

Practical Wireless

PW

amateur radio & more!

THE KENWOOD TH-D7 COLLECTION



HF MOBILE WITH THE HIGHLANDER



**"ADD
A NEW
DIMENSION
TO YOUR
HOBBY"**

ALINCO DX-70TH - SPECIAL OFFER!

May 1999 £2.50



Waters & Stanton PLC

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 Shop hours 9am - 5.30pm Monday - Saturday
 Web Site www.waters-and-stanton.co.uk
 e-mail Sales@wsplc.demon.co.uk

General 01702 206835
 204965
 Trade 01702 203353
 Fax 01702 205843



Order Line
 Freephone 0500 73 73 88



Open-Day Madness

Sunday 30th May. The day when we sell at trade price on many items. Also the day of the UK's biggest sea-front air display, just ten minutes away. More details next month.

There are many claims made by our competitors, but only at Waters & Stanton do you get the benefit of:

Public Limited Company
 ISO-9002
 Lowest UK Prices
 Price match
 Genuine UK Stock
 10-Day Approval
 4 Service Engineers
 Friendly Service

Financially Sound
 Guaranteed Standards
 No need to shop around
 Nobody beats our Value
 Full Manufacturer's backup
 No Risk to You
 To give you Fast Service
 We don't just shift boxes!

C-408

70cms Handy
 with CTCSS

£89.95



HORA C-150

20 Memories
 5 Watts (12v)
 Digital Display
 Keypad Entry
 1750Hz Tone
 130 - 174MHz Rx
 AA Cell Operation
 Programmable
 Very Sensitive
 12 Months Warranty



2 Metre Handy

£99.95

Dynamo - Solar Power & Battery Radio & Torch



£19.95

NEW

Ideal for car or camping. FM and AM radio plus powerful torch. Can be powered from 3 x AA cells, internal dynamo (hand cranked) or built-in solar panel. No more flat torches!

ADI AT-600 Dual-Band 2m & 70cms

Includes
 Wideband Receive
 5W Output (12v)
 AM Airband Rx
 Full Duplex
 Alphanumeric Display
 200 Memories
 CTCSS & 1750Hz Tone
 Ni-cads & Charger

£199



FC-130 Counter 1MHz - 3GHz



£79.95

This handheld counter represents amazing value. Sensitive enough to sniff signals up to 200ft away, every ham should have one. Ideal for checking handhelds, oscillators etc. The 600mAh pack gives up to 6 hours operation and the bargraph is ideal for field strength tests.

IC-706 II Still Available £799

Our 10-Amp Switch-Mode Supply Fits in a Briefcase!

Over Voltage and Over Current Protected W-10SM

Fan Cooled
 10 Amps Continuous
 12 Amps Peak
 Fan Cooled
 Switch Mode
 Weighs just 1.1kg
 Length: 235mm (9.25")
 Height: 83mm (2.5")
 Width: 98mm (4.00")



£49.95

Counter supplied with ni-cad AC charger, and antenna.

ADI AR-146 2 Metre Mobile

50 Watts of Mobile Power



Sale Offer

£169

YAESU FT-847 HF - VHF UHF



~~£1599~~

Phone for "Near Trade" Price

Includes 70MHz Transceiver

Yaesu's great new base station design lets you operate on all bands from 160m to 70cms. One small package - but what a package! Give us a call for the FREE leaflet.

YAESU FT-920 1.8 - 54MHz



~~£1229~~

Phone for "Near Trade" Price

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

NEW

YAESU FT-100 1.8 - 430MHz

All modes - All Bands - One Box



~~£1199~~

It's been a long time coming - first shown at Dayton 9 months ago - we really are promised it for March. As usual we will have the first stocks and the best prices.

ICOM IC-746 1.8 - 144MHz



Phone for "Near Trade" Price

The IC-746 has proved to be one of the best value base station transceivers around. All bands from 1.8 - 144MHz and a straight 100W makes this great value. Give us a call for the latest brochure and the best price around!

YAESU FT-840 1.8 - 30MHz



~~£649~~

Phone for "Near Trade" Price

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

YAESU FT-8100 Dual Bander Mobile

~~£399.95~~



Phone for "Near Trade" Price

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

ICOM New IC-2100 2M Mobile

~~£269~~

With Switched 12.5kHz & 25kHz Filters



Phone for "Near Trade" Price

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

email: sales@wspc.demon.co.uk

IC-706 Mk IIG

£Phone

UK's Lowest Price!



Phone W&S Icom's "Top Dealer"

In Stock Now!

Great Part Exchange Deals - Phone

1.8 - 440MHz 100W HF + 6m 50W 2m 20W 70cms

FT-1000MPDC (AC £2199) £1899



Phone for "Near Trade" Price

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

KENWOOD SALE



TS-870S

| Model | Normal | Sale |
|-----------------|--------|-------|
| HF Transceivers | | |
| TS-870S | £199 | £1495 |
| TS-570 | £999 | £849 |
| TS-790 | £1959 | £1295 |

Unbeatable Prices



VHF Transceivers

| | | |
|---------|-------|------|
| TM-255E | £1059 | £449 |
| TM-742 | £879 | £549 |
| TM-V7E | £569 | £479 |
| TMG-707 | £349 | £295 |
| THG-71E | £279 | £235 |

SGC-2020 QRP HF Transceiver

0 - 20 Watts SSB and CW with CW break-in. Runs from 12V DC and has very nice SCAF audio filtering. Very low current requirements.

1.8 - 30MHz

~~£599~~



YAESU VX-5R Three Bander

~~£329~~

5W Output (12V)
Deviation 2.5 / 5kHz
Battery & Temp. Displays
Barometer & Altitude (with SU-1)
220 Alphanumeric Memories
CTCSS decode & Encode
Spectrum Display



FREE BNC Adaptor

The radio with such a wide Rx coverage, it's like having a free scanner. Medium wave, short wave, WFM, airband, UHF, cellular. Manual or auto mode changing.

IC-706 Mk IIG looks like being another great rig from the Icom stable. To have a complete HF and VHF/UHF station in one box that fits in the car or in the draw of the shack desk is amazing - but Icom have done it. What is more, the track record of the two earlier versions are such that you should have no worries about reliability. Give us a call and we'll let you have the latest information.

KENWOOD £319

New TH-D7E

Dual bander VHF / UHF Built-in TNC Data Display

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

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



YAESU FT-50R 2m/70cms Handy



£279

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

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

ICOM IC-T8E Triple Band Handy

All in one small package.

6m 2m 70cms

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



ICOM Dual Bander

New IC-Q7E

2m & 70cms FM & AM Rx In Stock NOW

This pocket handheld provides 300mW of FM on 2m & 70cms plus wideband receive FM AM WFM from 30MHz - 1300MHz - no gaps. Runs from 2 x AA cells

ICOM IC-207H 2m/70cm Mobile



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

WATSON



Ham Radio Products

Where Value & Quality Come Naturally

NiMH High Capacity Battery Kits



Illustration only - Kit comprises 4 x AA Ni-MH cells

Twice the capacity of Ni-Cads
No Memory Effect
Very High Current Capability
Up to 500 Charges

Ideal for Digital cameras GPS & Transceivers

Kit comprises: AC charger suitable for either NiMH or Ni-Cad cells size AA, AAA or PP-3 plus a set of 4 x AA Ni-MH cells

Additional Cells
4 x AA NiMH £18.95
4 x AAA NiMH £9.95

WEP-501 Adjustable Boom Mic

NEW



This brand new design is fully adjustable and unlike some copies, does not break after five minutes! Lightweight earpiece and flexible and rotatable boom. Come complete with PTT box

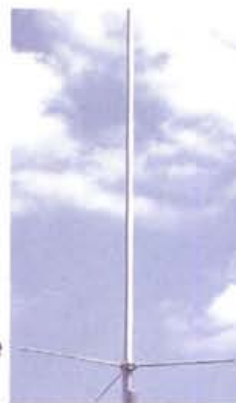
WEP-501 Yaesu etc £24.95
WEP-501 Kenwood £24.95
WEP-501 Motorola £24.95

Hands Free Mobile With Handhelds



This new boom microphone with single earphone is ideal for use with handhelds whilst mobile. Supplied with a locking PTT switch, you can talk hands-free. There are models for Yaesu and Kenwood.

LX-6 Yaesu etc £24.95
LX-8K Kenwood £24.95



W-50 Base Antenna



W-3HM Hatch Mount



X0-17 Throat Mic

Base Antennas

| | | |
|---------------|--------------------------|--------|
| Dual Band | 2m/70cm | |
| WVA-100 | 2/4.5dB 1.09m long | £29.95 |
| W-30 | 3/6dB 1.15m long | £39.95 |
| W-50 | 4.5/7.2dB 1.8m long | £49.95 |
| W-300 | 6.5/9dB 3.1m long | £59.95 |
| Triple bander | | |
| W-2000 | 2.15/6.2/8.4dB 2.5m long | £69.95 |

Mobile Antennas

| | | |
|------------------------|------------------------|--------|
| Single Band 2 metres | | |
| W-285 | 5/8th foldover base | £14.95 |
| Dual Band 2m/70cms | | |
| W-77LS | Low profile 0.39m long | £14.95 |
| W-770HB | 3/5.5dB 1.1m long | £24.95 |
| W-7900 | 5/7.6dB 1.5m long | £32.95 |
| Triple band 6m 2m 70cm | | |
| W-627 | 2.15/4.8/7.2dB 1.62m | £34.95 |

Accessories

| | | |
|-------|-----------------------|--------|
| W-3HM | Hatch / Boot mount | £14.95 |
| W-CK | 5m low loss cable kit | £18.95 |
| W-ECH | 5m standard cable kit | £12.95 |
| WAM-2 | BNC window clip mount | £12.95 |
| WMM7 | Magnetic mount | £10.95 |

X0-17 Throat Mic.

No, not the old fashioned type with horrible audio - this latest version offers amazing quality. Ideal for use in high noise levels or where discretion is of importance. Comes with PTT box for attachment to clothing and a lightweight earpiece. Versions available for Yaesu, Standard, Icom, Kenwood and Motorola.

| | | |
|--------|---------------------------|--------|
| X0-17 | For Yaesu, Icom, Standard | £39.95 |
| X0-17K | For Kenwood | £39.95 |
| X0-17M | For Motorola | £39.95 |

Speaker Mics.

These are a great alternative to the official factory models and far cheaper - yet with super performance. There are models for most of the current handhelds - if in doubt phone for confirmation when ordering.

| | | |
|----------|---------------------|--------|
| QSO-110 | For Yaesu, Icom etc | £16.95 |
| QSO-110K | For Kenwood | £16.95 |
| WMN-227 | For Motorola | £19.95 |

Equipment Cabinets



Great for construction projects, these boxes have internal side cheeks for mounting PC boards. The cabinets have louvred vents and are finished in a cream coloured plastic paint. Front and rear panels are plain alloy ready for drilling and finishing.

| | | |
|-------|-----------------------|--------|
| EM-01 | 160w x 120d x 75h mm | £10.95 |
| EM-02 | 210w x 150d x 85h mm | £12.95 |
| EM-03 | 200w x 170d x 110h mm | £15.95 |

Connector Kit



£49.95

Just the thing to have in any ham radio station. Now you can connect virtually anything to anything! This 32 piece set covers "N", BNC, SMA, TNC, UHF & Mini UHF. Supplied in smart zip-up case
Ref CON-K £49.85

WM-308 Base Microphone



Ideal for all base station applications, this high quality unit has electronic PTT / latching, plus, pre-amp and SSB / FM response switch. Matches impedances from 500 to 50k Ohms. Supplied with open ended lead and 8-pin plug plus wiring diagram.

| | | |
|---------|--------------------|--------|
| WM-308 | As above | £59.95 |
| WM-308W | Wired for your rig | £69.95 |

HF Headset at a Great Price



W-184PTTW

This headset has been designed by Watson to match the modern HF transceiver. Dual earphone and an adjustable boom microphone mount onto a lightweight assembly. Supplied with mono audio plug and open ended mic lead. We can also supply PTT box if required

| | | |
|-----------|--------------------------------|--------|
| W-184 | As described above | £39.95 |
| W-184W | Wired for your rig | £49.95 |
| W-184PTT | W-184 + PTT box | £49.95 |
| W-184PTTW | W-184PTT wired for your radio. | £59.95 |

Antenna Analyser



This professional quality unit covers 1.8 - 170MHz. The BR-200 measures VSWR and impedance from 12.5 - 300 Ohms. Dual gate times and excellent slow motion dial mean accurate tuning. Requires 6 x AA or 12V DC. Made in Japan.
BR-200 1.8 - 170MHz £329
BR-400 100 - 500MHz £399

Watson Power Supplies The UK Market Leaders



Rugged
Reliable

The Sensible
Choice

| | | |
|---------|--|---------|
| W-3A | 13.8V fixed 3 Amp continuous, 5 Amps peak. | £22.95 |
| W-5A | 13.8V fixed 5 Amp continuous, 7 Amps peak | £29.95 |
| W-10SM | 13.8V switch mode 10 Amp continuous, 12 Amp peak | £49.95 |
| W-10AM | 0 - 15V variable 10 Amp continuous, 12 Amp peak | £59.95 |
| W-25AM | 0 - 15V variable 25 Amp continuous, 30 Amp peak | £89.95 |
| W-30AM | 0 - 15V variable 30 Amp continuous, 35 Amp peak | £119.95 |
| WPS-312 | Inpu 12V DC Output 1.5 - 9V 800mA Cigar plug | £9.95 |

Watson VSWR / Power Meters

Great Value

A really accurate range of VSWR Meters - 5 / 20 / 200W



| | | |
|-------|--------------|--------|
| W-220 | 1.8 - 200MHz | £49.95 |
| W-420 | 118 - 530MHz | £49.95 |
| W-620 | 1.8 - 530MHz | £89.95 |

Waters & Stanton PLC

22, Main Road, Hockley, Essex. SS5 4QS
Tel. (01702) 206835 / 204965 Fax. 205843

Trade Enquiries 01702 203353

Free-Phone Orders 0500 73 73 88

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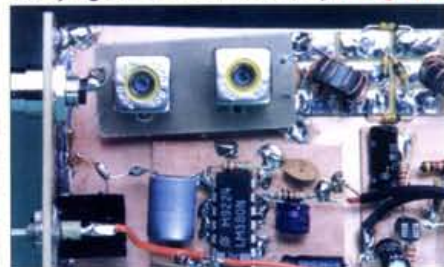
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56 RadioScene

Editorial Note: Due to a lack of space this month, we're sorry to announce that the Modern Microwaves Article promised this month and the second part of the Panther Project for 144MHz has had to be held over. Our apologies. Ed



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Our professional sales teams have a huge wealth of knowledge both in amateur and professional communications equipment. We are waiting to advise and help you. We will give you fact not fiction.



Geoff Brown



Derick Hitchins



Rodney Perry

NO DEPOSIT - SUPER FINANCE DEALS - RING NOW

Fact or Fiction?

We think you would prefer the truth not a load of bull

This new equipment is NOT available anywhere in the UK despite what you have read - delivery expected Late April

NEW from **ICOM**

**£1 Deposit
will secure an
early delivery**

- Two receivers enabling simultaneous receive 2m & 70cm.
- External Video Input
- Separate Controller 50 Watts of Power on VHF, 35 Watts on UHF
- Wideband receive
- 9600 Baud Packet Ready 6-Pin Connection Point on the Back Panel
- CTCSS Encode/Decode
- 232 Memory Channels
- Built In Diplexer
- HM98 Remote Control Microphone
- 4 Power Settings Per Band
- Cloneable with Optional Software and Cloning Cable
- Alpha Numeric Display
- Bandscope

These specifications are not guaranteed for the UK market



IC-2800E

ICOM PRICED at £549.99

**£1 Deposit
will secure an
early delivery**

- Up to 5W of power on 2m,6m,70cm & 1W on 23cm(13.5 VDC)
- MultiFunction 'Joystick' band change
- Ni-MH Powered
- Transmit/Receive 50-54MHz, 144-148MHz, 430-440MHz, 1240-1300MHz
- 124 memory channels with 20 scan edges and 1 call for each band
- Tone squelch with pocket beep is standard
- Backlit display with timer Built in guide function
- JIS grade 4 water resistance
- RIT & VFO Function for 1200MHz band
- 9 DTMF memories
- Handheld to handheld cloning capability (opt. OPC-474 cloning cable) or PC programming capability

These specifications are not guaranteed for the UK market

ICOM PRICED at £399



IC-T81E

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Hants. SO53 4BY

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South Midlands Communications Ltd

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Specials

We have limited stocks of these specials so **HURRY**



FT-1000MP **£2199 - PHONE**



FT736R 2m / 70cms BASE STATION

We have only two of these sort after VHF / UHF Base station radios
BRAND NEW STILL BOXED.

£1299 - PHONE



FT-847 **£1499 - PHONE**



TS-790E 2m / 70cms BASE STATION

If you are really keen on VHF / UHF then this is the **radio** for you.
ONE ONLY original cost £2000 BRAND NEW STILL BOXED

£1525 - PHONE



FT-100 **£1195 - PHONE**



FT-2500M 2m Mobile Military spec

This is still the best 2m mobile radio on the market. Built to military standards, superb performance
BRAND NEW STILL BOXED

£275 - PHONE



IC-706G **£1195 - PHONE**



TM-G707 **£299 - PHONE**



PS-30M 30 amp PSU

This just has to be the best value power supply on the market for running that HF radio 30amps peak output at 13.8Vdc

£83 - PHONE

We also have a mint condition
FT-767 with the additional 2m board
Bargain at £599

Aerial Bonanza



THD-7E **£310 - PHONE**

VCH-1 **£399.95 - PHONE**

BOTH ITEMS SPECIAL - PHONE

| | | | |
|-----------|----------------------------|----------|-----------------|
| A3S | HF 3 ele Beam | was £389 | NOW £275 |
| A4S | HF 4 ele Beam | was £469 | NOW £325 |
| DX77 | 10-80m Vertical | was £368 | NOW £277 |
| R7000 | 10-40m Vertical | was £389 | NOW £336 |
| R80 Kit | 80m Add on Kit (R7000) | was £129 | NOW £99 |
| R6000 | New 20 -6m Vertical | was £299 | NOW £275 |
| A50S | 6 ele 6m Beam | was £249 | NOW £199 |
| CL10 | Create 5 ele 28MHz Beam | was £298 | NOW £189 |
| CL6DXX | 7ele 6m Beam | was £279 | NOW £179 |
| CY103 | 28MHz 3 ele Beam | was £179 | NOW £119 |
| SQ144 | 2m High Gain Vertical Beam | was £69 | NOW £49 |
| A144-10SN | 2m 10 ele Beam | was £89 | NOW £65 |

Axminster
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BASE STATION SPECTACULAR



DX-394 Shortwave Communications Receiver

150kHz to 30MHz AM, USB, LSB, CW digital receiver with 160 memories

~~£199.99~~ **£99.99** + P&P.



PRO-2045 Base Scanner

200 channel AM/FM (switchable) scanner. Covers 66 to 1000MHz (with gaps)

~~£199.99~~ **£129.99** + P&P.

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& MILITARY
AIRBAND
COVERAGE



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Unfortunately, before I can begin my usual monthly 'chat' to readers I have to offer a profound apology. The apology goes to those of you who were unlucky enough to receive a truly 'mixed up' version of the April PW (no - that wasn't our 'April Fool' joke - you have to look elsewhere for that!) thanks to a problem at our printers.

The problem was due to a faulty collation of the various sections of the magazine which led to readers (as far as we know!) from Leicester northwards to Scotland, the Isle of Man, and Northern Ireland, receiving issues with some pages missing and others repeated.

The collation problem on the faulty magazines begins after page 34 when the section with page 27 onwards (carrying 'Radio Basics', 'Reminiscences Of The Macroelectronic Era', 'Lisle Street - Radio's Memory Lane', 'Speakers & Headphones') are repeated. The faulty magazine doesn't appear to return to normal until page 51.

Please accept our sincere apologies for the problems. As we go to press on this issue we think that most of the faulty issues have been returned (by 'Freepost') to us for replacement. However, if you have a wrongly collated copy please contact **Jo Williams** (PW News & Production Editor) at the Broadstone office on (01202) 659910 and give your full details - where you purchased the magazine or your subscription number, etc., so that we can send you a replacement. Full details are needed so we can fully inform the printers who have (incidentally) been 'struck off' my Christmas card list!

It was a frustrating incident for everyone - both readers and staff and compensation is setting in! Thank you for your understanding and we hope it won't happen again!

Hearing Problems

The Rev. Hubert Makin G3FDC's 'cry from the heart' letter (see star letter page 8) regarding Radio Amateurs with hearing problems landed on the desk of someone who has been concerned about the issue for a long time - Me! Hubert's letter has provided me with the

opportunity to raise the profile of the distressing problem of hearing problems and the enjoyment of our hobby. I've hesitated in the past but I now know how widespread the problem is because I've discussed it during recent 'Club Visits'.

I have a hearing problem myself (the result of an infection brought about by a nitrogen narcosis - 'nark' - in my sub-aqua diving days) which, although minor, requires a lot of concentration when listening to readers at rallies and shows. I have a small 'in the ear' hearing aid but it's virtually useless in crowded room situations, anywhere near transmitters and computers!

I've also learned how many other Radio Amateurs also suffer from Tinnitus (a continual 'ringing' or 'whistling' in the ear) in some form or other. Mine appears as a varying level of high pitched whistling and 'crackling'. Tragically, many Radio Amateurs who do suffer from this and other hearing problems are often forced away from the hobby.

However, although much can be done to help overcome some of the difficulties in hearing at equipment level (**Gordon King G4VFV's** article 'Speakers & Headphones', page 34 of the April issue is a good example) with careful choice, we're often stuck with what's offered by manufacturers and broadcasters!

Bad Example

At this point I must mention the broadcasters, both radio and TV (but especially television), because they must surely be the worst example when it comes to treating the sound aspect of transmission. It must be mentioned because once Radio Amateurs are aware of the difficulties caused by the broadcasters ... we can learn from their mistakes, making sure we don't do the same!

The major problems with broadcast sound communications (despite TV and radio programmes being 'entertainment' they are still in the realms of 'communication') in broadcasting today, comes about from the broadcaster's attempts to achieve 'reality'. This usually means radio microphones for each actor, with 'throat' or other 'contact' microphones often producing very poor 'nasal' sounds full of low

frequencies and resonances because the need for 'reality' takes precedence over audio quality.

Programmes such as the UK ITV's 'Bill' police drama and many other 'outside action' programmes are often spoilt by very poor sound reproduction. News programmes are also effected in the same way when carelessly hidden microphones on 'outside broadcast' reporters muffle the sound. The list is endless and frustrating and I'm often very grateful that 'instant' teletext subtitles are available (although the computer software can often provide hilarious interpretations of the actual spoken words!).

Despite TV sound being available in stereo nowadays, it still seems to be the poor relation to the picture. I say this because there are many times when it can be very poor - and no attempt (and no apologies are forthcoming) seems to be made when problems do occur with the sound. In fact I understand that separate 'sound control' desks have long since disappeared from TV studios. Perhaps that explains why the sound level increases so much when adverts are inserted by the local ITV contractor!

As I write this, I'm hoping that readers involved in broadcasting will take note - and pass the comments on to those who can do something about it. Perhaps someone who looks after the 'furry animal on a stick' (wind-screened microphone operator) may like to take note?

In the meantime I'm going to throw the debate open to readers and ask anyone who suffers from or has successfully overcome hearing problems so they can enjoy Amateur Radio to the full to write in to me.

For my own comfort and ease of use, I'll continue to try to use speakers and enclosure which provides the best reproduction in the audio range which I can hear easily. Perhaps someone will come up with an audio frequency shift device - similar to that used by divers breathing oxy-helium gas mixtures (the high pitched voices are caused by the vocal chords vibrating faster in the thinner gas) so that we can adjust the incoming frequencies to our comfort and best comprehension?

Finally on this topic, I'd like to mention (and I'm being practical and not sexist) how pleasant it was to work a German Amateur Radio station on 7MHz from my car during my lunch break at the London Show on Saturday 13th March.

The college club station was operated by Young Lady (YL) operators and their higher pitched voices really cut through the QRM. Perhaps all DX operators should be ladies?

Picketts Lock Hot Spot?

Whilst on the subject of the London Show I've got a question for readers: Did you find the Picketts Lock venue too hot on March 13 and 14th? Speaking for myself I thought that the ventilation - accompanied by the poor atmosphere provided by cigarette smokers and the 'Burger Bar' adjacent to the PW stand - made it very uncomfortable.

For many years I've asked the organisers - Radiosport - to do the decent thing and look after their customers by improving ventilation. All they've got to do is to have some doors open to provide fresh air and provided they position a security operative next to the door they're unlikely to lose out by the occasional visitor getting in (horror of horrors) for free. So how about it Radiosport - can you look after your customers a little better? They might even stay longer at the show if you do!

Irish Whiskey

I'm delighted to say that the Irish Authorities have granted me the callsign **EI5IW** (EI5 Irish Whiskey!) for use whenever I'm in Ireland. I feel highly honoured that they've further extended the hand of friendship in this way and you can be sure that I'll be delighted to work you during my 'flying visit' to Dublin (QRP Club station opening) on **Thursday April 8th and Friday 9th** and during my holiday between 23rd of April and 1st of May.

Mandy Memories

I've received very many letters, telephone calls and cards following the death of Mandy my Labrador in February. Thank you everyone - what a wonderful fellowship Amateur Radio is. You're a great bunch of people.

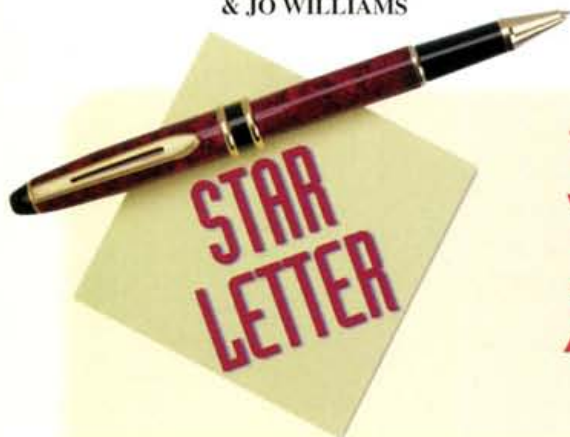
Rob G3XFD



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Hearing Problems

Dear Sir

I was in the Royal Naval Volunteer (Wireless) Reserve (RNV(W)R) before the Second World War, served for the first three years at sea and had my hearing damaged by wearing ear-phones and being subject to the sound of gun-fire. (The wireless cabin was just below the gun platform).

I have been wearing a hearing aid for 22 years and my hearing is gradually getting worse. I used to look forward to my retirement so that I could spend more time 'on the air', but it's getting almost impossible for me to hear. Clarity of speech is very important, not volume. Some chaps have a very good clarity of speech and it's very pleasant to talk to them, others talk (I'm sorry to say) as if they had a rag in their mouth and it's impossible to hear what they say, although the two signals may have the same volume. And s.s.b. sometimes makes it worse, for many of the signals are already distorted.

I have not seen this subject mentioned in either *RadCom* or *Practical Wireless* for years and I have been reading both since the early 1950s. The problem is very distressing. Surely many Radio Amateurs will be having the same difficulties as I have?

My telephone has a loop and an amplifier which emphasises the high frequencies and I can manage to hear with that. I bought the 'Crystal Amplifier With A Loop' from the Royal National Institute for the Deaf (RNID), 'Sound Advantage' marketing department and this helps me at meetings but it's not satisfactory with my Amateur Radio receiver.

For quite a while I have been experimenting in trying to make an induction loop (my hearing aid is compatible with loops). I have had moderate success but not really good enough for me to be comfortable whilst listening in. I have no difficulty with induction loops in churches or public buildings - **if they're properly adjusted**. The problem there is to get them to remember to switch the loops on!

I have been corresponding by E-mail with a few Radio Amateurs on this problem. **Richard G2DYM** suggests that I use an ear-phone and find the best place to put it on the bones surrounding my ear.

Derek G3XXN suggests that I try to get a modern telephone ear-piece, which already has a loop installed and energise the ear-piece from the receiver output and then switch my hearing aid to 'T'. This seems to be a very good idea, but where do you obtain this ear-piece?

I wonder if there are any more suggestions from Radio Amateurs with the same problem? I would be very grateful if this subject could be opened up for comments.

The main reason why I am writing is to tell you of another experiment I have done. It seems to me that hearing aids could be personalised to restore the hearing curve to normal, instead of amplifying all the frequencies. I understand the scientists at RNID (of which I am a member) are working on the problem of personalised hearing aids.

The difficulty with me is clarity, not volume. For example, my hearing is 50dB down at a frequency of 3kHz which obviously makes it difficult for me to hear final consonants and only 15dB down at 1.25kHz. I had the idea of using four frequency selective amplifiers and adjusting them to the volume required to restore deficient frequencies. This idea was stimulated by an experiment we did at an Open University Summer School on an electronics 'colour' organ.

We built the colour organ between us and it was most spectacular. We used the 741 integrated amplifier and had to work out the values of the components and design the circuit and used six frequencies to represent various colours, (e.g. red for the low frequencies and blue for the high). The trouble is that it was over 25 years ago and I have forgotten most of what I was taught. (I was a first year Under-Graduate of the Open University).

I wonder if there are any more suggestions from Radio Amateurs with the same problem? I would be very grateful if this subject could be opened up for comments

Rev. Hubert Makin G3FDC
Halifax

Editor's comment: Hubert's letter has provided the final 'push' for me to write on this subject (something I've wanted to cover for a long time) because there are a large number of radio enthusiasts with some form of hearing problem. It's a subject which has - as G3FDC suggests - been rather overlooked. Please see 'Keylines' for further comments on this distressing problem.

Dose Of His Own Medicine?

Dear Sir

Regarding "Wind - Does It Affect Frequency?" (*PW* April) Never has so much hot air been expelled by one author over two pages! Switch off your desk fan OM!

John Cunningham GM3JCC

Editor's comment: John GM3JCC's (I suspect) 'tongue in cheek' missive is to let us know that he hasn't been 'April

Fooled' by our latest (annual) joke against readers! We hope that everyone enjoyed this 'pseudo-technical' diversion! It also seems appropriate that John's letter is published as he was the originator of the 'April Fool' spoof 'Wireless Antenna' - lasers and 'bats in the belfry' in 1997!

Illegal Activities On The Amateur Bands

Dear Sir

I feel that I should respond to the Editor's comments in 'Keylines' in the March issue of *PW* concerning illegal operations. I'm doing so as the co-ordinator of RSGB's Amateur Radio Observation Service and have a direct interest in measures which might be taken to reduce or eliminate illegal activities and abusive/threatening operations on Amateur Radio frequencies.

You may wish to know that the recently re-formed AROS is served by a number of volunteer Observers who collect evidence of malpractices and non-observance of the 'rules' (BR68) which occur on Amateur Radio frequencies. Their activities are co-ordinated by me. The 'illegal' activities include: abuse of packet radio, repeaters, abuse on h.f. channels, etc.

However, I hasten to add at this point that neither I nor the Observers consider ourselves to be a 'Private Radio Police Force'. We operate under the oversight of Radio Society Of Great Britain's Licensing Advisory Committee and our main aim is to help and advise **all Radio Amateurs** - not just RSGB members - who are the victims of persons of ill-intent seeking to deny to others pleasure in their chosen hobby.

The method adopted is as follows: when cases of 'abuse' are reported to AROS, additional substantiated information and objective evidence is gathered by a number of Observers over a period of time. This is collated, assessed and analysed; and the 'dossier' is passed to the competent authorities for further action **if this is warranted**. This 'self-help' is as far as a 'non-executive' body can go.

I like to think that we are the Amateur Radio equivalent of 'Neighbourhood Watch' with the Radio Communications Agency (RA) perhaps in the role of the Police Force. Our methods seem to work adequately. I would also not disagree if some were to say that we were doing the RA's job for them. Indeed, we **are doing** what the RA would be expected to do **if it had an unlimited budget** in terms of finance and staff resources. However, as the Editor rightly pointed out in 'Keylines' - Amateur Radio is not at the top of the priority list for assignment of scarce resources.

I believe that if we demonstrate that we recognise when we have a problem, that we're trying to reduce or eliminate the malpractices/abuse which form part of the problem, that we're prepared to do some of the initial investigatory and assessment work ourselves - and if we can present to the authorities the results of our investigations/research in a coherent, unambiguous, readable and objective

Rob & His Roberts

Dear Sir

I agree with much of what the Editor says in his review of the Roberts RC828 multi-band radio cassette receiver in the March 1999 issue of *Practical Wireless*. Inclusion with this issue of the 'International Callsign Prefix Listing 1999' is also greatly appreciated (Thank you very much).

I am now well into my 76th year and you will readily appreciate that for one such as I to be able to listen, from the comfort of my chair, to world-wide broadcasts, including those from amateur sources and to record these easily and at leisure, to include stereo transmissions from such as 'Classic FM', has made life for me a much more enjoyable experience.

From my early days as a GPO Telegraphist, I have watched, almost at times in wonder, at the relentless and literally astonishing advancement of electronics and communications in general. Yes, truly, the RC828 is a fine piece of equipment, beautifully constructed and a joy to operate.

However, my particular receiver is not a Roberts RC828, but a Realistic DX392, identical in all aspects to the RC828, made in Taiwan and bearing the serial number 4075733212A6 which in itself may provide a clue as to the actual manufacturer. I purchased my DX392 some two and a half months ago from the Tandy shop in Norwich at their normal catalogue price of £149.99 which is £70.01 less than you paid for the same thing elsewhere! Also, comparing the items advertised on pages 17 and 32 of your March issue, the Sangean ATS909 receiver priced at £129.95 is clearly identical to the Roberts R861 retailing at £200!

Since, in my opinion, the facts clearly speak for themselves, I do not propose to comment further except to say that many radio enthusiasts such as we - and I am a member of the Royal Signals ARS (No. 3620) - are apparently being induced to pay considerably more than necessary for identical equipment offered for sale under a different name.

Ronald Sims
Norwich

Dear Sir

Rob Mannion's review of the Roberts RC828 receiver was most interesting. It was good to see a licensed Radio Amateur broadening his horizons by listening to the broadcast bands. I wonder how many transceivers with general coverage are sitting idle in Amateur Radio shacks?

Two points he didn't mention in the review: the receiver 'mutes' if you turn the rotary tuning too fast, which is not brilliant for band scanning. Also, the very annoying keyboard 'beep' - it would be better if this was an option that could be turned off, although I realise this is a useful facility for visually impaired listeners.

Finally, this receiver comes in several guises, you can pay in excess of £200 if you want a Roberts badge, but if you're willing to accept a Realistic or a Sangean, you could end up with a bargain at a much lower price!

Jonathon Kempster
Milton Keynes

Editor's comments: Very many readers wrote to me on this subject - all basically saying the same thing regarding the price and showing a great interest in the topic. However, a few (very fortunate) readers managed to buy the 'Realistic' version for less than £20 when the 'Tandy' shops recently changed hands following a 'take over' of the business. Finally, I'd like to remind Jonathon that I've often mentioned that 'general listening' (particularly to the h.f. broadcast bands) has always been a very enjoyable feature of my radio activities and suitable comments are always included in my reviews of equipment with 'general coverage' included

manner then they are far more likely to devote resources to the problem and we are far more likely to achieve the desired result. Additionally, it is easier to deal with a problem if the number of 'sources' is not too cumbersome a figure.

You will appreciate, of course, that AROS activity is carried out under conditions of the strictest confidentiality for legal and for safety reasons - and this might not sit too well with some. **Sources of information are never disclosed without the permission of the person who has provided it.**

Additionally - the identities of Observers are also never disclosed without their permission. The nature of the complaints made and the identities of alleged offenders are treated with the utmost confidentiality and are never revealed except to the competent authorities (the RA/Radio Investigation Service) when this becomes necessary.

So, I think that we are somewhere along the right road although there is still much to be done. We are trying to help ourselves and we have the support and

encouragement of the RA. Additionally, AROS is co-operating with our counterparts in Citizen's Band on matters of joint interest (i.e. radio abuse). I was invited to attend one of the regular meetings held between the CB section of our hobby and the RA in November and very interesting and useful an experience it was too. I intend to go to the next scheduled meeting early this month and I hope that the matter of so-called 'CB-ers' using 28MHz may be raised to useful effect.

Can I ask you for a plug? Would it be possible for you to mention in your column that: AROS exists, and the AROS aim is as stated above? Also, if any reader is suffering from problems caused by abuse or other operating malpractices on Amateur Radio frequencies that they consider alerting AROS to the problem, and if any reader would like to become a volunteer Observer they contact me directly: **Dave Peters, AROS Co-ordinator at PO Box 113, Potters Bar, EN6 3ZY. or E-mail at: AROS@rsgb.org.uk**

Dave Peters
Potters Bar

Radiocommunications Agency Response

Dear Sir

As a regular reader of the *Practical Wireless* Editorials and as one who cannot resist a challenge, what else could I do but pick up the invitation for a reaction from the Agency to the exchanges about interference to Amateur Radio due to illegal use on the 28MHz bands?

I entirely support what the Editor says in his 'Keylines' Editorial ('March PW') that Amateur Radio is allocated radio spectrum on the understanding that no protection can be given against interference within the bands. The Agency has to devote most of its resources to dealing with interference caused to the emergency services and business users who depend on reliable communications in order to conduct their businesses successfully.

I believe that most Amateur Radio users recognise that these priorities are reasonable and that they pay a relatively modest licence fee for their unprotected usage of the radio spectrum. However, having said that, the Agency also understands how frustrating it is when illegal users spoil the enjoyment for others.

A sense of balance has to be struck which both reflects our necessary priorities but which still gives Radio Amateurs some expectation of official action to assist them. That sense of balance can, and does, lead us to take enforcement action against offenders who cause serious problems to the Amateur Radio service.

What we need is documented specific information about offenders which is why we have strongly supported the RSGB's Amateur Radio Observation Service (AROS) who, if they cannot resolve problems themselves, will send fully documented cases to the Agency for possible action. This approach both encourages the initial resolution of problems within the Amateur Radio community itself and helps us better target our own scarce resources.

The original thrust of the debate was about interference from overseas operators and I strongly endorse the Editor's view that the International Amateur Radio Union could have a role in the resolution of such problems and the Agency can also pass on detailed information at an official level to overseas administrations for possible investigation.

I hope that this reply is a helpful input to the debate.

Barry Maxwell
Director
Radiocommunications Agency
London.

Editor's comment: I'm beginning to believe that PW Editorials reach the places where others can't, following the response to the March 'Keylines'! I thank Dave Peters and Barry Maxwell for responding and I've no doubt that readers will be interested to learn that Dave is already preparing a full length article on AROS which we hope to publish later this year.



COMPILED BY JO WILLIAMS

Headline News

The Bigger Picture

Icom (UK) Ltd have been in touch with *Practical Wireless* to tell us all about their new IC-2800H v.h.f./u.h.f. f.m. transceiver which they claim "... is set to revolutionise the Radio Amateur dual-band market by combining advance features, unparalleled value and a truly unique design".

Icom tell us that the IC-2800H is different from other mobile radios in that the main unit and control head are permanently separated from each other, allowing the Radio Amateur to situate the main unit somewhere out of the way - under a seat, for example - yet the control head can be placed in full view on, for example, the dashboard. This, Icom claim, is one of the reasons why they feel that this new transceiver represents "... a totally new concept in mobile radio design".

The transceiver is also the first mobile Amateur radio to incorporate a 76mm, full colour, l.e.d. display and Icom also state that it's capable of presenting operating data in a variety of formats and also of displaying video from an external source. The size of the control unit is a mere 140mm wide, 70mm high and only 34mm deep and Icom claim that this gives "... maximum installation flexibility ...".

Incorporating twin receivers and specially designed for the Radio Amateur on the move, the IC-2800H, say Icom, has incorporated a tuning dial for each band, separate a.f. level and squelch control and four function buttons all packaged up in a one-piece radio chassis constructed from die-cast aluminium for "... added reliability and to help keep the equipment cool ...".

Each band on this transceiver has 99 standard memory channels, five log and five repeater memories and a call channel coupled with various scanning modes topped off with a "... unique memory edit mode that allows the individual attributes of a memory

channel to be modified (frequency, tuning step, etc.). These functions all aid simple memory management, claim Icom.

Finally, Icom say that the IC-2800H has two accessory terminals as standard which allow direct connection to an external PAL video source and a 9600 b.p.s. Packet modem. The video socket also allows for many other applications and can be used in conjunction with a video camera, TV tuner or car navigation

system. With other features including broad-band receive, tone squelch (CTCSS) with alerting beep and tone scan,

adjustable squelch attenuator and programmable squelch delay, with 50W r.f. power on 144MHz, 35W r.f. power on 430MHz, advanced HM-98 remote control microphone supplied as standard and much more.

The IC-2800H is available for the price of £549.99 and Dale Blackman, Marketing Manager for Icom, says that the transceiver was "... developed as a successor to Icom's well-known IC-2710H. It features a modern, eye-catching design and is extremely user-friendly. Whilst its features are aimed at serious dual-band users, the price makes it attractive to a much wider group".

Message Board ML&S!

Martin Lynch & Sons (ML&S) have announced that they have a new service which is NOW available on their Web site. A 'Message Board' system has been set up on the site which, they claim, will enable visitors to "post" messages regarding Amateur Radio topics. Once a message has been posted, visitors can view a listing of topic, together with the poster's name and the date the message was sent.

Martin Lynch & Sons say that this service is completely free and that already visitors have put messages up on the ML&S Message Board ranging from wanted towers to discussions on 144MHz s.s.b. operation. The ML&S Web site can be found at <http://www.MlandS.co.uk> - so why not take a look?

Remarkable Radio Receiver?

Icom have just announced the release of their new radio receiver - the IC-R75. They say that it's a dedicated h.f.+50MHz, all mode unit and that it "combines the latest receiver technology with a range of new features to ease operation and improve reception and signal quality ...".

There are a number of things which Icom say make the IC-R75 a "remarkable receiver". Twin Pass Band Tuning (PBT) filters help to assure high quality reception, it's extremely sensitive, a two level pre-amplifier, selectable Automatic Gain Control (AGC) and noise blanker help to "capture and clean up" DX signals and the r.f. attenuator, Icom says, minimises interference from strong local stations.

Icom say that they have incorporated a number of other features so that this new radio receiver will suit a wide variety of applications - these include a bar-graph style, digital signal meter, 99 memory channels, two programmable scan edges and an internal clock with 'on/off' timer functions. They tell us that a speech synthesiser can also be installed to announce the frequency, mode, signal strength and time.

Dale Blackman, Marketing Manager for Icom says: "This superb receiver is designed to suit a range of market sectors from the demanding 'decoder' to the interested s.w.l. The IC-R75 incorporates Icom's leading edge technology and offers a range of features that make it exceptional in many ways ...". The IC-R75 costs only £699 including VAT. If you would like more information on this or any of Icom's products, you can contact them on (01227) 741741, Sea Street, Herne Bay, Kent CT6 8LD. Alternatively, you can visit their Web site on <http://www.icomuk.co.uk>

We Have Moved!

The *Practical Wireless* News desk have received two new change of addresses in the last month - RK3KP - the **Adventure Club**, have changed their address. They can now be found at **Doskaya str., 37, Moscow 117419, Russia**. Any future correspondence with the Adventure Club should go through this address.

Closer to home though is **Multicomm 2000**. They have informed us that from 25 February they will be based at **Unit 4, 17-E Little End Road, Eaton Socon, Cambs PE19 3JH**. Tel: (01480) 406770, FAX: (01480) 216456. They have requested that all letters and parcels should now be sent to this new address.

Super Scanner

Nevada have been in touch with *PW* to tell us about their excitement over the release of their new **TRIDENT TRX-100XLT ultra wide band scanner with computer interface**. Nevada state that this new scanner continuously covers

100kHz-2200MHz and receives narrow f.m. (n.f.m.), wide f.m. (w.f.m.) and a.m. modes. They say that it is "... packed with facilities ..." which includes a nine channel band scope display which will enable the Radio Amateur to monitor adjacent channels in manual, search and memory scan mode.

The TRX-100XLT also has a built-in decoder, optional software and a control cable and

Nevada state that it is possible to link the TRX-100XLT to a computer for monitoring and control. Other facilities include a 10dB attenuator, turbo scan, auto power off and cloning.

The TRIDENT TRX-100XLT will sell for £199. For more information, contact Nevada on Tel: (01705) 698113, FAX: (01705) 690626, 189 London Road, North End, Portsmouth PO2 9AE.



Solder Site

Antex Electronics, producer of soldering equipment and accessories for schools and colleges, hobby electronics and product servicing world-wide, have announced the arrival of their brand new Web site which can be found at <http://www.antex.co.uk>

Welcome to the Antex Website.

Try web that have full details of our products and the wide range of services & accessories available. You have also included some advice on soldering techniques and contact details for our distributors around the world.

This information has been gathered during more than 10 years of our soldering business. I hope that you find it of some value.

John Lusk, Managing Director

Antex state that this new Web site will contain all sorts of special features on soldering topics - from selecting products and accessories to techniques, problem solving and safety as well as technical tips, product information and prize competitions.

Designed for use by visitors of all ages and soldering experience, the site also has its own **search engine** for easy access to information through drop-down menus or keywords, backed up with a **glossary** of soldering terms and **'Frequently Asked Questions'** ('FAQ') section.

Ian Lockhart, Sales Manager, states that "The Web site will provide instant access to users or our products all over the world. We see it as an important educational tool as well as a promotional site for our products. As a dialogue builds with our customers, we will be able to add more information to help them produce better quality and safer soldering". If you're interested, why not take a look at the Web site for yourself?

Open Day!

Jeff Stanton of **Waters & Stanton PLC (W&S)** has written to *PW* to tell us all about their **Annual Open Day** which will be taking place on **Sunday May 30** at their store and in the car park at **Spa House, 22 Main Road, Hockley, Essex from 1000-1600**.

He states that they will erect a huge marquee behind their store and use this opportunity to "... clear many products, samples, ex-service department equipment and general junk at ridiculously low prices".

Jeff also tells us that because of extensive alterations to their warehouse and mail order department, "... a huge number of items will be up for grabs"! Branded equipment from Icom, Yaesu, Kenwood, Alinco and Watson will

Double Trouble!

Maplin Electronics have sent news of the release of their new electronics catalogue on CDROM. Launched on the **1 March 1999**, they claim that it is "... quite simply the latest, comprehensive and most widely used electronics catalogue in the UK".

This new catalogue, Maplin state, brings you the "largest semiconductor range in the UK"; "a range of refreshing new products"; "good competitive prices" and much more! This "Spring/Summer" edition is available in paper form (order code **CA19V, £3.99**), as well as the **double CDROM** (order code **CQ03D £1.95**).

Maplin say that with the March issue they have introduced a new section - "Optical" - **Dave Whittle, Senior Product Group Manager**, says that reason for this new section is "as a result of customer feedback, where the desire to locate optical products quickly was required".

The double CDROM comes with comprehensive search facilities which, Maplin say, makes product selection quick and efficient. Pictures, technical specification and pricing (in Sterling and in Euros) all appear on screen once you've located the item which you require.

Maplin tell us that the second part of the CDROM catalogue is a **free copy of the MacAfee anti virus software**, a **free 30 day Internet trial with Demon** including software and over 100 datasheets! Both catalogues are available mail order from Maplin Electronics through WH Smith or from one of Maplin's many stores around the country. Or, you could call Maplin's sales line on **(01702) 554000** or visit their Web site at <http://www.maplin.co.uk>

also be offer at specially low prices.

Mark Francis of W&S will be holding his "popular auction" and promises visitors the best yet! Most of their staff will be there for the day, so you'll have a chance to put a face to the name! Free refreshments will be provided and *PW* are assured by W&S that you won't want to miss out on this event - so pencil a note in your diary!

Historical ARS

The *PW* News desk received an interesting press release from a new national Amateur Radio Society

which has been set up. The **Vintage & Military ARS** say that they are a "non-profit making, democratic and specially [formed] for the licensed Radio Amateur, short wave listener and others interested in old radio coms gear ...".

This new society say that they will be concentrating on the preservation and operation of vintage commercial and home-brew Amateur Radio communication equipment. They say that there will be a regular newsletter sent to all members with descriptive, informative

Mini Maycom

Nevada have been in contact with the *PW* News desk to tell us all about the new **Maycom AR108 compact air band scanner**. They claim that this "palm sized scanner" will cover 108-180MHz and is "small enough to fit in a top pocket".

"Ideal for both airport and airshow use" the AR108 is a dedicated **v.h.f. radio** and its scanning receiver has been "optimised to give **powerful long distance reception** of the v.h.f. and civil air bands".

Nevada tell us that some of the AR108 features include: air band and weather band scanning; 99 memory channels; selective channel steps; dual channel switch; key lock; battery voltage indicator and low battery warning and much more. The set is priced at **£69.95** and you can contact Nevada on **(01705) 698113, FAX: (01705) 690626, 189 London Rd, North End, Portsmouth PO2 9AE**.



and technical articles on old radio communications gear and a specialist exchange, for sale and wanted ads section.

Other things which you can expect as a member of this society include: an exchange between members of information about equipment restoration, modification, setting up and use; technical help, advice and assistance; the study of history, development and original use of vintage (especially ex-military) gear; a valuation service for vintage communication equipment; organised nets on the amateur bands for people wishing to set up and much more. The first meeting will be taking place at **Bletchley Park on 29 May 1999**.

For more information please contact **Howard Aspinall G3RXH (Hon. Secretary)** at "Adare", Raikeswood Crescent, Skipton, North Yorkshire BD22 1ND. Tel: **(01756) 793555**, E-mail: **100646.144@compuserve.com**

Taking The 'Ham' Out Of Radio Today

Now for some news which you may already know about. We have had news from the **RSGB** that they will be changing the name of **Ham Radio Today** to simply **RadioToday** in an attempt to broaden the magazine's appeal. This change will take effect from the May edition.

news is continued on page 12





COMPILED BY JO WILLIAMS

Digital Radio Has Arrived!

You may remember that way back in the news of the December 1998 edition of *PW*, I (Jo Williams) wrote about the



digital revolution in radio - and mentioned the new **Arcam Alpha 10 DRT**. Well, this month I received a further press release from Arcam which announces the retail availability of the Alpha 10 DRT.

For more information on digital radio you can visit their Web site: <http://www.arcam.co.uk/news/digiguide.html> Or, you can telephone Arcam on (01223) 203203.

As from the 15 March 1999, you will be able to walk into one of the 100 Arcam hi-fi dealers and buy one! Arcam say that the Alpha 10 DRT is "the first home DRT [Digital Radio Tuner] to be developed and the first to go on retail sale". They go on to say that it is a "stand-alone component" which is "easily added to any hi-fi system, much as one would add a new CD player".

The Arcam Alpha 10 DRT retails at £800 and Arcam say that it is definitely worth it because once you've bought it "the music is free". You will be able to receive radio stations as a "clear, clean sound".

St George's Special Event

News now from **Bill Felton G3XZF** who wrote to tell *Practical Wireless* all about a Special Event which the **Wisbech Amateur Group** are organising to commemorate St. George's Day on **23 April 1999**. It will take place from **Peckover House** (a Georgian House owned by the National Trust) at **North Brink, Wisbech**.

Bill says that they have applied for a **GB99** Special Event call sign and **GB99SGD** is a possibility. Although they haven't had final confirmation (as

this copy of *PW* goes to press), Bill tells us that he feels certain that **GB99SGD** will be granted. They plan to be **QRV** on 3.5, 7, 14 and 18MHz, 144 and 50MHz is also likely. For further information on this Special Event please contact **G3XZF QTHR** or Tel: (01945) 588102.

Rob's Roving Again!

Rob Mannion G3XFD - our 'roving Editor' - is well and truly into his busy 1999 'Club Visit' schedule and he has managed to visit some clubs several

times in the past ten years, one of these is the **Chester & District Radio Society** - who have moved to a new venue since Rob's last visit.

Rob arrived on Tuesday 23 February at the new village hall near Waverton on the outskirts of Chester and was welcomed by Club Secretary **Neil Foster G0ONQ** before enjoying the evening where he provided an update to his previous visit and recalled some of the 'G3XFD Adventures in Journalism'.

The evening was rounded off with a presentation of £25 for the Radio Amateur Invalid and Blind Club (RAIBC). Rob remarked: "I've never been in such an attractive little building as this". He said that the wooden beamed and vaulted roof of the super hall is less than three years old. So, if you're looking for an active and friendly club, Chester is the club for you!

There was a true 'welcome in Wales' waiting for Rob **GW3XFD**

(mustn't forget the GW bit!), when he eventually arrived in North Wales - despite storms, floods and even snow - to visit the **Aberystwyth & District Amateur Radio Society** on Thursday 4 March.

The 'Welsh Welcome' mat was very much in evidence and despite the weather there was a good turn-out of local Amateurs, s.w.l.s and students from the local University. In fact, Rob claims he had an audience including visitors from British Columbia in Canada and Germany!

Rob was welcomed by **Katie Moore GW0SFO**, who had extended the original invitation and the evening concluded with a lively 'Question & Answer' and a buffet meal. Rob says that any student attending the University can be sure of "a real welcome from the local amateurs" in the town.

The **Silverthorn Club** was next on the 'Club Visit' list. Based in Chingford in north east London, it's a club with a long history. Thanks to the co-operation of the Silverthorn Club, Rob was able to incorporate a visit to one of the highest parts of Greater London, on Friday 12 March, while he was in the area for the London Show at nearby Picketts Lock.

The evening was a particularly successful event with a good attendance, wonderful atmosphere and a lot of lively 'feedback', followed by a well presented (and very tasty) buffet meal! **Andrew Mowbray G0LWS** led the welcome team and Rob left for his Hotel in Epping Forest with the memory of a precarious climb up the steep stairs to the Silverthorn Club station and clutching a £50 cheque donation for the RAIBC! Well done Silverthorn!



BARTG Launches Award

The **British Amateur Radio Teledata Group (BARTG)** has announced that as part of their 40th anniversary celebrations, they will be launching a new award - the **BARTG PSK31 Award** - which they say "... looks to the future of 'ham' radio data comms". Promoting new forms of 'ham' radio data comms was the reason why BARTG was first formed, they say, and they hope that this new award proves that after 40 years, they are still doing what they set out to do.

So, how do you go about achieving, what BARTG say (as far as they know) is the "first ever award, world-wide, for the newest data comms mode in 'ham' radio"? They state that the rules are simple:

"Contact at least 40 different countries world-wide using only PSK31 as the mode. This award is open to s.w.l.s who have heard at least 40 different countries on PSK31:

"No crossband or crossmode QSOs are allowed;

"Any 'ham' radio band may be used;

"There are no single band endorsements;

"All claims for this award must include a list of verified QSLs (which must state that PSK31 was the mode used) confirmed by two other amateurs".

The award costs **£6, \$10US** or **30 IRCs** and applications (with verified QSL list and fee) are to be sent to **Nigel Roberts G4KZZ**, **BARTG Awards Manager**, 13 Rosemoor Close, Hunmanby, North Yorkshire YO14 0NB. For more information, you can contact Nigel at his address or you can visit the BARTG Web site:

<http://www.bartg.demon.co.uk>

Success For GB175RNLI



David Barlow G3PLE, member of the **Poldhu ARC**, has written to

PW to tell us of their success with their Special Event station in aid of the **RNLI's 175th Anniversary**. **GB175RNLI** took place on the 6 March 1999 and Club members along with representatives from three branches of the RNLI had to deal with major pile ups - it was estimated that over 50 stations were calling at the same time!

Hundreds of contacts were made during the event which was organised by **Mike Soars G4TCI** and a substantial amount of money was raised for the RNLI through the distribution of certificates. Congratulations to the **Poldhu ARC** for raising money for a special cause.



"Last To First - Almost"!

PW 144MHz QRP CONTEST – THE GW8ZRE/P CONTRIBUTION!

My interest in the *Practical Wireless* 144MHz QRP Contest began way back in 1984 whilst I was on holiday on the island of Jersey and working the callsign: GJ8RVT/P. As a result of my enjoyment of this holiday, I visited Jersey again in 1985 and sent in an entry to the PW 144MHz QRP Contest myself, the result of which was 31 QSOs using a 5 1/8 whip antenna - this was to be the start of a very long career as a PW QRP contestant.

"Famous Home-Brew"

It was during 1989 that I constructed my, now famous, home-brew HB9CV antenna for portable operation from Cynr-y-Brain, Llangollen in North Wales - 561m a.s.l. (IO83JA). This turned out to be a superb site with a good take off in all directions. My antenna was supported approximately three metres a.g.l. on a couple of aluminium poles which were taped together.

Although I was very successful at this position, the rain of North Wales took its toll on both QRPer and QRP equipment so, in 1992, GW8ZRE/P moved to the warmer climate of Ibiza "EA" Spain. As my luck would have it, the Sunday of the contest brought heavy rain!

I had transported a kit HB9CV antenna to Spain comfortably wrapped in a sun shade and the X-ray machine at Manchester airport soon detected the elements, cable and PL259 plug. A further hand baggage search revealed transceiver and plastic cable ties (I recommend to other travelling QRPers that the latter are placed in the main baggage).

As soon as I arrived, the antenna was erected on the hotel balcony using the pole from the sun shade and cable ties - the result? One QSO achieving last place in the contest, but a place certificate for JM08.

In 1994, the contest provided the first GW-7X (Algeria) QSO on 144MHz 7X2CS QRA JM16SP. I remember asking the 7X station to standby while I worked G4ZTR in JO01. When I asked for the prefix, I realised that this was **not** a G7X and a hurried look at the QRA map confirmed that this was actually Algeria - worked on just 3W and an HB9CV antenna!

GW4MGR/P returned to the Llangollen site in 1996 so GW8ZRE/P moved to Halkyn mountain (IO83JF) 303m a.s.l. with a new Tenna mast and 7-element ZL special, in an attempt to move up the results table. My best placing to date is third - perhaps a larger antenna will enable a first or second place in the future?

Anyone Can Enter

The simplicity of the PW contest means that anyone can enter, there are no high power stations and there is room for everyone on the band either on home or portable operation. I have worked many stations who say "I am not in the contest - only giving points away". I think that these stations should send in an entry.

For portable operation, I recommend that you take warm clothing, as the sun does not always shine - and take a picnic or finger food that's easy to eat, as that rare station might pop up at any time. Always check access to the site and get the landowner's permission.

Ensure that you've checked all equipment, charged

any batteries and take any spare fuses for the time you put the 'croc' clips on the wrong way round. I know all this from personal experience!

It's always useful to take a small selection of tools, including several pens. In one contest, I needed a soldering iron to repair a PL259 which broke, but I'd forgotten the gas and had to wedge the plug with solder to make a good connection.

One thing which I find extremely useful is to study previous contest results in order to compile a list of stations which operate from rare squares. I also take an A4 QRA locator map of Western Europe so that each square can be crossed off as I work them.

A trial run to the site is a good idea if you want to discover the best beam headings using the various v.h.f. beacons. If you're not using a computer to score the contest, enter the serial numbers in your log before the competition day arrives as this will prevent errors if the QSO rate becomes hectic. A 'check log' listing the suffix and serial number of each call will help in rapid checking and will prevent duplicates.

Best Plans

The day arrives and even the best laid plans can go wrong. In 1998, the waterlogged grass and sheep droppings at my position defeated me on several occasions. Because of this, I suggest that you have an alternative site on stand-by as back-up.

On reaching the site, erect the mast carefully so that if it falls down due to gales or even sheep pulling out the guy rope pegs, it will fall away from yourself and your car. In strong winds, the antenna will only point one way, **Charlie G0PZO** suggested a rope attached to the beam with a brick at the other end - why didn't I think of this simple idea?

Also, it's sometimes a good idea to check and see if the site was used the previous year - it is possible to site share, as long as you both agree not to operate too close to each other's frequency - minimum QRM, that's the delight of QRP operation. I myself have found that you can operate from 1km away without any problems.

To quote the 'X-Files': "The truth [sorry, the squares] are out there" EI/GI/GM are in many good squares. If someone is suddenly on 'your' frequency, the station could have turned the beam, or better conditions have prevailed. Choose clear frequency CQ calls for 20 minutes, then spend five minutes hunting around the band.

Over the years, stations get to know each other and friendly rivalry develops. At the end of the contest, **Peter G17JYK/P** (winner of two PW EI/GI clocks), is always waiting on 144.330MHz to collect final scores and a squares tally to work out how well he's done.

I'm sure that **Neill Taylor G4HLX** (adjudicator of the PW 144MHz QRP Contest) and all PW entrants look forward to welcoming old and new stations to the 1999 contest. The number of entrants in some squares is low, so you could win a square certificate.

Please enter! But, most of all, enjoy yourself with fellow QRP stations! It's not the winning of the contest that counts - just the taking part!

PW

David Hewitt
G8ZRE shares
his personal
experiences in
operating 'P'
during the PW
144MHz QRP
Contest. From
last to first -
almost! You
might just learn
something from
his observations!

Fig. 1: Dave G8ZRE's QRP set-up.



DAVID HEWITT G8ZRE SHARES A LITTLE OF WHAT HE'S LEARNT ABOUT TAKING PART IN THE PW QRP CONTESTS!

RADIO BASICS

Rob Mannion

G3XFD begins the introduction of the next project in the 'Radio Basics' series - a special receiver 'front end' for 7MHz by looking at tuning methods using variable capacitors and variable inductances. Appetite 'whetted'? - read on!

Now that I'm starting the run up to the building of our next 'Radio Basics' project I have to find some space to introduce the less experienced readers to the tuning methods open to us as constructors. At the same time, bearing in mind that this column seems to attract both inexperienced, experienced and 'dead keen' constructors, I'm also going to describe and remind some of you of a nearly-forgotten method of tuning - 'variable inductance' or permeability tuning.

In fact, I'll start off with the 'nearly forgotten' method because I know from the large number of enquiries that come my way - that many of you really enjoy making very simple

receivers. And from my own experience I can tell you confidently that permeability tuning can provide an extremely simple tuning method, save you money, provide very fine tuning rates and

take up very little space. So, why is it not used so much nowadays?

Car Radio Tuning

Up until relatively recent times, permeability or variable inductance tuning was in common use in car radio receivers. In fact, if you've bought one of the 'Delco' car radios I suggested for the 'Radio Basics' 3.5MHz to medium wave converter, Fig. 1, you'll be able to look inside and see how the method is used professionally.

I'm in the process of building a 7MHz 'front end' for myself using 'permeability' tuning, employing the ceramic formers shown in Fig. 2. I've used the method before and it provides truly excellent 'bandspreading' and ease of alignment for a superheterodyne receiver - albeit at the cost of some mechanical complexity (perhaps the reason why it's not so popular nowadays?). However, despite this problem it proves to be quite easy to 'gang' three or even four permeability tuning cores together, using a 'yoke' system.

Again, despite the mechanical complexity of a permeability tuning unit there are advantages. For instance, with the relatively

Fig. 1: A view inside the 'Delco' car radio which many readers used as a tuneable intermediate frequency receiver unit. The 'permeability' tuning unit and its mechanically linked pre-set tuning dominates most of the chassis (see text).

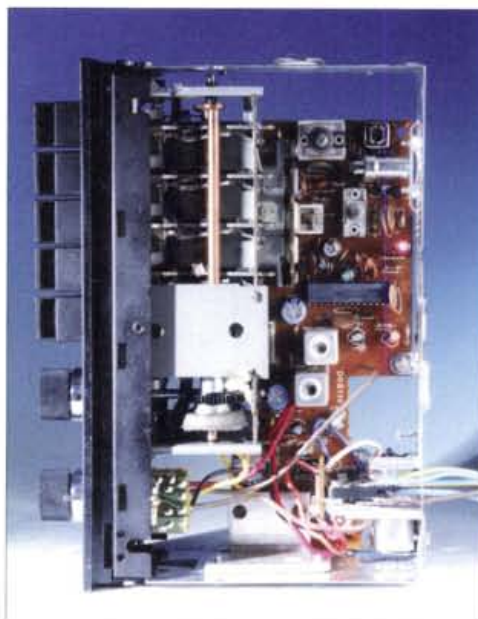


Fig. 2: The high quality (surplus) ceramic coil formers, suitable for use in a 'home-brewed' permeability tuning unit. No fixing nuts are available for the silver-plated threaded ends but G3XFD found that various types fitted and it's thought that the nuts are (or extremely close to) quarter inch UNF types with a thread of 28 turns per inch.

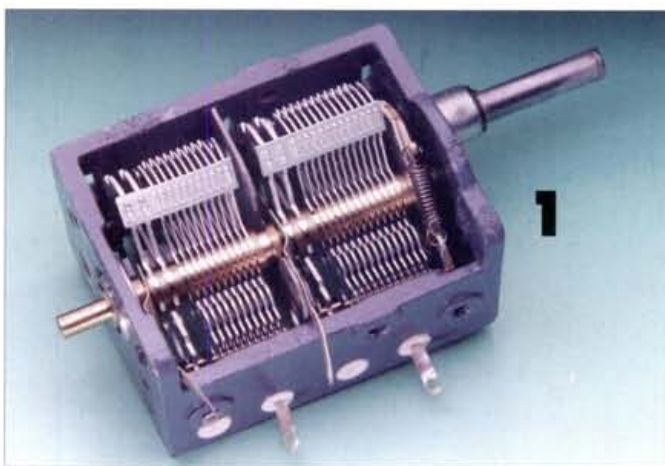


Fig. 3: This surplus variable capacitor, Ref is Type 1, is suitable for the 7MHz project and comprises ganged 350pF and 400pF together with 20 + 20pF. Excellent bandspread can be provided by the 20pF sections, and general coverage with the large 'ganged' sections, aided by a slow-motion drive.

narrow bands of frequencies needed for coverage of the amateur bands the correct 'tracking' (required for accurate

production of the intermediate frequencies) for a superhet 'front end' the coil unit providing the local oscillator tuning can be mechanically advanced over the tuning range rather than being electronically 'trimmed or padded'.

Years ago I even made up a four coil permeability unit to cover 7MHz, using ceramic formers. All cores were controlled by the position of the one 'yoke' and the position of each core within its own former could be adjusted by the thread I'd cut on the main 'yoke'. With such an arrangement I was able (with one fine tuning control) to obtain accurate tuning of the tuned r.f. amplifier stage, the mixer, the local (receiver) oscillator and the v.f.o. for the associated transmitter. Even the c.w. 'offset' could be set by adjusting the v.f.o. core!

I know that more advanced constructors get ideas from 'Radio Basics' - so now I've sown

the idea (perhaps) I'll mention simpler uses for less experienced readers.

Really Simple Tuning

The ceramic coil formers can provide a really simple tuning method for absolute beginners and in fact many cheap 'vintage' crystal diode/detector receivers used this form of tuning. I've also seen the same method used by Prisoners of War because the coil was easier to make and bribing prison camp guards used up too much tea, coffee and chocolate rations to get variable capacitors!

To use the ceramic former and core unit as a tuner the 'slug' and its screw-thread should be mounted inside the ceramic unit in the same fashion as a piston (or bicycle pump). With the whole assembly fixed at the base with a suitable nut, the coil is wound over the coil former between the terminating clips.

Use your 'Tinny Dipper' or other dip-meter to resonate the coil roughly to the band you require. This is best achieved by using a capacitor of 200pF or so (you can experiment - one of the advantages of having access to a dip-meter!) to 'set' the frequency and you can then tune the assembly by gently pushing or pulling the threaded rod.

Incidentally, you can also (for experimental purposes) try using small lengths of ferrite rod material to achieve the same results. Form a paper tube round a rod so that it can slide in and out (trombone style) for tuning. And although it's difficult to hold (unless you can successfully drill a hole to insert a screw thread which is then anchored with epoxy resin adhesive) it makes a worthwhile teaching aid or experiment.

The ferrite rod/variable inductance/permeability tuning is an effective way of making simple receivers. To use it

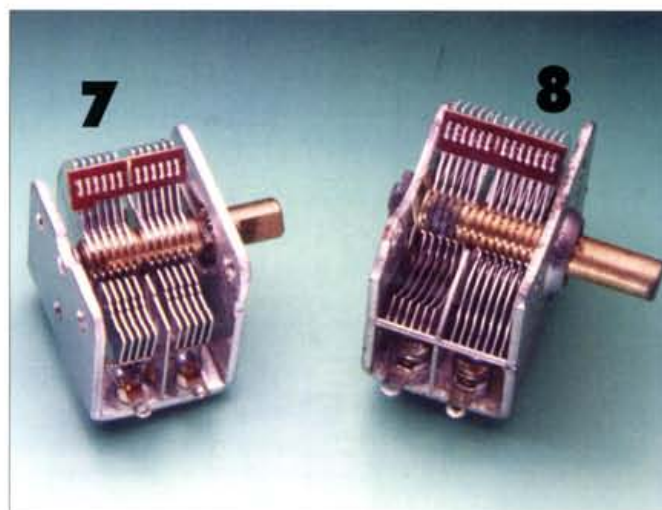


Fig. 6: Photograph illustrating a 100 + 200pF (reference Type 7, and a 150 + 150pF (reference type 8) suitable for general coverage tuning.

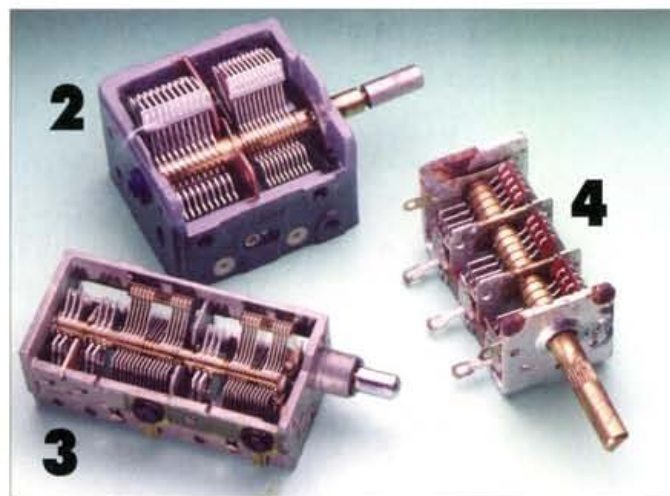


Fig. 4: This photograph shows a 200 + 300pF variable capacitor (top left, reference Type 2) with slow motion drive suitable for general coverage tuning, a 250+250pF and 20 + 20 + 20pF unit (left, lower, reference Type 3), with slow-motion drive suitable for many projects. On the lower right a 10 + 10 + 20pF variable capacitor (reference Type 4) is shown, suitable for 'bandspread' operation.

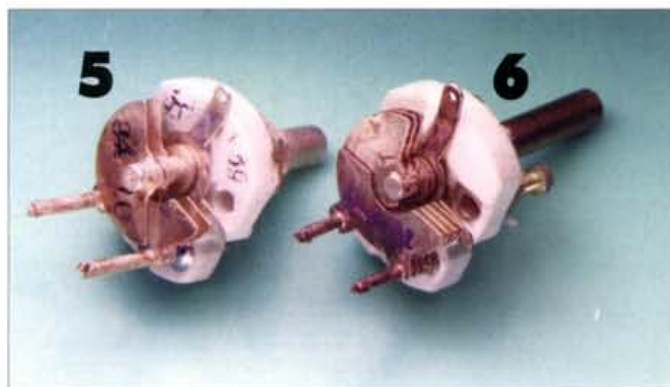


Fig. 5: The photograph shows two single variable capacitors, Type 5 (left) of 10pF and Type 6 of 25pF both are suitable for use as antenna trimmers, etc.

instead of a variable capacitor just replace the existing variable tuning capacitor in the simple receiver circuit with the coil and the (previously mentioned) resonating capacitor and tune 'trombone' style. It's an ideal project for a school group or radio club as I know from experience!

Finally on this topic - as I know there are many keen innovators and avid 'what can I do with this old radio chassis' types amongst our readers - why not partially dismantle an old long and medium wave car radio permeability tuning unit and rewind it for use on the lower short wave bands? If you do - let me know how you get on.

Variable Choice

Now we come to a variable choice - or a choice of variable

capacitors for the next and forthcoming projects. They're all available from the same source and it's important that you quote the correct reference when you order.

The variable capacitors to be featured in forthcoming projects will include **Type 1, 3 and 4**. Type 4 will prove to be very useful for a 28MHz narrow band f.m. receiver project later on in the series. However, my advice is that you order a selection of the various capacitors because they'll always be useful.

I'll always provide a reference to the types the various projects can use. And it's my intention to enable you to use either type 1 or type 3 in the 7MHz project. So, until next time, when I hope to present the circuit and other information... get busy. If you've not built, bought or borrowed a dip meter yet - you've still time to get organised!

PW

Component Suppliers

Ceramic coil formers: The high quality (ceramic) variable inductor units (Fig. 2) are available from **Robin Sykes G3NFV** of Syon Trading for £1.20 each plus 75p P&P. (P&P quoted is for three ceramic units, suitable for a 'three gang' tuning assembly - r.f., mixer, and oscillator). They are of superb quality with silver-plated ends and wire attachment collars. Very rare (Robin has a limited supply) and once they've gone I don't suppose we shall see their like again! Orders direct to: **Syon Trading, 16 The Ridgeway, Fetcham, Leatherhead, Surrey KT22 9AZ. Tel: (01372) 372587, FAX (01372) 361421.**

Variable capacitors: The selection of variable capacitor units suitable for projects already published in 'Radio Basics' or for the latest (7MHz 'front end') project are all available direct from John Birkett in Lincoln. When ordering please quote the PW reference number shown alongside. **Prices are: Types 1, 2, 3, 5, 6, 7, 8 cost £3.50 each. Type 4 costs £2.50. The cost of P&P is £2 for orders under £10, with orders over £10 being sent post free. Orders direct to: J. Birkett, 25 The Strait, Lincoln LN2 1JF. Tel: (01522) 520767.**

Second Helping - With An Extra!

The Alinco DX-70TH & EDS-4 Combination

Rob Mannion G3XFD describes the success he's had since buying a second Alinco DX-70TH which is used in conjunction with a front panel remote control panel kit. Rob says the extension cable adds even more to this versatile little transceiver and to help you share his success, Rob's also arranged a very special offer for readers!

Fig. 1: The EDS-4 1.5m front panel remote control cable kit shown as fitted to an Alinco DX-70TH. (See text for comments on the microphone socket).



Following requests from *PW* readers I've worked on the bands - to send them photocopies of the original review of the Alinco DX-70, I was rather shocked to see it was published in August 1995. Time flies by doesn't it? In the past four years or so I've had an enormous amount of enjoyment with my supremely versatile DX-70. In fact I've now just bought myself another DX-70, this time it's the latest TH model.

The new transceiver is now my 'main station' and my original DX-70 is available for use in my car permanently and is operated in conjunction with the MFJ-945E mobile antenna tuner I described last month (April). The whole assembly can be removed from my car in seconds - so security is not a problem and the remote control extension cable kit enables me to place the front panel just where I need it - adjacent to my left hand on the central console of my Peugeot 405 estate car.

The EDS-4 Cable Kit

The Alinco EDS-4 front panel remote control cable kit enables the operator to remotely site the DX-70TH (or the original DX-70) away from prying eyes. Although the cable, Fig. 1, is only 1.5 metres long, it has proved to be adequate for a range of vehicles and I've tried it in a neighbour's 'People Mover' (MPV) type of vehicle, a van and a motor caravan quite successfully.

During the time I've been the Editor of *PW*, very few 'remotely operable' h.f. transceivers have been reviewed. However, those that have come our way were provided with microphone sockets on the de-mountable, remotely operated front panel. Unusually, the DX-70 EDS-4 kit and presentation ends up with the microphone remaining in its original position on the transceiver main body.

When I first saw the unusual method adopted by Alinco regarding the placing of the microphone, I was (to be truthful) a little dismayed. However, I'm now a real 'convert' as I've actually found it to be an excellent idea!

The advantages of having the microphone still connected to the main chassis are numerous. The first is that you don't need to mount the microphone on the vehicle console and the second is that there's the minimum of cabling cluttering up the vehicle. The third (if you're actually intending to operate 'on the move') is that any voice operated transmit/receiving (VOX) unit or other switching does not have to trail its way to the front panel unit.

Finally, and this was particularly relevant because of the way I've arranged my front panel fixing in my car - by not having the weight of the microphone and its lead on the detached front panel - the

operator can use a variety of lightweight fixing methods ('Velcro', etc.). (More about this later).

Permanent Connection

At this point I have to say that I regard the connection of the EDS-4 cable kit to be a permanent installation rather than an 'in' one day and 'out' the next system. I say this because the plug and socket system adopted by Alinco would not (in my opinion) stand up to every-day installation and removal.

Regular readers may actually remember (in my original review published in the August 1995 *PW*) that I had definite reservations on the reliability of the front panel to main board connections (see Fig. 2). However, after four years of continual use, the system has proved me wrong! It has been very reliable and even when the front panel (on my original rig) has been removed it has been trouble free.

Despite the cabling proving reliable in practice I would still recommend that anyone using the EDS-4 kit to keep it connected. It will make the transceiver much more versatile at home and in the car. (I've even used my rig with the control panel on my computer keyboard!).

If you do decide to keep the cable kit in use all the time - make sure you don't lose the short (supplied as standard and shown linking the face-down front panel and the transceiver main body in Fig. 2) interlinking cable harness.

Fig. 2: The Alinco DX-70 (details same for the DX-70 and TH models) front panel detached, illustrating cable connections. The cable cover boxes (lower centre) are secured over the cable entry-exit points and are secured by (supplied) screws. The (front panel) cover box also provides a good mounting point for various methods of attaching the unit operationally (see text).



Keep it safe!

When fitted, the cable harness protecting cover (lower centre in Fig 2, with 'the Alinco' logo) is attached using the supplied self-tapping screws. It then provides protection, a small amount of 'stand-off' and can also be used to mount one half of a 'Velcro' fastener.

For use in my car I decided to mount the DX-70's front panel remotely by taking advantage of two useful narrow slots left by the small gaps for the 'security' cover for the fitted car radio and the (now removed of course!) ash-tray. The slots (with the covering flaps in the 'closed' position) leave enough of a gap to allow a thin section of p.c.b. material to be 'posted' through the slot - thus holding the control panel in place.

The simple 'posting' method has proved remarkably reliable in practice. I cut a 30mm wide piece of p.c.b. material (long enough to run almost the whole length of the top of the cable covering box), attaching it with self-tapping screws. Next I covered the p.c.b. material with a thin layer of black insulation tape before 'posting' it into the slot.

In practice, I tend to leave the control panel in place until I want to take the rig out of the car for security reasons. However, because of my large knees there's never much room left when I get into a car! it's useful to slide the DX-70 control panel to the left when driving, and placing it nearer when I'm operating. Altogether a very comfortable and practical arrangement!

The remote control cable runs to the transceiver which, in my car, is located behind my seat and between the rear passenger footwells. It fits very snugly indeed and is kept in place by miniature 'stretchy' rubber cable ties like those used on bicycle and motorbike parcel holders.

Although I've made myself a small extension speaker system (to place on the passenger seat), the built-in speaker on the DX-70 works very well indeed in that position. It would only become 'muffled' if the rig was placed under a seat for security purposes.

The microphone lead (still connected to the transceiver's main body) proved to be long enough for comfortable operation in my car. However, if a longer microphone lead is required in a certain vehicle - there's an Alinco accessory

available or you can make one up for yourself (I'm going to make up a single headphone/microphone unit with separate p.t.t. as this seems a very convenient method of operating - especially if you've only one arm!).

Table Unit

Another idea I've provided for myself is a little table unit (rather crude because I'm not a carpenter!), which stands astride the gap between the driver's and front passenger seat. It's made from surplus floor board off-cuts and I sprayed it with matt black paint.

In use, the table sits astride and rests on top of the handbrake unit, providing a very firm and convenient mounting base for a Morse key and 'tuning up' switch. There's also enough room for a mug of tea! (Morse tea Sir?). The whole G3XFD/P station is very comfortable to use and I'm thinking of making my main station just as user friendly!

On The Air

I'm absolutely delighted with my 'portable' Amateur Radio station using the Alinco DX-70/EDS-4 combination and it's proving to be a very worthwhile investment. On long journeys to and from 'Club Visits' I can be 'on the air' within a minute or so of stopping for a break. In conjunction with the Pro-AM mobile antennas I use, yet another dimension to our marvellous hobby has come my way.

I've already worked quite a few readers using DX-70s as news of their versatility spreads and I'm looking forward to working you on the bands too!

I'm pleased to say that the chances of our working 'DX-70 to DX-70' have increased because we've been able to arrange a 'Special Offer' so that readers can join in the fun. The special offer price includes a brand new DX-70TH, a Free EDS-4 remote front panel control cable kit PLUS a FREE one year subscription to PW.

So, don't miss out - add a new dimension to your Amateur Radio hobby!

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Fig. 3: The EDS-4 cable extension kit fitted, showing both cable cover boxes fixed in position.

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New Series!



The Mixer

This month sees the second in Gordon King G4VFX's new series called 'Looking At...'. This time he guides you through the workings of the mixer.

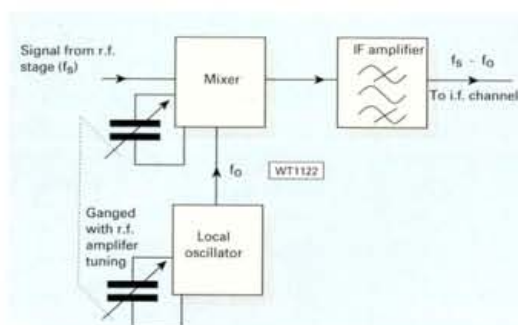


Fig. 1: Block diagram of the mixer where the incoming signal is heterodyned with a local oscillator signal to yield an intermediate-frequency signal for further amplification.

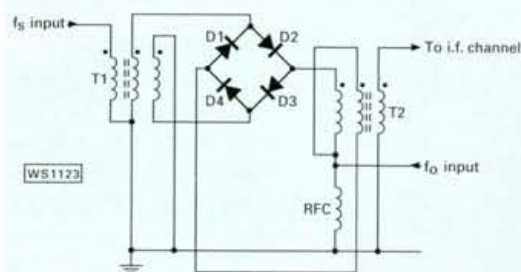


Fig. 2: A simple passive mixer circuit using a diode bridge, but which has conversion loss rather than gain (see text).

The mixer is the heart of all latter-day superheterodyne (superhet for short) receivers. In the early days, before the advent of the superhet, most radio sets were tuned radio frequency (t.r.f.) - so-called because the antenna signal was amplified by several variably tuned r.f. stages before being applied to the detector. With careful design and inter-stage screening to maintain stability they worked well at broadcast and short wave frequencies.

Tuning on the t.r.f. was accommodated by several (depending on the number of r.f. stages) tuning capacitors ganged to a common shaft. The requirement for optimum sensitivity and selectivity was for the tuning of all the circuits to correspond over each waveband, which called for careful tuned circuit design and alignment! The tuning problems were diminished by the coming of the superhet receiver because here much of the pre-detector amplification and selectivity are achieved at a fixed frequency - called the 'intermediate-frequency' (i.f.), regardless of the frequency of the incoming signal.

The block diagram in Fig. 1 illustrates the clever thinking behind the superhet scheme. Input signal (f_s), which can be direct from the antenna but is usually amplified by an r.f. stage, is fed to a stage called the mixer (sometimes known as the frequency changer or frequency converter). The mixer is also fed with a second signal (f_o) from a stage called the local oscillator.

Because the mixer is, in reality, a modulator the two input signals are caused to 'beat' or heterodyne one with the other, so that f_s modulates f_o and vice-versa, thereby yielding upper and lower sidebands at the sum and difference frequencies, in addition to the input frequencies.

Signals at other frequencies may also be present, but that which is to become the i.f. signal, is selected by the i.f. filter, the others being substantially rejected.

Sum Or Difference

The i.f. can be the sum or the difference frequency and it carries exactly the same modulation as either of the two originating frequencies. Hence the modulation on f_s is transferred to the i.f. signal.

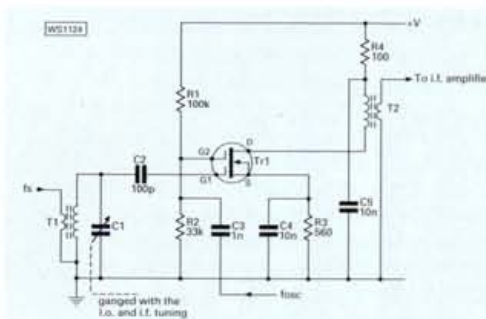


Fig. 3: An efficient mixer circuit based on a dual-gate metal-oxide field effect transistor (m.o.s.f.e.t.).

The local oscillator signal (f_o) should, therefore, be as close to a pure, low noise sinewave as possible, in order to avoid unwanted modulation or noise being transferred to the i.f. signal.

The local oscillator frequency might be the i.f. above or below the signal frequency. The i.f. selected by the filter in Fig. 1 is the difference between f_s and f_o , whose signal is then fed to the i.f. channel for amplification.

For example, suppose a 9MHz i.f. is required from an input signal of 14.06MHz, then the oscillator frequency could be either 23.06MHz ($14.06+9.0$) or 5.06MHz ($14.06-9.0$). The latter is the one implied in Fig. 1 so, in this illustration, the 9MHz i.f. is produced from an incoming signal of 14.06MHz minus an oscillator frequency of 5.06MHz (e.g. $f_s - f_o$).

In other receivers the local oscillator may operate at the i.f. above the signal frequency, which means that when the receiver is tuned, say, to 95MHz, then for an i.f. of 10.7MHz (which is the standard f.m. receiver i.f.), the local oscillator will produce a signal of 105.7MHz ($95+10.7$).

In some a.m. broadcast receivers, where the standard i.f. is 470kHz, the local oscillator works at the i.f. below the signal frequency, but may reverse on some wavebands. The trick is to achieve good gain, good selectivity and bandpass shaping with the least unwanted responses.

The local oscillator tuning is ganged to that of the mixer and r.f. amplifier; but in many specialised receivers and transceivers nowadays the variable-frequency oscillator (v.f.o.) has given way to the phase-locked loop or frequency synthesiser with digital readout which, in transceivers, is also related to the transmitter's oscillator. A buffer stage might also be employed between the oscillator and mixer, aspects which will be looked at in another article in this series.

Typical Circuits

To end this instalment, I have included a couple of fairly typical mixer circuits. The first, in Fig. 2, is a passive double-balanced diode mixer where a couple of trifilar toroidal transformers provide reasonably well isolated input and output ports. This relatively inexpensive arrangement performs quite well, but unfortunately carries the penalty of quite a high conversion loss.

The second, in Fig. 3, is an active arrangement based on a dual-gate metal-oxide field effect transistor (m.o.s.f.e.t.). The input signal, after being coupled and tuned by transformer T1, is fed to gate one, while the local oscillator signal is fed to gate two, which gives good isolation.

The required i.f. is selected and tuned by transformer T2 and then coupled from the secondary to the input of the i.f. amplifier channel. Sometimes a pair of m.o.s.f.e.t.s are used in push-pull, which improves conversion gain and noise performance.

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A Rig For All Reasons

The Kenwood TH-D7

Kevin Nice
G7TZC, Editor
of sister
magazine
SWM, beat
Editor Rob
Mannion about
the ears until he
was allowed to
bring you his
opinions of the
new TH-D7
hand-held dual-
bander from
Kenwood - so,
here it is!

Much enthusiasm was the feeling that stayed with me after attending the Kenwood pre-launch day (on behalf of PW and SWM) for the new **TH-D7 dual-band hand-held transceiver** - with bells and whistles. So much so, that I pestered Rob G3XFD until he agreed to let me review it when the sample was shipped to the magazine. Well, that was a couple of months ago and my enthusiasm for what the radio offers hasn't dampened at all.

Indeed, this 144 and 430MHz hand-held has stacks of features on offer. I'm sure that with this radio, which is competitively priced, **Kenwood** have a winner. You see, you don't just get a radio for your money - there's also a TNC which operates at both 1200 and 9600bps built-in to this mighty package.

That's not all, you can connect your **GPS receiver** - just so long as its data output conforms to NMEA (National Marine Electronics Association) standards - to the TH-D7 and enjoy the benefits of **Automatic Packet Reporting System (APRS)**. Plus, the recently launched **Visual Communicator** the VC-H1 from Kenwood plugs straight in - and you're ready for action.

So, there you have it - an instant APRS, Packet and SSTV station and all portable at that! There is, therefore, no shortage of roles for the TH-D7 to take in its stride.

In The Palm

After a brief introduction to what this new Kenwood can do, let's have a look at how it shapes up in the palm of your hand. The set weighs in at 340g with the standard PB-38 battery installed, a mere 60g heavier than my faithful friend the 430MHz hand-held TH-42. Not only is there very little difference in mass, but the volumes of both rigs is very close too.

The TH-D7 is 122mm tall with the concentric rotary control adding a further 20mm.

It is 57mm at its widest point - the location lugs at the bottom of the battery unit - whilst the casing is a slim 53mm (if you exclude the protrusions).

As far as depth is concerned, it depends on your battery option, but the review model, which came supplied with the PB-38 (as mentioned), is a maximum depth of 38mm and, at its thinnest point, 30mm. You have to add the depth of the belt clip if you have one fitted, it locates in the lugs moulded into the battery case, which is a further 5mm.

Power Source

The main power source for a hand-held such as the TH-D7 is, of course, its internal battery. NiCad is the order of the day with this model, the standard PB-38 is a 6V 650mAH unit - the optional high voltage replacement being the PB-39 - a 9.6V 600mAH battery for higher transmit power.

Shipped with the TH-D7 is Kenwood's BC-17 trickle charger (like the one supplied with my TH-42) which is a moulded plug affair supplying a nominal 13.8V to allow a PB-38 to charge in about 14 hours. First on my shopping list would be the rapid charger. It's not possible to operate the transceiver with the charger connected.

You can power the TH-D7 from an external source, such as a vehicle supply or a mains p.s.u. and accessory leads are available from Kenwood. There's internal regulation within the transceiver allowing quite a range of input voltages. The transceiver will warn you by beeping and with a display message if you exceed a maximum of around 16V.

Directions From Space

If you're fortunate enough to own a GPS receiver, the TH-D7 will allow you to get up and running with APRS and get directions from space! Although this type of activity is huge in the USA (correct me if I'm wrong), it's somewhat sparse here in the UK.

Being one of the many unfortunates who do not own a GPS receiver but would very much like to, I was left having to beg the loan of a **Garmin GPSIII** from **Waters and Stanton** (thanks Jeff). Kenwood supply a lead for use with GPS receivers, but it only has a connector on the transceiver end of the lead! (Kenwood state that this is due to the many different types of GPS systems there are in use). Obtaining a plug suitable for the GPSIII can be less than easy, but there

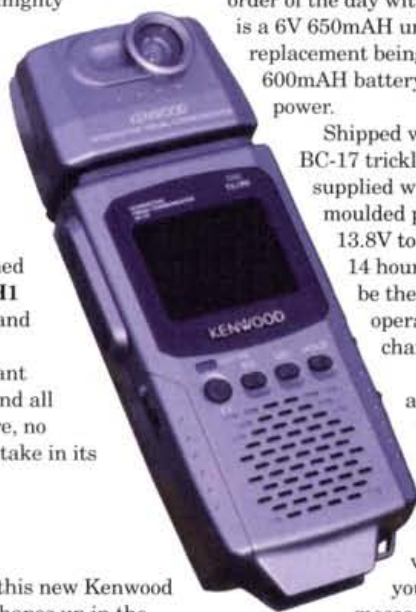


Fig. 1: Most controls are 'dual function'.

"... an instant APRS, Packet and SSTV station and all portable at that! There is, therefore, no shortage of roles for the TH-D7 to take in its stride".

PC or directly via the TH-D7 itself, as it can store data from up to 40 stations in memory.

Picture This

Another terrific feature which could be a life saver for RAYNET and other emergency service users of the professional version of the TH-D7, is the set interaction with the visual communicator.

Imagine an injured member of the public needing more than the attention of the trained first aider at the scene. Point the VC-HI's camera at the injury, hit the 'send' key and off goes the SSTV image in a matter of tens of seconds with fast f.m. mode. The trained medic at the other end of the radio link can quickly pass instructions by return - useful indeed.

But then there are less critical uses for this kind of set-up. For instance, you can keep friends and family entertained as you explore the terrain around you - as long as they're licensed of course.

Visual Communicator

Pressing that all important power button first, brings up a welcome message on the easy to read, wide angle liquid crystal display (l.c.d.). It's possible to program this message to cater to your own taste. Perhaps your own callsign lest you forget! A confirming 'di di' is emitted from the speaker to confirm that the transceiver is functioning. A similar pair of beeps are sounded as the set powers itself off in

response to a second depression of the power key.

Once on and ready for action, the TH-D7 is a joy to use. It retains the same character of its recent predecessors in that v.f.o. and memory functions work in the same manner. (I must admit, here, to thinking along the same lines as the team or individual at Kenwood that planned the way the software works. So I am biased on this point).

A new feature with this radio is the silver, four-way 'paddle' button at the top left of the keypad for navigation around the menu functions, accessing and entering data and controlling the various parameters of the TH-D7. In a very short time, you're left wondering why your previous transceiver didn't have this capability.

Speaking of the keypad, it comprises a four by four grid plus two additional slightly larger buttons for selecting active bands and invoking the radio's menu control system. All of the 18 keys are dual and some have three functions assigned.

For low light conditions, the keypad is illuminated along with the display. This lighting is invoked by pressing the 'lamp' button which lives adjacent to the dual function 'monitor/sql' button, both of which nestle comfortably below the much larger 'p.t.t.' key on the left hand side of the TH-D7. I found these controls equally easy to operate which ever hand I held the radio in.

Quite a combination! (See text).

are ways. Having made up the interconnecting hardware, we go onto using the set-up.

With an APRS station based on the TH-D7, you can beacon your whereabouts for other stations and have the radio work out distance and heading of remote stations with a similar set-up. With the addition of a computer (DOS, Mac or Windows software is available for them all), it's possible to plot the track of those same remote stations on a map to illustrate their movements.

To utilise the GPS and APRS functionality of the TH-D7, you must configure the radio with some key parameters. These are - the presence of a suitable GPS receiver, your callsign and your position - the latter is automatic with the GPS unit functioning.

Without a GPS connected, you have to manually enter your latitude and longitude in degrees and minutes. Upon entering a valid location, the TH-D7 displays the locator code for your position. This is very handy - a nice little touch.

If this radio was used by RAYNET members or similar, then it would provide an excellent way to automatically track the location of all the team members. Control could monitor the movements and locations of all suitably equipped stations, either via a

Fig. 2: Kevin G7TZC used the Garmin GPSIII unit with the TH-D7 (see text).

Specifications

Not being in a position to use calibrated and certified test equipment, there are no actual user measurements featured in this review of the TH-D7. But then, I'm not aware of any other UK magazine that uses a certified set-up for any measurements. So, I've provided the manufacturer's specifications for those who are interested in the figures.

General

| | |
|-----------------------|---|
| Frequency Range: | 144-146MHz/430-440MHz. |
| Mode: | F3E (f.m.), F1D (g.m.s.k.), F2D (f.s.k.). |
| Operating Temp Range: | -20° to +60°C. |
| Supply Voltages: | 5.5 to 16V nominal 13.8V via d.c. In socket. 4.5 to 15V nominal 6V at battery terminals. |
| Frequency Stability: | <±10ppm -10° to +50°C. <±15ppm -20° to +60°C. |
| Microphone Impedance: | 2kΩ. |
| Antenna Impedance: | 50Ω. |

Transmitter

| | |
|---------------------|--|
| Power Output: | H (13.8V): 6W 5.5W. H (9.6V): ~5W ~5W. H (6.0V): ~2.5W ~2.2W. L (6.0V): ~0.5W ~0.5W. EL (6.0V): ~0.05W ~0.05W. |
| Modulation Method: | Reactance. |
| Maximum Deviation: | <±5kHz. |
| Spurious Emissions: | <-60dB at High power setting. |

Receiver

| | |
|----------------------|--|
| Architecture: | Dual conversion superhet. |
| First i.f.: | 38.85MHz 45.05MHz. |
| Second i.f.: | 450kHz 455kHz. |
| Sensitivity: | <0.18µV for 12dB SINAD. |
| Squelch Sensitivity: | <0.1µV. |
| Selectivity: | -6dB - 12kHz; -40dB - 28kHz. |
| Audio Output: | >450mW @ 9.6V (battery); >300mW @ 6V battery. 10% dist into 8Ω load. |

I have a preference when operating this type of rig to hold it in my left hand, thus placing the p.t.t. button under my left thumb. This allows the easier use of my right hand for keypad and rotary control fiddling. Though, as I'm right handed, I guess this is to be expected. I've not really analysed this before but I've just noticed that I place my little finger under the bottom of the rig to allow it to sit low in my hand. This allows more comfortable access to the four-way paddle and the afore mentioned buttons under the p.t.t. pad. This arrangement sure gives you a powerful thumb.

The remaining controls live, as you might expect (well you've seen the pictures by now) on the top of the TH-D7. A dual concentric control provides channel selection via a rotary encoder and master volume control. In conjunction with the 'sql' key the squelch threshold is also set by using the rotary control.

I mentioned above that the 'master' volume is effected by the outer control. This is because the radio allows simultaneous reception of both of its bands. It's possible to set the relative level of audio for each band with a balance function directly from the keypad, thus saving on two rotary controls that you'd be more likely to find on a mobile or base station. By the same token, you only get the one 'S'-meter and antenna socket.

The antenna connector used by Kenwood for this radio is an SMA type - a wise choice from an r.f. point of view, but I've no SMA connectors in my shack! My TH-42 uses a BNC, which I personally prefer as all the interconnections below 1GHz in my shack are BNC too.

The antenna supplied with the TH-D7 is approximately 40mm longer than the single band one fitted to my 430MHz radio. It appears - and indeed must be - base loaded. It proved itself to be effective, as the usual signals at my QTH were available at a 'normal' level.

Fig. 3: The standard 'fitted' battery is a 6V 650MAH unit.

Sited between the antenna and the rotary controls are the two bi-colour l.e.d.s which illuminate green when the squelch is opened and red when the transmitter is keyed. This can be done either manually, by use of the p.t.t. key, or automatically under the TH-D7's own control due to, let's say, APRS beacon mode for instance. There's one l.e.d. per band.

The TH-D7 doesn't appear to have the best battery condition monitoring around, as when the charge is about all used up, the TH-D7 is far from graceful in giving up the ghost. Instead, it seems to get trapped in a strange hysteresis loop, beeping and flashing its



The UC-H1 - Visual Communicator

Kevin G7TZC takes a look at the VC-H1 and says that it promises to cause an explosion in SSTV operation. Not from fixed installations but on the move!

It's a long time ago when I first dabbled in SSTV, much longer than I care to think about. The set-up then was based on a photo multiplier tube, a lash-up home brew voltage multiplier type e.h.t., power supply and the lab oscilloscope for display purposes. Well, that was the theory anyway.

The school electronics club, of which I was a member, never really got things going - with the project being abandoned before completion - but I'm convinced that it would have worked if exams hadn't got in the way. That was over 25 years ago and boy, haven't things changed?

Pocket SSTV

Just think about it - SSTV on the move, what a terrific idea! Well it's one that's been implemented in a convenient hand-held package by Kenwood with their exciting VC-H1 product. I took the opportunity, whilst spending some time getting to know the TH-D7, to have an extended play with the 'Visual Communicator'.

Essentially a charged coupled device array (c.c.d.) camera and a passive l.c.d. colour display snugly packaged with all the required control electronics, the battery powered VC-H1 makes a brilliant accessory for the hand portable user.

For the guys at RAYNET it is, in my opinion, an absolute must. Just imagine that there's a sponsored run, for example and one of the competitors falls and injures themselves. The RAYNET man on the spot can capture the injury and relay it back to control and beyond for expert examination, all with the push of a button or two. In this



display with spurts of received audio being emitted from the sets speaker - which, incidentally, performs well under normal conditions.

I guess that the above behaviour is no real major problem - and it is the same as ... you've guessed it, my TH-42. I must say that I'm a happier with a more controlled power off routine though. The battery life is pretty good though, I found myself expecting the set to power down ages before the battery was finally exhausted.

Pocket Packet

The TH-D7 can be the basis for an amazing portable v.h.f./u.h.f. station. Adding the likes of one of the many palm-top PCs would provide a terrific Packet station that would literally slip into your pocket. If you're a seasoned DX chaser who makes use of the Packet DX cluster network, then you don't need a PC to utilise the TH-D7.

The radio can display call, frequency and time information and it will store a list of up to ten bulletins. With the TH-D7 configured this way you can't send DX cluster information, but what a useful feature this is!

Conclusion

As I said at the beginning of this review, what an amazing package Kenwood have produced with the TH-D7! It could truly be all things to all men (and to be PC, all women too!). I was enthusiastic at the beginning, that enthusiasm has grown as I spent



time unlocking the secrets of this little action-packed dual-band rig.

Many thanks go to Dave Wilkins at Kenwood UK, Kenwood House, Dwight Road, Watford, Herts WD1 8EB, (01923) 816444, for the loan of the transceiver which retails at £319.95 and the VC-H1 Visual communicator which retails at £399. How am I going to afford them? *PW*

Fig. 4: "Here's looking at you"! - The add-on SSTV package (see text).

kind of incident the VC-H1 is a potential life saver.

Whilst the scope of amateur uses for the VC-H1 is huge, it seems pretty obvious that this product will make huge inroads into commercial radio applications, emergency and security operations spring readily to mind.

In addition to the SSTV digital frame mode, the VC-H1 also provides video output - though sadly NTSC, not PAL D so, if you have a suitable multi-standard monitor or video recorder, you benefit from this functionally too. It must be said, however, that first and foremost, the VC-H1 is a digital stills camera, monitor, modulator/demodulator, frame store, control unit and speaker microphone.

Video camera functions are somewhat limited to say the least. The lens has no aperture control, so lighting levels can be critical. The sensitivity seems optimised for indoor situations. The fixed focus, wide angle lens also limits the ultimate performance of the unit. Put into perspective though, the functionality that you get with the VC-H1, in my opinion, is just what's needed for a portable video terminal.

The rather inevitable c.c.d. camera unit fronts-up the image collection side of the unit, whilst for display purposes, a TFT colour l.c.d. is utilised. The camera portion on the VC-H1, which resides at the top of the transceiver sized unit, is connected to the main portion of the VC-H1 via a 3.5mm stereo jack. This allows both the removal of the camera to operate remotely with an extension lead and for the camera to be rotated though 360° whilst 'in situ' in its normal position on the lower portion of the VC-H1. A neat idea indeed.

Cinch To Operate

The VC-H1 is a 'cinch' to operate - really! Once you've loaded your four alkaline AA size cells or connected a suitable 6V p.s.u.

and figured out the interconnections - there are a few available. There's the transceiver interconnecting lead, the computer lead and possibly a video lead too. Then you're off.

Most likely, for portable operation, you'll only need the transceiver interconnecting lead. Though in the shack it's another matter. While I remember, the VC-H1 is not solely for v.h.f. and u.h.f. operation, so it can easily be coupled up to your h.f. rig too. Modes provided by the VC-H1 are as follows - Martin M1 and M2, Robot 36 and 72, AVT90, AVT94, Scottie S1 and S2. When used with the TH-D7 or similar 9600 baud capable transceivers, Fast FM mode is also available for pretty quick (about 15 seconds per frame) picture transmission.

There are only a few controls, six buttons and slide switch for power. Mode of operation is set by holding different configurations of buttons at power on. All the functions that are controlled by these buttons are also remotely operated by interconnection - via a serial port - and use of a PC and the VC-H1 Control Terminal software which provides additional image storage and management facilities.

The VC-H1 only has room for ten stored images internally. It's possible with both the visual communicator alone to add annotation to images, such as your callsign, but the Terminal software allows more advanced addition of text to both images received and those to be sent.

Using The VC-H1

Using The VC-H1 is an activity which certainly adds appeal to SSTV operation, bringing the mode into a new dimension. Readily portable SSTV as provided by this kind of equipment will surely lead to some much more interesting images being exchanged on amateur bands - well we can hope.

If you would like to experience the delight of the VC-H1 it will set you back some £399.95. Many thanks go to Dave Wilkins and Kenwood UK for the loan of the VC-H1.



"The TH-D7 can be the basis for an amazing portable v.h.f./u.h.f. station".

"The VC-H1 is a 'cinch' to operate - really!"



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VHF Contests Getting Started

Neill Taylor
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Contest, brings
you some top
tips for
successfully
competing in
v.h.f. contests -
and he should
know!

Neill Taylor G4HLX in action at a v.h.f. contest with his son, Ben G8EQX and daughter, Katherine who is taking her Novice exam soon. Neill tells us that it was whilst helping him at a v.h.f. contest which sparked her interest in Amateur Radio!

Have you ever thought of entering a v.h.f. contest? If it seems a bit daunting, it needn't be. Getting started can be really straightforward and a lot of fun. There's the excitement of the competitive spirit, the friendly trial of your equipment and operating skills against others - but there's also a lot more! You can expect some contacts over much greater distances than you usually achieve, thanks to many stations operating from good v.h.f. sites far away. You should make a large number of QSOs, including some in regions, squares or counties that are normally hard to find.

If you have chosen to go portable, then there's the pleasure of a day in the great outdoors. Finally, there's the satisfaction of seeing your callsign in the results listings. Oh yes - and, of course, there's just the sheer delight of playing with radios all day long!

Ideal Event?

The *Practical Wireless* 144MHz QRP Contest is an ideal event for your first go at v.h.f. contesting. The rules are simple, the log-keeping and scoring straightforward and the 3W transmitter power limit makes it easy to compete effectively even with simple equipment.

Year after year we receive reports from first-time entrants who are amazed by the DX they have achieved with their simple station. Also, after your first experience of a v.h.f. contest, you might like to move on to operate in some of the many v.h.f./u.h.f. contests organised by the RSGB.

Preparation Essential

The first thing to stress about entering a v.h.f. contest is that preparation is essential. Planning is the key to success and it starts with taking stock of what you will need - in terms of radio equipment and other requirements.

Right at the start you must decide if you are going to 'go-it-alone' as a single operator, or get together with some friends to form a group. There's a lot to be said for this, in terms of pooling of resources such as equipment and antennas and sharing of the work on the day - not only operating the station,



but getting everything set up and running.

A very important decision to be made as early as possible is the choice of a site at which to set up the station and operate. You might prefer to use your existing base station at your home, but the real fun of a QRP contest is really only to be had by going to a good portable site. If you've never tried it before, you'll be amazed at how much more you can hear and work from a hilltop site.

What makes a good v.h.f. site? It's not only sheer height above sea level, but the quality of the 'take-off' or how the land falls off around the site. Ideally you want a good take-off in all directions - certainly in the directions that you expect most contacts to be made. If you're trying to choose between several alternative sites, it's well worth visiting them, armed with a v.h.f. receiver and comparing the relative signal strengths of distant beacons and repeaters.

There are two more very important aspects of selecting a site. The first is that you must **obtain** any necessary **permission** from whoever owns the land. Do not leave this until the last moment. It's usually easy enough, if you make a courteous request explaining clearly what you wish to do.

Secondly, do what you can to make sure that there's not another group also planning to use the same site, or one very close by. Asking around at the local club and checking with local known v.h.f. enthusiasts, should help here - and it's wise to have an alternative site in mind, just in case you do arrive at your chosen location on the day of the contest to find another group already set up there - you wouldn't be the first to encounter this problem!

The Equipment

Now let's turn to the equipment you'll be needing. Almost all v.h.f. contest activity is on s.s.b., so basically you need a suitable s.s.b. transceiver. If you're operating in an area where local f.m. activity is high, you might be able to pick up some extra contacts on this mode, but you should definitely expect to spend most of the day and achieve all your long-distance contacts, on s.s.b.

The c.w. mode is also very well suited to QRP operation, so if you're proficient at Morse then take your key along. (Although in the past, the amount of c.w. activity during the *PW* QRP contest has been disappointingly low).



In the *PW QRP* contest, the limit on the output power of your transmitter is 3W, so if you use a transceiver capable of more than this, you must find some way of reducing the power to this level. On many modern transceivers there's a control to adjust the output power and all you need to do is find a reliable means of measuring 3W. More advice on this will be published with the contest rules next month.

When using low power, it's even more important than usual to make best use of every fraction of a watt available to you. This means having low-loss antenna feeder and an antenna with the biggest gain that you can muster. However, don't choose an array that's so enormous that it will be impossible to get up on the mast, bearing in mind that the weather will probably conspire to make this as difficult as it can at the critical moment!

A high wind not only makes antenna erection troublesome, it can also make it impossible to keep the beam pointing in the direction that you want. So you should think about a means of anchoring the mast in place, especially if you are making use of the traditional 'armstrong' method of rotation.

It's probably even more important to consider the efficiency of the receive side of your station. To work your furthest distances and all those remote squares, you need to pull in the weakest signals.

One way you might be tempted to try to increase your receiver's sensitivity is to use a pre-amplifier. But be very cautious about this. A high-gain pre-amplifier is certain to worsen the strong-signal performance of your receiver and, in a contest (even a QRP one), there are likely to be quite a few strong signals around, which could leave you suffering from the effects of overload and intermodulation.

The one place that a receive pre-amplifier really can help is at the mast head, ahead of the antenna feeder. By almost eliminating the feeder loss from the system noise figure, this can noticeably improve the readability of weak signals above the noise.

If you do use a pre-amplifier anywhere in your system, make sure that you have a quick and easy way of switching it right out of circuit if you encounter strong-signal problems. These may manifest themselves in a number of ways, for example received signals (not necessarily the strong ones) may become distorted, intermodulated with others, or the receiver noise floor may seem to rise and fall erratically. A better solution, featured on some modern transceivers, is the ability to switch off the receiver's own r.f. stage when using an external mast-head pre-amplifier.

A QRP station shouldn't need a lot of power to run it, so when portable you may be able to power your station by a battery of some sort - a lead-acid accumulator of the car type may be suitable. An alternative to a battery is a small petrol-electric generator, although these tend to be noisy, smelly and messy. Or maybe you could try the true ecological approach and use an array of solar cells.

What Else?

So, apart from the transceiver, antenna, mast, feeder and source of power, what else do you need? Well, a microphone, of course, maybe a Morse key and headphones for the operator. Everyone else will want to hear, too, so you might like to arrange for both a loudspeaker and one or more pairs of headphones to be connected to the receiver output.

Some people like to use a speech processor, to raise the mean power level on s.s.b. while still maintaining 3W p.e.p. With a well-adjusted transmitter and a good microphone that delivers 'punchy' audio, you really shouldn't need a speech processor, but if you do use one, avoid setting too much compression that renders the audio unintelligible. On the other hand, with no processor, don't try to achieve compression by just turning up the microphone gain too far, as this leads to over-driving and a nasty broad signal.

Other things to remember are a station clock, power meter, a supply of pencils, pens, erasers, maps and all the stationery you need (more later) plus a scrap paper pad. Oh yes - and a compass, if you want to know which way your antenna is pointing!

Even with a simple station, there's enough bits and pieces

to make it easy to forget something vital! The answer is to write a **checklist**, identifying everything you need including spares and backups, (e.g. a second battery) and not forgetting other important supplies such as the food and drink.

Such a checklist should help you avoid the sort of problem that too many contest operators have had in the past - as in the following typical story of an experienced contestant in an event a few years ago. He struggled up to the top of a Welsh mountain with all his equipment, a hard two-mile climb. Only then did he realise that the feeder was terminated in N-type plugs, but the transceiver had a SO-239 socket! It's OK, he thought, I have an adapter - then the awful truth dawned - it's in the car at the foot of the mountain!

Of course this sort of slip-up wouldn't happen with proper preparation. It really is a good idea to have a 'dummy run', getting all the equipment together a week or two before the contest and setting it all up, in the back garden or somewhere else easy. Apart from checking out compatibility between all the bits and pieces, especially if several people are sharing resources, this is an ideal time to write that checklist.

The Day Arrives

So, the day arrives, **20 June**, you get to the site in good time, erect your tent, caravan, or whatever you have chosen to protect you from the weather, (even if it's bright sun) and get everything set up and operational in time for the 1000UTC start time. Then what? Well, I assume you are generally familiar with the format of contest QSOs. If not, don't worry, but it's a good idea to have at least listened to a bit of contest operation beforehand.

A good opportunity to listen to a contest is the **RSGB 144MHz contest** on 15/16 May, a 24-hour event starting at 1400UTC on the Saturday. The information to be exchanged in that contest includes a three-letter district code which will not be required in the QRP contest, but otherwise the QSO format is similar. Not everything you hear will necessarily be good operating practice, of course and maybe you can decide for yourself the techniques that sound effective!

When you get started, you'll soon find that what works best is to be unhurried and deliberate in the information you send, using standard phonetics and sending things in the order that the receiving operator is expecting to write them down - report, serial number, locator.

Being attentive to every detail of the information you receive is equally important and don't be afraid to ask for a repeat of anything which you're unsure of. If anything is incorrect in either log, both stations may lose points in the adjudication.

Be particularly careful about call signs - a very common error, for example, is omitting a 'P' suffix from a call in the log. The *Practical Wireless* contest is generally a very friendly affair, so although you'll want to be quick and efficient, do take the time to be courteous.

Accurate Log

Keeping a completely accurate log is, of course, essential. Some operators prefer to use a computer for this purpose and there are certainly some very suitable software products available. It's even possible at a portable station to use a laptop - as long as the battery lasts out!

The biggest risk with the computerised approach is the r.f. likely to be radiated from the computer, causing you unwanted QRN. So, if you plan to use computer logging, make sure that when you have your 'dummy run' you give it a thorough test.

Even after all this, you still can't be sure - preparing for a recent contest, I convinced myself that my laptop was not radiating anything detectable on the receiver. But once everything was set up on site, switching on the computer produced a just perceptible increase in the noise floor on the receiver. This is unacceptable, so the computer was instantly abandoned in favour of the traditional pen and paper log sheets, which had been brought along as a back-up.

Many people believe that hand-written logs are still the best way. Most

The 17th Annual Practical Wireless 144 MHz QRP Contest takes place between 0900 and 1600UTC on the 20th June 1999.

Full rules will be published next month in Practical Wireless.

NELL TAYLOR G4HLX EXPLAINS THE ESSENTIALS NEEDED FOR COMPETING SUCCESSFULLY IN QRP CONTESTS





operators prefer to write the entries themselves, although if you have a group of people, you could have a second person as log-keeper. If so, then both operator and logger really need to concentrate - both should use headphones.

Another important job, if using a manually written log, is keeping the 'checklog'. This is a record, kept up-to-date throughout the contest, of all stations worked in alphabetical order, usually of the part of the callsign after the prefix. (e.g. G3XFD goes under 'X'). A large sheet of paper ruled into 26 columns is suitable for this (though you won't get many under 'Q').

The person keeping this 'checklog' constantly checks to see if the station calling has been worked before, avoiding wasted time and duplicates. Of course, a computer log does this automatically, but I defy any operator to type in a callsign for checking as quickly as an alert 'checklogger' can cast his or her eye down the appropriate column in a manual system!

As well as this list of stations worked, you'll want to keep a record of locator squares worked. Because in the PW QRP Contest, your score is multiplied by the number of large locator squares (e.g. IO91) you work - every new one worked is very valuable to you.

A small map showing the squares, which you can shade in with a highlighter as you work them, not only shows how many you have so far, but also gives a clear indication of the directions in which you need to try to pick up some more. Useful information when deciding which way to point the antenna next.

Your First Contest

In your first contest, you're likely to want to spend as much time tuning the band and answering other stations' CQ calls, as you do sitting on one frequency calling CQ yourself.

When you do call CQ yourself, picking a 'good' frequency is

surprisingly important. It may sound nice and clear where you are, but on the other side of country, where you're hoping to reach, other stations may be audible. You don't hear them because of the beam heading that you and the competing station have set.

When one or both of you moves the antenna you suddenly realise that you've been sharing the frequency. There's nothing to be gained by being obstinate in this situation - one of you is going to have to move! On the other hand, you sometimes get a feeling that you have a good spot on the band to yourself, particularly if you get a string of calls from far afield and it's well worth hanging on to it as long as you can.

After the day is all over, there remains one further essential job to be done - preparing the log for submission as a contest entry. You'll have two weeks in which to get this complete and in the post. This is where a computer might come in handy, although hand-written logs are perfectly acceptable, if clearly written.

It's particularly important to find and mark any duplicate contacts and to highlight the first contact in each square being claimed as a multiplier. All required covering information must also be given - read the rules one more time before sending off your entry. A cover sheet form, as well as a log sheet, can be downloaded from the contest Web site:

<http://home.neill.org/contest> to help with this, although any A4 sheets may be used.

The full rules for this year's PW QRP Contest will be published in *Practical Wireless* next month. But if you're thinking of having a go for the first time in this event, don't wait until then - now is the time to start your planning and preparation. Then you'll be ready to join the hundreds of operators over the years who have found that entering the contest can be a lot of fun, rewarding and fill the log book with lots of good contacts. I look forward to welcoming your log as an entry and even maybe working you on that sunny Sunday in June!

PW



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The Australian-made Highlander HF Mobile/Portable Antenna

Richard Newton G0RSN reviews the Australian made Highlander Antenna from Talkabout Antennas and tells us all about just how impressed he was with its aesthetics, design and performance! Read on to find out more.

As a Radio Amateur and avid short wave listener (s.w.l.) of some years standing, it will be of no surprise to anyone that radio enthral me. The thought of sitting in a room and speaking to someone in a different country is, to me, thrilling. When I first got my h.f. licence I, like most, had a very modest set up. In fact I've always kept to just wire antennas at home.

Some time ago, however, I was chatting to Colin G3XAS who used to run our local radio store, we were chatting away and he and Gordon G3JTK started to recount stories of going mobile with h.f. equipment. These two people probably don't remember the conversation or realise they started me off on a crusade.

I bought myself a Trio TS-120V, it was a 10W multi-mode h.f. rig without the WARC bands. This rather large radio, by today's standards, was strapped and stuck with Velcro to the passenger floor pan on my car. I also had a mono band mobile whip for the 7MHz band, I was immediately hooked - h.f. mobile was to become part of my radio life!

The reason for sharing my interest in h.f. mobile is simple - I wanted to illustrate that I have undertaken many enjoyable hours of mobile h.f. working with all sorts of different set-ups. I love antennas. I am always buying different h.f. whips, both single band and multi-band - I enjoy trying out different designs. That's why I eagerly agreed to try out the Highlander multi-frequency h.f. mobile antenna courtesy of Paul Beevers and his Talkabout Antenna company. (Paul Beevers is himself a Radio Amateur and carries the callsign G1GCV and VK6UTE).

From Paul Beevers' own literature it would seem that Talkabout Antennas manufacture two h.f. mobile antennas - the one I had for review which is called the 'Highlander' and the aptly named 'Full Monty', which is a large, two piece antenna.

Highlander Aesthetics

The Highlander arrived and I eagerly unpacked it and, although I realise aesthetics are a very personal thing, I have to say that when I unpacked the Highlander I was very impressed. The antenna looks wonderful. Right away it gives the impression of sheer quality, if anything looks like it should work, the Highlander does.

The literature explains a little about the background of the Highlander. It claims that it (and other antennas in the Talkabout collection) have been developed over a 16-year period. It also states that along with its Talkabout cousins, it's apparently in use all over Australia by "... government departments and private companies, for transmission of r.f. signals over a long distance".

Fig 1: Different bands are selected by using a supplied 'wander lead' which plugs into tapping points along the antenna. This picture shows these - note how they all point downwards so that rain will run off (and not into) the connection.



The antenna for review was 1.67m in length with the tuning stub fully extended. The supplied spring added a further 111mm. This made the whole thing a little short of two metres. It covers the 3.5, 7, 14, 18, 21, 24, 28 and 50MHz amateur bands. With a power rating of 300W it will cope with most (sensible) mobile or portable set-ups.

Fitted with (3/8in) UNF thread screw mounts, the antenna is constructed of fibre glass with pre-tuned copper helical windings. This is then covered in a smooth epoxy resin coating, all of which helps to give the entire antenna both strength and durability.

'Wander Lead'

The Highlander antenna supplied for the review was finished in an attractive deep blue (I'm not sure whether there's a choice of colour). The base and top end containing the tuning stub are made of solid brass and different bands are selected by using a supplied 'wander lead' which plugs into tapping points along the antenna. These all point downwards so that rain will run off (and not into) the connection. (See Fig. 1).

The tapping points are labelled by prominent engraving of the band (in metres) next to the socket. No expense spared here either - the 'wander lead' connections are superior banana type plugs, they're gold plated and make a good solid connection into the gold plated sockets. (This antenna just oozes quality).

The antennas are actually handmade by Terry Ventoura. In his literature, Paul describes Terry as a craftsman, if you could see the quality of this man's work you might say that this is an understatement. The brass fittings are lightly brushed. The tuning stub is held in place by a tapered thread divided into quarters and tightened by a tapped brass cap. This brass cap is finished in a deep diamond shape knurling for part of its body. The antenna is quite large in comparison to a wire (rod) whip, it measures approximately 22mm at the widest point and this tapers down to the thinnest point (not including the tuning stub) of approximately 8mm.

The only way that I could measure the weight was with the help of my wife, Diane. I borrowed her trusted Salter kitchen scales. You try balancing an h.f. mobile antenna on a pair of kitchen scales! It took some time but the Highlander weighed in at approximately 500g

Careful Thought

The Highlander was obviously going to need careful thought in the way that it was mounted. An h.f. mobile antenna shouldn't really be mounted on a magnetic mount, as this does not offer a proper d.c. earth and in the case of the Highlander, a magnetic mount would never hold it. Paul Beevers had kindly sent me a mounting spring for use with the Highlander. This was going to prove invaluable. The spring was of a heavy duty, tight wound, chrome design. It's mounted between the base of the antenna and the feed point. (See Fig. 2).

The time had come to mount the Highlander on my car. I actually utilised an existing mount that my father-in-law, Terry G7VJJ, had made for my other h.f. mobile antennas. This was a length of metal bent into a right angle at one end, this end has an SO239 sized hole drilled in it. The other end has a groove cut out so it slips over a bolt. I then loosened off one of the bolts on my tow bar and clamped the mount on. This gives an excellent earth. I replaced the SO239 with a UNF fitting. I screwed on the Highlander and the spring and the whole thing looked really impressive, but would it work?

"I hardly had to touch the tuning stub and every band had an excellent s.w.r."

Richard's
Review Score:
9 out of 10

Fig 2: This picture shows the heavy duty, tight wound, chrome design mounting spring sent with the Highlander for review and is mounted between the base of the antenna and the feed point.



During the time I had the Highlander I also had a 50MHz f.m. mobile to review. I decided to try out the antenna on 50MHz. I set the radio up in the car and put an s.w.r bridge-in circuit. I did not adjust the tuning stub, which was about half way out. I plugged the 'wander lead' into the 6m (50MHz) position and got a reading of 1.3:1. It was as simple as that.

I used the Highlander on 50MHz on the Boxing Day journey up to my parents. My first contact was with Terry G7VJJ. As we drove onto the local dual carriageway the spring started to come into its own. It was a very windy day, in fact gale force winds had been forecast, we were also travelling at about 112kph on the dual carriageway. The Highlander was going all over the place ...

its weight and substantial body meant that it was being noticeably buffeted.

Performance

I don't think that an h.f. contact would have suffered too much because of this buffeting, certainly not as much as the contact with Terry did. You can imagine what the s.w.r was doing on 50MHz as the Highlander became (nearly) horizontally polarised! An old established way of preventing this is strong fishing line.

I've known of operators who use a couple of lengths of strong line to anchor the top of the antenna (so the antenna stays vertical) to the back of the vehicle. Do not be tempted to take the spring out of the equation, if the antenna does not have 'give' then there is a strong possibility it will break.

Later on in the journey the weather calmed and we were on A class roads, so our speed dropped. Under these conditions, I had much more solid contacts on 50MHz. The first was with Dave G4JXK in Barrington near Ilminster. I was mobile in his area and we managed about 14km before he lost me. I then contacted my brother, William G7GMZ. This was a 27km contact and was 'solid' copy all the way in.

The Highlander showed promise but I was eager to try it on h.f. I'm between h.f. mobile radios at the moment, having recently sold my beloved Icom IC-706 MkI to my brother, William.

So, on the day after Boxing Day, William and I set off to a wind swept barren hill overlooking the Bristol Channel to try some h.f. mobile work.

When we got there, I decided to check the s.w.r on each band. The Highlander was great for tuning. In fact it hardly needed tuning! I hardly had to touch the tuning stub and every band had an excellent s.w.r. The highest was about 1.9:1, however after a tweak with the tuning stub this came down to 1.4:1. This was in gale force winds and driving rain to boot!

One thing I must tell you about the Highlander is the band coverage. Even with a dedicated whip for 7MHz, I found the bandwidth of the antenna was about 20kHz and then I had to re-tune. Not so with The Highlander - I tuned

to 7.050MHz and had a working s.w.r which was practically constant over the whole 7MHz band!

The Real Test!

Let's face it ... ease of tuning and a good s.w.r are not necessarily the sign of a good antenna so, it was time to put the Highlander to the real test.

For the tests we used William's (can you hear the gritted teeth!) IC-706 MkI, set on output power 7, this equates to approximately 70W from the radio - we didn't use the pre-amplifier.

It being a Sunday, I tuned the 18MHz band. This is such a pleasant band and we soon heard **Tibor OM3SEM**. Tibor was a good solid 5 and 3 signal and gave us a 5 and 5 report! Unfortunately, Tibor did not give us his exact location but the former Czechoslovakia was not bad for a start.

We then heard an almighty pile up, again on 18MHz. The station with all the interest was **TF3AO**. I called "stroke mobile, stroke mobile"! I thought my efforts were in vain - not so! **Seli TF3AO** gave us a 5 and 6 report from his station in Reykjavik, Iceland! This was a distance of approximately 1785km. So the Highlander smashed its first pile up.

Our next chat was with **Alex IK5VLP** near to Florence in Italy, a distance of about 1382km. Alex was a 5-8 to 5-9 signal with us, he gave us a 5 and 9 plus report. Hot on the heels of this success was **Adam SP1ZQF** from Bialogard in Poland, this was a trip of about 1340km. Adam gave us a 5 and 7 report, we gave him 5 and 2 with QSB. (I think the wind had worsened!). My Dad, **John G8EAM**, then gave us a shout on 145MHz to tell us our lunch was nearly ready. We started the drive down off the hill - I couldn't resist a final contact and managed a chat with **Jon EA5ARC** from the Castellon region on the far side of Spain on the Mediterranean coast. Reports were 5 and 7 both ways and this time we were moving mobile!

A few days later, whilst returning home, I decided to try out my old favourite band for h.f. mobile working - 7MHz. I heard a romping signal from **GM3KHH** in Buckie, near Elgin in Moray, Scotland. Unfortunately, I missed the chance to make a contact with him and I missed his name, but he was a cracking signal as I was driving home along the A358 near Taunton in Somerset.

A little bit further along the road I heard **Bob LX9DX** from Wiltz in Luxembourg. This was a distance of about 650km. Bob gave me a 5 and 9 report and I was also able to give him the same.

A Lot Of Fun

I had a lot of fun with the Highlander. I would happily take this lovely antenna mobile or even portable when I go camping with the family. It's extremely well-made. As I said, aesthetics are a personal thing, beauty is in the eye of the beholder as they say; in my opinion the Highlander looks great and works even better but remember, you do have to mount it correctly due to its size.

As a terribly ostentatious final touch The Talkabout Antenna Company can make your antenna to order and will engrave your name or your call sign onto your antenna. The one I reviewed was resplendent in the words "Practical Wireless".

Non-engraved antennas are readily available from stock.

My thanks go to Paul Beevers of Talkabout Antenna Co., Hill Farm Granary, Lower Somersham, Ipswich, Suffolk, Tel: (01473) 658999, FAX: (01743) 658090, for the loan of the Highlander antenna. They can supply the antenna for £175 plus £5 P&P.

PW

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Carrying on the Practical Way

In the last two articles in this series, I have described a Universal VXO (Variable Frequency Oscillator) and a passive DBM (Double Balanced Mixer). Both are very useful modules for a variety of applications. For example, the VXO could be used as the frequency source for a transmitter, a receiver or even a complete transceiver. The double balanced mixer could serve as a first or second mixer in a receiver or as a balanced modulator in a single sideband suppressed carrier (s.s.b.) transmitter.

This month I'm offering the simplest application to combine the two modules ... a direct conversion (DC) receiver for the 7MHz amateur band.

Good Dynamic Range

A passive DBM offers a good dynamic range (strong signal handling capability) when used as a mixer for a direct conversion receiver. Additionally, the 7MHz allocation is a very popular amateur band, especially for QRP operation.

It also happens that 7MHz is a band which needs a healthy mixer on the front end of a receiver. Many of the simple direct conversion receivers used by home constructors on 7MHz crumple under the pressure of the strong broadcast signals located just above our allocation on the 41m broadcast band. The 7MHz band in the middle of the evening, in Europe anyway, is a good test for any receiver!

A short description can explain a simple direct conversion receiver concept (see block diagram in

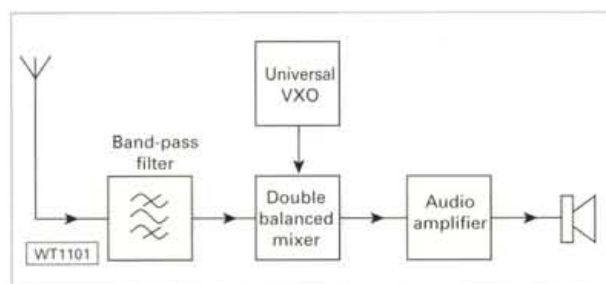


Fig. 1: Receiver block drawing.



Fig. 1). The signal from the antenna is filtered by a band-pass filter and fed into the DBM. The signal from the Universal VXO, tuning a portion of the 7MHz band, is also fed into the DBM.

The two signals mix to give a resultant audio signal. The addition and subtraction of the signals results in both upper and lower sideband audio signals. It's therefore possible to hear the desired station either side a 'zero beat' point. This is an inherent problem with simple direct conversion receivers. Although it has the advantage of being able to choose the sideband which is least affected by interference.

A DBM offers no gain to the signal, in fact there is an insertion loss and the total gain of the receiver is derived from the audio stages. The usual requirement is an audio pre-amplifier to drive audio output stages or an audio amplifier integrated circuit (i.c.).

The selectivity of the receiver relies entirely on the band-pass filter. However, it's also possible to add signal filtering at the audio frequencies. For simplicity, that's not shown this month, but I have plans to include a suitable audio filter in this column at a later date.

Band Pass Filter

The circuit of the band-pass filter is shown in Fig. 2. It follows a frequently used convention of two tuned circuits loosely top coupled by a capacitor C3.

The value of C3 is small and has been chosen to couple the signals between the tuned circuits without causing interaction between the tuned circuits and producing a 'humpy' response. If the tuned circuits are 'over-coupled' there will be two peak tuning frequencies with a null between them.

The tuned circuits, L1 plus C1 and L2 Plus C2, are made from two off-the-shelf Toko coils with fixed capacitors. The Toko coils are tuneable with a iron dust core.

Take care when adjusting the Toko coils. A proper plastic trimming tool is ideal. A metal screwdriver blade can easily damage the cores and will affect the tuning adjustment.

The low impedance link windings on the Toko coils are used to provide 50Ω input and output to suit a typical Amateur Radio antenna and the DBM.

"The beginner who is not endowed with a strong technical background is wise to build a few DC receivers".

Doug DeMaw W1FB (from QRP Notebook)

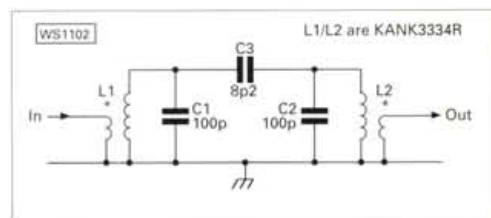


Fig. 2: Circuit of the necessary band-pass filter (see text).

Audio Pre-Amplifier

The necessary audio pre-amplifier is shown in Fig. 3. It's a circuit I have used for several

This month - after his usual (appropriate quotation) the Rev. George Dobbs G3RJV describes how you can use the double-balanced-mixer in a direct conversion receiver.

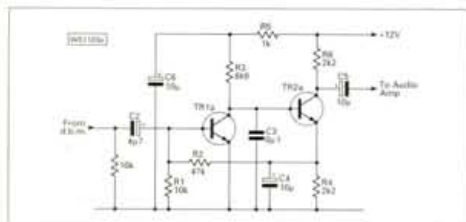


Fig. 3: A suitable pre-amplifier (see text), also illustrating the simplest form of input from the DBM (see text).

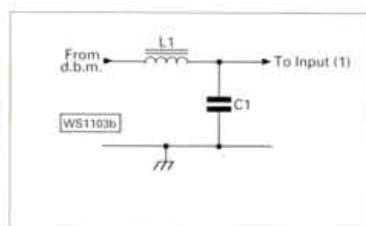


Fig. 4: Illustrating a 'tuned' audio input from the DBM (see text).

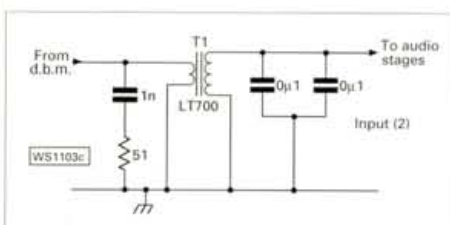


Fig. 5: In this version the DBM is better terminated with a 1nF capacitor and a 51Ω resistor. To match this low impedance to the audio pre-amplifier, G3RJV used an LT700 output transformer (see text).

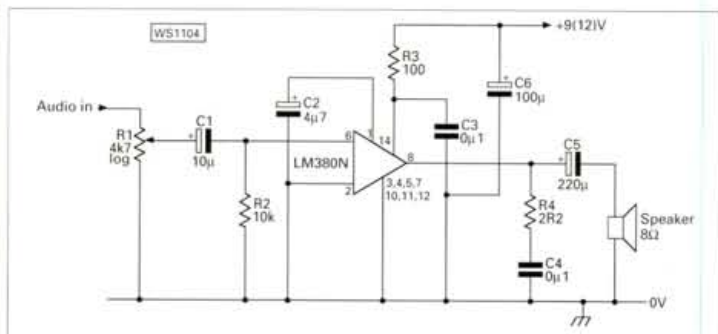


Fig. 6: This i.c. amplifier provides just about enough gain. Although there's not really enough output for comfortable loudspeaker reception, there's plenty to drive portable cassette player headphones.

works well and is stable and will accept a whole variety of transistors. In practice I've found there's great advantage in using low noise npn types and I've had good success with the BC338 and the 2N3565.

The termination of the DBM and the coupling into the audio stages is important and I have offered three alternatives. These alternatives assume that the output port of the DBM is decoupled with a 0.1μF capacitor as shown in the diagram in the last issue.

The easiest, if not the crudest, alternative is shown in Fig. 2 itself. The output of the DBM is terminated with a 10kΩ resistor at the input of the pre-amplifier, which feeds directly into the pre-amplifier stages. This is the simplest method and works very well, although the termination of the DBM is far from perfect.

Another alternative method, which incorporates a simple audio filter, is shown in Fig. 4. In effect, it's a tuned circuit at the desired audio frequency. For c.w. reception this is typically about 800Hz. (The filter parts, L1 and C1 need to resonant around this frequency).

A variety of combinations could be used but an easy off-the-shelf version is available by using a Toko 10RB fixed inductor of 82mH and a capacitor of 0.47μF. The output is then fed to C2 of Fig. 3. This arrangement works well for both c.w. and s.s.b. signals and reduces the audio bandwidth

enough to improve the signals.

The only problem I found was the tendency for the receiver to become microphonic. This happens because a large inductor on the front of an audio pre-amplifier and power amplifier can become a sensitive pickup and tapping the chassis may give loud 'pings' in the audio output.

A third alternative is shown in Fig. 5.

applications in the past. I picked it up from **Denton Bramwell K7OWJ** who published it in a QRP magazine several years ago and it has become one of my favourites.

Denton's circuit

Here the DBM is better terminated with a 1nF capacitor and a 51Ω resistor. To match this low impedance to the audio pre-amplifier, I've used an LT700 output transformer.

The LT700 transformer is designed for use in the common push-pull output stages used in cheap a.m. receivers. An output transformer gleaned from such a radio would probably work just as well.

There is even an attempt to tune the transformer output to audio frequencies by adding the two 0.1μF capacitors across the larger winding. However, I found that this method gave greater losses than the other two.

Output Stages

Almost any audio amplifier can be used for the output stages (my first tests were done with an

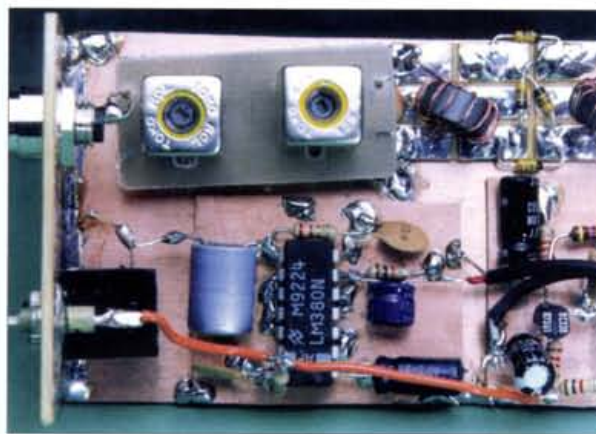


Fig. 7: Close up view of the receiver project showing the band pass filter using the Toko coils (top left) and audio output i.c. amplifier (lower centre).

MFJ-382 Amplifier Loudspeaker). But if in doubt, you'll find that I've described several suitable amplifiers in previous projects, all you have to do is look back in PW.

Editorial note: By pure coincidence both George and I presented differing 'add on' audio amplifier projects in the June 1998 issue. The 'Radio Basics' project is shown on page 16 and the 'Practical Way' projects are on pages 57 and 58. **Editor.**

Just to complete the receiver, I added the LM380 audio amplifier shown in Fig. 6. This provides just about enough gain, although there's not really enough for comfortable loudspeaker reception but plenty to drive portable cassette player headphones.

Prototype Style

As with most of my prototypes, the boards were built 'ugly' style. I find ugly construction suits simple one-off projects.

The low pass filter was however, built on a piece of scrap piece of copper laminated board intended for p.c.b. use. I drilled the holes to suit to pins and reamed out the holes that carry connections. The grounded pins are soldered direct to the copper board and the capacitors and input and output leads are soldered to pins at the reamed out holes.

The receiver copes very well on 7MHz ... even at the worst times in the evening. And when you build your version I suggest you (please!) do spend some time peaking the signals with the band-pass filter and use an antenna matched to 50Ω. I wish you good building and successful listening!

PW

Lead-Acid Batteries Sealed For A Longer Life

Sealed lead-acid batteries - or valve regulated lead acid (VRLA) batteries, to give them their modern name - are used when and wherever safe, low-maintenance secondary batteries are required. Although they share a similar chemistry to their wet lead-acid counterparts, they need somewhat more care in their use, particularly with regard to recharging.

The batteries are available either as single cells or, more usually, as groups of cells in a single housing. Each cell has a nominal voltage of 2V and batteries are commonly available in 6V and 12V versions.

Two Main Types

There are two main types of VRLA batteries - one type uses an acid gel, the other uses a liquid acid which is held in a retentive separator. For most applications, the difference isn't important and for amateur uses, both types can be treated the same.

Both types of battery are sealed but have vents to allow the release of any excess gas produced through misuse. During normal recharging any oxygen and hydrogen produced is recombined internally. Consequently, neither type of cell needs topping-up with de-ionised water.

There are two main applications for VRLA batteries - standby (float) use and cyclic use. Cyclic use is when a battery is repeatedly recharged and discharged throughout its life. Standby use is when a battery is only used for back-up operation and so spends almost all its life being trickle-charged. Many VRLA batteries are suitable for both types of use, whilst others are specifically designed either for cyclic use or for standby use.

Any Position

In practice, VRLA batteries can be used in any position, but common sense suggests that they be used with their terminals uppermost whenever possible. Using them on their side usually presents no problem but upside-down is not a good idea.

Most VRLA batteries are designed to work best at temperatures around 20°C to 25°C. Batteries used at higher temperatures will show improved performance but will have a shorter life. At lower temperatures, battery life is extended but performance suffers. So, keep them cool, but not cold, and keep them well ventilated.

It's important to know that VRLA batteries have a very low internal resistance. A large and potentially dangerous current can flow if a battery is accidentally short circuited. Therefore, it's

advisable to place a fuse in series with each battery, preferably close to one of the battery terminals. (**Under no circumstances should a VRLA battery be used without a fuse somewhere in circuit**).

Sources

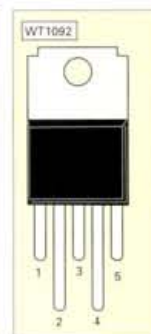
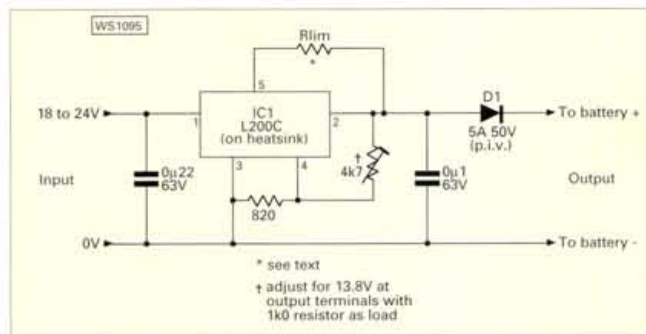
The VRLA batteries can be obtained new from **Maplin**, **RS Components** (**Electrovalue**) and other industrial electrical retailers. Whilst they're significantly more expensive than their automotive (wet lead-acid) counterparts, their cost is offset by the fact that they are maintenance-free and sealed. As such, they are safe for indoor use whereas car batteries, in my opinion, are most definitely not.

Occasionally, new batteries appear on the surplus market. These are an excellent buy **providing they have been stored correctly and are of recent manufacture**. More abundant are those batteries which have been removed from equipment, usually as part of normal preventative maintenance procedures.

(To explain - VRLA batteries are extensively used in fire and security alarms for backup in case of mains failure. These batteries have design lifetimes in the order of five years under standby conditions. They should, therefore, be replaced after four to five years).

Whilst many of the 'life-expired' batteries are immediately recycled some find their way onto the amateur market and most can still give useful

Phil Cadman
G4JCP takes a
close look at a
very old friend -
the lead-acid
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find out why.



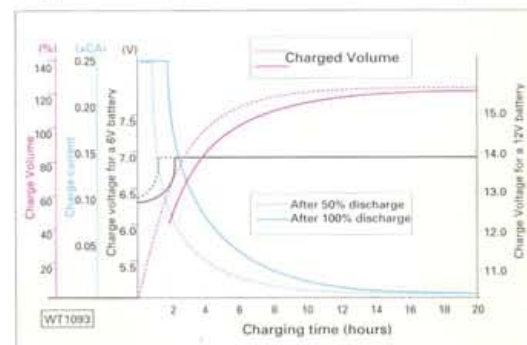
service. As it's impossible to tell the condition of these batteries before purchase you have to take 'pot luck'. However, never buy a battery which has a bulge or any other physical defect.

Constant Voltage - Current Limited

In practice, VRLA cells and batteries should always be recharged from a **constant voltage, current limited** supply, see **Fig. 1 (a & b)**. **On no account should you use a normal car-battery charger. Neither should you use a constant current charger.** Such chargers will damage the battery. The recharge curves shown in **Fig. 2**. (Courtesy of Yuasa Battery Sales [UK] Limited) are specific to

Fig. 1 (a & b): A suitable charging circuit for use with VRLA batteries, with the pin-out details of the recommended regulator i.c. (see text).

Fig. 2: The graph illustrates the recharging curves associated with VRLA cells. The curves are specific to the NP range manufactured by Yuasa UK who also kindly supplied the information.



Continued on Page 40...

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| ATAS-100 Fully automatic mobile antenna 7/14/21/28/50/144/432MHz (ATU NOT required) | £239 |
| MMB-66 Mobile Bracket | £29 |
| FVS-1A Speech Board | £38 |
| YF-115C 500Hz Collins Filter | £99 |
| INRAD MLS-706 2.6kHz SSB 455kHz Filter .. | £119 |
| INRAD MLS-712 300Hz CW 455kHz Filter .. | £119 |

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In today's crowded bands adequate selectivity may be the most important characteristic of a receiver. The radio's ability to separate signals is largely dependent upon the number and quality of crystal filters it contains. Whilst the main manufacturers offer a range of optional filters, there is always something magical about the way an American receiver sounds. (ask any Drake, Collins or TenTec owner!). International Radio has been in the business of making very high quality replacement filters for all the main manufacturers.

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FT-847 model

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FT-920 model

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| Use | Standby | Cyclic |
|----------------|--------------|--------------|
| 2V Single cell | 2.25 - 2.3V | 2.4 - 2.5V |
| 6V Battery | 6.75 - 6.9V | 7.2 - 7.5V |
| 12V Battery | 13.5 - 13.8V | 14.4 - 15.0V |

Table 1.

for a 12V battery. **Table 1** details these and the higher, cyclic, recharge voltages.

If you use the cyclic recharge voltage then you must either remove the battery from the charger, or revert to the appropriate standby voltage, as soon as the battery is fully charged. In any event, the cyclic recharge voltage should never be applied for more than 24 hours. If in doubt, stick to the standby recharge voltage. One important point - batteries specifically intended for cyclic use should never be left continuously on charge, even at the standby recharge voltage.

The battery manufacturer will always specify a maximum recharge current. Graph 1 shows this figure as 0.25A per ampere-hour of capacity (C/4 amps). (That's 1.5A for a 6Ah battery). Figures won't be available for most batteries obtained on the amateur market so my rule-of-thumb is to limit the recharge current to 0.1A per Ah of capacity (C/10 amps).

My other rule-of-thumb is this - with a maximum recharge current of C/10 and a recharge voltage of 2.3V per cell (that's 13.8V for a 12V battery) a battery, in any initial state of charge, will be fully charged in 24 hours. By the way, you don't **have** to recharge at C/10. A battery can be recharged at a much lower rate, it simply takes longer to reach full charge that's all.

Yuasa's NP range but can be taken as representative of most VRLA batteries.

For standby use, the recharge voltage should be in the range 2.25 to 2.3V per cell. That's 6.75 to 6.9V for a 6V battery and 13.5 to 13.8V

Battery Capacity

All VRLA batteries have their capacity given in ampere-hours (Ah). This capacity is obtained by discharging the battery at a constant current until its voltage falls below some specified value. The time taken (in hours) is then multiplied by the discharge current (in amps). The letter 'C' that appears in graphs and equations is numerically equal to the capacity of the battery in ampere-hours.

The capacity of a battery varies depending on the discharge time, see **Fig. 3**. Because of this, battery manufacturers quote a discharge time in connection with battery capacity, typically either 10 or 20 hours. Battery capacity also depends on temperature and so that's often quoted as well. Graph 2 applies specifically to Yuasa's popular NP range but **all** VRLA batteries follow similar discharge curves.

As an example, take a 12V, 6Ah battery and discharge it at a current of 0.05CA (top curve). Read '0.05CA' as: 0.05 x C, amps. In this case, 'C' is equal to 6. Therefore, 0.05CA is equal to: 0.05 x 6 = 0.3A. The 0.05CA curve meets the dotted line (the fully discharged point) at 20 hours. This confirms the capacity as 0.3A x 20h = 6Ah (at the quoted 20 hour rate).

Now increase the discharge current to 0.2CA; that's 0.2 x 6 = 1.2A. On the graph the 0.2CA curve meets the dotted line at 4 hours. This time the capacity is 1.2 x 4 = 4.8Ah - only 80% of the 20h capacity. Because capacity falls as the discharge rate increases it's always worth paralleling batteries - as long as they're of the same type and in similar condition - to reduce the load on each individual battery. That way you'll get maximum capacity from them.

Batteries can be recharged in parallel too. However, make sure they're in a similar state of charge before connecting them up.

Disposal of Batteries

The manufacturers recommend returning scrap batteries to the point of sale for disposal. In many cases this will be awkward if not impossible. However, this is no excuse for chucking them in the bin or for dumping them.

All VRLA batteries contain sulphuric acid and lead; **both are harmful to the environment**. Always take scrap batteries to either a friendly local battery supplier (check in Yellow Pages or other local business directory) or to your Local Council tip for safe disposal. **This is important.**

Example 12V Charger

The circuit in Fig. 1 shows a simple charger for 12V VRLA batteries. It's capable of up to 2A output and is based on the SGS L200 adjustable regulator.

The d.c. input should be in the range 18V - 28V. Remember to use an appropriate heat sink. The set-current resistor, R_{lim} , should be a wire wound type with a resistance of:

$$R_{lim} = \left(\frac{0.45}{I_{max}} \right) \Omega$$

(Where I_{max} is the maximum charge current)

Acknowledgement

My thanks to **Yuasa Battery Sales (UK) Limited** for permission to reproduce their graphs in this article. So, now you know a little bit more about them why not try using VRLA batteries yourself? You'll find they're in use everywhere - from wheelchairs to fire alarms - because they are so useful.

PW

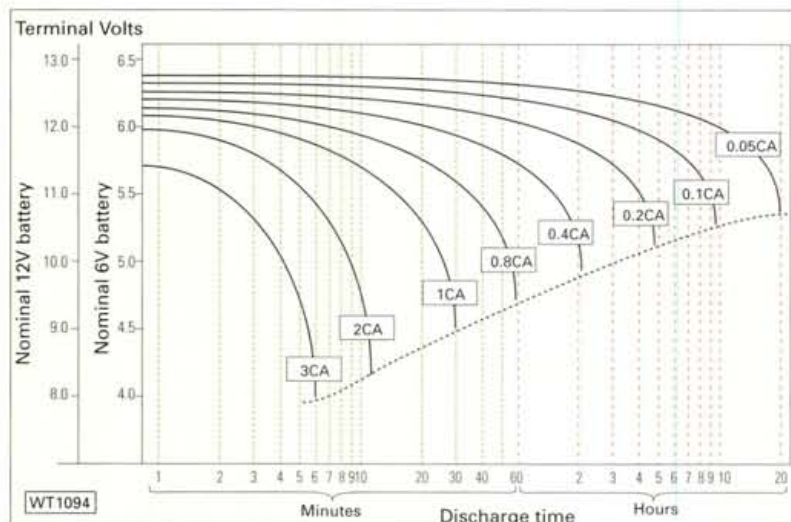


Fig. 3: Discharge curves for VRLA cells (courtesy of Yuasa UK). See text for further information.

VRLA batteries should **never** be left for any length of time in a discharged or partly discharged state. They should **always** be recharged as soon as practicable after use. Also, never let the battery completely discharge as this can cause irreparable damage.

Main Problems

There are two main problems that VRLA batteries can suffer from - loss of electrolyte and sulphation. Loss of electrolyte is irreversible but sulphation - the build up of lead sulphate crystals which occurs when batteries are stored in a discharged state - can sometimes be reversed.

If a battery appears high resistance you can try charging it from a much higher voltage than usual **for up to 12 hours providing you limit the current to C/10 and don't leave it unattended**. Remove it from charge immediately if any part of the battery gets hot.

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It's time to stand by your rigs and pay attention because this month Ben Nock G4BXD is bringing his usual 'military' theme into the vintage wireless shop. And it may be a case of ... 'I spy with my little eye....'!

Hello once more. Here I am at the helm again, looking forward to the summer - all that portable operating with vintage gear - and I hope I can interest you with the following selection of sets.

First of all ... how about an unknown set? I know the set number and I know the manufacturer. I also know the line-up of the valves and how it all works. But there are a few points that still need to be cleared up.

The set in question, **Fig. 1** and **Fig. 2**, is called a TR11HS, marked as being made by a company called "E.T.E.I. Ltd". The set is a tuneable receiver, 2 to 6MHz, with a crystal controlled transmitter with two 5B/254Ms in the power amplifier (p.a.) stage, plus another two for the modulation. Output is 8W on low power and 25W on high.

The unknown bit concerns the mode switch. This offers phone and modulated continuous wave (m.c.w.) as well as a position marked "S.S.D.", and one marked "FIRE"! What on earth are these for? I wonder. Switching to the positions mentioned simply throws the set into transmit mode.

Also, as well as screw terminals marked A (for antenna) and E (for earth) there are two more marked D. It was suggested to me that this was for a dipole, but a check inside reveals the wires to these terminals go nowhere near the radio frequency output side of things.

I did have a feeling that this set might be for marine use, maybe used on trawlers, etc., as it has a similar style and colour to the Reece Mace equipment. However, the S.S.D. and FIRE options are a real puzzle. Needless to say, if you can throw any light on to this problem I will pass it on to the other readers.

Spy Set

For many collectors of military radio the spy set is always of great interest. I still get E-mails and letters asking where such sets can be bought. The answer is, of course, that they are few and far between.

Normally any special 'clandestine' sets falling into the hands of real

collectors stay with them. There are the few 'dealers' who advertise in a lot of magazines who are happy to hype up the prices and pass them on though.

One way of not lining the pockets of such 'dealers' is to construct a replica. Indeed, if you build a copy of a vintage set, using vintage components and vintage methods, is it a 'copy' or simply a late production run?

One 'clandestine' transmitter-receiver which can be copied quite easily is the Second World War 'Para' set. This extremely well designed little unit uses just three valves. Two valves, 6SK7 types, are used as a 'straight' regenerative detector receiver with a single valve, a 6V6, being used as the oscillator/power amplifier (p.a.) stage.

The receiver is tuneable between 3.3 to 7.6MHz in two switched bands. The transmitter, giving about 4 to 5W output, is crystal controlled.

An external power supply running on a.c. or 6V d.c. was used and the set was housed in a firm Cadmium-plated steel box with a lifting lid. The original unit weighed around 1.4kg.

When the set was not in use the valves were extracted from their bases and stored in clips in the lid. This kept the overall height of the box down and meant for easier clandestine transporting.

On Receive

On receive, the operation of the 'Para' unit is straightforward. The set is tuned to the required frequency, a calibration chart held in the lid gave the correct dial reading, the reaction control was advanced until a rushing sound was heard in the headphones and a final 'tweak' on the tuning dial finds the station.

On transmit, the correct frequency crystal was inserted and the small built-in Morse key is pressed. The p.a. tuning control was then rotated while the operator watched a small bulb which glowed the brightest on tune-up.

The antenna tune capacitor was then rotated while the operator watched a second bulb, again showing brightest when on tune. Both controls were then given a final tweak and then the unit was ready to send any messages.

I acquired a 'copy' of a 'Para', **Fig. 3**, from a local Radio Amateur who is well known for his excellent construction projects. He built the set as a near-perfect copy but did make just one small mistake as

Fig. 1: The strange 'marine' set, with its unknown 'SSD' and 'FIRE' option on the centre mode switch (see text).



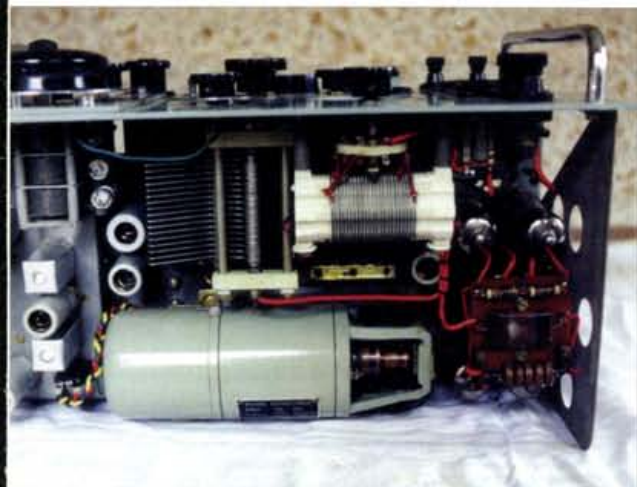


Fig. 2: Inside the TR11 with the receiver chassis on the left, the transmitter on the right and receiver dynamotor at the rear centre. The high voltage dynamotor for the transmitter is underneath.

the receiver/transmit switch and the bandswitch are transposed. Despite this, there's no great problem and this small error can be corrected quite easily, I have just not got around to it yet.

Next, there's the 'copy' built in France by Michel F5XM, Fig. 4. This again is very good but the tuning dial and knobs are slightly different to the original. I have heard Michel on 3.5MHz with his set but we have not managed to work 'para set to para set' yet.

Although I have used mine on 3.5MHz with good



Fig. 3: The British-made 'Para' set copy, shown with two receive valves (top left), single transmit valve (top right). The miniature Morse key is shown on the lower right (see text).

contacts up and down the country, I was using a good antenna. And of course, in original usage we must bear in mind that the controlling station the 'Para' set was working with would have been a high powered transmitter with very good antennas.

Chinese In Origin?

Now I've got a request from Dave G4BXH who has acquired a strange h.f. transceiver, Fig. 5, which he believes is Chinese in origin. The set has the number '892' boldly on the front and seems to be a 2 to 10MHz type set, running a.m., c.w. and lower sideband (l.s.b.). Large 'Nixie' type display tubes are used for frequency read-out and the construction is of a very solid type.

Obviously, the mystery transceiver was used in tanks or heavy fighting vehicles. Dave would like any information, circuits, etc., for the set so that he

can try and get it going. Can you help?

Radio Marvel?

In another letter, Wilf Naylor wrote asking the following: "I was meaning to ask you about a set of mine which someone gave me years ago. Called the 'Grid Leaks Pocketphone' with the quotation 'The radio marvel of the age', it has three Hivac X series valves in it. Someone took it to pieces and gave me the bits and I have been meaning to put it

together for years. Do you know anything about this one"? Needless to say, if you can help, do get in touch and I'll let Wilf know.

It seems that I was the only one not to know what the small wooden boxed 'Q & I' meter, mentioned last time, was. However, I now have the answer!

A somewhat overwhelming response came from Jim Grant, J. Gomer, E. Gastrell, Pete G4DHz, Jim Grant, Dennis Neech, Rex Wilkinson, Denis G3MNO, Michael G0NEE, A. Hunt and a very detailed reply from John Goldfinch (and a mystery person) who all sent me information which identified the meter for me.

It turns out that the 'mystery meter' is part of a testing unit for telegraph lines and detonators and firing circuits in explosives.

Apparently it was made before 1895 and used in the First World War

(as I thought from the one that I mentioned I saw in the television programme) the meter seems to have been in continual service with the military through to the Second World War, even branching off to become a GPO test meter at some time.

In use, the meter was used in conjunction with a battery, which were all housed together in a nice leather case. Thank you all for your help!

Translation Of Japanese

I must also thank Ikuo Fujimura for his translation of the writing on the Japanese war time crystal calibrator (shown on page 52 in the February PW) and Kazuo Takeda JH1AMC, for similar information forwarded via the UK Yaesu offices in Hampshire.

The unit turns out to be a 98 Type-4 Crystal Calibrator used by both the Japanese Navy and Army forces. And, as I surmised, it does allow a tone to be added to the carrier signal to aid in its location on the receiver.

So that's it for now. Hopefully I'll be able to meet one or two readers at the rallies throughout the summer and I can, as always, be contacted at: 62 Cobden St, Kidderminster, Worcestershire DY11 6RP, via the PW offices or you can E-mail me on G4BXD@compuserve.com You might also like to have a look at my Web page as well at <http://ourworlds.compuserve.com/homepages/G4BXD/> PW



Fig. 4: The French reproduction 'Para' set. This version is complete with lid and frequency chart and valve retaining clips (see text).



Fig. 5: The Chinese 892 set, showing the read-out tubes along the top with switch frequency selection along the bottom (see text).

This month, the Editorial team here at **Practical Wireless** have compiled some information on the latest CDROMs for you to download. If you're one of those Radio Amateurs that likes to keep up with the times then this could be something for you to look into! So, why not sit back, relax and browse through this month's special 'CDROM Profiles'?

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TELEPHONE, FAX, E-MAIL OR USE THE ORDER FORM ON PAGE 74

C.D. PROFILES

Call Seeker 1999 CDROM.

This RSGB CDROM is probably easier to use than the *RSGB Yearbook*, except that you'd have to boot up your computer every time you needed to use it - if you've got a computer that is!

We would strongly recommend this CDROM to anyone who has a computer as something to go hand-in-hand with the *RSGB Yearbook* therefore, when you are using the computer and need to look up a callsign from a name, or the name from a callsign you can simply load the CD and search for it. If you are not using the computer, however you can revert to the *RSGB Yearbook*.

The PW team think that most readers would agree that the way the old *RSGB Callbook* worked wasn't always the simplest and therefore the CDROM will solve a number of problems. You can go by callsign, surname or postcode and when it works well, it works well but sometimes you will have difficulty with certain callsigns and, of course, not everyone's callsign is in there. **Recommended.**

Shortwave Eavesdropper CDROM

The *Shortwave Eavesdropper* CDROM is a Windows compatible CDROM and is recommended to the shortwave listeners among you. On the front of the CD's cover, it claims to contain over 100Mb of frequencies and callsigns; the largest list of world-

wide utility stations; DX edge, maps and aircraft plotter and sound samples and built-in tutorial.

Produced by RG Software, *Shortwave Eavesdropper* claims to be "a huge step forward in the presentation of information

for the shortwave utility listener" with "instant access" to over 32 000 frequencies; over 42 000 callsigns (ITU and tactical); extensive lists of aircraft and

ARQ Selcal codes; audio samples of data modes; country-by-country information files containing QSL addresses, schedules, examples of traffic, maps and much more.

This CDROM appears to be good value for money and it comes

Recommended to those of you whose main interest lies in shortwave.

The ARRL Antenna Book 1999 CDROM Edition 1

The *ARRL Antenna Book 1999* CDROM will probably live up to all expectations which you might have of anything produced by the ARRL. The write up on the back of this CDROM claims that it has

"A wealth of practical information on antennas, feed lines and propagation ...". It states that the CD includes the complete text and all the illustrations from the printed book and also contains 70 000 pages of propagation tables.

This Windows compatible CDROM also contains DOS utility

programmes which the ARRL claim will "assist in the design and analysis of Yagi antennas and antenna tuners and analysis of local terrain effects". If you are a keen antenna designer and/or builder and you prefer CDROMs to books then this could be the one for you! **Highly Recommended.**

The ARRL Handbook 1999 CDROM Version 3.0

The *ARRL Handbook 1999* CDROM is convenient and easy-to-use, say ARRL. Once again, it contains the complete text and illustrations from the printed book, but the back of the CD states that it also includes a powerful search engine; audio clips to illustrate a variety of modes and activities; tools to create bookmarks; zooming controls; Windows printing and clipboard support (text and illustrations can be printed or pasted into other

Windows applications); all of the Handbook 'template packages' with PC board etching patterns and other useful information in Adobe Acrobat portable document format and much more. If you enjoyed

last year's *ARRL Handbook* in printed format and wish to move with the times then this could be just what you need! **Highly Recommended.**

1999 Super Frequency List CDROM Fifth Edition

The *1999 Super Frequency Listing* comes from Klingenfuss Publications who claim that their "... databases cover 11 000 entries with the latest schedules of all clandestine,

domestic and international broadcasting services on shortwave, compiled by top experts in this field ...".

As well as over 11 600 special frequencies from the *1999 Guide To Utility Radio Stations*, you also get 920 abbreviations and 16 100 formerly active frequencies and "... all on one compact disk for PCs with Windows".

You can search for specific frequencies, countries, stations, languages, callsigns and times and it also includes the digital data decoding shareware program: *Radiocraft* by the French Radio Amateur F6FLT. **Recommended.**

1999 North American/International Radio Amateur Callbook CDROM

All of you will probably be familiar with the *1999 North American / International Radio Amateur Callbook* in its original, printed format, but what about their new CDROM? The compilers of this CD say that it comes with more than 1,490 000 licensed Radio Amateurs (up by approximately 20,000 from last year) and includes International and North American listings.

Because of the way the data is displayed, you can search for that particular callsign or name by either callsign, name, street, zip, license class, issue and expiration, etc. Powerful search and label features plus QSL managers can also be found on this extensive CD.

So, for all of you who like chasing that DX from across the pond and further afield, this CDROM comes **Recommended.**



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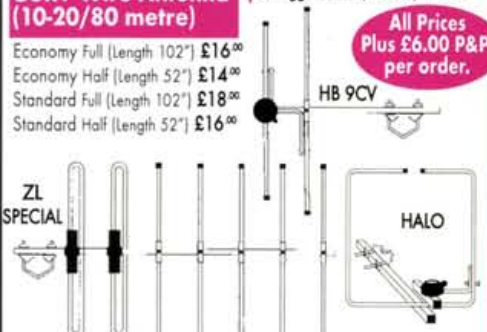
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antennas in action

NEWS & PRODUCTS ■ QUESTIONS & ANSWERS ■ ANTENNA WORKSHOP ■ REVIEWS ■

welcome to AiA!



Again space limitations limit Antennas-in-Action somewhat this month. So, I'll get on with it! In this issue you'll find some books for your library, the ARRL *Antenna Book* on CDROM and an antenna for you to build for the 144MHz band. But let's start with the books and that CDROM.

G17EX

The first book I'd like to tell you about this time is from the ARRL stable, and it's the hard-backed *Physical Design Of Yagi Antennas* by David B. Leeson W6QHS. Since the original descriptions in the mid 1920s by Shintaro Uda and Hidetsugu Yagi, the Yagi-Uda antenna has been described and written about many times and in many books. But now this book looks at, and takes a very different perspective of, the antenna. What's so different? (You may ask!).

The different viewpoint to the subject of Yagi antennas, is that they're looked at from the mechanical aspect. As mentioned, there have been many articles describing the antenna by the physical values to achieve its electrical dimensions. This book tells you how to build a better and stronger antenna that will withstand almost anything nature can throw at it.

There are 11 chapters in this well-presented book, with titles such as: 'The Wind In The Yagis', 'Wind And Ice Loading', 'Yagi Element Design' and 'Masts And Rotators'. The electrical side of the design hasn't been forgotten about all together, as chapters

eight and nine cover 'Self Impedance Of Yagi Elements' and 'Yagi Element Design Issues'. The final chapter looks at ten antennas from firms such as Cushcraft, Hy-Gain and QHS in more detail.

The book will not suit anyone looking for a quick antenna design for one or more bands, but if you fancy building antennas with a more professional finish it's the book for you. Now you can give that design the final polish by using the information within this book. The book: *Physical Design Of Yagi Antennas* is excellent value at £15.50. You'll feel proud to say "I designed and built that myself" of your next yagi antenna.

Second Book

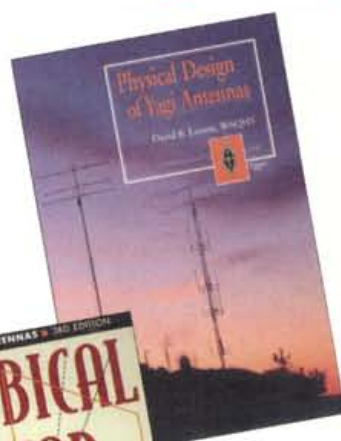
The second book I'd like to show you, actually has some significance to an antenna that is described later on. From the partnership of William Orr W6SAI and Stuart Cowan W2LX comes the book *Cubical Quad Antennas*, subtitled 'How To Build And Adjust Quads' and gives more examples of cubical quad antennas for many h.f. and low v.h.f. bands.

There are ten chapters in the 110 pages of this book, all choc-a-bloc with information on how to understand, design and build cubical quad antennas for any frequency. The first chapter deals with the history of the cubical quad antennas from its conception by W9LZX to answer an arc-over problem that was destroying the antenna systems originally built at the 10kW Ecuadorian station of HCJB set high in the Andes.

Chapters Two and Three deal with how the quad antenna works and its characteristics, while chapters Four and Five look at multiple element systems and cubical quad like antennas. Feeding and matching the various quad systems follows, before the final section dealing with building and adjusting cubical quad antennas. This is a small book but well worth having in your library if you fancy a cubical quad antenna with its small turning circle and size coupled with a good gain/bandwidth figure. And I think this book is more than worth every penny of the asking price of £8.95.

Upwards In Frequency

From antennas for the h.f. and low v.h.f. bands let's move upwards in frequency. Antennas for the v.h.f. and u.h.f. bands are both small and easy to construct as they tend to be self-supporting. In the book *Antennas For VHF*



And UHF, Ian Poole explores many of the aspects of antennas and feeding them that we need when starting out in the hobby. With nine chapters in a

little over 100 pages there's more than enough information to get you going.

After chapters on antenna basics and feeders Ian moves on to cover dipoles, which contrary to what you might think, work extremely well on v.h.f. and u.h.f. Other antenna types covered are vertical, Yagi, cubical quad and wide-band antennas (in the form of the log periodic). The final chapters deal with measurements and practical matters to do with antennas, finishing up with a simple frequency charts for the frequency range of 30-2450MHz. It's a simple book, but effective as well as remarkably purse-friendly at only £4.95

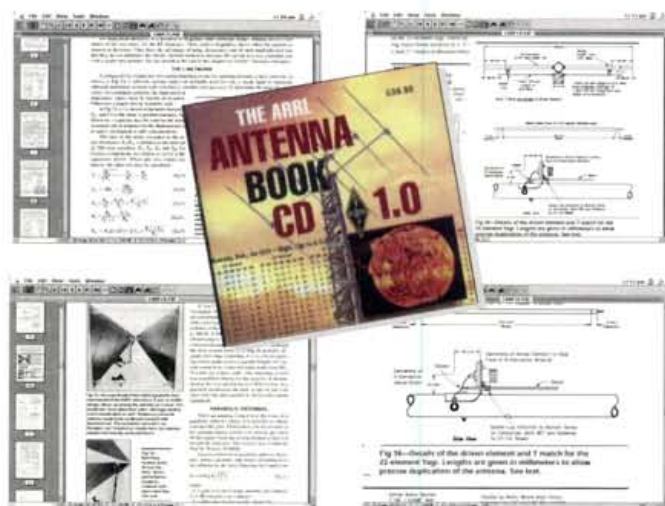
The final book this month, is one covering the more unusual type of antennas, and it's called *Experimental Antenna Topics* by H.C. Wright. In this book there are 28 'chapters' dealing with a

variety of antennas (and ideas) rarely seen or heard about. Some of the antenna models are dealt with in a rather 'distant' descriptive manner, leaving you to work out how to create your own. Others have sufficient design information to make this task a little easier.

You'll be able to see how to create your own 'Abe Lincoln', helical, loop or frame antenna, a doubly-fed coaxial antenna or build one in a plastic water bottle. This book is a veritable curiosity shop of strange and yet thought provoking antenna designs, that could be just what you're looking for as your next antenna challenge. And although my 'part-Scottish' heritage sometimes shows through, the asking price of £3.50 is enough to make me want to have a go at some of the designs. After all it isn't going to break the bank!

Book On A ROM

Now let's have look at an established book on CDROM. THE ARRL ANTENNA BOOK CD 1.0 is the first offering, on CDROM, of the well respected



paper version. So, how does the 'high-tech' version match up to the original paper version?

In answer to that question, the two correlate extremely well. In fact, I would say that the CDROM

version was produced at the same time and from the same work files that were used to create the paper version. Although the CDROM has only the featured software available for IBM PC (or clone) computers, I found the CDROM ran perfectly on my Macintosh computers that I have both here at work and at home.

The supplied Adobe Acrobat 'reader' software that may be installed from the CDROM makes 'reading the book' possible on almost any computing 'platform'. The files on CDROM are in 'Portable Document Format' (PDF) format allowing the viewing software to recreate (almost exactly) the paper version on screen. From Windows95 to Linux via 'the Mac', this CDROM may be used by almost everyone with a computer.

The 'on-screen' view of the ARRL

Your Projects

Now to the side of 'Antennas-in-Action' which you've all been waiting for! Let's have a look at two of your projects. The first project is from Nigel Booth M1DKN and it's the 'High Gain 4-El Cubical Quad Antenna' shown in Fig. 1. This is a simple, and above all, cheaply made antenna for the 144MHz band. A photograph of Nigel's version is shown in Fig. 2 which shows the quickly made antenna.

Nigel's antenna design offers a very high gain in a very compact size, when he says "It's ideal for Radio Amateurs with limited space who are unable to fix long-boom antenna atop a 40m mast, but who still want a reasonable performance. I think that the vast majority of us must fall into this category. The gain offered by this four element quad antenna is approximately 11-12dBd (dB referred to a dipole antenna) dependant upon location and accuracy of construction.

"I'll try to give you a better appreciation of what this gain figure of 11-12dBd means. A gain of this level means it's an effective power some 12-15 times the output power from the back of your radio. Not only do you get this power gain on transmit, but

you also get the same improvement on receive. All this power gain, and yet it's still a relatively small antenna.

"The boom used for the antenna is a mere one metre in length and it may be constructed from 25mm (1in) square, weather treated wood. The treatment should consist of a good outdoor or yacht varnish. The elements are all constructed from 2mm diameter (14s.w.g.) enamelled copper wire, the dimensions of which are shown in Table 1.

Nigel goes on to say "All the dimensions for all the loop elements were calculated using the formulae shown in Table 1, which were admittedly, gleaned from *The Radio Amateur Antenna Handbook* by William I. Orr W6SAI. (More information is available in the Orr and Cowan Book *Cubical Quad Antennas*. Ed.) The beam antenna that's described here is though, all my own design.

Table 1

| | |
|---------------------------------------|-------------------------------------|
| $L1 = \frac{78.7}{f \text{ (MHz)}}$ | $L2 = \frac{76.6}{f \text{ (MHz)}}$ |
| $L3/4 = \frac{74.3}{f \text{ (MHz)}}$ | $S = \frac{43.3}{f \text{ (MHz)}}$ |

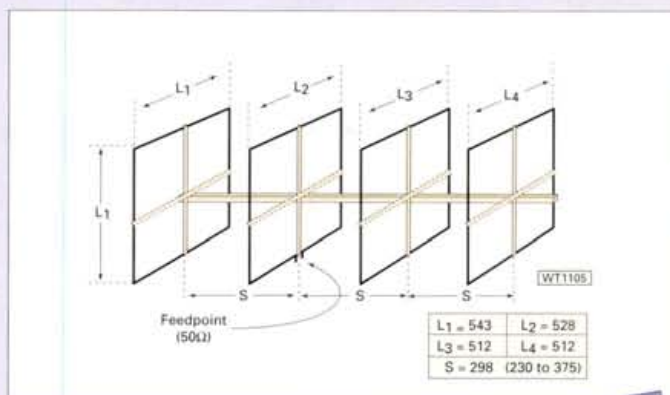
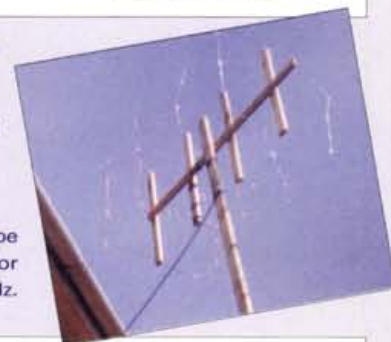


Fig. 1: Using heavy gauge wire to make an antenna that has good forward gain but is still fairly small. An idea from Nigel Booth M1DKN. See text for more detail.

Fig. 2: The M1DKN prototype cubical quad antenna for 144MHz.



"But please remember that as with most 'home' designs, the dimensions are only approximations, and some fine tuning may be needed once the antenna is complete and you've carried out some measurements of matching and gain (although I suspect that

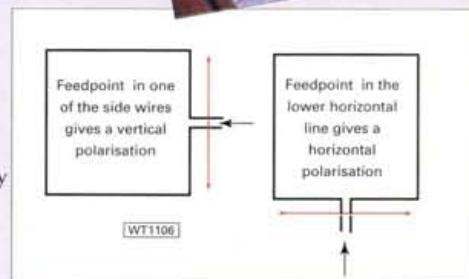


Fig. 3: How to work out the polarisation of the cubical quad antenna.

Table 1: The formulae for calculating the length of the quad loop antenna sides came originally from *The ARRL Antenna Book*, but are shown here for metric measurements.

50MHZ DELTA LOOP ANTENNA.

ANTENNA BOOK is, with one vital exception almost exactly like the printed version! The one difference between the 'real' and the 'on-screen' book is, that on screen the 'book' may be magnified to several times its size to make viewing easier. This facility alone makes the CDROM version a candidate for my 'very highly recommended' label. With a 17in computer screen the 'book' may be viewed at the equivalent of over eight times 'real' size, making it ideal for those whose sight is failing, or not as good as it might be.

I've included several 'screen-grabs' so that you can appreciate what the view on screen looks like. There is other software on the CDROM, but mainly for the IBM PC. Although there is a series of '.PDF' files for propagation prediction charts, making them 'viewable' on most computers.

These are the only 'pages' that use colour which is, I think, a bit of a shame. To the ARRL I'd say 'please use colour on the CDROM version next time', it would make the computer version 'nicer'. The CDROM version of the ARRL ANTENNA BOOK is highly desirable at only £28.

Little News

This time of year is well known for the paucity of news coming in from manufacturers and suppliers. In fact, the news cupboard is almost empty except for the catalogue from **Dave Martin of Aerial Techniques**. Probably better known to readers of our sister magazine

Short Wave Magazine, Aerial Techniques is well known among the TV DX 'crowd'.

This well produced catalogue lists antennas,

signal amplifiers, mounting and lashing kits, rotators, signal strength meters, converters and video systems, not to mention multi-standard TVs for the serious DXer. Aerial

Techniques supplied the Semaht signal



antennas in action

strength meter that was reviewed by **Gordon King G4VFW** in the May 1997 issue of *PW* where Gordon showed how such a device may be used in the fight against TVI. Costing only a nominal £1.50 the catalogue from Aerial Techniques is available from them by post at:

**11 Kent Road,
Parkstone,
Poole,
Dorset BH12 2EH.
Tel: (01202) 738232,
or FAX: (01202) 716951.**

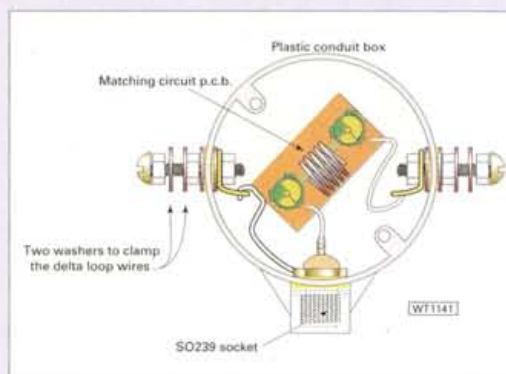


Fig. 4: Derek G7OXJ, says this delta loop feedpoint is extremely weatherproof and doesn't cost much to make. See text for more detail.

most of you will be happy with measuring only the matching of the antenna).

"The antenna was designed for a centre frequency of 145MHz in order to cover the whole of the 2m band. You could though, create the antenna based on any centre frequency (say 144.050MHz for the c.w. portion of the band). Final tuning may be done by adjusting the distance between the elements (*especially the driven-reflector spacing* Ed.). But do try to keep all the spacing between elements equal.

"The feeder used (50Ω coaxial cable should be ideal) is to be connected at the bottom centre of the driven element. This will give an horizontal polarisation to the signal in the direction of the beam. By twisting the whole antenna through 90° (i.e. feeding it in one of the vertical sides) a vertically polarised signal can be obtained (see Fig. 3)."

The antenna looks to be a winner

PW - Antennas in Action, May 1999

Nigel and I'll have to get it going around our radio club as there are several members who relish the possibility to try out things like this that I 'find' for Tex Topics and 'Antennas-in-Action'. Well done Nigel!

Delta Loop

Now let me return to an update to the 50MHz delta loop antenna that I described on page 30 of the September 1998 issue of *PW*.

Derek Morley G7OXJ, has sent me details of his modification to make the 'quick-lash-up' that was my original antenna design into a more weatherproof version suitable for more permanent outdoor installation. Derek writes "I saw your idea for the 50MHz delta loop and thought you might like to see how I mounted the p.c.b. with coil and trimmers inside a plastic single outlet conduit box".

Derek also says that it's possible to purchase a 'soft plastic gland'

to seal the coaxial cable in the outlet, instead of using self amalgamating tape. He says this will make a neater job of it. I have to admit Derek, that I often make this type of lash-up in response to a need (usually quite urgent). Then, if it works, it is ignored.

And this is what happened with the delta loop, which was needed to monitor the 50MHz band during the Annual Novice contest run by Poole Radio Society.

But back to Derek's description of the method he uses, shown in Fig. 4. The p.c.b. for the Pi-matching unit as described in the September 1998 issue of *PW* and it's placed in the conduit box as shown. When you're happy with the matching of the loop antenna then the lid may be screwed on and the matching rechecked.

If all is well then an application of the glue used to 'weld' plastic conduit piping together will give a very good weatherproof seal. Derek has also sent in details of

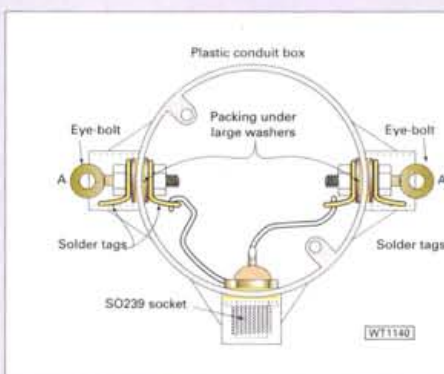


Fig. 5: A simple, cheap and easily made weatherproof dipole centre, also from G7OXJ.

the conduit box he uses for dipole centres shown in Fig. 5. This time he uses a three-exit version and instead of simple washer-clamped contact, he uses small eye-bolts as strain bearing point that offer some relief to the wire contact.

Interestingly enough, Derek shows his loop fed from the top of the loop, even though it is still shown as a single 'point' upwards, supported by a rope to a chimney or other point. But he says that he has never had any water get into his 'conduit-box' antenna feedpoints. Well done Derek, a simple effective antenna has been improved again - now who's next with modifications?

Ah well! That's all I have space and time for this month, I look forward to meeting you in the next issue of A-i-A. *G17EX*



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Antenna Workshop

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Fig. 1: The Double Dipole Antenna arrangement. See Table 1 for dimensions. The dipole centres 'T' are shown in detail in the inset drawing.

A half wave dipole antenna has many virtues; one being its very high efficiency, for more than 90% of the transmitter r.f. is radiated in its 'figure of eight' horizontal radiation pattern. The two gaps in its radiation pattern are off the ends of the wires and even in those two directions there is some high angle radiation. A dipole is often the antenna, against which others are compared, as it has little 'gain'. Under these circumstances the gain of any antenna is quoted in 'dBs' with the reference taken as a dipole - or in units of 'dBd'.

To achieve some gain a pair of identical dipoles, arranged in line and having the correct spacing between their ends, can be driven in phase and this pair of antennas will then give more than 3dBd (double the power) of gain at right angles to the line of the antenna wires. This 'in-line' arrangement of two antennas is called a Collinear antenna that can have a maximum gain of 3.4dBd which is possible when the two dipoles are separated by 0.45 of a wavelength at the operating frequency.

With end spacing closer than 0.45λ, the gain in the two side lobes falls to just over 1dBd. When the two dipoles is fed 180° out of phase (with one another), the radiation pattern becomes that of a full wave antenna, which is a four lobe pattern with maximum radiation directions 54° from the line of the dipole wires. Both of

these patterns are shown in Fig. 1. To achieve correct phasing each dipole must be fed with identical lengths of feeder from the switching point.

Under the arrangement I'm suggesting, feeder switching can be done at some point close to the operating position and I've given some details in Fig. 2. Positions one and two on the switch control both dipoles, but when the switch is in position number 3, one feedline is completely isolated and the antenna then effectively becomes a single dipole. But enough of the theory, let's have a look at a practical arrangement that may be put together at home.

Length Not Excessive

When such an antenna is designed for one of the higher frequency h.f. bands, i.e. 14MHz and above, the total length of the antenna will not be excessive. Many small or medium sized gardens will accommodate such a collinear antenna. The total length needed for 28MHz will be some 14.75m (48ft 4in), with twice this distance needed for the 14MHz version.

To operate effectively and provide the low angles of radiation needed for DX work, the dipoles should be elevated to at least a half wavelength from the ground. If possible, the antenna can be higher to be above the screening effects of nearby buildings and trees.

| Freq. (MHz) | Length 'D' (m) | Spacing 'S' (m) | Length 'L' (m) | Height 'H' (m) |
|-------------|----------------|-----------------|----------------|----------------|
| 28.50 | 5.01 | 4.73 | 14.75 | 2.6 |
| 24.94 | 5.73 | 5.41 | 16.87 | 2.9 |
| 21.30 | 6.71 | 6.33 | 19.75 | 3.4 |
| 18.10 | 7.90 | 7.45 | 23.25 | 4.0 |
| 14.25 | 10.03 | 9.46 | 29.52 | 5.1 |

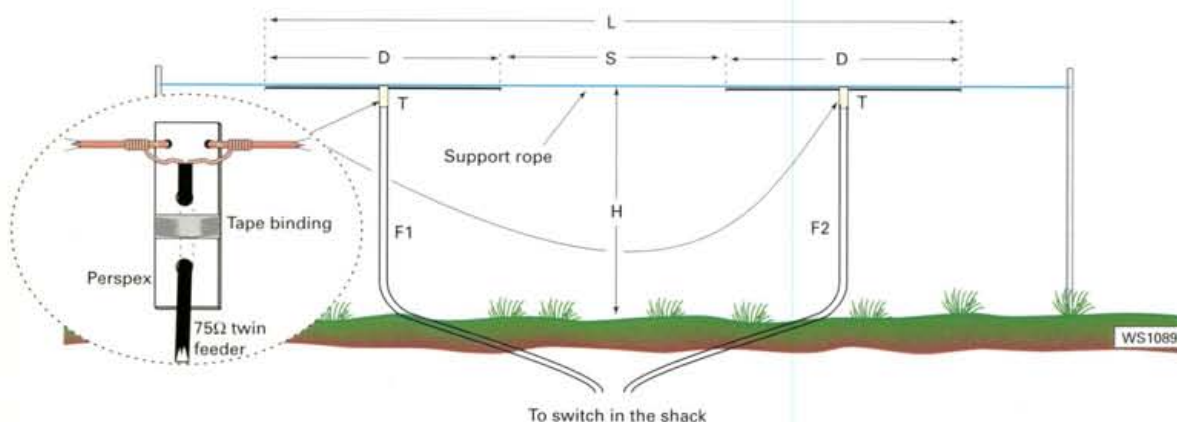
Table 1: Dimensions for the Double dipole system covering the 14-28MHz bands. Dimensions 'D', 'L' and 'S' critical for each band, but the height 'H' is a suggested minimum (but may be varied).

The dipole lengths are calculated from the well known $143/f$ (MHz) metres formula and the separation distance 'S' (as shown in Fig. 1) is calculated from the free-space full wavelength $300/f$ (MHz) metres multiplied by 0.45.

The optimum lengths of the dipoles and the spacings for five amateur bands are given in Table 1. Both dipoles must be as near identical as possible, by using vertical sticks in the ground and a cord to measure out the half dipole lengths and

allowing a little extra to take care of the bends at the insulators and at the dipole centres 'T'. This method of measurement is easier and more accurate than efforts using a metre rule or tape running along the wire.

A strong man-made cord such as Nylon or polypropylene, **not wire**, must be



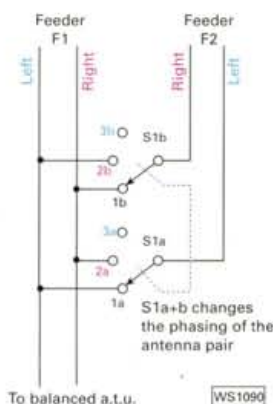


Fig. 2: Switching arrangements to vary the dipole phasing. Position 1 gives 'in-phase' operation, Position 2 is for out-of-phase operation. In position 3, the antenna becomes a single half wave dipole. 'Left' and 'Right' on feeders define the left or right-hand section of each dipole.

and is relatively cheap. It's sold as light to medium duty and is ideal for up to 400W p.e.p. levels of transmitter power.

Heavy Duty

There is a heavy duty type of this 75Ω twin feeder which is advertised as being suitable for powers levels of several kilowatts (a little 'over-the-top' in the UK). The 300Ω or 450Ω 'ladder' line feeders can be used, but these are heavier and cost about twice as much as the 75Ω variety which is also affected less by rainfall. Suitable 75Ω feeder can be obtained from **W.H. Westlake** of Holsworthy, Devon.

I've found that dipole wires will last longer and give many years of first class service if 16 s.w.g. hard drawn copper wire is used in preference to multi-strand wires. I have a personal dislike of multi-strand plastic insulated wires used by so many people for antennas. These wires often have invisible breaks inside the insulation and capillary action can lead to the corrosion of the thin internal wires. I have used the same hard drawn copper wires for antennas of all types for more than 20 years at my present location which is not far from the sea.

Each feeder must descend vertically (or at right angle to the dipole elements) for at least a quarter of a wavelength before it bends to travel towards the operating position. The feeders must not run together and I've found that a separation distance of at least twice the feeder's diameter will prevent unwanted coupling. At the shack the feeders must enter through separate and spaced holes.

The two pole three-way switch needed to change the phasing need not be an expensive item, for the r.f. voltage along the feeders is low. Often the junk box will provide a suitable component and I've found that rotary bandswitches rescued from old 'dead' broadcast receivers are ideal. Before the antenna is hauled up into position a multi-meter must be used to identify which feeder wires connect to the left or

used to maintain the spacing 'S'. The most critical measurements, however, are in making sure that the two feeders F1 and F2 (Fig. 1) are the same length. If the feeders are not of equal length, proper phasing cannot be

achieved. The two feeders, I find, are best made with 75Ω impedance twin balanced feeder. This is lightweight, has low loss (0.3dB per 30m at 30MHz)

right legs of each dipole. The wires can then be marked in some way. This cannot be done once the antenna is in the air.

Final Point

As a final point, I have to say that as the 'Double Dipole' system is longer than a 'normal' dipole, it isn't always possible to orientate the antenna into the most favourable position but when you have enough space available this can be done to give the greatest operating advantage.

A Great Circle world map will help a lot with this orientation and really your first consideration is to arrange the antenna so that the in-phase lobes which have good gain are directed towards desired countries or continents. If the antenna is positioned so that one in-phase lobe fires towards North America the antenna should give the same gain towards the South East. The 'out of phase' pattern of four lobes will then be found to cover much of the remaining land mass areas.

Unfortunately, there will always be two unavoidable poor 'directions'. These directions are always in the line of the wires off the ends of the dipoles. If possible, make sure that the line of the antenna wires is towards a direction where there is little amateur radio activity. Although each location is somewhat different, I'd always try to position the antenna so it runs a little east of north and west of south. This puts the radiation nulls towards Finland and the South Atlantic; two directions that the surroundings at my QTH doesn't often favour.

Balanced ATU

The feeders, being balanced, must connect to a balanced a.t.u. and of course, the impedance presented to the a.t.u. will be around 37 or 38Ω (half of the 75Ω nominal feeder impedance). When the system is switched to operate as a single dipole then the feed impedance will again be the 75Ω of a single dipole. If the a.t.u. (for example a transceiver internal a.t.u.) is only designed to work into an unbalanced feedline (coaxial connector) a simple 1:4 or 1:1 Balun is needed. If this is the case then the designs for a suitable balun can be found in many antenna books.

Although a fixed antenna, the Double Dipole is electrically steerable and is a cheap and easy way to 'cover the World'. The 3.4dB gain is as good as the gain available from some multi-element beams which, with their shortened trapped elements have very little gain at their lowest frequency of operation (which is often as high as 14MHz).

Switching the antenna when listening is interesting, for often the switch position giving most signal can be bettered on receive by switching to a position where, although the signal is not so strong, there is much less noise or QRM. If the feeders are 'strapped' the antenna can be tuned to operate as a top loaded wire on the l.f. bands.

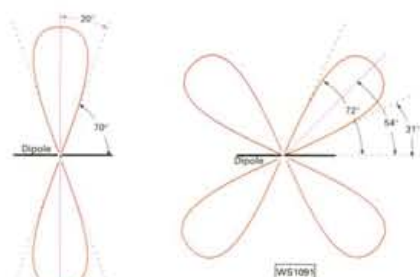


Fig. 3: Horizontal polar diagrams produced with the different switch positions which show the radiation nulls off the antenna ends. Please note that a single dipole has a rather broader radiation pattern than the Double Dipole (see text for more detail).

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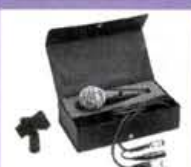
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RadioScene

VHF REPORT

REPORTS & INFORMATION BY
THE LAST SATURDAY OF EACH
MONTH.

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PACKET RADIO @ GB7MAD

UK DX CLUSTER @ GB7DXC

THIS MONTH DAVID BUTLER
G4ASR HAS NEWS OF BAND
PLAN PROPOSALS AND
DETAILS OF AN AUTOMATIC
PACKET REPORTING SYSTEM.

Hopefully the recent lack of good propagation conditions on the v.h.f. bands is indicative of the lull before the storm. Conditions were reported as 'rather quiet' in the December-January period and that in February was even quieter. Just two events were worthy of note - a Sporadic-E (Sp-E) opening to Scandinavia on February 8 and an auroral back-scatter event on February 18.

Novice station operator **Alex Gordon 2E1GJK** (IO93) reports that he heard the Sp-E opening on the 50MHz band between 1320-1420UTC. He mentions that for much of the day he listens to the band whilst driving vehicles around a large quarry in Lincolnshire. Alex uses an Alinco DX-70 transceiver running 3W into a ProAm PHF-6 loaded vertical antenna and was very pleased to make s.s.b. contacts with the stations of OH1VR (KP11), OH2VZ (KP20), OH3MF (KP20) and OH5NE (KP41).

The auroral opening on February 18 consisted of a number of discrete events commencing around 1330UTC, waxing and waning until late in the evening. Conditions on both the 50MHz and 144MHz bands were very similar with contacts being made from the UK with stations located in Norway, Sweden, Denmark, Germany

and Holland.

Surprisingly, there was a reasonable amount of activity on the 50MHz band. I say surprisingly as, in my opinion, most operators on this band tend to miss or perhaps they're just not interested in working the short-distance DX via auroral back-scatter. That's a shame as you really are missing out on this exciting propagation mode!

Among the stations reported on the 50MHz band were DJ4AX (JO31), DL8YHR (JO41), LA4LN (JP50), PA2TAB (JO32), PA2VST (JO22) and PE2ENG (JO33). As is normal for auroral openings such as this, much of the UK activity was situated in northern England and Scotland with the stations of G4FVP (IO94), G6YIN (IO93), G7LXK (IO93), GM3WOJ (IO77), GM4VHU (IO87), MM0AMW (IO75) and MM1ATY (IO85) being particularly active.

However, down south, stations such as G3NVO (IO91), G4HBA (IO80), G7RMG (IO80), G0HVQ (IO81) and GW7SMV (IO81) were also noted. **Jamie GW7SMV** was also active on the 144MHz band and he reported hearing s.s.b. signals from the stations of G6YAY (IO80), GM3JJJ (IO68), GM7WLE (IO88) and PE1HWO (JO22). Other stations known to be active during the afternoon included GM8LFB, MM0BQI (both in IO85) and OZ1LPR.

TRANSATLANTIC ATTEMPT

Later this year, during the June-August period, a Belgian contest group led by **ON7WP** will be attempting to make the first transatlantic contact on the 144MHz amateur band. Their intention is to win the Brendan Trophy which will be awarded to each of the operators of the two Amateur Radio stations which first establish two-way communication between the continents of Europe and America (North or South) without the assistance of repeaters or satellites.

The proposed equipment includes a Yaesu FT-225RD transceiver with MuTek front-end and a Kenwood TS-690S h.f. transceiver with an external transverter. Antennas are of

course a vital part of the system and the group intend to use an array of four 16-element F9FT Yagis at 20m above ground. To give the signals a fighting chance two 2kW amplifiers will be used (not both at the same time!) with a solid-state 600W unit as a spare.

So, what are the chances of hearing anything? According to **Emil Pocock W3EP** (v.h.f. columnist in *QST*) the chances of hearing a transatlantic signal on the 144MHz band, although small, may be distinctly possible. They're certainly much better when properly equipped operators on both sides of the Atlantic Ocean make concerted efforts.

Tropospheric ducting remains the best bet for sustained and repeated openings, especially from the Caribbean to southern Europe. This is the Bermuda 'high' which I mentioned in this column last year. Sporadic-E is a remote possibility but any openings are likely to be short-lived and unpredictable.

With the establishment of beacons in North America and Europe, serious consideration should also be given to a third possibility - Auroral-E. Single-hop auroral-E on the 144MHz band is common enough in the auroral zones and it probably appears during magnetic storms at the latitudes of these northerly beacons as well. Whether the necessary two hops can be put together is uncertain but it will certainly be worthwhile to listen for North American beacon stations both on the 50MHz and 144MHz bands during major storms.

SOLAR ACTIVITY

The increase in solar activity over the next few years could therefore make this time an ideal period in which to attempt a transatlantic contact via auroral-E. Coincidentally, a recent press release from **NASA** has provided details of the solar wind emanating from the Sun. Like water gushing through cracks in a dam, 'fountains' of electrified gas, called the solar wind, have been observed by scientists flowing around magnetic regions

on the Sun to begin their three million kilometres per hour rush into space.

Using the **Solar and Heliospheric Observatory (SOHO)** spacecraft, scientists have observed solar wind flows coming from the edges of honeycomb-shaped patterns of magnetic fields at the surface of the Sun. For over 30 years scientists have observed high-speed solar wind coming from regions in the solar atmosphere with open magnetic field lines, called coronal holes.

The solar wind comes in two varieties, high-speed and low-speed. The low-speed solar wind moves at **only** 1.5 million kilometres per hour, while the high-speed wind is even faster - as high as three million kilometres per hour.

As the solar wind flows past Earth, it changes the shape and structure of the Earth's magnetic field. In the past, the solar wind didn't affect us directly, but as we become increasingly dependent on advanced technology we become more susceptible to its effects. Researchers are learning that variations in the solar wind flow can cause dramatic changes in the shape of the Earth's magnetic field which can damage satellites and disrupt communications and electrical power systems.

The solar wind can also lead to major auroral events but whether a transatlantic contact is made via this mode, Sp-E or tropo it is useful to note what **Andy Nicholls G3VMZ** has to say on the subject. He thinks that it's very important to make tape recordings of any signals heard. Andy mentions that simple auto-record circuits are available.

Anyone attempting the challenge should easily be able to make a recording of the event. This will confirm to you that your ears are not playing tricks whilst listening for weak signals in a noisy environment and it will provide irrefutable evidence to those who doubt it is possible. It will also allow others to post-process the signals with digital signal processing (d.s.p.) units in case further information can be extracted. I'll be giving more details next time how d.s.p. can be used when listening for extremely weak signals buried in the noise.

BAND PLAN CHANGES

You may have recently heard that **NTL**, owner of many prime, hill-top communication sites (mostly ATV transmitting stations), are planning to charge site rental rates equating to those

levied to commercial operators. They're sympathetic to the Amateur Radio community but are under pressure from their customers to impose a more realistic fee for the space they provide to Amateur Radio repeater groups.

Organisations such as the **RNLI, National Trust** and other charitable groups already have to pay 80% of the commercial rate. Following discussions with the **Radio Society of Great Britain (RSGB)**, NTL have now agreed that the time scale for reaching the 50% of the commercial rate point will be extended from three to seven years and also agreed to a 5% reduction in the year one charge.

Amateur repeater groups (covering voice and data links) will now pay 10% of the commercial rate from April 1999 with the remaining 40% increase spread in equal increments over the six year period ending March 2006. From April 2006 groups will be required to pay 50% of the then current commercial rate.

Even at the 10% rate being charged this April, the fees being quoted are not inconsiderable. For example, they range from many hundreds to many thousands of pounds. Clearly this is a tremendous blow to groups who run key digital nodes and repeater units from these sites and it is apparent that many of these links may be lost in the near future.

During the forthcoming year, the RSGB will be working with both the repeater keeps and NTL to carry out a full survey of Amateur Radio equipment located on NTL transmitter masts with a view to seek further reductions in costs. An example of this is that if equipment can be re-sited in a lower position on the masts or be re-located into buildings on the site then the charges levied will be considerably lower than the commercial rate.

For some months, the RSGB v.h.f. and data communications committees have been aware of this issue and have sought solutions which would provide additional spectrum allocations for digital communications. It's expected that these proposals to the v.h.f. and u.h.f. band plans will go some way in easing the provision of replacement facilities for those which are under threat.

At the same time, work with the repeater management committee has enabled certain frequencies within the repeater sub-bands to be prioritised for emergency communications use. The proposals, shown in the tables **Figs.1-4**, go some way in achieving the requisite objective

while providing allocations which are proportionate to the current and projected use of the bands. That said, one downside to this is that it appears that Amateur TV (ATV) enthusiasts on the 430MHz band are slowly being squeezed out of what is a shared area of the spectrum.

Fast Scan TV (FSTV) carrier frequencies already need to be carefully chosen so as to avoid interference to other users, in particular the repeater input frequencies (434.600-434.975MHz) and the amateur satellite service (435-438MHz). Because of this, the **International Amateur Radio Union (IARU) Region 1** recommends that video carriers should be in the range 434.000-434.500MHz or 438.500-440.000MHz. The use of 438.025-438.525MHz and 439.600-439.999MHz for digital communications clearly reduces the available spectrum for the FSTV enthusiast.

Fig. 1: 50MHz Band Proposals:

| | |
|--------------------|--|
| 51.2100MHz: | Emergency communications priority (now deleted) |
| 50.7500MHz: | Emergency communications priority* |
| 51.2500MHz: | Emergency communications priority* |

***This channel pair is proposed for emergency communications talk-through operation.**

Fig. 2: 70MHz Band Proposals:

| | |
|--------------------|----------------------|
| 70.3625MHz: | Digital Modes |
| 70.3875MHz: | Digital Modes |
| 70.4125MHz: | Digital Modes |
| 70.4375MHz: | Digital Modes |

Because of the clash of interests affecting both television, emergency communication and other specialist users, the RSGB have decided that it would be unwise to proceed without having a further period of consultation with everyone affected. If you have any suggestions regarding these specific band plan proposals then you are invited to send them to **RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Hertfordshire, EN6 3JE** or alternatively to post them to **bandplan@rsgb.org.uk** if you have E-mail. Background information behind the reasoning for these band plan changes are expected to appear in the April edition of *RadCom*, the RSGB Society magazine.

Whilst on the subject of band plans, I've heard that requests have been received asking for the provision of an exclusive frequency within the 144MHz band for use by a new mode called **Automatic Packet Reporting System (a.p.r.s.)**. One of the suggestions being made is

that it's unnecessary to have both a slow scan TV (SSTV) calling frequency (144.500MHz) and a FAX calling frequency (144.700MHz). It may be possible to have a combined calling frequency for both of these modes, therefore releasing one for use by a.p.r.s. users.

In my opinion, I think that a.p.r.s. should be located on the 430MHz band but we are after all driven not by what is best for the user but by what the manufacturers think we want! What do you think? Please let the RSGB know your views.

PACKET REPORT SYSTEM

Never heard of the automatic Packet reporting system (a.p.r.s.) or unclear about what it does? Maybe the following will help. Basically, it's very similar to a Packet radio set-up but that's where the similarity ends. It consists of a transceiver

makes this system different is the a.p.r.s. software - written by **Bob Bruninga WB4APR**. It allows for real-time tactical communications and also provides a display system that shows you where other stations are located.

The software works by using specific Packet radio frames to transmit its data as a broadcast. By doing this, it's able to keep an 'all-informed' net. In other words, everyone running a.p.r.s. on the same frequency receives everyone else's transmissions. This is, therefore, an open network which, by its very nature, works most efficiently when all users share a common frequency. (Hence the reason for a new allocation within the v.h.f. and u.h.f. bands).

The real time communications permits any number of stations to exchange data just like voice users would on a voice net. Any station that has information to contribute simply sends it and all stations receive and log it. However, the data information sent isn't simply restricted to text messages - I've heard that some stations have recently been sending fixed pictures via the system.

You can also interface the system with a weather station (there are currently about ten

Fig. 3: 144MHz Band Proposals:

| | |
|--------------------|--|
| 144.675MHz: | Emergency communications priority. |
| 144.800MHz: | Digital Modes. Emergency communications priority. |
| 145.790MHz: | Proposed point-to-point links. 16kHz maximum bandwidth. |

Fig. 4: 430MHz Band Proposals:

| | |
|----------------------------|---|
| 430.000-431.990MHz: | Digital Communications |
| 430.825MHz: | Emergency Communications Priority* |
| 432.600-432.700MHz: | Digital Communications |
| 432.725MHz: | Emergency Communications Priority |
| 432.750MHz: | Emergency Communications Priority |
| 432.775MHz: | Emergency Communications Priority |
| 433.600-433.800MHz: | Digital Communications |
| 438.025-438.525MHz: | Digital Communications |
| 438.425MHz: | Emergency Communications Priority* |
| 439.600-439.999MHz: | Digital Communications |

*** This channel pair is proposed for emergency communications duplex digital operation.**

(normally operating on the 144MHz or 430MHz band), a terminal node controller (any standard TNC capable of 1.2Kb or 9.6Kb operation) and a computer (anything from a 'bog-standard' 286 to the latest speed-of-light PC).

As with conventional Packet radio transmissions, messages sent from the PC are converted into a suitable audio format (AX25) by the TNC and transmitted by the radio. What

units that are compatible) to automatically broadcast the weather at your location. The information could include pressure, wind direction, strength, rainfall and humidity.

The uses of weather information is almost unlimited, not only for keeping records, but also for the prediction of severe weather effects such as floods. There's also the possibility of using the information for propagation studies. In the

RadioScene

future, a network of remote unattended (and fixed attended) weather units could be set up to form a real-time national weather reporting system.

The display system is probably one of the major assets of a.p.r.s. as it can track fixed or mobile stations making it ideal for special event or emergency use. For the real-time tracking function to work, a global positioning system (g.p.s.) receiver needs to be interfaced into the Packet radio system of the mobile station. Fixed stations can, however, still use the tracking/display system by inserting their location information within the transmitted data frame.

The display viewed on the PC comprises of a map of your (selected) area with different stations shown as specific icons. The maps can be generated by using a variety of methods, for example: Notepad, g.p.s. unit or a digitiser and it's up to you what

information goes on them. If a station broadcasts his position it can be tracked.

So, if you plan to go out walking on the hills you take your hand-held, a pico-packet t.n.c. and your g.p.s. unit with you. Every few minutes you transmit your position and it can be seen on maps throughout the area. Alternatively, you have a tracker fitted in your car so the XYL knows when you're close to home or indeed where it is when someone has stolen it!

Applying this principle is almost unlimited. For example, you're watching the news and there's been a large chemical spill in a local village. You go to your a.p.r.s. and put a 'no-entry' icon on your map and call it 'Chemical Hazard'. Everyone else using a.p.r.s. can now see that symbol on their map and know of the restriction.

The system can also be used for direction finding by permitting the plotting of signal

strength contours. This permits stations with omni-directional antennas to participate and provide valuable information. It's made possible because a.p.r.s. has a line-of-sight power-height-gain (PHG) reporting and display format which it can use to draw range circles around each station showing his relative communication range and strength.

Trials have also been made using the **Mir Space Station** and other satellites as 'digipeaters'. Using satellites greatly increases the range and capabilities of a.p.r.s. This mode is an excellent way of introducing school children to Amateur Radio and satellites communications.

Sunsat will also contain a bulletin board (b.b.s.), a digital store and forward message file capability on the v.h.f. and u.h.f. bands. This digital system will operate at 1.2Kb or 9.6Kb audio frequency shift keying (a.f.s.k.). **Sunsat** also has a 'parrot' repeater system (mainly for schools) which can receive and repeat voice messages on 145.825MHz using narrow-band frequency modulation (n.b.f.m.) with a 3kHz deviation. Telemetry beacons will operate on 436.250MHz and 436.300MHz. The satellite is expected to remain in orbit for about six years.

DEADLINES

That's it again for another month. Please forward any news, views, comments or photographs to the address and by the date given at the top of the column.

THANKS FOR YOUR LETTERS AND GOOD LUCK WITH THE DX. SEE YOU AGAIN NEXT MONTH.

73 David G4ASR

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THIS MONTH LEIGHTON SMART GWOLBI REPORTS ON THE HIGHS AND LOWS IN PROPAGATION CONDITIONS AND THERE'S ALSO NEWS OF ONE RADIO AMATEUR'S LOW PROFILE ANTENNA SUCCESSES.

Following the high in propagation conditions during January, the month of February proved to be a great let down for many of us! Poor conditions were reported by all reporters, although there were a few days this month where things seemed to pick up a little.

Nevertheless, all the h.f. bands have provided some degree of both long and short distance propagation despite this 'dip' in conditions generally. At times like this, one really has to be on the right band at the right time and it really pays to scan the bands more carefully for that elusive DX station!

LOW PROFILE ANTENNA

A telephone call came in this month from **Ian Cowdrey G4TNZ** of Derby, who's as pleased as punch with the results he's achieved from the makeshift antenna he's erected. Ian tells me that it's a single wire affair, run around his garden through the apple trees at a height of just 3.5m. It's about 50m or so in length and used in conjunction with an MFJ Versatuner.

On the 21MHz band Ian has already racked up contacts with 3V8BB in Tunisia, KC3TL in the USA, a load of Europeans, as well as UN7BD in Kazakhstan, 4Z5LA in Israel and even YB0AZ in Jakarta, Indonesia! A total of five continents worked. Not bad for such an antenna eh? He's tuning it against a single earth rod, which is not a great earth for such an antenna and I'm sure that if he were to add a counterpoise and/or a few buried radials it would perform even better with greater earth return currents. Still, what Ian's doing just goes to show what amateurs can get away with in terms of antenna systems! eh?

Indeed, following Ian's telephone call, I decided to reconnect the rain gutting of my house as an antenna and give the 21MHz band a try. It tuned up reasonably well via the a.t.u. and with 5W of c.w. I managed to hook up with the USA, Canary

Islands, Belarus, Russia and Slovenia in a single afternoon. The impedance? No idea at all, probably horrifyingly high in my guess, but it worked well enough considering and, as I didn't already have an antenna for 21MHz, it's now my dedicated radiator for that band. I'm not sure what will happen when it rains heavily though!

Have you used unusual objects for antennas, or been forced to use makeshift antennas in all sorts of places? Write in and share your experiences with our readers!

NOVICE LICENCE RESTRICTIONS

Readers may recall that I raised the issue of Novice licence restrictions recently. I mooted the idea that Novice operators should be allowed 5 or 10W output and access to all band allocations according to their class of licence - as a way of increasing the appeal of amateur radio and reversing its decline.

A letter has arrived from **Alan Clay M0AXJ** of Wirral, who says: "I totally agree that these people should get a fairer deal. I've worked quite a number of Novice stations on 3.5MHz and have yet to come across a bad operator. Would it really cause a problem to let Novices use 10W and give them full access to all the bands (and

modes)? I don't think so!"

Alan goes on to say: "It's very strange how we operate our licensing laws here. Anyone can pass the RAE, learn the Morse code and then be allowed to operate without any practical experience at all. While the poor Novice has to undertake a practical course followed by an examination before they are allowed the so called 'privilege' of 3W and tiny slots in a few of our bands!" Any more thoughts on this anyone?

ALL AT SEA!

A note came in from **Martin Lewis MW0BRO/MM**, who is based on the 'Kan-Tan 4' oil rig in the North Sea. (See Fig. 1). Martin says that he's now had his QSL cards back from the printers and would like to assure everyone who's waiting for a card that they'll be receiving one soon.

It seems that since he was licensed in 1998, Martin has been really busy operating from the rig (the oil rig, that is!), but further details about his maritime mobile operation can be found on his Web site at: www.angelfire.com/on/kantan4

PROPAGATION REPORT

Now over to **Don McLean G3NOF** in Yeovil for his regular 'Propagation Report'. Don says:



Fig. 1: Martin Lewis MWØBRO/MM, who is based on the 'Kan-Tan 4' oil rig in the North Sea announces that his QSL cards (shown here) are now back from the printers.

"In my opinion conditions are not as good as they were a year ago, or even a month ago! On the 14MHz band the only DX of note were west coast Americans who came in between 1500 and 1700UTC and the band usually closed by around 1900UTC.

"18MHz was very poor and patchy. A few long path signals were heard between 0800 and 1000UTC from Australia, New Zealand and Japan, with Alaska coming in over the North Pole. US stations came in between 1200 and 1700UTC and the band usually closed by 1800UTC.

"A few long path openings on the 21MHz band appeared to Australia and New Zealand around 0930, with short path openings to Asia at around 1530UTC. North America came through between 1300 and 1800UTC and the band usually closed by 1700UTC.

"Another patchy band this month was 28MHz. There were long periods where no signals were heard. Some US stations appeared in the afternoons and a few African stations were heard during the mornings. The band was closed by 1700UTC".

YOUR REPORTS

Now over to your monthly reports, starting with the 1.8MHz band this time. First up comes c.w. operator **Ted Trowell G2HKU** on the Isle of Sheppey

in Kent who has, yet again, cracked Australia on 1.8MHz in the form of VK6HD, as well as working 4N800H (Yugoslavia) LY2WR (Lithuania) and HA1ZZ (Hungary), all at around 2100UTC. Ted uses 70W of c.w. and G5RV dipole/HF6 vertical antennas.

In between job-hunting, **Eric Masters GØKRT** of Worcester Park in Surrey has been elected Secretary of the **Wimbledon & District Amateur Radio Society** - no doubt leaving him with even less time for operating the radio! Nevertheless, he was pleased to work a new country on the

1.8MHz band this month, hooking up with UA2FJ in Kaliningrad at 2212UTC. Also worked on 1.8MHz was OK1DX (Czech Republic) at 2100UTC, both contacts taking place on c.w. with a wire antenna of just 26m in length!

Operating with 1W of c.w., GWØLBI hooked up with F9KP (France), DL2DCM (Germany) and G3TRU (England), while 0.5W brought in G3RLF/P, while GJ2D (Jersey) and OT9T (Belgium) were worked at 200mW, all contacts taking place between 1830 and 2300UTC.

THE 7MHz BAND

Leaping ahead now to the 7MHz band, we find **Sean Gilbert G4UCJ** of Milton Keynes, who agrees that conditions have been poor - he says 'rather lousy' in fact! However, using c.w. on the 7MHz band Sean lists contacts with the ZL9CI (Campbell Island DXpedition) at 0900, PY1HE (Brazil) at 0137, EL2WW (Liberia) at 0010, V31JZ (Belize) at 0025, as well as P21DV (Surinam) and W7CB (west coast USA) both at around 0700. Not bad going on a poor band, eh?

Down in Skewen in West Glamorgan we find **Carl Mason GWØVSW** who used his 5W QRP Plus rig and a G5RV dipole to hook up with the ZL9CI DXpedition, as well as working EA8/DL6SFG/P/QRP (Canary

Islands) at 1845, VP5/K8JIF (Turks & Caicos Islands) at 0131, and even that rare QRP DX station GWØLBI at 1122UTC!

THE 14MHz BAND

Even 14MHz, the most reliable of our h.f. bands seems to have taken a bit of a dive this month as far as conditions are concerned. On many occasions I listened here only to find one or two weak DX stations audible. Single-hop propagation, bringing in stations European stations was a little better though, but the long-distance traffic certainly has not been as prominent as it was a month ago.

However, on the 14MHz band Ted G2HKU lists all c.w. contacts with P4/K2LE (Aruba Island) and OY1CT (Faroe Islands) at 1000, as well as EA8/G3YXX (Canary Islands) and K6DC (USA) at 1600UTC, while operating around 1900 brought in contacts with VQ9QM (Chagos Islands), ZS1AAX (South Africa) and 5B4AGC (Cyprus).

Meanwhile, Sean G4UCJ lists his QRP contacts on the 14MHz band with FM5BH (Martinique Island) at 1752, TL5A (Central African Republic) at 1600 and 5A1A (Libya) at 1400UTC, whilst using 3W into an indoor wire antenna in the loft!

Yours truly GWØLBI loaded up his 60m long wire on the 14MHz band and used 500mW of c.w. to work K3LR and K1TO (USA) at 2350 during the UBA contest, while Eric GØKRT lists a single QRP contact with UA4CAM (Russia) at 1548UTC.

THE 18 & 21MHz BANDS

On to the 18 and 21MHz bands now and this month **Don McLean G3NOF** in Yeovil gave the higher bands all his attention and, starting with 18MHz, lists s.s.b. contacts with EL2WW (Liberia), a string of Japanese stations, as well as KL7AC (Alaska) and TP50CE (Council of Europe in Strasbourg), while the 21MHz band gave him contacts with J47XCF (Greece) W7RB (Idaho, USA), YBØDX (Indonesia), 8P9DX (Barbados) QSL via VE3ICR and 8R1Z (Guyana).

Using 3W and a 'Sandpiper' vertical antenna, Carl GWØVSW again 'bashed the key' on the 18MHz band to work CT1/G3KJX/QRP (Portugal) and W1KX (USA) at around 1400, while working at 1600UTC gave him two-way QRP contacts with VE2MMD (Canada) and KC3MX (USA).

Meanwhile Sean G4UCJ lists his 21MHz QRP c.w. contacts

with E21EIC (Thailand) at 1340, FM5BH (Martinique Island) at 1545, FG5EY (Guadeloupe) at 1800 and T26OF (Mali) at 1122, while Eric GØKRT listed a QRP s.s.b. contact with 5A1A in Libya at 1228UTC, "A rare one for me!", says Eric!

THE 24 & 28MHz BANDS

The 24MHz band is one that's often overlooked by many amateurs who tend to stick to the much wider 21 and 28MHz bands, however, it certainly has some characteristics of its own - not forgetting the fact that because its overlooked, it's not overcrowded! If you haven't tried 12m before, maybe now's the time to give it a go.

The 24MHz report from Ted G2HKU lists his impressive c.w. contacts with VU3VLM (India) at 1100, while operating at 1500UTC brought in ZS6DM (South Africa), VQ9QM (Chagos Islands), CO2OR (Cuba), EA8TB (Canary Islands) and PY2JM (Brazil).

The 24MHz band was the main spot for Don G3NOF this month, his s.s.b. DX here includes: EL2WW (Liberia), EP3HR (Iran), FR5HR (Reunion Island), HK3/GØSHN (Colombia) QSL via F6AJA, J3/KF8OY (Granada Island) QSL to home call, V47KP (Federation of St. Kitts and Nevis Islands) and finally 9G1YR (Ghana).

Although 28MHz was the patchiest of all the h.f. bands this month, **John Wheeler GØIUE** of Melksham in Wiltshire worked a load of stations from his mobile set-up of 100W into a mobile whip antenna. Working at around 1300-1400UTC, his s.s.b. contacts included VE1RMG (Nova Scotia), SV1CIB (Greece), KZ1H (USA), 9H1DE (Malta), EW2MA (Belarus) and UT3GX (Ukraine), while operating later at 1630UTC brought in LU5CW (Argentina).

Finally, The 28MHz report from Sean G4UCJ shows 30W c.w. contacts with PR72AJ (Brazil) and CP4BT (Bolivia) at around midday, while the mid-afternoon brought in 8P9DX (Barbados) and 9J2BO (Zambia), while operating with just 3W gave him a contact with CP4BT again, although this time at 1100UTC.

SIGNING OFF

Well that's about it for this month folks! Although conditions took a dive this month, it seems that our intrepid reporters have still managed to dig out the DX!

Still, it's now apparent that conditions will continue to

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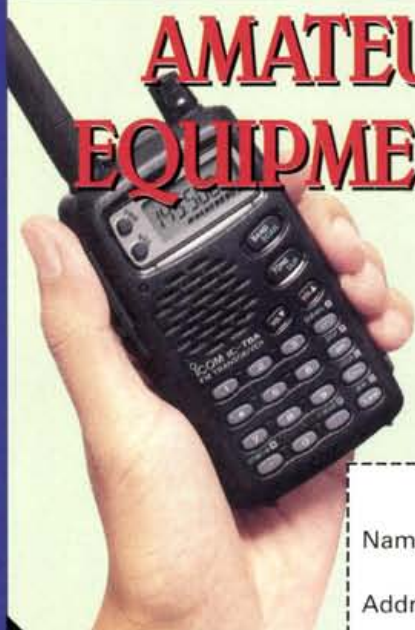
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RadioScene

improve, so keep your ear to the speaker! Thanks again to all correspondents for their reports, information and input to the column.

AS USUAL, REPORTS AND INFORMATION (AND PHOTOS AS I'M STILL LOOKING FOR PHOTOGRAPHS OF OUR REPORTERS!) BY THE 15TH OF EACH MONTH. DETAILS AT THE TOP OF THE COLUMN.

PW Listening & Operating Watch List. (All times in UTC).

Charlie Blake M0AIJ listens and operates:
0500-0700 on 7.061MHz s.s.b. with an NRD-525 receiver & Sloping Wire antenna and is also busy with his mobile rig.

George Woods G3LPT (Suffolk) operates:
an open net on 29.630 f.m. every weekday morning except Monday at 0930 local time.

Don McLean G3NOF operates:
1030 Saturdays on 3.685MHz on the ISWL Net or 1030 Sundays on the Yeovil ARC Net on 3.665MHz s.s.b. using a Kenwood TS-950 & trapped dipole antenna.

John Wheeler G0IUE monitors:
28.600 n.b.f.m. every evening between 1730 and 2230 regardless of conditions using a Yaesu FT-920 running 100W and a 2-element t.e.t. triband beam antenna/half-wave vertical antenna.

Leighton Smart GW0LBI operates:
on 1.949MHz s.s.b. and around 1.820 - 1.836MHz c.w. on weekday evenings between 1900 and 2230 using a Yaesu FT-747G QRP transceiver at 5W maximum and a 60m long wire Marconi antenna.

Rob Mannion G3XFD listens and operates (weekdays & weekends):
1800-1830 on 3.7MHz 100W s.s.b., & 3.530 or 3.560MHz and 18.105MHz QRP c.w. using an Alinco DX-70 transceiver and a long wire antenna or mobile whips. Also at 2300 on either 3.560, 7.025MHz (c.w.) or 3.7MHz s.s.b. Now also operating /P from the car on

weekends and on way home from work on 7, 14 and 18MHz after 1630UTC. (All operation dependent on PW workload!).

Sean Gilbert G4UCJ operates:
around 0700 to 1100 and 2100 to 0000 seven days a week on 14MHz and 7MHz using an FT-307 and Alinco DX-70 transceivers at 3/30W output and a G5RV dipole antenna in the loft space.

Leighton GW0LBI

DATA SCAPE

ROGER J. COOKE G3LDI

TEL: (01508) 570278

E-MAIL: rjcooke@FreeNet.co.uk

**PACKET:
G3LDI@GB7LDI.#35.GBR.EU**

ROGER COOKE G3LDI TAKES A LOOK AT A NUMBER OF DIFFERENT ASPECTS THIS MONTH STARTING WITH THE NEW MOVIESTAR SOFTWARE AND ENDING WITH A DISCUSSION ON THE GROWTH OF PSK31.

MovieStar is an exciting new development for the video buffs among us - no matter what video source you have, be it VCR, TV, Cable TV, satellite decoders, laser disk player, all types of camcorders, etc., you will be able to work wonders with this add-on board for your PC.

Applied Technologies Manufacturing (ATM) have just released their latest video editor with a four input video multiplexer. The whole package, called **MovieStar**, comes as a standard, high-quality PCI card - a four-layer p.c.b. constructed to UL 94V-0 standard.

The **MovieStar** package enables the user to capture video from a camcorder, VCR or TV through the S-video connector, or any one of four composite inputs, into an on-board video multiplexer. You can then save the video in AVI format and then

cut/edit both the video and audio, title, fade and splice it with the **MGI VideoWave SE+** software that is included with the package.

The software is now becoming the de-facto standard in entry level video editing. It's the interface to the **MovieStar** hardware. From within it, you can access the **MovieStar** drivers and select different video sources via the multiplexer as well as change the capture resolution. **MovieStar** drivers also support multi-standards in video, such as the NTSC standard and the various forms of the PAL standard.

You can also send the fully edited video over the Internet, include it on a Web page, copy it to CD-ROM, or put it back onto video tape. For copying back to videotape, you will need the **VGA-2-PAL** Pro card from ATM. Lots of amateurs are already using the Motion Picture card for SSTV and ATM usually have a stand at the major Amateur Radio shows, such as has been the interest in their products.

A full user guide and a tutorial on how to capture and edit a movie are included in the **MovieStar** package and I feel sure that present Motion Picture users will be interested in this card and it will certainly sell well at a very competitive **£69 plus VAT**. Present users of the Motion Picture product can buy it for **£49 plus VAT**.

There is another attraction for the card. There is an option called the **Security Patch Panel**, which ATM feel will produce a huge interest. It has four video inputs, each with its own power output 12V @ 1A and a trigger input that is alarm sensor compatible. When an event triggers the panel, the software switches to the correct camera and starts recording a time and date stamped AVI movie to disk for a pre-determined time. This will be a very useful selling point.

The operator can look at any of the four cameras immediately (selecting from the screen display) and record a time and date stamped video. There is also an auto sequence to go through the four-camera selection automatically. The **accessory lead is £10** and the **Security Patch Panel and software is a**

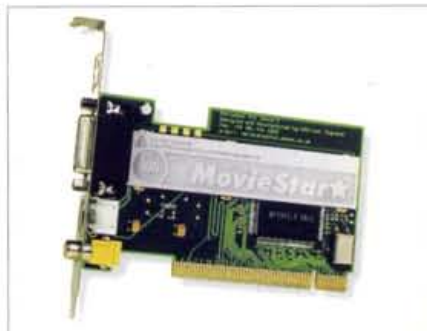


Fig 1: The MovieStar card.

further £99. When dealing with video on a PC, the storage space required is



Fig2: Pictures of Neil G0CAS, taken from his Web site at: <http://www.g0cas.demon.co.uk>



quite high, so the minimum host PC requirements are fairly demanding. However, HD prices are reducing all the time these days and it's not uncommon to find a 6Gb HD as a standard. To use **MovieStar**, the minimum requirements are a P166 processor, a 32Mb memory, a VGA card (24bit 800 x 600), a Motherboard PCI with a free slot, a hard drive UDMA IDE as large as possible, several Gb, a "16-bit" sound card with line in.

The **MovieStar** card is fully compliant with Microsoft's **Video for Windows** standard and you can use any AVI editor software with the **MovieStar** hardware drivers. The **VGA-2-PAL** Pro should be available by the time this is read. You can get in contact with **ATM** on **Tel: 0191-414 5929**. A picture of the **MovieStar** card is shown in **Fig. 1**. It comes complete with software, drivers, 20 page handbook and leads.

A very interesting and useful device to be used in conjunction

PSK31**Welcome to the
Official PSK31 WWW Page !!!**

(Last modified 27-Jan-1999)
This page is devoted to give information about the new PSK31 HF keyboard to keyboard mode.
Actually there are several implementations, almost all based on G3PLX evaluation module.
This will be the distribution point for every version.

**Home page of the
official PSK31 Web site.**

with the *Moviestar* board is the **Moviestar Security Patch Panel**. This consists of a surface mounted, all steel, polyester coated unit, designed to be mounted within two metres of the PC. The patch panel has four channels plus an output relay. Each of the four channels has a video input, a trigger input that can be configured as normally open for sensors like pressure mats or normally closed for sensors like the PIR or door contact switch. Each channel also has two 12V supply rails capable of delivering 1A in total. The 12V supply simplifies small-scale installation of low power cameras and powered sensors.

The patch panel is controlled by supplied software, which runs under *Windows 95/98*. This displays four separate windows on the screen from four separate cameras and a suitable low power camera can be obtained ATM directly, or from Maplin, part code PP30H.

Using suitable sensors, video can be recorded for future use, so all sorts of uses can be thought of for this unit. Obviously security is its prime purpose, but try putting one of the cameras inside a nesting box and see the chicks hatch! Again, the patch panel comes with software, 30 page handbook, leads and full instructions.

TAKEN TO TASK

In the **January** column, I mentioned the **Linux** operating system and passed a comment about Microsoft not being "worried" about another operating system. I received the following comments from **Jim Jackson**. Jim talks about the amateur providing competition for the commercials.

"Similar motivation drives people in the area of computer programming. And in that field it has been shown that 'amateurs' can, in many instances, do better than their commercial counterparts. I would expect fellow amateurs to applaud this success. Hence I was a little disappointed to read, what I took to be, a small sneer in the January 'Data Scape' column: 'I can't really believe that

Microsoft is worried though, can you'?

"Microsoft's success in the personal desktop PC market is not at all matched in the important,

critical internet and company server market, where Linux, other 'free' OSes (FreeBSD, etc.) and software products, hold a very significant share. Indeed, Microsoft's Hotmail free E-mail service runs on another FreeBSD and runs the famous 'free' Apache web-server software!"

I do take Jim's point but my comment, albeit flippant, was said with 'tongue-in-cheek', meaning that if I had £2000 billion in my bank balance, not much would worry me at all!

AGW PACKET ENGINE

I received a letter regarding the *AGW Packet Engine* software from **Graham G6YFF**. My personal experience has been positive and I have used it successfully in the following environments:

- 1). Pentium 60MHz - *Windows 95 - Winpack 6.4* using PK232MBX in KISS mode;
- 2). Pentium 60MHz - *Windows 95 - TCP/IP (Dial-up) MS Outlook Express* and ditto TNC;
- 3). Pentium 60MHz - *Windows 98 - TCP/IP (Virtual LAN Adapter)* ditto s/w and ditto TNC.

Well, apparently Graham has had no success with a Baycom modem! I have seen quite a few bulletins on the BBS from users with problems, especially with Baycom modems. I have not seen a copy of this software, but if anybody has been successful in getting it to run with a Baycom, please let me know!

INTERCENT 98

In the **March** column, I gave details of the **Intercent 98** programme. This has, apparently, been updated and is a much improved version called **'Intercent 99'**. The site is the same so get the latest version. This comes from **Gerald Bramwell** again, so thanks for that Gerald. It can save you money!

GOCAS WEB SITE

Neil Clarke G0CAS (seen in Fig 2), who produces the **RSGB propagation forecast** and also puts out propagation bulletins on the BBS, (very useful too, Neil!) has a Web site of his own which

can be found at <http://www.g0cas.demon.co.uk> It concentrates on propagation, solar information and astronomy and has useful links to like-minded pages. Well worth a visit - and some useful links too.

PSK31 GROWS!

The interest in **PSK31** is increasing. I took a look on T4 and 21MHz and heard quite a lot of activity. Following the article by **Peter Martinez G3PLX** in *Radcom*, the software has been downloaded by lots of interested amateurs. Locally, there are several using it already and these comments come from **Roger Basford G3VKM**. "If you haven't already seen it, I'd recommend **ZL18PU's** Web site, which is full of excellent stuff on "... human-readable digital modes ...".

I started taking an interest in soundcard applications in the last year or so and have had some success with the **WXSAT** program and also with **G3PPT's** Hellschreiber DOS programs, **Feld-Hell** and **MT-Hell**. The EVM module-based applications seemed very interesting but when I saw that Peter had also produced a soundcard version of his PSK31 software I could see that this was a chance to try out the mode with minimal outlay and, in my case, using existing cabling.

The soundcard version became available at Christmas 1998 and since then the software has gone through minor upgrades and is up to version 1.05 at time of writing. Peter G3PLX, has been very active on the mode, helping out newcomers with setting-up problems and generally keeping an eye on us!

The main trouble has been that some new users tend to ignore the copious warnings in the Help file to avoid over-driving the s.s.b. transceiver, which leads to broad band signals and QRM.

There are non-English versions of the Help file available on the Internet for overseas amateurs struggling with the English version and the mode supports the full *Windows* ANSI character set so allowing use of umlauts, accents, tildes and other non-English characters in the text. This means that Russian amateurs, for instance, can communicate in their own alphabet, something G3PLX believes has not been possible before on the amateur bands. I have to say the 'backspace' feature is my personal favourite and will appeal to all two-fingered typists!

I was decoding PSK31 signals within a few hours of downloading the software on the January 9 and, after a weekend's listening, I started off on the January 11 with a QSO with EA3VF on 14MHz. Apart from one minor problem specific to my rig (the IC-746 'monitor' function should be turned off when using PSK31), I had no real trouble getting started.

I did as the manual recommends and used the radio's accessory socket rather than the microphone input - not forgetting to disconnect the microphone! The waterfall and tuning wheel displays take very little getting used to and there are few 'bells and whistles', just a set of 'clickable' buttons for TUNE, CQ and CWID, frequency, etc.

The program supports file sending, so a brag tape can be sent and received text can be saved to a file. I would say that anyone who has used a *Windows*-based TNC program would find the PSK31 software a breeze. The availability of a good frequency counter to set up the software accurately would be helpful (explained clearly in the manual) but I suspect not everyone bothers with this, but as I had a counter I used it!

To date I've had QSOs with about 16 countries, no DX yet but I'm impressed with the number of people running QRP on the mode and most stations seem to be running 50W or less, as I am. A lot of the contacts have been rag-chews, with a lot of discussion on the new mode and less 'rubber-stamp' type QSOs.

I'm very pleased with the results and think that PSK31 will bring a lot of new people into RTTY-type modes who may have been put off by the data-forwarding type of digital operation that proliferates on the h.f. bands nowadays. As the mode is so narrow band it's often possible to 'slot-in' between the tones of other data mode transmissions and carry on without mutual QRM.

The weak signal performance is excellent, often signals are almost inaudible but still give legible copy, relying on the eye to fill in the gaps or correct the spelling rather than having an error-correcting system do it for you! Have a listen around 14.070MHz, you'll hear some activity there for sure.

THAT'S ABOUT IT FOR THIS MONTH.

Roger Cooke.

ROGER COOKE G3LDI DISCUSSES A VARIETY OF COMPUTER RELATED AMATEUR RADIO GOODIES THIS MONTH.

RadioScene

BROADCAST

REPORTS AND INFORMATION
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THIS MONTH PETER SHORE BRINGS YOU NEWS OF MORE SHUFFLING OF PROGRAMMES FROM THE THE BBC WORLD SERVICE, PLUS MORE NEWS OF PROGRAMMES TO KEEP AN EAR OPEN FOR AND WHERE TO FIND THEM.

Almost before the ink was dry on the pages of last month's edition of *PW*, the long awaited news about the **BBC World Service's** plans for its European language services were announced. German, the last western European service, was to close (its final transmission was on Friday 26 March at 1630UTC) and Hungarian and Czech were to have their budgets reduced.

English-language broadcasts are also affected - in positive and negative ways. Two distinct streams of programmes will be broadcast. One is a 24 hour news and current affairs service, the other is **World Service Plus**, with the existing 'rich-mix' of news, current affairs, features, magazine and sports programmes. The aim is to make World Service more appealing to local f.m. and a.m. stations around the world as a source of quality programmes for re-broadcasting.

At the same time, the



Voice Of America (VOA)
QSL card

number of short wave frequencies will be cut. Listeners living in parts of the world where there is a lot of local re-broadcasting, or where the BBC has its own f.m. transmitters, will have less choice of short wave channels to tune to. This is also true for parts of Europe which the World Service considers 'over-served' by short wave transmissions.

More money is being poured into the **BBC's Online Internet service**. The BBC's Web site is one of the most visited news sites in Europe. More language services from Bush House will be available via Internet audio and via Internet text, both live and 'on-demand'. World Service is embracing the Web in a big way.

OTHER STATION NEWS

The third generation of international music radio services from the **Voice of America** will be on the air by the beginning of this month. 'VOA Music Mix', a 24 hour English-language channel, will be broadcast world-wide via satellite - but only cable systems and local radio stations will be allowed to downlink the service for local re-broadcast. 'VOA Music Mix' succeeds 'VOA Express' and 'VOA Europe' and

will be a mix of contemporary music on weekdays and specialist music programmes at weekends including, for example, jazz.

If you want to know the transmission schedule of **Radio Free Asia (RFA)** and play a guessing game with the location of individual transmitters, check out RFA's Web site at <http://www.rfa.org>. One site is on the US-owned Northern Mariana Islands in the Pacific - the transmitters there carry Vietnamese and Chinese programmes and there has been jamming of these signals in recent months.

The US-funded radio service, based in the old National Public Radio building in downtown Washington DC, has incurred the wrath of governments across Asia who protest that the station's programmes interfere with their domestic issues. The Web site also allows you to listen to programmes in MPEG3-quality Internet audio using **AudioActive** software (the player can be downloaded free-of-charge).

Radio Free Europe (RFE) ended short wave transmissions in Estonian at the beginning of February. RFE now relies on transmission via local stations in the country.

As I reported last month, **Radio Australia** has been testing frequencies in the 21MHz (or 13m band). Nigel Holmes, Radio Australia's transmission manager, has been pleasantly surprised with the response, with good reception reported across Japan and North Asia, plus Europe.

Nigel Holmes intends to use 21MHz channels in the schedule period now underway - so keep your ears close to the receiver to see if you can hear Radio Australia coming in loud and clear, particularly between 0900 and 1400UTC. Let me know what you discover as it's rare that broadcasters use this band. In fact, 21 and 25MHz

frequencies are only really useable for about three out of the 11 year solar cycle!

Trans World Radio is adding a fifth 100kW transmitter on Guam to reach China and south-east Asia. The new equipment should be operational by early May.

Korean programmes will be beamed from **Radio Taipei International** again this year. The **Voice of Free China's** Korean service ended in 1994.

Radio Korea International is on the air with English at: 0200-0300UTC on 7.275, 11.725, 11.81 and 15.575MHz; 0800-0900UTC on 9.57 and 13.67MHz; 1130-1230UTC on 9.65MHz; 1230-1330UTC on 6.055 (to 1300) 9.57, 9.64 (from 1300)



Voice Of Free China QSL
card and sticker.



and 13.67MHz; 1600-1700UTC on 5.975, 9.515 and 9.87MHz; 1900-2000UTC on 5.975 and 7.275MHz; 2100-2130UTC on 6.48MHz; 2100-2200UTC on 15.575MHz; 2100-2200UTC on 3.98MHz via Skelton in the UK; 2200-2300UTC on 3.98MHz, also via Skelton.

Peter Shore



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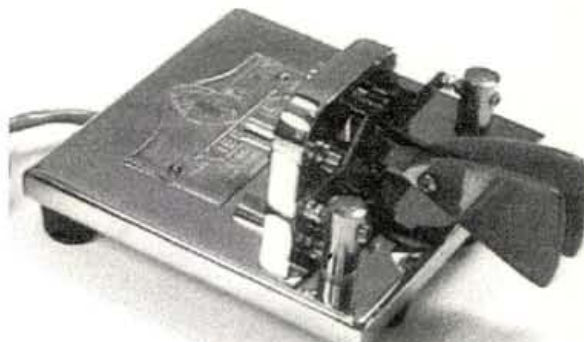
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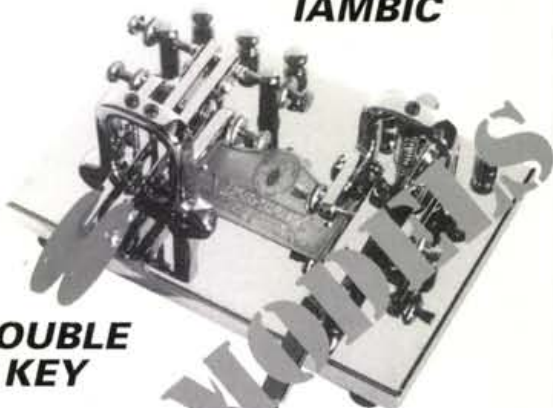


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TRANSCIEVERS HF

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| KENWOOD TS-505 HF MOBILE. | £499 |
| KENWOOD TS-930S HF 100W TX. | £699 |
| KENWOOD TS-680S 100W HF + 10W 6M + CTCSS | £599 |
| KENWOOD TS-440SAT 100W HF TRANSCIEVER | £499 |
| TRIO TS 120S 100W HF MOBILE/BASE | £250 |
| YAESU FT-757GX HF 10W TX/RX | £395 |
| YAESU FT-757GX TRANSCIEVER | £425 |
| YAESU FT-707 100W HF | £325 |

TRANSCIEVERS VHF/UHF

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|---|------|
| ICOM IC-240 2MTR 10W FM MOBILE | £99 |
| ICOM IC-228H 2M 45W MOBILE | £185 |
| ICOM IC-2350H DUAL BAND MOBILE | £139 |
| KENWOOD TM-732E DUAL BAND MOBILE TX. | £329 |
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| STANDARD C-78 70CMS PORT. + 10W AMP | £199 |
| STANDARD C-5200 TWINBAND 50W MOBILE | £299 |
| STANDARD C-8900 2M MOBILE | £185 |
| TRIO TR-2200 2MTR MOBILE TX. | £75 |
| TRIO TR-2200 GX 2MTR MOBILE TX. | £75 |
| YAESU FT-290R 2MTR M/MODE TX. | £199 |
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| YAESU FT-290 R11 + FL2025 AMP 2MTR M/MODE | £375 |
| YAESU FT-3000M 2MTRHIGH POWER MOBILE | £225 |
| YAESU FT-268R HF/2M/70CMS BASE TX. | £599 |
| YAESU FT-5100 DUAL BAND MOBILE | £269 |
| YAESU FT-8100R 2M/70CM MOBILE TX. | £325 |

RECEIVERS

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| DRAKE - R8E HF RECEIVER | £599 |
| ICOM IC-R7000 VHF/UHF RECEIVER | £599 |
| ICOM R-72 HF RX + ACC | £499 |
| KENWOOD R2000 + VHF/HF RECEIVER + CONVEY | £325 |
| SANGAN ATS-803A S/WAVE RX. | £99 |
| SONY ICF5W35 SHORTWAVE RECEIVER | £145 |
| YAESU FRG100 HF RECEIVER + PSU | £329 |
| YAESU FRG100 HF RECEIVER + PSU + FM | £349 |
| YUPITERU MVT-8000 WIDEBAND RECEIVER | £169 |

HANDHELDS

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|---|------|
| ADI AT-18 2MTR H/HELD TX. | £59 |
| ALAN CT-145 2MTR H/HELD TX. | £59 |
| ALINCO ALM-203E 2M H/HELD TX. | £129 |
| ALINCO DJ-180EB 2M HANDIE - EX DEMO | £129 |
| ALINCO DJ-180 2MTR H/HELD + EDC46 Ficharger | £129 |
| ALINCO DJG5EY 2MTR/70CM HAND. | £175 |
| ALINCO CS DUAL BAND MICRO - EX DEMO | £149 |
| ALINCO DJ-541C 70CM HANDIE - EX DEMO | £79 |
| ICOM IC-41E 70CMS - EX DEMO | £155 |
| ICOM IC-T8E 6M/2M/70CM HANDIE | £249 |
| KENPRO 202 2MTR H/HELD TX. | £39 |
| KENPRO KT-44 70CMS H/HELD TX. | £85 |
| KENWOOD TH-215E 2MTR H/HELD TX. | £89 |
| KENWOOD TH-28E 2MTR H/H TX+70CM RX | £149 |
| KENWOOD TH-45E 70CMS H/HELD TX. | £139 |
| REXON RL-102 2MTR H/HELD TX. | £69 |
| YAESU FT-23R 2M HANDIE | £99 |
| YAESU FT-50R 2M/70CMS HANDIE | £199 |
| YAESU FT-708 70CM HANDIE | £89 |

MISCELLANEOUS EQUIPMENT

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| COMET PS74BM 70/23 CM MOBILE WHIP | £25 |
| COMET CM420M MINI 2MTR/70CM SWR METER | £25 |
| DAIWA DX10N 2MTR/70CM DIPLEXER | £19 |
| DL1000 DUMMY LOAD | £59 |
| VECTRONICS HFT 1500 COASTER ATU | £249 |
| ICOM PS-55 20 AMP PSU - BOXED | £159 |
| JPS NTR-1 NOISE REDUCTION UNIT | £155 |
| KENWOOD AT200 ANTENNA TUNER | £175 |
| KENWOOD AT230 ANTENNA TUNER | £185 |
| KENWOOD AT250 ANTENNA TUNER | £225 |
| KENWOOD DFC-230 FREQ CONTROLLER | £65 |
| KENWOOD PS-20 12A POWER SUPPLY | £69 |
| KENWOOD TL-120 100W HF AMP | £185 |
| MFJ 986 3K PEP TUNER | £249 |
| MW MODULES 432/50 70CMS AMP | £195 |
| MW MODULES MMS2 MORSE TUTOR | £49 |
| MUTEK TLNA 432U 70CM PREAMP | £25 |
| TIMWAVE DSP 59 + DSP FILTER | £199 |
| TOKYO HL130U 70CM 120 WATT AMPLIFIER | £299 |
| TOKYO HC2000 2KW PEP ANTENNA TUNER | £225 |
| VECTRONICS VC300M ANTENNA TUNER | £70 |
| YAESU FT517 CTCSS & FT 411811 ETC | £39 |

WATERS & STANTON

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HF TRANSCIEVERS

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| ICOM IC-706 HF/2m 2m All Mode Mobile/Base with Gen Con. | £595 |
| Kenwood TS-850SAT Base Transceiver with Gen Con. and ATU 12V. | £899 |
| MFJ MFJ-9020 x2 20m CW QRP Transceiver | £125 |
| SGC SG-2020 QRP Transceiver 55B CW 20W 12V | £485 |
| Trio TS-530S Base Transceiver Mains | £325 |
| Trio TS-930S Base Transceiver Mains | £525 |
| YAESU FT-747GX Base Transceiver with Gen Con. 12V | £349 |
| YAESU FT-847 HF/2m, 2m, 70cm All Mode with Gen Con. 12V | £1,349 |

VHF/UHF BASE/MOBILE TRANSCIEVER

| | |
|---|------|
| AKD 2001 2m FM Mobile Channelised 25W | £145 |
| Alinco DR-M66DX 6m FM Mobile 20W CTCSS | £175 |
| Alinco DR-M66SX 6m FM Mobile 10W CTCSS | £159 |
| Standard C-5900D 6m, 2m, 70cm FM Mobile, Wide RX, Remote Head | £529 |
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| YAESU FT-790R II 70cm All Mode Portable 2.5W | £299 |
| YAESU FT-3000M 2m FM Mobile 70W | £275 |

VHF/UHF HAND HELD TRANSCIEVER

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|---|------|
| ADI AT-200 2m FM H/HELD with Nicad, sp. mic | £99 |
| ADI AT-600 2m, 70cm FM H/HELD Wide RX Full Duplex | £175 |
| Alinco DJ-190T 2m FM H/HELD | £99 |
| Alinco DJ-560 2m/70cm FM H/HELD | £169 |
| Alinco DJ-580 x2 2m/70cm FM H/HELD | £175 |
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| ICOM IC-2SE 2m FM Mini H/HELD | £125 |
| ICOM IC-2SE 2m FM Mini H/HELD with Battery box, Case | £109 |
| ICOM IC-2SET 2m FM H/HELD | £149 |
| ICOM IC-24ET 2m/70cm FM H/HELD | £179 |
| ICOM IC-P4E 70cm FM H/HELD | £169 |
| ICOM IC-W2E 2m/70cm FM H/HELD (with sp. mic) | £199 |
| Kenwood TH-22E x2 2m FM H/HELD | £125 |
| Kenwood TH-28E 2m FM H/HELD | £199 |
| Kenwood TH-42E x2 70cm FM H/HELD | £189 |
| Kenwood TH-46E 70cm FM H/HELD | £199 |
| Kenwood TH-G71E x2 2m, 70cm FM Palm Held with Wide RX | £229 |
| Standard C-520 2m, 70cm FM with Full Duplex Bant. box | £185 |
| Standard C-558 2m/70cm FM Handheld | £299 |
| YAESU FT-50R 2m/70cm FM Dual Display Wide RX | £179 |
| YAESU FT-51R 2m/70cm FM Dual Display Wide RX 80Ch | £249 |

SHORTWAVE RECEIVERS

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| AOR AR-7030 0-12MHz All Mode Receiver 12V | £449 |
| Drake R-8E 150kHz-30MHz All Mode Receiver Mains | £625 |
| Grundig YB-200 Portable Receiver with FM | £69 |
| Grundig YB-500 Portable Receiver with SSB | £139 |
| ICOM IC-R70 100kHz-30MHz AM/SSB/CW Mains | £425 |
| ICOM IC-R72 x2 Base Station Receiver | £449 |
| JRC NRD-525 90kHz-34MHz All Mode Receiver 200Ch. Mains | £529 |
| Low HF-225 x3 30kHz-30MHz All Mode Receiver 12V | £299 |
| Realistic DX-192 Portable AM/FM stereo LWSW with Cassette/BFO | £99 |
| Realistic DX-394 150kHz-30MHz AM/SSB Receiver Mains/12V | £115 |
| Roberts R-802 Digital FM/MW/SW Portable Radio | £45 |
| Roberts R-827 Portable 0-30MHz with BFO | £115 |
| Sangan PR-D1 Portable LWSW/FM stereo RDS 27Ch. | £49 |
| Sony ICF-SW10 Portable FM Stereo, MW/LWSW Radio | £29 |
| Trio R-600 x2 150kHz-30MHz AM/SSB/CW Receiver Mains | £195 |

SCANNERS MOBILE/BASE

| | |
|--|------|
| AOR AR-2800 0.5-600/800-1300MHz AM/FM/WFM 1000Ch. BFO | £149 |
| Realistic Pro-2026 x2 66-950MHz (with gaps) AM/FM 100Ch. 12V | £149 |
| Realistic Pro-2035 25-520/760-1300MHz AM/FM/WFM 1000Ch. | £199 |

SCANNERS HAND HELD

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|--|------|
| ICOM IC-R1 0.1 - 1300MHz AM/FM/WFM | £199 |
| ICOM IC-R1 0.1 - 1300MHz AM/FM/WFM 100Ch. | £205 |
| ICOM IC-R2 0.495-1300MHz AM/FM/WFM 450Ch. | £105 |
| Opto R-10 x2 30MHz-2GHz FM Interceptor | £129 |
| Realistic Pro-26 25-1300MHz AM/FM/WFM 200Ch. | £149 |
| Realistic Pro-32A 66-512MHz (with gaps) AM/FM 200Ch. (PSale) | £69 |
| RadioShack Pro-60 x2 30-512/760-999MHz AM/FM/WFM 200Ch. | £125 |
| Sony ICF-Pro80 150kHz-108MHz, 115.15-223MHz AM/FM & SSB | £129 |
| Yupiteru MVT-3300 x2 66-1000MHz (with gaps) AM/FM 200Ch. | £129 |
| Yupiteru VT-225 108-142.150-160, 225-391MHz AM/FM 100Ch. | £169 |

SOUTH EAST COMMUNICATIONS

00353 51 871278

STATION ACCESSORIES

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| Mirage B-34-G amp for handhelds | £79 |
| Garmin GPS 45XL handheld GPS | £149 |
| Garmin GPS II Plus handheld GPS | £169 |
| Yaesu MD-1 Desk mic boxed mint | £69 |
| MFJ 949E A.T.U. int. 300watt dummy load | £79 |
| Diamond SX100 SWR/PWR meter 3kw | £75 |
| Momentum 1100 multimode decoder with screen | £169 |
| Packrat PK232 multimode decoder as new | £179 |
| Kenwood SW2100 SWR/PWR 2kw meter | £89 |
| Kenwood MC90 digital desk mic | £99 |
| Yaesu FRT7700 short-wave A.T.U. | £49 |
| Global AT1000 short-wave A.T.U. | £49 |
| Watson 25amp P.S.U. Demo model | £79 |
| Vectronics VC300m 300watt mobile A.T.U. | £69 |
| Microwave Modules 10m to 144mhz transverter | £99 |
| Night Vision Scope by Moonlight new | £299 |

VHF/UHF TRANSCIEVERS

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| ICOM IC77E dual band handheld wide RX | £169 |
| Yaesu FT8500 dual band mobile 50/35watts | £299 |
| Yaesu FT2900 mkII 2m multimode mobile | £249 |
| ADI 146 50watt 2m mobile | £169 |
| Yaesu FT50R 2/70cm mill spec as new | £199 |
| Yaesu FT736R 2/70cm plus 50mhz module | £899 |
| Kenwood TM255E 2meter multimode 45watt | £399 |
| Alinco DJ180 2 meter handheld charger | £109 |
| Alinco DJG5E 2/70cm wide RX charger | £209 |
| Kenwood TM251E 2 meter 50watt mobile | £249 |
| Hora C150 2 meter handheld | £89 |

HF TRANSCIEVERS

| | |
|--------------------------------------|-------|
| Yaesu FT990DC Auto A.T.U. | £899 |
| Yaesu FT920AF Auto A.T.U. DSP | £949 |
| Kenwood TS770D Auto A.T.U. DSP | £675 |
| Kenwood TS870S Auto A.T.U. DSP | £1399 |
| ICOM IC706MKII HF+6m+2m mint | £499 |
| ICOM IC746 HF+6+2 100watts A.T.U. | £1099 |
| ICOM IC737 extra filters auto A.T.U. | £649 |

SHORTWAVE RECEIVERS

| | |
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| JRC NRD535 deluxe mint extras | £799 |
| AOR 7030 with remote control | £449 |
| Yaesu FRG8800 with VHF converter | £349 |
| Kenwood R2000 0-30mhz all mode | £299 |
| Low HF225 0-30mhz all mode | £299 |
| Low HF150 0-30mhz with keypad | £269 |
| Realistic DX394 0-30mhz new | £99 |
| Sony SW77 boxed mint with PSU | £229 |
| Yaesu FRG100 boxed mint with PSU | £349 |
| ICOM IC7000HF 0-2000mhz all mode | £699 |
| AOR 3000 0-2036mhz all mode | £399 |

SCANNERS BASE/MOBILES

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|---|------|
| Bearcat 9000XLT 25-1300mhz AM, FM, NFM | £249 |
| Bearcat 3000XLT 25-1300mhz AM, FM, NFM | £179 |
| AOR 8000 0-1900mhz 1000 memories | £239 |
| ICOM PCR100 0-1300mhz AM, FM, NFM | £199 |
| ICOM IC7100HF 0-2000mhz all mode 1000mem | £699 |
| Yupiteru MVT8000 base mobile boxed PSU | £229 |
| Yupiteru MVT7100 0-1650mhz charger nicads etc | £179 |
| AOR 2000 8-1300mhz 1000mems nicads etc | £149 |
| Realistic Pro2042 1000 memories base | £179 |
| Realistic Pro 2025 60 memories 66-512mhz | £79 |

UNICOM

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HF TRANSCIEVERS

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| Kenwood TS-820 240V 100W | £195 |
| ICOM IC-745 Gen cov RX 100W 12V DC | £395 |
| IC-735 Gen cov RX 100W 12V DC | £495 |
| IC-730 100W 12V DC | £295 |
| IC-725 Gen cov RX 100W 12V DC | £495 |
| Yaesu FT-101Z 240V 100W | £250 |
| FT-757GX 100W plus FP757 psu | £495 |
| Ten Tec ARGOSY plus PSU | £250* |
| 227 ATU | £60* |
| Corvar plus PSU CW filters | £350* |
| Headkit HW9 mc WARC | £225* |

RECEIVERS & SCANNERS

| | |
|--|-------|
| AOR AR-2000 Scanner | £125 |
| Kenwood R5000 HF Receiver | £599 |
| Uniden UBC50XL Handheld scanner | £50 |
| Low HF-125 HF 12V DC | £175 |
| HF-225 HF 12V DC | £249 |
| Ten Tec RX325 HF Receiver | £195* |
| Realistic PRO-2006 Base scanner | £125 |
| Yupiteru MVT-7100 Handheld scanner | £175 |
| 4m | |
| AKD 4001 Mobile 10W 2m | £125* |
| ICOM IC-260E M/mode mobile 10W | £195 |
| IC-2SE Handheld | £125 |
| IC-2E Handheld | £50 |
| CTE CTE-1600 Handheld | £50 |
| Yaesu FT-208R Handheld plus fast charger | £95* |
| FT-480R M/mode mobile 10W | £195* |
| FT-290 M/mode mobile 1W | £249 |
| AKD 2001 Packet ready | £125* |
| 2001 FM mobile | £125* |
| 70cm | |
| ICOM IC-471E M/mode base 12V DC 25W | £495 |
| ADI AT-48 Handheld k/pad | £99 |
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| Yaesu FT-790R M/mode portable 1W | £199 |
| Dualband 2/70 | |
| ICOM IC-W21E Handheld | £175 |
| IC-W2E Handheld | £150 |
| IC-32AT Handheld | £125* |
| Alinco DJ-C5 Handheld | £125* |
| DJ-G5EY Handheld | £195* |
| ADI AT-600 Handheld | £149 |
| Standard C-528 Handheld | £199 |

STATION ACCESSORIES

| | |
|-------------------------------------|-------|
| ICOM AT-100 auto ATU | £150* |
| RM-3 Controller | £45 |
| Yaesu FC-700 HF ATU | £99 |
| SEM Transmatch HF ATU | £65* |
| KW KW 207 supermatch | £75 |
| Microwave Mod 144-30LS 2m L/amp 30W | £75* |
| MMCS0/28 6m rx converter | £15 |
| MFJ 1786 10-30MHz Loop ant | £199* |
| Roake Bug key | £25* |
| Zetagi BV131 amp 240v 10m 75W | £75 |
| Kantronics KPC3 TNC | £99 |
| Microset PT1012 12A PSU | £49 |

CB

| | |
|------------------------|------|
| Midland 77104GTL + PSU | £45 |
| Danita 640 (Eur) | £30* |
| Altai 5-7A PSU | £15 |

RADIO DIARY

April 18: The Lough Erne Amateur Radio Club will be holding their 18th rally at Killyhevin Hotel, Enniskillen (Northern Ireland) at 12 noon. Attractions include the usual interesting variety of traders and the no charge Bring & Buy. **Kieran G17NET** on (01365) 348063 day or (01365) 327133 evenings.

April 18: The 13th Rainham Radio Rally has moved to a new date, but, still at the same venue, which is The Rainham School for Girls, Derwent Way, Rainham, Kent ME8 0BX. Doors open 1000 (0930 for disabled visitors and Bring & Buy). Admission is £2 (under 14s go free). There will be all the regular traders, plus a few new ones. Many special interest groups will also be represented. Plenty of off road parking and hot and cold snacks will also be available. **Martin** on (01634) 365980 any reasonable time.

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

April 18: The Yeovil Amateur Radio Club are holding their 15th QRP Convention at Digby Hall, Hound Street, Sherborne, Dorset from 0900 to 1700. There will be interesting lectures, trade stands, a Bring & Buy and refreshments. Talk-in will be on S22. Entrance fee is £2. Further details from **Mike G7SDD** on (01935) 814612.

April 24: A Marconi Birthday Exhibition will be held at the National Wireless Museum, on the Isle of Wight. Open from 1100 until 1700 with free entry and parking. More details from **Douglas G3KPO** on (01983) 567665.

May 3: The Dartmoor Radio Rally is to be held at Pannier Market, Tavistock, Devon. This new location has much more space for traders and visitors, with access for

disabled too. There is plenty of free public car parking within five minutes walking distance. There will be trade stands, Bring & Buy, and refreshments, etc. Doors open 1030, with a talk-in on S22. There are beautiful views over Dartmoor, ideal for picnics, so why not take the family? **Ron G7LLG** on (01822) 852586.

May 3: Amateur Radio & Computer Rally at the Civic Hall Winsford Cheshire, May Day Bank Holiday Monday. Doors open 1030 for disabled visitors, 1100 others. Admission £1, large Bring & Buy stall. Full catering with bar service, ample parking. Talk in 2m/70cm (144/430MHz). General Inquiries to Mid Cheshire Amateur Radio Society. Tel: **Ted Bannister (01606) 592207** or **David Bevan (01606) 77787**. E-mail: **g0rba@tbannister.freemove.co.uk**

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

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

May 16: The Mid Ulster Amateur Radio Club Rally will be held at the Silverwood Hotel, Lurgan, Co. Armagh. Doors open from to the public from 12 noon. Traders will have access from 0900. **Jim Lappin G100ND** on (01762) 851179.

May 16: The Dunstable Downs Radio Club will be holding their 16th Annual National Radio Car Boot Sale at Stockwood Country Park, Luton, Bedfordshire. Doors open 0900 till 1500. Talk-in on S22. For a booking form to be sent please write to **DDRC, PO Box 4053, Dunstable, Beds LU5 5ZJ** enclosing an

s.a.e., FAX enquiries to (01525) 383898 or E-mail: **ddrc@magstripe.demon.co.uk**

May 23: The Three Counties Radio & Computer Rally is to take place at the Perdiswell Leisure Centre, Bilford Road, Worcester. Full restaurant services from 0700, licensed bar from 1100. All traders in two adjoining halls, easy access to the halls (ground level) and convenient parking for traders. There will also be free parking for 900 cars and coaches. Being close to the City Centre, wives and children can spend a pleasant day in historic Worcester sightseeing, shopping, etc. **William E. Cotton G4PQZ** on (01905) 773181, for FAX please ring first.

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

May 30: 23rd East Suffolk Wireless Revival, the Ipswich Amateur Radio Rally will be taking place at the Hollies Sports and Social Club, Bucklesham Road, Ipswich. Directions to get there are as follows: From the junction of the A14 and A12 east of Ipswich, follow the A1156 for just under 1 mile, turn right at the ESWR sign. Map reference No.TM223422. Rally opens from 1000 (0930 for disabled visitors) until 1600. Vehicles for the large car boot sale will be admitted from 0800. Talk-in on S22. For further details contact **Sam Jewell G4DDK** Tel: (01394) 448495 (home) (01473) 644520 (work), E-mail: **jewell@btinternet.com**

June 6: A Radio Rally is to be held at the

Medstead Village Hall, near Alton, Hampshire. Doors open 1000 and admission is just £1. Refreshments will be available and there will also be a Bring & Buy. More information from **Derek G0NFA** on (01420) 22018 or **Chris G0WYF**, E-mail: **chris@g0wyf.freemove.co.uk** or check out their web site, which will be updated with any fresh information, at **http://www.g0wyf.freemove.co.uk**

June 6: Spalding & District ARS are holding their annual rally at the Springfields Exhibition Centre, Spalding, Lincolnshire. Opening time: 1000. This Radio, Electronics and Computer Rally and includes a 'Car Boot' area. Ample parking available on site. Talk-in station G1DSP, refreshments available. Admission £1.50, overnight camping if required. Contact **Ray Pearson G8ELV** on (01775) 711953.

June 13: The Elvaston Castle National Mobile Radio Rally are holding their rally at Elvaston Country Park, on the B5010, five miles south east of Derby. Further details from **Brian** on (01332) 751412 or contact **Stuart** for trader enquiries on (01283) 537778.

June 20: The Newbury & District Amateur Radio Society will be holding their 13th Annual Amateur Radio Car Boot Sale at Cold Ash playing field, near Newbury. Sellers/Traders should arrive by 0800. Sale open from 0900 till 1500. **Ian Trussion**, Secretary, on (01635) 826019, E-mail **g3rym@compuserve.com**

June 20: The Bangor & District Amateur Radio Rally will be held at the Clondeboy Lodge Hotel (formerly known as The George) just outside Bangor. Doors open between noon and 1600, disabled access from 1130. All the usual radio and computer dealers will be in attendance as well as the portable station G13XRQ/P should you wish to try before you buy. Full restaurant (may be wise to book as it's Father's Day), Bar and Bar snack facilities will be available and there is ample car parking. Talk-in will be on S22 and doors open at noon. Further details available from **Keith Stevenson** on (01247) 884635, E-mail: **g10ssa@qsl.net**

June 20: Mansfield ARS have their annual Radio, Computer and Electronics Car Boot Sale at Debdale Lane Sports and Social Club, Debdale Lane, Mansfield Woodhouse, Notts. Open from 0930-1400, bar and refreshments, ample parking. For more details contact **Angela** on (01623) 429218, E-mail: **g6cuk.force9.co.uk**, for latest information there's a Web site: **http://www.g6cuk.force9.co.uk**

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

The Editorial Staff of PW cannot be held responsible for information on Rallies, as this is supplied by the organisers and is published in good faith as a service to readers. If you have any queries about a particular event, please contact the organisers direct. - Editor

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Alinco DX-70 with Zurich power supply, £450. Timewave DSP592X, £200. SG-230 smartuner, £200. MFJ-401C keyer, £25. CAHFV1 vertical 3.5+, £50. Cushcraft AR6, £25. Less than 200 QSOs, lot for £850. Tel: Jack G3MEY on Wiltshire (01249) 461641.

Amstrad PC-1640 HD, floppy, colour monitor, Yaesu FT-200 h.f. transceiver with p.s.u., 2m (144MHz) whip antenna, 2m 8-element cross beam antenna with rotator, Electret microphone kit, reasonable offers please. Tel: Elaine G6NU on Chelmsford (01245) 359910.

AOR AR3030 receiver, in mint condition, 30kHz-30MHz, plus v.h.f. 108.000-170.000MHz, 100 memories, s.b., a.m., a.m.n., f.m., c.w., FAX, Collins filters fitted, gift at £400. Tel: (01608) 662488.

AOR AR3030 receiver, mint condition, all modes and FAX, 100 memories, two v.f.o.s. Collins filters, DDS, 5kHz-30MHz plus 118.000-170.000MHz, rotary tuner plus keypad entry, £390. Tel: (01680) 662488.

AOR AR5000-3 frequency range 10kHz-2.6GHz, all mode, u.s.b./l.s.b./a.m./w.f.m./c.w.-f.m. ten months left on warranty, cost £1549 will sell for £1225 plus P&P, no offers. Tel: John on Kirkcaldy (01592) 203279, anytime.

AOR AR8000 hardly used, boxed, power supply, 500kHz-1900MHz, no gaps, all modes (a.m./f.m./w.f.m./u.s.b./l.s.b./c.w.) 100 memory channels, full manuals, £220. Tel: John on Hornchurch, Essex (01708) 445961, evenings after 8pm.

AOR AR8200 scanner, as new, RU8200 digital recorder, OS8200 lead and level converter, £320. Tri-T-120S, 100W, PS430 p.s.u., SP120 speaker, DFC230, £310, collect or carriage at cost. Tel: Alan G6PHT on Loughborough (01509) 550420.

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Armstrong 127 valve tuner amplifier in working order, £20 o.n.o. Tel: Woking (01483) 723563.

Books: *Telephony*, Volume One,

Herbert & Proctor, 1932, £17.50. *Electric Railway Engineering*, first edition, Ferguson, 1955, £15. *BTC Handbook For Steam Loco Engineers??*, £15, all good condition. Tel: Stuart (01427) 611160.

Bush Radio, 1947 model, l.w./m.w., Bakelite case, slight damage on top, mains only, still in g.w.o., sensible offers please. Tel: Bridlington (01262) 678553.

Commтел model Com305 small digital world radio receiver (no b.f.o.), 14 wave bands with stereo f.m., multiple presets, clock and wrist strap, as new, boxed with instructions, £20, no offers. Tel: Norwich (01603) 665927.

Coscor 234 melody maker c.w., two batteries, eliminator, spare valves, manual, £60. P6V car radio, six inches square internal vibrator, £35. MNIB?? accepted unit, £25. Eddystone 688ASP speaker??, £40. Tel: Glasgow 0141-562 4571.

Decca Radiogram stereo v.h.f./l.w./m.w./s.w., twin speakers, built-in, teak cabinet, 54 inches long, 33/78 r.p.m., g.w.o., prototype, £60 o.v.n.o., buyer to inspect and collect. Tel: GTDDL East Sussex (01892) 664926.

Drake 4A receiver with matching speaker, T-4X transmitter and power unit, MN-4 200W antenna matching unit, Shure 444 desk microphone, 6 items £395, will split, all as new. Tel: (01872) 862291.

Drake TR4CW transceiver, 300W p.e.p. out, a.m./s.b./c.w. modes, matching external v.f.o. and p.s.u., all in excellent condition with new spare p.a. valves, £450. Tel: (01892) 660045.

Eddystone 940 receiver with base speaker, £100. Sommerkamp FR100B receiver, £70. Advance OS250 dual channel oscilloscope, 0.5 seconds to 1µ STB??, £50, 4/250 power valve, £25. Racal Morse keyboard and reader, £75. Tel: Brian (01285) 656069.

Eddystone 1650, top class condition, £995, inspect and collect or pay P&P. Grundig 700 Satellite, like new, excellent first class radio for short wave, £200. JRC NRD-525, first class radio, like new, £500. Tel: Middlesex 0181-813 9193.

For sale Ten-Tec Omni-D transceiver, 1.8-30MHz, filters, all bands, matching power pack, a.t.u., desk microphone, manual, £425, buyer collects. Tel: S. Lincs (01406) 540934.

Force 12, 5-element, 10m (28MHz) monobander, excellent performer, £150. Yaesu FT-480R 2m (144MHz) multimode, £195. BNOS 2m, 100W amplifier, £90. Tel: (01803) 665772.

FT-290R MkII?? multi-mode, 2m (144MHz) transceiver, including battery pack, charger and boxed. FL-2025 linear, boxed, mobile mount

bracket, gutter mount antenna, £375 o.n.o. Tel: Swindon (01793) 740786.

Galvanised steel solid lattice tower, 37 feet, dismantled in two sections, 15 feet, new QTH so not required, fittings for 2 inch mast attached, buyer to collect, £120 o.n.o. Tel: Gerry G7VVF (01296) 432234.

Global 1000 a.t.u., £40. Outside antenna, 500kHz-1500MHz, stainless steel and fibreglass, stick type, unused, £35. (All includes P&P). Tel: (01608) 662488.

Global a.t.u. (1000), £40. Antenna (outside) 25-1300MHz, stick type, stainless steel and fibreglass, new, £35. AOR AR3030, mint condition receiver, with extra 108-170MHz v.h.f. fitted, £390, includes carriage. Tel: (01608) 662488.

HV Transformers 3.8kV-1A, 2kV-1.4A, 2kV, 1A, three very big LDF 450 plus connectors, Collins 75A4 receiver, many microwave bits and bobs, 'phone for lists. Tel: Mansfield (01623) 478985.

Icom IC-2050H dual-band, mobile radio, excellent receiver, still under warranty, as new, £380 o.n.o. Also Kenwood 79E with 6V pack, £180. Tel: Bob on North Wales (0145) 730148 or mobile (07803) 054448.

Icom IC-271E 2m (144MHz) transceiver multi-mode, 5/25W, no microphone, good condition, £250. Kenwood TH-25E 2m hand-held, £80. Trio R2000 receiver with 2m converter fitted. AKD 4001 4m (70MHz) transceiver with antenna, £100. Tel: Ken G0KWS QTHR, Whitby Bay 0191-252 7141.

Icom IC-706i, immaculate condition, £535 o.n.o. Alinco DG-G5 dual-band hand-held with spare battery case, microphone, etc., £160 o.n.o. Tel: Mike 0181-423 0576.

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Kenwood AT-200 a.t.u., 200W max. size 9" x 9" x 9" approx. collect or pay carriage, v.g.c., £85. Contact T Chapman, 17 Trevor Rd, Swinton, Manchester, Lancs M27 0YH (no phone).

Kenwood R-5000 receiver, little used, in mint condition (with dust cover!), boxed with manual and ready to listen to the world, £560, might part exchange for a different, interesting receiver. Tel: W. T Johnston on Bournemouth (01202) 430043.

Kenwood TH-75E dual-band hand-held, speaker, microphones, antennas, leads, charger, spare battery, CTCSS fitted, £140 o.n.o. Tel: Cambridge (01223) 242427.

Kenwood TM-733 f.m. dual-bander, detachable front, 2m/70cm (144/430MHz), 50/10.5-35/10.3W, microphone, mobile bracket, power lead manual, boxed, mint, not been used mobile, non-smoker, £275 o.n.o. Tel: Mick (01226) 742971.

Kenwood TM-733E dual band mobile, complete with microphone and manuals, mint condition, £275 o.n.o. Or swap for Kenwood TS-811E 70cm (430MHz) multi-mode. Wanted: RC-600 control box. Tel: Mike 2E1FCG (01226) 742971 QTH I093GM??

Kenwood TR-751E 144MHz multi-mode, boxed with user manual, never used mobile, little used as base station, plus Kenwood MC-60 desk microphone, both in v.g.c., £350 o.n.o. Tel: Colin (01475) 786831, anytime.

Kenwood TS-690S transceiver, new, £670, includes delivery. Datong FL3 filter, £60. Thurlby true r.m.s. digital multimeter, £45. Tel: Colyn (01624) 801592.

Kenwood TS-790E v.h.f./u.h.f. transceiver, £900, no offers. Icom IC-706 MkI, £700, no offers. Two large air spaced variable capacitors for a.t.u., £20. Tel: Tony G0CZV on East Yorkshire (01430) 422657.

Kenwood TS-830, TS-130, DFC-230 filters, boxed, as new, also some TV test gear, all going cheap, retired - would swap for 2m (144MHz) equipment, WHY? Tel: (01752) 700255, evenings.

Kenwood TS-870 h.f. d.s.p. transceiver, 100W output, as new, boxed, manuals, £1100. Icom IC-T7E 70cm/2m (430/144MHz) hand-held, g.c., £120. Service manual for TS-450/690, £10. Tel: Terry G4OXD on Hitchin (01462) 435248, after 6pm.

Kenwood TS-930S h.f. transceiver with a.a.t.u., handbook, boxed, nice condition, £495. Yaesu FT-757GX h.f. transceiver, handbook, nice condition, £395. Tel: (01606) 862175.

Kenwood TS-940S h.f. transceiver with SP-940 speaker and desk

microphone, box, handbook, very good condition, £795. Tel: (01606) 862175.

Kenwood TS-940SAT, boxed, with manual, £675. Kenwood TS-850SAT, excellent condition, boxed, £745. Icom IC-706 MkI, boxed, £495. Yaesu FT-840, excellent condition, boxed, £475. Zetagi B2002 1kW linear amplifier, £375. Tel: Gary (01203) 559702.

Low pass filter Kenwood LF-30A, 1kW, collect or pay carriage, v.g.c., £28. Contact T Chapman G0MKA, 17 Trevor Rd, Swinton, Manchester M27 0YH (no phone).

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Mobile radio 230R car radio m.w./s.w., 16/90m?? complete with packaging??, collectors item, best offers. Tel: Savage 0151-924 5547.

Packet modem MFJ-1274, h.f./v.h.f. leads, Handbook, £75. Timstep WXSAT receiver, PC board, as pre-amplifier programme, £125. Tel: (01984) 633060, E-mail: kenn@mistral.co.uk

Pair of crystals for Pye M296 on RBO, £10 for the pair. Tel: John (01362) 638142.

Philips model AE3650 pocket-size digital world radio receiver (no b.f.o.) 15 wave bands with stereo f.m., multiple presets and clock, pocket-size with soft pouch, as new, boxed with instructions, quality set, £30, no offers. Tel: Norwich (01603) 665927.

Private collection 50 domestic radios for sale (1930s-1960s), please send large s.a.e. for lists (plus £1 for illustrated catalogue, if required). Tel: Chris Moreton (01291) 673849/650499, 10 Castle Parade, Usk, Gwent NP5 1AA.

RA17L v.g.c., manual, £95 or swap for RA171. Eddystone 730/4, g.w.o., manual, £75, no offers, buyers collect. Tel: Neil G8LIJ on Uxbridge (01895) 230006.

Realistic desktop scanner PRO-2024 by Radio Shack, covers 66-512MHz with some gaps, in g.w.o., boxed with manual, £65, buyer to collect. Tel: Accrington (01254) 384557.

Schaub-Lorenz music centre 5001, unusual historic radio/tape player in original box, instruction book with English translation and circuit diagram, size - 31 by 11 by 13 inches high. Tel: Dean 0181-948 3430.

Shack clearout, all in g.w.o., h.f. receivers: Racal RA-1217; Racal RA-217D in military transit case with f.s.k. unit; Plessey PR-155; also German LF30MHz field strength meter with complete set of antenna loops, interested? Offers please. Tel: (01293) 885701.

Shack clearout, Yaesu FT-480R 2m (144MHz) multi-mode, Icom IC-04E 70cm (430MHz) hand-held, BNOS 50W 70cm linear amplifier, Wetz SP-300 1.8-500MHz s.w.r./power meter, various antennas - mobile and base, power supplies, oscilloscopes, etc. Tel: Boston (01205) 351603.

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TS-450S GWO. Boxed. Manual mic for sale. £600 ono. Buyer collects or will post. Tel Ted 01234 357089 after 6pm.

KENWOOD TS-530S 1.8-30MHz. General coverage. Leak "trough line stereo". 80-100MHz, Rx matching leak "stereo 30" audio amplifier, Creed 444 G4XOS closing down. Tel: 01885 482980.

PRACTICAL WIRELESS magazine 1964-74, 87 copies. Also *Practical Electronics* (49). Similar period. Offers? Tel: 01276 21993.

TS-430S matching AT-250 auto tuner plus Datong filter FL-3. £400. Tel: 01354 658186.

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Over 40 years of experience in HF transceiver design has firmly established Yaesu as the choice of the world's top DX'ers. The knowledge that produced unequalled RF technology and design that is found in the State of the Art FT-1000MP can also be found in the miniature FT-100. The FT-100 while small in size 6.3"×2.1"×8.1" (160 W×54 H×205 D mm w/o knob) is large in features and performance. This is accomplished by using the most advanced manufacturing techniques and component mounting technology. High Dynamic range RF front-end technology and Advanced Digital technology such as DSP sets a new standard of receiver performance for miniature HF transceivers. The single piece die cast frame, dual cooling fan system and revolutionary RF high power design technique keeps the FT-100 running cool and smooth in the most adverse operating environments. (TX Power output=100W HF, 50W VHF/20W UHF) The TX Equalizer offers crisp, clear and clean TX audio reproduction that until now was only found in top of the line HF base stations. The optional ATAS-100 (active tuning antenna system) ushers in a new age of mobile and field day operation (from HF to UHF frequencies). Add the optional ATBK-100 base kit (Good for limited space, simple setup.) and you've got a base station that ranks among the best in the world.

Features

- Frequency coverage:
RX : 100 kHz-970 MHz
TX : 160-6 m/144-146 MHz/430-440 MHz
- Power output : 100 W (160-6 m),
50 W (144 MHz), 20 W (430 MHz)
- DSP Bandpass Filter, Notch Filter, Noise
Reduction, and Equalizer
- IF Noise Blanker
- IF Shift
- SSB, CW, AM, FM, AFSK, Packet
(1200/9600 bps) operation
- Detachable Front Panel
- Two Antenna Jacks (HF/50 and 144/430)
- VOX
- Dual VFOs
- Available IF bandwidths of 6 kHz, 2.4 kHz,
500 Hz, and 300 Hz (6 kHz, 500 Hz, 300 Hz
filters optional)
- Built-in Electronic Memory Keyer
- Speech Processor
- Built-in CTCSS and DCS for FM operation
- Automatic Repeater Shift and Auto-Range
Transponder System
- Smart Search™ Automatic Memory
Channel Loading System
- 300 memory Channels
- Quick Memory Bank
(QMB)
- Bright LCD with multi-
function display
- Optional FC-20 External
Antenna Tuner
- Compatible with ATAS-100
Active-Tuning Antenna
System. Add the optional
ATBK-100 base kit

FIELD COMMANDER

FT-100

Ultra-Compact HF/VHF/UHF Transceiver

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