a residual reactance even when the secondary is short circuited.

Avoid Confusion

For the sake of those readers who have some familiarity with the topics I’ve mentioned, a few more words of explanation might help avoid confusion.

For example, you may wonder why the ‘voltage appearing across the secondary’ is not referred to as the ‘e.m.f. in the secondary’. The reason is because in the more formal treatment of transformers and mutual inductance it has been found convenient to represent the secondary winding by an equivalent circuit consisting of an e.m.f. induced by the primary current acting in series with the inductive reactance of the secondary winding.

If the e.m.f. is defined in this way described, it’s not the same thing as the voltage appearing between the ends of the winding - unless the secondary happens to be in open circuit.

The simple method I’ve employed here is correct and quite fundamental. The voltage appearing across the winding depends only upon the alternating magnetic flux in the core and what gives rise to the flux is immaterial.

I set out to disperse some of the mystery behind transformation. And hopefully, you won’t find those transformers so trying now!

Manners

My original letter to PW entitled ‘Good Manners’ was published in ‘Receiving you,’ July 1995. My comments regarding both manners and etiquette seems to have opened a small ‘can of worms’...on the air and by way of written reply! (and I’d like to thank all those who have made their views known).

The subject of manners and etiquette has been dealt with several times over the years, mainly by the late Jack Hum G5UM. So if some of what follows sounds familiar, it’s thanks to Jack, the acknowledged ‘Gentleman of the Airwaves’.

Manners are of course open to a certain amount of interpretation by the individuals. But some words and phrases were drummed into us (weren’t they?) at an early age by our parents and teachers as being ‘de rigueur’.

Please & Thanks

If you were to walk into a shop and ask for a certain item, you would begin or end the request with the word ‘please’. And upon the satisfactory outcome of the sale you would say ‘thanks very much’ or something to that same effect.

So, if you’ve been listening to an interesting QSO for a while and you think you might be able to add to the conversation, you would ask to join in by saying ‘break please’, wouldn’t you? Also, I remember reading (probably one of G5UM’s articles) that it is a good idea to leave a pause of about three seconds between ‘overs’, just in case someone wishes to call in.

Try this experiment: time how long it takes to say ‘break please, (plus your callsign)’. I’ve just tried it and it took just two seconds. So a polite break with full callsign shouldn’t cause any undue disruption to the conversation.

Break please GHBVE sounds much less nasty than that aggressive or mumbled single-worded ‘break’!

If you have ever tried to call into an interesting QSO with some useful information, but both participants were using the ‘hair-trigger’ technique with almost no pause (and sometimes very tight squelch), you’ll know the value of the three seconds pause.

In A Net

When there are several operators working in a ‘Net’, it can take quite a long time for your turn to come around. This leads to the temptation to make the most of your ‘over’.

Before you know it, you have been waffling on for ten minutes or more, most of the time spent trying to remember what you had planned to say. So, it’s best to make notes of the other participants’ queries and comments in order to deal with them efficiently when it’s your turn.

Remember, while you’re ‘umming and erring’, the others are impatient for your turn. So, don’t hold onto the microphone if you have nothing to say. Nets usually try to use the same frequency every time. How often have you said ‘QSY to the usual’ instead of giving the frequency? All your Net members know what the ‘usual’ is, but casual listeners don’t!

So why not announce the QSY frequency and save new listeners a time wasting search? I’m not sure if there is a stipulation in our licence conditions about changing frequencies, but it makes sense to say where you’re going; it can prevent two QSOs ending up on the same channel.

PW

Practical Wireless, February 1997
Andrew Howlett G1HBE originally wrote a letter to PW's 'Receiving You' pages on good manners when operating and the resultant feed-back and general reactions have prompted the following suggestions. So read on! (please).

Beacon Bother

Beacons and those using them can get into some 'manners please' bother too, so it's worthwhile taking a look at frequency allocations. The two metre beacon sub-band extends (in theory) from 144.805 to 144.990MHz, although our RAYNET service operates up to 144.875MHz on occasions.

Some people monitor very weak foreign beacons 24-hours per day. They employ pen recorders and high gain beams to keep an eye on the day-to-day changes in propagation over long paths.

Long-term listening to beacons may seem like an odd thing to do. But bear in mind that we owe much of our knowledge of v.h.f. propagation to these enthusiasts, some of whom hold records going back over many years.

Can you imagine the frustration caused by QSOs that appear right on top of, or very close by, the beacon being investigated? And just because you've never heard a beacon on that frequency doesn't mean there isn't one there - the distant ones are very weak and unlikely to be detected at all on f.m. equipment.

So the next time you're checking the s.w.r. of your antenna, remember that the group of frequencies around the band centre are "taboo" as far as transmission goes. You'd better advised to find a clear simplex channel around 144.800 or 145.200MHz.

Working Mobile

Repeaters can be extremely useful devices for those in poor locations or those working mobile 'on the road'. But if you're chatting on your local repeater and you are not mobile, you should always give way to any mobile station who may call in.

After all, repeaters were designed with mobile stations in mind, and the mobile operator might lose the box at any moment. How do you know the station is mobile? Well, they called in with their callsign, of course!

It's bad manners to hog anything, and this applies to repeaters too. The problem seems to be it's worst during the morning and evening rush-hours, when the repeaters are populated by the same crowds, day-in-day-out.

Hogging the Channel

The amateurs 'hogging the channel' tend to be friends, familiar with each other's operating techniques and favourite subjects. Under these conditions, a multi-way QS0 can soon degenerate into a quickfire 'wisecracking' session during which anyone travelling through the area is discouraged from calling in. It's not deliberate, but it is rather thoughtless.

Waiting for the repeater's 'pip' gives strangers a chance, and of course that is its intended function. Completely inexcusable is the practice of deliberately holding onto the repeater when it's obvious that someone is asking to use it.

Holding on seems to occur when the regular evening users (usually not mobile) settle down for a long chat about some subject or other on what they have come to regard as their box. This is regardless of the fact that the stations in question could make a simplex contact if they tried.

What often happens is that up pops another station, usually a Novice or a new licensee, and asks if they can briefly call a friend, only to be completely ignored by the first two stations. If the novice is brave enough to persist, they're often given the 'no break' treatment. Not only is this a shameful display of bad manners, it's childish in the extreme.

Nuisance Operators

Unfortunately, there are people out there who delight in spoiling things for others and these include the nuisance operators (the scratchers, the raspberry blowers and the swearers). What these poor individuals want (apart from a brain transplant) is attention.

The 'scratchers & blowers' are just waiting for you to respond to their bait, whether that bait is a rude comment or raspberry. The worst thing you can do is give them what they want - this means they have succeeded, and they will carry on as long as they keep getting a reaction.

A while of no response, the nuisance operators will get bored and clear off. So don't talk to these people - not even to tell them to go away. And you should certainly not swear at them or threaten them with violence, as this puts you on their level. Remember you're a Radio Amateur!

What kind of image do you want in the public's mind (or tabloid press!). How about headlines that could read:

'RADIO HAM IN BASEBALL BAT ATTACK'

Possible headlines as that above could be disastrous for our hobby. Count to ten and ignore the taunts!

Tuning In

While we're on the subject of swear words, perhaps it's worth reminding ourselves that when we're in QSO, anyone can be tuning into our transmissions. Including women and children.

Do you use foul language in public? What about in front of your children, or at the school gates? And you should certainly not swear at them or threaten them with violence, as this puts you on their level. Remember you're a Radio Amateur!

Can you imagine headlines that could read:

'Amateur Radio is only a hobby, and there must be an element of fun along with the self training, but good manners and decent behaviour cost nothing. So there we are...that's my personal view on manners and etiquette of the air. If my view reads as though it's a little 'straight-laced' then so be it. But if we don't want to see our bands heading down the same route as some of those operating on the 27MHz CB band, then we must all look at our own behaviour. Let's give it a whirl.'

Practical Wireless, February 1997
Green Light For Budget

The Albrecht AE 550 144MHz FM

By Rob Mannion G3XFD

My new car has many advantages over the previous vehicle. However, it's got one real disadvantage in that as it's relatively new...there's very little space to fit Amateur Radio equipment.

So, once I took delivery of my new car I started to look around at the various ways that my existing 70 and 144MHz rigs could be fitted so I could operate them with safety. That's when I heard about an interesting budget-priced transceiver....

The Albrecht AE 550 is from 144 to 146MHz. Frequency tuning 'steps' are provided as follows: 5, 10, 12.5, 20 and 25kHz. Ten memory channels are available.

The transmitter employs reactance modulation to provide the f.m. signal. Power output is claimed to be a full 25W, with a low power facility which can be selected from the front panel. (The manufacturers don't mention what the lower power level is but we measured it as being 1W output on the review transceiver). The quoted frequency coverage of the AE 550 is from 144 to 146MHz. Frequency tuning 'steps' are provided as follows: 5, 10, 12.5, 20 and 25kHz. Ten memory channels are available.

The transceiver in question has been recently introduced into the UK and marks a milestone in the Amateur Radio hobby by introducing Albrecht - a new name into the UK from their base in Germany. However, before you're misled, I should point out that the actual rig itself is made in Korea.

As prices inevitably rise, I think we're going to see many more items of Amateur Radio equipment being manufactured in countries such as Korea, the Philippines, Singapore and Taiwan. And indeed, Taiwan is already well in front with its experienced specialised equipment manufacturers.

Are you looking for a compact budget-priced 144MHz rig for the car? If so, you may well be interested in the Albrecht AE 550 transceiver that Rob Mannion G3XFD has recently tried out.

Audio output from the internally mounted loudspeaker is quoted at 2.5W (see specifications). Unusually for a lower priced transceiver there's also an external loudspeaker socket included as standard.

The antenna I used was a little magnetic-mount quarter-wave whip. I was immediately struck by the 'sharp' receiver on the AE 550. It's extremely sensitive, so much so that I was picking-up alternator whine from the engine as it ticked over. This also suggests to me that the f.m. receiver is not fully 'limiting' but in practice I don't see it being a problem.

On The Air

During my 'on the air' tests I tried the AE 550 in the 'odds & ends' cum glovebox between the driver's and front passenger seat on my car. The antenna I used was a little magnetic-mount quarter-wave whip.

Reports on my transmitted audio were very good, but on receive I found that I was able to give far better results because of the receiver's sensitivity and the good received audio. This was undoubtedly because of my relatively poor basic whip antenna.

The weekend I had the AE 550 coincided with a 'lift' on 144MHz and from a relatively high spot for coastal east Dorset anyway! I worked into France, Belgium and Holland. Reports received were consistently good, and even though the AE 550 has only a 21MHz first i.f. it coped very well indeed...
get Mobiles!

Mobile Transceiver

though every single channel seemed to have at least three stations working on it!

I had a few successful QSOs via repeaters in the Southampton area. And I had no difficulty whatsoever with good reports from all stations I worked.

But when I consulted the manual again to write my review I was puzzled. I saw that to access a repeater (once you've selected the necessary frequency split for transmit and receiver)...the operator has to press TC control on the front panel to provide the necessary tone burst.

So, either the manual supplied with the Albrecht AE 550 is wrong, and the tone burst is switched on automatically when you transmit, or I was 'piggybacking' on other operator's tone bursts or catching the repeater before it switched over*. But whatever happened (I've no doubt other operators - those with two arms anyway- won't find it a problem to operate the TC control when necessary! )

* The manual is correct

General Impressions

My general impressions of the Albrecht AE 550 are that it offers excellent value for money. It's very well presented, simple to operate and has some delightfully easy-to-operate control switches (although small they're very positive in action, providing a soft 'click' as the do so).

The relatively large (bearing in mind the small size of the transceiver) LCD display is clear and easy to read. The display is also illuminated by back-lighting.

All the translucent push-button controls are illuminated in a soft green colour which is pleasing to the eye and relaxing. The larger rotary controls are also indirectly illuminated by having softly illuminated rings around the periphery of the control - thus showing you where the control is by the 'shadow' effect. Very clever!

The manual - although informative - has some hilarious typographical and translation errors.

They'll amuse you, but the booklet still does the job!

And be warned... don't think you're going mad if the English language version of the manual suddenly turns into a German language version. It's just that you will have picked it up...upside down and the wrong way round.

The German version is upside down compared to the English version, with its front cover being the back cover of the English manual. Unusual and economical in style but in the spirit of the transceiver itself.

So, what do I think? Is the AE 550 a good buy in the budget-priced bracket? In answer I've got to say yes. It's easy to use, delightfully simple in concept and incorporates many features you'd expect in a much more expensive transceiver.

There's no need to worry about leaving this transceiver in the car. Just disconnect the antenna lead and power supply and put it in your jacket pocket as you leave the car. It really is quite small!

My thanks go to Martin Lynch & Son of 140-145 Northfield Avenue, Ealing, London W13 9SB. Tel: 0181-566 1120, FAX: 0181-566 1207, who can supply the Albrecht AE 550 for £199.95 plus £10 P&P.

PW

Manufacturer's specifications

- General
- Frequency Coverage: 144.0 - 145.995 MHz
- Frequency step: 5, 10, 12.5, 20 and 25 kHz (user selectable)
- Modulation type: FM (FSK)
- Operating voltage: 13.8V ± 10%
- Memories: 10
- Antenna impedance: 50Ω (SO239 socket)
- Dimensions: 140 x 125 x 41 (W x H x D)

- Receiver
- Receiver type: Double superheterodyne
- Frequency (IF 1): 21.4 MHz
- Frequency (IF 2): 455 kHz
- Sensitivity: 0.22 μV for 12dB S/NAD (at 145 MHz ± 5 kHz deviation)
- Squelch sensitivity: 0.3 μV (for 20 dB noise quieting)
- Squelch gap: 10 dB
- Audio output: 2.5 W @ 10% THD, into 80 Ω

- Transmitter
- Power output: 25 W (± 13.8 V) (23 W)
- Modulation: reactance method (FSK)
- Max Deviation: ± 5 kHz
- Tone burst deviation: ± 4 kHz
- Spurious emissions: > 60 dB down on carriers
- Microphone: Electret condenser

The ± after a measurement figure means that, when checked on our test equipment, the rig matched (within measurement limits) the quoted specification.

The £1 coin placed on the heat-sink provides a good size comparison.
NEW! Albrecht AE-550

"NO-HOSENSE LOW COST 2M MOBILE"
- 25 Watts [ 5/10/15/20/25 kHz]
- Steps: 1kHz-14.8MHz or (adjustable)
- Compact size: 140mm (w) x 125mm (h) x 41mm (d)
- 10 [YES ONLY] 10m memory channels
- Programmable calling channel

Enter the no frills, no messing AE-550. Simple to use - great in operation. Even better price...

£199.95 INCL VAT. P&P £10

Yaesu FT-8500

Yaesu's new super dual bander is available from Martin Lynch & Son at a fantastic discount!

- Full remote head
- 50 Watts on 2M
- 35 Watts on 70cm
- RX: 110-174/410-500MHz
- 9kHz Packet input jack on rear panel
- Built in CTCSS Encode
- Personal Computer Control
- Massige Omni-Glow Display
- 110 memories with Alpha display

RRP £749 ML PRICE: £495
SAVING £254!!

NEW! Icom IC-775DSP

Icom's flagship machine offering a massive 200 watts of power and DSP. Despite its size, the IC-775DSP is relatively light thanks to a high power switch mode supply fueling the transceiver and huge brightly lit display.

- 200 Watts output
- Massive display
- Twin PBT on each side
- Twin RX with display
- DSP Noise reduction
- Twin Antenna input
- Auto Notch
- APF on CW
- 1Hz tuning
- Triple Band Stacking register

RRP: £3699 ML PRICE £1949

NEW! Icom IC-821H

Icom brings you the latest in all mode dualband technology. The new IC-821H is an "enhanced" version of the W-820H, sporting some very important features. If you are serious on VHF/UHF then join the queue for the best of the best.

- All mode incl. 9kHz packet compatibility
- 35W on 2M SSB
- 45W on 2M FM
- 30W on 70cm SSB
- 40W on 70cm FM
- 0.11 microvolt for 10dB S/N
- SSB, CW
- IF Shift for either band
- Satellite Mode operation
- Twin receivers allowing 2/70 duplex operation

RRP £1595 ML PRICE £1429

NEW! Icom IC-756

WITH 5 YEAR WARRANTY & ACCIDENTAL DAMAGE!
The new IC-756 was rather like the new Jaguar XK-8 coupe at the Motor Show. You couldn't get near it. Like the new Jaguar the IC-756 is bursting with innovative features and (as long as has been Jaguar tradition), offered at a very competitive price.

- Integrated 4.9" Data Display
- Band Scope
- Full DSP at 15kHz
- Visible TX Message on memory keyer
- Dual Watch as standard
- 160m - 6m ALL MODE
- DPW output + All Bands
- APR. Twin PBT, Auto Notch

SPECIAL PACKAGE OFFER:
IC-756 HF Transceiver...........£1995
FL-222 1.8kHz SSB...........£129
SP-21 Matching Speaker........£65
UT-102 Speech announcement...£28
FIVE YEAR WARRANTY
(including Accidental damage)...£126

SPECIAL PACKAGE PRICE: £2195
SAVE £348!!

Yaesu FT-990

SAVE OVER £600!!
The Yaesu FT-990 has been a world best seller since its introduction a few years ago. Thousands world wide are used daily by Radio Amateurs who want a simple to use, beautifully built HF Transceiver. No other is built using plug-in boards for example, allowing servicing to be quick and easy. The FT-990 was the first to offer Digital Filters allowing high and low cut to the received signal.

- 100 watts on all HF bands
- General Coverage RX
- High Speed Internal Auto ATU
- Available with or without internal PSU
- Digital h/to cut filter as standard
- Twin VFO's
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- Brilliant RF Speech Processor
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- IF Notch
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AC Version: RRP £2149 ML Price £1549
DC Version: RRP £2199 ML Price £1399

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HURRY
Only 5 pieces left at this price

Yaesu FT-8000 Dual Bander

THE LATEST DESIGN FROM THE YAESU STABLE. A SMALL COMPACT HIGH POWER DUAL BAND MOBILE.

RRP: £649 ML Price: £479.

Yaesu FT-8000 Dual Bander

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**NEW! Standard C-156**

The latest addition to the STANDARD CORP family, the C-156 will become the real "standard" in 2m handies. Typical Standard engineering with features that price for pound are unheard of in todays market. Take a look:

- **Coverage 100-200MHz RX**
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- **100 capable memory channels, incl. Alpha tag, Repeater/simplex, offset, Tone Squelch frequency (option), + more**
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**Yaesu FT-900AT**

The best mini HF base station available. Full feature including 100 watts all mode, General Coverage and much more.

**RRP £1299 ML PRICE: £1049**

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The magic in the new Yaesu HF transceiver is the inclusion of "EDSP" filters. The result is audio that harks back to the "S Line" days. Rounded, full and real depth but with a crispness that is easy on the ear.

Add to that the latest in technology with "EDSP" signal processing and the magic turns into reality.

**FT-1000MP RRP £2849 with Internal PSU. ML Price: only £2249**

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**Kenwood TS-50S HF Mini 100W mobile/base**

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Cruise The Caribbean

By Rosemary Whelan

Rosemary and Bob Whelan G3PJT cruised the Caribbean with Yaesu, and here Rosemary tells the tale through non-amateur radio eyes.

Setting-up the antennas ready for operation at Dominica.

When Bob and I talked casually in February 1995 I would like to go on a cruise for our annual holiday that year I was somewhat surprised. A cruise didn't really sound like the sort of holiday we would like at all. Bob then added that he thought the southern Caribbean would be rather nice in June. And thus the idea of going on the Yaesu DX Caribbean Cruise 2 was introduced.

The 1995 Yaesu cruise started in Aruba (P4) and visited Dominica (Pt), Barbados (t8P), Martinique (FM) and Curacao (PJ2). The cruise was advertised as a 'holiday with a radio theme' and included all of the usual cruise features, entertainment, scuba diving, shore visits, shopping, etc. for more 'normal' humans too!

The experience of the operators ranged from the very experienced 'old hands' to the recently licenced like Margaret KA7RYG, who had her first ever QSO from Aruba.

There was an amateur radio station on board which was available at all times when the ship was at sea, including through the night! For those who felt they had to... and believe me some had to!

On the Sunday we boarded the ship at Oranjestad, the capital of Aruba. The evening welcome party was hosted by Chip K7JA.

On Course

Monday dawned as a hot, but rather dull day, which found us on course for Dominica, complete with several flying fish and sea birds.

Roy AC6CQ showed Bob how to use a hand-held Geo-stationary Positioning System (GPS). When Ray put the coordinates and times of Aruba and Dominica the GPS predicted that we would arrive in Dominica early on the Tuesday morning.

During the day Roger and Bob gave lectures on IOTA. Rusty W6JLT presented a talk on operating practices and the management of 'pile-ups'. Some of the places we were to visit could cause a pile-up to form on the bands. This can be a bit unnerving to the inexperienced operator.

I went to the wine tasting lecture, wines and reds, from Chile to the Philippines, what to see and what to buy and where to shop. A lot more interesting than radio in my opinion!

On the last evening we had a lecture, whites and reds, From Chile to the Phillipines, what to see and what to buy and where to shop. A lot more interesting than radio in my opinion!

Some of the party again operated for most of the night on 7MHz and experienced great propagation over-wide.

Dominica is a verdant mountainous island very dependent on the banana trade. The operating location was at a beach club on a long beach of dark sand.

It was hot and humid and it even rained for a very short period. The sea was very warm, about 28°C. The stations were set-up right on the beach, field day style.

Propagation conditions were poor with 14 and 18MHz closing towards late morning, but between about 2 and 3 o'clock the bands improved. Bob started mainly on 14MHz and after working a string of W stations Ray G3RGD, called in.

I soon realised that propagation must be poor when I saw some of the party, including Roger G3KMA, taking a swim in the sea. A group of us took a bus down to Roseau. This involved a drive down the western side of the island with spectacular scenery.

At the end of each afternoon during the cruise, we held a lecture. On Tuesday, Gordon WB6NDA, gave a talk on trans-pacific propagation.

Gordon illustrated this with propagation recordings, even for very
QSO of W8ADMT who whistled the contact because he had forgotten his key. Gordon, the owner of Radio School, has probably helped more people become Radio amateurs than anyone else on earth. With 100,000 copies of his instruction tapes being sold!

**Cruising to Barbados**

On Wednesday, we arrived in Georgetown, Barbados. The cruising ‘feeling’ was getting to us and it was becoming harder to get up in the morning.

Bob had discovered that the early breakfast bar was just above our cabin. So, I persuaded him to zip up and get me a cup of fresh coffee before I got up.

Carlyle Bay was the site for that day’s operation. It’s a beautiful beach and the stations were quickly set up in a diving and beach resort club.

Judging by how quickly the radio amateurs went down for a swim or a trip on a glass bottomed boat trip propagation must be even worse than it was before. Bob tells me he only worked three stations all day.

Lunch was the highlight of the day. This was due to the appearance of 10 local 8P operators and someone comments that this was probably the biggest group of 8P calls in one place ever.

The evening lecture was on programming the Yaesu FT-1 HT handheld. We learned it’s possible using the serial port that Yaesu are planning to make the radio for everyone. The radio can then be controlled with a joystick or mouse. (This is also possible on the FT-11/125 series and the FT-100-530 series).

We also heard that software packages such as the DX Designer & Virtual Microphone are appearing. The possibility of integrating the microphone that becomes a plug in card in your PC was also debated.

Our Thursday soap was the return of the Loose Ends to Barbados, on the south side of Martinique. It was really first class with a pool and a private bay and beach.

The amateur radio stations were set up under some sunshades in the garden of the hotel, under some very large trees. The antennas were perched on the edge of a low cliff with a south easterly take-off.

Conditions seemed to be a bit better. Roger was fortunate to have been issued a special call T06OTA, which caused quite a stir on the bands.

Bob managed to operate a few short periods.

One of the problems with a group is that the operating periods are short. Therefore Bob felt that with conditions so poor then you should share it with the others, especially the less experienced.

**Slide Show**

On returning to the ship we were treated to a slide show on the YKOA CQWW CW operation from Damascus. The show was in two parts, the first on the amateur radio side and the second on Syria and Damascus. This was one of the most interesting presentations I had seen for a long time.

Rusty observed that Syria was nothing like he had expected. He felt like apologising for his pre-conceived ‘western’ views.

The contest station was set up in the Telecommunication HQ. The Syrians plan to make the room available for other contest groups and to encourage amateur visitors.

Much of the credit for the success of the effort must go to Omar YK1AU. It’s hoped that as a result of the DXpedition there will be more YK activity.

The second part of the presentation was a more general view of Syria. We could see that Damascus is a city of wide open boulevards, clean and reasonable modern. And the ancient civilisations, the ruins, all largely unknown to western visitors, were spectacular.

Syria clearly has a fantastic potential for tourism as the Middle East settles down. Western dress is normal and everyone met up in the hotel bar for the planning sessions.

After dinner we went back to the Shack and found that the 3.5MHz hand was open to Europe. Herman got into the DX group at the top end of 3.5MHz and passed the microphone over to Roger and Bob.

Chip K7JA adjusting the Moonbounce antennas during the Barbados radio operations.

Chip K7JA, Roger G3KMA (on mic) and Millen NX3D handling a ‘pile-up’.

Practical Wireless, February 1997
A number of UK stations were worked with reasonable reports both ways, though tropical static was heavy. We were called and worked by a number of South Americans as far south as CE3 and LL1. (Good DX by any standard).

Unfortunately we were chased off the channel. Apologies to any GS who would have liked to work us. We didn’t manage to get on 3.5MHz again.

**Radio Olympics**

The Friday was an ‘at sea day’ as we retraced our track back towards the Netherlands Antilles. It was also the morning of the ‘Radio Olympics’, events to test the competitive skills.

Our first ‘game’ was the Sea-W pile-up (audio Morsel). Everyone was issued with a party tooter and drew a callsign out of the hat.

The game was to see how many calls you could ‘work’ in 10 minutes. To make things a bit more interesting a large number of loud horns were also issued to the non-amateurs in the group. These were QRM.

The final result was a tie between Jim K1ZX, and Rich K8RLW, however Jim withdrew when it was discovered that he had sent his call incorrectly to everyone. Bob came second in this game, holding up the European end.

The next game was antenna building. Teams of two built an antenna from wire and insulators to resonate on 28460, (where else?). Roger and Bob got something wrong because theirs came out at 24860!

Our final game was the ASCII, sending c.w. from the ‘throne’. Points were awarded for accuracy and style.

The style judges were Gill, Suzy NGCLE, and the ships sound and vision engineer. And as Glenn WR6D, had bribed the judges before he started to send then the outcome was never in doubt! This ended a great morning and one which had caused great amusement.

Highlight of the afternoon was a visit to the ship’s bridge where we were shown round by the navigating officer. The Magellan GPS is used these days but I was quietly pleased to hear him admit that he checked it every hour using the old methods and plotted the course on a chart, ‘just to be sure’.

The ship had started life as the Shaw Savill Line’s Southern Cross, and was built in Belfast in the 1950s. The quality of the workmanship was very evident on the bridge and all of the original equipment was in perfect working order and was tested every cruise as emergency back up. This was just as well as we were crossing one of the deepest parts of the Caribbean at 5040m deep!

Later in the afternoon Bob went to hear Chip talk about DXing with a ‘quiet sun’. However, he stopped by the Shack and found one of the operating positions was vacant.

Bob fired up on 18MHz c.w. and found that he had hit a good European opening. G3LPL and G3NOF (one of 18MHz keen Dee’s) were really quite outstanding signals.

We arrived early in Curacao on the Saturday. Operations were from the Holiday Inn with a superb pool and beach.

We set-up the equipment, again right on the sea edge with with the 18MHz antenna off shore so to speak. Conditions sounded rather better on 14 and 18MHz with quite a few US stations audible, many of whom were preparing for US Field Day.

Propagation was a searchlight pattern, with very strong signals over limited area, continuously moving around.

Many of the US took advantage of the Hotel bus to visit the shopping in the centre of Willemstad. It made a change!

The 50MHz band was still dead and in order to create some interest Gordon offered $100 to the first station to work him. Unfortunately no-one heard him or if they did we didn’t hear them. So the $100 was safe as Curacao represented the end of the radio operations.

**Farewells And Impressions**

The farewell party was held in one of the cabins on board and was attended by the captain, whose father is a radio amateur and the ship’s sound and vision engineer who was a VE3. All had put up with some strange requests and gone out of their way to make our cruise one to remember.

A theme holiday of this type can be very enjoyable. There was plenty of opportunity to participate in all the many activities of the cruise.

You didn’t have to stick with the radio programme. In fact many who had been on the first cruise in 1993 ‘mixed and matched’ according to location, conditions and the attractions on offer.

Propagation conditions were, in general poor. But on several nights conditions from the ship were very good. The performance of the 7m whip was quite exceptional, and just goes to show how low loss marine systems can be.

The FT-1000 and FT-900 worked very well. As did the verticals on shore. The 18MHz band was the best. However, the 50MHz results were mixed. 50MHz was the big disappointment, having a total blank.

**Thanks To Yaesu**

Acknowledgement and thanks must go to Yaesu for the impressive organisation of such a large group and especially for the licences. Many thanks also to the Yaesu team, Chip, Mike, Janet and Susan and Brian and Cheryl from Landry and Kling, to the captain and crew of the SS Oceandream, the telecommunications minister in Dominica, who interrupted a cabinet meeting to authorise the 17 operation personally, to the authorities in Barbados, Martinique and Curacao for smoothing our path.

Well done Yaesu. It’s nice to see one of the companies putting so much back into amateur radio, see you on the next one!

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Practical Wireless, February 1997
**Jonny Boy Is Here!!**

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Jon, 27, started his working career as an engineer at a Racal Vodac Service Centre and then worked as a service engineer in office equipment before moving into radiocommunications as a manager with Bodley Knose Ltd. After a spell with Codercom Radiocommunications in Kent he flew the nest and joined us in November.

Jon’s specialities are PMR and commercial radio products and systems although he’s fast coming up to speed with the amateur radio products.

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Stand to attention! This month it’s Ben Nock G4BXD’s ‘duty’ to man the PW vintage ‘wireless shop’ where as usual he takes a keen interest in older amateur radio and military equipment.

Here we are again and a very happy new year to you all. I hope you got all that you asked Santa for, and that you keep those new year promises. I’m aiming to keep mine!

Further to my mention of the Arnhem Airborne museum in my August 1996 column, I visited the commemorations there in September. And along with meeting a number of veterans who operated wireless sets mainly 68 and 22 sets in the battle, there was a fine collection of military vintage vehicles. The vehicles, some Dutch and some English were brought together for the event.

The sort of event held in Arnhem, and similar shows here in the UK, provide an opportunity to see radio sets mounted in the likes of the famous Willys jeeps, as in Fig. 1. The owner of the vehicle usually has a quite good installation and they give a fine example of how these sets were used.

Unusual KW

Now I'm going to look at an unusual example of an old friend from the KW range of sets. The range included for example the Vanguard, the Vicroy, the Atlanta, the Vespa and perhaps the most famous, the KW2000 which all served the radio amateur for many years.

One unusual version of the KW2000 - called the KW2000CA - came to light recently. And I can only assume, by its particular arrangement, Fig. 2, that it was designed for communication use in Embassies, and Consulates, point-to-point communication, etc.

Incidentally...as I do not have a copy myself I would be very interested in seeing a circuit diagram if anyone has one.

Looking internally similar to the Amateur Radio version, the KW2000CA is different in that it’s fixed frequency 4 channel crystal controlled model. The crystals for the frequency selection and the sideband generation are held in temperature controlled ovens.

The required single sideband suppressed carrier is generated at 455kHz and is then mixed with a couple of crystals to give u.s.b. or l.s.b. at 2MHz. Next it’s mixed with a further crystal to give an output on the wanted frequency.

Four crystal positions are available, each position on the wavechange allowing tuning of a different segment of the spectrum. When I acquired this set it was crystallised and was tuned up for use around 2.4, 3.4, 5.8 and 7.4 MHz.

Each frequency position selects a separate set of tuned coils in the r.f. and driver stages. The separate p.a. (for each channel) tuning capacitors can be seen in the photograph, Fig. 3.

The nice thing on the KW2000CA is that the p.s.u. plug at the rear is the same as that on the 2000 and Vespa. And having a spare Vespa p.s.u. I tried the set out...with good results.

The crystal tuning does limit the transceiver’s appeal on the amateur bands but fitting an external v.f.o. would not be too great a problem. Another thought I had was to use it on packet. Crystal the set up on an h.f. BBS station.
and away you could go. Still, if one comes along at the right price, it might be worth playing with regardless of future use.

Little Black Boxes
It's on to little black boxes now. But I'm not talking about the usual, non-descript Japanese plastic sets this time but information on small (almost clandestine) types of transceivers.

Firstly, I've had a request from Martin Wills G3ZZS, regarding an elderly item of equipment from a now silent maker. The transmitter, Fig. 4, which looks as if it should have transmitter measures from what I can make out in the valves, the set is cm. only. It numbers are visible. No maker's markings or model name is visible, so if anyone has one of these...I'll be interested (I'll say no more!).

Interesting Museum
I've now got details of another interesting military museum for you to visit. For those of you not interested in enemy Second World sets, Chevet Supplies Ltd., of Blackpool, are doing a two volume set that details some of the German, Italian and Japanese sets of the period. For information, contact them on (01253) 791986, or FAX on (01253) 302979.

And for those interested in a British line of communication receivers, and in particular valved receivers, of a bygone era, the Edystone Users Group (EUG) offers a monthly magazine and a plethora of well informed members whose advice can always be sought. The contact for the EUG is Graeme Wormald G3GLL, and he can be reached on (01299) 403372.

And Finally
And finally...going back to my previous comment on where to buy old gear, the rally scene does seem to be getting quite poor as far as this goes. There may be several reasons but one, the relatively high cost of tables at some events, may be putting some off taking along any items to sell, the relatively high cost of tables at some events, may be putting some off taking along any items to sell. For example, there was a rally in the south west midlands late last year, at

Cheers from Ben, see you in May.

Practical Wireless, February 1997
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**PLEASE MENTION TRADERS’ TABLE WHEN ENQUIRING ABOUT ANY ITEMS ON THESE PAGES!**
Although he lives in ‘Mount Nod' - a delightfully-named area of Coventry, Barry Sowter... complete with appropriate callsign G3NAP certainly isn't asleep! He's come up with a simple and effective 144MHz antenna ideal for c.w. and s.s.b. use.

It became necessary for me to erect a temporary antenna for s.s.b. or c.w. operation on the 144MHz band. So, for just £10, a horizontally polarised bi-directional antenna giving a little more than 3dB gain was constructed.

You may think that 3dB gain is not very much. But if you were using a half-wave dipole and wanted to increase your signal by that much, you would have to double your power. That could cost you a lot more than £10, especially if a new power supply was required!

Consider the following: This antenna has near omni-directional coverage, in other words, no rotator is required. It's simple to build. It's easy to erect. It's unobtrusive (no complaints from the neighbours). Little or no maintenance is required. What more can you ask of a simple antenna?

Three Half-Waves

In essence, the antenna is a centre fed dipole, three half-waves long, constructed from two aluminium elements and a commercial dipole centre, as shown in Figs. 1 and 2. When cutting the elements to length, care must be taken to measure from the dipole centre.

The dimensions given are accurate enough for the antenna to work on. But if precision is required, and you decide to cut the elements oversize and trim, you must remember that the antenna will resonate on two frequencies.

Being three half-wavelenghts on the 145MHz band, the antenna is also a half-wave dipole on one third of that frequency. So if it's cut for 145.000MHz, the antenna will also resonate at 48.333MHz. A dip meter will show only the 48MHz resonance with any clarity, so the frequency you measure must be multiplied by three for the two metre band.

Barry Sowter G3NAP's 'temporary' replacement antenna, shown at his 'Mount Nod' QTH in Coventry, proved so useful it became permanent! It also has the advantage of looking very much like a basic Band II broadcast receiving antenna.

In practice however, tuning on the antenna is quite flat across the whole band and it will work well enough using the quoted dimensions whatever frequency you use.

Fig. 1: Diagram illustrating the dimensions for the simple 144MHz antenna.

Setting-Up

Having positioned the antenna on a mast, the only setting-up procedure is to check for s.w.r. and to trim the coaxial cable. A s.w.r. of 1:1 can be expected at the centre frequency with very little fall off right to the band edges.

My original reason for putting up the dipole was that an eight-over-eight Yagi array, which had been in position for several years, fell down and was deemed to be scrap. Obviously, I then needed a temporary antenna until other arrangements could be made.

But the 'temporary antenna' proved tenacious! I found that the performance of the dipole was so interesting and surprising that it's been in use ever since. Fed with just 10W, it has worked into fourteen countries so far using both tropospheric and Sporadic-E layer propagation.

Continued on page 57
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**Best DX**

The best DX I’ve managed with the antenna has been into Naples in southern Italy and into Yugoslavia by Sporadic-E and Norway in a tropospheric ‘lift’. In flat conditions, it yields nearly as much as the big antenna did, although at reduced signal levels.

My QTH by the way, is not a really good one as there’s rising ground in almost every direction. So living in ‘Mount Nod’ isn’t really a big advantage.

It would be possible to discuss the antenna at great length, as is always the case with antennas. And no doubt much would be said about matching and balance in the process.

In this case, the cable I’ve used is the same 50Ω coaxial cable that fed the old antenna, even though the impedance should be nearer 75Ω.

Also no balun or any other balancing system has been used. Despite that, the cable and antenna system as it is gives a good match at the transmitter.

So, what started out to be a ‘quick fix’ to cover for a fallen beam antenna has proved to be a very interesting and useful project. And if you need a quick fix or a low cost solution to an antenna problem, or need a low profile antenna, why not give it a try?

**Fig. 2: Close up view of dipole centre (see text reference impedance).**

---

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Rob Mannion G3XFD

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F. A. Wilson
Again this book - which I've had for some years on my bookshelf - hides its talents behind a title. Yes the mathematics are explained and yet the formulae are also shown and discussed. But the author doesn't leave it there...he shows the reader why something happens and how the mathematics are involved. A better title would be 'A Practical Approach To Radio & Electronics Maths' for that's just what it is. Highly recommended. £3.95

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Are you 'fuzzy about' filters? Well if you are and would like to learn more about designs, applications and practical ideas...this little book is for you. Some of the projects included are more of interest to the electronic music enthusiast, but despite this I think it provides an excellent 'first steps' learning approach for anyone wanting to design and make their own filters. Recommended. £4.95
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Practical Wireless, February 1997
First this month I'm going to start with Finger printing and no, I've not started on the wrong subject! This application of computing has a lot of potential both in commercial and amateur radio.

The system of finger printing, as it's been developed so far, can operate on any signal that puts-up a strong carrier during its transmission, i.e., a.m. and f.m. signals. From an amateur radio viewpoint the system's main application is for tracking and eliminating interference from illegal transmitters.

In the US the system has been used by repeater groups to bar certain transmitters from access to repeaters. This is a very practical and comparative simply way to overcome what is normally a very thorny problem. So, how does the system work?

The application I've looked at is the one produced by MoTron in the US and is based around the use of a dedicated board that fits into a standard IBM PC expansion slot. The plug-in card links to an i.m. receiver's discriminator and the voltage at this point is sampled, digitised and stored.

The leading edge of the transmission is then captured, stored and displayed on the PC. The system can also store many other parameters such as peak deviation, DTMF data and spectrum occupancy information. All this information is then put together to build the individual fingerprint for the transmitter.

Once you have all the information it is then comparatively easy to build a link between a repeater and the PC to check whether or not a particular station is to be allowed access to the repeater. You could also adapt the system and set it up to look out for particular stations and raise some form of alarm.

This system could be a handy, but expensive way of looking out for friends on the calling channel. Nevertheless the system looks to be very powerful and may well appeal to repeater groups in the larger cities.

If you are interested and want more information the only supplier I'm aware of is MoTron Electronics in the US they can be contacted by phone on (541) 687 2118 or FAX: (541) 687 2492. If you have internet access they have an interesting web site at http://motron.com

AMTOR Tutorial

Continuing in my line of tutorials on digital communication systems, this month I'm going to take a look at AMTOR. Although many past users of this system have now moved on to PACTOR, it's appropriate to take a close look at this system as many of the fundamentals are carried forward into PACTOR.

Although known as AMTOR amongst the amateur radio fraternity a very similar system known as SITOR has been in regular use in maritime radio systems since the 1970's. As with many digital systems the names SITOR and AMTOR are acronyms for Simplex Teleprinter Over Radio and AMateur Teleprinter Over Radio respectively.

Let's start with some background to the development of AMTOR and why, indeed, it was needed at all. Although good old RTTY was well established and simple to operate, it suffered from very poor reliability due to its susceptibility to interference.

It is RTTY's simplicity that let it down because there's no way that the receiving station can tell whether or not the received data is correct. As a result, bursts of interference will be treated as valid data and included in the resultant message.

What also frequently happens is the interference is seen as a shift character and the message suddenly turns to all numbers instead of letters. Anyone who's used RTTY in anger will be familiar with this problem.

As you can imagine, trying to get a message through under poor conditions could be extremely frustrating and limited RTTY's commercial usefulness to very reliable radio links. What was desperately needed was some form of automatic error correction that

would give some immunity to interference and give some assurance that a relatively error-free message would get through.

This was the key to the development of the commercial SITOR system which was subsequently adapted by Peter Martinez G3PLX to produce the AMTOR system. I remember buying a and using one of the very early AMT-1 boards. Although all the timings and interactions of this mode can get quite complicated, the basic principles are really very simple.

Let's start with the most basic of this system: automatic repeat request.

Let's start with what's known as Mode A or ARC (Automatic Repeat Request). The AMTOR equipment or software takes the message to be sent and breaks it up into groups of just three letters at a time. These are then sent to the transmitter and, when complete, the system switches back to receive to await a confirmation of the receipt signal from the distant station. If all is received okay, the transmitter then sends the next three characters and so on until the complete message has been sent.

It's the repetitive bursts of data that give AMTOR its characteristic chirrup-chirrup sound. If you've followed me so far you're probably wondering how on earth does the receiving station know if the message has been received without error?

The secret lies in the use of a special telegraph alphabet. Whereas RTTY uses the 5 bit international Telegraph Alphabet number 2 (ITA2), AMTOR uses a completely new 7-bit alphabet that conforms to CCITT Rec. 476. The special feature of this alphabet being that each character uses a combination of 3 spaces and 4 marks.

The use of a 3:4 ratio is specifically to provide a simple, yet effective, form of error correction. The process is very simple and goes like this.

At the receiving end of the radio link each character is checked to see if it has this 3:4 ratio, if it does it's accepted, if not it's discarded and marked as an error. The distant station will then send a repeat request to indicate that the sending station needs to retransmit the last block. It's really that simple, but in practice it's proved to be remarkably effective.

I've used AMTOR for many years, my first introduction being...
back in the 1960's when I built an AMT-1 unit to connect to my Ohio Superboard (6502 based) computer! I had many very successful contacts with this set-up and used to delight in turning the transmit power as low as possible to keep the link alive. I was frequently amazed by the overall reliability of the system and was able to reliably work into Argentina with just a few watts.

Although all this switching from transmit to receive sounds very longwinded in practical systems it all happens very quickly. In fact the original systems were designed to link to the international Telex network that operated at 512 baud. This was achieved by increasing the data rate to 100 baud to allow time for the distant end to acknowledge receipt.

**Forward Error Correction**

The second AMTOR mode is known as Mode B of FEC (Forward Error Correction) and was designed specifically for broadcasting messages to lots of stations. It was thought that the international Telex network that FEC was used primarily to put out CQ calls. The FEC mode uses the same alphabet as ARQ but clearly can't rely primarily to put out CQ calls. Instead on receiving an acknowledgement group twice, the second transmission being delayed by three characters as shown in Fig. 1.

![Fig. 1](image)

At the receiving station the AMTOR equipment again checks for the 3:4 ratio and tries the second group if it hits an error. Although this is not as good as mode A, it's still significantly better than RTTY.

Another important point about the make-up of AMTOR signals is the use of synchronous data, as opposed to the asynchronous system used for RTTY. So what's the difference?

In a synchronous system each transmitted character is wrapped-up with a start bit at the front and a stop bit at the end. This makes it very easy to join a transmission part way through but is very wasteful as 2.5 bits serve no useful purpose.

With a synchronous system, such as AMTOR, each character is sent one after the other with no start and stop bits. This does make the mode slightly more difficult to monitor, but is very much more efficient.

Another important characteristic of synchronous signals is that data needs to be sent all the time. As there are obviously gaps in everybody's typing the AMTOR system inserts a couple of idle characters known as alpha and beta to fill in the gaps.

I hope this brief explanation of AMTOR has helped you to see it's uses.

**Audio Spectrum Analyser**

Just as this month's 'Bits & Bytes' was going to press I came across a brand new program that will interest all PC users that have a SoundBlaster system. The program is called SbFFT by Kevin McWilliams K5QO and is a display and filtering program for SoundBlaster 16 and compatible systems.

The program looks to be very impressive and features bandwidths of 2, 4, 8 or 16kHz and can display spectral resolutions of 1 to 16Hz. You can also define a wide range of filters and set the parameters graphically using the mouse. As if all this wasn't enough, it's being distributed as copyrighted freeware!

I'll cover the program in more detail in a later column but, if you want to locate it on the Internet, the file name is sbfft1.zip.

**Special Offers**

I'm afraid I've had to temporarily withdraw my offer to supply Fact Packs and frequency lists. Quite simply, the demand has outstripped my ability to supply and I'm incurring heavy delays with the inevitable complaints. So, my apologies to all who have waited patiently, but enough is enough.

Once I've caught-up with the backlog, I hope to be able to introduce an improved service for some of the items. Looking on the bright side, I do still have the special offer with the Public Domain and Shareware Forum (PDSL). The PDSL has put together a library set of all five disks for just £12, all inclusive. Using PDSL also makes ordering simpler provided they accept all the usual credit cards so you can order by phone and don't even have to write a letter.

So in future, please direct all requests for this disk to PDSL Winscombe House, Breaston Road, Crowborough, Sussex TN6 1UL Tel: (01892) 633298 and request library volumes.

HIDOS (30 disks). The disk contents are as follows: Disk A - JVFAX 7.0, HAMCOMM 3.1 and WXFXAX 3.2; Disk B - DSP Starter plus Texas device selection software; Disk C - NuMorse 1.2; Disk D - UltraPak 4.0; Disk E - Mscanc 1.3 and 2.0.

That's all for this month. Don't forget if there's anything you'd like me to mention in next month's column send your letters, ideas and suggestions to me Mike Richards G4WNC, 'Bits & Bytes', PO Box 1463, Ringwood, Hants, BH24 3DQ. Email: mike.richards@dial.pipex.com or visit my Web site: http://dialspace.dial.pipex.com/mike.richards/

**Bits and Babanis**

As we work on this magazine it's not yet Christmas, and by the time you read this the shops will be selling Easter eggs. But if you may have had a computer from Santa (although I bet he made you pay for it) and if you're new to them, just where do you start?

Almost every now computer is likely to be an IBM PC or 'clone' I've picked out six books that I think will complement your new 'toy'. You may also be toying with the idea of going on the 'web' or Internet, but what is it? What can it do? And to help I've found a book that goes part way towards answering those questions as well.

**MS Works for Windows 95**

`BP402, P. R. M. Oliver and N. Kantaris. Microsoft Works has always been the forgotten small'brother' of MS Office. But it actually has more components, it's a word processor, a spreadsheet calculator and graphics presentation tool. Microsoft Word, Excel and PowerPoint may be the most widely used Windows programs, but that doesn't make them easy to use. This book goes some way to redressing the balance.

**Recommended starter book. £5.95.**

**Access 95 one step at a time**

`BP406, N. Kantaris and P. R. M. Oliver. Add Access 95 database program to the MS Office 95 suite of programs, and you've created MS Office Professional. This book, of 115 pages, takes you through creating a database, updating and querying data in a database form with the Windows 95 Version of Microsoft Access.

**Good database starter book. £5.99.**

**How to expand, modernise and repair PCs and compatibles**

`BP177, R. A. Pentfold. No new computer from Santa - just the old one that's becoming somewhat 'tired'. This book both explains the hardware you have and how to improve its capabilities. With the rush to upgrade, there's many older but perfectly working 'bits' available. Capitalise on these cheap items to upgrade your own PC, but cheaply (100 pages £9.95).

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**The Internet and World Wide Web**

`BP405, J. Shelley. One hundred and thirty pages of easy explanations of the many new terms to be encountered when you start looking at the Internet and World Wide Web (WWW). Starting from the simple idea of a computer network, this book leads you through what to expect and what software you'll need to get going on the WWW.

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**Windows 95 explained**

`BP400, P. R. M. Oliver and N. Kantaris. The Windows 95 operating system is likely to be found on your new system, but somehow Microsoft's documentation is just a bit difficult to use. What you need is something that will get you going on getting going. This book should make it easier in its 170 pages of simple descriptions of how Windows 95 deals with things.

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Practical Wireless, February 1997
David Butler G4ASR has details of significant changes to both the 50 and 144MHz band plans. There's also reports about band conditions and news from other European countries.

First up I’ll take a look at what’s been happening recently on the v.h.f. bands. Nigel Booth, a s.w.l. from Norwich, has sent in a report about the "1K" in conditions on the 144MHz band during October.

Nigel describes his station as very modest, consisting of a Steepletone MBR7 receiver and an antenna made from wire wound helically onto a section of plastic pipe. Not surprisingly with this setup he can only hear local stations but on October 24 he heard PD0RM, PD0RY and DC2JVR.

Nigel asks whether this was tropospheric propagation or perhaps Sporadic-E (Sp-E). Well, Nigel the answer to that question is that it was most definitely tropo.

The distinguishing features of tropospheric propagation and Sporadic-E are completely different and I’ll take a brief look at some of them. Simply put, a lift in the tropospheric conditions is indicated by the ability to hear more, that you don’t normally hear.

Sporadic-E openings on the other hand can last for weeks at a time. Tropp activity * that you don’t normally hear.

David Butler G4ASR has details of significant changes to both the 50 and 144MHz band plans. There’s also reports about band conditions and news from other European countries.

Under normal circumstances the strength of semi-local stations (inter-UK for example) will also be increased. However, with Sp-E (at 144MHz) you will only hear DX stations located well in excess of 1000km, normally 1500-2000km.

Nigel heard stations DBOFAI (JN58), EA1VHF (IN27) and HB9RB (IN37) on the 144MHz band during the evening of October 30.

On November 1 Lee heard OK1AFQP and OltKVK/IP (both in J00I) and HSDB/P (J070). Unfortunately, the good tropo conditions declined with the approach of the IARU Region 1 144MHz contest on November 2-3.

There were still a few DX stations being worked from the UK but generally conditions were not ideal. Among the stations noted were H8BDSE (UN37), F6DRO (JN03) and F6HEYP (JN36). Propagation picked up again on November 16 with the station of GW7SMV (I081) hearing HS9DRE and some nearer continental stations all peaking 59.

Conditions on the 50MHz band during November were generally depressing. There was however one Sp-E opening on November 10, an unusual event so late in the season.

The 50MHz band was open between 1000-1400UTC to stations located in ES, I, DE, OH, DK, DM, SP, 35 and 9A. Some minor auroral openings were also noted on November 13-14 but very little DX activity was spotted. The event on November 13 did reach the 144MHz band allowing GM stations to work into DL and PA.

Last time I mentioned that trans-equatorial (t.e.p.) openings had been observed on the 50MHz band in October 28-29 and October 16. I’ve subsequently been informed that the TMN worked G1KTZ, G11MW, G3ZYY and G61ON in the opening on September 28. All stations being worked from the UK on September 28-29 and October 16 into GM stations to work into DL and PA.

Following on from those reports I have received news that CX8BE (Montevideo, Uruguay) made t.e.p. contacts on October 22 with WP4ARI (Puerto Rico) and 715NLE (Costa Rica). In Australia VK2BD reports that their Sp-E season has started again with contacts being made in early November with stations in ZL2 and ZL3. It’s good to see that there’s still some life left in the band even at the bottom of the solar cycle.

International Conference

At the Region 1 International Amateur Radio Union (IARU) conference held during October 1996 a number of important changes were made to some of v.h.f. band plans. (Region 1, by the way, covers Europe, Africa and a large part of Asia).

The use of the 50MHz band for repeater operation in the UK has been very slow to get off the ground possibly due to constraints made by the primary user of the band. To speed the process the RSGB proposed that, in the UK, the repeater output frequencies should be some 500kHz lower than the agreed IARU plan.

The conference accepted the change allowing repeater inputs to lie between 51.210-51.390MHz and outputs between 50.710-50.910MHz. A change to the 50MHz band plan, affecting all of IARU Region 1, was to...
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replace the national s.s.b. calling frequency on 50.200MHz with a centre of activity based on 50.150MHz. The aim of this move is to encourage repeaters to move away from the 50.110MHz international calling frequency.

As an aside it should be noted that the whole question of s.s.b. calling frequencies is problematical. In the USA, for example, the Six Meter International Radio Klub, SM/IRK, have just agreed to replace the 144MHz calling frequency on 144.250MHz with one on 144.300MHz. Almost 200kHz of this year and will now lie between 144.250MHz and 144.300MHz and 144.440MHz (c.w., s.s.b.) and 144.520-145.750MHz (c.w. and f.m.).

Unfortunately, the 144.440-144.490MHz allocation now clashes with the 10M frequency allocation on 10.040MHz. The two bands are now allocated on an exclusive basis. A list of standard c.t.c.s.s.

deviation must be altered and this is simply accomplished by adjusting a pre-set potentiometer somewhere inside the rig. (It must be understood that thousands of packet radio stations did this when first setting up their packet radio stations!).

The second item that needs changing is the receive I.f. bandwidth filter. This will take much more effort and in my opinion is unlikely to be carried out by the majority of stations. However, if you can put up with some adjacent channel interference, most current f.m. transceivers will remain usable without any receiver modification.

Tone Systems

Two other Conference decisions worth noting were associated with the allocation of tone coded access and a new channel numbering system. The use of a continuous tone coded squelch system (c.t.c.s.s.) as an alternative or an addition to the standard 1575Hz tone access for v.h.f. and u.h.f. repeaters will be encouraged. The aim of this is to reduce inadvertent interference by users to repeaters using common input frequencies.

A list of standard c.t.c.s.s. frequencies have been adopted so that compatibility between repeater systems in different countries can be maintained. The principle of c.t.c.s.s. is that in addition to the normal voice modulation a sub-audible tone is also continuously transmitted. A user, maybe located between two repeater service areas, will therefore only activate the particular unit which accepts the user's c.t.c.s.s. tone. The current system of channel numbering for n.b.f.m. and digipeater channels on the 50, 144 and 430MHz bands (e.g. 52, RB1) will be replaced by a new uniform designation system. The letter 'F' will be used in the 51MHz band, 'V' in the 145MHz band and 'U' in the 430MHz band. I'll give more details of this next time.

National Changes

A number of national societies have recently reported changes that have been made to their v.h.f. and u.h.f. bands. In October 1996 all Bulgarian IZ radio amateurs were granted access to the 50Mhz band. Bulgarian radio amateurs are allowed, on a secondary basis, to operate between 50.100-50.150MHz with an output power of 5W. The negotiations for this allocation were carried out by Rumen Getchev LZ1MS, who is both the Bulgarian Vice Prime-Minister and President of the national society (BFA). The Italian society (ARI) has also recently obtained changes to their 50 MHz permits. All licence classes, including no-code v.h.f. operators (IV) can now operate on the band.

Additionally the band, previously a 12.9kHz slot centred on 50.156MHz, has been changed to a full 1MHz between 50.0-51.0MHz. The output power has been raised from 10 to 300W and no restrictions have been made to antenna size or gain. Repeater, robot stations and packet radio (BBS) are not allowed however.

Previously there were very few operators in Romania (YO) with a permit for the 50MHz band but the good news is that all YO operators have now been granted permission to use the band. They will be allowed to operate between 50.0-52.0MHz, any mode but power restricted to 20W in p.e.p. In June 1997 the situation will be reviewed when it is expected that some restrictions will be removed. According to the Austrian society OVSW operators on the 50MHz band are now allowed to use up to 100W p.e.p. into a horizontally polarised, directional antenna.

Vertical and omni-directional antennas are not permitted in Austria. Some previously restricted areas around the capital Vienna have now been eased resulting in increased activity from this location.

Gert PDOHCV (LJ01) passes on the news that all Dutch licence holders (PD) now have a new frequency allocations within the 144 and 430MHz bands. They are allowed to run 25W output between 144.110-144.130MHz, 144.440-144.460MHz (c.w. and s.s.b.) and 144.592-145.750MHz (c.w. and f.m.).

Deadlines

That's it again for another month. Don't forget to start making your list of locator squares, counties and countries that you have worked on the v.h.f., u.h.f. or s.s.b. bands.

Entries for the 1997 table can be for any mode and although intended for direct point-to-point terrestrial QSO's you can include contacts made via satellite as long as they are entered as a separate listing. Please forward any corrected entries for the 1997 table to me by the date given below.

Nigel's specific case was he looking for the addresses of PoDrim and PoDriv who, being newly licensed Novice operators, would probably not appear in any recent listings. Are there any Dutch readers of this column who can help?

I should add that stage reminder to those that QSL reports should contain sufficient information to be of genuine value to the transmitting amateur concerned.

Don't forget the common courtesy of enclosing a self addressed envelope (s.a.e.) and some form of return postage such as an international reply coupon (IRC) or a one Dollar bill.

G. H. Smith
Well here we are, into a brand new year. And I send greetings for a happy and prosperous new year to all readers!

I'm hoping that 1997 will show an increase in sunspot activity. Some reports I've read have suggested that the new cycle started back in late summer, but others have stated that mid - 1997 will see the cycle beginning. Whatever the case may be, I'm sure that h.f. devotees will be anxiously awaiting an increase in propagation this year. And although as our reporters logs indicate, there's still DX to be found...it just means that you have to look a little harder for it sometimes!

Here's The News!

And here's the news! To start off I've culled from the pages of the RSGB's DX Newsheet information of 3.5MHz activity from:

John 3DAOCA is operational daily from G3OUC on 3.511MHz listening 1kHz up. John uses a 'stopen' antenna and 500W output.

Next, a report that FT5ZG has arrived on Amsterdam Island on the 20th of November, and will be active from there for an entire year. No band details were given, but if you hook up with him, the QSL goes to F5RQQ.

Don't forget, every Wednesday and Fridays on 1.1333MHz±, listening 2kHz up. John uses a 90W into a simple GSRV dipole, include OZ1KW (Denmark) and 9Y3LEA (Romania) both at around 2300UTC. While his c.w. (again at 80W) neted him EVM in Vitebsk at midnight, and U49FAQ (Asia) at 1804UTC.

The 7MHz Band

It's up to '40' now to read the 7MHz band report from Ted Trowell G2HKU. He says that "conditions have improved with the darker evenings" and the report certainly backs this up.

Ted's 70W c.w. reached out to VK8AV in Alice Springs, and OY2H (Faroe Islands) at around 1900UTC. While around 1800 he contacted 5N3/SP5XAR (Nigeria), EA9PB (Cataluña & Mellilla, N. Africa), and VO1HP (Newfoundland).

I now extend a warm welcome to new reporter Larry Stringer G4GZG of Essex. He works mainly c.w. using around 100W output and a centre fed 33m (68ft) dipole.

Larry's huge log lists contacts on 7MHz with JR8EBO (Japan) at 1905, BY4A (China) at 1935UTC. Then he logged E2BAA (Turkmenistan) at 2208, VK8AV (Australia) at 2008, 8M1U (Antarctica) at 1949, and 7Z500 (Saudi Arabia) at 1727UTC.

Now it's on to Charlie Blake MA9AL, who by now may have sorted out 'antenna business' with the local authority in Milton Keynes. Fingers crossed, Charlie! Still in the s.w.i. mode for the time being, Charlie's log includes s.s.b. reception of KG4QD (Guantanamo Bay). This station was in contact with YV5GGB in Venezuela at 0509UTC, (QSL via WA4YDG).

Also logged was HR2GVM (Honduras) working PA12ZH at 0613, VK2CP (Australia) in contact with DL1LB (Germany) at 0630UTC. Charlie also heard PY2RlK (Brazil) working ZL2BU in New Zealand at 0533, and T13VLM (Costa Rica) in contact with IK5ORP in Italy at 0510UTC.

The 14MHz Band

Space is very limited this month, so it's straight up to the 14MHz band. This is where it's "not been good" according to the regular report from Don Mclean G3NOF down in picturesque Somerset (Yeovil).

Don's very long 14MHz list includes his s.s.b. contacts with A61AN (United Arab Emirates) at 1123 and DJ6ECU (Bolivia) at 0634. He also worked SUY3Y (Egypt) at 1649 QSL via Box 545 Port Said, 4211. Then he reports a 30 minute chat with VK6ACY in Australia, at 0800, plus 8P9Z (Barbados) and 9K2NG (Kuwait) at around 2100UTC.

I received a six page log from new reporter Sean Gilbert G4UCJ in Milton Keynes this month! We extend a warm welcome to Sean, who works exclusively on the "key". His log includes contacts with around 50W output into a simple G5RV antenna.

Sean worked KP5ZL (Puerto Rico) at 2216, PY3XE (French Guiana) at 1951, and E80DX (Khirgistan) at 1228UTC. Also logged were J38DF (Grenada) at 1123, 9M2ZA (Malaysia) at 1716, 4K70DF (Azerbaijan) at 1022, VQBIE (Chagos Island) at 1544, and AA4NC/CY0 (Sable Island) at 1202UTC.

The 18MHz Band

Just enough space for a very brief look at the 18MHz band news. Carl GW0SVW lists s.s.b. contacts with 7X5JF (Algeria), CU3DJ (Azores Islands) and 9K2NG (Kuwait City), while Ted G2HKU on c.w. hooked up with 9L1KA (Sierra Leone), KH7AAD (Colombia), and K4EF (USA).

Finally for this month, Don G3NOF has listed amongst others, s.s.b. contacts with KL70TH (Aeropital Mobile) flying over New Zealand at 1433 and FG5HR (Guadeloupe) at 1429 (QSL to FSBUM). Then he worked HC9N (Galapagos Island) at 1749, and YV2J38DF (Antigua and Barbuda Islands) at 1436UTC.

Time To QRT

Well, that's all I have space for this month folks and it's time to QRT! Thanks again for your information, logs and comments. Alas, space is my only limitation, but do I can do to fit as much as I can in, so that you all get an equal 'share'? How about some photographs so we can 'put a face to the name' eh?

As usual, I appreciate your reports to the address below, by the 15th of the month. All the best DX for now, and cheers! Your reports to me: Leighton Smart GW0LBI, 33 Next Gwyn, Trellewis, Mid-Glamorgan CF46 6DB, Wales. Tel: (01443) 411459.

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Financially. Written quotations on request.

Practical Wireless, February 1997
Graham Hankins G8EMX has news of a permanent ATV station at Bletchley Park. An ATV expedition to Skegness, microwave pictures that cross water and of a balloon that went up over Belgium.

My 'Introduction to Amateur TV' feature in the December 1996 issue of PW has produced several enquiries. Please keep them coming and I'll answer: the common questions in April's 'Focal Point'.

Billled as 'Britain's Best Kept Secret', Bletchley Park Cryptology Museum is home to the re-built 'Colossus' - the world's first large electronic valve code-cracking computer. Yes, the original 'Colossus' preceded the American ENIAC machine by two years.

You can discover amateur TV inside Faulkner House, towards the far end of the Bletchley Park site. The Milton Keynes and District ARC has provided 1.3 and 10GHz facilities with monitors, camera and vision mixing available. Licenced visitors to the ATV station can access repeaters G83TV (24cm) and G83TG (3cm) and try out the Dual Tone Multi-Frequency (DTMF) repeater control unit.

My thanks to the museum staff for permission to the photo. Fig. 1. Bletchley Park is open on alternate weekends - for dates and events 'phone (01908) 640404.

Portable Expedition

Now to an expedition which operated portable ATV from a site near the east coast. The team, from Telford, had set-up on a hill about 12 miles west of Skegness.

Marty Vincent G3JKV had been working 10GHz s.s.b. phone to Ireland and Dave Hall G2EZT was aligning his 10 and 24GHz ATV dishes. Dave had worked 10GHz for many years, telling me proudly: “During 1993 I sent the first ATV pictures on 10GHz from Anglesey to Dublin”.

Completing the team were Jim Wakenell G9GUL, Tony Colton G0UYE and John Rawson G4ZJY, driving the 24cm (12/20MHz) ATV station, camcorder and 2m (144MHz) talkback rig. The local 1.3GHz ATV repeater G83TN (Fakenham) was being monitored and soon Len Tomlinson G8GNX appeared in vision with some 'shack shots', then colour pictures of his garden and antennas. A 28-element home-brew loop-yagi was carrying the ATV, driven from a Solent transmitter and p.a.

Then on came Adrian Howman G0PVE, displaying his home-built 10GHz antenna with plastic bucket radome for weather protection! Adrian cleared the repeater to be replaced by Robert Scarfe G4TUH in Norwich with more video from an Astex transmitter.

Everyone put out first-rate colour pictures and clear sound while we just sat back and watched TV!

Sea Ducting

Now for some news of more ‘sea ducting’ across to Holland. Peter Johnson G4LXC and Trevor Wooding G0DVUN set-up their ATV gear for a weekend of microwave trials from Joss Bay, near Margate. During the Saturday afternoon pictures and sound on 1.3 and 10GHz duplex were being exchanged between Kent and Holland. At the Dutch end were Richard PE1OUP, Frank PE1EWR and eventually (another) Peter PE1OCD. Picture quality varied when ships interrupted the path. Peter G4LXC comments: “We enjoyed over three hours of duplex ATV with PE1CDP, who was running 20W on 24cm and 800mW on 3cm. Good pictures were received from PE1PSJ, who was running only 300mW on 3cm”.

By mid-morning the next day, PE1DCD had been contacted again and more two-way duplex ATV was enjoyed on 10GHz with P1 - P5 pictures. At 1330UTC Hans PE1EWR sent 3cm pictures which were almost immediately up and running at P5.

Peter G4LXC was using two dishes so a duplex contact was possible with Hans PE1EWR/P and PA3FXY. Was this due to ‘ducting’ again? Peter observed: “My 3cm transmitter was running 22mW and seemed to disappear first, when ships passed. But I noted that higher power signals of 300 to 800mW did not completely cut off. Maybe the extra power produces a scattering effect around an intervening hull”? An average ship is about 10 - 20 metres high. The current theory is that a vessel blocks the low power signals and would indicate that the duct extends no more than a few metres above the surface.

To establish single or multiple ducts, Peter plans a return to Joss Bay, saying: “On the next trip I will position two stations. One will be at 10 metres, the other at 20 metres to see if there are any major differences - there might even be more than one duct!”

Aeronautical ATV

Now to portable or is it aeronautical mobile ATV, from Jean-Marie ONGAF. Jean Marie’s letter starts.

‘Hello Graham, thank you very much for your interest about our ATV experiment. Practical Wireless is a well-known magazine here in Belgium.

“For its 25th anniversary, the Radio-Club du Borigne, calling ON6RM, has successfully achieved an ATV transmission from an hot-air balloon despite not very good atmospheric conditions. The balloon lifted off from ‘Site du Grand-Hornu’, Belgium, carrying 1W of 1255MHz, f.m. PAL ATV transmission with 5.5MHz f.m. audio, feeding an Aldor Slot antenna. In the basket, operating, was Claude DNXCN.

“The flight had authorisation for more than one duct!”

Jean Marie.

New Zealand News

Michael Shefelton ZL1ABS packeted me a message from New Zealand in which he says: “Hi Graham, a new MK7 Teletext (16 page) EPROM has been fitted to the ZL1UX ATV repeater. These new pages list the Waikato area v.h.f. and u.h.f. repeaters and beacons, other page lists the three other ATV repeaters in New Zealand - ZL1BO, ZL2WA and ZL1AC.

Michael concludes: “Wayne Griffin ZL1UJK says that his MK3 Teletext board supports two EPROMS, has a 9V regulator onboard and is intended to be used with an external RGB coder”.

There’s good news from Mike Dixon G0PFR RSGB Microwave Manager. Following the 1996 IARU conference, the 430-440MHz UK band will be retained for the present. Mike points out that it is the CEPT/ERO who decide to retain the full 1016MHz of the 70cm band, not the IARU as stated in October’s ‘Focal Point’.

All this has squeezed out the ‘A to Z’ for this month. So, until next time please keep those packet messages coming to G075SOL.a29.GBR.EU or by letter to me, Graham Hankins G8EMX, 111 Cottesbrook Road, Auckcks Green, Birmingham B27 6LE.
Welcome to The Practical Wireless Amateur Radio Buyers Guide. This has been compiled from information supplied by the various manufacturer's specification sheets. It is only intended as a guide as to what you can expect to find on the dealer's shelves and to help you decide which radio will suit your needs.

All the data given is correct, to the best of our knowledge, at the time of going to press. You are strongly advised to consult your local dealer before finally deciding on which radio to buy, as he will be able to demonstrate working models to you. Further information and full specification sheets are available from all approved dealers or direct from the manufacturers.

We hope you find the 'Buyers Guide' useful and would like to point out that many more radios will be added to the list in the near future.

The PW Editorial team would like to thank Icom UK Ltd., Kenwood Electronics UK Ltd., Waters & Stanton Electronics and Kenux UK Ltd. for their help in supplying the information needed to compile this new regular feature.

We hope you find the 'Buyers Guide' useful and would like to point out that many more radios will be added to the list in the near future.

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<td>DR-150</td>
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Keys

Coverage:
- Frequencies listed are not 'true' bands, they are just an indication of the amateur bands that the set covers.
- L: 100kHz - 200kHz
- H: 30 - 50kHz
- T: 50 - 52MHz or 70 - 70.5MHz
- V: 144 - 145.995MHz
- U: 430 - 439.995MHz
- S: 1200 - 1300MHz

Modes:
- AM
- FM
- S: Sideband
- D: Data

Power Source:
- Battery (in-built)
- External 12V (13.8V) supply
- Mains (in-built)

Special Facilities:
- A: Antenna Tuning Unit
- B: Automatic Band Change
- CTCSS

The PW Editorial team would like to thank Icom UK Ltd., Kenwood Electronics UK Ltd., Waters & Stanton Electronics and Kenux UK Ltd. for their help in supplying the information needed to compile this new regular feature.

We hope you find the 'Buyers Guide' useful and would like to point out that many more radios will be added to the list in the near future.
Don’t forget the PW Post Sales Department can supply back issues from 1992 - 1996 or photocopies of articles prior to 1992.

Back issues are available for £2.30 including P&P or photocopies for £1.50 including P&P.

To order call the Credit Card Hotline on (01202) 659930 or use the Order Form on page 78 of this issue.
A brand new radio receiver has been launched in the UK by the Roberts Radio company. The R861 is aimed at people who want a travel set and are prepared to pay for a serious sum of money for a piece of kit that offers ease of operation, portability and good performance.

The new receiver costs just under £200 in this country. But I think that if you are looking for a set that is going to last for a good number of years, you'll have problems bettering an investment in this model.

However, some qualification of my statement is needed. The R861 has a broad coverage from 150kHz, the lowest broadcast frequency, to 29.999MHz, at the very limit of short wave. There is also f.m., which includes Radio Data System - or RDS.

When you tune to an f.m. station using RDS (which includes nearly all the UK's f.m. transmitters, plus an ever increasing majority of continental radio stations), the large digital display on the set provides the station's name, like 'BBC R1' or 'Jazz fm'. And if you listen using the miniature headphones that come with the radio, you'll enjoy stereo reception on f.m.

A key feature of the R861 is the 300-plus memories. Most are devoted to short wave, and many of them have been pre-programmed in the factory to key frequencies of the world's leading international broadcasters.

The designers of Robert's Taiwanese-built receiver have divided the memories into pages, just like the Sony IC-SW55 and SW77. Nine frequencies are contained in each page, and you can turn the pages by pressing a couple of buttons on the keypad below the digital display.

Many Features

BBC World Service has three pages of frequencies stored in the R861's memory, then there are other important frequencies of broadcasters from Radio Austria to the Vatican. Each of the memorised frequencies can be altered as frequencies change, and there are many spare memory positions so that the user can store their own favourite frequencies, together with a name that will appear on the display when it's selected.

There are many other features on the R861, including the usual clock/timer/sleep/alarm function. In addition, there's a clever system that converts the clock to the local time in one of 42 countries and cities around the world so if you travel, you don't have to spend ages reprogramming the set's clock to local time to be able to use the alarm every day. Add to that selectable sidetone mode, adjustable r.f. gain and narrow and wide filter selection for a.m. listening, and you have a package that seems to offer a great deal.

But of course the best designed set is no use at all without associated good performance. I have had the opportunity to try the R861 out over a number of weeks, and simply using the telescopic whip antenna, I've found it pulls in even the weakest broadcast signals (you can also connect an internal antenna, or use the 'fishing-line' antenna that comes with the receiver). So, I judge its sensitivity as good, and its selectivity seems to be just about right too for general broadcast listening.

Overall, the Roberts R861 - available now at around £200 - seems like a good buy for a state-of-the-art f.m. and short wave receiver.

Station News

On to station news now and The Voice of Malta is back on the air from transmitters in Russia. English is on the air daily, except Friday, at 1500 for an hour on 7.44 and 7.39MHz to Europe. There is also a transmission to Asia on Sundays only at 0130 on 17.57 and 15.55MHz.

Vietnam has shuttled from its summer time frequency to its winter time one. The Hanoi-based station, Voice of Vietnam, is now on the air on 15.01MHz, replacing 12.02MHz, at 1600, 1800, 1900, 2030 and 2330UTC to Europe, plus a transmission to Asia at 1000 and 1230 on the same 25 metre band channel. All programmes are thirty-minutes long.

For a taste of life 'down under', try Radio Australia. The station recommends these times and frequencies to listeners in Europe: 0000-0400 on 15.51; 0600-0800 on 15.53; 0800-1100 on 21.725; 1100-1400 on 11.86; 1400-1600 on 11.66, 9.35 and 7.15; 1500-2000 on 9.615; 1800-2100 on 7.33 and 2100.

Voice of Israel was having problems with its 0500UTC transmission on 7.255MHz at 0455-0700, 0900-1100, 1500-1700 and 1900-2100. Voice of Nigeria is located at Broadcasting House, PMB 4003, Falomo, Ikoyi, Lagos, Nigeria.

Transmission Problem

Voice of Israel was having problems with its 0500UTC transmission on 7.45MHz, but the transmitter fault which caused the difficulties are now reported to be cured. This same transmission is heard on 17.545 and 9.435 MHz. Try English at 1500-1530 on 11.605 and 9.395MHz and at 2000-2025 on 15.64, 9.435, 9.365 and 7.45MHz.

As well as taking a look at the broadcast bands this month, Peter Shore has also been trying out the new Roberts Radio, the R861.

The R861 is the latest short wave receiver from the Roberts Radio company.
of 0W1W | W1PAM | W1WAV

---

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- 0115-928 0267

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- A. H. SUPPLIES, 12 Bankside Wks, Darnall Road, Sheffield S9 5HA
- 0114-244 4278

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**Rules:**

We cannot deal with technical queries over the telephone.

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**Figure:**

NINE HF BANDS | NO PLANNING PROBLEM | NO MAST REQUIRED | OK PLACED OVER THE ROOF

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- 0114-244 4278

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**Practical Wireless,**

February 1997

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**Compiled by Zoë Crabbe**

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Beat those Freezing February Blues with our selection of fireside reading.

As technology progresses, the challenge of operating on the Amateur Radio microwave frequency allocations becomes even more attractive. And as there are some excellent books on the subject we've looked some out to encourage you to go 'mad on microwave' yourself! So, take a look at what's available to help you explore this fascinating part of the radio spectrum.

The ARRL UHF/Microwave Experimenter's Manual

If you're just getting interested in the possibilities that Amateur Radio microwave operating can offer you, this book offers an excellent starting point. Along with covering the basics it provides a brief history of microwave operating (with an American bias of course, but none the less fascinating for that) before offering theory, practice and practical project. However, although there are some projects in this book...those that are included are aimed at helping you to experiment and use the knowledge gained in reading the book.

Covering everything from antennas, components and design - with a very great deal in between - this book provides an excellent reference source, along with a source of ideas in itself. It's also very readable, which in a technical book is a recommendation in itself.

The ARRL UHF/Microwave Experimenter's Manual is available for £14.50 plus P&P.

The ARRL UHF/Microwave Projects Manual

This recently published book from the ARRL has already been introduced to PW readers in a previous 'book profile'. But we've got no hesitation in reminding you that it's available because together with the ARRL UHF/Microwave Experimenter's Manual already mentioned on this page, it will provide a superb source of ideas and projects.

So, we at PW recommend that you consider buying this with the ARRL UHF/Microwave Experimenter's Manual as a pair to 'launch' yourself off into microwave operating using both books as a foundation to your UHF/Microwave library. At only £14.50 it's an affordable addition to your library too.

Microwave Handbook - Volumes 1, 2 & 3

This series of books has proved popular, especially for those who prefer the 'British' style of approach to technical textbooks. The layout, style and general approach is typically that of all RSGB books and all British readers will feel very much at home reading them.

Whereas the series could have been published in one massive volume, the RSGB took the decision to issue the books in a set of three. The result is three volumes, each consisting of around two hundred well bound and produced pages, which are convenient to handle and use and provide a most comprehensive library on the subject of microwave Amateur Radio.

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Packet Radio Special
Discovering the world of Amateur Radio packet operation. Readers often ask us what books we've got on packet radio operation. So, if you're keen to have a go or to learn about the techniques here are some interesting titles to check out for your bookshelf.

Packet Radio Primer
This book looks very American in style and presentation...but it's not! Dave Coomber and Martyn Croft, the authors, have made strenuous efforts to provide the reader with an easy-to-read first book on packet radio operation. And if you're interested in the possibilities of the mode their efforts will inform and amuse you - the use of the occasional cartoon helps in this respect.

Packet radio - although it is totally absorbing for those involved in the subject - is not an easy aspect of Amateur Radio to write about. But in this 'primer' the authors have explained data communication, how it works, the packet station, nodes and the network, writing messages and getting files.

All in all Packet Radio Primer provides a very helpful guide for the beginner and for anyone needing an easy-to-read explanation of packet and the variations the mode offer, along with advice on how to use the systems. And with a price tag of just £8.95 it's affordable too!

Your Packet Companion
If you're a complete beginner, with no idea of what packet radio is, this book must surely be the one to start with. In effect it's a very concise 'idiot's guide' to the mode.

In its 168 or so pages the author, Steve Ford WB8IMY, has done what many others have forgotten to do - he explains it simply and in a very straightforward manner! Readers who can remember the truly excellent 'Common Core' Basic Electricity, etc., series will appreciate this slim volume.

Packed with good diagrams and explanations Steve even shows (in diagrams) a typical packet pathway and what happens enroute. Although of course it is very 'American' in approach, any reader interested in finding the very basics of the mode before proceeding further won't be disappointed.

A highly recommended 'starter' book for your library, available for just £5.95.

Practical Guide To Packet Operation In The UK
Mike Mansfield G6AWD's book has established itself over the last few years and still proves popular. In ring-bound loose-leaf format it should prove useful to anyone actually working on setting-up a packet radio station.

Within its 'workshop manual' style text and in a information packet style and presentation this book has proved its worth. With sections covering packet levels, setting-up, basic command settings, radio connections (Amateur), packet satellite operation, AMTOR, CLOVER, FACTOR and Internet to Packet gateways, this book would really be justified in calling itself a 'User's Manual'.

Practical Guide To Packet Operation In The UK costs £11.50.
Well, it’s a new year and time to get stuck into a new book. Why not treat yourself and curl up in that cozy seat in front of the fire without the television on for a change! There’s plenty of books to choose from, our varied list of titles, so go on order today!

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