CHECK OUT THE LATEST SECOND-HAND PRICES WITH TRADERS' TABLE

January 1997

practical
Wireless

INTRODUCING antennas in action
8 EXTRA PAGES OF ANTENNAS

REVIEWED
KENWOOD'S FRIENDLY TS-570D

FREE INSIDE
POSTER SIZE
AMATEUR RADIO 1997 WALLPLANNER

SPEECH PROCESSING
Explained by Ian Poole G3YWX

NEW SERIES
Radio...Discover the basics

PLUS ALL YOUR REGULAR FAVOURITES
JOIN THE DIGITAL REVOLUTION TODAY WITH SISKIN!

Just the sound of those words "Digital Radio" is often enough to frighten many people away from what outwardly appears to be a complex and hi-tech aspect of our hobby. Terms like "baud rate" and "RS-232" probably were not even mentioned when you swatted your way through the RAE and yet the advent of the Internet and the home PC has generated a whole new vocabulary we are all supposed to be conversant with!

At Siskin we’ll try our best to take away the guess work and guide you through the "techno-maze' and chances are you’ll wonder what all the fuss was about. (Our oldest customer is 82 whilst our youngest is just 9.)

Siskin offer the W-I-D-E-S-T selection of amateur digital products in Europe available at key locations in the UK including Southampton, London, Axminster and Leeds with a staff of over 65 people ready to help you. We offer an incredibly large selection of ready-made computer-to-TNC and radio-to-TNC cables at down to earth prices and we ALWAYS include software at no extra charge.

So where to start ...

BREAD AND BUTTER STUFF!!

THE AEA PK-12, a no-nonsense plug in and play 1200 baud TNC with built-in Personal Mailbox (expandable to over 100K), software DCD as standard (means you can run with the squelch wide open) and of course ready-made cable and software. A snip at £129 plus carriage. (128K upgraded model available at just £149.)

THE PACCOMM TINY 2 MKII - over 19,000 sold and still going strong. The superbly engineered 1200 baud TNC again sports a built-in Personal Mailbox, upgradeable to 9600 baud operation, lots of their party add-ons for Node and BBS operation, also makes an ideal platform for satellite operations. Again the Tiny includes ready-made computer cable plus software, £139 including VAT plus carriage.

THE SISKIN MINI-PAK - well, this isn't actually a TNC but a surface mount constructed miniature modem built inside a 9-way D Shell. The Mini-Pak is actually made for us by Baycom in Germany and unlike many dubious clones you'll see advertised elsewhere the Mini-Pak is supplied with an official copy of the BayCom software and manual plus ready-made lead.

THE SYMEK TNC2H - a beautifully made German 9600 TNC2 compatible, ideal for regular AX25 Packet plus TCP/IP and satellite operations. The TNC2H employs officially licensed G3RUII 9600 technology and is gaining popularity fast. We've kept the price keen on the TNC2H at just £179 plus carriage including a ready-made computer cable and software. (Ready-made radio cables are available at just £14.95 each.)

THE AEA PK96 - similar to the PK12 but with the added convenience of 9600 or 1200 baud Packet Radio with a simple software command. Supplied complete with ready-made transceiver and computer cables, software, and, if you mention the words “I SAW YOUR AD IN PW" we’ll chuck in the 128K optional ram upgrade free of charge (offer ends January 31st 1997). Price £219 plus carriage.

OUR FLAGSHIP MODEL...

THE AEA DSP232 - at last, we have them in stock and they are going like wildfire. The DSP232 is the natural successor to the best-selling PK232 model. Using state-of-the-art Digital Signal Processing techniques the DSP232 is able to emulate many popular hardware based modem characteristics such as RTTY, AMTOR, ASCII, PACTOR, CW, HF PACKET, 1200/9600 Packet and more! At the moment we are also bundling a free copy of PC Pakratt for Windows II software (normally £79) and ready-made cables! £479 plus carriage.

AND THAT'S JUST A SMALL SELECTION OF WHAT'S ON OFFER.

PLEASE CALL OR WRITE FOR A FREE CATALOGUE.

Merry Christmas and a happy new year
from SMC SISKIN

SMC SISKIN, School Close, Chandlers Ford Industrial Estate, Eastleigh, Hants SO53 4BY
Tel: 01703 254247

And if it's engaged? ....
OK, our direct line gets busy at times during office hours so if it's an order you wish to place dial 01703 255111 and ask for Phil, Graham, Dave or Toby all of whom are radio amateurs by the way!
Or ... Fax us 01703 263507 Or ... E-mail us info@siskin.co.uk
### ANTENNA ROTATORS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR303</td>
<td>Light duty</td>
<td>£49.95</td>
</tr>
<tr>
<td>G-490XL</td>
<td>New medium duty model</td>
<td>£269.00</td>
</tr>
<tr>
<td>G-650XL</td>
<td>New H/D version of G-450XL</td>
<td>£369.00</td>
</tr>
<tr>
<td>G-900SDX</td>
<td>45&quot; deluxe model</td>
<td>£429.00</td>
</tr>
<tr>
<td>G-1000SDX</td>
<td>H/D version of G-900SDX</td>
<td>£499.00</td>
</tr>
<tr>
<td>G-28000SDX</td>
<td>H/rotator 45°</td>
<td>£1129.00</td>
</tr>
<tr>
<td>G-50CA</td>
<td>Elevation rotator</td>
<td>£289.00</td>
</tr>
<tr>
<td>G-5406B</td>
<td>AZ/EL rotator</td>
<td>£529.00</td>
</tr>
<tr>
<td>G-5606B</td>
<td>AZ/EL rotator H/D</td>
<td>£629.00</td>
</tr>
<tr>
<td>RCS-1</td>
<td>Medium duty create</td>
<td>£329.00</td>
</tr>
<tr>
<td>RCS-3</td>
<td>Medium duty + preset</td>
<td>£439.00</td>
</tr>
<tr>
<td>RCSA-3</td>
<td>H/D v/speed + preset</td>
<td>£699.00</td>
</tr>
<tr>
<td>RCSB-3</td>
<td>V/H v/speed + preset</td>
<td>£989.00</td>
</tr>
<tr>
<td>ERC5A</td>
<td>Heavy duty elevation</td>
<td>£1095.00</td>
</tr>
<tr>
<td>GC038b</td>
<td>Lower clamp G-400, 800, 1000,250 B</td>
<td>£25.00</td>
</tr>
<tr>
<td>GC038G</td>
<td>Lower clamp G-600</td>
<td>£25.00</td>
</tr>
<tr>
<td>M0C</td>
<td>Lower clamp create</td>
<td>£49.95</td>
</tr>
<tr>
<td>GS-950</td>
<td>Rotary bearing up to 1½ mast</td>
<td>£25.00</td>
</tr>
<tr>
<td>GS-065</td>
<td>Rotary bearing 2&quot; mast</td>
<td>£45.00</td>
</tr>
<tr>
<td>CK46</td>
<td>Create rotary bearing 2&quot; mast</td>
<td>£57.00</td>
</tr>
<tr>
<td>CD-45</td>
<td>Telex meter controller</td>
<td>£315</td>
</tr>
<tr>
<td>HAM IV</td>
<td>Medium duty meter controller</td>
<td>£445</td>
</tr>
<tr>
<td>HAM V</td>
<td>HAM IV with digital controller</td>
<td>£749</td>
</tr>
</tbody>
</table>

### HVF Antennas

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR-270</td>
<td>2/70 Dual Band Vertical 1.13m long</td>
<td>£99.00</td>
</tr>
<tr>
<td>AR-706</td>
<td>2/70 Dual Band Vertical 2.3m long</td>
<td>£99.00</td>
</tr>
<tr>
<td>AR21</td>
<td>2m Vertical 1.2m long</td>
<td>£39.00</td>
</tr>
<tr>
<td>AR6</td>
<td>6m Vertical 3.1m long</td>
<td>£59.00</td>
</tr>
<tr>
<td>DVA27B</td>
<td>2W 2m 10-12MHz</td>
<td>£23.50</td>
</tr>
<tr>
<td>DVA140</td>
<td>2W 2m 10-12MHz</td>
<td>£23.50</td>
</tr>
<tr>
<td>DVA220B</td>
<td>2W 2m 10-12MHz</td>
<td>£38.00</td>
</tr>
<tr>
<td>DVA300B</td>
<td>2W 2m 10-12MHz</td>
<td>£49.95</td>
</tr>
<tr>
<td>A50-5</td>
<td>5m 10-12MHz</td>
<td>£89.00</td>
</tr>
<tr>
<td>A50-5S</td>
<td>5m 10-12MHz</td>
<td>£89.00</td>
</tr>
<tr>
<td>A50-5S0</td>
<td>5m 10-12MHz</td>
<td>£109.00</td>
</tr>
<tr>
<td>A50-5S1</td>
<td>5m 10-12MHz</td>
<td>£179.00</td>
</tr>
<tr>
<td>A50-5X</td>
<td>5m 10-12MHz</td>
<td>£179.00</td>
</tr>
<tr>
<td>A50-5X0</td>
<td>5m 10-12MHz</td>
<td>£179.00</td>
</tr>
<tr>
<td>A50-5X1</td>
<td>5m 10-12MHz</td>
<td>£179.00</td>
</tr>
</tbody>
</table>

### VHF Antennas

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS</td>
<td>18/21/15/17/20 vertical</td>
<td>£295.00</td>
</tr>
<tr>
<td>R7000</td>
<td>10 thru to 40m vertical</td>
<td>£389.00</td>
</tr>
<tr>
<td>A61</td>
<td>Radial kit for R7000</td>
<td>£129.00</td>
</tr>
<tr>
<td>AV3</td>
<td>14-21-28MHz vertical</td>
<td>£99.00</td>
</tr>
<tr>
<td>AV6</td>
<td>3-5-7-14-21-28MHz vertical</td>
<td>£169.00</td>
</tr>
<tr>
<td>AP8A</td>
<td>8 Band Vertical</td>
<td>£329.00</td>
</tr>
<tr>
<td>APR18A</td>
<td>Radial Kit</td>
<td>£54.00</td>
</tr>
<tr>
<td>40-2CD</td>
<td>2-elem 60MHz</td>
<td>£499.00</td>
</tr>
<tr>
<td>A561</td>
<td>12/17/18 MHz</td>
<td>£299.00</td>
</tr>
<tr>
<td>AT13</td>
<td>30m Extension ASWS</td>
<td>£119.00</td>
</tr>
<tr>
<td>204CD</td>
<td>4-elem 10MHz</td>
<td>£499.00</td>
</tr>
<tr>
<td>154CD</td>
<td>4-elem 15MHz</td>
<td>£299.00</td>
</tr>
<tr>
<td>D4</td>
<td>Dipole 10/15/40 MHz</td>
<td>£399.00</td>
</tr>
<tr>
<td>D20W</td>
<td>Dipole 12/17/30 MHz</td>
<td>£199.00</td>
</tr>
<tr>
<td>A4S</td>
<td>3-4-ele 10/15/20 MHz</td>
<td>£449.00</td>
</tr>
</tbody>
</table>

### FT-5200 Offer

**ONLY £429**

YSKI remote kit **£29.00**

Carr post £5.50. Next day delivery £8.50

*When purchased with the above*
COMET NEW PRODUCTS
CA HV
HF/VHF Mobile Whip 7.14-21-28-50-144
IDEAL FOR IC-706/1!
99.95

COMET ANTEENNA ACCESSORIES
RS-20 Mini Gutter Clip £15.50
RS-21 Mini Back and mount £15.50
CK-3MB Mini Cable Assembly £26.50
WS-1M Window Mount & Cable £39.00

COMET ANTENNAS
CBL-20 HF 1:1 Balun 1Kw PEP £23.50
CBL-200 HF 1:1 Balun 2Kw PEP £27.50
CF-30MR HF Low Pass Filter 1Kw PEP £43.50
CF-50MR HF Low Pass Filter 2Kw PEP £68.00
CF-30S HF Low Pass Filter 15Kw PEP £25.00
CF-300S 6K Low Pass Filter 150Kw 1000P £25.00
CF-BP2 2M Band Pass Filter 150P £49.95
CMX-2 PWR 1.6-600MHz 20/200/2000W £119.00

COMMUNICATIONS LTD
We now have the widest range of data specialist knowledge of the products we must be by far the number one choice for packet equipment.

AEA
PK12 1200 baud TNC £129
PK16 9600 baud TNC £219
PK22/212/212 Multimode data modem £319
*DSP222 Multimode Data modem £479
*PK900 Multimode data modem £479
Free Pack - Win software

PACCOMM
Tiny 2 1200 baud TNC £139
Picopacket 12 baud portable TNC £119
Spirit 2 9600 baud TNC £219

Kantronics
KPC3 1200 baud TNC £139
KPC612 1200/9600 dual port TNC £275
Kan+ Multimode data modem £395

Symek
TNC2H 9600 baud TNC £179

BayCom Modems
USC 4 port plug in card W/O Modems £107

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

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

HOKUSHIN ANTENNAS
HS-7025 2M/70CM Whip BNC £12.50
HS340 5W VHF Mobile BNC £8.50
HS320 2M X Wave Whip £6.50
2NE 2M X Wave Whip £19.00
8RF 2M/8/9 Wave Mobile Whip £19.00
HS-7275S 2M/70CM Mini Mobile Whip £17.00
EX104B 2M/70CM Mini Mobile Whip £22.50
EX601B 6m Whip £37.00
SMC125E 12M Mobile Whip £16.50
SMC155E 15M Mobile Whip £16.50
SMC17E 17M Mobile Whip £16.50
HF3 12/17/30 Base Vertical £59.00
2BSH2HB 10M 2EL ZL Beam £65.00
HS-G962 2 x 6 Base Co linear £39.00
GP23 3 x 6 Base Co Linear £39.00
SQ144 2M SWISS QUAD £45.00
WX1 2M/70CM Base Co Linear £75.00
WX2N 2M/70CM Base Co Linear £99.00
WX4N 2M/70CM Base Co Linear £199.00
NEW GDX30 100-1500MHz £95.95
c/w 10M RG58U

Taiwan Serene
MOBILE ANTENNAS
TSM-1005 2m 7/8 1.89m £29.50
TSM-1316 2m 70/28 3.8m £25.50
TSM-1319 2m 70/28 2.25m £25.00
TSM-1309 2m 70/28 3.93m £25.00
TSA-5004 Mirror/Rack mount £16.00

BASE ANTENNAS
TSA-3301 2m 70G/Fibre/1.8m £68.00
TSA-3302 2m 70G/Fibre/1.7m £55.00
TSA-3303 2m 70G/Fibre/1.16m £42.50
TSA-3303 2m 70G/Fibre/3.07m £85.00
TSA-3006 C/Duplexers £25.00
TSA-3001 C/Duplexers £25.00
TSA-6001 E Duplexer £29.00
TSA-6002 E Duplexer £39.00

HANDHELD/(SCANNER ANTENNAS
TSC2601 BNC Whip 144/430/900MHz £119.00
TSC2602 BNC Whip 144/430/900MHz £119.00

TOKYO HY-POWER Amplifiers
HL 100B/10 21-28/Hz 10W out £210 C
HL 100B/20 14M 10W out £210 C
HL 100B/80 7MHz 10W out £210 C
HL 60V 50MHz 10w out £169 C
HL 62VX 2m 25-25W in 50 out £235 C
HL 180V 2m 25-25W in 170 out £368 C
HL 36U 70cm 5-10W in 30 out £155 B
HL 63U 70cm 10-25W in 50 out £259 C
HL 130U 70cm 3-25W in 120 out £485 C

TELEX HY-GAIN
AERIALS £5.00 STATION ACCESSORIES £5.00 MODEMS £5.00 TRANS/BASE/MOBILES £13.50 HANDLES £9.50

(3MC II) Data Communications Hotline Tel: (01703) 254247 9.30am - 6pm for personal callers 9.00am - 3pm for telephone queries.
Bry 35, SBS 35, Tel: (01703) 255111 Fax: (01703) 265370 Email: amatets@smc-comms.com

09pm Saturday Reg Ward & Co: 1 Western Parade, West Street, Axminster, Devon EX13 5NY Tel: (01297) 349199 9.00am - 5.15pm Tues-Sat 8.30-10.30am Mon-Thurs 8.00am - 1.00pm Saturday

* YAESU * STRUMEC CUSHCRAFT * LAFAYETTE * HY-MOUND * MIRAGE KLM * HENRY * MANSON * REXON *
ALINCO "Factory Direct" Sales Policy
Bypass the Wholesaler - and SAVE!

ALINCO DR-605 Dual-Band Mobile
2m & 70cms Mobile 50/35W CTCS & DTMF
£399
£329

ALINCO DX-70 100W + 6M Rig
100W of SSB - CW - FM - AM
£695
£595

ALINCO DR-130 2m 50W Mobile
A Great chance to get a cheap mobile!
£249
£199

ALINCO DR-M06 6m Mobile
Super 6m mobile at a great price.
£249
£219

ALINCO DJ-G5 2m & 70cms Mobile
Full Duplex Airband Receive Ni-cads & Charger
£299
£229

ALINCO DJ-G1 2m Handy
Very Special Deal
2m Transceiver Widerband Receive 400-470/800-950MHz AM Airband - VHF 80 Memories Channel Scope CTCSS Encode
£239
£189

ALINCO AT-200 2m Handheld
AT-400 70cms Model New Low Price
£164
£149.95

ADI AR-146 2m Mobile
50 Watts
£169.95
£149.95

Yupiteru's New Scanner 530kHz - 2300MHz FM WFM AM LSB USB Band Scope Display 18 Steps 50Hz-125kHz Blazing Scan Speed 1000 Alphanumeric Mems Dual Frequency Display Duplex Monitoring
£489

NEW MVT-9000
It's Arrived!
Yupiteru's New Scanner 530kHz - 2300MHz FM WFM AM LSB USB Band Scope Display 18 Steps 50Hz-125kHz Blazing Scan Speed 1000 Alphanumeric Mems Dual Frequency Display Duplex Monitoring
£489

THE NEW Micro-Mag
WATSON Mobile Aerials
WSM-270 Dual Bander 2m/70cm £24.95
WSM-1900 25-1900MHz scanning £29.95

Each comprises latest Japanese "super 29mm diameter magnet, black element and 2.75m of coax cable terminated in BNC WSM-270: 190MHz - 1900MHz/400mm

The Ultimate Earpiece!
WATSON WDB-30 Dual Band Amp
2m/70cms 30 Watts Out Auto switching 1-8 Watts input
£139

WATSON Power Supplies
3 Amps to 30 Amps - Fully Protected
W-3A 3 Amp 12V current/volt protected £22.95
W-5A 5 Amp 12V current/volt protected £29.95
W-10A 10 Amp 12V current/volt protected £49.95
W-10AM 10 Amp 3 - 10V variable £95.95
W-20A 20 Amp 3 - 10V variable £95.95
W-30A 30 Amp 3 - 15V variable £119.95

Shop: 22, Main Road, Hockley, Essex. SS5 4QS Tel: (01702) 206835 Fax: 205843
MAIL ORDER (01702) 206835 / 204965 - 24 Hour Answerphone Fax: 205843
OPEN Mon. - Sat. 9am - 5.30pm
ACCESS

ALINCO MEGA DEALS
ALINCO DX-70 100W + 6M Rig
100W of SSB - CW - FM - AM
£695
£595

ALINCO DR-130 2m 50W Mobile
A Great chance to get a cheap mobile!
£249
£199

ALINCO DR-M06 6m Mobile
Super 6m mobile at a great price.
£249
£219

ALINCO DJ-G5 2m & 70cms Mobile
Full Duplex Airband Receive Ni-cads & Charger
£299
£229

ALINCO DJ-G1 2m Handy
Very Special Deal
2m Transceiver Widerband Receive 400-470/800-950MHz AM Airband - VHF 80 Memories Channel Scope CTCSS Encode
£239
£189

ALINCO AT-200 2m Handheld
AT-400 70cms Model New Low Price
£164
£149.95

ADI AR-146 2m Mobile
50 Watts
£169.95
£149.95

This rig is superb. It leaves the competition for dead! At our price you can't afford not to have 50W high power 2m FM in the car.

WATSON Base Aerials
W-2000 6m - 2m - 70cm The Model Designed for UK Bands no USA!
IN STOCK NOW
W-3A 3 Amp 12V current/volt protected £22.95
W-5A 5 Amp 12V current/volt protected £29.95
W-10A 10 Amp 12V current/volt protected £49.95
W-10AM 10 Amp 3 - 10V variable £95.95
W-20A 20 Amp 3 - 10V variable £95.95
W-30A 30 Amp 3 - 15V variable £119.95

Open Mon. - Sat. 9am - 5.30pm
BACK ISSUES

There are limited numbers of back issues available. This could be your LAST CHANCE TO ENSURE your collection is complete.

£1 EACH inc P&P!

ORDER NOW!

January 1992
February 1992
March 1992
April SOLD OUT
May 1992
June 1992
July 1992
August 1992
September 1992
October 1992
November 1992
December 1992

January 1993
February 1993
March 1993
April 1993
May 1993
June 1993
July 1993
August 1993
September 1993
October 1993
November 1993
December 1993

January 1994
February 1994
March 1994
April 1994
May 1994
June 1994
July 1994
August 1994
September 1994
October 1994
November 1994
December 1994

Please use the form on page 70 of this issue
Merry Christmas

&

A PROSPEROUS NEW YEAR

TO ALL OUR READERS & ADVERTISERS
A nything to do with antennas, how they work, projects and ideas are all very popular with PW readers. So with that in mind, the Editorial team have come up with something rather special for you on this subject. And appropriately enough the new bi-monthly section is called ‘Antennas In Action’.

Antennas In Action is a very apt title for the new 8-page section because that’s exactly how Tex Swann GITEX plans to present our latest offering. There’ll be loads of ‘antenna action’, projects, news, ideas, up-dates and discussion on literally anything to do with antennas and associated subjects.

Tex Swann GITEX as the member of the team in overall charge of the new section - has taken to the job ‘like a duck to water’ (Swann more like it!) and produced an excellent first edition. As the section ‘Editor’ Tex can call on the rest of the PW team to prepare what we think will become a very popular part of the magazine.

We hope you enjoy the first edition of A-I-A and that you’ll send your comments, suggestions and ideas straight to Tex here at the Broadstone offices. And don’t forget that Antennas In Action is an extension of our coverage of this topic. ‘Antenna Workshop’ and other associated articles will continue to appear monthly but will also form part of our new section.

In the meantime, between answering your letters on the subject, I’m hoping to recruit Tex’s help to rebuild my h.f. antenna system which was wrecked during the recent storms in October. It’s not that my new antennas were at fault (I built in as many ‘fail safes’ for the weather as I could think of) but I didn’t allow for flying roofs from other properties - plus a small greenhouse from next door - demolishing my systems.

So, with the help of Antennas In Action (and perhaps Tex) I hope to be on air again soon on the full system rather than the ‘jury rigged’ temporary wire I have up at the moment!

Amateur Radio Beacons

Amateur radio beacons provide a very useful service in helping the operator evaluate the prevalent propagation condition. They’re an extremely useful aid on whatever part of the spectrum they operate on.

I often listen out for the v.h.f. beacons, particularly when there’s a ‘lift’ on...just to see what happens. And although I’m not a DX chaser I really do find propagation and the variability factor to be absolutely fascinating. I can really understand why some people make a hobby of listening for beacons themselves...rather than using them as aids.

However, I’m becoming increasingly frustrated with the QRM on the common 14MHz beacon frequency. The problem is h.f. packet radio ‘interference’ and I’m finding it extremely difficult to listen to the International beacon frequencies between 14.099 and 14.101MHz.

As readers will appreciate I have access to the most modern receiving equipment. But even the most selective has difficulty in providing readable signals from the h.f. beacons due to the very potent h.f. packet radio transmissions on (very close indeed) adjacent channels.

So, what can be done about the ‘interference’ problem? I don’t want to ‘interfere’ with the packet user’s enjoyment of 14MHz...but conversely I don’t wish to be denied the use of the beacons either!

Have you had difficulty using the beacons on 14MHz? If so what do you think we can do? If it’s a problem originating outwith the UK (as I think it must be) surely our National Society the RSGB cannot help in this respect? I’d like to hear your opinion on this matter because I feel that with care, both the low power beacons and the higher-powered packet stations can co-exist. After all both ‘modes’ are to someone’s advantage.

Name That Trophy!

Following my request for your help in choosing a suitable name for the new special EUGI Trophy (to encourage EI and GI entrants into the PW 144MHz QRP Contest), I’ve had many letters of support. I have also had many suggestions for a name for the new trophy and because of this I’m now announcing a little competition to choose the name!

As I’m personally sponsoring the new award - a miniature clock in a green (naturally!) hardwood case which will be presented each year. The recipient/recipients will keep the clock as a memento of the occasion and a small brass plaque will record the callsign of the winning station, the year and the title of the trophy.

The new trophy will be presented to the winner on behalf of Practical Wireless (depending on what station wins it) either by the South Dublin Radio Club or the Gengormley Electronics Amateur Radio Society from Newcombabney in County Antrim, Northern Ireland. (The two societies are ‘twinned’ which I think in itself is a marvellous idea!). And I have to thank Peter Lowrie G1JYK and friends for their help, advice and support on this matter.

So - now to the competition itself! The shortest and most appropriate title will be selected by the Editorial team from your entries. (Don’t forget...as sponsor I’m denied entry into the competition and disqualified from being mentioned!). The title you choose should reflect the nature of the trophy, the contest itself or the personality behind it (Dr. Neil Taylor G4HLM).

Please send your entries (on a postcard) to EUGI Trophy Title Competition, C/O The Editor, Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW, to reach us by Monday 27th January 1997. I’m donating a special prize and the nature of the prize will be announced when we publish the results in the June 1997 issue of the magazine. The winner will be notified and my decision will be final! Good luck.

Africa Up-Date

I’m still receiving offers of help from Radio Amateurs all over the world keen to help budding radio enthusiasts who live in Africa. I hope to provide more details as soon as possible. In the meantime keep writing in and we’ll soon amass a shipload of radio ‘bits & pieces’ for Nigeria and other countries!

Peace & Goodwill

It’s the time of the year when I - on behalf of everyone working on Practical Wireless - like to wish you all a happy Christmas. We also wish you all a happy, peaceful and prosperous new year. God willing our world, our families, our day-to-day lives and our wonderful hobby will go from strength to strength in the coming months.

I wish you all well. God speed and Bless you all...wherever you are.
RECEIVING

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

The Star Letter
worth letters will Wire.

Dear Sir

Does Tim Cattley G0CWZ (November ‘Receiving You regarding “CB” on 6MHz’ live in a different world or listen to different 10, 15 or 20m bands to those I receive here? I refer to his comments that “all radio amateurs know exactly what frequency they are transmitting on and certainly what band they are on and do not call ‘CQ 10, certainly what band they are on?”

All I can say is that there must be an awful lot of ‘pirates’ on these bands then as I regularly log radio amateurs from all over the world, including the UK, using just such a call.

John Noble

KENT

Enamel Wires

Dear Sir

Can anyone tell me how to scrape the enamel off the thinner wires, 24s.w.g. to 30s.w.g. without making the wire brittle or getting pieces of copper embedded in my finger. I usually scrape mine with a knife, but have come to the conclusion there must be an easier and safer way.

John Noble

Louth

Editor’s reply: For many years I’ve kept an old mustard jar half filled with methylated spirit on the bench to prepare wire that’s not covered with the ‘solder through’ modern enamel. I beat the enamel wire in a match flame (A cigarette lighter would perhaps be better, but I neither smoke or have the dexterity to hold a lighter and keep it working!) before plunging the hot wire into the ‘meths’. A bright copper wire ready to solder results (of course, the cover is kept on the jar when it’s not in use). A refinement of this method is to put a small amount of ‘meths’ into a METAL container, heating the wire in the flame before plunging the wire into the reservoir of liquid under the flame.

Any other tips from readers?

Under ‘Twenty Shillings’

Dear Sir

Having been a reader of PW for many years, one series that I have found very good from around the seventies was the articles entitled something like ‘under twenty shilling’. Each month a small project was described that could be built for under a pound.

Now, obviously, time and inflation go on but I wonder if the Editor would consider running a new series of simple cheap projects designed to be built for under, say, a ‘fiver’ or a ‘tenner’. I am sure this could be very useful to newcomers. Novices and old hands alike.

Who knows, with confidence and experience gained in little projects, the sky is the limit. So, I’ll put the soldering iron in the fire and wait eagerly for lift off. All the best and thanks for many years of interesting reading.

Tony Green G4JGU

Swansea

Editor’s reply: Reader’s comments and suggestions are awaited with interest on this one!

PW 144MHz QRP Contest

Dear Sir

You asked for views for the award for the leading E/U/GI station in the PW 144MHz QRP Contest, I think as you suggest, the award should be in honour of Dr. Neill Taylor G4HLX. This is because as you say in under, say, ‘Keylines’, Neill has adjudicated the contest for all these years. Thanks for the excellent

Yours faithfully

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

broadcast band listener myself I’ll be interested to read YOUR comments!

Dear Sir

I have just returned home from a trip to the amateur radio show held in Leicester, with the intention of looking for a suitable replacement for my now ageing Trio TS-830 amateur transceiver, which has served me well for the last 14 years. As I am also a keen broadcast band listener, high on my list of priorities was that it should have general coverage receive capability and also a good performance in the a.m. mode.

After coming home and looking through the pile of leaflets passed onto me from dealers, it would appear that in nearly all cases the a.m. mode has been added as an extra to pander to sales, with poor bandpass filters being fitted in most cases, (no doubt to cut costs). It is too much to ask, when one may be paying over a thousand pounds, and sometimes two or three thousand, to expect to see a good quality bandpass filter, to give good selectivity in the a.m. mode.

I would expect to see selectivity readings of 12kHz wide at 6dB down the skirt; instead of 20kHz wide at 40dB down, which seems to be the norm on a lot of these transceivers. Some manufacturers do offer high quality 6kHz crystal filters for a.m. use on some models in their range as an optional extra, but not all.

It is clear to me that in most of the test reports that are published in the radio press, very little is said about the performance of some of these transceivers, when they are used for serious short wave listening on the broadcast bands. In a lot of cases, the selectivity results for s.s.b. and c.w. will be printed, but nothing is said about the a.m. performance. Could you please, if possible, spend some time when doing your tests, to report on the sets suitability for a short wave receiver on a.m. Or am I alone in thinking that this information will be of interest to your readers?

The outcome after reading through my stack of leaflets on the latest batch of super transceivers is to sodder on with my old TS-830S for the amateur bands and carry on with a separate receiver for my broadcast band listening. (This at least has some good filters for a.m.)

Roy Maskey G4TDW

Lancashire

Editor’s reply: Comments from readers and manufacturers would be of interest here. As a keen h.f. broadcast band listener myself I’ll be interested to read YOUR comments!

Letters Received Via The Internet

Many letters intended for ‘Receiving You now arrive via the Internet. And although there’s no problem in general with E/U, many correspondents are appearing to provide us with their postal address. I have to remind readers that although we will not publish a full list of postal addresses we are asked to do so, we require it for the letter to be considered. So, please don’t forget to include your full postal address and call sign with your E-Mail correspondence.

comments in 1996 and I am looking forward to the 1997 event. I think it will be hard to win leading single operator again as G7IY/KP now knows which station to beat!

Neil Hewitt G8ZRE

Chester

Editor’s reply: Please see ‘Keylines’ for further news on the proposed E/U/GI Trophy.

Packet Radio

Dear Sir

Reference: Packet Panorama and packet radio. Shortly after amendments to the rules on Amateur Radio to allow unattended operation on Packet Radio, we now find that BBS operators now wish to provide a private radio club within Packet radio. The plan to use password control to ensure other amateurs from BBS services, and then only to allow usage by approved operators. Surely the best way to cut down alleged abuse is to make the author of any libel responsible for the libel by making the calling sign a compulsory part of any packet operation. The 24 hour monopoly of a huge part of the band is bad enough.

Denying access to other legitimate amateurs is bad enough. (Remember the clause ‘with the permission of other amateurs’ when a further portion of the band was ‘hijacked’ for packet radio). The hidden agenda is to section off amateur radio for private use.

Perhaps the rescinding of permission for unattended operation is the only way to prevent abuse which would be regrettable. I view
Editor: I passed on Mr Charlton's letter to Roger Cooke G3LDI (author of 'Packet Panorama') for comment and his reply follows:

I feel Mr Charlton is being somewhat churlish in his letter when he suggests that BBS operators wish to provide a 'private radio club' within packet radio. This is, of course, total nonsense. However, having seen the utter mess that some of the voice repeaters are in, and hearing some of the garbage emanating from them, we would seek to prevent ANY such happening on packet radio. This at least does give the opportunity to exclude the abusive operators that seem to enjoy preventing normal, sane amateurs from using the voice repeaters.

I would agree totally with Mr Charlton when he says that the author of any libellous comment should be made responsible for their actions. But again, he is being naive to assume that any person using the packet network for this purpose would be stupid enough to use his own call sign!

By issuing passwords, the BBS Sysop can ensure that ONLY legitimate licensees would have access. It would be mandatory for the user to use the password and they could not assume any other identity because they would NOT then access the BBS. Garbage cut 100% in one stroke! NO legitimate user would be denied access; a new user would be able to read messages and send a message to the Sysop, in order to obtain full access. This would then be issued on a personal basis only, and only then, if the applicant was a known trouble-maker (and we do know some) would be refused a password, UNTIL, such time as they were considered acceptable. Again the BBS Sysop would have the right to exclude anyone again if they caused any problems. Thankfuly, in our amateur radio barrel of apples, there are very few rotten 'fruit'. But we want a 100% pure barrel of fruit - without any rotten 'apples' at all, and packet gives us that possibility.

Mr Charlton is also right when he says that the hidden agenda is to sell off parts of the amateur bands for private use. But that threat comes from the commercial sector, NOT from radio amateurs. In fact, using packet on the bands has a 24 hour basis is probably the best thing that has happened to the v.h.f./u.h.f. bands in order that we keep them. Use of the segments for packet are actually part of a bandplan. Room has to be found to accommodate new modes in the same way that we had to make room for RTTY in the late 1950s. Being involved with that too, I well remember the objections to those jingle-bells on OUR bands. Prior to packet, you could listen over both 144 and 430MHz hearing very few signals. Such evidence is just what the commercial intruders are looking for. Use them or lose them is the motto!

There is still plenty of room on both bands to cater for all modes, and we would very much like the same spread as our American and Canadian cousins enjoy, double what we have. To sum up, the BBS Sysops are interested in making the system more enjoyable for the genuine user and making life extremely difficult for the graffiti artist.

I hope that Mr Charlton will try packet radio and all that it offers.

Roger Cooke G3LDI.
Electronic Constructors Catalogue

The Winter 1996/97 edition of the Circuit Electronic Constructors Catalogue has recently been published. This new edition contains all the usual lines, with everything from batteries, through kits & modules to test equipment and transformers being included within its 248 pages.

This 1996/97 Electronic Constructors Catalogue offers readers the chance to win a £25 worth of discount vouchers. There is also a free 32-page Computer catalogue with every copy of the magazine. The Winter 1996/97 edition of the Catalogue you should have on your constructor, then this is one Computer catalogue with every Everything from batteries, through to test equipment and transformers being included within its 248 pages. This new edition contains all the usual lines, with.

Martin Lynch Celebrations

On Saturday 2nd November, Martin Lynch held his annual open day at his Northfield Road Radio 'Superstore'. As usual he had something to celebrate, and it's usually something very worthwhile too.

In the past, it's been an anniversary, the birth of 'MicroHenry' or an important announcement for his customers. This year it was Martin's 40th Birthday and, as usual, he promoted it to one and all well in advance of the event.

As Martin's business goes from strength to strength, so does the popularity of his open days. This year Martin pre-empted the number of people attending by erecting a marquee on the pavement outside his shop, to cram more bodies in. This actually made the event a little more comfortable, being able to stand outside for a breath of fresh air with a glass of wine and a bite to eat from the superb running buffet, which gets bigger and better too!

Thanks must go to Daniel, Martin and Jennifer's eldest son, for keeping everyone well fed during the day, not forgetting the ladies behind the "bar" keeping us lubricated!

On technical note, all the major distributors were present to answer questions and talk of new developments in the hobby. A quick glance around, while I was there (only for a couple of hours) saw representatives from Icom, Yaesu UK, Kenwood, AOR, Waters & Stanton and, of course, Martin's staff.

A novel event throughout the day was a 'reverse auction'. Prices tumbled quickly, so when you thought the price was right, you had to strike quickly for that bargain - wait too long and it had gone!

When Martin picks a day to celebrate next year, take note of the date and put it in your diary, so as not to miss a tremendous day out. It's really worth making an effort to travel to his store to meet old friends, make new ones and see the very latest gear in action.

Steve Hunt.

Dayton Experience

The world's largest radio show takes place in Dayton, Ohio USA. The PW trip to this awe inspiring show, has in the past brought much in the way of experience and enjoyment to the many readers who have experienced this trip of a lifetime.

The 1997 Dayton Ham-Vention takes place over the weekend of May 16, 17 & 18th and you could be there! Yes, the PW trip is running again, but this year it's slightly different in that you can have a tailor made trip to suit you.

All you have to do is contact Andy Garside or Marie Tozza at Guilliver's Groups & Incentives, Fiddington Manor, Teanburys, Gloucestershire GL20 7BJ; Tel: 01604 293175 and ask for details on the Dayton Ham-Vention Holiday 1997. They will then be able to help you sort out a holiday to suit your needs. Please note we are unable to deal with any enquiries via the Editorial Offices.

House Of Elliott

Three generations of the Elliott at the 1996 Leicester Amateur Radio & Computer Show. The picture, shows on the far right, Frank Elliott G4PDZ, who is not only well known and respected in the amateur radio but is also the organiser behind the Leicester Show.

To the side of Frank (R-L) are his son Paul G4MQS and his grandson Scott 2EIF.1B who has just gained his Novice Licence. Both Paul and Frank were busy searching out bargains at the Waters & Stanton stand when this photo was taken by Jeff G4XYU.

Seeing three generations of the Elliott family enjoying a day out a radio show just goes to show that radio can be handed down through the generations and is truly a hobby for all the family! And of course you'll be able to meet the family at the 1997 Leicester Show, the date and venue of which we will publish as soon as it's announced.

Radio Amateurs Examination Course

Joh Beaumont G3NGD will be running a 36 week RAE course starting on Monday evenings in early January 1997 and running through to the examination in December. J ohn says the reason behind running such along course is that in the past he has found it difficult to cover the syllabus when starting a course and Septemer in...
Joy Does It Again!

The second National Novice Contest organised by Poole Radio Society took place on Sunday 22nd September 1996. The number of entries was up on last year and there were many new entrants taking part.

As you can see from the results tables most of the QSOs took place on 430MHz f.m. simplex channels. Band. For the second year running the overall winner was Joy Fowler 2E1DXA/M, operating from Derbyshire. The runner-up was Graham Westwood 2E1FDP/P who was entering the contest for the first time.

The logging standards for the competition were generally good and the contacts on 50MHz more than doubled from last year. It was suggested by one station that future contests be moved to June, July or August to bring it into the main sporadic-E propagation season and also suggested was the possibility of including the h.f. Novice bands or to run a separate contest. Your comments are welcome on both these points by the Poole Radio Society.

All entrants who enclosed an s.a.e. will receive a certificate. Check logs were received from Robert Snary (G4OHE) and members of the Poole Radio Society. Congratulations go to all winners, participants and everyone who helped to make the contest a success.

Knowden's New Mobile

Kenwood (UK) Ltd. have announced the introduction and imminent arrival of their latest dual-band v.h.f./u.h.f. mobile transceiver. The new TM-V7E is to replace the current TM-733E.

Claiming it as a “World first” Kenwood announce that the TM-V7E incorporates a “cool blue” i.c.d. display panel. The display is capable of showing dot matrix characters which can be switched between positive and negative display modes to ensure optimum visibility in all conditions.

The control panel on Kenwood's new transceiver is larger and also incorporates a five-in-one programmable memory, provides dual receive on the same band and up to 280 multi-function memory channels.

A feature which will be of interest to many v.h.f./u.h.f. mobile operators is the TM-V7E’s “Auto Simplex” checker facility. This checks whether or not it's possible to achieve simplex, rather than retransmit, communication.

Some of the main features include: a removable front panel 'head', auto-band change, time-out timer and audible frequency identification. Kenwood (UK) have informed PW's newsletter that the new transceiver will be available early in 1997 at a price to be announced.

Editorial note: There’s a review on the new TM-V7E coming to PW in the very near future.

Popov Versus Marconi 1996

Plus

Titanic & The Radio SOS 1997

Popov versus Marconi: The Centenary of Radio was the title of a lecture given by Ralph Barrett G2FQS at London's Institute of Physics in Portland Place on Wednesday 23rd of October.

Ralph Barrett, CEng, MIEE, MIET, provided the lecture and the reputation he has as an authoritative speaker - and an enthusiast on the subject - was truly reinforced. And although controversy has reigned from the early days of wireless...both Marconi and the Russian scientist Popov paid tribute to the work of Oliver Lodge which paved their way to successful radio communication.

Another of Ralph Barrett’s popular lectures - which should be of particular interest to PW’s readers, is to take place in the Maple Room, Fairfield Hall, Croydon in Surrey (Outer London) on Wednesday evening 12th of February 1997. Entitled ‘Titanic And The Radio SOS’ the dissertation will tell of the RMS Titanic’s maiden voyage and sinking and the radio apparatus which made played such a vital part in the event.

Working models will demonstrate the principles of the early 'state of the art' radio equipment. The account will also cover the recent high technology finding of the ship and recovery of artefacts.

Admission is free and there’s no charge for coffee and sandwiches at 7pm. No tickets are needed and PW readers are invited to ‘just come along’. Further details on the evening are available from the Hon. Secretary, IEE London Centre C/O IEE, Savoy Place, London WC2R 0BL (Photocopies of the full leaflet with car parking, train station and location details are available from the PW office on request).

Editorial note: Rob Mannion G3XFD and Tex Swann G1TEX from PW are planning to attend and look forward to meeting readers for an enjoyable evening’s meeting listening to another of Ralph Barrett’s very popular presentations.

Did it really work? Fascinated members of the audience examine replicas of the equipment used in the early days of wireless during Ralph Barrett G2FQS’s lecture at Portland Place, London on 23rd October 1996. (Photo courtesy of Susan Aldridge).

Tennamast News

Anyone living in the Benelux countries wishing to obtain any of the Tennamast range products can do so through their Dutch distributor Doeven Elektronika. Doeven are based at Schutstraat 58, 7901 EE HOOGEVEEN, The Netherlands. Tel: 0528 269679 or FAX: 0528 272221.

Lucky Winner

Paul Mooney G7SPV (right) is pictured here with Martin Lynch in front of a new icon display at the Martin Lynch & Son showroom in Ealing, West London. Paul won first prize of an IC-706 in a joint competition run between PW and Martin Lynch which ran in of PW three issues last year.

Paul travelled from his home in Cleveland to London on his motorbike to collect his prize and to take the opportunity to look around the Lynch empire. Paul winning came as double surprise, as he received notification on his birthday!

The Editorial team would like to say 'congratulations' to Paul and wish him many hours of happy operating with his IC-706 and also 'thanks' to Martin Lynch for supplying the prize.
In his new regular column aimed at the beginner, Rob Mannion G3XFD plans to go ‘back to the basics’ of radio. And to launch this new initiative, Rob introduces the PW ‘Cadet’…a radio kit specifically designed for the beginner to ‘whet their appetite’.

The completed PW Cadet receiver. (top right)

The PW Cadet Receiver Kit

The specially designed and commissioned Cadet receiver kit is available direct from the Practical Wireless offices for £23.95 E1 P&P (UK), £2 P&P (overseas). The kit contains comprehensive instructions and all the components needed to build the project, plus wire for the antenna. All you need to supply is a battery, suitable headphones, solder and soldering iron.

The smile says it all! Young Barry Rimmer discovers the world of radio.

The Editorial team on the magazine have been increasingly aware that a building enthusiast reading PW for the first time with no knowledge of radio, would be stuck! The result is this new bi-monthly column in which I’m aiming to help ‘launch’ them off on a lifetime’s interest in radio.

And although I’m probably breaking with tradition (usually theory first then a ‘bit of building’) my approach has worked over the years. So, here I go and in marches the PW ‘Cadet’ kit.

The PW Cadet is a very basic receiver kit specifically designed for the beginner on behalf of Practical Wireless by Tim Walford G3PCJ. Tim has produced for us a kit aimed specifically at encouraging the ‘raw’ beginner, in the form of a project that will work well and give enjoyment at the same time.

The photograph, top, shows the completed Cadet. It’s built on a single-sided printed circuit board and is ‘open plan’ (it doesn’t have a case) style. As you can see…it’s very straightforward.

The receiver covers the medium wave bands (approximately 500kHz to 1.5MHz) and one short wave (from approximately 3.3 to 6MHz) band. It uses one 2N3819 junction field effect transistor (JFET) as an infinite impedance detector, with two stages of audio amplification provided by two B317 metal oxide semiconductor field effect transistors (MOSFETS).

Audio output is suitable for feeding into portable stereo cassette player headphones. Power is provided be by an on-board PP3 9V battery.

Assembling The Kit

Assembling the kit is very simple and the designer has provided some excellent instructions. However, although the kit is designed for the beginner, I suggest that (depending on the ability of the individual) someone under the age of 12 be closely supervised.

The p.c.b. is not screen-printed with a component overlay. Tim considers that the learning process is helped if the builder has to check the component placement carefully with the (accurate) placing diagram which he supplies. And having helped Barry build the radio I agree that it does help!

Careful orientation of the semiconductors (the JFET and MOSFETS) is important in kit building and this is the area where anyone can go wrong. But the really difficult area is soldering!

Young Barry — although he’d tried soldering before — tended to put too much solder ‘on the job’. So, my advice is that if you’re trying a kit for the first time, that you practice your soldering first.

Altogether, assembling the kit took two hours. We built it on my dining room table (rather than in the shack) and used an angled desk lamp to improve the lighting. Extra time taken was spent on explaining things as we progressed. That’s why I think this type of kit is an idea ‘let’s do it together’ exercise.

At the end of the assembly stage Barry had learned (thanks to the comprehensive and clear instructions provided in the kit and some help and reassurance from me) how to identify the resistors and capacitors and their associated values. He also learned how to handle the transistors and to solder them correctly.

Excellent Results

The ‘proof of the pudding is in the eating’ and I’m pleased to say we got excellent results! With the antenna supplied in the Cadet kit (draped around the room) we could hear medium wave stations from all over Europe. And on short wave we could hear many short wave broadcasting stations. Radio China was predominant on the evening the Cadet was built!

I didn’t have any portable cassette player headphones, so we used some low impendence stereo headphones. These had separate (as-built) volume controls...quite useful because on some stations the resultant audio was quite loud!

The smile on Barry’s face said it all! But I must add that the kit does all that I hoped it would and the many discussions that the designer and I had, was time well spent!

However, the next stage has started because Barry asked me the inevitable question: “How does it work Rob, how does electricity flow?”

So, in the March issue you’ll be able to join Barry and I as we look at the basics of electricity with the aim of answering the questions and exploring this fascinating subject together! We’ll be setting out to really discover the basics behind radio.
### SERENE BASE ANTENNAS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSB-3001</td>
<td>144MHz/2.4GHz (1.4m)</td>
<td>£29.95</td>
</tr>
<tr>
<td>TSB-3002</td>
<td>144MHz/5.5GHz (2.4m)</td>
<td>£42.95</td>
</tr>
<tr>
<td>TSB-3301</td>
<td>144MHz/5.5GHz (3m)</td>
<td>£58.95</td>
</tr>
<tr>
<td>TSB-3302</td>
<td>144MHz/5.5GHz (3.7m)</td>
<td>£58.95</td>
</tr>
<tr>
<td>TSB-3383</td>
<td>144MHz/3.5GHz (1.1m)</td>
<td>£39.95</td>
</tr>
<tr>
<td>TSB-3312</td>
<td>144MHz/4.5GHz (1.1m)</td>
<td>£28.95</td>
</tr>
<tr>
<td>TSB-3164</td>
<td>5/10/15/20MHz (2.5/3.5/2.4GHz)</td>
<td>£29.95</td>
</tr>
<tr>
<td>V-2000 Diamond</td>
<td>6m/20m, 2/1/2/4 GHz (2.5m)</td>
<td>£134.95</td>
</tr>
<tr>
<td>GPSX Comet</td>
<td>6m/20m/70cm/36cm (2.6m)</td>
<td>£124.95</td>
</tr>
</tbody>
</table>

### ACCESSORIES

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSA-6001N Duplexer</td>
<td>£24.95</td>
<td></td>
</tr>
<tr>
<td>TSA-9003 Duplexer</td>
<td>£135.95</td>
<td></td>
</tr>
<tr>
<td>CFX-514 Triplexer</td>
<td>£56.95</td>
<td></td>
</tr>
</tbody>
</table>

### CARAVAGE

- Aluminium mast sets available in 4 x 5 foot sections.
- Carriage is available in the following sizes:
  - 10W dia £7.00
  - 13W dia £8.00
  - 2W dia £10.00

### SECTIONAL MASTS

- Aluminium mast sets available in 4 x 5 foot sections.
- Each section is swaged on its end and so that they slide into each other. The final section is left plain to allow for a mast cap or pulley assembly. Each mast totals 20 feet in height and is available in the following sizes:
  - 1/4 dia £18.00
  - 1/8 dia £20.00
  - 1/8 dia £24.00
  - 2 dia £45.00

### HANDHELD ANTENNAS

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-2602</td>
<td>2m/70cm/23cm (2/2/5.5dB)</td>
<td>£22.95</td>
</tr>
<tr>
<td>DB-770H</td>
<td>High gain 2m + 70cm telescopic antenna with wideband receiver.</td>
<td>£24.95</td>
</tr>
</tbody>
</table>

### TELESCOPIC MASTS

5 section telescopic masts. Starting at 2 1/4" in diameter and finishing with a top section of 1 1/4" we offer a 8 metre and a 12 metre version. Each mast is supplied with guy rings and stainless steel pins for locking the sections when erected. The closed height of the 8 metre mast is just 5 feet and the 12 metre version at 10 feet. All sections are extruded aluminium tube with a 16 gauge wall thickness.

### FIBREGLASS MASTS

- Non-inductive (¾ thickness). Sizes available:
  - 2 dia £10.00 per mtr
  - 1 1/4 dia £8.00 per mtr

### DELUXE G5RVS

Multi-stranded plastic coated heavy duty antenna wire. All parts reusable. Stainless steel and galvanised fittings.

Full size - 102ft. Only £39.95.
Half size 51ft. Only £29.95.

Carriage £6.00.}

### GET THE ACCESSORY CATALOGUE

Send £1 refundable against any purchase.

Full with masts, brackets, aerials and accessories. EVERYTHING NEEDED FOR THE RADIO AMATEUR.

### LONDON SHOWROOM & MAIL ORDER:

- Address: 132 High St. Edgware, Middx HA8 7EL
- Tel: 0181-951 5781/2
WARNING!! Not all advertisers in this magazine are authorised stockists for the products they sell. Manufacturers advise customers to purchase from authorised dealers to ensure full company guarantee back-up. HAYDON COMMUNICATIONS sell only brand new factory sealed stock direct from the manufacturers and are authorised for all its brands.

ALINCO PRICES

ALINCO DX-70
100W HF + 10W 6m transceiver with detachable head for mobile or base operation. Includes wide and narrow filtering, QSK, 100 memories, reverse CW, speech processor and pass-band tuning.
RRP £899. OUR PRICE £695.00

ALINCO DR-605
Dual band mobile transceiver 50/35W full duplex mode, RRP £395.
OUR PRICE £399.95

ALINCO DR-130
2m FM mobile transceiver. 50W.
RRP £339.
OUR PRICE £249.95

ALINCO DJ-G5
Dualband handheld transceiver. Includes: twin band Rx (wideband Rx) - full duplex + band scope and much more. RRP £399.
OUR PRICE £299.95

ALINCO DJ-190
2m FM handheld transceiver. The best value 2m handheld transceiver on the market includes nicads & charger. RRP £199.
OUR PRICE £149.95

ALINCO DJ-S41
70cm handheld transceiver with full CTCSS encode. 1.6MHz shift program steps, 300mW FM. Ideal for novices. RRP £149.
OUR PRICE £129.95

HF TRANSCEIVERS

KENWOOD TS-570D
New HF transceiver with built in ATU.
RRP £1499. OUR PRICE £1349.95

YAESU FT-1000MP (AC)
State of art HF transceiver.
RRP £1999. Our Price £1799.95

ICOM IC-T7E
HF transceiver with 6m + 2m.
OUR PRICE £995.00

ICOM IC-706
New HF/6m DSP transceiver.
SPECIAL OFFER £1999.99

VHF/UHF HANDHELD's

YAESU FT-50R
New ultra compact dual band transceiver with wideband RX: 76-950MHz (AM, FM, FM-N).
RRP £599.
OUR PRICE £289.95

ICOM IC-T7E
RX available 108-180/400-500/850-950MHz Compact dual band handheld. Incredible, everything you would possibly want incl CTCSS fitted as standard along with high power nicad + charger.
RRP £599.
OUR PRICE £295.00

VHF/UHF MOBILES

YAESU FT-8000
Dual band mobile transceiver with wideband RX: 110-550/750-1300MHz. RRP £549.
OUR PRICE £469.95

ICOM IC-2350H
Superb value for money dual band transceiver. 50W on 2m and 35W on 70cm.
Introductory offer we are giving away a FREE magmount and dualband antenna worth over £50. OUR PRICE £479.95

YAESU FT-290R II
2m all mode transceiver. We're giving away a free FL-2025 25W matching linear with every 290 sold this month. RRP £529.
OUR PRICE £549.95

Nissei EP-300T
Over the ear earpiece with lapel mic & PTT. Fits Kenwood, Alinco. Yaesu or Icom.
RRP £49.95
NBD 30 dual band version of the above £119.95

Nissei EP-300T
Over the ear earpiece with lapel mic & PTT. Fits Kenwood, Alinco. Yaesu or Icom.
RRP £22.95
P & P £1

INTEREST FREE CREDIT NOW AVAILABLE.
SEND US FOUR POST DATED CHEQUES OF £252.00 (INCL P&P UK MAINLAND)

ICOM IC-821H
The very latest all mode dual band base. RRP £1355.00
INTRO PRICE £1395.95

Please mention Practical Wireless when replying to advertisements
LONDON SHOWROOM & MAIL ORDER:- 0181-951 5781/2 FAX:- 0181-951 5782
Address:- 132 High St. Edgware, Middx HA8 7EL
Open Mon-Fri 9.30-5.30pm Sat 9.30-4pm. Close to Edgware underground station (Northern line) close to M1, M25, A406.
WEST MIDLANDS BRANCH:- Tel: 01384 481681
Unit 1, Canal View Industrial Estate, Brettel Lane, Brierley Hill, W Mids DYS 3LO

**POWER SUPPLIES**

P-2512
25-30 amp power supply with variable volts (3-15). Dual meters (VS + amps) and over voltage protection.

Most of our competitors are selling the 20A versions for the same price.

OUR PRICE £89.95

PORTABLE 12V POWER STATION
Will deliver 50 amps peak.
Charges from AC mains or trickle charge from car cigar lighter using lead supplied. RRP £10

OUR PRICE £46.95

__NEXT DAY DELIVERY__ £8.00

**DIGITAL AUDIO FILTERS**

DSP-399ZX RRP £299.00.........OUR PRICE £269.95
DSP-59 PLUS RRP £229.00........OUR PRICE £229.95
DSP-3 PLUS RRP £239.00.........OUR PRICE £219.95

MFJ 784B RRP £259.95....OUR PRICE £249.95

**A.E.A. PRODUCTS**

DSP-232.........Our price £479.95 Free P&P
PK-232MBX......Our price £319.95 Free P&P
PK-96...........Our price £219.95 Free P&P
PK-12...........Our price £129.95 Free P&P

All AEA products include software

**SECONDHAND EQUIPMENT**

IC-735 Immaculate condition.....£649.95
IC-751 Excellent condition.....£699.95
IC-765 VGC....£1199.95
IC-471 70cm all mode.....£649.95
IC-R7000 Wideband receiver....£749.95
IC-R70 Communication receiver.....£399.95
IC-R1 Handheld scanner....£199.95
TS-850S VGC.....£999.95
TS-450SAT As new.....£999.95
TS-680S HF + 6m.....£749.95
TS-530S VGC.....£499.95
TR-751E 2m all mode.....£499.95
AT-50 Matching ATU for TS-50.....£199.95

**THE SCANNER AND SHORTWAVE SPECIALISTS**

**OPTOELECTRONICS**

NEW OPTO CUB
The Cub is ideal for communication, surveillance and recreational monitoring applications. From 10MHz-2GHz. The Cub has maximised sensitivity for detecting RF in the near field and displaying the frequency detected. The cub features a digital filter that reduces false counts and random noise, digital auto capture that acts like an intelligent filter. It will capture and memorise up to 400 frequencies that can be recalled directly into the AR-8000. Supplied with Optalinx A universal interface

Optalinx A universal interface.........RPP £129.95
Opto-Xplorer.........RPP £139.95

NEW OPTO SCOUT 3.1-Mk2
Latest mini frequency finder from Optoelectronics. It will capture and memorise up to 400 frequencies that can be recalled directly into the AR-8000. Supplied with ant, nicads and fast charger. This month we are giving away a free case worth £18.

**SCANNERS**

AOR AR-8000
The ultimate handheld scanner covers everything from 50kHz-1900MHz without gaps. All mode AM, NFM, WFM, USB, LSB + CW. RRP £199.

OUR PRICE £339.00

YUPITERU
The ultimate handheld scanner covers 100kHz-1650MHz (all mode). RRP £299.

OUR PRICE £269.95

**ACCESSORIES**

POLICE STYLE HOLSTER HHC-T2
Matches all hand helds. Can be worn on the belt or attached to the quick release body holder.

£19.95 +P&P £1

HANDBELED MOUNTS
MA-399 Mobile holder. Fits all handheld radios. Sticks onto dashboard of car.

£9.95 P & P £2

QS-200 Air-vent hand held holder £9.99

QS-300 Desk top hand held holder £19.99

**COMMUNICATION RECEIVERS**

ICOM IC-R8500
The ultimate all mode base receiver. 100kHz-2GHz. Perfect your old receiver and move into the 21st century. RRP £1685. OUR PRICE £1549

Interest free credit available. Send us four post-dated cheques for £389 (inc. P&P UK mainland).

AOR AR-7030
Brilliant new all mode short wave receiver with synchronous AM + remote control.

OUR PRICE £749.95

TARGET HF-3
Communication receiver covers 30kHz-30MHz. Complete with power supply and long wire aerial.

ORDER YOUR TODAY AND CLAIM FREE DELIVERY.

SANGEAN ATS-818
Award-winning portable shortwave receiver (all model) 0-30MHz. RRP £189.95

OUR PRICE £139.95

**MULTI-BUY EP-300**
Deluxe over the ear earpiece.

Buy 1 £9.95 + £1 P&P
Buy 2 £15.00 + £1 P&P.

Practical Wireless, January 1997
SUNRISE ELECTRONICS
CENTRAL LONDON'S ONE-STOP COMMUNICATIONS CENTRE
229 TOTTENHAM COURT ROAD, LONDON W1P 9AE

MAIL ORDER HOTLINE
0171-637 3727
Fax: 0171 - 637 3728

MAGELLAN GPS
- GPS-2000.............£145.00
- GPS-3000.............£199.00
- GPS-4000.............£239.00
- MERIDIAN XL...........£249.00
- TRAILBLAZER...........£279.00
- NAV DLX10.............£479.00
- SKYBLAZER.............£POA

Full range of Magellan GPS in stock (new only).
★ Discount for Scouts
★ Discount for clubs & institutes

GARMIN GPS
- GPS-38..................£159.00
- GPS-40..................£199.00
- GPS-45XL..............£229.00
- GPS-75..................£399.00
- GPS-89..................£349.00
- GPS-90..................£469.00
- GPS-120.................£354.00
- GPS-MAP 130...........£619.00
- GPS-MAP 175...........£619.00
- GPS-MAP 210...........£884.00
- GPS-MAP 220...........£1188.00

ALL ACCESSORIES FOR MAGELLAN & GARMIN GPS IN STOCK
- Power data cable
- PC kits
- Marine antenna
- Mounting brackets
- Training video
- Car adaptor
- Extension antennas
- Car antennas
- Software for PC available

SCANNERS/TRANSCEIVERS

Stockists of Kenwood, Yaesu, Alinco, Yupiteru and AOR. Call us now for further information.

- AOR-8000
  All mode scanner
  500kHz-1900MHz.
  PC compatible.
  £365

- YUPITREU MVT-710E
  0.1kHz-1650MHz.
  One of the best.
  £285

- WELZ WS-1000E
  Smallest scanner in stock.
  500kHz-1300MHz.
  £310

- AOR AR-2700
  500kHz-1300MHz.
  No SSB.
  £189

- YUPITREU VT-125
  108MHz - 142MHz
  £169

- YUPITREU VT-225
  Air - Sea - Land.
  £230

- ALINCO DJ-S41
  UHF Transceiver.
  Compact size.
  £130

- YAESU FT-50R
  VHF/UHF dual bander.
  £295

- ICOM IC-T7E
  70 memories dual bander.
  £295

- KENWOOD TH-22E
  VHF 144MHz handheld.
  £230

- KENWOOD TH-28
  2m handheld. Very compact trans'.
  £280

- ALINCO DJ-190E
  2m handheld trans' with charger.
  £175

NIGHTVISION

PRICES FROM £199.00

- Moonlight NV-100
  with illuminator.
  Tremendous night vision performance at an economical price.
  £319.00

- Moonlight Mini
  Sleek, miniaturised design – only 5.5" long.
  £269.00

SECOND GENERATION

PRICES FROM £699.00

- ITT QUEST 100
  £699.00

- ITT QUEST 150
  £899.00

- ITT QUEST 250
  £1699.00

- ITT QUEST 300
  (VIDEO CAMERA ADAPTABLE)
  £POA

NEXT DAY DELIVERY AVAILABLE. QUANTITY DISCOUNTS AVAILABLE. EXPORT ENQUIRIES WELCOME. TRADE CUSTOMERS CALL FOR BEST PRICES. ALL PRICES SHOWN INCLUDE VAT.

16
Practical Wireless, January 1997
Did you know that by taking out a subscription to Practical Wireless and its sister publication Short Wave Magazine you can save £1.40 over a year? If you were to buy both magazines individually every month it would cost you £5.60 (UK), but take out a joint subscription and it will only cost you £4.51.

By subscribing to PW & SWM you will be ensuring that you keep up-to-date, not only with the latest in Amateur Radio, but also with the latest developments in the world of short wave listening.

Short Wave Magazine is packed every month with items of interest and includes features and regular columns on Airband, Satellites, Broadcast, DXTV and Scanning, as well as reviews of the latest equipment, a comprehensive Frequency Exchange and all you need to know to keep in touch with where to listen for what interests you.

Take advantage of this offer and your radio hobby will be complete, with not one but two radio magazines dropping through your letterbox every month! It also means that by subscribing you’ll be exempt from any cover price increases during the period of your subscription and that you’ll have all the ‘radio reading’ you need to hand for under £4 a month!

So, what are you waiting for?
Fill in the form below or call the Subs Hotline on (01202) 659930 TODAY! Then sit back and wait for your double dose of radio every month.

Subscription Rates
£45 UK
£55 Europe Airmail
£58 Rest of World Airmail
£67 Rest of World Airmail

Please arrange a Joint Subscription to PW & SWM for just £

Name: ____________________________
Address: ____________________________
Postcode: ____________________________
Tel: ________________________________

I enclose a Cheque/PO payable to PW Publishing Ltd.
I Please charge my Access/Visa card the amount of £
Card No: _______________________
Valid from: ________________________ to ________________________
Signature: ________________________

Editor

Practical Wireless and Short Wave Magazine

SAVE OVER £1.40 WHEN YOU SUBSCRIBE TO PRACTICAL WIRELESS AND SHORT WAVE MAGAZINE
Amateur Radio Marathon

Glyn Jones GWOANA has recently written into 'Club Spotlight' to report on a successful event held at Barry Amateur Society's Club House back on Sunday 22 September. On that day, the Barry Amateur Radio Society did a 24 hour radio marathon to raise money to buy specially built radio cassettes for use by the blind in South Wales.

The object of the "Marathon" was to contact as many people and countries around the world by amateur radio in 24 hours using only 100W. All contacts were sponsored by the following groups of people: BP Plastics, Llantwit Lions, Cowbridge Club, Bridgend Lions, Llantwit Lions, Cowbridge Club, Athans Engineers, Barry Rugby Club, RAF St. Tombs, BP Plastics.

Unfortunately, the event was not blessed with good radio conditions due to QRN, static crashes and bangs. The bangs, hisses and crackles made it hard on the ears, but in the spirit of the cause, the team battled on and made 260 radio contacts in 44 countries. Their efforts were rewarded with some good contacts.

The farthest country reached was Thailand (HS1GUW), 6047 miles from Barry! The most interesting contact was in Baghdad Iraq (Y19681F), 2688 miles from Barry. This station was the most interesting contact was in Baghdad Iraq (Y19681F), 2688 miles from Barry. This station was the farthest country reached, with the station operator passing on his good wishes to the club, 'hobby' Clark G3BEC, Don McLean G3NOF and Den Hayward G3OMH.

Despite the troubles in Iraq, the station operator passed on his good wishes to the people of Wales and to the blind in particular. He said that if it was possible, he would send a contribution to the club's appeal, but it was not possible, but he sent his kind thoughts as he fully understands the tragedy of blindness.

New Venue For Three Counties

The Three Counties Amateur Radio Club celebrated its 50th Anniversary in September. On that day, the club chairman, 'hobby' Clark G3BEC, Don McLean G3NOF and Den Hayward G3OMH.

The Three Counties Amateur Radio Club celebrated its 50th Anniversary in September. The club chairman, 'hobby' Clark G3BEC, Don McLean G3NOF and Den Hayward G3OMH.

The event was opened by the club chairman, who was persuaded to keep the welcome speech to less than five minutes!, which gave the club the opportunity to explain the significance of Yeovil town in the amateur radio world. The club received many letters of congratulations from neighbouring radio clubs and also from the major radio publications.

A representative range of radio equipment spanning the 50 year period was on display, which attracted considerable interest, as did the h.f. on-air station operated by the club's newest A-class operator, Rob MOAGT. The evening was then rounded off by a superb buffet provided by the ladies of the British Red Cross, the Red Cross being the club's landlord.

A commemorative booklet of useful circuits and club history was released to the unsuspecting audience, including the Mayor of Yeovil, Councillor Mrs P. Martin and her husband Ian, Ashley Edwards G7WFL, Chairman Mike Smith G7SDD, The Mayor, Councillor Mrs P. Martin and Councillor Roy Mills of the South Somerset District Council. The isolated hand (centre) on the Morse key belongs to Rob Markam MOAGT, the club's newest A-Licence holder!

Golden Anniversary For Yeovil

Back in October, the 17th, the Yeovil Amateur Radio Club celebrated its 50th Anniversary in style, with over 50 members and guests in attendance, including the Mayor of Yeovil, Councillor Mrs P. Martin and her husband Ian, Vice Chairman of South Somerset District Council, Mr Ray Mills, the RSGB RLO, Dick Atterbury and three founder members of the club, 'Nobby' Clark G3BEC, Don McLean G3NOF and Den Hayward G3OMH.

The event was opened by the club chairman, who was persuaded to keep the welcome speech to less than five minutes!, which gave the club the opportunity to explain the significance of Yeovil town in the amateur radio world. The club received many letters of congratulations from neighbouring radio clubs and also from the major radio publications.

A representative range of radio equipment spanning the 50 year period was on display, which attracted considerable interest, as did the h.f. on-air station operated by the club's newest A-class operator, Rob MOAGT. The evening was then rounded off by a superb buffet provided by the ladies of the British Red Cross, the Red Cross being the club's landlord.

A commemorative booklet of useful circuits and club history was released to the unsuspecting audience, including the Mayor of Yeovil, Councillor Mrs P. Martin and her husband Ian, Ashley Edwards G7WFL, Chairman Mike Smith G7SDD, The Mayor, Councillor Mrs P. Martin and Councillor Roy Mills of the South Somerset District Council. The isolated hand (centre) on the Morse key belongs to Rob Markam MOAGT, the club's newest A-Licence holder!
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 Hoddesdon 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, in January 1997, 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, including details of how they're produced. Most importantly, remember to mark your envelope 'Spotlight Club Magazine Competition'.

The panel of judges (last year) are: Dave Wilkins G3SHY, myself, Zoe Crabb, 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!

Zoë

Hornsea's 25th Anniversary

Back in October, the Hornsea Amateur Radio Club celebrated the 25th anniversary of its foundation by holding a reunion of current and past members of the club in the Hornsea Floral Hall. Over a hundred members and guests enjoyed a very pleasant social gathering.

The club was formed from an RAE class of six students and the instructor G3TLI. Three of the founder members, Duncan Heathershaw G3TLI and his wife, Joan G4CHH and Norman Shields, who was the first Chairman. Running the RAE and subsequently the Novice scheme has been two of the main activities of the club and it has produced many local amateurs. Among the guests were two members who became Presidents of the RSGB.
Special Offer

Following the publication of Ray Petri’s G00AT new book Basic Radio and Electronic Calculations and the favourable review it was given by Rob G3XFD in the December 1996 issue, we’ve managed to put together a special offer for PW readers.

We are offering Basic Radio and Electronic Calculations together with the Casio FX-115s Scientific Calculator as featured in Ray’s book for the special price of £24.95 plus £1 P&P (UK), £4 P&P inc. insurance (overseas). That’s a saving of over £7, as the pair would normally cost £31.94 plus P&P. And, don’t worry if you’ve already got your copy of Basic Radio and Electronic Calculations or already own a Casio FX-115s as we are able to offer you the chance to buy either item separately at an equally special price.

You can buy Basic Radio and Electronic Calculations for the special price of £13.50 plus £1 P&P (UK), £2 P&P (overseas) and the Casio FX-115s can be yours for just £13.50 plus £1 P&P (UK), £4 P&P inc. insurance (overseas).

So, go on what are you waiting for? - Place your order today by using the Order Form on page 70 of this issue or calling the Credit Card Hotline on (01202) 659930 and quoting PW1.

Offer open until 24 January 1997.

---

The G0LOV & G4LUE UK Callbook-On-Disk gives listings for callsigns up to M0AMR, M1BBR and 2E0APE and 2E1FIG. Once installed the callbook can be used to search for information by callsign, address, postcode, surname or frequency (repeaters). The callbook requires an AT-PC 286 (or a PC with a 286 processor) computer system (or better) with a VGA/mono monitor, 3.5in 1.4Mb floppy disk drive. The program is supplied on three 3.5in disks and requires a minimum of 6.5Mb of hard disk space to run the basic data or a total of 10.5Mb hard disk space to run the full address and surname searches.

So, if you want to put your computer to good use or just want a quicker and easier way of finding callsign entries, why not enter our competition and you could be one of 25 lucky recipients of a UK Callbook on disk. If you’re not lucky enough to win, copies of the GOLOV/G4LUE Callbook-On-Disk are available from the PW Book Store for £11.75 plus £1 P&P (UK), £2 P&P (overseas).

How To Enter

All you have to do is to find Santa. We’ve hidden Santa elsewhere in this copy of PW and all you have to do is fill in the form telling us where you found him. Then send your completed entry form to Christmas Competition, Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. The first 25 entries pulled from Santa’s sack will win a copy of the UK Callbook on disk.

The Editor’s decision on the winner is final and no correspondence will be entered into. Please do not put any other correspondence in with your competition entry.

I found Santa On Page

Name: ........................................................................................................
Callsign: .............................................................................................
Address: ............................................................................................... Postcode:

*If you do not wish to receive future mailings as a result of entering this competition please indicate.
Closing date for entries is 10 January 1997.
Please mention Practical Wireless when replying to advertisements

Communications Centre (Photo Acoustics Ltd.)

TWO-WAY RADIO • AMATEUR RADIO • AUDIO VISUAL • SALES & SERVICE
58 High Street, Newport Pagnell, Bucks MK16 8AQ. Tel: (01908) 610625 FAX: (01908) 216373 (E-Mail: 100304.71@compuserve.com)

KENWOOD

<table>
<thead>
<tr>
<th>Model</th>
<th>List Price</th>
<th>Our Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS-870S</td>
<td>£2399</td>
<td>£1969</td>
</tr>
<tr>
<td>TS-50S</td>
<td>£1059</td>
<td>£889</td>
</tr>
<tr>
<td>TS-790E</td>
<td>£1969</td>
<td>£1699</td>
</tr>
<tr>
<td>TM-255E</td>
<td>£949</td>
<td>£799</td>
</tr>
<tr>
<td>TM-455E</td>
<td>£1059</td>
<td>£925</td>
</tr>
<tr>
<td>TM-733E</td>
<td>£729</td>
<td>£629</td>
</tr>
<tr>
<td>TM-251E</td>
<td>£419</td>
<td>£359</td>
</tr>
<tr>
<td>TM-451E</td>
<td>£459</td>
<td>£409</td>
</tr>
<tr>
<td>TH-79E</td>
<td>£479</td>
<td>£409</td>
</tr>
<tr>
<td>TH-22E</td>
<td>£254</td>
<td>£219</td>
</tr>
<tr>
<td>TH-42E</td>
<td>£289</td>
<td>£249</td>
</tr>
</tbody>
</table>

Yaesu

<table>
<thead>
<tr>
<th>Model</th>
<th>List Price</th>
<th>Our Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT-1000</td>
<td>£3799</td>
<td>£2999</td>
</tr>
<tr>
<td>FT-1000MP/AC</td>
<td>£2849</td>
<td>£2279</td>
</tr>
<tr>
<td>FT-800R</td>
<td>£649</td>
<td>£489</td>
</tr>
<tr>
<td>FT-840</td>
<td>£959</td>
<td>£779</td>
</tr>
<tr>
<td>FT-736R</td>
<td>£1999</td>
<td>£1399</td>
</tr>
<tr>
<td>FT-290R2</td>
<td>£599</td>
<td>£539</td>
</tr>
<tr>
<td>FT-690R2</td>
<td>£649</td>
<td>£539</td>
</tr>
<tr>
<td>FT-3000M</td>
<td>£479</td>
<td>£389</td>
</tr>
<tr>
<td>FT-50R</td>
<td>£349</td>
<td>£299</td>
</tr>
</tbody>
</table>

Icom

<table>
<thead>
<tr>
<th>Model</th>
<th>List Price</th>
<th>Our Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC-775DSP</td>
<td>£3699</td>
<td>£2999</td>
</tr>
<tr>
<td>IC-736</td>
<td>£1969</td>
<td>£1599</td>
</tr>
<tr>
<td>IC-756</td>
<td>£2195</td>
<td>£1995</td>
</tr>
<tr>
<td>IC-8500</td>
<td>£1649</td>
<td>£1548</td>
</tr>
<tr>
<td>IC-706</td>
<td>£1195</td>
<td>£999</td>
</tr>
<tr>
<td>IC-821H</td>
<td>£1595</td>
<td>£1249</td>
</tr>
<tr>
<td>IC-275H</td>
<td>£1496</td>
<td>£1395</td>
</tr>
<tr>
<td>IC-2350H</td>
<td>£649</td>
<td>£469</td>
</tr>
</tbody>
</table>

P-2512

25-30 amp power supply with variable volts (3-15). Dual meters (VS + amps) and over voltage protected.

£89.95

SAVE £10

5 YEAR WARRANTY AVAILABLE

EXAMPLE

Yaesu FT-1000 with 1 year manufacturer's warranty: 4 years extra warranty = £169.80

KEnwood TS-570D

Setting the standard in performance

£Ring for price

KENWOOD

* 16 bit DSP AF signal processing
* CW auto tune
* 5W QRP setting
* Built-in auto ATU
* Electronic keyer

New IC-756 DSP HF transceiver + 6m £1995

POWERCLEAR™

Add on DSP
• Built in audio amp.
• Speaker mounting bracket.
• Use with ANY Radio, Transceiver, voice or Data Link, even noisy telephone lines.
• Ideal for vehicle mounting.
• Noise reduction
• Notch filter
• Variable band pass filter

£329.00

SAVE £70

SG-230 Smartuner®

Antenna Coupler SSB, AM, CW & DATA

£329.00

SAVE £70

You can't buy a smarter tuner than this. An automatic antenna coupler so intelligent it precisely tunes any length antenna - 8 to 80ft - in the HF band.

The Smartuner® automatically evaluates and switches 64 Inout and 32 output capacitance combinations, plus 256 inductance combinations in a “pi” network. The amazing result is over a half-million different ways to ensure a perfect match for your transceiver.

The most intelligent feature of all is that the Smartuner® remembers the chosen frequency and tuning values, and will automatically reselect those values - in less than 10ms, each time you transmit on that frequency.

Buy Smart.

SAVE £269.00

Carr £10.00

5 YEAR WARRANTY IS AVAILABLE ON ALL LISTED PRODUCTS

AUTHORISED AGENTS FOR KENWOOD, ICOM, YAESU & ALINCO. FULL SERVICE FACILITIES AVAILABLE

Spend up to £1,200 instantly with a Photo Acoustics Ltd. credit charge card.

Part exchange welcome. Ask for KERRY G6IZF. Jon or JANE.

Retail showroom open Mon - Fri 9.30 - 5.30, (Thursday 9.30 - 12.30) Saturday 9.30 - 4.30

Goods normally dispatched within 24 hours. Please allow 7 banking days for cheque clearance. Prices correct at time of going to press - E&OE

Practical Wireless, January 1997
**MULTICOMM 2000**

**PRE-STOCKTAKING SALE**

**SPECIAL OFFERS**

<table>
<thead>
<tr>
<th>Brand</th>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>YAESU</td>
<td>FT-900DC</td>
<td>£1199</td>
</tr>
<tr>
<td>ICOM</td>
<td>IC-2350H</td>
<td>£425</td>
</tr>
<tr>
<td>YAESU</td>
<td>FT-50R</td>
<td>£285</td>
</tr>
<tr>
<td>KENWOOD</td>
<td>TH-79E</td>
<td>£399</td>
</tr>
<tr>
<td>YUPITERU</td>
<td>MVT-7100</td>
<td>£259</td>
</tr>
<tr>
<td>ICOM</td>
<td>IC-766</td>
<td>£189</td>
</tr>
<tr>
<td>BEARCAT</td>
<td>9000XLT</td>
<td>£235</td>
</tr>
<tr>
<td>TIMEWAVE</td>
<td>DSP-599ZX</td>
<td>£325</td>
</tr>
<tr>
<td>TIMEWAVE</td>
<td>DSP-9+</td>
<td>£189</td>
</tr>
<tr>
<td>AOR</td>
<td>AR-8000</td>
<td>£340</td>
</tr>
</tbody>
</table>

**Bargain clearance of used equipment + Ex-Demo**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOR 1500EX</td>
<td>£159</td>
</tr>
<tr>
<td>ICOM AT-100</td>
<td>£195</td>
</tr>
<tr>
<td>ICOM IC-255</td>
<td>£39</td>
</tr>
<tr>
<td>JRC NRD-525</td>
<td>£450</td>
</tr>
<tr>
<td>JRC NRD-535</td>
<td>£575</td>
</tr>
<tr>
<td>KENWOOD TH-28E</td>
<td>£149</td>
</tr>
<tr>
<td>KENWOOD TS-50</td>
<td>£699</td>
</tr>
<tr>
<td>KENWOOD TS-820</td>
<td>£299</td>
</tr>
<tr>
<td>KENWOOD TS-140</td>
<td>£445</td>
</tr>
<tr>
<td>KENWOOD TS-440SAT</td>
<td>£699</td>
</tr>
<tr>
<td>KENWOOD TS-450SAT</td>
<td>£899</td>
</tr>
<tr>
<td>KENWOOD TS-850SAT</td>
<td>£1099</td>
</tr>
<tr>
<td>KENWOOD TS-930SAT</td>
<td>£799</td>
</tr>
<tr>
<td>KENWOOD TS-940S</td>
<td>£895</td>
</tr>
<tr>
<td>KENWOOD R-5000</td>
<td>£550</td>
</tr>
<tr>
<td>KENWOOD R-1000</td>
<td>£265</td>
</tr>
<tr>
<td>LOWE HF-225 RECEIVER</td>
<td>£325</td>
</tr>
<tr>
<td>OPTO 2300 COUNTER</td>
<td>£75</td>
</tr>
<tr>
<td>OPTO INTERCEPTOR</td>
<td>£145</td>
</tr>
<tr>
<td>SIGNAL R-532</td>
<td>£159</td>
</tr>
<tr>
<td>SIGNAL R-535</td>
<td>£325</td>
</tr>
<tr>
<td>SIGNAL R-537</td>
<td>£93</td>
</tr>
<tr>
<td>UNIVERSAL M-8000</td>
<td>£575</td>
</tr>
<tr>
<td>YAESU FRG-100</td>
<td>£375</td>
</tr>
<tr>
<td>YAESU FT-101</td>
<td>£250</td>
</tr>
<tr>
<td>YAESU FRG-50B</td>
<td>£65</td>
</tr>
<tr>
<td>YAESU FT-290</td>
<td>£225</td>
</tr>
<tr>
<td>YAESU FT-290II</td>
<td>£269</td>
</tr>
<tr>
<td>YAESU FT-690</td>
<td>£269</td>
</tr>
<tr>
<td>YAESU FT-480</td>
<td>£145</td>
</tr>
<tr>
<td>YAESU FT-736</td>
<td>£1050</td>
</tr>
<tr>
<td>YAESU FT-980</td>
<td>£769</td>
</tr>
<tr>
<td>YAESU FT-5100E</td>
<td>£325</td>
</tr>
</tbody>
</table>

**SALES HOTLINE: 01480 406770**

Unit 3, 86 Cambridge St. St Neots, Cambs PE19 1PJ

Fax: 01480 406770  E-mail: multicom@intecc.co.uk
Automatic Auteck

At last, Auteck Research have launched a v.h.f. version of their rather neat antenna and feeder analysing tester. The RF Analyst RF1 model for h.f. has been available for some time, now it's joined by a v.h.f/u.h.f. version, the VHF Analyst model RF5.

The Auteck RF5 model has a coverage of 35-550MHz in three bands, over which it will measure frequency, s.w.r. or impedance automatically, displaying the result on a four digit display. Like its low frequency partner, the RF5 runs from a single 9V battery and has a series of small push-buttons to select the desired function to be displayed.

A function of the RF5 is its ability to display two parameters alternatively, by pressing the desired buttons rapidly one after another. You can watch the impedance and s.w.r. on the display while sweeping through the frequency range. A rather neat 'trick' is that by pressing both the UP and DOWN together, the unit will sweep the current frequency band to find the point of lowest s.w.r. A tap on the FREQ then the SWR buttons will show both the frequency and s.w.r. alternately, a rather neat idea. The VHF Analyst Model RF5 costs £289.95 + £10 P&P from Eastern Communications, Cavendish House, Happisburgh, Norfolk NR12 012U Tel: (01692) 650077 or FAX your order on (01692) 650925.

Kit Or Bits

One of the most popular antennas for general h.f. operation has to be the G5RV version of a doublet. Hayden Communications make a full kit of high quality parts to self-assemble your own antenna. If you have a G5RV already, is it due a refurbishment? If so, Hayden will supply all the various parts to refurbish the one you already have. The full kit costs £39.95 for a full sized G5RV and £29.95 for a half-sized version. For the cost of the parts contact Hayden Communications at 132 High St. Edgeware, Middlesex HA8 7EL. Tel: 0181-951 5781/2 or at their West Midlands branch at: Unit 1, Canal View Industrial Estate, Brettel Lane, Brierley, W. Midlands DY5 3LO. Tel: (01384) 481681.

Welcome to AiA!

Welcome to the first issue of Antennas in Action, the new bi-monthly section of Practical Wireless. This section is to feature radio related items that start after the r.f. output socket of your rig: be it cable, feeder, accessory or antenna.

In this section I hope to bring you news of related products and try and answer your questions that relate to getting your precious r.f. energy out into the wild blue yonder. Along with 'Antenna Workshop' and a good project, I shall try to answer your questions. I'm not claiming to know it all, I just might know someone who can answer your questions and I have access to a good library. I shall look upon this section as a way that we can all learn more about antennas and how to feed them. We also want your ideas, to learn we have to listen, but someone has to talk while we listen. Let's do both in this section.

Contents

News & Intro 23
Postage Stamp Loops 24 by Des Heath G3ABS
Antenna Workshop 26 by David Butler G44ASR
Tex Topics 28
Tex' Swan GITEX
Late News 30

8 pages of antennas
Since I was first licensed, my main interest in Amateur Radio has been the construction of antennas. I had many years of making 'doodlebugs', 'V' beams, and even tried rhombics antennas. Then I had to move house and, due to the shortage of space, had to find new ideas for my antennas. I would have to scale down the size of the antenna farm.

In the new location, local bye-laws prevented me putting up a tower with a rotary beam, so my only option seemed to be a vertical antenna. Vertical antennas have given me reasonable success, but they were not without their problems. I was almost at my wits end, when an article on magnetic loops by an Italian amateur set me on a new course.

--

Postage Stamp Loops

Since I was first licensed, my main interest in Amateur Radio has been the construction of antennas. I had many years of making 'doodlebugs', 'V' beams, and even tried rhombics antennas. Then I had to move house and, due to the shortage of space, had to find new ideas for my antennas. I would have to scale down the size of the antenna farm.

In the new location, local bye-laws prevented me putting up a tower with a rotary beam, so my only option seemed to be a vertical antenna. Vertical antennas have given me reasonable success, but they were not without their problems. I was almost at my wits end, when an article on magnetic loops by an Italian amateur set me on a new course.

Perspex sheet 800x400mm. To aid tuning a '0.1' slow motion drive and tuning control was then added.

To connect the capacitor I wrote a small BASIC program to calculate what value it should have. I soldered two pieces of coaxial cable braid, 100mm long, to the ends of the loop with a complete turn round the tube. The new 'tails' were soldered one to each stator. Each end of the loop was then mechanically secured to the Perspex with two small 'U' bolts.

I decided to use a gamma matching system to feed the antenna so, a small copper angle bracket an SO239 coaxial socket was fabricated and fitted. This socket and bracket was then soldered to the loop diametrically opposite the tuning unit to form the input side of the gamma match.

The gamma matching rod I made from a piece of 3mm copper tube 550mm long. One end was soldered to the SO239 socket inner, the other has a copper clip to slide along the loop to find the best matching point for the lowest s.w.r. The drawing of Fig. 1 shows the general idea of my first loop antenna.

As a support for the complete antenna, I used a good strong broom handle treated with several coats of marine varnish. One end on the handle was fastened to the Perspex sheet with 'U' bolts and across the circle was secured to the small angle bracket.

Testing Phase

Then came the testing phase of the job, during which the antenna was mounted on a portable folding workbench. After connecting to the transceiver and applying about 20W of r.f., I quickly tuned the loop to resonance. Then, using a pair of well insulated pliers, I made the final adjustment to obtain 1:1 s.w.r. by varying the distance between the gamma rod and the loop.

Loop tuning is critical and made more difficult by the effects of hand capacity, so I decided to motorise the task. I used a barbecue spit motor as it fitted on the Perspex sheet as before, but I fitted the tuning parts inside a plastic food storage box 250x305x100mm. This simple container provides excellent weather protection.

The insulation on the cable meant that I had to try a different method of feeding the loop. I decided to use a Faraday loop method, in which a small section of coaxial is made to form a smaller loop with the inner of the coaxial cable connected to the outer screen after forming the loop. Have a look at the layout of Fig. 3.

Faraday Loop

The Faraday feed loop was made from a 930mm length of coaxial cable with the inner conductor connected to the braid. This particular method proved very difficult to obtain an acceptable match. So, as a second attempt I tried a loop of 3mm copper tube 930mm long. This new feeder method gave an s.w.r. of unity first try, but trials showed that noise levels were still very high. I had to screen this new loop to reduce noise pick-up.

I covered the tube with heat shrink tubing then with a length of braiding from coaxial cable. Finally I then covered the new 'screen' with heat shrink again to connect the braid to the SO239 outer at the feed point. This new feed loop, as shown in Fig. 4, works really well on 14 and 18MHz.

The loop, with its general layout shown in Fig. 5, is then mounted on a length of light grey or white 40mm pvc tube. Don't be tempted to use the cheaper dark grey or black piping. The colouring is carbon based and makes the tubing looky, at r.f. which absorbs your precious power.

On c.w. in just over two years, I've worked nearly 200 countries, without burning midnight oil. But since my initial trials I've since made another loop, with a diameter is 860mm and using the same type of

PW - Antennas in Action, January 1997

24
The feed loop in this instance is double-throw reversing switch and a regulators provide a 2V and -IV at heater transformer, rectified and motors uses 6.3V a.c. from an old on the air on a new band.

I don't have sufficient space in the garden to mount all three loops at the same time. So I have a 2m length of aluminium mounting pole driven into the ground close to the shack. The coaxial cable feed and the motor control cables are contained in a small die cast box bolted onto the tube. It's only a five minute job to put one of the loops on the tube, screw the coaxial cable, plug in motor control plug to be on the air on a new band.

The power supply for the tuning motors uses 6.3V a.c. from an old heater transformer, rectified and feeding two voltage regulators. The regulators provide a 2V and 1V at about an amperere. A double-pole double-throw reversing switch and a push button control look after motor direction and drive control.

The shack control box is connected via three wire cable and a socket to the outside control box. It's most important that each voltage feed control wire is amply bypassed with capacitors of about 10nF to common.

**Bi-directional**

The loop's power lobes are bi-directional and at right angles to the plane of the loop. There are narrow deep nulls (in the radiation pattern) in the plane of the loop. These may be used to reduce local interference. To take full advantage of the directional properties of the antenna, two cords are fitted to the antenna and mount. The two lines enable the loop to be rotated through 90° from inside the shack.

The performance of these loop antennas can be improved by fitting four radials (twice the loop diameter in length) at right angles at ground level. These earth radials improve the bandwidth, and tuning is made easier using them. I've found still greater improvement by covering an area some four metres square with small-mesh wire fencing buried under the turf and connected to the radials.

**Miniature Antenna Farm**

With the further decline of the sunspot cycle and to complete my miniature antenna farm, I needed a loop covering the 3.5 and 7MHz bands. To be efficient on these bands a loop circumference of 8.750m is required. The Heliax cable I'd used for the smaller loops was too thin to keep its shape, so a more robust material was needed. This time I used LDF5-50HD Heliax, which is about 30mm in diameter.

The LDF5-50HD cable proved ideal and was cut to the required length of 8.750m. After removing 50mm of insulation from each end and innning the exposed copper, I fitted two pieces of 25mm copper tube 50mm long as ferrules as described above.

The new cable was formed into a loop about 2.75m diameter. A visit to the next rally provided a 1000pF 7.5kV vacuum capacitor although, this time I had some hard work haggling to keep the cost down to £2.5. And as the loop is much bigger, this time I made a wooden frame to support the loop.

To enclose the tuning components I used two plastic trays (sold as car litter trays) and fixed a piece of 10mm perspex to reinforce the bottom of one tray. The capacitor and motor are mounted on this and the second tray fixed on top to keep the weather out. The tuning unit is fixed at the bottom of the support frame, connection of the loop ends is again made with copper braid.

The feed loop is 550mm diameter and made from 5mm copper tube. It's shielded in the same way as the 14MHz loop. With the present fixed support this loop is unable to rotate, so it is installed firing north and south. The loop performs quite well during regular weekly skeds with Torquay, and gets a S-5/S-9 report on 80m using 100W s.s.b.

Contacts with stations east or west are usually S-5. Eventually I hope to scrap the support frame and use a 10m length of 50mm diameter hardwood to support the loop and allow it to be rotated through 90° by a similar method to the other loops I've mentioned.

When I commenced this construction of loops I had a limited budget and I'm pleased to tell you that I can still afford one for the 10MHz band. Only this week I managed to buy another length of LDF-50 Heliax for a 2m diameter loop. Next rally I shall be looking for the capacitor to work with this new loop.

I read an article in a recent copy of QST, claiming that the overall efficiency of mag loops could be improved. This improvement could be achieved by using two FT240-61 ferrite toroids fed with a Faraday loop at the end of the coaxial cable in place of the normal feed loop. I have tried this but without success, the s.w.r. is 1.4:1 at its best and the received signal is two or three '5' points down.

I think the main reason for the failure to improve the efficiency, is because the toroids are too big for the small Heliax. I am waiting the arrival of two FT411-61 toroids which are a better fit on the Heliax and I think they will give a better performance.

I would also like to record my thanks to Jack G3MMK, Maurice G3AVV and Neale G3AAV for their help and encouragement during the last few years working on this project. By the way, I'm having some success with two parallel Heliax loops, but using one tuning capacitor. But more of that in my next report.
THIS MONTH DAVID BUTLER G4ASR DESCRIBES AN UNUSUAL AND RARELY SEEN ANTENNA. BUT FOR THE 50MHz.

antenna workshop

S
seasoned 50MHz operators know that the low v.h.f. band has characteristics quite unlike any other. Seemingly devoid of any apparent propagation, it can suddenly be turned into something resembling the hurly-burly of a CQ World Wide contest on 14MHz. Openings may be brief and geographically selective. Different propagation modes can exist at the same time to widely separated regions.

For example, it is not uncommon for trans-equatorial propagation (t.e.p.) to southern Africa, to occur at the same time as auroral propagation to northern Scandinavia. Similarly Sporadic-E (Sp-E) openings can develop paths in many differing directions, perhaps to Europe, Africa and North America at the same time.

Normally most operators will use a Yagi antenna mounted on a rotator to monitor the band in specific directions. This is quite acceptable but how do you catch those transitory openings on the 50MHz band that spring up in unexpected directions? In the December 1996 column ('VHF Report') I reported on the success that Don Kirby GW9IP had when using a vertical antenna on the 50MHz band.

I mentioned that during one particular Sp-E opening, contacts were being made simultaneously all around Europe. To the north of the UK contacts were made with JX7DFA on Jan Mayen Island and JX7JN in Iceland and was called again by JX7DFA on Jan Mayen Island for a rag chew! All these contacts show one advantage of using a vertical antenna. (Because it has an omni-directional beam pattern and is horizontally polarised, but also has a useful amount of gain in all directions.)

Vertical Advantage

However, the disadvantage of using a vertical antenna is that the cross polarisation losses are quite substantial. When using narrow-band modes (normally c.w. or ssb) on v.h.f. it is conventional practice to use horizontal antenna polarisation. (Theoretically, if a vertical antenna is received on a horizontally polarised signal then nothing would be received).

In practice the cross polarisation loss can be around 30-36dB, which equates to a reduction in signal strength of some five or six S-points. Another disadvantage of a simple vertical antenna is its lack of gain. When monitoring for openings on the 50MHz band (or working DX) you can ill afford to throw away receive sensitivity or transmit capability by using the wrong polarisation or having an antenna with only unity gain.

To spot the 'DX' propagation on the 50MHz band it's useful to have an antenna that possesses not only an omni-directional beam pattern and is horizontally polarised, but also has a useful amount of gain in all directions. In a recent 'VHF Report' I suggested that you could use a 'Halo', a 'Big Wheel', the 'Cloverleaf' or similar horizontally polarised antenna.

Stacking two similar antenna types together, normally one above the other, would give a useful amount of horizontal gain without being unduly large. I described something similar in a recent 'Antenna Workshop' (albeit using three different band antennas, but the technique still holds).

Details of how to create antenna systems by this method, can be found in various books and manuals dealing with v.h.f. antennas. But they all have one major problem, and that is feeding and matching the coaxial line to the feedpoint impedance of the antenna.

So what is this wonderful antenna system I'm going to describe? In answer I'm going to describe the far less well known skeleton Allford slot. The unit has horizontal polarisation, an omni-directional pattern and has a gain of 6dBd, which is the equal to many commercial 4-element Yagis available for the 50MHz band. This antenna has been developed for use on the 50MHz band by Mike Walters G3JVL.

The Slot Antenna

The Allford slot is actually derived from work carried out by Andrew Allford in the mid-1940s and 50s. Allford's work was applied to v.h.f. and u.h.f. broadcasting antennas and was in itself derived from research carried out by the English scientist Alan Blumlein in 1938.

Alan Blumlein's research showed that if a vertical slot was cut in an infinite sheet of metal it would behave in a similar way to a dipole radiator. The important point to note is that it produces the opposite polarisation to the pattern it is cut from. This is quite apparent.

A vertical slot in a sheet of metal gives a signal with horizontal polarisation and vice versa, a horizontal slot (or turning the sheet through 90°), produces vertical polarisation. Further research was carried out to determine to what extent the infinite sheet of metal could be reduced before the slot antenna created 'lost' its radiating property.

This research led to the classic cylinder shaped antenna often referred to as the 'Allford Slot'. Additional work showed that the sheet of metal that formed the cylinder could be further reduced by using a series of metal loops.

Electrically the performance is almost identical to that of the solid cylindrical version. Bearing these ideas in mind.

---

Fig. 1: The basic overall idea of the 50MHz antenna. The relative size of the loop elements has been exaggerated for clarity.

Fig. 2: This balun was used to feed the slot antenna. Its length is calculated on a velocity factor of 0.66 such as found in solid polythene dielectric coaxial cable.

In practice the cross polarisation loss can be around 30-36dB, which equates to a reduction in signal strength of some five or six S-points. Another disadvantage of a simple vertical antenna is its lack of gain. When monitoring for openings on the 50MHz band (or working DX) you can ill afford to throw away receive sensitivity or transmit capability by using the wrong polarisation or having an antenna with only unity gain.

To spot the 'DX' propagation on the 50MHz band it's useful to have an antenna that possesses not only an omni-directional beam pattern and is horizontally polarised, but also has a useful amount of gain in all directions. In a recent 'VHF Report' I suggested that you could use a 'Halo', a 'Big Wheel', the 'Cloverleaf' or similar horizontally polarised antenna.

Stacking two similar antenna types together, normally one above the other, would give a useful amount of horizontal gain without being unduly large. I described something similar in a recent 'Antenna Workshop' (albeit using three different band antennas, but the technique still holds).

Details of how to create antenna systems by this method, can be found in various books and manuals dealing with v.h.f. antennas. But they all have one major problem, and that is feeding and matching the coaxial line to the feedpoint impedance of the antenna.

So what is this wonderful antenna system I'm going to describe? In answer I'm going to describe the far less well known skeleton Allford slot. The unit has horizontal polarisation, an omni-directional pattern and has a gain of 6dBd, which is the equal to many commercial 4-element Yagis available for the 50MHz band. This antenna has been developed for use on the 50MHz band by Mike Walters G3JVL.

The Slot Antenna

The Allford slot is actually derived from work carried out by Andrew Allford in the mid-1940s and 50s. Allford's work was applied to v.h.f. and u.h.f. broadcasting antennas and was in itself derived from research carried out by the English scientist Alan Blumlein in 1938.

Alan Blumlein's research showed that if a vertical slot was cut in an infinite sheet of metal it would behave in a similar way to a dipole radiator. The important point to note is that it produces the opposite polarisation to the pattern it is cut from. This is quite apparent.

A vertical slot in a sheet of metal gives a signal with horizontal polarisation and vice versa, a horizontal slot (or turning the sheet through 90°), produces vertical polarisation. Further research was carried out to determine to what extent the infinite sheet of metal could be reduced before the slot antenna created 'lost' its radiating property.

This research led to the classic cylinder shaped antenna often referred to as the 'Allford Slot'. Additional work showed that the sheet of metal that formed the cylinder could be further reduced by using a series of metal loops.

Electrically the performance is almost identical to that of the solid cylindrical version. Bearing these ideas in mind.

---

Fig. 1: The basic overall idea of the 50MHz antenna. The relative size of the loop elements has been exaggerated for clarity.

Fig. 2: This balun was used to feed the slot antenna. Its length is calculated on a velocity factor of 0.66 such as found in solid polythene dielectric coaxial cable.
in mind Mike G3JVL, then, in the spirit of development, used the previous work to design skeleton slot antennas for use on various v.h.f., u.h.f. and s.h.f. amateur bands.

**Antenna Construction**

Although it's not my intention to give methodical step-by-step details of construction the following notes will enable any competent constructor to fully assemble the antenna. The construction although relatively simple in component parts does require the use of an aluminium MIG welder. This is probably the time to get in an expert, as many of you won't have the necessary skill. So have a look in the Yellow Pages for a welder that can do the job at your place.

As shown in the diagram of Fig. 1, the skeleton Alford slot antenna simply consists of two tubes onto which fifteen split loops are attached. A backing structure, consisting of a single tube, is attached to the loops on the side directly opposite the slot. There's also a matching balun which is attached to the feed point at the base of the structure.

Two aluminium tubes, 19mm x 10.8m long, form the slot material. Because of the length of each tube it will be necessary to construct them from several pieces. If you use 18SWG tubing then each length can be joined together by using a section of 15mm aluminium tubing which should be a sliding fit inside the 19mm tube. Affix each joint with stainless steel screws.

The two tubes should be arranged to have a 65mm gap between them. The tubes are short circuited at the top and attached to a glass fibre printed circuit board (p.c.b.) at the feed point. The p.c.b. acts both as an insulator between the copper inner and outer conductor and is easily soldered to the copper water pipe.

**Matching The Antenna**

The base impedance of this slot antenna is some 2000Ω, and because of this feedpoint impedance a 4:1 balun is required to match the (balanced) antenna to the (unbalanced) 50Ω coaxial feed line.

The diagram, Fig. 2, shows the connections to make a coaxial 4:1 impedance transformer (balun). Although you may not recognise it as a balun because it uses transmission line techniques it consists of a half wave electrical length of 50Ω feeder, approximately 2.29m long.

The balun is conveniently connected to the copper lands of the p.c.b. insulator tied to the base of the radiating slot. To tune the antenna connect a low power transmitter to the feed line and measure the voltage standing wave ratio (V.S.W.R.) at the required operating frequency. If desired the width of the slot can be altered to optimise the V.S.W.R. reading.

**Robust Antenna**

On completion you will possess a robust antenna ideal for general DXing on the 50MHz band. The gain is 6dBd (B.16dB) and the circularity (ratio of maximum to minimum gain) is typically better than 1dB. The prototype V.S.W.R. bandwidth (≤ 2:1) measured ± 250kHz from the selected frequency of interest. Of course, on receive, the antenna can be used over a considerable frequency range without any apparent drop in performance.

Although Mike's prototype antenna was constructed from aluminium parts an alternative method could be to use copper water pipe and a 20m length of surplus LDF-450 heliax hard line feeder for the loops. This cable has a solid copper inner and outer conductor and measures only 540mm in length, unlike the 50MHz version which is nearly 11metres tall.

However, this scaled version isn't an exact copy of the design it uses 19 loops each 20mm in diameter. The feed point details are also different on the 1.3GHz version. It's fed in the centre of the slot via a 4:1 matching transformer made from 3mm semi-rigid feeder.

If you need any further details regarding construction of these skeleton Alford slot antennas you can contact Mike Walters G3JVL on 01705 464482.

---

**Fig. 3:** The feed point is made from a piece of p.c.b. material with the copper cut away between the cable inner joining points.

**Fig. 4:** David's son William models the colourful England football team's sweatshirt and the 1.3GHz version of the skeleton slot antenna.

**Antenna Workshop**

moves back to its usual spot next month.

---

P.W. - Antennas in Action, January 1997
Charging The MFJ Antenna Analyser

Kicking off the first Tex Topics is a missive from reader Niel Starkie who says: "A friend of mine got one of the MFJ antenna analysers that you in PW had as a special offer some time ago, and he was kindly enough to let me have one with it. Please note that was until he noted how fast it gobbled up batteries when he inadvertently left it switched on.

He solved the cost problem when he fitted eight rechargeable batteries inside and this is definitely a much cheaper option. But after a while opening the case to take out the battery packs out to recharge them became a nuisance. He then asked me if I could come up with a solution to the problem of charging the batteries in situ.

The MFJ Antenna Analyser has a power socket for a 12V supply that bypasses the internal batteries. But strangely enough it doesn't have a charging socket for charging NiCad batteries. So this is how I modified his MFJ Antenna Analyser to charge the batteries from a cheap plug-top p.s.u.

Have a look at the part circuit shown in Fig. 1. This shows the battery pack with the internal circuits. I added a few components to the box. These components are an I.E.D., a diode to prevent wrong polarity units discharging the batteries and a small 12V 40mA bulb as a current limiter.

I've used a small bulb as a current limiter because it keeps the charge current more constant with differing voltage applied to the circuit. The photograph of Fig. 2 shows how simply the modification fits inside the case, while the photograph of Fig. 3 shows where I've mounted the small charge indicating I.E.D.

Needless to say my friend hasn't had to open the case to change the batteries since this modification was made many months ago".

Thanks for that interesting modification to the MFJ Antenna Analyser Niel. I'll have to try that one on my own unit, as I also find that taking out the eight screws, just to change the batteries a bit of a fiddle.

For those that haven't seen the MFJ Antenna Analyser, it's a combined 3-170MHz oscillator, frequency counter, and resonance and s.w.r. bridge. It's an extremely useful piece of equipment and I'll be showing you some of its versatility in future issues of A-I-A.

Identifying Plugs

I'm often asked by friends how to identify plugs and sockets just by looking at them, and just which one should they use for which 'job'.

And I have to admit that identifying the basic types is fairly easy, but there are two types that can catch me out.

And I have to admit that identifying the basic types is fairly easy, but there are two types that can catch me out. These are an I.E.D., a diode to prevent wrong polarity units discharging the batteries and a small 12V 40mA bulb as a current limiter.

I've used a small bulb as a current limiter because it keeps the charge current more constant with differing voltage applied to the circuit. The photograph of Fig. 2 shows how simply the modification fits inside the case, while the photograph of Fig. 3 shows where I've mounted the small charge indicating I.E.D.

Needless to say my friend hasn't had to open the case to change the batteries since this modification was made many months ago".

Thanks for that interesting modification to the MFJ Antenna Analyser Niel. I'll have to try that one on my own unit, as I also find that taking out the eight screws, just to change the batteries a bit of a fiddle.

For those that haven't seen the MFJ Antenna Analyser, it's a combined 3-170MHz oscillator, frequency counter, and resonance and s.w.r. bridge. It's an extremely useful piece of equipment and I'll be showing you some of its versatility in future issues of A-I-A.

Identifying Plugs

I'm often asked by friends how to identify plugs and sockets just by looking at them, and just which one should they use for which 'job'.

And I have to admit that identifying the basic types is fairly easy, but there are two types that can catch me out. These are an I.E.D., a diode to prevent wrong polarity units discharging the batteries and a small 12V 40mA bulb as a current limiter.

I've used a small bulb as a current limiter because it keeps the charge current more constant with differing voltage applied to the circuit. The photograph of Fig. 2 shows how simply the modification fits inside the case, while the photograph of Fig. 3 shows where I've mounted the small charge indicating I.E.D.

Needless to say my friend hasn't had to open the case to change the batteries since this modification was made many months ago".

Thanks for that interesting modification to the MFJ Antenna Analyser Niel. I'll have to try that one on my own unit, as I also find that taking out the eight screws, just to change the batteries a bit of a fiddle.

For those that haven't seen the MFJ Antenna Analyser, it's a combined 3-170MHz oscillator, frequency counter, and resonance and s.w.r. bridge. It's an extremely useful piece of equipment and I'll be showing you some of its versatility in future issues of A-I-A.
Welcome to the first 'Tex Topics' column in the first Antennas in Action (A-i-A). The purpose of this section is to become a clearing house of ideas and answers to many of the problems to do with transmission and measurement of signals.

There are many people who ask about the above topics - then let's have it and I'll try and get an answer for you.

Fig. 6.

Both the PL259 and the N-type plugs have a multi-turn locking cap, but the BNC type plug (in the middle in Fig. 4) and socket lock together with just a short quarter-turn action. Two small pegs on the outside of the barrel of the socket locate into two small slots in the locking cap of the plug.

By pushing gently on the body of the plug and giving a short clockwise twist (as seen from behind the plug) the plug is locked into the socket. Like the N-type plug the BNC may be used up into the s.h.f. range where its quick action locking makes coupling up coaxial cable quick and easy. The speed and ease of connection makes the BNC plug and socket probably the most popular for test equipment such as signal generators and oscilloscopes.

What are the things to watch out for when buying BNC connectors? Well, in answer to that, there are at least two characteristic impedance versions of BNC connectors (50 and 75Q) which are not compatible. I've also seen 90 or 95Q versions for computer local area networks in the past. There are also variants of the BNC plug to suit both thick and thin cable as shown in Fig. 5. So choose your BNC connector with care.

Being physically smaller than the N-type and with its own quick-lock method it's possible, when using BNC connections, to get more coaxial cables into a smaller area. There is also a variant of the BNC system that uses a threaded locking cap known as the TNC plug and socket. The TNC plug and socket may be used where a more weatherproof combination is needed. Although none of these coaxial connectors are very weatherproof, and would need extra covering if used outdoors.

Photographs of matching plugs and sockets are shown in Figs 6, 7 and 8. The pair shown in Fig. 6 is a PL259/SO239 combination. The PL259 is also an adapter to a BNC socket, but more of that later. The N-type plug/socket pair is shown in Fig. 7 (my apologies for the quality of the photograph Ed.). The photograph of Fig. 8 shown the BNC pair, the socket (on the right) is actually part of a 'T' adapter that allows two test leads to be twinned onto one BNC socket.

The patch lead shown in Fig. 9 is a very short one. I made up to couple a 144MHz transceiver to the 430MHz transverter I was using. This adapter illustrates the principle of using the correct plug for the job. The PL259 plug was to connect into the 144MHz rig. The N-type connected into the transverter, although over this sort of length losses do not present much of a problem.

In Fig. 10 I've shown a few of the many types of adapters available to couple equipment together. One type I'm very fond of is the PL259 plug to BNC socket in the middle top of the photograph. This particular adapter (I have a box full of these) allows me to use the quick fit type of lead (BNC plug) onto a rig that has the ubiquitous SO239 socket fitted (it seems to be about 99% of all rigs). Other adapters have many uses and remember it's almost impossible to have too many adapters (you never have the one you really need at the time).

Both Lake Electronics and C M Howes Communications have promised details of kits and projects relating to antennas and feeding them.

If there are any other suppliers out there, write or FAX in to A-i-A and let everyone know what you can supply - watch this space.

Looking To The Future

Right that's all the space I have this time. Let's look ahead to what I'll be letting you know about in the future. As I've already said, I'll be showing you how to make better use of the MFJ Antenna Analyser. I'll be looking into using the new Autek RF5 transverter, although over this sort of length losses do not present much of a problem.

As I've already said, I'll be showing you how to make better use of the MFJ Antenna Analyser. I'll be looking into using the new Autek RF5 transverter, although over this sort of length losses do not present much of a problem.
Low Banding DX

Recently back in stock in the PW Book Store is an intensing book, on antennas and DXing techniques for the 1.8, 3.5 and 7MHz bands, by John Devaldore ON4UN. Antennas And Techniques For Low-Band DX-ing is a 395 page tome full of ideas for getting the best possible from your antenna and location.

Not everyone goes hunting for the best DX, but making your signal go as far as possible is surely the dream of everyone. The cost of this dream is £15.50 + £1 P&P from the PW Book Store.

Three-Up The Pole

The name Watson appears on a small, but growing range of radio related accessories. The range covers p.s.u.s speakers, earphones and power and v.s.w.r. meters (including the SWR-500M 144/430MHz antenna tuner/power meter).

Many of us are limited in the amount of space we have for mounting an antenna farm, and so we must compromise somehow. One of the best compromises is to use a multi-band antenna covering more that one v.h.f. band.

The Watson W-2000 antenna covers the very popular 50, 144 and 430MHz bands in a 2.5m high vertical antenna. Offering rising gain with frequency, the antenna can withstand 150W maximum but costs less than £30 a band at £89.95 + £8 P&P.

Details of the W-2000 and the other items in the range of Watson products is available from Waters and Stanton Electronics, Spa House, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835.

VHF/UHF Eagles

Eagle Communications can supply a range of high quality antennas to suit the 70, 70, 144, 430 or 1296MHz bands. The range of antennas for each band is comprehensive and there must be at least one Eagle antenna to suit your pocket or performance.

The Eagle DX range of optimised Yagi antennas features a folded driven element and a p.e. high power capable balun fed from a silver plated N-type socket. The Oscar range in each band features crossed Yags with either left or right hand circular polarisation (switchable polarisation is an option). If you want to stack and buy a number of antennas then you will need power dividers for the particular band. Eagle can provide these for the 50-1296MHz bands, along with frames and phasing harnesses to suit the bands.

To find out about the Eagle range of antennas, and when then 2.4GHz versions will be available, contact Eagle Communications at Unit E3, Bank Top Industrial Estate, St Martins, Oswestry, Shropshire SY10 7BB. Tel: (01691) 777511 or via Internet E-mail eaglecom@celtic.co.uk

SGC On Tune

American equipment manufacturer SGC have announced a 500W automatic tuner that will tune any piece of wire longer than 23 foot (7m) anywhere within the h.f. amateur bands within 10 milliseconds (ms).

The SGC 235 automatic tuner is fully waterproofed to military standards and needs only a 24V supply to operate. The action has over half a million 'Pi'-match combinations available to tune a 500W signal. The unit remembers the best combination for the frequency in use and returns within 10ms.

The SGC 245 costs £1017+VAT and is available from the importers Nevada Communications, 189 London Road, North End, Portsmouth, Hants PO2 9AE. Tel: (01705) 662145.

Welsh Traps

C. Reynolds GW3JPT tells us of his new 3.5 and 7MHz tuned traps for dipole antennas. Beacon Traps have three items presently available: a dipole centre, traps tuned for 3.5MHz and traps tuned for 7MHz.

Provide your own wire and coaxial cable and you have your own antenna that matches some of the more well known ones at a price that won’t break the bank. For instance, a pair of 7MHz traps and a dipole centre costs only £23 post paid.

Please make all cheques (payable to C & E Reynolds) or postal orders to: Beacon Traps, GW3JPT, Bronwylla Road, Welshpool SY21 7RD.

I hope you’ve enjoyed the last eight pages...there’s more Antennas in Action in the March Issue.
IT'S PACKED FULL OF EXCLUSIVE PRODUCTS

VHF/UHF MOBILE & BASE ANTENNAS, HF BEAMS, TEST EQUIPMENT, WIRE ANTENNAS, HF VERTICALS, MORSE KEYS, SWR METERS, SWITCHES, POWER SUPPLIES

CLOCKS, FILTERS, ROTATORS, DUMMY LOADS

THE LATEST EASTCOMM CATALOGUE

JUST SEND 10, 2nd CLASS STAMPS TO:
Eastern Communications, Cavendish House, Happisburgh, Norfolk NR12 ORU

If you can't see the wood for the trees get an excellent value for money. The price includes VAT and postage. At a cost of £117.44 for the FL2 and £152.69 for the FL3 they offer available in most radio shacks or we can supply one for £10.50. At a cost of £117.44 for the FL2 and £152.69 for the FL3 they offer very sharp cutoff total there are 12 poles of filtering available. This gives you filters that have a modes of operation such as SSB, AM, CW, RTTY, Packet and AMTOR. In addition, the built-in notch filter allows whistles and tuning signals to be removed, even if they are on top of the signal you are trying to hear. In the case of the FL3 the notch filter is automatic so you don't even have to touch any controls. This allows you to get on with working the DX... matter and signal 'splatter' by stations operating close to your frequency. In the case of the FL3 Audio Filter enable you to do just that.

For Converters, Filters and Active Antennas call now for a catalogue and information.

Datong Electronics Ltd
Clayton Wood Close, West Park, Leeds. LS16 6QE

RST PHONE LANGREX SUPPLIES LTD RST FAX 0181 684 0181 684 1166 3056
DISTRIBUTORS OF ELECTRONIC VALVES TUBES AND SEMICONDUCTORS AND I.C.S. 1 MAYO ROAD • CROYDON • SURREY CRO 2QP
24 HOUR EXPRESS MAIL ORDER SERVICE ON STOCK ITEMS

Essex Amateur Radio Services
The little dealer with the big heart

We buy and sell new and second hand amateur radio equipment. We pay cash same day or 24 hours by post. Always large stock available. Phone today for the best deals.

4 Northern Avenue, Benfleet, Essex SS7 5SN
Telephone 01268 752522
7 days a week 8am to 8pm

Please mention Practical Wireless when replying to advertisements
Ian Poole G3YWX takes a look at how speech processors can help you to make use of all your transmitted power.

Fig. 1: Example of a waveform in speech.

Fig. 2: Block diagram of a speech compressor.

In today's band conditions it's absolutely necessary to make the most use of all the transmitted power. Speech processors play a vital role in achieving this.

Speech processors have been in general use for many years, but even now some people doubt their real advantages. If used wrongly, a processor can degrade the sound of a signal, making it less intelligible.

When used properly, a speech processor can provide as much 'gain' as a linear amplifier and at a fraction of the cost. Without one, the full potential of a transmitter can never be realised. In fact when DXing a processor is absolutely vital whether it is an integral part of the transmitter or an additional unit.

Need for Processing

Before looking any further at the mechanics of speech processing it's best to see why processors are needed. And to start human speech is far from the ideal form of waveform to modulate a transmitter.

Human speech has a whole variety of sounds which vary from the soft vowels to plosive sounds like 'p' and 'b' and fricative (produced by friction in the mouth) ones such as 't' and 's' and many more. Owing to this very wide variety of sounds and their nature the waveforms which need to be transmitted become very inefficient in terms of modulating a transmitter.

In the first instance, the full frequency range of speech is very wide. To transmit high fidelity speech a bandwidth of 15kHz or more is needed.

Transmissions made on v.h.f. or f.m. use 15kHz of audio bandwidth and there is a definite improvement over the narrower audio transmitted on the medium wave band. Unfortunately bandwidth is a very valuable item, and communications transmissions need their bandwidth limited so that there is room for other stations.

The additional frequencies required for the improved quality also use up valuable transmitter power and they may not add much to the intelligibility of the signal.

Apart from the wide bandwidth of speech it also has a poor peak to average power ratio. Looking at a speech waveform on an oscilloscope it will be seen that there a number of short peaks and the average power level is very low.

In fact, within a waveform like this, the peak to average ratio can be as much as 10dB. This can be made slightly more difficult by the fact that the peaks are not symmetrical.

Secondly different sounds in the same word will have vastly different power levels. Some will have a high level which lasts for a short time whereas others will have much lower levels, possibly lasting for longer. This will also make the peak to average power level poor.

There are further variations in the sound levels which appear in speech. And in this respect a different emphasis is placed on different words or even different parts of words to stress some particular point. This is quite natural within speech and it would sound very dull without it.

However, it makes the task of fully modulating the transmitter all the time more difficult. In fact, by the time all these variations are taken into account, the peak to average level of the transmitted signal could be very low indeed.

Fortunately, when most amateurs are talking into a transmitter they will keep one eye on the p.a. current and this tends to take out some of the level variations. However, there is still a lot which can be done to improve the average level of the signal and make the optimum use of all the available power. Fortunately, there are several ways in which this can be done, and techniques like compression, clipping and frequency tailoring all play their part.

Compression

Speech compression can take a variety of slightly different forms depending upon the actual use in mind. However, they are all basically the same, consisting of an
amplifier whose gain can be altered according to the level of the incoming signal.

For a small signal the gain is high and then as the level of the signal increases the gain is reduced. This has the effect of levelling the signal out.

There are two main types of compressor. In the first type the level of the gain is adjusted instantaneously, varying the gain of the stage over each part of the waveform of the signal. This form of compression is understandably called instantaneous compression.

The other type of compression has a time constant introduced into the adjustment loop as shown in Fig. 2. By doing this the gain will be dependent upon the level of the envelope of the audio signal.

To give a comparison the circuit operates much like an a.g.c. in a radio. This type of compressor is the one which is more likely to be found in amateur radio systems where names like VOAGD (Voice Operated Gain Adjusting Device) and others can often be seen. They are usually used to maintain a constant level of audio to the next stage of circuitry.

When designing the VOAGD type of compressor the time constants in the feedback loop must be chosen carefully. A fast attack time is of paramount importance. It is required so that the circuit can react very quickly to any sudden increases in signal level or transmitted which are characteristic.

If the attack time is too slow then the transients will pass through the next stages where they may cause overloading and distortion. As a general rule an attack time of 10 milliseconds is taken to be quite adequate.

The decay time is also important, but it's generally longer. For most amateur applications a decay time of around 300 milliseconds is used. The decay time of 300 milliseconds enables the compressor to follow the general declinations of the speech level and keep the overall level correct. If the time constant is reduced then it can be made to follow the different levels of each syllable. This type of syllable compressor is not normally used, but can be effective in some situations.

It's worth noting that whatever the type of compressor it's also possible to regenerate the original audio at the remote end. This can be done by having an expander with the inverse response i.e. it has a larger gain for larger signals.

The equipment usually consists of a compressor and an expander and is called a compressor for obvious reasons. Many systems use these techniques.

For example many telephone links or broadcast relays use compressors to ensure the best signal to noise ratio while still being able to regenerate the original audio. However, compressors are rarely used in amateur radio.

One reason for not using compressors in amateur radio is that it would be almost impossible to match the responses of all the different systems in use and usually there is no need for high quality transmissions. Another is that most amateur processors involve further stages of processing.

Automatically Clipping

When talking of speech processing most people automatically think of 'clipping'. Clipping turns the band of very many speech processors and can give very large gains in terms of increasing the average power level of a transmission.

Yet as the name implies clipping distorts the signal quite severely in terms of the waveform. In many respects it is quite similar to instantaneous compression.

Basically the action of a clipper is to remove the peak of any waveform once it reaches a certain level as shown in Fig. 3. The actual level of clipping is often quoted. This is simply the ratio of the peak level of the waveform (if no clipping takes place) to the peak level of the clipped waveform.

Clipping appears to distort the signal to a degree where intelligibility is almost totally lost, but this is not the case. The reason for this is that the ear recognises sounds by the frequency content and not by the amplitude shape.

However, clipping still introduces distortion which appears in the form of harmonics and intermodulation distortion. These products have to be removed whenever possible because they reduce the intelligibility of the signal.

As a result of the problems mentioned, it is standard practice to have a low pass filter to remove any products which fall outside the audio spectrum. Normally 3kHz is taken to be the cut-off frequency for this purpose.

Unfortunately, any products which fall below the 3kHz frequency cannot be removed and they actually reduce the intelligibility of the signal. This limits the amount of clipping to a maximum of about 3dB giving about 4 or 5dB of gain.

Radio Frequency Clipping

In order to overcome the problems of audio clipping it's necessary to remove any harmonic distortion. This can be done if a radio frequency single sideband waveform is used.

Here the harmonics will be generated at multiples of the frequency of the r.f. signal as shown in Fig. 4. It's then an easy matter to remove the distortion and regenerate the clipped audio signal.

If the processor is part of a single sideband transceiver there may be no need to regenerate the original audio. This is because the sideband signal generated in the transmitter itself can be clipped then filtered.

Radio frequency clipping is undoubtedly far superior to a.f. It's possible to achieve almost infinite levels of clipping whilst still retaining the intelligibility.

With the levels of clipping mentioned an r.f. clipper can offer a gain which is in the region of 8dB about 3 or 4dB more than an a.f. clipper. However, the circuitry required for the r.f. version is more complicated than its a.f. counterpart.

Circuits are required to generate a single sideband signal with good carrier suppression. Then this has to be clipped, filtered and demodulated. As this involves c.f. circuitry the layout is a little more critical, although there is no reason why the frequency of the sideband signal cannot be comparatively low.

Frequency Tailoring

Although limiting the amplitude range of a signal is very important, it's also necessary to reduce and tailor the frequency response of the audio signal. This can also bring improvements to the signal for a number of reasons.

The first reason is obvious. An audio signal with the full range of frequencies present will require a large amount of bandwidth and in today's crowded bands this is not acceptable. In addition to this there is no advantage to be gained by wasting power on transmitting frequencies, which are not really needed to carry the speech information.

Fortunately the bandwidth of speech can be reduced quite substantially without unduly impairing the intelligibility. The main criterion is to be able to reduce the bandwidth as far as possible without unduly compromising the intelligibility.

Generally a bandwidth of 300Hz to 3.3kHz is taken as the telecommunications standard. Even so it is possible to reduce it still further and many amateur transceivers will only have a bandwidth of 3.7kHz or less.

The main problem encountered in reducing the bandwidth is that some of the sounds with a large high frequency content will not be easily distinguished.
Speech Processing - The Basics

**Fig. 6: A block diagram of an r.f. clipper.**

![Block Diagram](attachment://block_diagram.png)

from one another. The letters 's' and 't' are prime examples.

Not only is it advantageous to just limit the frequency response. There are a number of benefits which can be gained by altering the overall response and emphasising or reducing the level of various sections of the audio spectrum before the clipping process. This is called pre-emphasis.

It's found that components of speech below 600Hz have a fairly high power content but contribute little to the intelligibility, adding mainly to the natural sound of the speech. It can be an advantage to reduce these frequencies.

Conversely the components between about 1.5 and 3kHz are lower in level but carry more of the natural information needed to recognise the words and it can be an advantage to emphasise them more.

It is also found that the act of clipping has the effect of reducing the portions of the spectrum which have a lower level, and giving even greater dominance to the frequencies with the higher power levels. Accordingly some form of pre-emphasis can be used to redress the balance. Usually a simple filter which reduces the level of frequencies below about 600Hz is quite satisfactory.

**Full Speech Processor**

To make a full speech processor, elements of each type of processing are needed. A typical block diagram for an a.f. processor is shown in Fig. 5.

As shown in Fig. 5 the audio from the microphone enters the unit and first it is filtered and pre-emphasised. The next stage of processing involves compressing the signal so that a constant level is maintained before it is applied to the clipper.

The stage of compression or audio a.g.c. is very important because it enables a constant level of clipping to be maintained despite differences in the audio level. After being compressed and clipped the signal is then filtered to remove any out of band distortion products.

The diagram Fig. 6 shows the block diagram of an r.f. clipper. Again the signal from the microphone undergoes pre-emphasis and compression. Then the signal is fed into a balanced modulator with a signal from a local oscillator to generate double sideband. This signal has to be filtered to remove the unwanted sideband to give the single sideband signal which is then clipped.

After this there is a further stage of filtering to remove the unwanted harmonics before the clipped audio is regenerated by mixing the r.f. with the local oscillator. This signal can be buffered before being fed out of the unit.

**Number of Problems**

Even though there are significant advantages to be gained from using speech processors there are also a number of problems which can be encountered. One of the most important is that of feedback.

Feedback is far more likely to occur when no processor is used. This is because the audio gain is being increased by the degree of clipping which is employed.

As a result even very small amounts of r.f. on the microphone lead can cause a major problem. Sometimes the feedback does not show itself in terms of the normal "howl round" effect noticed with audio systems. Instead it can cause severe distortion on the transmitted signal.

There are several measures which can be taken to cure feedback. First ensure that the microphone screen is well earthed to the processor case as soon as it enters the unit.

Next check the tightness of the connector on the processor as this may not be tight enough. Obviously the case must be metal to give sufficient screening, but even so if it is made up from several sections, it may not be tightly screwed together and some r.f. may creep in.

Most processors have some r.f. filtering on the microphone lead. This is absolutely essential and two possible designs are shown in Fig. 7 in case none is fitted.

Another way r.f. can enter the processor is via the power input. If a low voltage d.c. supply is used then a few ceramic capacitors should be placed at the point where the supply enters the unit and also on the board.

The filtering will be improved if a small series resistor can be placed in the line as shown in Fig. 8. Another possibility is to place some ferrite beads over the supply lead. It has already been mentioned that the limit of audio clipping is limited to about 15dB. If this limit is exceeded then it will be found that the quality of the signal will be reduced and the speech processor will make the signal less intelligible.

Accordingly it's absolutely necessary to resist the temptation of squeezing out a little extra from an audio clipper, so that it can add intelligibility to the signal rather than detracting from it.

**Conclusion**

Speech processing is part of today's DX communication scene and processors are included as part of most transceivers. Even so it's still necessary to have a working knowledge about them to ensure the best is being made of the signal.
GET REGISTERED

After you've tried the shareware version of HamComm DL4SAW SSTV and PD2.03 you can now buy the FULL VERSION from your newly authorised UK outlet.

HamComm 3.1 with Pactor Receive at £19.99
DL4SAW (GSHPC) SSTV at £34.99
PD2.03 (Pager Monitoring) at £19.99

JVFax HAMCOMM PKTMON12 DL4SAW SSTV & POCSAG (PD)

Use our receive only Demodulator for these popular programs - connect it to your audio output, plug the 25 way connector into your PC and then monitor Fax RTTY Morse Packet and SSTV at a REALISTIC price. UK/Eire price £16.99 – Overseas £19.99. Transmit version below. 25 way to 9 way Adaptor UK/Eire £3.00 – Overseas £5.00.

JVFax 7 + HAMCOMM + PKTMON12 + POCSAG on 3.5” HD £2.50
DL4SAW SSTV SHAREWARE (V1.2) £2.50

THE NEXT GENERATION

The world's most popular receive demodulator is now joined by the TRANSMIT version (For Fax and RTTY) at £24.99 and the IMPROVED (Adjustable hysteresis) version for receiving POCSAG at £19.99

ALL PRICES INCLUDE VAT and POST & PACKING

For non-EU deduct 17.5% VAT from above prices. All products (NOT Software) carry a full money back guarantee.

Minimum Credit Card order value £15.00

Pervisell Ltd, 8 Temple End, High Wycombe, Bucks HP13 5DR
Tel: (01494) 443033 Fax: (01494) 449236
http://www.pervisell.com e-mail ham@pervisell.com

LAKE ELECTRONICS

The kits with all the bits!
(AND THAT INCLUDES THE HARDWARE)

Transmitters, Receivers, ATUs, Test Equipment, Filters, etc.

Send SAE for brochure

7 Middleton Close, Nuthall, Nottingham NG16 1BX
Tel/Fax: 0115-938 2509
E-mail: 100775.730@compuserve.com

Callers by appointment only

Attention Radio Dealers!

Would you like to stock our best selling titles like the World Radio TV Handbook & Passport to World Band Radio? If the answer's yes then telephone Michael Hurst in the PW Book Store on (01202) 659930 for the best quality discounts.

C.M.HOWES COMMUNICATIONS

NEW! HOWES DC2000

Beginner's SSB/CW Receiver Kit - £22.90

The ease of construction, the sensitivity and the low quiescent current consumption make this a great little receiver for both the first time builder and holiday and portable use! It covers a single band at a time, but uses the same interchangeable band modules as the DX2000, to give the choice of any HF band on a simple plug-in basis. Choose from 160, 80, 40, 30, 20, 15 & 10M amateur bands. Also suitable for BM11 and BM54 HF air-band modules. Like our other receivers, the DC2000 will interlink with many of our other kits to form a complete station. Fancy a digital frequency display, "5 meter", sharp CW filtering, a matching transmitter? There are many reasons why building the DC2000 is a great way to start your station!

ACCESSORY KITS

AF3 Automatic Speech Processor £16.50
AF4 Mic Amp with active filtering £6.20
OM2 Quality Electret Mic with VOX £3.50
CS4 Internal SSB & CW Filter for all RgS £10.50
DC5 "Putter" for direct conversion RgS £10.90
SMB30 30MHz Power Indicator, 30W 1-200MHz £54.90
OM25 Counter Buffer (kit to Rx to fed DRO) £15.10
HMI Crystal Calibrator, 8 inters, + free £16.90
(*) Please enquire about hardware packs to cut Per stone kits - there is not enough space to list all here)

The famous HOWES Active Antenna Kits

A22 Covers 150kHz to 30MHz. The neat compact answer for those with limited space. Kit: £8.90 Assembled PCB modules: £14.90
AB118 Optimised for long distance reception on 118 to 137MHz air-band. Kit: £11.80 Assembled PCB modules: £27.90
MB156 156 to 162MHz marine band antenna system (the brother of AB118) Kit: £18.50 Assembled PCB modules: £27.90

Enjoy your radio more with great projects from HOWES!

Multiband SSB Receiver

DX20: Covers 50 to 100 MHz and optional plug-in band modules (same type as DC2000). Versatile and popular with great performance! Kit: £39.90. CS25 "5 meter" Kit: £10.90. HA2OR hardware pack: £28.90

CTU8. Covers 500kHz to 30MHz. Matches antenna impedance and helps reduce spurious signals and interference with extra from-end filtering for the receiver. 50239 sockets.
Factory Built: £49.90. Kit (including case and all hardware): £29.90.

CTU9. As CTU8 plus balun, bypass switch and terminal posts. The fully featured Rx ATU! Factory Built: £69.90. CTU9 (including case and all hardware): £39.90.

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

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

From Dave G4QKH, Technical Manager.

Mail Order to: Eydon, Daventry, Northants. NN11 3PT
Tel 01327 260178

C. M. HOWES COMMUNICATIONS

Wireless, January 1997

35
This month the Rev. George Dobbs G3RJV presents what he describes as "an almost digital voltage indicator" project to monitor 12V in the shack, car or in the field.

After reading the quote from Mr. Horowitz and Mr. Hill (below, right) I think they are right. However, there's an exception: it's when you're using a power supply with a piece of radio equipment (then it's better when nothing interesting is happening!).

Most amateur radio equipment is designed to run at a nominal 12V. It's a "nominal" voltage level because much equipment is actually designed to run at just above 13V (this is the usual voltage for a fully charged 12V lead-acid storage battery).

Most of us have at least one bench power supply, run from the domestic mains supply to provide the nominal 12V. When the equipment is used in the car, or in the field we'll probably use a battery, whether lead-acid, gel-cell, NiCad or even a non-rechargeable battery.

Over the years I have enjoyed portable operation with QRP equipment. It was either powered from a gel-cell battery or hooked up to the battery in the car. Some of the equipment is quite voltage sensitive. I well remember one of my QRP expeditions being ruined at the end of the day because the battery voltage had gone too low for the change-over relay of a home-brew transceiver to operate. After that I usually packed a meter to monitor the voltage of the battery supply!

**Useful Unit**

The useful little unit I'm describing this time replaces a test-meter. It is 'digital', but not 'fancy digital', in that a line of light emitting diodes (L.E.D.s) indicate the state of the supply voltage.

It would be possible to set it up to read from zero volts to the required supply voltage but that is wasteful. All that we require is an indication around the nominal supply voltage. In this case we have 10 L.E.D.s showing half volt steps from 10 to 14.5V. (This is the likely area of interest for a 12V supply).

The indicator uses an LM3914 dot/bar display driver chip. The LM3914 lights up to ten L.E.D.s (in the bar mode) or one of 10 L.E.D.s (in the 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. There is an internal reference voltage source which can be used to set high and low reference points on two pins at either end of the voltage divider chain to adjust the range of measurement.

Another pin sets the LM3914 to operate in the dot or bar mode. Altogether a useful chip!

**The Circuit**

The circuit of the battery voltage indicator is shown in Fig. 1. The battery (or supply) being monitored provides the operating voltage.

In practice, the LM3914 operates with any supply voltage from 3 to 18V. A preset potentiometer feeds the input to pin 5. This is used to set the highest reading point. Another preset control sets the low reading voltage...
using the internal reference voltage. Pins 1 to 10 feed the l.e.d.s. It is possible to obtain "bar" indicators with 10 l.e.d.s mounted in a row but this indicator uses individual l.e.d.s. These are red or green according to the desirability of the voltage.

The diodes indicating 11.5 to 13.5V are green and the voltages above and below are red. The green represents the probable safety margin for using 12V equipment.

Building Techniques

Of all the building techniques for making amateur radio equipment, the one I like least is Veroboard. (Well...I have made an enemy with one company!).

Veroboard of course is that system which uses a 0.1 inch pitch matrix of holes with tracks joining the holes in one direction along the board. It’s not that there is anything intrinsically wrong with Veroboard but that I find it difficult to think in straight lines!

Using Veroboard really requires careful soldering because the tracks are placed close together. The tracks are also easy to bridge by accident.

But despite what I’ve just said...this project lends itself so well to the Veroboard method of construction! The l.e.d.s are conveniently fed from sequentially numbered pins and the rest of the circuit fits with very little trouble.

Layout Design

The Veroboard layout design is shown in right. The parts simply fit onto the board as shown: note the direction of the tracks. Note: there are breaks between the pins of IC1 and the two variable resistor sliders. There are also breaks between the two 'end' contacts on R2 and R4.

The board requires five straight links and a link that curves around the edge of the LM3914. The tracks have to be cut in 12 places, nine of these being between the adjacent rows of pins on the LM3914.

I recommend that you use a proper Vero spot cutter, or alternatively a small twist drill held in the fingers. The connections to the battery and the l.e.d.s all come from one end of the board.

I mounted the completed unit in a small ABS plastic box, 110 x 60 x 30mm deep. (I happened to have the box, as I did the l.e.d.s and their holders).

The l.e.d.s are mounted in a row along the lid of the box. The l.e.d.s holders are nice but can cost as much as the l.e.d.s themselves.

An alternative is to drill the mounting holes undersized and gently ream them out until the l.e.d.s are a push fit. Remember that the shorter lead of the l.e.d. (often marked by a 'flat' on the casing) is the cathode.

Fly Leads

Two fly leads (red and black) with crocodile clips seemed the easiest way to feed the indicator. And there you are - just clip the indicator on to the battery or supply and you know the state of the voltage!

By the way, if you prefer a bar display (with all the l.e.d.s up to the measured voltage alight) connect pin 9 to the positive of the supply rather than to pin 11. Go on...have a go...it’s an ‘illuminating’ project this time!
**Yaesu FT-8500**

**SAVE £254!!**

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
- 9.6k Packet input jack on rear panel
- Built-in CTCSS Decode
- Personal Computer Control
- Massive Omni-Glow Display
- 110 memories with Alpha display

**RRP £749 ML Price: £495**

**NEW! Albrecht AE-550**

"NO-KONSENCE LOW COST 2M MOBILE"

- 25 Watts 5/10/1.5/20/25kHz steps 5/144-146MHz (extendible)
- Compact size: 140mm (w) x 125mm (h) x 41mm (d)
- 10 (YES, ONLY 10) memory channels
- Programmable calling channel


**SPECIAL OFFERS & FIVE YEA-550**

now with ACCIDENTAL DAMAGE!

Only from Martin Lynch & Son

**Yaesu FT-990**

**SAVE OVER £600!!**

The Yaesu FT-990 has been a world best seller since its introduction a few years ago. Thousands worldwide are used daily by Radio Amateurs who want a simple to use, beautifully built HF Transceiver. No other is built using plug-on 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 hi/lo cut filter as standard
- Twin VFO’s
- Fly wheel tuning
- Brilliant RF Speech Processor
- Electronic Keyer
- IF Notch
- IF Shift

AC Version: **RRP £2399 ML Price £1549!**

DC Version: **RRP £1999 ML Price £1399!**

**NEW! Icom IC-775DSP**

**SAVE £800!!**

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 I.F.
- Twin RX with display
- DSP Noise reduction
- Twin Antenna input
- Auto Notch
- 100 Watts on 2M
- 50 Watts on 1.8kHz
- 1Hz tuning
- Triple Band Stacking register

**RRP: £3699 ML Price £2899**

**Kennwood TS-870S**

**SAVE £450!!**

Offered from Martin Lynch & Son with uprated 40/80MHz performance, the TS-870S is still the reigning champion for full "DSP" transceivers.

- 100 watts on all HF Bands
- General Coverage RX
- Internal Auto ATU
- Full DSP - Variable bandwidth to 50kHz
- Full DSP also available for TX
- Auto Notch
- Twin Antenna input
- Contest keyer
- Fly Wheel Tuning
- TWIN VFO’s

Now just take a look at the price!

**RRP £2399 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 IC-820H, sporting some very important features. If you are serious on VHIF/ULF then join the queue for the best of the best.

- All mode incl. 96k packet compatibility
- D5W on 2M SSB
- 45W on 2M FM
- 30W on 70CM SSB
- 40W on 70CM FM
- 0.11 microvolt for 10dB SNR SSB, CW
- IF Shift for either band
- Satellite Mode operation
- Twin receivers allowing 2/70 duplex operation
- CI-V bus

**RRP £1595 ML Price £1429**

**NEW! Icom IC-R10E**

**INCLUDING 5 YEAR WARRANTY & ACCIDENTAL DAMAGE**

The latest Scanner from the Icom stable that's burying the rest of the scanner market! Don't think that the IC-R10 is an alternative to the Tandy homey lucky 2000. it's a serious and monitor receiver. Take a look at the spec, then order one.

- All mode
- 5-1300MHz NO GAPS
- Tunable bandwidth filters for excellent image & intermod rejection
- 1000 memory channels with Alpha tag up to 8 characters
- Multi function dot matrix LCD display
- Real time band scope
- 100Hz frequency res.
- Multiple scanning modes
- Noise blanker & Auto noise limiter
- Full PC interface compatibility

**RRP £439**

**INCLUDING 5 YEAR WARRANTY & ACCIDENTAL DAMAGE**

**NEW! Icom IC-R8500**

**SAVE £275!!**

When Icom introduced the IC-R7000 ten years ago World Government establishments, Commercial organisations and true "enthusiasts" queued up to place orders. The IC-R7100 then followed and today ICOM bring you the new IC-R8500. Another masterpiece for "All Band" monitoring? If it was a painting, you'd hang it on the wall!

- 100kHz-1999.9999MHz continuous
- All mode as standard
- 1000 Memory channels - All alphanumeric
- Optional 500Hz CW/Data Filter
- Built-in RS-232C Interface
- APF and IF Shift
- Digital AFC function
- Multiple tuning steps
- Three antenna inputs
- Optional voice announcement module
- Versatile Scanning features

**RRP £1699.**

**SPECIAL PACKAGE DEAL FROM MARTIN LYNCH & SON:**

New boxed ICR-8500, FL52 500Hz CW/Data Filter (worth £129), Martin Lynch & Son (worth £20) FIVE YEARS Breakdown & Accidental damage cover (worth £126)

**ALL FOR £1699.00 SAVE £275!!**
The latest addition to the STANDARD CORP family, the C-156 will become the real “standard” in 2m bandies. Typical Standard engineering with features that price for pound are unheard of in todays market. Take a look:

- Coverage 100-200MHz RX
- DOT Matrix LCD & Menu Display
- Message delivery, 10 fixed, 9 customised by user
- 39 tone encoder + 1750Hz tones built in
- 100 Capable memory channels, incl. Alpha tag, Repeater/simplex, offset, Tone Squelch frequency (option), + more
- Up to 5 Watts output with optional CNB 157 or 13.8V input.
- Lightweight & very compact, only 290g with batteries!

**PRICED AT ONLY £149.95 WITH CELL CASE OR £99.95 WITH NICADS & CHARGER**

---

**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** SAVE £250!!

---

**Yaesu FT-8000 Dual Band**

THE LATEST DESIGN FROM THE YAESU STABLE, A SMALL COMPACT HIGH POWER DUAL BAND MOBILE, OFFERING THESE FEATURES:

- Wide Band RX, 110-550 / 1300MHz.
- Smart Search sweeps a band and loads active frequencies in dedicated frequency banks.
- 108 Memory Channels, storing repeater offset.
- Optional CTCSS, Packet Speed & Power level.
- Digital DC Voltage display.
- Dual receive on same or cross band, plus cross band repeat facility.
- Full 50 Watts out on 2m, 35 Watts on 70cm.
- 1200 or 9600 Baud Packet available per memory channel with easy interface via a dedicated input socket.
- ADMIS-1D Windows programming software.

**RRP: £549 ML PRICE: £475.** Deposit £75, 12 x £36.73. Cost of loan £40.83

---

**YAESU FT-1000NIP**

The magic in the new Yaesu HF transceiver is the inclusion of "COLLINS" 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 £2199**
Over a period of many years, I have been asked the question "Who invented radio?" on a number of occasions. And depending on how I felt at the time, I would answer, 'Why, Marconi of course'!

However, if I was feeling a bit stroppy, I would reply "Professor A S Popov" and watch a blank look come over the face of my interrogator. It would be a good bet that they had heard of Marconi but Popov was a stranger to them and they would not want to display their ignorance by asking who he was!

Now, after much thought, I have come to the conclusion that radio was not invented, nor discovered, by any one man. Radio can be likened to a camel - no one person could ever design a camel. It is obviously the result of a committee, a gathering together and amalgamation of ideas. So, let me explain further...

**Busy Fighting**

In the 17th century, the super powers of the time were busy fighting each other and very often themselves (remember we had our civil war long before others!). But fortunately, a few more saner men were involved in exercising their minds instead of their muscles. Newton, Kepler and Wren being such examples.

A new age was dawning when the study of the sciences became a fashionable pursuit amongst the wealthy. Many of the big houses had a laboratory in which the lord and master could follow his hobby. (I suppose today's equivalent is a shock in the cubby hole under the stairs?).

By the beginning of the 18th century, electricity was the great mystery. It was believed to be part of the life force and experiments were conducted to try to understand it and to measure and control it. How many must have found that electricity has a habit of biting back?

**First Experimenter**

I suppose the first great experimenter was a genius named Benjamin Franklin (1706 to 1790). He was an inventor, a diplomat (and possibly a spy during the 1770s) and a man who believed that electricity was a fluid which could be tapped.

Franklin went as far as flying kites in thunderstorms in order to induce his electric 'fluid' into the kite string and transfer it to a key suspended on the string. How these experiments did not kill him defies logic! But he understood the phenomena of electrostatic action.

Electrostatic action was, at the time, treated almost as a party trick, or a way of impressing your less brainy friends. But some men were seriously researching such matters.

One of the serious researchers was Sir Henry Cavendish (1731 to 1810), a man of independent means. He was a man with influence, a nephew of the Duke of Devonshire, and he was clever!

Cavendish had a wide range of scientific interests and identified Hydrogen as a separate gas and in 1798 deduced the density of the earth. He anticipated Coulomb, Ohm and Faraday, deduced the square law of electrical attraction and repulsion and discovered scientific inductive capacity.

Unfortunately Cavendish's main discoveries in electrostatics remained unpublished until 1879. (Many years after his death)

**Similar Experiments**

Over on the continent, similar experiments were taking place and the Italians were getting 'in on the act'. For example, Luigi Galvani (1737 to 1798) was an anatomist; who in the 1780s, made the chance discovery that frog's legs placed in an electric field produced by his electrostatic generator would twitch.

Galvani believed that he had discovered another type of electricity - animal electricity and published his findings.

Galvani's claim was disputed by a fellow Italian, blessed with the name of Alessandro Giuseppe Antonio Anastasio Volta (1745-1824). Volta was following similar researches and suggested that Galvani was wrong in saying that he had produced electricity out of animal tissue and that is was normal electricity produced by the contact of two dissimilar metals.

Volta proved his theory by inventing the voltaic pile (not the painful medical condition!), otherwise known as the electrochemical battery, a device to produce a constant source of electric current.

Volta then toured Europe demonstrating his battery and on showing it Napoleon in 1801, was made a Count.

**Also Busy**

While Napoleon was ravaging Europe, one of his subjects was also busy. He was Charles-Augustin de Coulomb (1736-1806) an experimenter from an old and wealthy French family.

Coulomb announced that the forces between two electrical charges are proportional to the product of the sizes of the charges and inversely proportional to the square of the distance between them. He thereby defined the quantity of an electrical charge. The Coulomb and Coulomb's Law are still with us.

The study of electrical charges was also being taken up in Scandinavia. And it was Hans Christian Oersted (1777-1851), who in Denmark in 1820, whilst passing a current through a length of wire (which just happened to be near a compass) noticed that the compass needle deflected. He then deduced that an electric current has a magnetic effect.

Oersted's findings were published and came to the notice of one of the greater mathematicians of the age, a Frenchman Andre-Marie Ampere (1775 to 1836). Ampere became one of the founders of the study of electromagnetism and following Oersted's finding, mathematically proved the relationship between magnetic force and electric current.

**In Germany**

It doesn't seem strange to find from the history books that yet another
physicist, this time in Germany, was working on similar experiments. This man was Georg Simon Ohm (1789-1854). It was Ohm who, as we know, found our "Ohm's Law". He discovered that the electric current flowing through a wire is directly proportional to the potential difference and inversely proportional to the resistance.

It’s not thought that Volta, Ampere and Ohm ever met each other. However, I wonder if they had, would they have stood in a triangle formation? But there’s no doubt that their individual published researches were read by the others.

Two other men of the age pushed the electromagnetic knowledge further. One was the great Michael Faraday (1791-1867). Like others before him he initially concentrated on analytical chemistry, but his interests were wider.

In 1831, Faraday discovered electromagnetic induction by which a permanent magnet could generate electricity. This vital breakthrough in electro-dynamics, previously investigated by Ampere, led directly to the telegraph system. Faraday also proposed the concept of lines of force. But this time he left the proof to later physicists.

Independent Henry

At the same time and entirely independent from the others (although no doubt following the same lines of research available to Faraday, and indeed to all interested in academics) an American, Joseph Henry (1797-1878) also conducted accurate research into electromagnetic induction. His name became the unit of induction - the Henry.

By the time Queen Victoria came to the throne, the basic building blocks of radio had been discovered and proved. Electricity and magnetism, potential difference, current and resistance were terms understood by the scientific community and were being used in commercial ventures.

The telegraph system was a prime result of the discoveries I’ve listed. Although research was being carried as a pure academic interest, the industrialists had realised that there was money to be made in faster communications and were beginning to finance research. Governments were also aware that military communications needed upgrading and so they also encouraged further studies.

James Maxwell also identified the electromagnetic nature of light and most importantly as far as we are concerned, predicted the existence of other electromagnetic radiation. (Here was the first suspicion of what may be termed radio waves). Maxwell also published the findings of Henry Cavendish in 1879.

Back to Germany

Maxwell extended the work of Faraday and Kelvin. He produced field equations which unified magnetism and electricity.

Hermann Ludwig Ferdinand von Helmholtz (1821-1894). He was involved in many sciences and amongst his research he studied the properties of oscillating electric currents. He left his assistant to continue with this line of enquiry.

How fortunate it was that Helmholtz’s assistant was Heinrich Rudolf Hertz. He was born in 1857 and who so tragically died of blood poisoning at the early age of 37 in 1894. Hertz was made Professor of Physics at Bonn in 1889. Hertz was able to follow the works of Helmholtz and Maxwell. In 1886 he demonstrated experimentally, by using an induction coil to produce sparks across a gap between two metal balls. He was also able to induce a current into a metal loop connected to another spark gap and thereby producing sparking across this gap.

Just As Clever

The men of the 19th century were just as clever as their mentors! For example, a Belfast man, William Thomas Kelvin (1824-1907) although famous for other studies, experimented in Faraday’s theories of induction and Kelvin’s concept of an electromagnetic field was derived from his own and Faraday’s work.

Kelvin was involved in the laying of the first Transatlantic cable. His work influenced the Scot James Clerk Maxwell (1831-1879) who was the first Cavendish Professor of Physics at Cambridge in 1871.

Maxwell extended the work of Faraday and Kelvin. He produced field equations which unified magnetism and electricity.

James Maxwell also identified the electromagnetic nature of light and most importantly as far as we are concerned, predicted the existence of other electromagnetic radiation. (Here was the first suspicion of what may be termed radio waves). Maxwell also published the findings of Henry Cavendish in 1879.

Back to Germany

Maxwell extended the work of Faraday and Kelvin. He produced field equations which unified magnetism and electricity.

James Maxwell also identified the electromagnetic nature of light and most importantly as far as we are concerned, predicted the existence of other electromagnetic radiation. (Here was the first suspicion of what may be termed radio waves). Maxwell also published the findings of Henry Cavendish in 1879.

Back to Germany

Maxwell extended the work of Faraday and Kelvin. He produced field equations which unified magnetism and electricity.

James Maxwell also identified the electromagnetic nature of light and most importantly as far as we are concerned, predicted the existence of other electromagnetic radiation. (Here was the first suspicion of what may be termed radio waves). Maxwell also published the findings of Henry Cavendish in 1879.

Back to Germany

Maxwell extended the work of Faraday and Kelvin. He produced field equations which unified magnetism and electricity.

James Maxwell also identified the electromagnetic nature of light and most importantly as far as we are concerned, predicted the existence of other electromagnetic radiation. (Here was the first suspicion of what may be termed radio waves). Maxwell also published the findings of Henry Cavendish in 1879.

Back to Germany

Maxwell extended the work of Faraday and Kelvin. He produced field equations which unified magnetism and electricity.

James Maxwell also identified the electromagnetic nature of light and most importantly as far as we are concerned, predicted the existence of other electromagnetic radiation. (Here was the first suspicion of what may be termed radio waves). Maxwell also published the findings of Henry Cavendish in 1879.
The receiver was placed a few feet away from the transmitter. Hertz then proved that the waves behaved like light and radiant heat, thus proving that they too, were electromagnetic.

In England

Back in England during 1879, Professor D. E. Hughes, produced electric sparks in his house and detected them half a mile away by means of a simple detector and earpiece. His peers refused to acknowledge his claims of radio waves, and the existence of radio waves were not accepted until Hertz, some seven years later, demonstrated the waves were not accepted until Hertz, some seven years later, demonstrated his results.

During the same period, Sir Oliver Lodge was also experimenting and was developing an early form of the principle of a semi-conductor) to detect and rectify signals. In later life, Lodge became interested in spiritualism and tried to contact the dead (not unlike calling CQ on 144MHz at times!).

Early Radio

It can now be seen that early radio had arrived, although in a very primitive state. It was not appreciated by the general public and not thought to be much more than a scientific phenomenon.

However, the 'super powers' of the time had already grasped the possibilities of improved communications. They were looking around for someone to come up with a reliable working system.

In the scientific world, where advances in any discipline are deemed to be original they are published for the good of all science. So it's not surprising that the discoveries and inventions of Hertz and Lodge in particular came to the notice of two more men living far apart, but following similar lines of research.

One was Professor A. S. Popov (1859-1904), a physicist working in Russia. The other was an Italian, Guglielmo Marconi (1874-1937) who was an electrical engineer. It would appear that their experiments were almost identical and one supposes that they were working from the same published material.

Successful Communications

In the spring of 1897, Popov achieved successful communications over a range of 600km during experiments with the Russian Navy in Kronstadt Harbour. Later the same year he increased the range to 5km.

In July of the same year, Marconi demonstrated communication between Newfoundland and England. The receiver was placed a few feet from the transmitter. The Marconi instrument was a simple detector and earpiece. His peers refused to acknowledge his claims of radio waves and mercury in between. A kite was used to support the aerial.

In the next few years, radio developed quickly. In 1904, Sir Ambrose Fleming invented the thermionic diode valve and two years later, Lee de Forest, an American, invented the triode, thereby allowing amplification of current, an essential requirement for successful radio communications.

But to get back to the original question, 'Who invented radio?' I'm afraid I don't know and neither do I know who designed the earpiece. PW

Transatlantic Transmission

The culmination of Marconi's early experiments was of course the first transatlantic transmission from Poldhu in Cornwall to Signal Hill, Newfoundland on 12 December 1901. Using a spark transmitter rated at 25kW to a 'fan' aerial, the transmission was confirmed at the Newfoundland end, reception was via a 'coherer. This was a glass container with a plug of iron at one end, a copper plug at the other end and mercury in between. A kite was used to support the aerial.

In the next few years, radio developed quickly. In 1904, Sir Ambrose Fleming invented the thermionic diode valve and two years later, Lee de Forest, an American, invented the triode, thereby allowing amplification of current, an essential requirement for successful radio communications.

But to get back to the original question, 'Who invented radio?' I'm afraid I don't know and neither do I know who designed the earpiece.

A British First.....From Uzbekistan

By Phil Whitchurch

Phil Whitchurch G3SWH describes memories of the DXpedition to Uzbekistan that he and Barry Steele G3LZK enjoyed in 1991.

In August 1990, Barry G3LZK received a letter of invitation from Nazim Tashkarov UI8A for him to visit Nazim in Tashkent, Uzbekistan. This letter was something of a surprise as Barry had only worked Nazim a couple of times on the air previously.

Barry was very keen and asked me if I would like to join him on a c.w. - only mini-DXpedition. Of course I jumped at the idea!

Barry then wrote to Nazim explaining what was proposed and duly received a telegram from Nazim saying: No problem. Fly to Moscow then to Tashkent!

So, it was decided to try and travel in May 1991. We started to organise reciprocal licences and airline tickets.

First Obstacle

The first obstacle was to get travel visas applications from the Russian Embassy in London, at a cost of £10 each. These had to be completed in triplicate with photographs and two copies sent to Nazim, the third copy being returned to the Embassy.

When he received them, Nazim had to take his two copies to the 'authorities' in Tashkent for them to issue us with a formal letter of invitation to the Soviet Union. This then had to be sent to the Embassy in London for the actual visas to be issued.

Copies of our UK amateur licenses were sent off to Box 88 in Moscow. And after much correspondence and the assistance of Vlad U3DR, we were issued with the callsigns UI8A/G3LZK and UI8A/G3SWH.

Airline tickets were booked, but these involved a change of airport at Moscow, as well as an eight hour delay between flights. We fell back on our amateur radio contacts...much to our advantage!

We were met at Sheremetyevo Airport by Valery UA3DEA and Jacob UAS3BR who showed us the sights. They also got us spectacularly drunk on vodka and they eventually
There May Be Impostors Out There

**ONLY THE RSGB CAN DO ALL THIS FOR YOU**

1. Represent your interests at Government level with UK, Europe and internationally through the IARU
2. Send RadCom post free every month to your door
3. Provide 15% discount off all books/products that we sell
4. Give EMC advice to help you with those interference problems
5. Provide advice on obtaining antenna planning permission
6. Provide technical advice
7. Discounted equipment insurance - which now includes breakdown cover

**ALL for less than 10p per day**

**DON'T BE OUT THERE IN THE COLD - JOIN US AND WE WILL HELP YOU TO ENJOY AMATEUR RADIO TO THE FULL**

Yes, please rush me my RSGB Membership Application form!

Name ........................................... Callsign ...........................................
Address .................................................. ...........................................
Post Code ..................................................

**Internet: WWW.rsgb.org**

---

FREE 32 page full colour
Computer Equipment Catalogue
with the Winter 96/97 Cirkit Catalogue

The Winter 96/97 Edition brings you:

- Even further additions to the Computer section extending our range of PC components and accessories at unbeatable prices.
- **WIN!** a 28,800 Fax Modem in our easy to enter competition.
- 100's of new products including Books, Connectors, Entertainment, Test Equipment and Tools.
- New Speakers, Mixers and In-Car Amplifiers in the Entertainment section.
- £25 worth discount vouchers.
- 248 Page main Catalogue, plus 32 Page full Colour Computer Catalogue, incorporating 24 Sections and over 4000 Products from some of the Worlds Finest Manufacturers.
- Available at WH Smith, John Menzies and most large newsagents, or directly from Cirkit.

**Get your copy today!**

**£1.95 + 30p p&p**

---

Cirkit Distribution Ltd
Park Lane • Broxbourne • Hertfordshire • EN10 7NQ
Tel: 01992 448899 • Fax: 01992 471314
Email: mailorder@cirkit.co.uk
It’s Charles Miller’s turn to look after PW’s vintage ‘wireless shop’ this month. Charles continues the story of the pioneers and in the first of a two part story he turns the spotlight onto one of the most famous… John Scott-Taggart.

If you talk to almost anyone who was around in those vintage days of radio, the 1920s and 30s, it’s a near certainty that sooner or later the name of John Scott-Taggart will crop up. It comes as something of a shock to find that Scott-Taggart was really in the public eye for less than 20 years, because in that time he contrived to make himself better known than almost everyone in radio, save Marconi himself.

It’s almost pretty certain that for every person you find who considers Scott-Taggart a near genius, there’ll be another who will denounce him as a near charlatan. One thing that is certain is that he had a Wonderful gift for (mainly self) publicity.

One Hundred Years

John Scott-Taggart was born one hundred years ago. It was just at the time when the 23 year-old Guglielmo Marconi had arrived in Britain with his ‘new-fangled’ ideas about wireless telegraphy. Whether the timing had any effect or not, John grew up to make an extraordinary career exploiting Marconi’s discoveries.

Scott-Taggart’s education ranged from what he described as various (unspecified) Technological Institutions, to University College London, where he studied Law. He was, in fact, eventually ‘called to the bar’ but he had already taken out the first of over 30 patents relating to valves, transmitters and receivers. He was also under way with the first of a series of books on these subjects.

Two years later, Scott-Taggart was in charge of the patents department of the then influential Radio Communications Company, but was still looking farther ahead. In 1922 he founded The Radio Press Limited, and embarked on the job of putting the name of Scott-Taggart firmly before the eyes of the public.

Radio Year Book

In an advertisement published in Pitman’s first Radio Year Book (1923) Scott-Taggart announced modestly that “as publishers of authoritative wireless literature we can guarantee that everyone interested in the science, either professionally, experimentally or merely as a fascinating hobby, will derive full satisfaction from reading some (or all) of the following publications”. The list appended gave the names of Modern Wireless (edited by John Scott-Taggart) and four books that also had come from his pen. As a matter of fact, the source of the above quotation is his own copy of the Year Book (I acquired this some years ago along with a good selection from Scott-Taggart’s personal library) and it has a cross marked against it in the great man’s own hand.

There are many small annotations and underlinings in the
Grandioso Advertisement

In a characteristically grandiose advertisement (6 November 1926) Scott-Taggart announced that he had relinquished all his journalistic activities in order to go into the production of valves that were (naturally) going to be better by far than anything else on the market.

As far as Radio Press was concerned, all its publications passed to the Amalgamated Press of Fleetway House. EC4. Modern Wireless continued for a while, under the editorship of Norman Edwards with G. V. Dowding as technical editor.

Wireless Constructor carried on for some years under the guidance of Percy W. Harris. Then he was replaced in the early 1930s by the more charismatic P. P. Eckersley, late chief engineer of the BBC. The title Wireless was absorbed into Amalgamated’s long running Popular Wireless.

Meanwhile, what of John Scott-Taggart and his wonderful new valves? Pictured at his desk, looking the reader straight in the eye, as he asked diffidently in a display advertisement:

"Supposing a month ago you had been on your way to a dealer to buy a valve and you had met Scott-Taggart. If he had recommended a certain valve as ideal for your purpose, would you have taken his advice?"

The advert continued: "Supposing he had said, "When you get it I shall be happy to test it out thoroughly and, after I am satisfied it is up to standard, give you a personally signed certificate to that effect", would you have accepted this offer?"

You would not consciously have analysed the reputation he has built up as the best known expert on valves in this country. You probably did not even know that his books on this subject have been a guide to over 500,000 readers of them. It might flash across your mind that he was the head of their great Elstree Laboratories and the keenest of critics of valves and apparatus.

How far would his opinion have influenced your judgement? Would you have put his recommended and tested valve in your valve holder with confidence? Today you actually to answer this question. John Scott-Taggart has relinquished all other activities to produce the best valve he can.

It is available in every type and the designer personally initials every box to certify that the S T valve inside has been tested dynamically (tested under actual operating conditions) under his own supervision. You are about to buy a new valve. Let it be an S T - the valve which, as its dynamic curve shows, gives high amplification and wonderful purity of reproduction. Thanks to the "torodium" filament (see my comment below) and the high constant vacuum, its performance will be maintained for S T valves are built - like the Pyramids - to last!"

How could any wireless home constructor resist this blandishment? Especially when it was followed by several more pages of highly coloured prose extolling the virtues of the new valves? *But I can't find any reference to "torodium" in any scientific dictionary. Perhaps it's a word 'invented' by Scott-Taggart himself?*

Here's an example of the prose accompanying the advert: "...Mr Scott-Taggart was in charge of the manufacture of valves made for the British Government...more than fifty patents (but compare it with his entry in Who's Who!), all concerned with valves, stand in his name, some proof of the inventive genius of one of whose technical life has been concerned entirely with this branch of radio...inside the glass bulb is all the ingenuity of modern science, the precision of specially designed machinery...the bulb itself, the whole design of the valve..."..."...in the early days the designer of the S T valve refused to continue unless he was above the others..."..."...in the early days the designer of the S T valve refused to continue unless he was..."..."...in the early days the designer of the S T valve refused to continue unless he was..."

Also on the authors list were John W. Barber and John Underdown. But these may well have been pseudonyms used by Scott-Taggart.

There were now companion magazines, Wireless Weekly, also edited by Scott-Taggart, and Wireless Constructor, a monthly under the guidance of Percy W. Harris. In addition, there was a trade-only weekly called The Radio Dealer.

To those of us engaged in producing single monthly or bi-monthly publications, the very idea of bringing out all that reading matter week after week is daunting indeed! But as if that wasn't enough, Scott-Taggart had established what he called a research laboratory in Elstree to develop and test new wireless equipment.

Although on the surface all seemed well with Radio Press, there must have been rumblings underneath. The first indication of changes to come was the sudden abandonment of Wireless Weekly ('the 100% valve paper') halfway through 1926 and its incorporation (a polite euphemism for submergence) in a new weekly entitled simply Wireless.

Initially, Percy W. Harris and J. H. Reyner were credited as joint editors with G. P. Kendall as assistant editor and John Scott-Taggart as technical director. Although in September, his name was erased (literally since the gap in the credits list is quite obvious) and a month later the other names went as well.

Economical Or Prodigal

Whatever you may think of Scott-Taggart's ability to be economical or prodigal with the truth as the occasion demanded, in the cause of self-advancement, it had to be admitted that he really did show real talent for grabbing publicity!

Scott-Taggart is such an important "character" of the vintage wireless days that I've run out of space this time. So, I'll have to continue his fascinating story when it's my turn to look back from the "shop" again in the next year. Until then I wish you all the best and good reading, happy Christmas and New Year!

Cheerio from Charles, see you in April.

Practical Wireless, January 1997
Listen to Your World!

Subscribe to Monitoring Times and Satellite Times Magazines

Do you own a radio, a shortwave receiver, a scanning receiver, or a ham radio? Then Monitoring Times is your magazine! Each monthly issue of MT offers 20 pages of worldwide, English language, shortwave broadcast schedules; departments on aero, military, government, public safety communications; broadcast band, satellite television, long-wave coverage; reviews of new products and radio-related software; technical articles and projects for the hobbyist; feature articles, and much, much more.

Satellite Times is the world’s first and only full-spectrum satellite monitoring magazine, exploring all aspects of satellite communications, including commercial, military, broadcasting, scientific, governmental and personal communications as well as private satellite systems. The satellite industry’s most respected experts contribute to every bi-monthly issue of Satellite Times, addressing both amateurs and experts alike.

If it’s on the radio, it’s in Monitoring Times!

Mail this subscription form to: PW Publishing Ltd., FREEPOST, ARROWSMITH CT. STATION APPROACH, BROADSTONE, DORSET BH18 8PW.

Subscription rates include speedy AIR MAIL SERVICE!
- 1 YEAR MONITORING TIMES - £38 (12 ISSUES)
- 1 YEAR SATELLITE TIMES - £32 (6 ISSUES)

NAME
ADDRESS
POSTCODE
TELEPHONE

I ENCLOSE CHEQUE/PO (PAYABLE TO PW PUBLISHING LTD) £
OR CHARGE TO MY ACCESS/VISA CARD THE AMOUNT OF £
CARD#______
VALID FROM______THRU______
SIGNATURE______TEL

CREDIT CARD ORDERS TAKEN ON (01202) 659930
FAX ORDERS TAKEN ON (01202) 659950

MAIL THIS SUBSCRIPTION FORM TO: PW PUBLISHING LTD., FREEPOST, ARROWSMITH CT. STATION APPROACH, BROADSTONE, DORSET BH18 8PW.

Subscription rates include speedy AIR MAIL SERVICE!
- 1 YEAR MONITORING TIMES - £38 (12 ISSUES)
- 1 YEAR SATELLITE TIMES - £32 (6 ISSUES)

NAME
ADDRESS
POSTCODE
TELEPHONE

I ENCLOSE CHEQUE/PO (PAYABLE TO PW PUBLISHING LTD) £
OR CHARGE TO MY ACCESS/VISA CARD THE AMOUNT OF £
CARD#______
VALID FROM______THRU______
SIGNATURE______TEL

CREDIT CARD ORDERS TAKEN ON (01202) 659930
FAX ORDERS TAKEN ON (01202) 659950
literally "poured" us onto the aircraft at Domodedova Airport for the overnight flight to Tashkent.

**Arrival At Tashkent**

On our arrival at Tashkent Airport we were met by Nazim, his friend Bahadyr and a teenage girl called Lena. She introduced herself as our interpreter, as Nazim was not at all sure of his spoken English and we spoke about four words of Russian between us.

We then drove in Bahadyr's car to Nazim's home and settled in. Our room was next to the shack and after a couple of hours sleep, we lost no time in getting on the air.

Barry had taken his Bencher keyer, but without the supporting electronics. This proved to be a problem as Nazim's electronic keyer was not designed for iambic keying. So Barry had to learn to use Nazim's home-made hacksaw blade keyer in a very short time.

I had taken my Vibroplex mechanical key, which just connected to the electronic keyer output and worked first time. Thus, I had the first QSO with U19AWD on 21MHz. Our first G station was G5VQ, who was in fact QSO No. 8.

As soon as Barry had mastered Nazim's crude keyer, we spent as much time as possible on the air, taking turn and turn about of an hour or so each. Activity was, however, restricted to 14 and 21MHz.

All of Nazim's equipment was home-made, with exception of the receiver, which was an ex-military general coverage type. The transmitter was capable of 100W output of s.s.b., as well as c.w. and was built to the famous UW3DI design. The equipment used valves throughout.

Antennas were mounted on a lattice tower and consisted of three element monoband beams for 28, 21 and 14MHz. Wire dipoles were available for 7 and 3.5MHz.

Nazim is chief operator for three other club stations locally. These included U19AWD located at a hostel for Tashkent textile factory workers, U19SWI located at a secondary school, literally next door and U19BWR located at a "Pioneer" camp near the town of Charwak, about 100km north of the city.

With the exception of the universal ex-military receivers in use, all the towers, antennas, transmitters, etc. at all three stations had been constructed by Nazim. That at U19AWD the station was particularly impressive.

The antenna set-up at U19AWD it had no less than four 22m towers with full sizes monoband beams for 7MHz (3-element), 14MHz (5-element), 21MHz (5-element) and 28MHz (6-element). We later learned that this was the station operated by Lloyd and Iris Colvin of YASME fame during their own visit in June 1989.

**Pioneer Camp**

The high spot of the trip was a visit to the Pioneer camp at Charwak where U19BWR is located. From an amateur radio viewpoint, this is a superb location, with good take-offs in all directions, especially to Europe.

There was an impressive array of low band delta loops as well as the inevitable lattice tower and 3-element monobanders. We planned to spend two days here and lost no time in getting on the air, as we had now access to 7MHz as well as 14 and 21MHz.

The signal was obviously much stronger than from Tashkent city and the pile-up built up very quickly. We kept strictly to our one hour on and one off routine with breaks for meals, etc. and the number of QSOs in the log increased dramatically, finally reaching 3152.

**Last Night**

All too soon it was time to pack up and return to Tashkent for our last night before the trip home. Nazim's wife Merxem had laid on a special meal of pilau rice with beef followed by strawberry gateau and we were showered with beautiful gifts. We did our best to reciprocate with western consumer products, but were agreed that we were outdone.

After some fairly emotional farewells at the airport the following morning, the flight to Domodedova Airport in Moscow was uneventful. But we arrived early and missed our meeting with Valery UA3DEA and took a taxi to Shermensy, as our connecting flight time to London did not allow any room for error.

When we arrived at Shermensy, the first people we saw were Valery, Jacob UA3BR and Alex UV3DPP who, having missed us at Domodedova, had driven to Shermensy to wish us farewell. Needless to say, we were very embarrassed, but parted the best of friends.

We should particularly like to thank Nazim U18AA and his family for their unsurpassed hospitality Vlad U3DR for his help with the licenses, Valery UA3DEA and Jacob UA3BR for their help and assistance in getting us across Moscow.

*PW*

(Please note transmitter ventilation trunking on left of photograph) at U19BWR.
Kenwood have just launched the TS-570D transceiver which they say is aimed at replacing the TS-450 transceiver. Rob Mannion G3XFD takes a look at the many facilities - including digital signal processing - on the new rig.

On looking back through my bound copies of *PW* I see that I reviewed the Kenwood TS-450SAT (automatic antenna tuning unit version) in the April 1992 magazine. I was impressed with the rig then and on the few occasions I've operated one since...the effect has not worn off.

Many h.f. transceivers come my way and I have been impressed by several. The TS-450SAT was one, and the Yaesu FT-900AT was another. These 'favourites' were then joined by the Alinco DX-70 which suited me very well indeed.

However, everything I've had the pleasure of trying in the last few years was overshadowed by the mighty Kenwood TS-870. What a machine and what amazing facilities and performance! And although I realise that it would be difficult for anything to come up to the standards of the TS-870, I was more than pleased to be the first Amateur Radio journalist in the United Kingdom to get the opportunity to review the new TS-570D.

**Remarkable Looking**

The new Kenwood TS-570D has a remarkable looking display. It's very large, clear and exceptionally concise. Unusually for Kenwood the display is black i.c.d. with a sandy-yellow backlighting.

I was immensely impressed with the display as it is very 'pleasant on the eye'. (I think it will prove to be ideal for those long hours of operating during contests!). And although I'm not keen on using too much 'techno-speak' I must also add that the ergonomics on the TS-570D are good. This is particularly noticeable with the exceptionally well laid out keyboard 'switch pad' on the front panel. They (much to my surprise) were very easy to use despite the limited feeling I have in my fingertips.

In fact, Kenwood's designers have engineered the switches with a sloping surface so that (in effect) the button control surface is facing slightly upwards. This provides the operator with an excellent tactile characteristic. Because of this I've no doubt this transceiver will prove to be very useful for someone with limited or failing sight, (there's also a voice synthesiser unit available to further help in this respect).

Another feature which I (as someone who does not usually enjoy working with 'computer type' equipment) is the 'scrolling' message facility which informs the operator of exactly what's been selected. This is provided when the operator selects 'Menu Mode'. It's very useful, helpful and non-confusing as it really does tell you in words. There's no need to look for a code translation book for symbols of abbreviations.

So, now I've briefly described the initial impression of the transceiver it's time to delve deeper. Let's find out what's in this particularly 'user friendly' (a very appropriate word in this case) rig.

**Digital Signal Processing**

There's no doubt about it...digital signal processing is gradually making its mark on Amateur Radio transceivers. In a few years time I think all 'mainstream' h.f. transceivers will come with d.s.p. as standard and at increasingly lower prices. Whereas at the moment it's only fitted (as standard) on the higher price equipment.

The TS-570D includes a 16-bit d.s.p. unit to process the audio frequencies. And along with providing enhanced interference facilities, it also improves transmitted audio quality.

The transceiver uses a double conversion superhet for a.m., s.s.b. and f.s.k. and triple conversion for f.m. First i.f. is 73.05MHz and the second is 8.83MHz. (Third i.f. for f.m. use is 455kHz).

The TS-570D employs the d.s.p. technology to provide high performance receive filters and enhancement of the heterodyne and noise reduction capabilities. It also provides an interesting facility by providing 'automatic zero-beating for c.w. operating.

The d.s.p. facilities on transmit are also very useful. This is because the operator can actually 'tailor' the transmitted audio to suit their voice and operating conditions by using the 'transmit equaliser' function.

**The Manual**

As I was privileged to be the first Amateur Radio journalist in the UK to have the TS-570D on review, I was also the first to have it on loan without the manual!

The TS-570D I had was the model which was on display at the Leicester show and I had the pleasure of taking it back to Dorset with me. The manual arrived several days later.

In my opinion it's a credit to the 'user friendliness' presentation of the TS-570D that I was able to go on the
air without the manual. In fact, I had many QSOs on the day after Leicester (Sunday 19th October) and the only difficulty I had was that quite a few of my friends didn't recognise my voice until I found out how to adjust the transmit audio characteristics. And I achieved this without the use of the manual, but with the help of the 'scrolling menu' and a lot of practice.

However, once the manual arrived I realised it was worth waiting for. As is usual with most manufacturers now, the 'Japanese English' has gone, to be replaced by accurate, precisely prepared and well thought out instructions. But the advice from G3XFD is - "If you got the manual...read it!" And this sentiment is certainly applicable with the TS-570D instructions as you'll save a lot of your time which could be used on the air or listening.

On The Air
I was fortunate...indeed I was lucky that the time I had the transceiver on review - and on the air - was before the storms (the tail end of a hurricane apparently) struck hard here on the south coast. All my new h.f. antennas were wrecked and I was forced off air, until I 'jury rigged' a crude long wire antenna.

However, I managed to put the TS-570D through its paces and experience a rather different automatic antenna tuning unit (a.a.t.u.) before the storms. I'd been warned the auto a.a.t.u. on the transceiver was an electronic switching type but it still caught me unawares!

The electronic a.a.t.u. didn't seem much quicker than the electro-mechanical types which use 'roller coaster' or mechanically switched tapings. On the other hand because it was very quiet I had to watch the front panel display to see if all was well. Rather un-servicing at first, but you soon get used to it and the a.a.t.u. then memorises the settings for that frequency for the antenna you're using at the time.

Audio from the transceiver's built-in speaker (there's an optional external unit available) was very good. The reports from other stations on my transmitted audio (as I've already mentioned) were also good following the initial set-up process.

Incidentally, I found that the built-in speaker gave very reasonable results on broadcast band listening when I used the general coverage receive capabilities. This is not often the case with a communications receiver and to be quite honest I didn't feel the need for an external speaker for communications use.

Morse Mode
Most of my operating is in 'Morse Mode' although I like to have a chat on 'phone. And it was on c.w. that I found the 'auto' zero beat function to be helpful. This provides a quick (very!) automatic zero beat to the incoming c.w. signal.

The auto zero-beat also takes into account the operator's preferred offset (beat note). And although I did find it useful I've no doubt that this ingenious facility will really come into its own for contest working.

Working The DX
Tuning up and down my favourite band (7MHz) I found that the impressively clear display made operating a relaxing time and I thoroughly enjoyed working the DX. The d.s.p. proved its worth by virtually eliminating the splatter from another European station who (although beaming to New Zealand) was obviously firing a lot of rf. at me - assuming he was beaming his 7MHz beam the other way of course.

I worked a string of ZLs on 7MHz and then a few West Coast American stations on phone and c.w. And by using a selection of setting combinations on the DSP Slope (high and low control) was able to copy all the DX without difficulty. It was particularly helpful on c.w. because on this mode I often found myself literally 'buried' under signals as other European operators called the DX station.

The d.s.p. facilities really come into their own on 3.5MHz - and 'Top Band'. This is where I really found the interference reduction capabilities to be very helpful in reducing line timebase interference from TV receivers, and the various high power (it's a problem down on the south coast) maritime signals which seem to spread or literally appear from nowhere on a previously quiet frequency.

At the times I operated, neither 21, 24 or 28MHz were offering any DX or worthwhile signals. However, 14 and 18MHz were busy and I had many QSOs on s.s.b. and c.w. on the bands.

There's a real challenge for any receiver to be met on 10MHz though. But the d.s.p. helped on this band - our narrowest allocation. I'm often
The Kenwood TS-570D HF Transceiver

The addition of the digital processing, larger memory capacity, an excellent main display (you've got to see it to appreciate the clarity) and good layout and simplicity of operation does make the TS-570D an attractive proposition. However, personally I must say that I'd prefer manufacturers (when they've gone to the extent of offering d.s.p.) also make any other filters a standard fitting.

But on the other hand, Kenwood intend that this transceiver sells at a lower price - with the benefit of d.s.p. - than the model it replaces. So I suppose in the long run you have to be realistic and although I would like the c.w. filter fitted too...the d.s.p. would be the first choice!

With everything considered, if you can't afford the absolutely superb TS-870 (my 'dream machine'!) the TS-570D will provide you with an excellent transceiver. And although the TS-870 requires some 'driving' (it really is an 'operator's rig') to provide its best, the new TS-570D is much easier to use from the word 'go'. And that's why I think many Kenwood enthusiasts will go straight to their dealers to try one for themselves. They won't be disappointed!

My thanks go to Kenwood UK Ltd. at Kenwood House, Dwight Road, Watford, Hertfordshire WD1 8EB, Tel: (01923) 816444, FAX: (01923) 819134, for the loan of the review model. The TS-570D is available from Kenwood dealers at a recommended price of £1499.95.

Manufacturer's Specifications

Table 1 Sensitivity Specifications

<table>
<thead>
<tr>
<th>Mode</th>
<th>From</th>
<th>To</th>
<th>Sensitivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>s.s.b., c.w., f.s.k.</td>
<td>1.705MHz</td>
<td>1.705MHz</td>
<td>&lt;4µV</td>
</tr>
<tr>
<td></td>
<td>24.5MHz</td>
<td>30MHz</td>
<td>&lt;0.2µV</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1.9µV</td>
</tr>
<tr>
<td>f.m. @125kHz (SINAD)</td>
<td>28MHz</td>
<td>30MHz</td>
<td>&lt;0.25µV</td>
</tr>
</tbody>
</table>

Table 2 Selectivity Specifications

<table>
<thead>
<tr>
<th>Mode</th>
<th>α-6dB</th>
<th>α-50dB</th>
<th>α-80dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>s.s.b.</td>
<td>2.2kHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4kHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>12kHz</td>
<td></td>
</tr>
<tr>
<td>a.m.</td>
<td></td>
<td>2kHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2kHz</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>25kHz</td>
<td></td>
</tr>
<tr>
<td>f.m.</td>
<td></td>
<td>5kHz</td>
<td></td>
</tr>
</tbody>
</table>

50kHz (f.m. only)
Sensitivity
Third i.f.
73.05MHz
Second i.f.
8.83MHz
First i.f.
73.05MHz
Audible output

Audio output

<2µV (±70 - 30MHz on a.m./s.s.b/c.w.f.s.k.)
<0.25µV (±150µV; V f.m. only)
>1.5W (into 8Ω at 10% distortion)

Transmitter

Modes
J3E (s.s.b.) A1A (c.w.), A3E/F3E (voice), F10 (f.s.k.)
Frequency range
1.8 - 2.0 3.5 - 3.8 7.0 - 7.1
14.35 - 14.35 18.068 - 18.168
21.0 - 21.45
Output Power
5 - 100W (on a.m./s.s.b/c.w./f.s.k/f.m.)
5 - 25W (on a.m.
Modulation
Balanced (s.s.b.), Reactance (f.m.), Low level (f.m.)
Spurious emissions
-50dB or less
Carrier suppression
40dB or more
Unwanted sideband
suppression
40dB or more (at 1kHz modulating frequency)
Deviation (f.m.)
±25kHz (nominal), ±5kHz (wide)
XIT frequency
±5.98kHz (transmitter offset tune)
Mike Richards G4WNC rounds up

the month's news and views from

the computing world.

One of the benefits of running
my readers offers is that I have been able to keep a very close eye on the price of good quality formatted disks. Whilst you can get unbranded disks very cheaply, I've found them to be very unpredictable and generally not worth the effort. As a result, I only use branded disks. I've been using the office stationers Staples for some time now and their latest offer is unbelievable. They are currently offering AT&T branded, formatted IBM PC disks at £22.50 inclusive of VAT for a box of 100. This is extremely cheap!

Staples are also offering smaller packages at equally silly prices. If you need disks I would recommend you get down to your local branch of Staples.

Leicester Rally

It was great to see so many of you at the Leicester show this year. Thanks for making the effort to come and see me. The show didn't seem to be as busy as usual but this was probably because the Motor Show was also running at the NEC along with a Multi-Media Computer show.

I didn't spot any particularly stimulating new applications at the Leicester show although there were some good software offers around.

Windows '95 upgrades were available for £49 whilst the Capital Products stand had lots of bankrupt stock that was well worth a close look.

I did however, manage to pick-up a copy of Visual Basic 3 Professional for just £22. There were also a host of other Microsoft applications available at knock down prices.

SSTV Software

There seems to be lots of SSTV software about these days and the latest to get my attention is GSH-PC by OLSAW. Like many of the new programs, this package has been designed solely for SSTV and so has not had to compromise on any of the facilities.

Although the GSH-PC program has been around for a while, the UK distribution for registered copies has just been taken over by Pervisell, famous for their excellent Hamcomm/JVFAX interfaces. Phil Perkins of Pervisell has kindly sent me a full, registered version for review.

In its compressed, distribution format the GSH-PC program fits neatly on a single PC disk and self expands once copied to an appropriate directory. It takes full advantage of the VESA video format and so requires a 386 or better PC with a VESA graphics card that supports 640 x 480 VESA modes 15, 16 or 24 bits per pixel (VESA modes 272, 273, 274).

You will also need at least 1Mb of extended memory, though 4Mb is recommended. The interface with your rig is dead easy as it uses the standard comparator system and is fully compatible with existing Hamcomm/JVFAX interfaces.

Because GSH-PC needs expanded RAM and likes a hefty chunk of conventional memory, I found I needed to make-up a boot disk to configure the PC for best operation. However, to be fair, I have to do this with most DOS based applications, I really ought to tidy-up my config.sys and autoexec.bat files!

Once the programs are up and running you're presented with a very smart graphical interface with 3-D control buttons and 2 main image screens. This was supplemented by a number of thumbnail frames where received images are temporarily stored as a reminder of what you've received.

There are all the usual options to save and view images and everything was available at the touch of a button. The image formats supported were bitmap and TIFF though it's only the INTEL variant of TIFF without LZW compression. There was also some good on-line help just in case you got stuck.

That's all for this month so, until next time keep computing and keep those letters coming to me Mike Richards G4WNC at PO Box 1863, Ringwood, Hampshire BH24 3JG. Internet mike.richards@dial.pipex.com or visit my Web page at http://dialpipe.dial.pipex.com/mike.richards/

An SSTV picture received using GSH-PC version 2.1.

The transmission of test cards was made very easy with a whole range available for rapid loading into the transmit screen. You can also add your own text over the top of an existing image using the text edit mode.

On the receive side, GSH-PC has a couple of excellent tuning aids. You can either choose the oscilloscope or a bargraph type display.

The oscilloscope is fairly conventional and I found it to be particularly useful for helping to get the best from noisy signals. However, for most occasions the bargraph/spectrum analyser display was just the job.

The bargraph/spectrum analyser display was very clearly set out with markers for black, white and sync pulse. I was particularly impressed with the responsiveness of both displays.

Another well set-up aid was the slant correction that's used to adjust the PC's clock offset. In this program you first receive an image with a slant and then align a marker with the slant. A press of the Return key calculates the offset and automatically stores the details for future reference.

If you want to try a copy or buy a registered version of GSH-PC, you need to contact Pervisell Ltd. at 8 Temple End, High Wycombe, Bucks HP13 5DA. Tel: (01494) 443033. You can also visit their Web site at http://www.pervisell.com My thanks to Pervisell for the supply of the review copy.

Special Offers

Those of you who've ordered any of the Special Offers recently may well have suffered rather long delays, I'm sorry for that but unfortunately demand has outstripped my ability to supply. I've been trying to find a better way to handle the offers. As a result I've managed to secure a very special offer with the Public Domain and Shareware Library (PDSL).

The PDSL have put together a library set of all five disks for just £12 all inclusive. Using PDSL also makes ordering simpler as they accept all the usual credit cards so you can order by 'phone and don't even have to write a letter.

In future please direct all requests for this disk set to PDSL, Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel: (01892) 663298 and request library volume: HP9873abcde.

The disk set consists of IBM PC Software (1.44Mb disks): Disk A - JVFAX 7.0, HAMCOMM 3.1 and WXFAX 3.2; Disk B - DSP Starter plus Texas device selection software; Disk C - Numor 1.2; Disk D - UltraPak 4.0 and Disk E - Mscan 1.3 and 2.0.

I am still supplying my FactPacks, but am looking at better ways to do this, so watch this space!

Printed Literature

Beginners Utility Frequency List (Order Code BL)

Complex Signals Utility Frequency List (Order Code AL)

Decode Utility Frequency List (Order Code DL)

FactPack 1 Solving Computer Interference Problems (Order Code FP1)

FactPack 2 Decoding Accessories (Order Code FP2)

FactPack 3 Starting Up

FactPack 4 JVFAX and Hamcomm Primer (Order Code FP4)

FactPack 5 On the Air with JVFAX and Hamcomm (Order Code FP5)

FactPack 6 Internet Starter (Order Code FP6)

For the printed literature just send a self addressed stamped label plus 50p per item (£1.50 for four, £2.50 for seven and £3.00 for nine) to me at the address at the foot of the column.

END
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 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 just an indication of the amateur bands that the set covers. The PW Editorial team would like to thank Icom UK Ltd., Kenwood Electronics UK Ltd., Waters & Stanton Electronics and Yaesu 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.

---

### Buyers Guide

**Amateur Radio**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Coverage</th>
<th>Power Source</th>
<th>Power Input</th>
<th>AM</th>
<th>FM</th>
<th>SSB</th>
<th>VFO Coverage</th>
<th>VFO Memory</th>
<th>Single Sideband</th>
<th>Dual Conversion</th>
<th>Special Facilities</th>
<th>Mains Input</th>
<th>RF Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT-100</td>
<td>V</td>
<td>5, 2.8, 1.0</td>
<td>B, E</td>
<td>1075x320x25</td>
<td>220</td>
<td>20</td>
<td>125</td>
<td>225</td>
<td>30</td>
<td>20</td>
<td>C,D,X</td>
<td>290</td>
<td>Nov 95</td>
</tr>
<tr>
<td>FT-110</td>
<td>V</td>
<td>5, 1.5</td>
<td>B, E</td>
<td>120x25x25</td>
<td>225</td>
<td>150</td>
<td>15</td>
<td>290</td>
<td>C,D,X</td>
<td>290</td>
<td>Sept 95</td>
<td>FT-110</td>
<td></td>
</tr>
<tr>
<td>FT-220</td>
<td>V</td>
<td>5</td>
<td>B, E</td>
<td>125x25x25</td>
<td>225</td>
<td>250</td>
<td>15</td>
<td>190</td>
<td>C,D,X</td>
<td>190</td>
<td>Apr 95</td>
<td>FT-220</td>
<td></td>
</tr>
<tr>
<td>FT-420</td>
<td>V</td>
<td>5, 2.8, 1.0</td>
<td>B, E</td>
<td>1075x320x25</td>
<td>225</td>
<td>325</td>
<td>30</td>
<td>290</td>
<td>C,D,X</td>
<td>290</td>
<td>Aug 95</td>
<td>FT-420</td>
<td></td>
</tr>
<tr>
<td>FT-2R</td>
<td>V</td>
<td>5, 2.8, 1.0</td>
<td>B, E</td>
<td>125x25x25</td>
<td>225</td>
<td>325</td>
<td>30</td>
<td>290</td>
<td>C,D,X</td>
<td>290</td>
<td>Aug 95</td>
<td>FT-420</td>
<td></td>
</tr>
<tr>
<td>FT-500</td>
<td>V</td>
<td>5, 2.8, 1.0</td>
<td>B, E</td>
<td>1075x320x25</td>
<td>225</td>
<td>325</td>
<td>30</td>
<td>290</td>
<td>C,D,X</td>
<td>290</td>
<td>Aug 95</td>
<td>FT-500</td>
<td></td>
</tr>
<tr>
<td>FT-810</td>
<td>V</td>
<td>5, 1.5</td>
<td>B, E</td>
<td>125x25x25</td>
<td>225</td>
<td>325</td>
<td>30</td>
<td>290</td>
<td>C,D,X</td>
<td>290</td>
<td>Aug 95</td>
<td>FT-810</td>
<td></td>
</tr>
<tr>
<td>FT-1000</td>
<td>V</td>
<td>5, 3.1, 0.5</td>
<td>B, E</td>
<td>134x45x30</td>
<td>325</td>
<td>375</td>
<td>62</td>
<td>440</td>
<td>C,E</td>
<td>440</td>
<td>Apr 93</td>
<td>FT-1000</td>
<td></td>
</tr>
</tbody>
</table>

### Keys

**Coverage**

Frequencies listed are not 'true' bands, they are just an indication of the amateur bands that the set covers.

**Power Source**

- B: Battery (in-built)
- E: External 12V (13.8V) source
- M: Mains (in-built)

**Special Facilities**

- A: Antenna Tuning Unit
- B: Automatic Band Change
- C: CTCSS

**Modes**

- A: AM
- F: FM
- S: SSB
- D: Double Conversion Superhet
- T: Triple Conversion Superhet
- K: Keypad Options
- P: 9600bps Packet Operation without mods needed
- S: Channel Scope
- T: Thet Deterrent Front Panel

---

Practical Wireless, January 1997
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 70 of this issue.
This month David Butler G4ASR takes a look at the variety of propagation modes that were observed recently on the v.h.f., u.h.f. and s.h.f. bands.

During the month of October a surprisingly high number of propagation modes were observed on the v.h.f., u.h.f. and microwave bands. These included aurora, sporadic-E (Sp-E), trans-equatorial propagation (t.e.p.), meter scatter (m.s.), rain scatter and tropospheric enhancement (tropo).

At the end of the October there was also the international ARRL earth-moon-earth (e.m.e.) contest. Although not strictly a propagation mode it does involve a scattering medium, albeit 395,000 kilometres away.

Of course not all parts of the spectrum were similarly affected by the modes I’ve just mentioned. For example t.e.p. was only observed on the 50MHz band whereas rain scatter was only observed on the upper microwave bands.

Nevertheless there was sufficient variety to keep many v.h.f./u.h.f./s.h.f. enthusiasts very happy. It’s just a pity that activity on some bands was fairly low because there were some very good DX contacts being made.

Now I’ll take a look at the openings in more detail. One of the modes that occurs at the lower end of the v.h.f. frequency spectrum is auroral propagation. It’s frequently observed on the 50 and 70MHz bands, although lack of serious DXers on this latter band means that many openings regrettably go unnoticed.

Openings on the 144MHz band are fairly common whilst those at 430MHz are encountered only during larger events. Three auroral openings on the 50MHz band were reported in the UK during this period. Those openings however were very much weaker in terms of intensity and duration compared to those over the south-easterly path.

The Sp-E openings on the 50MHz band were reported in the UK on October 5, 13, 14, 15, 16, 20, 21, 22 and 23. Virtually all openings were with countries to the south-east of the UK. For example, between 1000-1100UTC on October 5, contacts were made with stations to the south-east (ES, LA, OH, OZ, SM) and by 60PG0 in 1092.

The station of G7EXO also produced contacts with stations in CT, EH and YU. A further eight days of openings between October 13-18 and 20-22 produced contacts with stations in CT, EH, F, HB9, I, OE, SS, YO, YU and 9H. There were also reports of contacts being made with stations to the north-east (ES, LA, OH, OZ, SM) and many Italian stations between October 13-16 and 20-23.

50MHz band were unusually late in the season, possibly nature’s way of making up for the very poor conditions experienced during the summer! At times during October the maximum usable frequency (m.u.f.) almost reached the 70MHz band.

According to DL8EBW the m.u.f. was around 67MHz on October 14 and 14 in the EA/CT direction. On October 20 at 0830UTC the m.u.f. was in excess of 90MHz in the LZ/YO direction and at 0834UTC the station of DL8EBW heard LZ2FR on the s.s.b. calling frequency 144.300MHz.

Another LZ1 station was heard on c.w. but signals faded out before contact could be made. The m.u.f. bounced around the 50MHz mark all morning of the 20th reaching the 144MHz band again between 1000-1015UTC. At that time the station of LZ1YOI reported working a number of Belgian stations.

In central England, operators of the 50MHz band were reporting contacts with S52R, Y07V, Z23MA and many Italian stations between 0930-1020UTC. Did you hear any unusual activity on the 144MHz band during this period?

Trans-Equatorial Propagation

Last time I reported that a number of stations throughout England had noted the return of trans-equatorial propagation (t.e.p.) on the 50MHz band. This propagation mode allows contacts to be made across the geomagnetic equator (hence trans-equatorial) with countries situated within southern Africa.

Theoretically many countries are workable from the UK, for example Botswana (A2), Malawi (7Q7), Namibia (7Q7 previously ZS3), Zambia (5J) and Zimbabwe (Z2).

However, it very much depends on the resident amateur activity and beacon availability.

Both V51, Z2 and 7Q7 have operational beacons (V51VF on 50.018, Z21SIX on 50.052, and 7Q7SIX on 50.033MHz). As reported last month the V51VFH and 7Q7SIX beacons were heard in the UK on September 28 and 29. Amateur activity in these two countries is very low but at least they have more operational beacons than ever before.

Look out for V51DM, V51E, 7Q7JL and 7Q7RM. Unfortunately in other countries the only active stations are those of A22BW, ZZ3JO and 9J2CR. On October 16 between 1545-1645UTC the V51VFH beacon (JG8T) was heard by G7EXO and G4RGK, both in locator square 1091 and by G9FGO in 1092.

The station of G7EXO also
reported hearing 9H5ET (JM75) at the same time indicating that the t.e.p. path was being extended into the UK via Sp-E propagation. I mentioned last time that this is perfectly normal and that a two-mode path occurs relatively frequently.

On reflection I should have mentioned that this normally refers to the period around solar minimum. At other periods, in the years either side of solar maximum, the first hop from the UK (towards the main t.e.p. path) could well be sustained by F-layer propagation. It's also a possibility that at solar maximum the northern t.e.p. zone may well extend as far as central England. The need for an additional propagation mode (such as Sp-E or F-layer) to get into the t.e.p. active region is therefore not required.

I also mentioned last month that the t.e.p. season is accepted to occur between September/November and February/April. These openings in the UK on September 28-29 and October 16 tend to confirm this.

Incidentally if, like me, you want to predict when these openings might occur then the recent that the last recorded opening in the UK was on 24 October 1993. So, there has been a two-year gap (1994-1995) with no t.e.p. activity reported in the UK.

The autumnal openings in 1993 occurred on October 14 (to A22BW, ZL2UJ, ZS6WB and 7Q7RM) and October 24 (to 72JL and 70RM). Earlier that year (1992), the spring openings occurred on March 16 (707) and March 25 (V5 and ZSB). Openings in the previous year, 1991, were much better with two openings in September (V51 and 707) and five in October (A2, V5, ZS6, ZS9 and 707). Even better propagation was recorded during the spring equal period with eight openings recorded in March and three in April 1992.

So, based on this (very short) reporting period it could be deduced that there might be two or three t.e.p. openings around March 1997 and even more (possibly four or five) later in the year around October. Well you can't say I didn't warn you!

Other Modes

Now I'll continue with reports of other propagation modes. A number of meteor scatter streams were encountered during October, the best of these being the Orionids shower. The earth passed through the Orionid shower between October 16-27, with maximum activity being noted on October 21. Very little activity was noted on the 50MHz band. This is a shame because some good results can be obtained even with low power and a small antenna. Many years ago I ran a series of meteor scatter tests with LA6DBA on both the 50 and 144MHz bands. These tests were always scheduled outside of shower periods and relied on random meteors, early in the morning.

Running 8W of s.s.b. into a 5-element FR9T Yagi on the 50MHz band I could generally complete a contact within 15-20 minutes. However, on the 144MHz band, running 150W of c.w. into a 5-element Cuscutter Yagi, the schedules would take up to one hour or more to complete.

The simple example quoted shows how easy it is to make m.s. contacts on the 50MHz band. My personal choice however, is to make schedules or carry out random operation on the 144MHz band. There are undoubtedly more DX'ers interested in making schedules on this band than all the others put together.

Along those making m.s. contacts on the 144MHz band during the Orionids shower were G4KRV (J001) who contacted IBTW/K8 (J179) some 1720km away and G8FLU (J098) who worked ES2RL (K029) over a path in excess of 1900km.

Rain Scatter

A propagation mode that very few operators encounter is rain scatter. That is unless you happen to be a microwave operator! Heavy rain between two microwave stations will almost always attenuate signals by many tens of dB. That's because large numbers of rain drops can act as a reflector to s.h.f. signals. However, if the rain storm is located away from the line of sight path then both operators can beam at the 'reflector' and make a contact via rain scatter. Interestingly, many fixed station 1GHz operators find they can often work greater distances during intense rain storms rather than trying on a calm summer day.

The rain cloud effectively becomes a 'metallic mirror' in the sky and can enhance signals by 30dB or more. The only problem is locating the specific rain storm that acts as a reflector to microwave signals and communicating that fact to other operators, maybe up to 800km away.

Recent contacts made by Sam Jewell G4DOK (J002) via rain scatter on the 10GHz band include PA0CIS and DF7JS. A contact was also made with DL3YE over a path length of 540km.

Signals peaked 56RS (the 'RS' is the convention used to indicate rain scatter. It's similar to sending 56A to indicate an auroral contact). Interestingly because of the relative motion of the rain storm there is a pronounced doppler shift on received signals. On the 10GHz band c.w. signals canspread more than 1kHz making the signals sound auroral.

Autumnal Lifts

It's generally recognised that the best tropo enhancements are often observed during the months of October and November. These annual 'lift' in conditions normally occur when mist or fog are present and high pressure extends from the UK for hundreds of kilometres into Europe.

The autumnal 'lift' in conditions normally occur when mist or fog are present and high pressure extends from the UK for hundreds of kilometres into Europe. I view to form such conditions existed on a number of days during October allowing many operators to make some long distance contacts. For example, the station of G4UF (J301) reported hearing HB9AIM/H (JN37) peaking 575 on October 22.

Simon Freeman G3LOR (J002) also made some good contacts, working HB9MIO (JN27) over a distance of some 700km and DL4VC (JN38) at 550km. The station of G4DOK had similar success contacting OJ6J at 430km and F6KW over a 380km path.

Did I forget to mention I was reporting activity on the 10GHz band! Yes, that's right, 10,000MHz Million watts of r.f. and 60mm dishes. So, now imagine what work most operators were working on lower frequencies. Probably the best period for lift occurred in the three days between October 22-24. The build up to the openings was predictable and as usual it was the u.h.f. and s.h.f. operators that capitalised on the tropo enhancements.

On the 1.3GHz band, operators as far north as locator square i093 were making contacts into Germany, Switzerland, southern France and Spain. John Durrant GW3XY (J002) reported making many s.s.b. contacts including QSO's with DX2LR (JN57) at 910km and HB9SNR (JN36) at 800km.

John also worked FG6MBI (JN04) over a 890km path and EA2LP (IN83) at 1013km. Not bad for an s.h.f. band.

It was a similar state of affairs on the 430MHz band with much traffic being noted on the DX Clusters. Among the many distant stations being worked from the UK were EA1BLA (IN32), EA2AWD (IN98), EA3YK (JN11), HB3AM/H (JN27) and K1MTZ (JN35).

German stations, both to the south of the country (JN48, JN58) and to the east, (JO56, JO51) were putting in rock-crushing signals for much of the period.

Ralph Sachs G2CZS (J001) mentions that having missed out on the Sp-E openings earlier in the summer he is happy to report some DX on the 144MHz band at long last. In addition to many s.s.b. contacts with stations in F and DL he also worked LX1JA (JN29), HB8RDE (JN29) and HB9IVNA (JN37).

According to Ralph the Swiss stations were 'end-stopping' at his QTH.

Earth-Moon-Earth

The last mode I'll look at this month is that involved with earth-moon-earth (e.m.e.) communication. The principle behind this is relatively simple.

Create as much power as you can, point your group of Yagis at the moon and attempt to bounce your signal off the lunar surface to someone on the other side of the world. In practice it's a little more complicated than this!

Conditions during the ARL contest on October 26-27 were quite good. The geomagnetic activity was low which meant that there was insignificant absorption to v.h.f. signals.

Activity was good on all bands, most operating take place working on the 144, 430 and 1296MHz bands. Stations of note being worked from the UK included JA0LBC (Fig. 1) and KL7X on the 144MHz band and HP2XUX and PY5ZBU on the 430MHz band.

Activity Table

Just another reminder for you that I will be running an activity table during the 1997 period. Entries can be for any v.h.f., u.h.f. or s.h.f. band and for any mode.

Although intended for terrestrial communications I'm not averse to the idea of satellite contacts being included (as long as they are entered as a separate listing). To enter you only need send details of the number of contacts, locator squares and countries worked on each band.

Deadlines

That's enough of me for this time. Thank you to everyone that has written in to the column with news and photographs. It's very much appreciated.

I therefore only leave to wish you a very 'Happy Christmas' and hope that 1997 is yet another year full of DX on the v.h.f. bands.

As usual please send any news, comments, photographs for your column or entries for the all-band tables to me (by the end of the month) at Yew Tree Cottage, Lower Maesroad, Herefordshire HR2 0HP. You can also forward material to me via packet radio at GB7MAD, the UK DX Cluster at GB7DXC or E-mail via dave@mmf81.rjv.m.com.Alternatively you can telephone me on (01883) 806679.

Practical Wireless, January 1997
Canadian Reciprocal Licence

Before anyone tells me, I know that Canada is not part of the United States, and that this column is called 'Scene USA'. However, I won't stop me mentioning Canada occasionally. I explained last time (October 1996) how to get a reciprocal permit for the USA and I would now like to do the same for visits north of the border.

For reciprocal operation in Canada you need a form called an Application to Operate an Amateur Radio Station in Canada's see Fig. 1. This is very straightforward and it reflects the laid-back attitude Canada has towards regulation of amateur radio.

The Canadian national society, Radio Amateurs of Canada, can supply copies of the form. They can be contacted at 720 Belfast Road, Suite 217, Ottawa, Ontario K1G 0Z5, Canada. Tel: (from the UK): 001 613 244 4367. If you have access to the Internet, everything you need is available at http://www.rac.ca.

When you have completed the form, send it to the address corresponding to the proposed location of your operation in Canada. Tel: (from the UK): 001 613 244 4367.

The Canadian national society, Radio Amateurs of Canada, can supply copies of the form. They can be contacted at 720 Belfast Road, Suite 217, Ottawa, Ontario K1G 0Z5, Canada. Tel: (from the UK): 001 613 244 4367. If you have access to the Internet, everything you need is available at http://www.rac.ca.

Fig. 1: This form is used to apply for a Canadian reciprocal licence.

Ed WT3U at his workbench.

Ed WT3U explains how to get a reciprocal licence for Canada, he also continues with his look at the US licensing system.

Licence Examinations US Style

In last April's 'Scene USA' I gave examples of some of the questions a prospective amateur would encounter when taking the Novice and Technician examinations. Look at the April '96 copy of Practical Wireless if you have it, for background on the testing and 'Volunteer Examiner' system. Let's have a look now at questions for the General Class licence, but certain useful sections are reserved for higher licence categories.

Fig. 2: Map showing Canadian call areas, which are determined by the province you're operating in.

Ed WT3U at his workbench.

3: What is the total bandwidth of an f.m. phone transmission having a 5kHz deviation and a 3kHz modulation frequency?
(a) 3kHz
(b) 5kHz
(c) 8kHz
(d) 16kHz

4: A signal report is '20dB over S9'. If the transmitter power is reduced from 1500W to 15W, what should be the new signal report?
(a) S9
(b) S7
(c) S5
(d) S4

How did you get on? I found myself wondering if an intelligent guesser would be able to pass, then decided it would be difficult! Question 3 sent me scurrying to a text book and question 4 made me reflect on why
Please mention Practical Wireless when replying to advertisements.

AERIAL ROTOR FOR ONLY £49.95!

AR300XL Aerial Rotor, Control Unit and Optional Alignment Bearing

- Rotor unit type AR300XL and control console.
- Continuous indication of beam heading.
- Clamps to 2in (50mm) max. mast and takes 1.5in (38mm) max. stub mast.
- Offset type mounting.
- Vertical load carrying cig.
- Special offer £9.95 plus £4.95 p&p.
- AR12301 Alignment (upper) bearing.

RR 50 Marginally tuned satellite receiver, ideal ATV 1.3GHz use and DXing.

CURRENT CATALOGUE

Send £2 for our latest 32pp catalogue which you will receive back by return of post.

Best seller... the bargain priced

Adapt-A-Mast

- Lifts to 25ft - Wall mounting
- Complete with all brackets, cable and winch
- Accepts 2in stub mast - Adaptable to tilt-over
- Available hot dip galvanised BS725
- Simple four bolt installation

MANY OTHER MASTS AVAILABLE

Call (01505) 503824
Mobile (0374) 951660
or write to

TENNAMAST SCOTLAND LTD
81 MAINS ROAD
BEITH, AYRSHIRE KA15 2HT

Advertisements are expected to conform to rules and standards laid down by the Advertising Standards Authority. Most do.

The advertising rules are at the disposal of advertisers. In this issue:

- AERIAL TECHNIQUES
- A. H. SUPPLIES
- AERIAL TESTS
- A. H. SUPPLIES
- AERIAL MASTS
- A. H. SUPPLIES

Practical Wireless, January 1997

PRACTICAL WIRELESS PCB SERVICE

Printed Circuit Boards for Practical Wireless constructional projects are available from the Practical Wireless PCB Service.

The boards are made in 1.5mm glass-fibre and are fully tinned and drilled.

When ordering PCB's please state the article title, magazine cover date and the board number.

Mark your envelope Practical Wireless PCB Service.

Cheques to be crossed and made payable to: Badger Boards.

Please print your full name and address in block capitals and do not enclose any other Practical Wireless correspondence with your order.

Please allow 28 days for delivery.

Send orders and remittances to:

Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF.
Tel: 0956 374918

PRACTICAL WIRELESS PCB SERVICE

PW PCB SERVICE

Every month and save money.

Telephone (01202) 659930 for more details.

Practical Wireless, January 1997

SCOPE SE. LABS. SM.111 general purpose bench or port scope for use on 240V or 24V DC spec. DC to 10mgs at 20 MHz/V Cm or 4mgs at 2 MHz/V Cm. T.R. 0.2 Us Cm to 1 Sec Cm plus 5 expansion in CRT 10 x 8 Cm dual trace, size 16 x 16 x 17 weight 11kg tested with book. £135.

FREQ COUNTER Racal type 5998.6 digit 520 mgs 50 MHz/V with TCXO crystal unit option. £125.

COAX SWT 1 pole c/o BNC 50 ohms with plugs £1.50. £9.50. AERIAL TEST 1 to 1.2 Ghz with BNC connector 6 by 1/2" dia weather proof. £125.

COAX ACXR incl Dir Coupler, Pasion Attenu. F & Throat each BNC 50 ohm plugs please note for use at 4Ghz lot.

POWER UNIT Army bench unit 240V DC 0 to 5v 0 to 40v at 0 to 5 amps cont. £1 or 1 volts inc by decade with current by meter checked with book. £65 also 12/14V DC at 10 amps or stub modules. £125.

AMPLIFIER UNIT wide band for 240V was used to increase amp older type army VTMs can be used alone as amp or with rect o/p to meter as VTG gain 10/50/100 at 50/40/15 mgs valve unit with book. £15.

TAPE UNITS Racal 4851 lead tape recorder units 4 channel tape min & 4 channels max for £350. £250. POWER UNIT Army bench unit 240V DC o/p var 0 to 40V at 0 to 5 amps cont. £1 or 1 volts inc by decade with current by meter checked with book. £65 also 12/14V DC at 10 amps or stub modules. £125.

POWER UNIT Army bench unit 240V DC o/p var 0 to 40V at 0 to 5 amps cont. £1 or 1 volts inc by decade with current by meter checked with book. £65 also 12/14V DC at 10 amps or stub modules. £125.

TAPE UNITS Racal 4503 lead tape recorder units 4 channel tape min & 4 channels max for £350. £250.
COLOMOR (ELECTRONICS) LIMITED
170 Goldhawk Road, London W12 8HJ
Day Tel: 0181-743 0899 Fax: 0181-749 3934

OVER A MILLION VALVES IN STOCK. PLEASE ASK FOR A QUOTE

P & P - Orders up to £20 Over £20
KT66 - GEC £40 each DA100 - GEC £100 each
KT67 - GEC £60 each 42126 - STC, OR £150 each
KT66 - GEC £60 each EL34K - SHOW £15 each
KT67 - GEC £1.00 each PX4 - Globe shaped £20 each
KT69 - MUL 12.95 each QV03-10 1.25 each
KT88 - 25.95 each 6AL5 1.00 each
KT86 - 3.15 each 6A2 2.25 each
KT86 - 5.10 each 6G9 1.00 each
KT86 - 9.90 each 6FQ7 1.00 each

P & P - £4.55. Over 2Kg at cost. VAT included in all prices.

AMESLAM PRODUCTS
AUTO-TONEBURST 170Hz repeater toneburst, high stability, 7-18V supply, 28mm square, 12mm high. Type AT1765. PCB Kit £8.50. PCB Built £7.25.

PIPETONE End of transmission power letter K. Type KT100. PCB Kit £9.00. PCB Built £16.50.

FM BOARDs For Yaesu and Trikkenwood AV/SER/CW rigs. FT101. B, L, Z. FT120, M. TR505, etc. RX board FDS-1X £16.75. TX board FDMS00 £19.75.

SPEECH PROCESSOR Audio clipping and bandpass filtering. Increases the average power
TR530S, etc. RX board FD3-11X £56.75. TX board FM2000 £19.75.

FM BOARDS For Yaesu and Trio/Kenwood AM/SSB/CW rigs. FT101, B, E, Z, FT102, M, 12mm high. Type AT1750. PCB Kit £5.00. PCB Built £7.50.

SEND SAE FOR CATALOGUE OF AMATEUR KITS AND BUILT UNITS

WEATHER SATELLITE SYSTEM
WEATHER SATELLITE RECEIVER 6 channel crystal-controlled receiver with scan facility and effective signal meter. Good immunity to adjacent channel paging interference. Monitor ARISS and remote switching facility. Output suitable to drive computer interface. Type WSR. Boxed Kit £127.40. Boxed Built £184.75.

SATELLITE ANTENNA 2 element crossed Yagi phased for circular polarisation and beamwidth. Ready to assemble £25.00.

COMPUTER INTERFACE Universal computer interface that works really well with all popular software for Weather pictures. STDV, RTTY, AMTOR & CW. Type UNIFACE 2003. Boxed Kit £65.50. Boxed Built £96.25.

SYSTEM CABLES DIN to DIN for Receiver to Uniface. DIN to D for UNIFACE to Computer.

WEATHER SATELLITE RECEIVER 6 channel crystal-controlled receiver with scan facility and effective signal meter. Good immunity to adjacent channel paging interference. Monitor ARISS and remote switching facility. Output suitable to drive computer interface. Type WSR. Boxed Kit £127.40. Boxed Built £184.75.

SATELLITE ANTENNA 2 element crossed Yagi phased for circular polarisation and beamwidth. Ready to assemble £25.00.

COMPUTER INTERFACE Universal computer interface that works really well with all popular software for Weather pictures. STDV, RTTY, AMTOR & CW. Type UNIFACE 2003. Boxed Kit £65.50. Boxed Built £96.25.

SYSTEM CABLES DIN to DIN for Receiver to Uniface. DIN to D for UNIFACE to Computer.

ATTENTION RADIO DEALERS!
Would you like to stock our best selling titles like the World Radio TV Handbook & Passport to World Band Radio? If the answer's yes then telephone Michael Hurst in the PW Book Store on 01202 659930 for the best quality discounts.

SPECTRUM COMMUNICATIONS
Unit 6b Poundbury West Estate, Dorchester, Dorset DT1 2PG. Phone and Fax 01305 262250
Opening times: 9-1 2-5 Tue-Fri, 9-1 Sat. Closed Sun & Mon.

WEATHER SATELLITE SYSTEM
WEATHER SATELLITE RECEIVER 6 channel crystal-controlled receiver with scan facility and effective signal meter. Good immunity to adjacent channel paging interference. Monitor ARISS and remote switching facility. Output suitable to drive computer interface. Type WSR. Boxed Kit £127.40. Boxed Built £184.75.

SATELLITE ANTENNA 2 element crossed Yagi phased for circular polarisation and beamwidth. Ready to assemble £25.00.

COMPUTER INTERFACE Universal computer interface that works really well with all popular software for Weather pictures. STDV, RTTY, AMTOR & CW. Type UNIFACE 2003. Boxed Kit £65.50. Boxed Built £96.25.

SYSTEM CABLES DIN to DIN for Receiver to Uniface. DIN to D for UNIFACE to Computer. State a pin or 26-pin D type required. Parts £3.50. Made up £10.00.

COMPLETE SYSTEM ready-assembled as shown including complementary JV FAX version 7.1 software but not including antenna downloaded £239.25.

PW SERVICES
Querries: Practical Wireless, PW Publishing Ltd., Arrowmith Court, Chesterfield, Derbyshire, B69 18R8
We will always try to help readers having difficulties with Practical Wireless projects, but please note the following simple rules:
1: We cannot deal with technical queries over the telephone.
2: We cannot give advice on modifications either to our designs, so commercial radio, TV or electronic equipment.
3: All letters asking for advice must be accompanied by a stamped self-addressed envelope (or envelope plus IRC for overseas readers).
4: Make sure you describe the problem adequately, with as much detail as you can possibly supply.
5: Only one problem per letter please.

Back Numbers
Limited stocks of many issues of PW are available at £2.50 each including post and packing. If the issue you want is not available, we can photocopy a specific article at a cost of £1.50 per article or part of an article.

Over the years, PW has received many letters of radio related equipment. A list of all available reviews and their content can be obtained from the Editorial Offices at Arrowmith Court, Chesterfield, C, 1018 R8W for a large stamped self-addressed envelope.

Binders
PW can provide a choice of binders for readers. Large plain blue binders are available, each holding 12 issues of any similar A4 format magazine. Alternatively, blue binders embossed with the PW logo in silver can be supplied. The price for either type of binder is £3.50 each (£1 P&P for one, £2 for two or more).

Send all orders to PW Publishing Ltd., PRELIMST, Arrowmith Court, Chesterfield. Chesterfield, Derbyshire, B69 18R8

Mail Order
All items from PW are available Mail Order, either by post or using the PW Mail Order Hotline (01202) 659930. Payment should be by cheque, postal order, money order or credit card (Mastercard and Visa only). All payments must be in sterling and overseas orders must be drawn on a London Clearing Bank.

PW SERVICES
Querries: Practical Wireless, PW Publishing Ltd., Arrowmith Court, Chesterfield, Derbyshire, B69 18R8
We will always try to help readers having difficulties with Practical Wireless projects, but please note the following simple rules:
1: We cannot deal with technical queries over the telephone.
2: We cannot give advice on modifications either to our designs, so commercial radio, TV or electronic equipment.
3: All letters asking for advice must be accompanied by a stamped self-addressed envelope (or envelope plus IRC for overseas readers).
4: Make sure you describe the problem adequately, with as much detail as you can possibly supply.
5: Only one problem per letter please.

Back Numbers
Limited stocks of many issues of PW are available at £2.50 each including post and packing. If the issue you want is not available, we can photocopy a specific article at a cost of £1.50 per article or part of an article.

Over the years, PW has received many letters of radio related equipment. A list of all available reviews and their content can be obtained from the Editorial Offices at Arrowmith Court, Chesterfield, C, 1018 R8W for a large stamped self-addressed envelope.

Binders
PW can provide a choice of binders for readers. Large plain blue binders are available, each holding 12 issues of any similar A4 format magazine. Alternatively, blue binders embossed with the PW logo in silver can be supplied. The price for either type of binder is £3.50 each (£1 P&P for one, £2 for two or more).

Send all orders to PW Publishing Ltd., PRELIMST, Arrowmith Court, Chesterfield. Chesterfield, Derbyshire, B69 18R8

Mail Order
All items from PW are available Mail Order, either by post or using the PW Mail Order Hotline (01202) 659930. Payment should be by cheque, postal order, money order or credit card (Mastercard and Visa only). All payments must be in sterling and overseas orders must be drawn on a London Clearing Bank.
some people over-use high power! Here are the answers: 1: (d), 2: (c), 3: (d), 4: (c).

In April’s ‘Scene USA’ I was a little bit hard on the Novice and Technician examinations. The main problem is that the standard is not really commensurate with the ability to go straight out and use a kilowatt amplifier, fortunately this is not what most American amateurs do! I am much happier with the level in the Extra examination. The breadth of knowledge is quite large, although the depth is relatively superficial. This seems fine to me, after all, we are testing for a hobby, not a postgraduate degree. It’s interesting to note the lack of diagrams in the exam questions. The General syllabus could be criticised for being too theoretical.

Advanced Level Licence

The Advanced Licence is designed to appeal particularly to h.f. s.s.b. operators. It allows operation in the ‘phone bands anywhere except for three 25kHz slices on 80m, 20m and 15m (which are reserved for Extra class). Since there are no additional c.w. privileges associated with Advanced Class, a c.w. operator is likely to view this as a stepping stone to the Extra Licence.

The Advanced examination has 50 questions and 37 must be answered correctly to pass. Here are some examples:

5: What is the purpose of D1 in the circuit shown in Fig. 3?
(a) Line voltage stabilization
(b) Voltage reference
(c) Peak clipping
(d) Hum filtering

6: In Fig. 4, what values of V2 and R3 result in the same voltage and current characteristics as when V1 = 10V, R1 = 20kΩ, and R2 is 10kΩ?
(a) R3 = 30kΩ and V2 = 10V
(b) R3 = 6.67kΩ and V2 = 10V
(c) R3 = 6.67kΩ and V2 = 3.33V
(d) R3 = 30kΩ and V2 = 3.33V

7: What is the Q of the circuit in Fig. 5, when the resonant frequency is 3.625MHz, the inductance is 3μH and the resistance is 2.2kΩ?
(a) 0.0021
(b) 900
(c) 4700
(d) 2350

Here are the answers: 8: (a), 9: (b), 10: (c). The Extra syllabus requires understanding of many other subjects, including licence regulations in some detail, as well as the examination system itself, satellites, moon-bounce, logic circuits, the Smith Chart, active circuits, modulation and more advanced antenna theory.

Exam Wrap-Up

That ‘wraps-up’ my perusal of the US licence examinations. Obviously, I have only been able to look at things in overview.

My opinion of the American licence system is that it works very well, and covers a lot of ground. A beginner starting from scratch would have to work hard to get an Extra Class licence. But nothing’s perfect, and I would like to see more emphasis on practical matters, including antennas and operating.

The sample questions above came from the excellent ARRL manuals, one manual is available for each class of licence. Even if you didn’t want a US licence, you would learn some very useful things. Call the ARRL mail-order department, telephone (from the UK): 001 880 594 0200.

Morse Endeavour

The July 1996 ‘Scene USA’ about Samuel Morse continues to attract my correspondence. Jim W6CF, wonders why I made no mention of Alfred Vail, Morse’s partner in their Wireless Telegraph business. Jim says: “After all, Alfred Vail did invent the key, the sounder, was responsible for virtually all of Morse’s mechanical and electrical improvements (other than the relay) once they became partners. And there is even reason to believe (although not iron-clad proof) that it was Vail himself who set the ball rolling on Morse code. Some day I do hope Vail gets his just due. Even Morse wished as much shortly before he died”.

Yes, Jim, there is some argument about who actually invented the various innovations attributed to Morse. Sources are not clear on the subject, and Vail was obviously a leading inventor as well as Morse. Thank you for your contribution to this fascinating discussion!

That’s all for this time. In the next ‘Scene USA’ in the April PW I’ll be interviewing the President of the US national society, the ARRL. He has some interesting things to say about the future of amateur radio in America and world-wide.

73, keep writing to me Ed Taylor WT3U, PO Box 261304, Denver, Colorado 80226, USA or E-mail me at 102662.2222@compuserve.com The deadline for April is the middle of January.
I'm writing this month's column in late October, and the dark autumn nights have finally arrived, heralding an increase in DX traffic on the lower bands. Unfortunately, the weather has also taken a 'darker' turn - last night saw some of the worst storms we've had here in Wales since the 'big one' in 1987.

As a result, my one and only antenna (the 80m long wire) was cast adrift, so to speak, and ended up tangled around neighbours sheds, washing lines, garden fences, etc. ! Oops! Time to 'go and have a little chat' I think! Afterwards I'll have to consider putting up a spare antenna or two as well.

Nevertheless, I have no doubt that many of us will be welcoming the winter season. Not for the weather of course, but for the hoped for upturn in F2 propagation on the higher bands like 14, 21 and maybe even 28MHz.

(Don Mclean G3NOF has reported 28MHz openings to Africa of late). Certainly, 1.8, 3.5 and 7MHz will have shown a marked increase in DX compared to the summer months by the time you read this. So let's hope the higher bands become more reliable too.

Mind you, the thought of a warm, cosy shack at this time of year away from the cold blustery winter conditions is attractive. And this must surely mean that this is the time of year when more and more amateurs are on the air, and as a result, there's more to work!

News & Snippets

I received a short note from s.w.l. reporter Len Stockwell of Grays, Essex, who has informed me that he has now passed the RAE, and will be active on the air soon. Well done Len, keep up the good work!

Secondly, I also received a query from Walter Farrar G3ESP who says 'I don't believe it! Yesterday and today [27/28 Sept] on 3.5615MHz c.w. at dusk I heard "CP1MS de L3CC" repeated ad nauseam, without the sender even stopping to listen! Surely it can't be Argentina calling Bolivia?'

Walter asks 'Do you or any readers have any ideas on this?' Well...it's a bit of a puzzle this one Walter, although it's possible that it could have been a commercial or Government (Fixed or Maritime Mobile) c.w. station judging by the 'LS' callsign. Normally they call a particular station and give a separate receive frequency. However, perhaps other readers may have an answer. Any ideas anyone?

Finally, some really spectacular stuff.

In his propagation report, Mike says that "Around the 7th of October, the K index went to zero - this means that polar absorption due to the sun's radiation is very low, and the ionosphere becomes very stable".

The result was a really good opening across the polar region to Alaska and the west coast of the USA. At one point I heard no less than seven Alaskan stations on 1.8MHz at the same time - a rare occurrence on this band! Mike's list shows c.w. contacts with

**The 3.5MHz Band**

Down to Skewen in West Glamorgan now, and Carl Mason GWOVSW. He's been bashing away at the key again.

Carl's 3.5MHz c.w. list, at around 90W output into a simple dipole antenna includes contacts with VE1UA (Canada) at 2326UTC, and HA9GT (Hungary) at midnight.

For his report Ted Trowell G2HKU on the Isle of Sheppey in Kent confirms 76W c.w. contacts with RA2FJ/MM in the North Sea, plus HB0/HB9NL in the Principality of Liechtenstein, both at around 0500UTC.

Not to be outdone, Don Mclean G3NOF in Yeovil offers a solitary s.s.b. contact on the 3.5MHz band, in the shape of 9O3JE in the Faeroe Islands.

**The 7MHz Band**

Now 7MHz is definitely one band which gets overcrowded during the winter months! Love it or hate it, '40' is a great DX band, although my preference is for c.w. here, due to its restricted bandwidth. Nevertheless, if you want to increase your country score, this is one place you might just like to try - if you've never tried it before now, that is!

'Forty' is certainly a favourite of Charlie Blake M0AJJ in Milton Keynes. And although suffering from local noise on the band in the early morning, he still digs out the DX.

Charlie has made his first h.f. contact with Greta HB9ARC, who has received many s.w.l. QSLs from Charlie in the past. "Was she surprised?" says Charlie.

Charlie has been operating the...
It's always nice to hear from new people who are 'discovering' h.f., and to think 'I can do that too'! Many of the reports we receive make us think if it's a 10MHz FM rig, or even a simple receiver, I'll start the 14MHz band report this month with Don Maclean G3NDF. And as usual he provides his regular report. Don says that ‘14MHz has been the best h.f. band again. In the mornings around 0800UTC there were openings to Japan and Australia on the short path. The best time on the band was around 1500, with good signals from north America. African stations were heard between 1600 and 1800UTC with excellent signals’. Don’s 14MHz log includes s.s.b. contacts with A61AN (United Arab Emirates), SU3YM (Egypt) G3L via Box 545 Port Said, 42111, Egypt. He also logged VK4AU (Australia), 4AS/5HANX (Sultanate of Oman), V60VM (Chagos Island), 2V0MB (GSL to PTG1T), 9K2MG (Kuwait), 7S5JF (Algeria), 2E1UGMR (Mexico), and CP6UA (Bolivia).

Back to Ted G2HKU, whose c.w. worked a treat here on 14MHz, hooking up with 7S50D (Morocco), 3VSBB (Tunisia) and 2W5B (Brazil), 3VSBB (Tunisia) and FM/PA3BBP (Martinique Island), CO2VG (Cuba), and CN8BK (South Africa)

The 18 & 21MHz Bands
A huge 18MHz log came this month from Don G3NDF. But unfortunately (because of lack of space) there's just a small selection included here.

Using s.s.b. as usual, Don logged contacts with A26GD (Botswana), F59HR (Guadeloupe), J38B0 (Grenada) G3L via DL2BO, 3V3BB (Tunisia) and SA1A in Libya.

Charlie Blake 1410A1,1 listens: 3VSBB (Cayman Islands) at 0500, 0700UTC on 7.061MHz. All times in UTC.

The 10MHz Band
The 10MHz allocation is our narrowest h.f. band. But although it’s just 50kHz wide, it still throws up a few surprises.

Ted G2HKU for instance, always a c.w. man, reached out to CN8GB (near Casablanca, Morocco) at 1320UTC, and 9A8000S celebrating 800 years of Osijek, Croatia.

Phil... that was a case of (almost!) all h.f. bands being featured this month! Must be a first! My grateful thanks to all reporters for your time efforts. I get many favourable comments over the air about the column, but always state that it is not my column, but yours. This is because without your continued (and patient) support, it wouldn't be here at all.

So to all reporters and readers, I say (in Welsh too!) a Merry Christmas and Happy New Year! Nadolig Llawen ar Blwddyn Newydd Da i chi! See you next year!

All Bands This Time!
As usual, reports and information (and photos!) by the 15th of each month to: Leighton Smart GWOLBI, 33 Nant Gwyn, Trelewis, Mid Glamorgan CF6 6DB Wales.

Tel: (01144) 411459 or (01144) 71079 (9am - 6pm)
YOUR GUIDE TO SECOND-HAND EQUIPMENT

WATERS & STANTON

01702 206835

PLEASE NOTE SECONDHAND ITEMS COME WITH FULL 3 MONTH PARTS & LABOUR GUARANTEE. MORE INFORMATION PHONE ANDY TUTTLE 01702 206835 OR FAX 01702-205843.

HF TRANSCEIVERS

INDEX QRPS 3w QRPS HF transceiver £149 . MEI 904B 10m CW, 5w portable transceiver £139.

Trio TR-5305 10w HF transceiver £129.

M/MODULES MMSI Morse unit £59.

VECTRONICS AT100 Indoor active antenna £140.

DATONG FL3 Audio filter & notch filter £99.

MEI 20$1 VHF SWR analyzer £79.

YAESU FT490Rx 2m handheld £129.

ICOM IC2E 2m Handheld Transceiver £135.

ICOM IC-730 HF 100W Mobile Transceiver £295.

YAESU FT757 HS TRANSCEIVER GENERAL COVERAGE RX £605.

ICOM IC75A HF TRANSCEIVER GENERAL COVERAGE £959.

ICOM IC700 HF TRANSCEIVER WITH AUTO A.TU £955.

ICOM IC770 HF TRANSCEIVER £475.

ICOM IC751I GENERAL COVERAGE HF TRANSCEIVER £605.

ICOM IC75A GENERAL COVERAGE HF TRANSCEIVER £745.

ICOM IC750I GENERAL COVERAGE HF TRANSCEIVER + AUTO A.TU £1195.

ICOM IC750I GENERAL COVERAGE HF TRANSCEIVER WITH ATU £1195.

YAESU FT203R 2m Handheld £149.

Trio TR-2300 2.5Watt Transceiver £349.

Trio TR-2300 MOBILE ALL MODE TRANSCEIVER £450.

YAESU FT-900R AT £95.

YAESU FT-ONE £89.

YAESU FT-707 £95.

YAESU FT-221R £95.

YAESU FT-290R £745.

YAESU FT-480R £225.

YAESU FT-221R £125.

YAESU FT-221R MOBILE £225.

YAESU FT-480R £375.

YAESU FT-104E £110.

YAESU FT-ONE £99.

Trio TR-2300 £99.

YAESU FT-900R £325.

YAESU FT-290R £145.

KENWOOD TH-22E £145.

KONWOOD TH-79E+SM3 £375.

KENWOOD TH-221M £199.

KENWOOD TH-221M £199.

PROJECT ACCESSORIES

MFZ 20W VHF SWR analyser £79.

DATING FLA Audio filter & notch filter £99.

MIZUHO PL-75 40W 10w listen amplifier £129.

VECTRONICS AT100 Indoor active antenna £99.

MM/MODULES MMSI Morse taker £99.

MFZ 722 LSB & CW filter unit £139.

MFZ 1825A Indoor active afterawave listening aerial £99.

MFZ 726C All mode dual tuneable audio filter £99.

DECKWHIS Morse taker £99.

MAGELLAN L8S GPS receiver £99.

LONGWAVE 150 Active HF preselector £99.

WGR 1007 Dual Digital signal processor £129.

ICOM 412L Receive controller £59.

OPT Receptions antenna £99.

Items are held at various branches, please contact branch for location on 0117 9115403.
### ARC EARLESTOWN
**01925 229881**

<table>
<thead>
<tr>
<th>HF TRANSCEIVERS</th>
<th>PHOTO ACOUSTICS</th>
<th>SHORTWAVE SHOP</th>
<th>SMC GROUP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yaesu FT990AT - boxed £950</td>
<td>Yaesu IC-728 100W HF General Coverage Transceiver, (Mint Condition) £699.00</td>
<td>Yaesu FT970D c/w FT7500 £575.00</td>
<td>01703 251549</td>
</tr>
<tr>
<td>Kenwood TS-850SAT plus DSP-100 as new with all accessories £1999</td>
<td>Yaesu IC-730 100W 80 - 10M Amateur Band Transceiver £349.00</td>
<td>Yaesu FT970D c/w FT7500 £575.00</td>
<td></td>
</tr>
<tr>
<td>Kenwood TS-140S + AT230 boxed £1650</td>
<td>Yaesu IC-2900 10W 2M Multimode £425.00</td>
<td>Yaesu FT970D c/w FT7500 £575.00</td>
<td></td>
</tr>
<tr>
<td>Yaesu FT-102 £650</td>
<td>Yaesu IC-738 100W HF General Coverage Transceiver with Auto ATU (Mint) £1100.00</td>
<td>Yaesu FT970D c/w FT7500 £575.00</td>
<td></td>
</tr>
<tr>
<td>Yaesu TS-201 £575</td>
<td>Yaesu FT-787 100W 80 - 10M Amateur Band Transceiver with Auto ATU, memory unit and Heavy Duty power supply £475.00</td>
<td>Yaesu FT970D c/w FT7500 £575.00</td>
<td></td>
</tr>
<tr>
<td>Yaesu TS-780 boxed £275</td>
<td>Kenwood TM-732E 2M/70cms Mobile Transceiver with removable front panel, (VGC) £399.00</td>
<td>Yaesu FT970D c/w FT7500 £575.00</td>
<td></td>
</tr>
<tr>
<td>Kenwood TS-780S £575</td>
<td>Yaesu FT-470 2M/70cms Dual Band Handheld £499.00</td>
<td>Yaesu FT970D c/w FT7500 £575.00</td>
<td></td>
</tr>
<tr>
<td>2 x Yaesu FT-290R Mk 1 plus accessories from £225</td>
<td>Yaesu FT-290R1 £499.00</td>
<td>Yaesu FT970D c/w FT7500 £575.00</td>
<td></td>
</tr>
<tr>
<td>Nvico AR1-1000S from £140</td>
<td>Handheld £499.00</td>
<td>Yaesu FT970D c/w FT7500 £575.00</td>
<td></td>
</tr>
<tr>
<td>Kenwood TM-742 + 10m module as new £1625</td>
<td>Kenwood TH-75E 2M/70 cms Handheld £175.00</td>
<td>Yaesu FT970D c/w FT7500 £575.00</td>
<td></td>
</tr>
<tr>
<td>Yaesu FT-202 £225</td>
<td>Yaesu FT-290R1 £499.00</td>
<td>Yaesu FT970D c/w FT7500 £575.00</td>
<td></td>
</tr>
<tr>
<td><strong>RECEIVERS</strong></td>
<td><strong>ICOM</strong></td>
<td><strong>SMC</strong></td>
<td><strong>HF TRANSCEIVERS</strong></td>
</tr>
<tr>
<td>2 x Yaesu FRG-8890 + extras from £425</td>
<td>Yaesu FT-290R1 £499.00</td>
<td>PX FT970D £1050</td>
<td></td>
</tr>
<tr>
<td>2 x Yaesu FRG-7700 with memories &amp; accessories £1275</td>
<td>Yaesu FT-290R1 £499.00</td>
<td>PX FT990D £1500</td>
<td></td>
</tr>
<tr>
<td>Icom IC-R7000 £1650</td>
<td>Yaesu FT-290R1 £499.00</td>
<td>PX FT990D £1500</td>
<td></td>
</tr>
<tr>
<td>Kenwood R-5000 boxed £999</td>
<td>Yaesu FT-290R1 £499.00</td>
<td>PX FT8700 £1500</td>
<td></td>
</tr>
<tr>
<td>Yaesu YFG-100 VGC £375</td>
<td>Yaesu FT-290R1 £499.00</td>
<td>PX FT970D £1500</td>
<td></td>
</tr>
<tr>
<td>AR-2011 £175</td>
<td>Yaesu FT-290R1 £499.00</td>
<td>PX FT8700 £1500</td>
<td></td>
</tr>
<tr>
<td>Sony SW-77 Immaculate condition £1650</td>
<td>Yaesu FT-290R1 £499.00</td>
<td>PX FT970D £1500</td>
<td></td>
</tr>
<tr>
<td>2 x Icom IC-R71E boxed £999</td>
<td>Yaesu FT-290R1 £499.00</td>
<td>PX FT970D £1500</td>
<td></td>
</tr>
<tr>
<td>Regency MX-7000 £1650</td>
<td>Yaesu FT-290R1 £499.00</td>
<td>PX FT970D £1500</td>
<td></td>
</tr>
<tr>
<td>Tivo R-808 + VHF converter £425</td>
<td>Yaesu FT-290R1 £499.00</td>
<td>PX FT970D £1500</td>
<td></td>
</tr>
<tr>
<td>Yaesu FRG-7 + a mechanical filter £175</td>
<td>Yaesu FT-290R1 £499.00</td>
<td>PX FT970D £1500</td>
<td></td>
</tr>
<tr>
<td><strong>ICOM</strong></td>
<td><strong>SCOTTISH</strong></td>
<td><strong>HELPER</strong></td>
<td><strong>FT9700</strong></td>
</tr>
<tr>
<td>Yaesu FT970D £575.00</td>
<td>Yaesu FT970D £575.00</td>
<td>Yaesu FT970D £575.00</td>
<td></td>
</tr>
<tr>
<td>Yaesu FT970D £575.00</td>
<td>Yaesu FT970D £575.00</td>
<td>Yaesu FT970D £575.00</td>
<td></td>
</tr>
<tr>
<td>Yaesu FT970D £575.00</td>
<td>Yaesu FT970D £575.00</td>
<td>Yaesu FT970D £575.00</td>
<td></td>
</tr>
</tbody>
</table>

### Disclaimer
Advertisements from traders for equipment that is illegal to possess, use or which cannot be licensed in the U.K. will not be accepted. While the publishers will give whatever assistance they can to readers or buyers having complaints, under no circumstance will the magazine accept liability for non-receipt of goods ordered, late delivery or faults in manufacture.
Clem Patchett VK6CW lives in Thornlie, near Perth, Western Australia, regularly sends me the data news from that part of the world. I usually file this away in the Teletext server of the BBS here and update as necessary. Clem is very keen on h.f. working and has just invested in a Clover installation, utilising the HAL board for his PC. Once he had configured it all properly, he reckons that it performs extremely well, and he spends a lot of time working on that mode.

I must confess to complete ignorance of Clover and am not sure if receivers are many stations using it in the UK. However, I would be interested in hearing from those that are, together with any further information regarding activity that might be available.

Multi-Mode Interface

Peter Lockwood GBLSB has sent me details of his multi-mode interface units that he has available for SSTV and FAX. They come in kit form or as fully encapsulated units.

The encapsulated units seem to be very popular and do stand up to the rigors of “heavy hands” much more than a p.c.b. mounted on a plug. The complete JV-FAX PACK for the GBLSB comes complete with manuals, software, and a selection of pictures.

Peter’s units will transmit and receive SSTV, FAX, c.w., RTTY, ASCII and AMTOR. It will also receive SITOR, NAVTEX, SYNOPs and PACKET, but will not transmit these modes. Peter does advertise in PV and can be contacted at most times on 0181-505 8823.

Radiocommunications Letter

The Radiocommunications Agency (RA) recently sent out a letter to all BBS Sysops together with a questionnaire which we had to complete and return. This letter underlines the concern that the RA has regarding the prohibition of and some form of mandatory control of the type of bulletin allowed on the BBS being considered. In other words, a self-policing and monitoring of all Locally Entered Bulletins before allowing them onto the network. I, for one, have no problem with that, and in fact already do it anyway. I have very few, if any, problems locally and consider myself lucky that I live in a relatively sensible part of the country. However, there are those that would try to upset and abuse the system and these must be stopped.

Luckily packet radio has the means to do this quite easily and possibly with the introduction of passwords, only then will we be able to clean up the network completely. Some people advocate the abolition of the NOV system of BBS licensing altogether, allowing a free-for-all which would, in my opinion, lead to chaos. When comparing our licensing system to that of the USA or Canada, we are more restricted, and seem to have the usual British red-tape surrounding our every move.

More local organisations is possibly a good idea, but under the umbrella of a national body still has to be the best way for us in the UK, especially when comparing bandplans. We have exactly half of what the USA and Canada have on both 144 and 430MHz, so they are able to have more packet allocations than we have.

Down Under

As well as receiving news from Clem VK6CW, I also receive the AAPRA Newsletter, a quarterly bulletin sent out by the Australian Amateur Packet Radio Association. The AAPRA has an impressive list of over 200 members, including five G stations. If you would like to join, please send $18 Aus to: AAPRA, 59 Westbrook Avenue, Wahroonga, NSW, 2076, Australia.

In the latest edition of the AAPRA bulletin there’s news of the long awaited 9600 baud link on a dedicated frequency from Sydney to Newcastle. Now up and running this link has been long planned and struggled with. Thanks are due to Dave VK2DSJ, Brian VK2YBE, and Gerard VK2DAA for their efforts in this project.

The link comprises at each end a Parcom Tiny 2-9600 at 10m and a Plessey 9000 10 h.f. 25W transmitter. The antennas are 5-element horizontally polarised Yagis. The path is about 12km and a great deal of trouble has been suffered getting the link to work due to poor signal path. Putting the antenna at VK2RNS at 100ft helped a great deal.

There is also a 4800 link working between VK2RND at Newcastle and VK2RGL at Forster. User ports are also planned for 4800 access.

The AAPRA have a very comprehensive software library, with nearly six pages of updates and details. Rumours have it that F6FB is about to announce a Linux version of his BBS program.

“Aunt Harriet” has an interesting feature each time with helpful comments, hints and excerpts from amateurs letters. I didn’t get to meet Aunt Harriet when I was there, or did I?

Norfolk News

We are still in the planning stages of our 19.2k 1.2GHz network, although the modem, by Matthew Phillips G5WJP, and John Ferguson G8STW is working. A demonstration has been organised and radios are just about ready, so I hope to report next time that the first link is in place.

User ports at 5kb are planned, but problems with Maxon radios are holding back that project at present. Hopefully, by the time this is being read, the problems will have been solved.

As for work down in deepest Bedfordshire, Rob Compton G1PZU, reports he is currently working on a 10Mbit (yes MEGABIT) 10GHz link between GB7KHW and his system. Although the distance involved is only a couple of miles, it should be possible to prove the technology, leading to the possibility of linking hilltop sites at this unheard of speed using simple and cheap equipment.

For example, the transceiver kit will work out at around £40, based on an ATVTX with mods for data. The receiver will be nothing more than a cheap Amstrad or similar Satellite RX which can be had for around £10 at the rallies.

A sample in LNB modified for 10GHz receive will be about £30 (new) or £25 (second-hand). The receiver will only need to have a base-band output for the raw video signal. For full data rates the communication medium is actually 4 wire ethernet. Speed can be anything from 1Mbit/sec to 10Mbit/sec (100Mbit would require modifying the receiver circuit even more, and also some serious TX mods, plus it’s also pretty band hungry as the 10Mbit link will want 20MHz of the band for a full duplex link, therefore a 100Mbit link will want 200MHz).

It ‘would’ be possible to have a number of T/RX units on a hilltop site linked into an ethernet active hub (an inanimate black box that buffers the ethernet signals, and send them out on the ports), which would act as a ‘node’ allowing multiple sites to be connected together, just as an office LAN system, only for the amateur packet network. User access will be via their local BBS/TCP/IP gateway.

The system will be predominantly for IP since that is designed to work over ethernet links, or should I say that ethernet was designed to carry TCP/IP AX25 data can be piggybacked using the AXIP protocol (as used between GB7ZPU and GB7KHW, and GB7MH and GB7KHW to great effect - more efficient than normal AX25!).

To users it will be both totally transparent, and very fast! Coupling it up with some RUH, or RUH clone modems for fast user access at up to 64kbit/sec, there is no reason why full ‘Inernet’ World Wide Web type services could not be used. This is pie in the sky, and requires the first prototype link to work, but it’s nice to dream!

That’s all for now, so Merry Christmas and Happy packeting. Don’t forget to keep all (our news coming to me GB8DI @ GB8DI or The Old Nursery, The Drift, Swardsten, Nr. Widow.)

Practical Wireless, January 1997
This month Peter Shore has news of a new station, reports that the BBC World Service faces a potential shortfall and catches up on broadcasters' schedules.

The uncertainty surrounding the long-term future of many of the world's most well-known international radio stations continues as budget cuts take effect from Washington DC to Melbourne. The Voice of America (VoA) announced that cash cuts would reduce almost seven per cent of the station's short wave output. English to the Americas via short wave is almost wiped out. And reductions also affect services to Europe in Croatian, Polish and Serbian, plus Spanish to Latin America, and most surprisingly, two hours of Arabic are lost.

The Voice of America (VoA) from Washington DC to Melbourne. Continues as budget cuts take affect international radio stations reduce almost seven per cent of the output in Indonesian and Mandarin would be reduced. With all these cuts planned, is international broadcasting going to become the plaything of the Murdoch empire? Will short wave become the Cinderella of the frequency spectrum? Maybe it is destined to become a niche market, whatever else happens.

Potentially Shortfall

Back in Britain, BBC Director-General John Birt revealed to the House of Commons Foreign Affairs Committee that BBC World Service faces a potential shortfall of £40 million in two years time unless budgets are restored by the government. Birt said that some savings would be achieved by the plans revealed earlier this year to merge World Service production and resources into the domestic BBC, but these would not solve the problem entirely.

Radio Australia's chief, Derek White, has warned that the station will probably have to close its Cantonese and French services if planned budget cuts go ahead. In addition, output in Indonesian and

Regular Programmes

The Republic of Ireland recently came on to the international broadcasting scene with the launch of regular programmes from West Coast Radio (WCR). Since Thursday 31 October, WCR has been beaming programmes to Africa, Europe and North America. The programmes include news and features from Ireland, plus music, letters, and the odd competition or two.

West Coast Radio is hiring transmitter time at the Julich site in northern Germany, initially sending the programmes over on tape. But if the programmes prove successful, says Michael Collins, one of the organisers, the station may change to a live format.

You can tune in to WCR at: 1500-1600 on 6.015MHz to Europe, 1800-1900 on 11665 to Africa and 0100-0200 on 5.911MHz to the Americas.

New Station

Another new station is Radio Free Asia, the Far Eastern equivalent of Radio Free Europe and Liberty. This US-run station is on the air in a number of Far Eastern languages, and has attracted negative comments from the state-controlled press in many of the countries to which it beams programmes. Radio Free Asia is hiring time on a range of transmitters in the former Soviet Republics, plus Monitor Radio's Saipan transmitting station. Try the Mandarin transmissions at these times and frequencies revealed in Media Network on Radio Netherlands: 1500-1600 on 5.86, 6.205, 7.24, 7.495, 7.53 and 9.43MHz; 2300-0000 on 5.86, 6.205, 7.24, 7.495, 7.53 and 13.80MHz.

Language Services

Catching up on broadcasters' schedules is always an uphill struggle after the twice-yearly frequency changes. I have been trawling through the stacks of programme guides that arrive on my doormat from around the world, and have come up with this selection of English language services for you.

Radio Austria International can be heard at 0530, 0830, 1030 (except Sunday) 1330 and 1530UTC on 6.155 and 13.73MHz and at 1930 and 2230 on 5.945 and 6.155MHz. All programmes are 30 minutes long.

Kol Israel can be heard at: 0500-0515 on 7.465, 9.435 and 17.545MHz; 1500-1530 on 9.39MHz and at 2000-2025 on 7.465, 9.365 and 15.64MHz.

Radio Netherlands can be heard at: 1130-1135 on 6.045 and at 7.19MHz via Julich and Nauen transmitters in Germany; 2130-2225 on 1440kHz medium wave via Luxembourg. Also on Astra via WRN (transponder 22, audio at 7.38MHz) at 1030-1125, 1730-1825, 0030-0125 and via R Netherlands, own Astra feed (transponder 58, audio at 7.38 or 7.56MHz) at 0030-0125, 0730-1025, 1130-1225 and 1830-0025.

Radio Norway International can be heard at: Half-hour programmes on Sundays only at 0600 on 5.985, 7.18MHz; 1300 on 9.59MHz; 1900 on 5.98, 7.485MHz and 1314kHz medium wave.

Radio Sweden can be heard at: 1930-2000 on 6.065, 7.24 and 9.655MHz; 1179kHz medium wave, 2030-2100 on 6.065MHz and 1179kHz medium wave 2130-2240 (weekends only) on 6.065, 7.23MHz and 1179kHz medium wave 2230-2300 on 6.085, 7.325MHz and 1179kHz medium wave and via Astra (ZDF television, audio 7.38MHz).

Radio Vlaanderen International (Holland) can be heard at 0730-0800 on 5.985, 9.295, 9.94MHz and 1512kHz medium wave, 1000-1030 Monday to Saturday on 6.035MHz; 1900-1930 and 2200-2300 on 5.31MHz and 1512kHz medium wave.

Name Changes

Finally this month news of name changes in broadcasting. This is because NHK Radio Japan, the international service of Japan's public service broadcaster, has become Radio Japan NHK World Network. NHK's international television service also becomes NHK World. In Europe, Belgian Radio and Television is to be renamed Flemish Radio and Television from the beginning of 1997.

That's all this month. Please let me know if you find something interesting on the short wave broadcast bands, from frequencies to programmes. I'm sure that other readers of PW will be interested to hear your discoveries!

Until the next issue of the magazine, when I'll be offering a sneak preview of the highest short wave portable receiver, good listening!
**For Sale**

25W fm. base station, Chartistone, ex-p.m., will tune down to 144MHz. £200, £250 Drum Pk, ex-p.m., will modify to 144MHz, £12. Instructions included, Special Spectrum 128{k}+2 with radio software, £15. Andy, GwJn. Tel: (01433) 426065 6-7pm.

Alien DJ-188RA blank head 2 {mm} and card plus 4 [{cm}^2] bushing, £3. View and pack, charger, speaker mic., £1.50. Richard J. Guess Jr., 16 Mitre Rd, Wokingham 0118-947 5036.

DRAE SSTV RX, TX, and 600A digital, excellent condition, £30. John, G8V01. Portsmouth. Tel: (01705) 270301.

Kenwood R5000 receiver with V.h.f, fitted, 18 months old and immaculate, £150. Mike, G8Voz. Tel: (0208) 790 7020.

Kenwood T-751E 2m (144/430MHz) 25W, multi mode transceiver, boxed and manuals, complete with mobile antenna and Diamond boot mount system, hardly used, v.g.c., £250 o.n.o. Nicky (G7HY), Cheshire. Tel: 01925 928 474 evenings/weekends.

Kenwood TR751E 3m (144/430MHz) 25W multi mode transceiver, very good condition, £350. G. Chatfield (E0LEH), London. Tel: (01582) 546075.

Kenwood TS-830SAT with MPF-50T satellite interface, condition is excellent, £600. GY4HW, Exeter. Tel: (0394) 34908.

**FREE ADS**

Browse our list of free ads and post an ad of your own! No charge, easy to use and free. Click here to get started.

*Now's your chance to send in a photograph of your equipment (a good idea is a 'before' and 'after' photo) to accompany your ad. Please note that all photos will be published at our discretion and are non-returnable. When sending in your ad, please write clearly in BLOCK CAPITALS up to a maximum of 50 words. Please state your contact details. Please stick to the order form above.*
<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garry Jones</td>
<td>Gw7gdh, Cardiff</td>
<td>(01534) 852093</td>
</tr>
<tr>
<td>Mick G7Jce</td>
<td>Worthing, West Sussex</td>
<td>(01903) 812392</td>
</tr>
<tr>
<td>Dave, London</td>
<td></td>
<td>(01234) 546995</td>
</tr>
<tr>
<td>John Alton</td>
<td>6 Church Lane, Amesbury,</td>
<td>(01427) 812348</td>
</tr>
<tr>
<td>Pete, Bristol</td>
<td></td>
<td>(01234) 546995</td>
</tr>
<tr>
<td>Mick G7JCE</td>
<td></td>
<td>(01234) 546995</td>
</tr>
<tr>
<td>Dave, London</td>
<td></td>
<td>(01234) 546995</td>
</tr>
<tr>
<td>Ian GM7JED</td>
<td>Qtrh, Warwick</td>
<td>(01295) 670749</td>
</tr>
<tr>
<td>Mick G7JCE</td>
<td></td>
<td>(01234) 546995</td>
</tr>
<tr>
<td>George, Lincs.</td>
<td></td>
<td>(01427) 812348</td>
</tr>
<tr>
<td>Ian GM7JED</td>
<td>Qtrh, Warwick</td>
<td>(01295) 670749</td>
</tr>
<tr>
<td>Dave, London</td>
<td></td>
<td>(01234) 546995</td>
</tr>
<tr>
<td>Ian GM7JED</td>
<td>Qtrh, Warwick</td>
<td>(01295) 670749</td>
</tr>
<tr>
<td>Dave, London</td>
<td></td>
<td>(01234) 546995</td>
</tr>
</tbody>
</table>

**Blind operator needs digital display power and s.w.r. meters for all bands up to 70cm (430MHz).**

Information on suppliers also welcome. Please contact Ossic Gibson on (01404) 812348 or CBA.

### Wanted

- **10956** variometer, working and complete, £30.
- **Wijuteed C** microwave, £10. Gloves 01245 789017.
- **Sheffield 0114 287 5824**.
- **Fairmait 32**. 320 scanner. Fair price. Thousand, Tele (01295) 876379.
- **Yaesu FRG-70** transceiver. £125. 01245 789017.
- **Yaesu FT-535G** all mode transceiver with mic. and operating manual, £100. 01903 812392.

All ads should be sent to -

Zoe Crabbe
Bargain Basement Free Ads
Arrowsmith Court
Station Approach
Broadstone
Dorset BH18 8PW.
**Classified Ads**

To advertise on this page see booking form below.

### For Sale

**TECHNICAL MANUALS**
- AR88, CR100, R210
- HRD
- Each Circuit £1.50.
- $5 each.
- Distributed by Practical Wireless.
- Contact: Geoff Davies (Radio). Tel: 01788 574774.

**EAGLE HIGH PERFORMANCE YAGIS** from 50 MHz to 1296 MHz. AS size SAE for details. 
- Eagle Communications, Unit E3, Bank Top Industrial Estate, St Martins, Shropshire SY10 7RQ. Tel: 01691 777511 Fax: 01691 777516.

**RF-9000 24 BAND RECEIVER** - Reasonable offer accepted. Quartz crystals large range £1.00 each. Collection quantity Y-bars. Also Valves. Lists available. Electronic Design Associates 0181-391 0654 Fax 0181-391 5256.

**TECHNICAL MANUALS** for WWII radio, radar etc. RAF, Army, Navy, Luftwaffe, Wehrmacht, US Forces. Tel: 0151 722 1178 or SAE with requirements to Vintage Technical Services, 28 Welbourne Road, Liverpool L16 6AJ.

**G4TNY** is buying and selling top quality used amateur equipment. My low overheads mean a better deal for you. Whether buying or selling, we work on the lowest margins around. Go on, give me a call. G4TNY Radio, 41 Onslow Crescent, Colchester, Essex CO2 8UN. Phone or fax on 01206 575265, or E-mail: dw4tny@aol.com.uk. Callers by appointment please.

**THE UK'S LARGEST SOURCE** for Vintage Receiver data, circuits and manuals from 1900 to 1975. Free brochure from Tudor & Savoy Hill Publications, 50 Meddon St, Bideford, The Little White Town, North Devon, EX39 2EQ. Tel: 01273 424260.

**INTERESTED** in Vintage Radio? Send SAE for latest list of books and components. Old Time Supplies, PO Box 209, Banbury, Oxon OX16 5FR.

**EDDYSTONE** Rx 960 £60. 1155Rx large model 7GR.

**TOP PRICES PAID**

for all your tubes, valves, semi-conductors and ICs.

Langrex Supplies Ltd.
1 Mayo Road, Croydon
Surrey CR0 2QP.

Tel: 0181-684 1166. Fax: 0181-684 3056.

**WANTED**

- For cash: KT88, £48
- PX4, PX25 £50
- DA100 £90
- EL34, £10
- EL37, £9
- CV4004 £5
- ECC83 £3

Valves must be Mullard/GEC. Send list, prompt and courteous service. Visitors by appointment only (we are a very busy Export Warehouse). Billington Export Ltd. Billinghamstur, West Sussex RH14 9EZ.

Tel: (01403) 784961, Fax: (01403) 783519.

**WANTED:**

- **OVER 50000 STOCKED** Ham, Vintage, Military, Audio. SAE for FREE list to: Wilson Valves, Urm Fish G4TNY, 28 Banks Ave., Golcar, Huddersfield, West Yorks HD7 4LZ.
- Tel: 01484 654650.
- Fax: 01484 656999.
- Visa etc. Fast & personal service.

**RECEIVERS**

- **B.F.O. KITS** Resolves single side-band on almost any radio, £16.49. H. CORRIGAN, 7 York Street, Ayr KA8 BAR.

**COMPUTER SOFTWARE & HARDWARE**

**HARDCORE SPECIALISED AND UNUSUAL PC SOFTWARE**

We have the largest range of specialised technical, scientific and rare programs for DOS and Windows in Europe, on CD ROM or floppy disk.

Send stamped SAE and we will provide a list. E-mail: info@pdsi.co.uk

**PRODUCTS WANTED**

- Vintage Technical Services, 28 Welbourne Road, Liverpool L16 6AJ.
- Contact: Peter Lockwood G8SLB, 36 Davington Road, Dagenham ESSEX RM8 2LR. Tel/fax: 0181-595 0823.

**DOMESTIC RECEIVERS AND EQUIPMENT**

- Also used/new spares and valves, amps, radio etc. E-mail: rrc@hamnet.demon.co.uk.
- Callers by appointment only, 1017881 574774.

**DOMESTIC RECEIVERS AND EQUIPMENT**

- Also used/new spares and valves, amps, radio etc. E-mail: rrc@hamnet.demon.co.uk.
- Callers by appointment only, 1017881 574774.

**EDUCATIONAL**

- CITY & GUILDS RADIO AMATEURS EXAM.
- Pass your exam the easy way with an RRC home study course. For details write or phone THE RACFAST RESULTS COLLEGE, Dept. JX400, Tuition House, London SW19 4DS. Tel: 0181-947 2211.

**RAE:** Pay-as-you-learn correspondence. £3 per lesson, includes tuition. Ken Green &Son, Beds LU6 2AG.

**DISCLAIMER**

Some of the products offered for sale in this magazine may have been obtained from abroad or from unauthorised sources. Practical Wireless advises readers contemplating mail order to enquire whether the products are suitable for use in the UK and have full after-sales back-up available.

The publishers of Practical Wireless wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.
A collection of lesson notes written for and used by students of actual RAE courses. An invaluable aid to studies for the Radio Amateur Examination.

Price £8 including post and packing from:

R.W. Griffiths
Ridgeview, 4 Wolrise Way, Plymouth
Plymouth, Devon PL7 2RU

To advertise in the classified section of Practical Wireless, just fill in the order form at the foot of this page!
Last Minute Stocking Filler


The latest edition of the UK Call Book would make the ideal last minute stocking filler for a fellow radio enthusiast. The 1997 edition contains over 61,000 callsigns covering up to MWDA-11, M1AVK and 2E0A0X and 2E1FGD. As in previous editions the directory continues to carry a Surname and Town Index designed to aid in the looking up of callsigns, together with the WAB square and IARU locator listing for most entries. The IARU locator information has been expanded to include amateurs listed in Northern Ireland. A new innovation for 1997 is the introduction of 'tabs' down the side of the pages (very like that used in address books) to make callsign finding easier. As well as all this information on Band Plans, Clubs, Beacons, Contests, Licensing, Special Event Stations and much more is included within the Call Book's 480 pages.

The Amateur Radio Call Book And Information Directory really is the radio amateur's 'Bible' and is truly an invaluable reference book containing much more than just names, addresses and callsigns.

So, go on what are you waiting for? At only £13.50 plus £1 P&P (UK), £2 P&P (overseas) it's well worth it.

To order please use the form above or telephone Michael or Shelagh on (01202) 659930 and quote PW1.
Last Minute Stocking Fillers

Christmas is just around the corner and to help you solve those last minute gift problems we’ve got six new titles to offer you, which would make ideal stocking fillers. So, go on, make your selections, get your order to us by December 19 and you can be assured that Santa will have your selections in his sack!

**World Radio TV Handbook 1997 - Order Now & Save £2 on RRP**

New in this month is the 1997 edition of the World Radio TV Handbook (WRTH). This book is billed as 'the most complete, accurate and up-to-date source book on international broadcasting' and has been called the 'authoritative reference book for anyone seeking information on radio and television around the world'.

The information contained within its 608 pages includes details of stations on the long, medium and short wave bands together with contact information, listings given in frequency order of medium wave and shortwave broadcasts, an hour-by-hour guide to 1000 broadcasts in English. There is also a section giving internet addresses of international broadcasters, independent reviews of shortwave receivers and accessories and a directory of hobby clubs for international listeners.

The WRTH is already a bestseller world-wide and is eagerly awaited every year by many radio enthusiasts who use it daily as an invaluable reference guide. So, if your interests lie in the world of international broadcasting then this book is a must for you and at only £17.95 it’s well worth every penny!

**The ARRL Satellite Anthology**

If you’re looking forward to joining Amateur Radio activity that’s really in the ‘space age’ the ARRL’s Satellite Anthology will provide a great deal of information and a good read. This relatively small book packs a great deal of information within its covers.

Browsing through the pages and chapters such as ‘A brief history of amateur satellites’ and ‘Phase 3D, “Radio Sputnik” (the Russian satellites) and Microsats shows the reader just how much is available ‘up there’! There’s even a section telling the reader how to get information ‘off the Web’, software details and future satellites.

Altogether this book provides a very good ‘read’ and there’s no doubt it will launch many more Radio Amateurs off into ‘extra terrestrial’ radio operations. With price tag of just £7.95 it’s affordable too!
The latest editions of the North American and International Listing Radio Amateur Callbooks have just arrived in the PW Book Store and with over 1600 pages they are surely an essential directory for every serious DXer.

The North American edition lists the calls, names and addresses for over 700,000 licensed amateurs in all countries of North America including Panama, Greenland, Bermuda, the Caribbean, Canada and the US Possessions. The International Callbook contains entries for 600,000 licensed amateurs in countries outside North America.

Both the North American and International Listing Callbooks contain Beacon lists, DXCC countries list, information on the worldwide QSL bureau and radio amateur prefixes of the world in addition to their comprehensive callsign listings. Copies of both books are available for £20.95 each.

The ARRL UHF/Microwave Projects Manual

The PW team is often asked for advice on where to get the latest information on u.h.f. and microwave projects. In answer the team point readers to the ARRL books on the subject.

While not decrying the RSGB's books on the subject the Americans have the advantage in that they can publish their books more often and as a direct result the projects are also up-dated. The ARRL UHF/Microwave Projects Manual is a prime example of this and although it certainly has an American 'slant', a great deal of the contents are directly applicable here in Europe and elsewhere.

The book is not just a 'projects' manual, it's also a comprehensive guide to 'getting going' on u.h.f. and microwaves. Covering topics and projects from 'Making the most of microwaves' plus 'Getting Started on the microwave Bands' through to filters, amplifiers, transmission lines, antennas and test equipment...The PW team think it can be justifiably be called a 'Practical Microwave Working Manual'.

Copies of the The ARRL UHF/Microwave Projects Manual are available for £15.50 from the PW Book Store.

The ARRL Handbook For Radio Amateurs 1997 - with Software

The ARRL Handbook for Radio Amateurs is well established and widely used within the field of Amateur Radio and that probably explains why this book is now in its 74th Edition. The 1997 edition is again packed with information covering right through from What Is Amateur Radio? to Practical Design, Construction Techniques and Operating Practices.

Following the success of the decision to include software with last year's Handbook the ARRL have again included a disk which contains design and information software. The disk has a Windows database, TISPIN, which contains information on over 1000 equipment and parts suppliers. Also included on the disk are a standard value capacitor filter design program and a grid-square locator to name but two.

Containing 1200 pages and costing just £25 the ARRL Handbook for Radio Amateurs would make a welcome addition to any shack bookshelf and is well worth considering whether you are an 'old hand' or a newcomer to the world of radio.
<table>
<thead>
<tr>
<th>Title</th>
<th>Pages</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELECTRONICS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A REFERENCE GUIDE TO BASIC ELECTRONICS TERMINS</td>
<td>115</td>
<td>£4.99</td>
</tr>
<tr>
<td>A REFERENCE GUIDE TO PRACTICAL ELECTRONICS TERMINS</td>
<td>150</td>
<td>£4.99</td>
</tr>
<tr>
<td>A REFERENCE GUIDE TO MODERN ELECTRONICS COMPONENTS</td>
<td>150</td>
<td>£4.99</td>
</tr>
<tr>
<td>CIRCUIT SOURCE BOOK 1 - BP212</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>CIRCUIT SOURCE BOOK 2 - BP242</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>ELECTRONIC HORRIBLE DATA BOOK</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>GETTING STARTED IN PRACTICAL ELECTRONICS BP245</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>NEWES RADIO AND HF ENGINEER'S POCKET BOOK Third Edition</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>DATA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARR ELECTRONICS DATA BOOK</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>ELECTRON TUBE LOCATOR</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>ORIGINAL CHARACTERISTICS (TUBES &amp; TRANSISTORS)</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>PRACTICAL ELECTRONICS CALCULATIONS AND FORMULAE BP53</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>RADIO AMATEUR AND LISTENERS DATA BOOK</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>RADIO FREQUENCY TRANSMITTERS PRINCIPLES AND PRACTICAL APPLICATIONS</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>RADIO VALVE GUIDE BOOK 1-5</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>RCA RECEIVING TUBE MANUAL</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>RCA TRANSMITTING TUBES</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>SOLID STATE DESIGN FOR THE RADIO AMATEUR</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>TRANSMITTER HUNTING - RADIO DIRECTION FINDING SIMPLIFIED</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>TRANSMITTER DATA TABLES (BP401)</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>PROJECTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COIL DESIGN AND CONSTRUCTION MANUAL BP160</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>HOW TO DESIGN AND MAKE YOUR OWN PCB'S BP121</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>MORE ADVANCED POWER SUPPLY PROJECTS BP192</td>
<td>100</td>
<td>£3.99</td>
</tr>
<tr>
<td>SHORT WAVE SUPERHET RECEIVER CONSTRUCTION BP276</td>
<td>100</td>
<td>£3.99</td>
</tr>
</tbody>
</table>

ORDER NOW ON (01202) 659930 OR PLEASE USE THE ORDER FORM ON PAGE 70.
KEEP THOSE FREEZING FEBRUARY BLUES AT BAY

Wireless

CAN YOU AFFORD TO MISS IT? • ON SALE 9 JANUARY 1997 • PLACE YOUR ORDER TODAY!

REVIEWED!
○ The Albrecht AE-550 Budget Priced 144MHz Mobile Transceiver from Martin Lynch
○ The New Vibroplex Deluxe Morse Key from Eastern Communications

NEW!
○ Ian Poole G3YWX starts his new series, ‘What Is A...?’, which deals with electronic components

BUILD!
○ Doug Gibson G4RGH shows you how to build a transformerless Chatterbox
○ Denis Payne G3KCR shares his idea for a ‘mini’ antenna for ‘Top Band’.

PLUS ALL YOUR REGULAR FAVOURITES!

CAN YOU AFFORD TO MISS IT? • ON SALE 9 JANUARY 1997 • PLACE YOUR ORDER TODAY!

 Quieting your Longwire Antenna, Bandpass Tuner Unit, Scancat Gold Review, Roberts R361 - Reviewed, Simple One Valve Receiver Project and Listening Contest

Plus Regular Columns covering: Frequency Exchange, Utility and Data Modes Listening, USENET, Scanning, Broadcast News, Logs and much much more.....
ICOM technology brings you a high performance, full-function handheld with advanced features yet simple operation to meet the demands of both novice and experienced operators.

Functions and features include; Independent tuning and volume controls for each band on the top panel, allowing adjustment of either band! plus... a new VHF/UHF exchange function that assigns VHF/UHF tuning and volume to either knob. The IC-W32E also simultaneously receives both VHF and UHF bands or you can use the V/V and U/U functions for receiving 2 frequencies on the same band! Also featured are 200 memory channels with memory name capability, handheld-to-handheld cloning with CS-W32 software, built-in CTCSS, auto power-OFF function plus loads more user-friendly features that make this a worthy and affordable addition to the ICOM range.

WANT TO KNOW MORE?
CONTACT YOUR LOCAL DEALER TODAY!
Compact HF Transceiver **FT-900AT**

A full-featured HF base station, compact enough to go mobile.

**Features**
- Remote Front Panel Design
- Built-In Auto Antenna Tuner
- Direct Keypad Entry when used as a Base Station
- Large, Bright Omni-Glow LCD Display
- 100W on SSB, CW, FM modes; 25W on AM
- 2.75 kHz SSB Collins Mechanical Filter
- IF Shift and 30dB Notch Filter
- Digital S/RF, SWR & ALC Meters
- Programmable CTCSS Encode w/Repeater Offset
- Direct Digital Synthesis (DDS)
- 100 Memory Channels
- Frequency Range RX: 100 kHz - 30 MHz TX: 160-10 meters
- CW Full Break-in Keying w/ Adjustable Speed
- Fast/Slow AGC Circuit
- Intercept Point Optimization
- Duct Flow Cooling System
- Twin Band Stacking VFOs
- Built-in Noise Blanker
- Built-in Adjustable Speech Processor

**ACCESSORIES:**
- YSK-900 Remote Mount Kit
- MMB-62 Controller Bracket
- MMB-20 Mobile Mtg. Bracket
- SP-7 Mobile External Spkr.
- SP-6 Base Station External Spkr.
- DVS-2 Digital Voice Recorder
- FP-800 20A HD Power Supply
- YH-77ST Headphone

Built with commercial-grade engineering and a heavy-duty die-cast aluminum heat sink, like all Yaesu base stations — this radio leads the competition in state-of-the-art compact HF technology.

No other radio this small offers 10-key direct frequency entry. Built-in antenna tuner, dual metering in the display, built-in CW keys, VOX — and a heavy-duty heat sink with a duct-flow cooling system that lets you key down longer. As a bonus, to round out the feature-rich FT-900AT, Yaesu's exclusive Omni-Glow display provides the best viewing possible under any light condition. Try to find all this on any real HF compact enough to be a mobile. You can't!

Mobile HF has never been better, because the FT-900AT is the first transceiver with true HF technology developed as a base performer and adaptable for simple mobile use. Just snap off the FT-900AT front panel control head and install it just about anywhere in your car, truck or RV. Secure the RF deck under a seat or in the trunk, out of sight and away from critical automotive electronics.

This isn't a cheaply-made, plastic toy! This marvel of Yaesu engineering was built to last. Fitted to exacting standards with the performance, sensitivity, and selectivity that have made Yaesu famous for over 40 years, the FT-900AT will provide you with trouble-free performance wherever you travel!

See the new FT-900AT dual-purpose radio at your dealer today. Find out why Yaesu HF is the choice of the world's top DX'ers.

**Choice of the World's top DX'ers**

---

**Specifications**
- Choice of the World's top DX'ers
- Yaesu UK LTD. Unit 2, Maple Grove Business Centre, Lawrence Rd., Hounslow, Middlesex, TW4 6DR, U.K.
- Specifications subject to change without notice. Specifications guaranteed only within amateur bands. Check with your local Yaesu dealer for specific details.