

practical

MARCH 1997 £2.20

Wireless

8 pages of

*antennas
in action*

WIN
A YAESU
FT-8000R

UPWARDLY MOBILE

REVIEWED

Two VHF/UHF
Transceivers

Yaesu FT-8000R
&
Kenwood TM-V7E

LONDON SHOW ISSUE



03 >



Plus All Your Regular Favourites

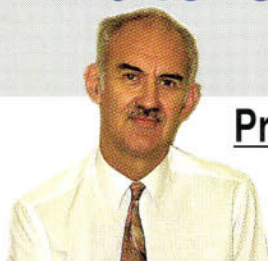
FREE
READER'S
ADS

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SEE US AT LONDON HAM RADIO SHOW 8/9th MARCH

Standard C-108 2m FM



**W&S
£169**

- 2m FM Handy
- Ultra small size
- 230mW
- LCD display
- 1750Hz tone
- 20 Memories
- Scanning
- 2 x AA cells

A micro sized handheld that has a great performance. Ideal for local repeater use, rallies etc.

Standard C-156 2m FM



**W&S
£149**

- 2m FM Handy
- 2.5W Output
- 1759Hz tone
- 100 memories
- 8 tuning steps
- 3 power levels
- Keypad entry
- LCD readout
- Supply - AA batts.

A great little handheld that has just been introduced into the UK. Complete with dry cell box and antenna

ADI AT-200 2m FM

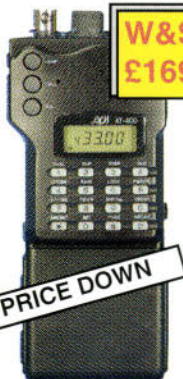


**W&S
£129**

- 2m FM Handy
- 2.5W output
- 5W on 13.8v
- 1750Hz tone
- Illuminated keypad
- Ultra sensitive
- Wideband Rx
- 20 memories
- Keypad entry
- DTMF
- Uses AA cells

This has proved to be our most reliable handheld. It has a very sensitive receiver and is built to professional standards.

ADI AT-400 70cm FM



**W&S
£169**

- 70cm FM Handy
- 2W output
- 5W on 13.8v
- 1750Hz tone
- Illuminated keypad
- Ultra sensitive
- Wideband Rx
- 20 memories
- Keypad entry
- DTMF
- Uses AA cells

This has become the standard radio for Novice hams. Its the most sensitive and cost effective way of getting on 70cms.

ADI AR-146 2m Mobile

"Beats the Japanese Rigs for Sensitivity and Adjacent Channel" QST Nov. 1996



**W&S
£249**

ADI AR-446 70cms Mobile



PRICE DOWN

**W&S
£269**

ALINCO DR-610 2m & 70cms



**W&S
£449**

FREE Remote kit Exclusive to PW!

- Detachable front head unit.
- 2m & 70cms (50W 2m & 35W 70cms)
- CTCSS Encode, 1750Hz tone
- 100 Memories, 9600 bps for Packet

DR-130 2m FM Mobile



PRICE DOWN

**W&S
£229**

- 20 memories
- 50 / 10W
- CTCSS encode
- 1750Hz tone
- Wideband Rx
- Time out etc.

DR-150E 2m FM Mobile



PRICE DOWN

**W&S
£269**

- 100 memories
- 50 / 25 / 10W
- CTCSS encode
- 1750Hz tone
- Wideband Rx
- Time out etc.

WATSON Dual Band Amp.



30W
2m &
70cm

**W&S
£139**

Completely auto switching, this dual band amplifier is an absolute bargain. Ideal for all modern dual band handhelds. Requires 13.8v and 1-6W input

Orders: 0500 737388

01702 206835

Enquiries 01702 206835

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Open Mon-Sat 9.00AM - 5.30PM

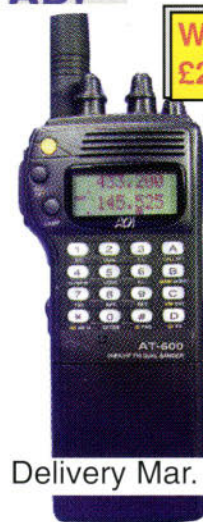
50W of Pure Performance Lowest UK Price

QST reviews are respected and accurate! This rig beat the more expensive ALINCO DR-150 for sensitivity and adjacent channel performance - the most important features that customers look for. Ask for laeflet. (Source QST).

Both rigs feature:

- 3 Power levels - Wideband receive
- 40 Memories plus call channel
- 7 Programmable steps
- Channel or frequency display
- The best sensitivity in the business
- 24 months warranty
- Keypad mic and mounting kit

ADI AT-600D Dual Bander



**W&S
£279**

Alpha Numeric Display

- 2m & 70cms tcv.
- 5W on 13.8V
- Full duplex
- AM/FM Rx
- Rx up to 990MHz
- DTMF fitted
- CTCSS fitted
- 1750Hz tone
- Auto power off
- Batt. volt meter
- Illuminated keypad
- Battery saver
- Ni-cad & charger

Delivery Mar.

Wonder why Alinco is being dumped at silly prices? - wait till you try this one!

ALINCO DJ-G5 2m & 70cms



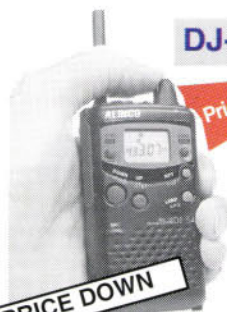
**W&S
£269**

A compact dual band handheld that is offered by us direct from factory. Why pay more?

- Up to 5W output
- CTCSS & DTMF
- 1750Hz tone
- Electronic controls
- 100 Memories
- AM airband
- Channel scope
- Programmable steps
- Extended receive
- Full scanning
- Ni-cads and charger

ALINCO DUMPING FACTORY DIRECT

ONLY WE HAVE THE
EXPERIENCE TO SERVICE
ALINCO - OTHERS DON'T!



DJ-S41 70cms

Price Match

**W&S
£119**

- 430-440MHz
- 340mW output
- CTCSS
- 1750Hz tone
- 20 memories
- 6 Steps
- 3 x AA cells

PRICE DOWN



DJ-G1E 2m

Price Match

**W&S
£199**

- 144 - 146MHz
- 108-174MHz Rx AM/FM
- 400 - 510MHz Rx
- 800 - 950MHz Rx
- 80 Memories
- 5W on 12v DC
- CTCSS + 1750Hz
- Ni-cads & charger

PRICE DOWN

DR-430 70cm Mobile

PRICE DOWN



**W&S
£249**

- 430 - 440MHz
- 20 Memories
- 25W output
- 20 Memories

- CTCSS Encode
- Time out feature
- Wideband Rx
- Inc. Mic and kit

WATSON



FC-128 Counter

1MHz - 2.8GHz

This new model has a wide frequency range and is powered by internal ni-cads. External BNC socket with aerial makes it very sensitive. Supplied with AC charger, it is very well built. Don't be fooled by the price!

**W&S
£79.95**

Remote Speaker Offer



**W&S
£4.95**

£14.95

- Up to 10 Watts
- 4" Driver
- 111 x 111 x 64mm

- Adjustable bracket
- 3.5mm plug
- Use mobile or base

WATSON

Base Mic. WM-308



Built-in buffer amplifier provides matching. Modern rigs will power it direct from mic socket - otherwise use 2 x AA cells. Includes connecting cable for 8 pin rig sockets wired ready for Kenwood - info provided for Yaesu & Kenwood changes.

**W&S
£59.95**

HF RIGS We've got the DEAL PHONE! "BEST PRICE" ORDER LINE 0500 73 73 88

KENWOOD HF RIGS



NEW TS-570

PRICE DOWN

TS-570 RRP £1499 but PHONE!

It's causing a lot of excitement, and rightly so. A lovely clear display with full DSP built-in. This is a serious rig.

TS-870 RRP £2399 - £1949

This is the big "daddy" of Kenwood's latest offering. It's got so many features that you first need the brochure and then you need a demonstration. Don't worry, we're not pushy here, take your time and enjoy a cup of coffee whilst you operate.

YAESU PRICES DOWN We've smashed Yaesu Prices until end of March!

YAESU HF RIGS



FT-1000MP

SAVE £850!

FT-1000MP Technical Overview Manual available for loan 46 - pages - Phone

FT-1000MP	£2849	£1999
FT-1000MPDC	£2599	£1849
FT-990AC	£2199	£1499
FT-900AT	£1299	£1049
FT-840	£959	£695
FT-3000	£479	£359

Yaesu FT-8500 2m/70cms Mobile



SAVE £300!

**W&S
£449**

- 50W 2m 35W 70cm
- Smart control mic.
- 9600 bps ready
- Spectrum Display
- 53 Function Prog.
- 110 Memories
- Alphanumeric display
- Detachable Front
- CTCSS - 1750Hz
- Full Duplex

Yaesu FT-2500 50W 2m

SAVE £140!



**W&S
£259**

- 3 Power levels
- CTCSS & 1750Hz
- 31 memories
- Alphanumeric display
- US Mil. Spec.
- Mic. and hardware

Yaesu FT-50R 2m/70cms



Save £60!

**W&S
£269**

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

1997 Catalogue

144 pages full of
rigs accessories
and articles
Send £2.50
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ICOM HF RIGS



IC-706

IC-706 OUR PRICE £995

All the way from 1.8MHz to 144MHz in one box. A great little design at a great little price - 100W HF-6m + 10W 2m



IC-756

IC-756 RRP £2195 - But PHONE!

Just arrived, this is the new 1.8 to 50MHz super rig. Band scope, full DSP, 100W all bands etc.

CALL NOW FOR A GREAT DEAL!

NEW IC-207 2m/70cms Mobile 50/35W Below £400! Phone for full details

NEW KEN-



TM-V7E

- 144 & 430MHz FM 50W / 35W
- Dual receive on same band + full duplex
- 280 Multi-function memories
- Detachable compact command panel
- Cool large blue LCD with contrast adjust
- CTCSS and 1750Hz tone
- 8 channel steps - voice synth option
- 9600 baud Packet ready
- Graphic scan display
- Auto simplex checker - a unique feature!
- 4 page colour brochure on request

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- * We PRICE MATCH
- * Give you 10 days approval
- * Have 4 Service Engineers
- * Still offer help after the sale!

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MFJ-784B Filter

Price Down! £239



- Works with any rx. or tcvr.
- DSP filter, fully programmable
- 16 Factory pre-sets
- Plugs directly into audio out
- Drives speaker or headset
- Requires 12v at approx 500mA

MFJ-948 HF ATU

Price Down! £129



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

MFJ-949 HF ATU

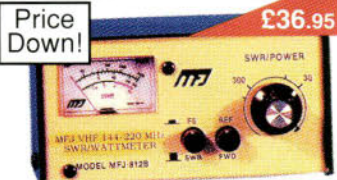
Price Down! £149



- 160 to 10m 300W PEP 150W CW
- Wire, coax or balanced feed
- Built-in Dummy Load
- 30 / 300W power meter - PEP / RMS
- Antenna selector, by-pass etc.

MFJ-812B 2m VSWR

Price Down! £36.95



- 144 - 148MHz 30 / 300W
- Forward & Reflected Power
- Reads field strength
- Easy to use - convenient size
- Low cost - efficient accessory

MFJ-259 HF Analyser

Price Down! £229



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

Connect to aerial or coax and adjust it in seconds. Turns hours into minutes and ideas into antennas!

MFJ-1278DSPX Data Unit

£399



- Multi-mode
- Packet
- Amtor
- Pactor
- Colour SSTV
- 10 Modes total
- DSP filtering
- Tuning scope
- Simple to us
- Software

MFJ-8100k HF Rx

KIT PROJECT £69.95



- 3.5 to 23MHz SSB and CW
- Smooth regenerative control
- Ultra sensitive - even on 10ft wire!
- Kit includes everything - as pictured.

MFJ-492 Keyer

Price Down! £99



- Electronic memory keyer
- 192 Character memory
- Easy to programme with messages
- Chain regular phrases - QTH, name etc.
- Tutor mode for practice
- Semi-auto, Auto and Iambic modes

MFJ-914 Auto Match

NEW £59.95



Auto-Tuner Extender
Connect between auto tuner and transceiver - no more problems with G5RVs and all those difficult antennas - 160 to 10 metres

MFJ-864 160M to 70cm

Price Down! £79.95



- All bands from 1.8MHz to 440MHz
- Cross needle meter - 30 / 300W
- Comprehensive user calibratable
- Separate HF and VHF/UHF sensors
- Illuminated meter (ext. 12V)
- Everything you need in one box
- 185 x 65 x 75mm

Ameritron 811 1kW

Price Down!



The only currently available HF linear to have passed a full lab. CE test

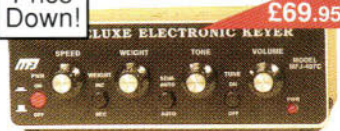
- 1 kW linear 9dB Gain
- Like a 5 element Monobander!
- Uses low cost 811A tubes
- Built-in rugged AC Supply
- Instant by-pass switch
- PA V/A meter + Grid meter
- Over rated variable capacitors
- Fan cooled for long life
- Very efficient - 600W output
- Easy to tune and connect
- Size 16" x 13.75" x 8"

160 to 10M of DX-Getting Power
Perfectly matches all 100W rigs

£799

MFJ-407C Keyer

Price Down! £69.95



- Self contained - ext 12 or internal batt.
- Semi auto and full auto modes
- Dot dash memory - self completing
- Weight, tone and Vol. controls
- Just plug in paddle and connect to rig
- Works with all modern rigs.

MFJ-781 DSP Filter

NEW £139



Just arrived, this new DSP filter that is specially designed for CW and data modes.

- Digital Audio Filter
- CW 50, 100, 200, 500Hz
- Amtor, fax, GTOR, PACTOR
- RTTY, SSTV, We-FAX

MFJ-901B HF Atu

Price Down! £69.95



MFJ-941E Atu

Price Down! £109



- 160m to 10m ATU - 300W
- Wires, Coax and Balanced Feed
- Cross Needle VSWR & Power
- 3-Way antenna selector
- By-pass position - Dummy load socket
- Internal Balun - 30 or 300W position
- 260 x 180 x 70mm

MFJ-250X 1kW load

Price Down! £34.95

- 1kW Dummy Load
- Oil cooled design
- SO-239 socket
- Ideal for linears
- 1MHz to 400MHz

* Oil is not supplied

MFJ-260C 300W

£34.95

- Dummy Load
- 50 Ohm
- 300W
- OK to 450MHz
- Air cooled
- SO-239
- Totally enclosed
- Essential item

MFJ-264 1kW Load

£64.95

- Dummy Load
- 50 Ohm
- 1.5kW
- OK to 650MHz
- Air cooled
- SO-239
- Ideal for linears
- Ruggedly built

MFJ-704 LPF Filter

£39.95

- Low pass filter
- 1.8 - 30MHz
- Cleans up output
- Reduces TVI
- 1kW rating
- SO-239 sockets
- Fully shielded

MFJ-1118 Dis. Board

Price Down! £69.95

- Complete 12V distribution system
- 5 Output terminals - RF by-passed
- Built-in 0 - 25V Volt meter
- Fused input and outputs
- Master switch and LED indicator
- Super heavy gauge DC input cable
- Max current 35 Amps
- Heavy metal shielded case

MFJ-840 Handy Meter

£23

- 144 - 146MHz
- 0 - 5 Watts
- BNC Handheld fitting
- Reads power out
- Checks all handhelds

MFJ-9406 6M Trancvr.

Price Down! £249



- 50 - 50.3MHz 10W SSB
- RF speech processing
- 10MHz xtal filter
- Super performance
- Ideal way to 6M DXing

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Fax. 01702 205843

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- 7 EDITOR'S KEYLINES
- 8 RECEIVING YOU
- 10 SUBSCRIPTION OFFER
- 14 CLUB SPOTLIGHT

18 RADIO - DISCOVER THE BASICS

Rob G3XFD uses simple analogies to explain electron theory.

21 NEWS 1997

22 RADIO AMATEURS ON TRACK

Bruce McCartney GM4BDJ goes on a railway holiday to Lithuania.

24 RADIO DIARY

25 ANTENNAS IN ACTION

Eight pages of antenna and associated action!

antennas in action

8 pages of
antennas

37 REACTIVATING AN ANCIENT RECEIVER

Walter Farrar G3ESP brings back to life an ancient HRO receiver.

38 NON-LINEAR SCALES

Andy Gayne G7KPF draws power scales using his computer.

40 STRUCK OFF ALMOST!

When Ben Nock G4BXD was asked to provide radio props for a TV drama he realised things are not often as they seem!

46 CARRYING ON THE PRACTICAL WAY

George Dobbs G3RJV shows you how to 'roll' your own filters.

50 LONDON AMATEUR RADIO & COMPUTER SHOW FLOOR PLAN

52 FINDING YOUR WAY TO PICKETTS LOCK

54 TRADERS' TABLE

Your guide to second-hand equipment.

57 WIN A YAESU FT-8000R MOBILE TRANSCEIVER

58 LONDON SHOW NEWS

60 NEW FROM PW PUBLISHING - FERRELL'S CONFIDENTIAL FREQUENCY LIST



61 OF SPECIAL INTEREST

An insight into some of the Specialist Interest Groups attending Picketts Lock.

62 VALVE & VINTAGE

Phil Cadman G4JCP opens up the PW vintage wireless shop.

66 REVIEW - THE KENWOOD TM-V7E DUAL-BAND TRANSCEIVER

Leighton Smart GW0LBI goes mobile with the latest from Kenwood.



70 VHF REPORT

73 REVIEW - THE YAESU FT-8000R DUAL-BAND TRANSCEIVER

Richard Newton G0RSN puts our competition prize through its paces.



77 HF FAR & WIDE

80 BITS & BYTES

82 PACKET PANORAMA

85 BROADCAST ROUND-UP

89 BARGAIN BASEMENT

95 BOOK STORE

104
Page
Bumper
Issue

100 ADVERTISERS' INDEX

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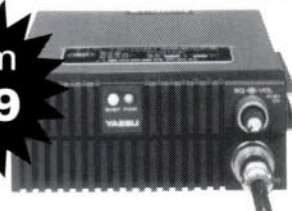
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channel spacing suitable for setting up on
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2m handi

only
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AR-303	Rotator	only £39
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15SE	15m mobile whip	£13
17SE	17m mobile whip	£13

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A3WS	12/17m 3-ele Yagi	£299.00
A103	30m Extension A3WS	£119.00
204CD	4 ele 20m Yagi	£499.00
154CD	4 ele 15m Yagi	£289.00
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D3W	Dipole 12/17/30m	£199.00
A4S	3-4 ele Yagi 10/15/20m	£449.00

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EDITOR'S Keylines

Rob Mannion's viewpoint on the World of Amateur Radio



Many readers seem to have been particularly interested in the PW 'Cadet' receiver kit which we've recently introduced in our continuing efforts to encourage newcomers to the radio hobby. And I'm pleased to say that this innovation is proving popular, and the series I'm writing - which actually introduced the Cadet to readers - is also proving to be of interest to readers judging by the letters I've received!

The PW 'Cadet' kit will continue to be available for beginners and instructional purposes to those who require a 'starter' constructional idea. And along with the other projects we've done (and will continue to do) we hope this kit along with the many major kits available from the specialist suppliers - some resulting from PW commissioned projects - will continue to encourage readers to carry on enjoying the 'practical' side of the radio hobby.

Price Of Kits

Among the letters I received about the new 'Radio - Discover The Basics' series and the PW kit, was one from **John Noble** in Kent who was commenting on what he thought was the relatively high price of the Cadet kit. Unfortunately in one sense...I had to agree with him that relatively speaking such kits **are expensive** and the reasons behind the expense are the same facts which are increasingly effecting the 'home-brew' side of the radio hobby.

I replied to John - who lives near Rainham in Kent - that when you compare the price of a kit such as the PW Cadet (£23.95 plus postage) with that of a Far Eastern import there's no comparison. Obviously, when you realise that you can buy a very reasonable long,

medium, short wave and v.h.f. Band II (the so called 'FM' radios) portable for less than £20 - a d.i.y. kit for a very simple receiver cannot compete technology or price wise.

However, the benefits in self-training, discovering technology and understanding physics and enjoyment offered from building something yourself **are immeasurable!** And even though I'm sitting writing my editorial while listening to classical music from a complex modern Japanese made v.h.f. Band II radio - I get even more enjoyment designing and building (relatively) small radios. (I can't get them much smaller because of the infamous 'bifocal 'specs' problem that comes to us grandfathers!).

When I originally started the process off to introduce a PW commissioned kit the eventual price was very much a concern. The designer and I discussed the pricing and we worked carefully on the project to ensure the very best value for money for all concerned.

The basic problem involved with our specialised hobby is that of volume sales. If there was the demand (such as that for the ready-made products from 'sweat shop' factories in low wage earning countries) I've no doubt prices could be much lower. You've only got to see the remarkably lower priced multi-mode CB radio transceivers to realise the effect a mass market has on equipment prices and availability.

However, my feelings on the price of the kit available through PW and those from our specialist advertisers can be summed up simply: I think they offer good value for money and many other

advantages (some of which I've already outlined).

My thoughts on the value-for-money subject have been backed up recently when I saw extremely basic crystal sets (comprising literally of just a 'crystal' diode, a cardboard former coil, sliding inductance type tuner and 'crystal' earpiece) selling via promotions in weekend newspapers for up to £15!

The 'Crystal Set' kits I've seen advertised in 'weekend supplements' and the specialised marketing catalogues are beautifully presented and marketed in a very clever way. But I wonder how many of the receivers have acted as radio 'turn-offs' for the recipients of the gifts?

Of course diode only receivers **do work** - but you can imagine the effect on a keen young builder when they can only hear one very faint station on their birthday or at Christmas. I think that once they've been built many of the 'Christmas Crystal Sets' are consigned to the attic, while the young person returns to the computer keyboard to carry on working while listening to their nice shiny stereo radio (like me at the moment perhaps!).

No Choice

Like many people I had no choice as a youngster. Any radio for my own use, I had to build. The radio in our living room was a part of the house furniture and I wasn't allowed to do anything other than 'twiddle the knobs' and even then only when Dad was around to supervise me.

Nowadays young people have no incentive to build radio or electronics themselves unless they

have an instinctive or natural interest. And perhaps rather surprisingly I've found that one of the routes into radio is now turning out to be via computers!

Many of the younger radio enthusiasts I'm meeting have 'discovered' radio as a hobby when they've delved into the accessory market for their computers. When they come across problems interfacing computer equipment, radio receivers and associated electronics they're beginning to realise there's a great deal of interest waiting behind the screen and under the keyboard!

And continuing on the computer theme. The Internet is now playing a tremendously important part in learning, communications and our hobby. There's a large number of Amateur Radio related 'Web' sites. At the moment this is only available for most people via telephone lines...but I wonder how long it will be until an 'International' h.f. frequency for computer users (a 'Radio Internet') will be set up?

Once 'on air' with low power fixed frequency radio links (similar in concept perhaps to CB radio regarding 'free access') I think many computer users will be attracted to radio as a hobby itself. I think it's only a matter of time and I think it's up to us to encourage the newcomers to the further delights of Amateur Radio communications in general when the time comes. And I feel it will come sooner than we think!

*Rob Mannion
G3XFD*

The Star Letter will receive a voucher worth £10 to spend on items from our Book or other services offered by Practical Wireless. All other letters will receive a £5 voucher.

RECEIVING You

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

Letters Received Via The 'Internet'
Many letters intended for 'Receiving You' now arrive via the 'Internet'. And although there's no problem in general with E-Mail, many correspondents are forgetting to provide their postal address. I have to remind readers that although we will not publish a full postal address (unless we are asked to do so), we require it if the letter is to be considered. So, please don't forget to include your full postal address and call sign along with your E-Mail hieroglyphics! Editor

Looping Again

Dear Sir

I was interested to read the article in *PW* by Ben Nock G4BXD called 'Looping Over The Lawn' (*PW* July 1996), which he wrote for Robin Wood G4UDK about a Ferrite transformer coupled Magnetic loop. This antenna undoubtedly stems from a QSO I had on the 14th March 1994 with Robin G4UDK and G0EVY when I described my antenna to them.

I explained that it was a wire loop, a tuning capacitor and the coupling device was a Ferromagnetic transformer. I also pointed out that I had already filed a Patent Application No. 9400764.8 and GB 2285712.

However, I would like to point out that with the one-to-one ratio transformer, as shown in the article, the loop will not match to the 50Ω coaxial feeder well enough to work on both 1.8 and 3.5MHz. To use the loop for both 1.8 and 3.5MHz, a transformer needs to be constructed, which is capable of matching the loop when it is at resonance to the 50Ω coaxial feeder, this also means that an a.t.u. will not be required.

The stations that I have worked on my loop include North America on Top Band, New Zealand, America and the Caribbean on 3.5MHz without the use of an a.t.u. As the construction details are too long to go through in this letter, I will send full details to anyone who sends a stamped addressed envelope to me at: Micro Museum, 54a Load Street, Bewdley, Worcestershire DY12 2AP.

Ben Edginton G0CWT
Worcestershire

HF Data Card

Dear Sir

Some years ago *PW* issued a free insert card listing all the h.f. frequencies and their recommended user allocations. On the back was a short summary of band propagation characteristics.

I would very much like to see an updated edition of this card, to keep in a clear plastic photographic frame on my rig. Please give serious consideration to a re-issue!

Although retired and a full licence holder for some years, I never tire of reading basic practice and theory articles - something I missed out on during my working life as an architect.
Raymond Fuller G0KXK
Surrey

Editor's comment: Glad you still find your Data card useful Raymond. I occasionally meet readers at shows and rallies who suggest the same as yourself. Readers who would like to see a new card issued are invited to send a postcard (only postcards please) to me, with name address, so we can evaluate the interest.

The 934MHz CB Band

Dear Sir

I wonder why the Government gave us 934MHz CB, just to take it away again? After all, it was the government that chose 934 in the first place. (Well, in fact it was 928MHz and then went on to include 934MHz in their final decision).

The main plus of the system which featured strongly in the Government's considerations was that it

would be less likely to give interference to other users of the radio spectrum. And, the expected sensible use of the frequency was, and still is, one of the reasons we should not give up our fight to save what I believe to be one of the most friendliest frequencies of all time.

So, please keep those letters coming and let's hope that the death sentence we have been given will be extended to life on the 'airways'.

Bill Reynolds
Northants

Arranging Skeds On 23cm

Dear Sir

As everyone knows, all contacts on higher frequencies start with a telephone call, so I thought I would go one better and advertise in the press for

contacts. There are two excellent 23cm repeaters here in Yorkshire just waiting for someone to use them.

We have GB3UY in York on 1297.325 which is working well and GB3WC on 1297.375, which is now back on horizontal polarisation. This repeater is on Emley Moor television mast and has a tremendous signal and coverage area.

I monitor GB3WC most of the day and call on both after 2000hrs and 2230. There is also a daily Net on 1296.210MHz u.s.b. at 0925 and 1925hrs.

Roy T. Oxley G0FYM
Yorkshire

Editor: Best of luck! If Roy or anyone makes a successful 'sked' through *PW*...David Butler G4ASR of 'VHF Report' would be very interested to hear about it.

No Plugs?

Dear Sir

I thought it might be a good idea to write to warn would-be buyers of new rigs that they find their new kit comes with no plugs. Last October an insurance policy matured, so I had a rush of blood (Hi!) and decided to plan an update my station. The h.f. rig was seven years old, the v.h.f. 144MHz rig was ten years old.

I bought an FT-1000MP. It's a great rig, the best I have ever used. In the kit was a bag of plugs so that I could use all the outlets of the rig.

In mid November, an FT-8000R v.h.f./u.h.f. rig arrived as part of the plan. Alas, not a single plug in the kit. The rig has an N socket, being an h.f./v.h.f. operator, I didn't have an N plug in my stock. My friend M0ANM loaned me one so I got back on the air, thanks John. The

This Month's Star Letter

Under £1

Dear Sir

I am writing in response to the letter from Tony Green GW4JGU in the 'Receiving You' of the January 1997 edition of *PW*. With him commenting on an old *PW* series called 'Under Twenty Shillings'. Being only a Novice holder and someone that does not have a great deal of money to spend on equipment I'm interested in the possibilities offered with the idea.

Personally, I think that any section in *PW* similar to the ones that he suggested would be a great help. Not just to me, but to many other people who are on tight budgets like I am, it could also help the Novice licensees. You currently produce construction slots in *PW*, but one of these are really aimed at the younger and novice class reader.

When you do one of these articles the writer uses jargon that I understand, (only because I have gained a B grade at GCSE Electronics). But I know people (younger than me) who don't understand them, and they have to ask their technology teacher at school to explain. So, please can you give this a great deal of thought and if you do, can you please put it in language that the younger reader will be able to understand.

Even people with limited technical knowledge would be interested in knowing how to build their own radio equipment. Many people, of all ages, have an interest in radio, but find it too complicated and costly to fulfil their dreams of being able to achieve such a complex object.

Matthew Lawrance 2E1FIF (aged 17)
Essex

Editor's comment: All noted Mathew, thanks for writing. Any other comments on this subject readers? I'd be interested to read your suggestions.

Packet Problems

Dear Sir

I would like to reply to **Roger Cooke G3LDI** ('Receiving You' January 1997) by saying that the password system is just a way of denying access to parts of the Packet radio system to licensed amateurs and reserving portions of the amateur bands for their friends or people approved by them. It would seem that according to Mr Cooke, that after obtaining a radio licence, one must obtain a password in order to operate on packet radio and after having to write off to get this password one also receives a letter asking for a subscription.

Fair enough, but many people find it hard to find where to send to. I suggest the only jingle bells are in Mr Cooke's head as many of us have been on packet for some time. Far from ensuring the use of the bands for radio amateurs, a report said that packet radio proved their suitability of the band for private digital modes.

I would suggest to Mr Cooke that packet be available for all of us and the password control is a denial of the right to do so. Being just an ordinary chap, I cannot see why I should be prevented from doing so by anyone but the authorised Radio Agency.

It is a frightful pain finding out who to contact and how many people to contact in order to operate on packet radio. I suggest a central source for this information.

M. Charlton G0MDF
Nottinghamshire

Again, we asked our Packet Radio specialist author **Roger Cooke G3LDI** to reply directly to Mr Charlton via 'RY'.

Dear Sir

Thank you for passing the letter from **G0MDF** onto me for reply. I think **Mr Charlton** is somewhat over concerned about the 'password' access to a BBS. Let me try and explain yet again for him and quote a scenario that could happen.

Firstly, NO sysop would wish to deprive Mr Charlton access to the BBS. In fact most sysops are 'Elmers' in their own right and go to great lengths to help newcomers to enjoy this facet of our

hobby. Let us assume that Mr Charlton has just purchased a TNC and has got onto packet. Now, if he wished, he could operate with impunity on a user channel, with other users and never use a BBS. He would not need permission, or a password to do that.

If he then decides to use the local BBS to send mail to other amateurs in any part of the world, making use of the BBS, the Network and possible satellite gateway, he could log onto the BBS, read and follow the registration instructions and then, if he wishes, for full access, send a message to the sysop and apply for a password.

The password is installed for the reasons I gave in my previous response to Mr Charlton, and it is there for the users' protection as much as the sysop's protection. In no way does it reserve portions on the bands to friends, etc. This is just a silly statement to make.

The password would only be issued on a personal basis to again prevent any fraudulent use of the system by some unlicensed person. I can also assure Mr Charlton that no sysop will issue a letter to him asking for a "subscription". Obviously the BBS does take a lot of the owner's reserves of time and money, as it runs 24 hours per day. Donations are very welcome, but are not solicited by sending letters to users.

I would agree again with Mr Charlton that "jingle bells" are probably in my head, as I have operated digital modes since 1957. I was also one of the first UK stations to operate packet radio and have been running my BBS on both v.h.f. and u.h.f. and h.f. since 1984.

Finally, I would suggest that if Mr Charlton has any problems at all that he contacts his local DCC representative, or the sysop of his local BBS who I'm sure would be only too pleased to help. He can also contact me if he wishes to do so on **(01508) 570278** and I would be only too pleased to discuss the matter with him.
Roger Cooke G3LDI
Norfolk

Editor's Note: The correspondence on this subject in 'Receiving You' is now closed. However, there's nothing to stop interested parties writing directly to each other or sending packet messages!

We asked Barry Cooper G4RKO of Yaesu (UK) Ltd. to reply:

Albert raises some interesting points in his letter. What is supplied or not with your radio transceiver is invariably determined by the staff of Marketing Departments who decide how a product should be 'packaged' for a particular market. However, to get direct customer feedback is always useful as it helps us to 'get it right' for the most important person,

you, the customer.

As regard the specifics raised by Albert, these serve to illustrate the point. The FT-1000MP, the 'Rolls Royce' of the range comes fully equipped with very conceivable accessory plug.

The FT-8000 mobile, aimed at the fiercely competitive low-cost dual-band mobile market, is supplied only with spare fuses and the mounting hardware for the mobile mount included in the package. No 6-pin mini-DIN! The reason for this

omission is that Yaesu provides an optional CT-39 Data/packet leads terminated with a 6-pin mini-DIN plug and, of course, to include the mini-din adds further cost.

Having used the rig, I am sure Albert now appreciates the wisdom of fitting an N type connector rather than the much less expensive SO-259. In doing so, Yaesu is providing a much better signal path for those u.h.f. signals, which, on the FT-8000 receive-side, go all the way up to 1.3GHz!
Barry Cooper G4RKO
Yaesu UK Ltd.

Can You Help?

Dear Sir

As a committed and enthusiastic reader of the best amateur radio magazine this side of the Atlantic, I wonder if you can help?

Though very comprehensive, your book pages cannot provide me with a source for a book that I am trying to obtain a copy of. The publication in question is *The Hut Six Story* by Gordon Welchman.

The Title has been published in both hard and paperback versions as far as I know. The hardback version was first published by McGraw Hill in the US the paperback version in the UK by Penguin.

I wonder if any of your readers has a copy that they no longer want, I would be very grateful if anyone could help.

Thanks and keep up the hard work.

73

Kevin (full name and address supplied)

Editor's comment: How could we resist Kevin's request? Can any reader help him find this book which features the exploits of the famous Bletchley Park and the 'Enigma' decoding organisation. We'll pass on details on this book and any other details you have to our keen reader!

Lacking Information

Dear Sir

Under the 'Receiving You' heading in January's issue of *PW* was an article by **Roy Maskey G4TDW** about which the Editor asked for comments. I heartily agree with Roy. There are so many sets on the market lacking sufficient information as to their performance that life gets confusing.

If, like me, money is not exactly growing on trees, the outlay for a modern short wave receiver is a consideration that requires some serious thought. One does not wish to arrive home to find one has bought a 'pup'.

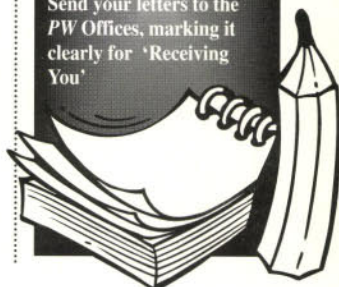
Like Roy, I have retained my old receiver which, believe it or not (I can see lips curling) is a one transistor and one i.c. home-brew job. It has good selectivity, good audio response and rakes in some really out of the way stuff, so why should I change?

At least what I receive is obtained by my own efforts and not (as is so much the case with today's so-called Amateur Radio) dependent on the size of your wallet's contents.

John Noble
Kent

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

Send your letters to the *PW* Offices, marking it clearly for 'Receiving You'



crunch was that the rig required a 6-pin mini DIN plug for packet operation.

Local shops don't have them, and it proved difficult to find any. The moral is to ask your dealer to include all plugs with the deal, so that you can use the rig when you get it. The FT-8000R is a nice rig ready for 12.5kHz spacing and 9.6kb on packet. But it cost me about £3 on telephone calls and postage to get a 75p plug. Come on Yaesu, gizza plug, Hi!
Albert Heyes G3ZHE
Cheshire

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UK's best selling SW receiver. RRP ~~£599~~

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Communication receiver covers 30kHz-30MHz. Complete with power

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Zoë says:
"keep the News and
those Club
magazines coming!"

CLUB Spotlight

Compiled by Zoë Crabb

Swindon's Origins

The Swindon & District Amateur Radio Club (SDARC) traces its origins to before the Second World War. But the club, as it is known today, was inaugurated in August 1955 in what was then the Connaught Restaurant in Cromwell St. (now the site of Marks & Spencer's food hall).

The club has met at several other venues since, including The Cold Harbour Public House in Blunsdon, Oakfield School in Park North and, most recently, at Rowborough Farm in South Marston. In November 1994, the club made its most recent move, taking up residence at the Eastcott Social Hall, Savernake Street, off Eastcott Hill, Old Town.

The club meet every Thursday from 7pm to about 9.30pm, with refreshments available from 7.15pm. The activities of the club have always been centred on amateur radio with support for a broad range of members' interests, including antenna and equipment construction and operating.

Indeed, those considering preparing for the Radio Amateurs Examination or the Novice Examination will always find experienced operators and skilled technicians willing to provide support and advice. It has become the club's practice to organise a talk on an aspect of Amateur Radio or a related topic on the 1st and 3rd Thursday of each month (except during August) and to provide what the club describe as 'Natter Nights' on the remaining Thursdays.

Talks begin at 8pm and are generally arranged to last

Recently, Colchester Radio Amateurs decided to make a presentation to their long serving Honorary Secretary to commemorate two of his many remarkable achievements. Firstly, the organising and teaching of the RAE Course in Colchester by **Frank Howe G3FIJ** over a period of 40 years without a break from 1955-1996.

Frank started classes for the Amateur Radio certificate and training for the Morse test in 1955 to enable interested persons to become licensed Radio Amateurs. These have continued every year until now, with no breaks. Indeed, for some years, it was said that the only day without Morse Practice Transmissions in Colchester was Christmas day!

In the years up to 1979, more than 300 people had obtained their Amateur licence. From 1979 on, the Multiple Choice Examination was introduced and to date there have been over 900 entries with around 750 first time passes and 180 referrals on one paper. Most of these managed a pass at the next attempt.

In one year, there were over 100 candidates taught in three classes per week on three evenings. New courses were devised for the Novice Licence Amateur Radio Examination, with similar success.

Candidates, of both sexes, aged from 9-70 years have travelled from various parts of East Anglia, from as far away as Norfolk, Southend in Essex and Newmarket in Suffolk. Many Morse candidates have listened to Frank and **Ted G4LFD** (144.160MHz daily at 9.15pm) from Kent to Lincolnshire and have had their efforts corrected and speed improved.

just over an hour. 'Natter Nights' allow members to exchange information informally, to seek help with special projects and for the club to keep members up-to-date with developments, both of local issues and those on a wider horizon.

As a further service, members provide Morse Code classes on Natter Nights from 7.15pm, targeted at all levels of experience and on request, members will find experienced Morse operators

willing to send practice transmissions locally using v.h.f. The club has two active call signs G8SRC and G3FEC and these are used to provide facilities for the operation of a full h.f. station and a packet station every Natter Night using club equipment.

In addition, the club uses its call signs to enter several of the annual operating contests where members who are interested, work together as a club team, spending from a few hours to a complete

Some candidates are physically handicapped or partially sighted and therefore unable to attend classes. Frank Howe has tutored them personally in their homes so that they have obtained Amateur Radio Licences and thus widened their horizons considerably.

For the disabled group particularly, Frank has recorded six long play cassette tapes to enable them to cope with RAE theory. Copies are loaned whenever needed.

Under Frank's direction and organisation, with this team of helpers from Colchester Radio Amateurs, it is likely that the achievement of training more than 1200 Radio Amateurs will not be surpassed.

Secondly, in 1965 Frank helped form Colchester Radio Amateurs and became Secretary. He still holds this office and his guidance has been the key to the club's success. It has gone steadily from strength

to strength, participating in many Amateur Radio activities and is one of the largest in East Anglia, with a membership of over 70.

Frank is a natural teacher in some demand, particularly for his antenna demonstrations, which he gives freely to many schools and clubs in North Essex and Suffolk. He is always ready to assist other amateurs from the newly qualified licensee to advanced operators, attempting satellite communication for the first time. All benefit from his support and encouragement.

The value of Frank Howe's efforts should be seen in the context of the Amateur Radio Service being officially recognised for maintaining communications in times of a national disaster, when the essential services communication systems have been unable to cope in an emergency.

The club would like to wish him well in the continued enjoyment of the Amateur Radio hobby to which he has given so much.



(L to R) Colin Smith G0LIN (Chairman of Colchester Radio Amateurs), Frank R. Howe G3FIJ (Hon. Secretary of Colchester Radio Amateurs) and Peter Chadwick G3RZP (Ex RSGB President and member of the RSGB Council).

weekend at one of the local contest sites 'playing radio' competitively and attempting to contact as many other stations as possible, both within the UK and beyond.

Over the past few years, the SDARC's efforts have led to the club appearing in the top dozen stations in the UK results list of several v.h.f. contests. With a suitable level of interest, the club's next goal might just be to enter one of the h.f. contests, again just for a bit of fun - the basic

philosophy for all their contest activity.

Membership of the SDARC is available to anyone interested in radio and allied subjects. New members, whatever their experience in amateur radio, are always welcome, as are visitors who are considering the hobby.

One of the delights of amateur radio is the breadth of activity which it encompasses. If you live in the Swindon area and are

Heart Charity To Benefit From Amateur Radio

The Wincanton Amateur Radio Club have announced the launch of their VHF Postcode Charity Challenge. This is an annual event, 1st January to 31st December each year. The event is specifically v.h.f./u.h.f., with emphasis on the lesser used bands to try to increase general levels of activity.

The challenge is based on postcodes and IARU squares. These references are constant and not susceptible to changes in county or district boundaries.

The primary motivation in the further development of the challenge was to

honour a founder member of the Wincanton Club, **Dave Sugden G4CGS**, a good friend was lost to the club as the result of a heart condition. Dave was always prepared to help others, had an active interest in v.h.f. and microwaves and was very knowledgeable on matters associated with these bands - both operational and technical. He was also instrumental in the development of the 70cm repeaters GB3WY and the soon to be operational GB3TC.

The secondary motivation behind the development was to try to stimulate activity through direct communications on what seem to be becoming the lesser and lesser used v.h.f. and u.h.f. amateur bands.

The basic concept is similar to WAB and comparisons will be made. However, the

challenge is based upon Locator Squares and Postcodes, these being unaffected by changes to country, county or district boundaries. It is anticipated that, since the majority of amateurs are likely to know their primary postcode area, eg. BA or LE, etc., and v.h.f. operators are likely to know their principle locator square, eg. IO81 or JO03, etc., it should be very simple for all v.h.f. operators to participate.

Participating UK amateurs purchased a Postcode Charity Challenge book for the sum of £5.50. Cheques and postal orders should be

made payable to the Wincanton Amateur Radio Club and crossed Postcode Charity Challenge. Overseas amateurs are requested to send 16 IRCs.

The Postcode Charity Challenge book contains all the documentation that will be required for full participation, including: The Rules, a General Postcode/Locator Map, Multi-band Cross Referenced Logging Sheets and an Entry Form.

For those who are contest minded,

there will be an annual contest on each band covered by the challenge and therefore the book also contains a Contest Log Sheet, Cover Sheet and Scoring information for both UK and Overseas entrants. Particular encouragement is given to participating stations to contact Novice stations.

Further information may be obtained by sending an addressed A4 envelope with attached postage stamps for 100g 2nd class postage (currently 31p) to: **The VHF PCC, The Wincanton Amateur Radio Club, c/o King Arthur's Community School, West Hill, Wincanton, Somerset BA9 9BX**. Brief details may also be obtained on Packet via **G3OOL @ GB7BNM** or via E-mail from **warc@timanmar.demon.co.uk**

The challenge is open to all, with special emphasis being given to Novice operators.

Fully licensed amateurs, Class A or B
Novice class amateurs, A or B
s.w.l.s and also
Overseas amateurs and s.w.l.s

Fixed station, portable and mobile operation

All mode operation

a.m., c.w., f.m., RTTY, s.s.b. and TV modes

Operation on the principal v.h.f. and u.h.f. bands

6, 4, 2m, 70cm and 23cm

Recognition for ALL

A trophy or certificate will be awarded to every participant who submits a duly completed entry form

ALL profits go to the British Heart Foundation

Committee Change

The Aberystwyth & District Amateur Radio Society now have a new committee, consisting of Chairman - **David Williams GW4TUC**, Secretary - **John Woodward GW6IDK**, Treasurer - **Chris Davies GW7HAE**, Ordinary Members - **Bob Southwood GW7GNF** and **John Barrett GW7OZP**, Membership Secretary - **Wyn Williams GW4TUD**.

Katy GW0SFO will

continue to organise the West Wales Amateur Radio & Computer Rally this year, on Saturday 1 March 1997 (see Radio Diary for more details), and in conjunction with Martin GW0RBZ to produce the club Newsletter. Contributions are welcomed from anyone on Amateur Radio topics, serious or otherwise. Contact Katy, QTHR, or telephone on (01545) 580675.

The Society meet on the 2nd Thursday of each month (except July and August) at

The Spotlight's On Again!

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

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

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

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

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

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

Zoë

P.S. Please note, the closing date for entries is Friday 25 July 1997

the Scout Hut, Plas Crug, Aberystwyth. Special events are held during the summer months at various locations. Members have a wide range of interests and visitors are always welcome.

Club night on the air takes places on S17 every last Thursday in the

month at 8pm throughout the year, under the auspices of **Les GW3SON**, listen out for GW0ARA on 2m. Other club members are also welcome to join in.



Editor of *PW*, **Rob Mannion G3XFD**, receiving a FADARS hat from **Dennis G0SLJ** at his recent club visit to the Folkestone & District Amateur Radio Society. Sitting down, behind the hat, is **Stan G6ZNW**. (photo by Harry G3SBV)

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DX-70 TH High Power 6 m + HF Transceiver

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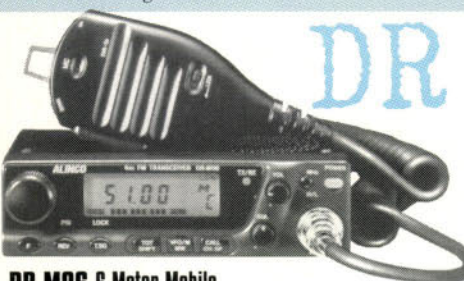
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RADIO DISCOVER THE BASICS

By Rob Mannion G3XFD

In his new column aimed at the beginner, Rob Mannion G3XFD goes back to the real basics of radio. Each month he'll aim to provide simple explanations and analogies which can then be backed up with further reading.

My young friend Barry Rimmer enjoyed building the PW Cadet receiver kit in January...but the inevitable happened and he started asking me questions! Barry listened to the radio for a while and then asked 'How does it work Rob...how does electricity flow'?

So, to answer his questions I thought it would be a good idea to use a technique I've employed for many years. Simple explanations to get you going which can be backed-up by further reading. In other words I'll provide a basic foundation, which can then be built on by adding further knowledge, strengthening both your knowledge and understanding at the same time.

Basic Force

I explained to Barry that the basic force behind electricity is the Electron. The electron is negatively charged and as far as we're concerned...it doesn't like other electrons. In fact they push away from each other.

Electrons form part of everything we're made of, surrounded by and walk about in. In other words they're very much part of all the various 'building'

blocks of the chemical elements of life.

I drew a diagram of the simplest 'building block' element known - that of the Hydrogen atom as shown in **Fig. 1**. Here a single negatively charged electron is in 'orbit' around a positively charged 'nucleus' (It really

with a ball attached to some string. Whirl it around your head (not indoors please!) and the ball will travel as far away from you as the string allows (you'll feel the pull). This 'balanced' situation will carry on until the pull (you holding the string) is broken or the ball is removed.

To start a 'flow' of electrons you have to introduce an 'unbalanced' situation by providing other electrons. Once extra electrons are introduced, they repel each other and are forced away into other areas (where they're just as unwelcome) and a chain reaction starts.

I told Barry that in my younger

days the 'chain reaction' was often explained as a shunting engine hitting the buffers of a wagon and that wagon hitting another's buffers and so on to the end of the line of wagons! But nowadays I find it easier to illustrate 'electron flow' by using the pipe and tennis ball routine.

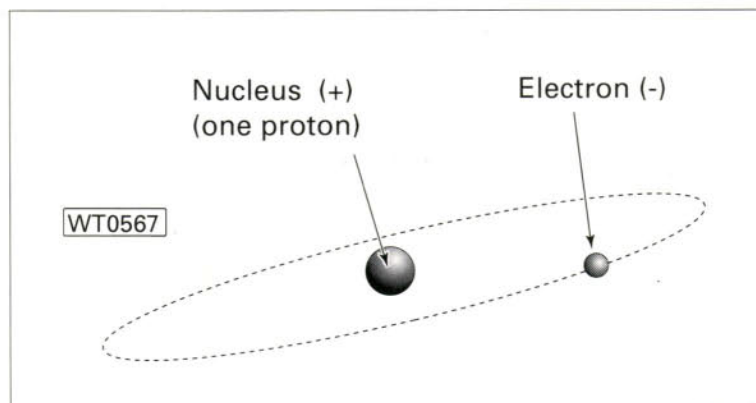


Fig. 1: The simplest 'building block' (see text).

does look like a 'planet' with a 'moon' or satellite in orbit doesn't it!).

The single electron is quite happy to 'orbit' the positively charged nucleus because it's attracted to the positive charge. But it's kept at a distance by other forces which

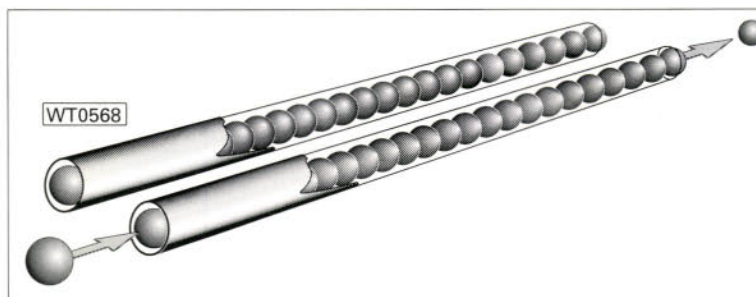


Fig. 2: Rob G3XFD uses the tennis ball analogy to illustrate electron flow

balance out the attraction.


















You can demonstrate the 'satellite in orbit round a planet' effect yourself

conductor in my very basic explanation.

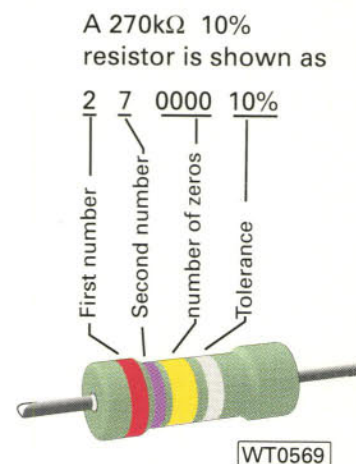
As soon as another electron (a

Pipe Full

If you can imagine, as in **Fig. 2**, that there's a clear plastic pipe full of tennis balls (playing the part of the electrons) we can start the analogy. The pipe represents the simple wire

Resistor colour code				
Numbers			Tolerance	±%
Black		0	None	20
Brown		1	Silver	 10
Red		2	Gold	 5
Orange		3	Red	 2
Yellow		4	Brown	 1
Green		5	Green	 0.5
Blue		6	Blue	 0.25
Violet		7	Violet	 0.1
Grey		8		
White		9		

WT0569a



WT0569

Fig. 4 & 4a: The resistor colour code with a 270kΩ 10% resistor shown as an example.

tennis ball) is added to the 'circuit' ...a displaced tennis ball pops out at the other end. The effect is almost instantaneous. Movement (albeit almost invisible except for the end result) has occurred and a 'flow' has started.

Obviously it takes some time for our original 'electron' (tennis ball) to pop out of the other end, but it does eventually. In the meantime the electron we've moved or disturbed has gone on to effect others and all we've got to do now is to provide a continual 'stream' of electrons to keep the 'chain reaction' going.

There are various ways of providing electrons to initiate a 'flow'. Next time I'll share with you how I explained to Barry how metals slowly dissolve with chemicals to provide electrons using the familiar

battery and how you can also 'generate' a flow of electrons by bullying them with magnets!

In the meantime I strongly recommend that you try some 'further reading' to back up your basic knowledge. And to help I've made a list of books...some of which will be available from your local library.

Vital Components

As Barry and I worked our way through building the Cadet kit I pointed out each vital component. So, I think it's a good idea that we take a look at each basic component as the series progresses. I'm going to start off with the resistor and provide a very short description of what the component does in circuit.

Resistors come in many shapes and sizes and as the name suggests they offer 'resistance' to electron flow. The term 'Ohm' (symbol Ω) is used to indicate the level of resistance.

Later on in the series I'm planning to devote the main part of the column to talking about resistance, Ohm's law (a really important fundamental law) and how it effects how the component is used. But for now I'll just introduce you to the resistor generally and explain how you identify the values.

The diagram, Fig. 3, shows a selection of the resistor types you'll come across - especially in the 'goody bag' bargain bins at rallies. Resistance values and the percentage of tolerance (how 'near' percentage wise you can expect it to be in the marked value) are shown by the coloured bands.

Next time I shall be sharing the experience Barry and I had with simple 'batteries' and generators and how to measure voltage, current and resistance. If you want to join in the experiments, I recommend you buy a simple analogue (one with a needle pointer) test meter. They're available from many sources, many of our advertisers, d.i.y. stores, electrical and hobby shops.

Look for a 'pocket' testmeter which should cost less than £10. But if you want any help or advice on what to get so you can join in the fun, please refer to the advice on the 'further' reading list. I've mentioned several sources of meters and guide prices there to help you.

PW

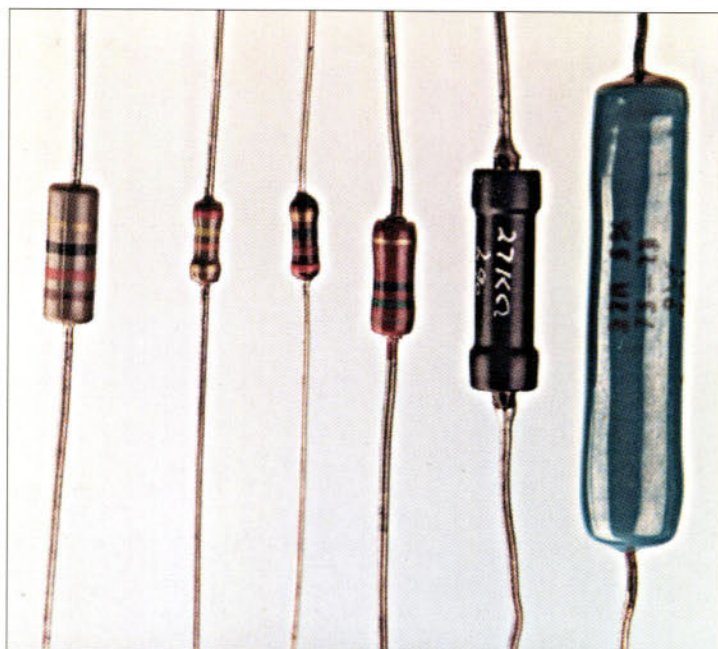


Fig. 3: A selection of resistor types.

Further Reading

Basic Electricity (In 5 Parts), Published by Common Core Press. Only available from libraries nowadays. There were and still are outstandingly successful 'first technical' books. (Your local library may well have this series bound in one volume).

Foundations Of Wireless: This famous book by Scroggie (Published by Illife originally and latterly by Newnes) is often still available in libraries. It went to 30 or more editions. Ask your library for help.

To help interested readers find the most helpful books for 'further reading' Rob has prepared a list of recommended books. To receive your list, send an s.a.e to 'Discover The Basics' Further Reading to the Editorial address in Broadstone.



Cheerio until next time!

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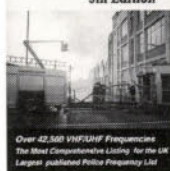
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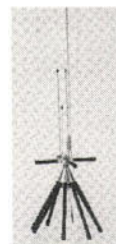
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30.000-87.495	5.0kHz	FM	225.000-400.000	12.5kHz	AM
87.500-107.995	50kHz	WFM	400.005-520.000	12.5kHz	FM
108.00-136.995	12.5kHz	AM	760.000-1300.000	12.5kHz	FM



QUANTEK FC2000 FREQUENCY COUNTER

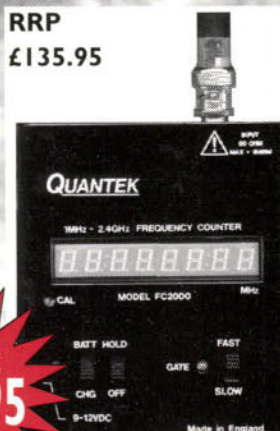
This sensitive "nearfield" counter is ideal for on-air frequency checking. Simply hold the counter near to the transmitter to get an accurate frequency reading. Comes complete with nicads, AC charger and aerial. An ideal frequency counter for service engineers or surveillance personnel who need an accurate handheld counter.

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Timebase stability:	+/-1ppm 25-35°C
Timebase ageing:	1ppm per year typical

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Size:	100 x 87 x 28mm
Specifications subject to change without notice	

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NEWS 1997

Compiled by Donna Vincent G7TZB

New From Lake Electronics

Not on 10MHz yet? If not, you may be interested in the latest transceiver from Alan Lake G4DWW.

Alan's new transceiver - so new that we don't have a photograph yet - is the latest addition to his long-established 'DTR family' or transceivers. It closely follows the pattern of its predecessors incorporating v.f.o. control, power output of (nominal) 5 and maximum of

7W. A 7-element filter follows the power amplifier stage, for minimal harmonic radiation.

As with other DTR transceivers, the DTR10-5 incorporates a direct conversion receiver and Alan reports that this has a sensitivity of better than 1µV minimum detectable signal (m.d.s.). The receiver also includes a passive audio filter providing selectivity of approximately 250Hz @ 6dB. The kit will be available at £97.80 plus £4 postage. It's also available 'built to order' for £162.

For further details contact Alan Lake at **Lake Electronics, 7 Middleton Close, Nuthall, Nottingham NG16 1BX. Tel: 0115-938 2509. E-mail: 100775.730@compuserve.com**

338 candidates. The December 1997 RAE will be the final examination in its present form. It will be the last opportunity for candidates who have been previously successful in only one paper to retake the paper they need to pass. From May 1988 the RAE will comprise a single paper of 80 questions. There will be 25 questions in the first part covering licensing conditions and operating conditions and practices. Candidates will have to be successful in Part 1 of the paper to be successful in the examination as a whole. For further information on the RAE and City & Guilds in general please contact **Roger Bone at C&G on 0171-294-2468, extension 2766.**

To obtain copies of the full summarised reports on the December 1996 RAE papers, please send an A5 stamped and self-addressed envelope to: **Lynnette Ranger at RSGB Headquarters at Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE.**

Fred Camm - The Practical Man

Many readers - including myself - can remember the time when F. J. Camm was the Editor of *Practical Wireless* and most of the magazine's sister titles. And it becomes patently clear when I visit clubs to provide 'PW' talks that there are very many people who thirst for knowledge on the almost anonymous man behind the famous name. It's also been patently obvious that I was lacking in knowledge about the great name - and just how little I knew was brought home to me after I read a copy of a newly-published book devoted to his life and work.

The book *F. J. Camm - The Practical Man 1895-1959* by Gordon G. Cullingham describes itself on the front cover as being "An outline of his life and works". And believe me...it does just that. It's absolutely fascinating!

Gordon Cullingham, the Honorary Archivist of the Royal Borough of Windsor has researched at length the interests, writings and skills of the remarkable Windsor man responsible for *PW* and many other magazines. Born at the end of the Victorian era, 'FJ' grew up in the early days of motoring, aviation and electronics and contributed - via his extensive writing in this and other magazines - a great deal to the public's understanding of the new technologies.

Camm was a skilled modeller, and this is clearly shown in the photographs carefully sourced by Gordon Cullingham. His research also enables us to 'peek' into the life of a man whose work - if not the man behind it all - was known to many of

us.

Fred Camm (he was married and had one son...something I didn't know until reading the book!) was born into a large family as the second of 12 children. His eldest brother Sydney - eventually Sir Sydney - was the well-known designer of the Hawker Hurricane of Battle of Britain fame.

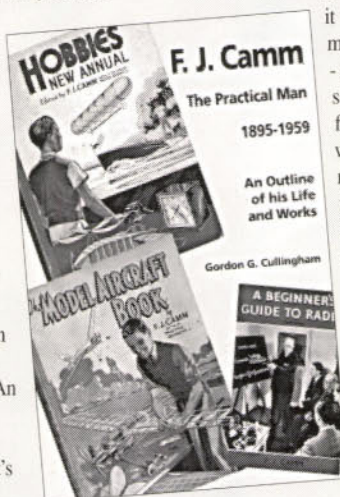
It's time that Fred Camm's life and work should be honoured and recorded by a book. In my opinion Gordon Cullingham's work does it admirably

and I intend to take it with me on all my club visits. It is - as I've already said - absolutely fascinating and will bring many memories flooding back for *PW* readers and anyone who also enjoyed *Practical Woodworker* and the host of other titles. It's a great tribute to a great man whose work we knew and

now we have the chance of learning a bit about the man himself.

Rob Mannion G3XFD

Copies of *F. J. Camm - The Practical Man 1895-1959* are available direct from **Gordon Cullingham** (Honorary Archivist Royal Borough of Windsor) for **£7.50 plus £2 P&P (UK)**. Airmail postage (surface post not recommended) is available for addresses abroad for **£3 (£10.50 inc. P&P)**. Please send your cheques (Payable to **Gordon. C. Cullingham**) to: **54 Alma Road, Windsor, Berkshire SL4 3HA. Tel: (01753) 863951. FAX: (01753) 861383.**



RAE Results.... Could Do Better!

A summary of the December 1996 RAE results from the City & Guilds makes interesting reading and those who do so will perhaps remember comments from their school reports: "Could do better"!

However, full summarisation of results in the report on Paper 7650-001 states that despite the comments, overall performance was about average for the paper. The report was prepared and the paper moderated from the analysis of

The ISWL On Air In 1997

Chris Carrington, Publicity Officer of the **International Short Wave League (ISWL)** reports that the club's callsign **GX4BJC** will be active during 1997 by the following operators:

February	Roy Smyth G14CBG (Using GN4BJC/P)
March:	Nigel Dyche G0RRW
April	Brian Smith G0IER
May	David Beale G0DBX
June	Mike Rutland G0VIX
July	Paul Westrip G0SLD
August	Fred Connor G4FMI
September	Dick Rugg G2BRR (Using G4BJC)
October	Roger Provins G0RGJ
November	Bill Griffiths GW0UHI
December	Philip Conway G4LAN

As in previous years, a special ISWL Club Callsign Card is available to anyone who either hears or works the station. A QSL will be sent on receipt of an incoming QSL or reception reports. You can QSL via the bureau or direct to: **David Beale G0DBX (G-10618), ISWL Club Callsign QSL Manager, 'Kenwood', London Road, Louth, Lincolnshire LN11 8QH.**

Radio Amateurs On Track

By Bruce McCartney GM4BDJ

If you are prepared to expect the unexpected and prepared to expect the expected NOT to happen to schedule, then look no further than a holiday with the BDX Group in Lithuania. Bruce McCartney GM4BDJ explains all...

The Baltic DX Group have organised a Summer Camp for radio amateurs in Lithuania for the past few summers. A special call has been allocated LY*BDX, (* depends on the year). About ten of us went from the UK in 1993.

In 1993, towards the end of our stay at BDX in Preila, I found out that a fellow BDXer, **Norman GI4SZP** and I had a mutual interest in railways. However, due to the rather remote location of Preila and the lateness in the holiday, we could not visit any railway locations that year. We said that we would return 'some time' to BDX.

Suitable Location

When it was announced that BDX 94 would be more or less in the middle of Lithuania, a much more suitable location for railway travel, packet messages went between me and Northern Ireland - yes, BDX 94 was a possibility. Norman and his **XYL Anne** would drive out to Lithuania, while I would fly, but this time we would request if it would be at all possible to visit a railway location during BDX 94.

A letter to the organiser, **Willy LY2PX**, produced the reply, 'Come early before BDX and stay with my family'. The three of us from the UK decided to rendezvous in Vilnius on the Wednesday before BDX, this

would give us two days of freedom to discover Lithuanian railways.

So, I arrived at Vilnius airport on Wednesday 20 July 1994, to a welcoming party of **LY2PX, Tadas LY2BAW**, his son, **Tomas LY3NNC** and Norman and Anne.

Willy introduced me to a totally new concept in driving. He couldn't put his car into gear with the engine running, every time we had to halt at traffic lights, he switched off the engine, pressed the clutch, put it into gear and, usually, but by no means always, we would lurch away!

Railway Museum

After depositing my luggage and eating my fourth meal of the day (it was just mid-day UK time) we set off in 30° of dry heat to meet with Norman and Anne to visit the Lithuanian Railways Transport Museum. In the centre of Vilnius, quite far from the railway station, we, with **LY2PX**, his son, **Jurgis** and **LY3NNC**, entered a grand building being renovated.

There were no signs outside of any railway nature at all! However, Willy assured us this was the place! There were fine long marble corridors, pillars, seemingly endless amounts of doors, Norman whispered that it would be rather difficult to get a locomotive in here as we went up the second flight of stairs.

Behind a curtained doorway stood the Director of the Museum. There were maps, plans, diagrams, buttons, pictures galore, but no major items. It was a slight disappointment, but the enthusiasm of the Director and the fun of our Lithuanian guides had translating, or trying to translate, railway technicalities into English made up for that!

Plans Adrift

After being introduced to the Director's wife, who had come along to meet his foreign visitors, we left after signing the visitors book. It was then decided that the next morning I would meet Norman and Anne and would then head north in Norman's car, with the teenagers, **Jurgis** and **Tomas**, as our interpreters, to visit a narrow gauge line which the Director had said was open to passengers.

We had discovered on the previous BDX that plans occasionally went adrift! So it was no surprise to Norman when we finally turned up at 1030 with Willy who had had his car 'repaired' that morning.

Thus two cars set off using 144MHz (2m) hand-helds to communicate. We stopped at a brand new motorway services, filled the cars with fuel and were about to head north again (it was now 1130 - so much for the early start!) when Willy discovered he had forgotten his medication. Never bother - the occasional stop and bite to eat would do instead!

Willy drove virtually flat out at 80km/hour, with the windows down to get rid of the engine fumes, to keep up with Norman and his three passengers. After what seemed an eternity the six of us reached our destination, **Anykschciai**. As we went into the cafe for lunch, Norman asked if my St Christopher was worn-out - 'nuff said!

Radio Time

After lunch, we went to the station, the timetables were translated and we had four hours to put in before the next train, the evening one from the west. Time for some radio!

Willy telephoned a local amateur. We met **LY1CQ** and his brother **LY1CX**. Both work at a local 'wine factory'. **Valdas** and **Audrius** took us on an interesting tour of the hilly and heavily wooded country-side around **Anykschciai**.

We were shown a giant boulder monument in honour of the two

Russian built narrow gauge locomotive running around at **Anykschciai**.

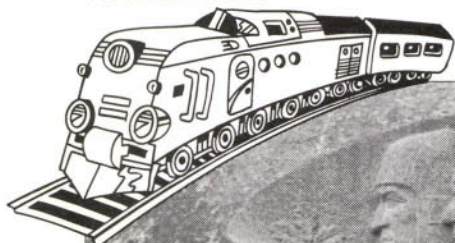




Lithuanian aviators who crossed the Atlantic in 1936. Next followed a tour of the wine factory, here, basically, virtually any fruit is fermented and made into what I would describe as a sweet desert wine. There was much evidence of recent foreign investment in the machinery in the plant.

In a room in the factory was the amateur radio contest station LY5R, the six element beam and top band dipole attached to the chimney having been in evidence all through our tour. All of the gear was home constructed or of ex-Soviet origin and it was amongst this array of equipment that we sampled some of the factory's products. (Our drivers totally abstained, the Lithuania laws being particularly severe).

The sight of a Soviet equivalent of a QV06/40 being used with the anodes strapped together in the driver stage of a 3.5MHz linear will stay with me for a while. LY1CQ reckoned that the linear could give out in excess of 1kW.



Exploring & Photographing

Next visit was the local 'horse' museum - this turned out to be a museum of farming! Finally, at 6.20pm we drove to Anyksciai station and had a few minutes exploring and photographing the buildings, sidings and abandoned section over the 'Holy Water' to Utenas.

Although narrow gauge, the carriages were 'normal size', quite unlike any UK narrow gauge line I've been on. We purchased tickets for the next station down the line for the train's return journey. (Five adult tickets for the six kilometres cost less than 40p).

The train paused for a few seconds at our destination and we had to jump off, as did the other few passengers. There was no hint of a platform. Willy gave us a lift back into town where we found somewhere to eat.



Peaceful looking Anyksciai station between (rare) trains

Car Trouble

The day still had surprises in store. Willy tested the oil level in his car, it didn't even reach the dip stick! The car needed five litres of oil at least.

A call on 144MHz produced, after some delay, a can of used sump oil and after this was poured in, we left Anyksciai at about 10pm. Just as the cars were leaving the town, Willy was flagged down by the Police!

A local farmer had walked 15km to the Police Station to report an incident at his farm and the Police didn't have enough petrol in their car to take him home - would he mind? Again the windows were wound down, but this time it wasn't the engine fumes causing the grief!

Interesting Experiences

Finally, amidst a spectacular 'shooting' display of meteorites, we arrived safely back in Vilnius. Perhaps railways had occupied about 10% of the day, but it had been a day of interesting experiences. Although we had originally planned that the Friday was to be a 'railway' day, we headed out to Birštonas and LY94BDX a day early.

The Summer Camp at Birštonas had amateurs from several countries. We experienced hot air ballooning, survived a visit to a mead factory and ate in the revolving restaurant high up Vilnius's TV tower. There was so much to do in BDX that although the

radios were available 24 hours a day, I only managed one contact with the UK!

If you are prepared to expect the unexpected and prepared to expect the expected not to happen to schedule, then look no further than a holiday with the BDX Group in Lithuania!

PW

Left: Monument in tribute to the two Trans-Atlantic Lithuanian aviators, near Anyksciai.

We're well into the New Year now, so we've decided to print all the Rally details that we have on file, at the time of going to press. Have a look through and see which Rallies you'll be attending this year.

RADIO Diary

Compiled by Zoë Crabb

1997

If you wish to have your Rally featured in Radio Diary, all you have to do is send in as much information about the Rally as possible, ie. date, location, time, who to contact, etc., and send it to Zoë Crabb at the PW Editorial Office.

February 16: The 16th Northern Cross Rally is to be held at Thornes Park Athletics Stadium, Wakefield - one large hall - just out of town on the Horbury road. Easy access from M1 junctions 39 & 40 - well signposted and with talk-in on 144MHz and 430MHz. Doors open at 11am (10.30am for disabled visitors and Bring & Buy). Further details from **Peter G0BQB** on (01924) 379680, FAX: (01924) 257445, E-mail: rally@waveg.demon.co.uk Web page: http://www.waveg.demon.co.uk/rally/

February 22: The Tyneside Amateur Radio Society will be holding their 11th annual rally at the Temple Park Centre, South Shields. The Temple Park Centre is located on John Reid Road, approached from A194 and with excellent access from all parts. Doors open at 11am with special entry at 10.30am for disabled persons. Admission is £1 on the door. The talk-in station will be provided on S22 from 8am. There is ample parking space for visitors and special arrangements will be made for disabled visitors. There will be a Bring & Buy and all the usual trade stands. More details from **Jack G0DZG** on 0191-265 1718.

February 22: The 12th Rainham Radio Rally, sponsored by the Bredhurst Receiving and Transmitting Society. This is the 4th year at the new venue, which is, The Rainham School for Girls, Derwent Way, Rainham, Kent ME8 9PP. Talk in on S22 GB4RRR. Doors open 10am, (9.30am for disabled visitors and items for Bring & Buy). Admission is £1.50, under 14s free. There will be the usual mix of trade stands, Bring & Buy, many special interest groups will also be represented, ie. RNARS, RAYNET, KRG, KEPAC, BARTG, etc. There will be plenty of off road parking, a licensed bar, food and refreshments. More details from **Martin M0AAK** on (01634) 365980 at any reasonable time.

February 23: The Barry Amateur Radio & Computer Rally will be held at the Barry Leisure Centre, off Holton Road, Barry. Doors open at 10.30am, (10am for disabled badge holders). There will be trade stands, a Bring & Buy, refreshments, a swimming pool and free car parking. **Brian GW0PUP**, Tel/FAX: (01222) 832253.

February 23: The Kidderminster Radio & Electronics Fair is to be held at the Kidderminster College, Hoo Road, Kidderminster, Worcestershire. Doors open at 10.30am to 3pm. Admission is £1. There will be traders, a Bring & Buy, Flea Market, food and drinks and talk-in on S22. **John G8MGK** on (01527) 545823 or mobile on (0860) 147954 or **Tony G4ALT** on (01562) 96552 or mobile on (0860) 902165.

March 1: The 4th West Wales Amateur Radio & Computer Rally will take place at Penparcau School, Aberystwyth. Doors open at 10.30am to 4pm (disabled visitors 10am). Admission is £1. All on one level with ample free parking. There will be trade stands, computers and radio, Bring & Buy, special interest groups, Repeater Group, West Wales Packet Group. Listen out for h.f. and v.h.f. G0DARA on the air. There's also lots more for the amateur radio and computer hobbyist, this is where the bargains are. Talk-in on S22. Further details and trade bookings from **Katy** on (01545) 580675.

March 2: The West Manchester Radio Club's Red Rose Rally will be held at Horwich Leisure Centre, Victoria Road, Horwich, near Bolton of J6 M61. There will be a cafe, bar, Bring & Buy, special interest groups, parking for 300 cars and children's activity room (up to 7yrs), supervised by parent. Doors open 10.30am and admission is £1, children free. Talk-in on S22. **Albert** on (01204) 62980.

***March 8-9:** The London Amateur Radio & Computer Show is to be held at the Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London, N9. Doors open 10am to 5pm each day (disabled visitors from 9.30am). There will be a trade show, with over 100 exhibitors, Bring & Buy, RSGB Committee and book stands, on-demand Morse tests, talk-in on 144 and 430MHz, special interest groups, disabled facilities, priority admission

for disabled persons, bars, restaurants, ample free car parking and lectures. (01923) 893929.

March 9: The Wythall Radio Club are holding their 12th Annual Radio Club Rally on Sunday at Wythall Park, Silver Street, Wythall, near Birmingham on the A435, just two miles from junction 3 of the M42. Doors open from 10am to 4pm. Admission is just £1. The usual traders in three halls and a large marquee. Bar and refreshment facilities on site, big Bring & Buy stand and talk-in on S22. More information from Rally Organiser, **Chris G0EYO** on 0121-430 7267 evenings, weekends for details.

March 16: The Mid-Devon Rally, sponsored and arranged by the Tiverton South West Radio Club, is a permanent fixture set for the 3rd Sunday in March, so no need to watch the magazines for the date in future! There will be a wide selection of traders to the rally, no matter what your interest, you will be able to find something useful to take home to the shack. There will also be all the usual, excellent catering facilities. More details from **Alan G0MAS** on (0884) 252259.

March 23: The Bournemouth Radio Society will hold its 10th annual sale at the Kinson Community Centre, Pelhams, Kinson, Bournemouth, Dorset. Doors open from 10am until 4pm. Talk-in by RAYNET will be available on S22. As usual, there will be a mixture of radio and computer equipment on sale plus a Bring & Buy stall. More details can be obtained from **John G1HOK** on (01202) 535219 or mobile (0850) 240931. Those with Internet can contact jbutens@bournemouth.ac.uk or via packet as **G1HOK@GB7BNM** with 'BRS Sale' as the subject.

March 23: The Pontefract & District Amateur Radio Society are holding their 17th Components Fair & Spring Rally at the Carlton High School, 300 yds from Carlton Community Centre. Doors open at 11am (disabled visitors at 10.30am). There will be many traders on the ground floor and in the main building, admission by prize programme. **Colin Wilkinson G0NCE** on (01977) 677006.

***May 16/17/18:** The Dayton HamVention, the largest amateur radio show in the world, is taking place at the Hara Convention Centre in Ohio, USA. Doors open at 12pm on the 16th, and the event runs until early afternoon on the 18th. For the early risers, the Flea Market is open from 6am on the 16th. You will be able to visit many trade stands, attend lectures and meet amateurs from all over the world.

May 18: The Dunstable Downs Radio Club are holding their 14th Annual National Amateur Radio and Car Boot Sale at Stockwood Country Park, Luton, nr. junction 10, M1. Doors open 10am to 4pm. Talk-in on 144MHz. Free entry to Mossman collection of Horse drawn vehicles, craft museum, plus much, much more. Plot details on (01582) 613899, pre-bookings for plots until May 14th. Plots can be purchased on the day.

May 25: The Plymouth Radio Club is holding its rally at the College of Further Education, Kings Road, Devonport, Plymouth. Admission is £1. Doors open at 10am for disabled visitors and 10.30am for others. Anyone wanting further information, contact **Stephen Ramsden G7UXX** on (01752) 662051 during office hours or before 9pm on (01752) 777189.

***June 27-29:** Ham Radio '97 - Europe's largest Hamfest will take place in Friedrichsafen, Germany. The Barnsley & DARC in conjunction with the RSGB will again be organising a coach trip to this Hamfest. More information from **Ernie G4LUE** on (01226) 16339 or mobile on (0836) 748958.

***June 29:** The 40th Longleat Amateur Radio Rally. Doors open at 10am. Further details from the bookings manager **Gordon Lindsay** on 0117-940 2950.

July 6: The 8th York Radio Rally will be held in the new Knivesmire Building, York Racecourse, York. Doors open at 10.30am and admission is £1.50. Children accompanied with an adult go free! There will be ample free parking, amateur radio, electronics and computers, Morse tests and repeater groups, refreshments and a licensed bar. Talk-in on S22. Further details from **Pat Trask G0DRF** on (01904) 628036.

July 27: The Colchester Radio & Computer Rally with a hobbies and leisure fair is to be held at St Helena School at 10am. This is a family event. Further info. from **Frank Howe G3FJH** on (01206) 851189.

***July 27:** The Scarborough Amateur Radio Society is holding its annual Radio, Electronics and Computer Rally in The Spa, South Foreshore. Doors open at 11am. The rally features all the usual traders, radio, electronics, components, computer hardware and software. Morse tests are available on demand, but please remember the fee and two passport type photographs. Further details from the Rally Manager/Secretary **Ross Neilson** on (01377) 257074 after 6pm.

***August 10:** Flight Refuelling ARS Hamfest '97 will take place at the Flight Refuelling Sports Ground, Merley, Wimborne, Dorset. The event will run from 10am to 5pm and will include the usual mix of traders, bring & Buy, craft exhibitors, car boot sale and field events. Talk-in will be on S22. **Richard Hogan G4VCQ** on (01202) 691021.

August 10: The Derby & District Amateur Radio Society are holding their 40th Derby Mobile Rally at the Littleover Community School, Derby. More information on (01332) 556875.

August 15: The Cockenzie & Port Seton Amateur Radio Club are holding their 4th Annual Radio Junk Night at the Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton. Doors open 18.30 to 21.30. Bring along your own junk and sell it yourself. Tables will be provided on a first come first served basis (no charge for the table). Raffle at approx. 21.00. Refreshments will be available. Disabled persons access. Entrance fee is £1 for all persons. All money raised is donated to the British Heart Foundation. Further details from **Bob Glasgow GM4UYZ** on (01875) 811723.

August 25: The Torbay ARS are holding their rally at the Torbay Leisure Centre, Paignton. Doors open at 10am. Talk-in on S22 by G8NJA/P. Further details can be obtained from **Alan G7UEK** on (01803) 214445.

October 25: The G-QRP Club Mini Convention is being held at St Aidans Hall, Sudden, Rochdale. Admission is £1 and doors open at 10am. Talk-in on S22. There is a large social area, lectures on QRP subjects, Bring & Buy, surplus, junk, components, kit traders, food and drink all day including the famous pie and peas. **Rev. George Dobbs G3RJV** on Tel/FAX: (01706) 31812.

November 9: The Midland Amateur Radio Society Birmingham 9th Radio & Computer Rally is being held at Stockland Green Leisure Centre, Slade Road, Erdington, Birmingham. Doors open 10am to 4pm and admission is £1. There is a large free car park, free hampers draw, trade stands, local clubs, special interest exhibits. Trader details from **Norman G8BHE** on 0121-422 9787 or general information from **Peter Haylor** on 0121-443 1189.

December 14: The Verulam Amateur Radio Club will hold its annual rally at the Watford Leisure Centre, Horseshoe Lane, Garston, Watford, from 10am to 4pm. The Leisure Centre is located off the A405 near junction 6 of the M1 and junction 21A of the M25. Attractions will include trade stands, Bring & Buy, grand raffle, cafe, licensed bar and free car parking. Morse tests will be available. For further details call (01923) 262180 or for trade information call (01923) 265572.

**Practical Wireless & SWM in attendance*

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

antennas in action

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

There's not much room for the news in this month's AiA so, let's begin by looking at a CDROM for those of you who have an IBM (or clone) PC available. The Public Domain Shareware Library (PDSL) have a new CDROM of antenna related information.

There are over 2000 information files and programs on the disk, covering over 50 types of antenna. All the common ones are there Yagis, cubical quads, verticals and common dipoles. But

there are also some uncommon ones such as parabolas, corner reflectors and horns.

I shall have a closer look at this comprehensive CDROM in a later issue of AiA, but if you're interested in antennas it's worth a look yourself at £24. Available from PDSL, Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel: (01892) 663298, FAX: (01892) 667473

Fancy a new mast to support that new beam antenna? Tennamast (Scotland limited) would be a suitable start point for your quest. Tennamast's 'Adapt-A-Mast' series of masts can be either free-standing or supported on the side of a building.

Tune & Feed

An antenna tuner and s.w.r. meter with an unusual coil system is available from Lake Electronics. The TU4 ATU kit has a spiral etched printed circuit coil for repeatability which may be seen in the photograph, along with all the other parts for the project.

Lake Electronics claim that they "have the kits with all the bits, and that includes all the hardware" and it's easy to see why. A few hours work with some simple tools should leave you with a finished project that looks good in the shack.

Available from Lake Electronics, 7 Middleton Close, Nuthall, Nottingham NG16 1BX. Tel: 0115-938 2509 the TU4 kit costs £68 (£88 fully built)+£4 P&P.

Any antenna is, of course, only as good as the quality of the feeder used. The W. H. Westlake company of Holsworthy in Devon are well known for supplying only the best quality feeders. If you're travelling to the London Show pop along to stand P in the Red Hall and have look for yourself.

Or write to them for a catalogue of their extensive line of coaxial and feeder products. W. H. Westlake Electronics, West Park, Clawton, Holsworthy, Devon EX22 6QN. Tel: (01409) 253758 or FAX: (01409) 253458.

If you would like to put up a lightweight tower they can also supply lattice sections from three to six metres long with a variety of end fixings. Tennamast (Scotland Limited), 81 Mains Road, Beith, Ayrshire, Scotland KA15 2HT. Tel: (01505) 503824 or FAX: (01505) 503824.

There are many radio amateurs who live in flats with little outside access, or in



house or flat space. The EMDR antenna is a form of crossed-field radiating delay line. It radiates along its whole length without the high voltage points present on a resonant wire antenna.

For more information about the EMDR range of antennas contact Hatley Antenna Technology, 1 Kenfield Place, Aberdeen, Scotland AB15 7UW.

Glancing through the pocket-sized brochure from Fringe Electronics I found a solution to one of the problems facing radio listeners and TV viewers. As many smaller firms add radio to their ranges of vehicles, breakthrough can become annoying.

If you have this problem to contend with, a v.h.f. rejection filter could be the answer. Designed with a rejection bandwidth of 20MHz the filter may be tuned to give a 36dB reduction of interfering signals in the 120 - 240MHz range. For more details contact Fringe Electronics, Fringe House, 4 Highfield Road, Clipstone, Nr Mansfield, Notts NG21 9ER. Tel: (01623) 643802 or FAX: (01623) 25407.



contents

News & Intro	25
Antenna Workshop by Ray Fautley G3ASG	26
Up The Ladder by Allan Wightman	28
A Multi-Band Antenna by Glen Ross G8MWR	33
Tex Topics 'Tex' Swann G1TEX	34

8 pages of
antennas

welcome to AiA!



Welcome to the second issue of 'Antennas in Action', the new bi-monthly section of *Practical Wireless*. It's the section that features radio related items that start after the r.f. output socket of your rig: be it cable, feeder, accessory or antenna.

News, views, projects and ideas are all part of this specialised part of *Practical Wireless*. So,

this month: You can DF with 'Antenna Workshop', build the T2FD multi-band antenna and cure one form of TVI. I've also been delving into the library, on behalf of three readers, for information on BNC plugs, stacking antennas and coaxial cable balun matching.

This section is a way that we can all learn more about antennas and how to feed them. We also want your ideas. To learn we have to listen, but someone has to talk while we listen. Let's do both in A-i-A.

G1TEX

antenna workshop

This article was inspired by a reader's letter to PW. In the letter the reader said that many years before he had worked on a receiving station employing a Bellini-Tosi antenna system.

The station that the reader had worked on was for the reception of programmes from overseas broadcasting stations, which were then relayed by cable to subscribers. He wondered whether it would be possible to set-up a similar system in his attic.

Let's consider the antenna system itself. The Bellini-Tosi antenna was one of the systems intended to be used for direction finding, but as I'll show later it can also be used as a steerable receiving antenna.

To find some information about a system that has been used for some time a little research was needed. During my research, I found that between the two World Wars radio direction finding systems were being used as navigational aids, particularly by ships at sea. The method used at the receiving station (the ship) was to take bearings of two or more radio stations of known positions, using a suitable antenna system. These directional bearings were then plotted on a map of the area. The intersection of the drawn bearing lines would then give the approximate location of the receiving station.

One of the antenna systems used to take the original bearings was the Bellini-Tosi system. The system consisted of two loops, usually triangular, which were mounted at right angles to each other. On a ship, one loop would go fore and aft, and the other across the ship from port to starboard. The apex of each triangle would be mechanically fixed at the same point, although electrically insulated.

Dimensions of the receiving loops were not critical and they were untuned. But they were trimmed to be as identical, electrically, as possible. Feeders from each of the loops were also made identical in type and electrical length. A typical system is shown in Fig. 1. The loops are labelled 'North-South' and 'East-West', but this is simply to indicate that they are mounted at right angles to each other. They could be called 'Along' and 'Across' (the attic) - the actual directions aren't important as long as they are at right angles to each other.

The Question

Now we come to the question - what is used to provide the bearing readings? This function was carried out by a device called a radio goniometer. In effect, the goniometer electrically rotated the antenna, but without having to rotate it mechanically. The goniometer was made of two fixed coils also mounted at right angles to each other as the loop antennas. There is also another coil mounted inside the fixed coils which could be rotated. The skeleton idea is shown at the bottom of the system in Fig. 1.

The actual construction of the radio goniometer device is shown in Fig. 2. Although the coils are shown as rectangular in shape, this is only to show the position of the coils clearly. The goniometer could be made from a

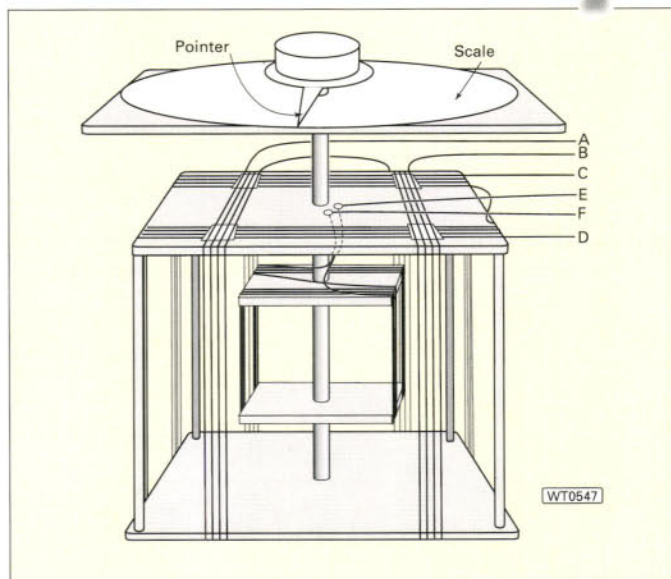


Fig. 2: This radio goniometer is drawn for clarity rather than an actual layout. (See text for details of an actual unit).

piece of plastic tubing on which one coil was wound around its circumference and the other at right angles across the ends of the tube and along its length.

Inside the tube a third coil is fitted, on a smaller diameter former, which could be rotated so as to be able to line up with one or the other fixed coils, or take up a position between the two. Rotation of the goniometer coil through its complete 360° range which would produce two nulls for each signal, one at x° and one at $(x+180)^\circ$.

Of these two possible bearings, which is the correct bearing for the received signal? To remove the ambiguity of direction, it's necessary to introduce another antenna. But in this case a simple vertical wire of some 5m in length. The ambiguity is removed by adding the signal from the simple antenna to the signal from the goniometer output. In one direction the new signal will increase the overall signal, and it will reduce the overall signal from the other bearing.

Here a problem rears its ugly head! The phase of the signal received by the fixed wire is at 90° to that provided by the goniometer search coil, so to enable the two signals to be added or subtracted it is

necessary to introduce a 90° shift to the fixed wire signal.

To add to the confusion, this addition of the two signals has the effect of shifting the original direction of the nulls by 90°. This is not to bad as it first appears, because if the fixed vertical antenna is left permanently connected, then the complete system becomes effectively a steerable beam!

When the goniometer is rotated for maximum signal in the receiver it will be indicating the approximate bearing of the transmitting station, and at the same time it will provide minimum reception from the opposite direction. This minimum will be much sharper than the maximum, so the resultant polar diagram will be a cardioid pattern similar to that of a conventional beam antenna.

The next problem is, how should the vertical antenna be connected into the system? One way is to connect it to the input (gate) of a field effect transistor (f.e.t.) and connect the goniometer search coil into its output (drain) circuit. Any signals at the amplifier input (ie. from the fixed wire) will be shifted by 90° at the drain circuit. An emitter follower is used to provide a low impedance output for connection to the input (50Ω) of the receiver. The amplifier shown in Fig. 3 shows a suitable amplifier.

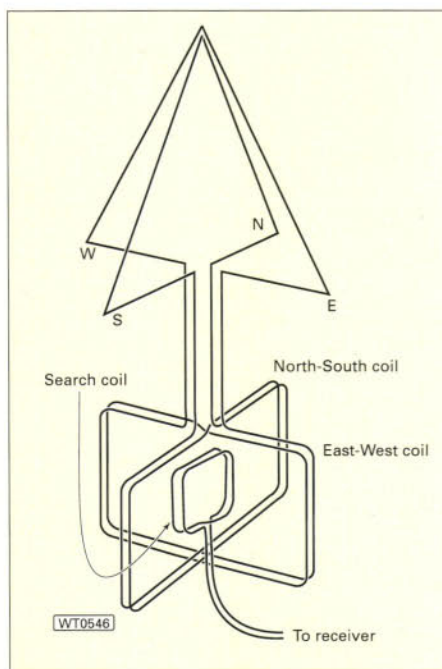


Fig. 1: The Bellini-Tosi direction finding system. See text for more information.

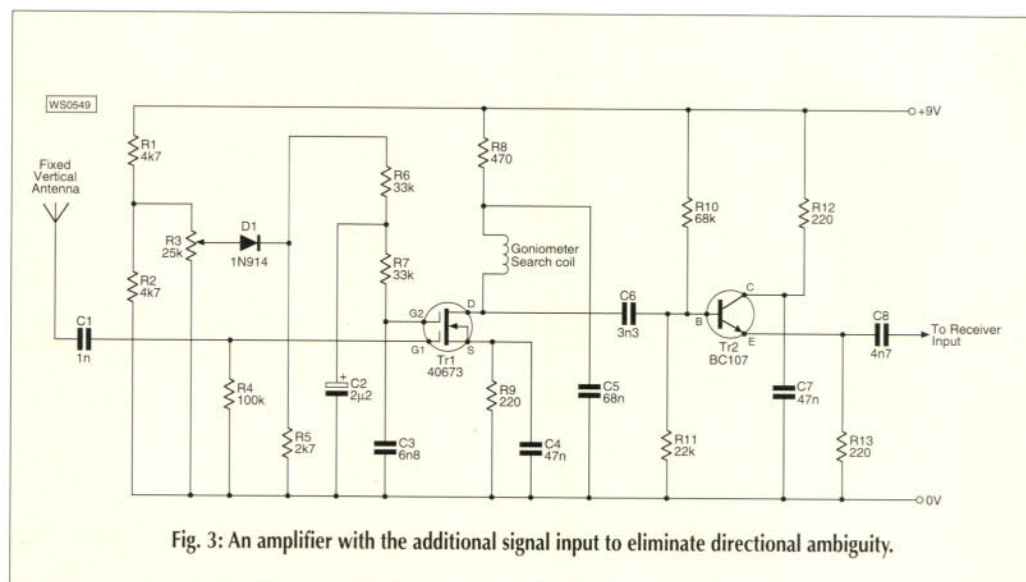


Fig. 3: An amplifier with the additional signal input to eliminate directional ambiguity.

In the past, direction finding was almost always used with medium frequencies up to about 600kHz, but of course it's useful for obtaining bearings for short wave broadcasting stations. And direction finding on amateur stations is most certainly an area for some amateur experimental work.

One of the difficulties in using this system of direction finding, is that sky wave signals contain components from different paths, which produce the well known phenomenon of fading. However, for those who like a challenge, here are a few ideas for the construction of a Bellini-Tosi d.f. system in the attic.

The timbers of the roof slope itself can be used as the support for one triangular loop with the other loop made as nearly identical as possible at right angles as in Fig. 4. The apex of each loop should be at the same point of support. I've shown the loops aligned to the compass rather

than the attic, as I consider this rather more useful. As to the dimensions? Well, the original ship's loops were only about one or two metres from base to apex, so try any size as long as both loops are the same. The feeders to the goniometer should be of identical lengths of 300Ω twin feeder, and should be connected to the centre of the base of each triangle and taken together to the shack.

Making A Goniometer

To make an effective radio goniometer. A piece of circular plastic tube about 70mm in diameter should be cut to be exactly the same length as its diameter. A hole is drilled through the tube, half-way along its length on both sides so that a rod of about 8mm can be passed straight through the tube. The size of the hole should be just sufficient to allow free rotation.

On this rod is mounted a plastic tube of about 45mm diameter and about 35mm in length. The hole drilled through this 45mm tube for the rod should be a drive fit so that sticking would be unnecessary.

The number of turns on the coils will depend on frequency in use. For up to 4MHz try about 12 turns close-wound, split into two groups of six turns on each side of the rod. The coil at right angles should also have 12 turns close-wound with a gap after six turns to make it as similar to the other coil as possible. The smaller, search coil, could have just four turns close-wound, two on each side of the rod. Its rotation should be restricted to around 370° so as not to twist the coil ends to breaking point!

As to the connections to the coils. One of the 300Ω feeders should be joined to one of large coils and the other feeder to the other coil. It doesn't matter which feeder is joined to which coil. The centre rotating coil is connected to the drain circuit of a field effect transistor amplifier, as in Fig. 3. The emitter follower has been included to provide a low impedance output to connect to the receiver 50Ω input.

The fixed vertical wire antenna is connected to the input of the amplifier, also as in Fig. 4. A pointer joined to the rotating rod can be used to indicate on a suitable scale which will have to be calibrated

from 0° to 360°. To calibrate the goniometer, tune in a station of known location, and therefore of known bearing.

For the purposes of illustration let's say the station is known to be due North. Adjust the pointer until a null or minimum signal is obtained. Now set the scale so that 180°(due South) is aligned with the pointer. And that is the calibration! As you've adjusted for the sharp minimum signal the actual bearing of that station will be in exactly the opposite direction, or 0° (ie. due North). Other stations of known bearing can then be used to confirm the calibration.

To provide the effect of a rotating beam antenna, just adjust for the broad maximum signal. A small adjustment of the goniometer setting together with amplifier gain may be used to reduce interference from unwanted signals if they are arriving from the opposite direction. This effect is similar to changing the front to back ratio.

For direction finding use, rotate the goniometer coil for a minimum indication, adjusting the gain of the amplifier until a sharp null or near zero signal is obtained. The actual bearing of the station would then be 180° from the pointer indication. This may seem to be an unnecessary complication, but is necessary because the null is so much sharper than the maximum indication.

You may ask - can this system be used as a beam antenna for transmission? The answer is that it is rather unlikely because of the low radiation resistance of the loops. However, small loops have been used successfully for transmitting although high r.f. current flow in the loop. However, where the size of each loop is comparable with the wavelength of the transmitted frequency - who knows?

Some more experimentation is needed. Is there a method of combining the Bellini-Tosi loops with the fixed vertical antenna still to be found. How about trying to find out! Let the readers and myself know if you are brave enough to have a go!

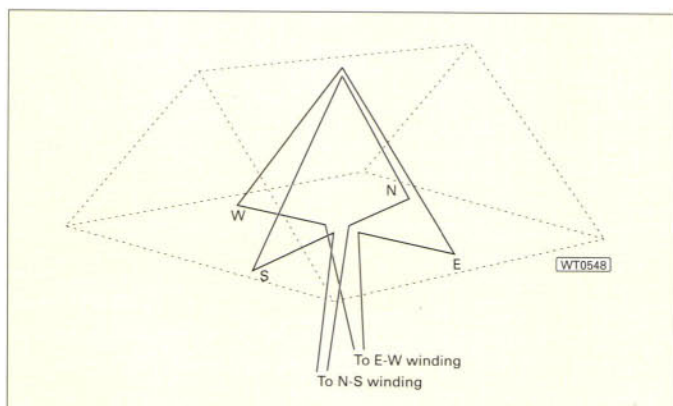


Fig. 4: A suggested layout within the attic space, as described this system is aligned to the compass rather than the attic. (See text).

■ **ALLAN WIGHTMAN HAS BEEN IN THE TV AND RADIO ANTENNA-ERECTING BUSINESS FOR MANY YEARS. HERE HE RECALLS AN ANTENNA AND RECEPTION PROBLEM OF INTEREST TO RADIO AMATEURS FROM HIS NOTEBOOK.**

up the ladder

Although I am not a radio 'ham' myself, over the past years some interesting problems have come my way. I've sorted them and helped both my customers and the radio 'ham' at the same time.

My work covers the 'Solent' area in and around Southampton in Hampshire, where most customers receive transmissions from the Rowridge transmitter on the Isle of Wight. From this powerful transmitter comes all four channels of BBC1, 2, ITV and Channel 4. The transmitter also provides v.h.f. Band II f.m. radio services.

Some years ago I was asked to go and see a customer who had a radio 'ham' move in next door. Their TV reception had been satisfactory until the 'ham' went on air but now they were getting interference on one channel only when the 'ham' was on the air. Fortunately, there was no bad feeling as both neighbours were trying to meet 'half-way'. I'd been called in because a neighbour of the new customer had got me to sort out a previous problem. So I got the job...and it turned out to be interesting and satisfying too.

Line Of Sight

Many parts of Southampton are 'line of sight' to the Rowridge transmitter, which operates on Band IV (4) and it

proved an excellent signal. In fact, the signal is so strong that many people make the mistake of using indoor antennas...but more of that in a later 'notebook'.

When I arrived at the house I could actually see the Isle of Wight very clearly indeed. The signal from the transmitter was so strong - well over 200mV on my field strength meter - at ground level with my test antenna, that I wondered what the trouble could be. The customer's antenna was a good quality model - an older Antiference type and the coaxial cable seemed in reasonable quality. But once in the house and with my field strength meter plugged into the feed I realised there was a problem.

Three channels were perfectly okay with terminated signal levels of 150mV. But the fourth (the one suffering from interference) had a real problem and was less half of the other channel's strength. So it was time to go 'up the ladder' to see why.

Ground Reflections

Once up my ladder I could clearly see the transmitter and guessed that ground reflections were probably the cause of the problems. Why did I think this? Because the antenna was in good condition and the cable and connections were all watertight and generally sound.

After setting-up a 'test loop' - feeding the signal back up to my field strength meter which hung from a strap around my neck while I was working on the chimney-mounted Yagi. Back up aloft, I started the essential 'height versus gain' check'. And I'd only moved the antenna up in height by about four or five inches when the signal levels changed dramatically.

By moving the antenna up I had proved that the ground reflected signals, **Fig. 1**, were obviously causing addition and subtraction (cancellation) of the 'direct waves' from the transmitter. And in fact I found several points where all four channels were at very low levels which would cause the TV's automatic gain control (a.g.c.) system to open right out. This dramatically increases the possibility of interference.

After about five minutes or so of slowly moving the antenna up, and down, the mast, I found a point where there were equal strength signals on all channels. At the same time I also checked the f.m. sound levels (the u.h.f. TV sound is of course transmitted as an f.m. 'intercarrier' signal) to make doubly sure everything was okay. I did this because the ground reflections can alter the sound-to-vision ratio to alter, causing its own problems.

If I'd not been able to find a point on the antenna mast's available height adjustment...I would have lowered the antenna so it was below the roof ridge.

In this way the ground reflected signals - usually much weaker than the 'direct waves' would have been less of a problem.

No Problem

I then wrapped the job up and explained to the customer that there should be no problem now. But disappointingly for me, the customer didn't notice the great improvement on the third channel. Perhaps that was not surprising because neither she or her husband had noticed the increased 'noise' ('snowy' or 'grainy') on the TV's screen when they changed channel!

Apparently in the evening my customers forgot to tell the radio 'ham' that I had been. In fact it was several weeks before they asked him if he had stopped using his radio because they had not seen any interference. "No", he said "I've been on every evening".

Oh well, it's good to sort problems out. And it was a case of three satisfied customers at one go.

aa

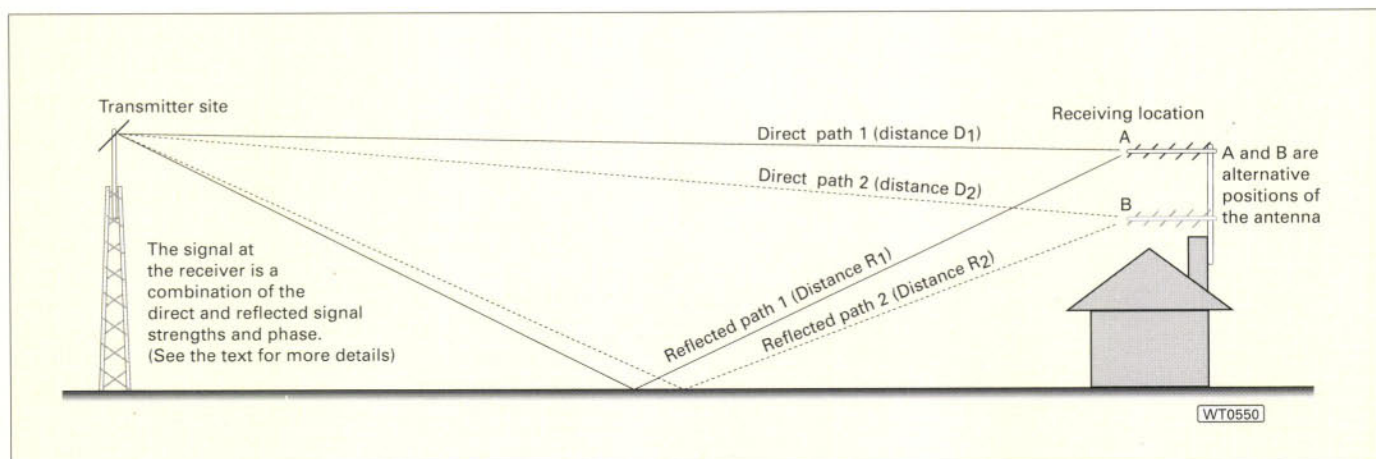


Fig. 1: Being able to see the transmitter isn't everything! Strong reflected waves can cause signal level reduction, making it more prone to TVI. This was the cause of interference on one TV channel as Allan Wightman found and cured.

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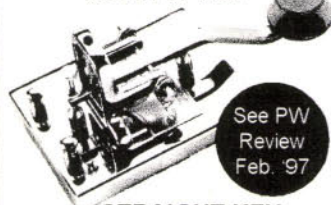
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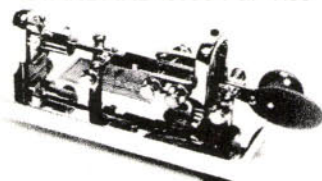
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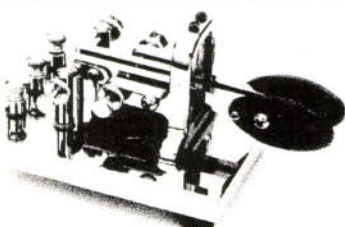
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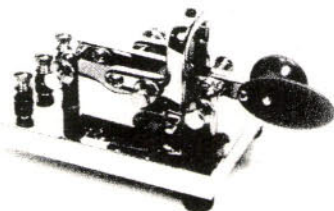
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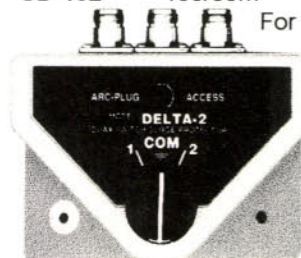
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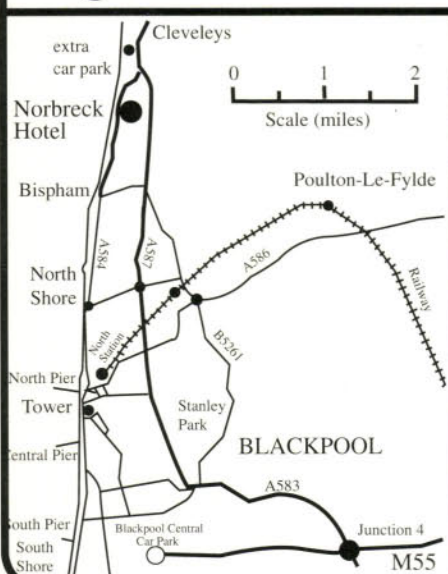
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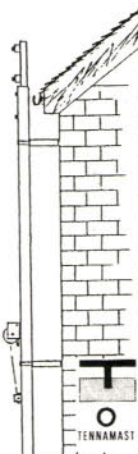
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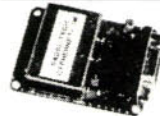
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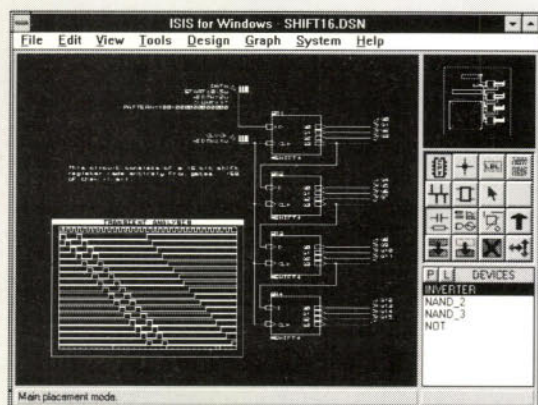
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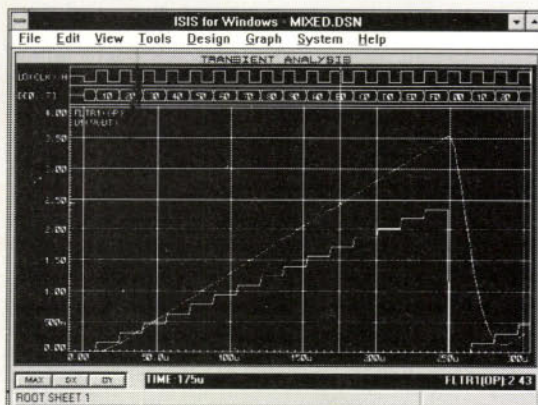
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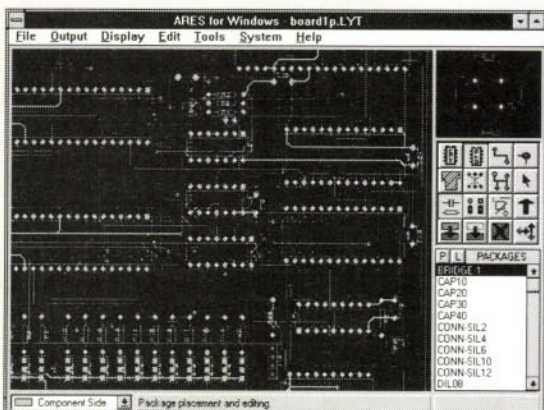
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The Answer

To find the answer to wide-band use, we have to look back to antennas developed in the 1950s. At this time a very popular antenna was the T2FD. The strange title stands for 'tilted terminated, folded dipole'. This is an aperiodic, or non resonant, antenna which was developed by the American Navy in the early 1940s. Tests carried out by the American Navy showed that the antenna outperformed conventional Marconi types by as much as 4dB.

Later tests by a Japanese broadcast company showed a similar improvement over the dipole to which it was compared. Another major advantage is that the antenna will operate over at least a four to one frequency range whilst showing close to 1:1 standing wave ratio (s.w.r.). Beyond this range, the performance only deteriorates very slowly.

Shown in the operating position in Fig. 1, the optimum slope for the antenna is about 30°. Although there seems to be little practical performance difference when mounted between 20° and 40°. A 7MHz band version can be accommodated in a ground length of about 15m and will operate on all WARC bands up to and including 28MHz. A 14MHz version will go into 10m or so and will work right up to 50MHz. The low end is normally supported at around two metres above ground.

The centre of the antenna is connected to a terminating resistor of 390Ω. This must be non inductive and capable of dissipating about 35% of the transmitter power on continuous carrier modes or around 25% when using s.s.b. and c.w. This resistor will probably have to be made up from

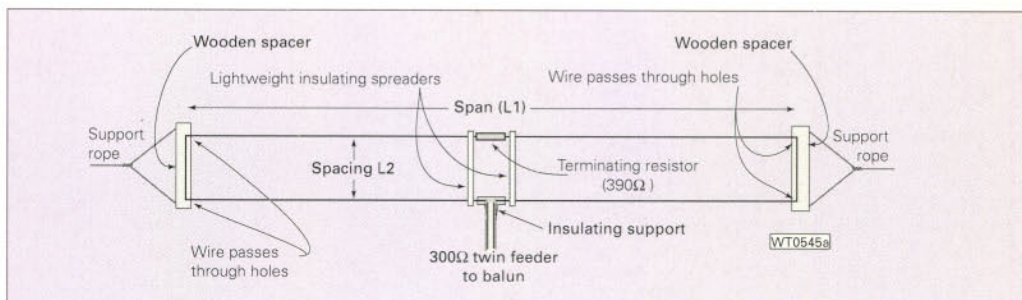


Fig. 2: How to create your own T2FD antenna. See the Tables 1 and 2 for the dimensions of L1 and L2.

of 3 by the frequency. These dimensions are not precise but this is of little importance in such a broad band antenna.

Matching

To illustrate the broad-banded capabilities, I measured the s.w.r. of a 7MHz unit. So, using a balun but no a.t.u., I carried out s.w.r. tests across the bands from 7MHz upwards with the results as shown in Table 2. I think the results shown speak for themselves, greater than 4:1 frequency coverage and a fairly steady medium-low s.w.r. It seems we are in business! A small, low mounted, multi-band, well matched antenna that fits in a small space.

And if you don't want to use the antenna for transmitting and you simply want to use it as an s.w.l. installation, the resistor needs to be only a quarter watt rated job. And you'll have the advantage of correct matching on all the broadcast bands as well. A typical antenna for these conditions, with a span of of 16.5m and a spacing of 600mm will give virtually flat response from the 6 to 25MHz broadcast bands and everything in between.

Could you want for anything more? Get folding, terminating and tilting for a good signal.

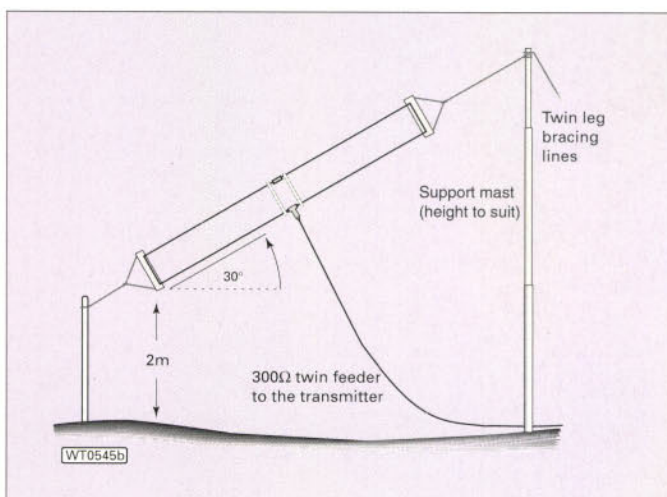


Fig. 1: The T2FD in operation. The antenna will work at other tilt angles, but 30° is optimum.

several resistors in parallel. The value of 390Ω will give a feed point impedance of about 300Ω.

The antenna should be fed with 300Ω ribbon feeder with a suitable balun or balanced a.t.u. at the transceiver end to provide accurate matching for the rig. The a.t.u. is only

used to provide an impedance match, the antenna shows an almost flat 300Ω impedance across the entire frequency span.

The dimension L1 is the total length of the antenna and L2 is the distance between the two wires, Fig. 2 will make this clear. Dimensions for various bands are shown in Table 1. The slight variation from the calculated sizes after s.w.r. adjustments. To make up the antenna for other bands, the length L1 (in metres) is calculated by dividing a figure of 100 by the lowest transmitter frequency. The spacing L2 (metres) is obtained by similarly dividing a figure

Table 1

Band (MHz)	L1 (m)	L2 (mm)
3.5	28.57	786
7.0	14.28	500
10.0	10.00	300
14.0	7.143	214

Table 2

MHz	s.w.r.	MHz	s.w.r.
7.0	1.5:1	24.9	1.5:1
7.1	1.4:1	28.0	1.5:1
10.0	1.2:1	28.5	1.6:1
14.0	1.4:1	29.0	1.5:1
14.3	1.5:1	29.5	1.4:1
21.0	1.4:1		

Table 1: Dimensions for the major h.f. bands See text for sizes for other bands.

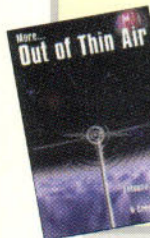
Table 2: Test results of a 7MHz antenna on that and higher h.f. bands.

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In the January issue of 'Tex Topics' I described the various types of plugs and sockets in general use in our hobby. These three main types are of course, and in no particular order, BNC, N-type and the ubiquitous SO239/PL259 combination pair. And I also mentioned that there are, at least, two different impedance varieties of the BNC plug in common circulation, but I didn't elaborate further.

A few days after the publication of that issue, Doug G0CZG 'phoned me in the office to berate me for not saying what the difference was, and how to tell them apart. Doug mentioned that the only difference that he could see was in the insulation around the centre conductor of the socket. To start my answer I suggest you have a look at the photograph of Fig. 1, where I've shown the business ends of two BNC sockets.

In Fig. 1, as you can probably see the Teflon surround of the centre connector of the 50Ω socket (on the right) is very much thicker, than the 75Ω version on the left of the photograph. That bit's very easy to see, there certainly is an easily visible difference. And it was this difference that Doug G0CZG had pointed out. Although Doug said that he couldn't see any difference between the pins of the two impedance BNC plugs. I have to report that there are differences between the pins of the plugs, but you'll need good glasses to see the differences.



Fig. 1: Two BNC sockets. The 50Ω version is on the right and the other is a 75Ω socket.

■ TEX SWANN DELVES INTO OUR POSTBAG, PASSES ON HINTS AND TIPS

tex topics

Now look at the photograph Fig. 2. As in Fig. 1 the 50Ω plug is on the right and although it isn't too obvious from the photograph, the pin on the 70Ω plug is slightly thicker. But the major difference between the plugs is that the pin of the 75Ω plug goes straight back into the insulation. However, the pin of the 50Ω plug although slimmer than its 75Ω counterpart, has in fact a small shoulder on it at the point where it enters the Teflon shroud.

With the pin size difference in mind, take another, closer look at Fig. 1. You may now be able to tell that there is a slight variation between the centre connector of the sockets. However, when you're being jostled by others at a rally, I'd defy anyone to tell them apart without a known impedance unit to compare it with. And then it would take some time.

A Test

As with all good instruction, there should be a test to see if the information has been learned so, have a look at the photographs of Figs 3 and 4. See if you can tell what the impedances are of the plug and socket shown. Both of these items were purchased at rallies in the last year, and both were labelled BNC connectors. (My answers are at the bottom of the column).

Your Letters

And now to letters from two readers. Baluns was the subject of the letter from Richard Walker in Essex. He says "I would like to use a balun, to match other balanced aerials of different impedance to coaxial feeders of other impedance using appropriate impedance cable in the balun". Richard was referring to David Butler

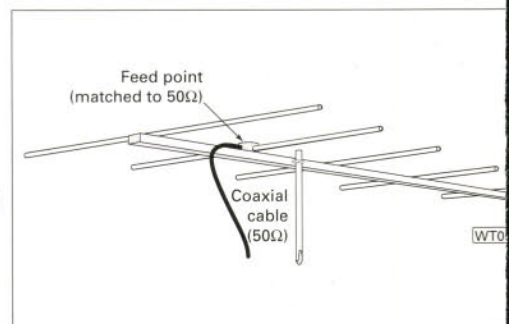
G4ASR's 'Antenna Workshop' in the January 1997 issue of *PW*.

In his 'Antenna Workshop' David used an electrical half-wave-length section of 50Ω coaxial cable to make a 4:1 impedance step-up balun to feed the 200Ω impedance of an Alford Slot antenna. Refer back to the drawing of Fig. 2 on page 26 of the January '97 issue of *PW*, where the idea is shown. The important part of this balun is that: **the length of coaxial cable used in the loop has to be an electrical wavelength at the frequency in use.**

If we take two points in a feeder system exactly half a wavelength ($\lambda/2$) apart, then the signals are of equal values **but opposite phase**. In coaxial cable the signal travels slower than in 'free space' and so, its $\lambda/2$ distance is physically shorter. The ratio of a frequency's wavelength in feeder to the same frequency's 'free space' wavelength, is known as the 'velocity factor' of the feeder. The velocity factor of most solid polythene dielectric coaxial cable is taken to be 67%.

Referring to Fig. 2 in January's 'Antenna Workshop', you will see that the length of cable in the loop is shown as 1.97m. The free space wavelength of a 50.5MHz signal is 2.97m, which agrees fairly well with the velocity factor of 67%. The important point about the balun used in the antenna that David described, is that it only worked at one frequency 50.5MHz. (It will also work at multiple of that frequency, such as 101, 151.5, 202MHz, etc. **but it is frequency dependent**).

At the design frequency of 50.5MHz at the two feed points there are two equal, but opposite signals. Let's say the transmitter can produce some 50W



of power. From $P=(V^2/R)$, where $R=50\Omega$ the voltage is 50V. So, at the left hand feed point, where the two inners join, there is 50V. But at the other end of the loop there is also 50V **but of opposite phase**.

So, the two feedpoints now have 100V of r.f. The important point is that there is still only 50W of power available so, something has to change to compensate. The thing that has to change, to keep the dissipated power constant is the load impedance and that has to increase by a factor of **four** to reflect the **doubling** of the voltage presented to the load.

There are ways of using varying lengths of coaxial cable as a way of matching impedances, (see later) but they are usually only used at 'fixed' designed frequencies. There is an excellent book about matching antennas systems, called *Antenna Impedance Matching* but, as it is very theoretical, this may not be what you want. Perhaps if you contact me again Richard with a few more details about the system you have in mind, we may be able to help further.

This brings me on to the second question this month. From Harold Bent G0EZW in Nottingham. Harold uses a pair of VK quad loop antennas on his 1.2GHz ATV set up, one for transmit

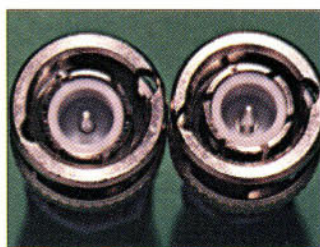


Fig. 2: Two BNC plugs. The 50Ω version is on the right and the other is a 75Ω type.



Fig. 3: Bought at a rally - is this BNC plug a 50 or a 75Ω type? (See text).



Fig. 4: Bought at a rally - is this BNC socket a 50 or a 75Ω type? (See text).

Fig. 5: a simple antenna matched to feeder - but what happens when a second antenna is added? (See text).

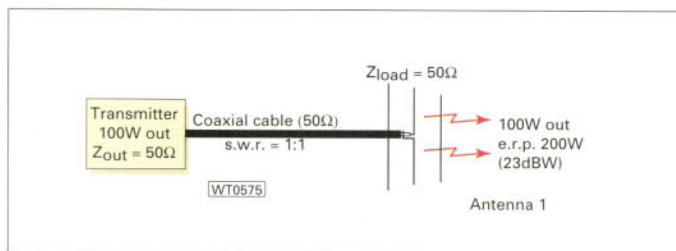


Fig. 7: The matching arrangement of the antenna shown in Fig 5.

Fig. 6: A stacked antenna pair. What is the impedance at point X, and what does that do to the matching? (See text).

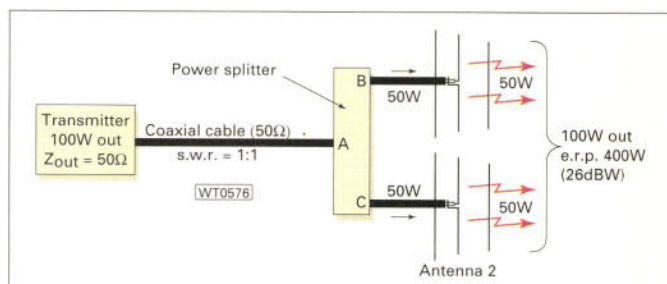
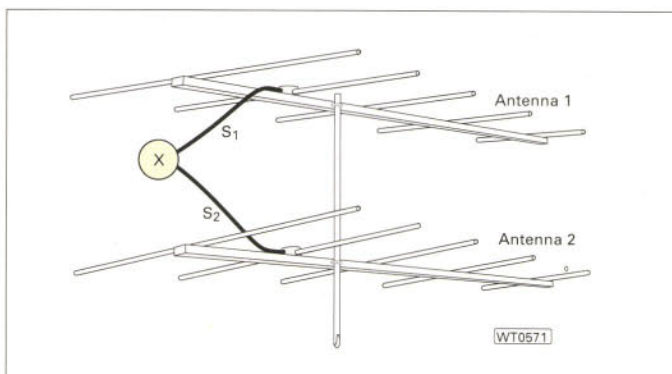


Fig. 8: Adding another antenna brings more forward gain but at the expense of other considerations. (See text).

and one for receive. He would like to improve his set-up but is unsure how to do it. Should he buy new 36-element antennas with greater gain for transmit and phase the two VKs together for receive?

Or should he use the two phased VKs on transmit and the new 36-element antenna on receive? Hmm.. not an easy one Harold, but let's look at the advantages and disadvantages of each option. When correctly phased and matched, the two VKs would have a theoretical gain of 3dBs (over one VK on its own) on both transmit or receive (more likely about 2dB in practice). Back in August 1996 David Butler in his session for 'Antenna Workshop'

dealt with stacking antennas, albeit for different bands on one pole. So that's worth reading again for some of the ideas involved.

Let's have quick look at stacking (one above the other) and baying (side-by-side) antennas. Each approach has pros and cons, and there are common problems. Look at Fig. 5, a simple Yagi antenna. The feedpoint matches well to 50Ω cable, because that is what it was designed for! A simple installation with 50Ω coaxial cable to the shack will work as well as can be expected.

However, if we add (by stacking) another antenna onto the mast and try to use a common feedpoint, shown as X in Fig. 6, you may be able to see an

immediate problem. From maths we know that at the common feedpoint (X) there is an impedance of only 25Ω (50Ω in parallel with 50Ω), causing standing wave ratio (s.w.r.) problems. To cure this we need a coaxial feeder of 25Ω (expensive and non standard) or to get two antennas with feed impedances of 100Ω and lengths of 100Ω coaxial joining cables (same problems as above).

The drawing in Fig. 7 shows the simple case of a single antenna. 100W of power from the transmitter arrives along the 50Ω cable to the 50Ω feedpoint antenna. I've assumed the antenna has a forward gain of 3dB (doubling) so the effective radiated power (e.r.p.) is 200W in one direction. In Fig. 8 I've shown two similar antennas coupled through a loss-less power splitter so that each antennas

gets 50W of power. Because each has a gain of 3dB the e.r.p. from each individual antenna is only 100W and yet I've shown that with both antennas the e.r.p. should be now double the original antenna as 400W. How can that be?

To answer, take look at Fig. 9 where I've shown two antennas and their power lobes overlapping. Because of this overlapping there is an increase in power in the forward direction (there are now two signals in the area of overlap). But this increase in forward gain has its drawbacks as shown in Fig. 10. In Fig. 10, the reference point is now to be the point of maximum signal, and for both the original antenna, and the new combination pair, this is the 0dB point.

Take first the wider, outside, loop of

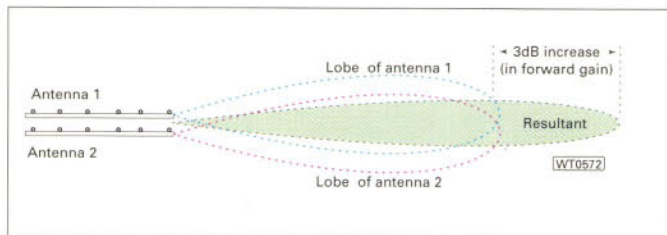


Fig. 9: Stacking antennas gives better forward gain, but reduces the beamwidth of the pair. (See text).

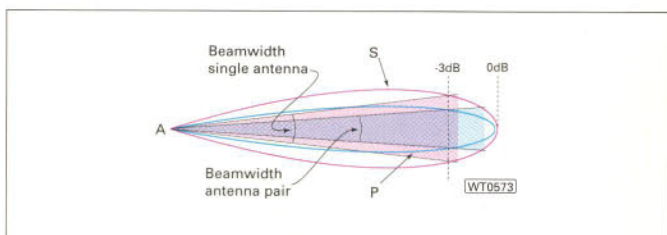


Fig. 10: How the beamwidth is reduced when using stacked antennas. (See text).

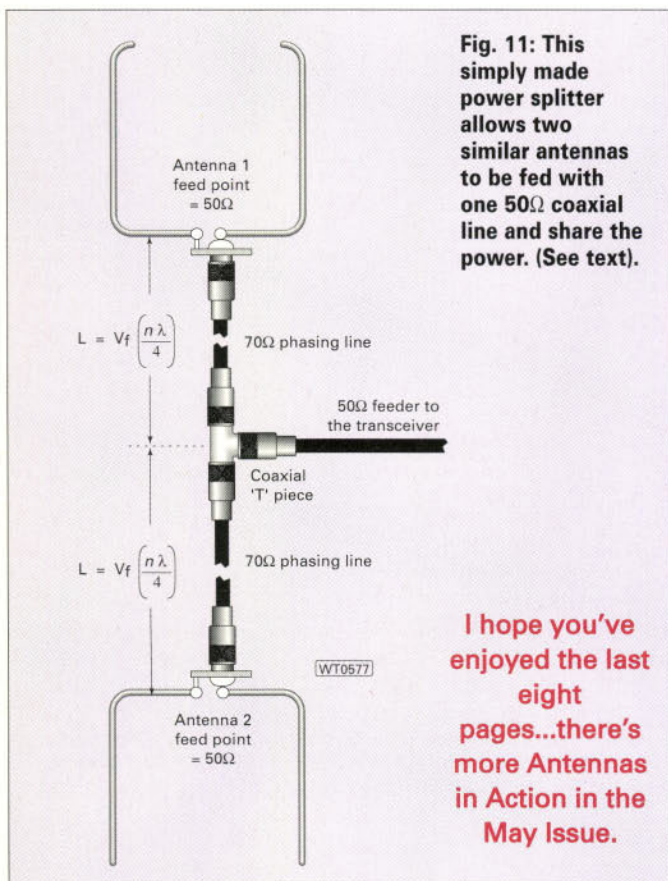


Fig. 11: This simply made power splitter allows two similar antennas to be fed with one 50Ω coaxial line and share the power. (See text).

I hope you've enjoyed the last eight pages...there's more Antennas in Action in the May Issue.

the original antenna. At the points where the power has fallen to half of the maximum, this is defined as the beamwidth. Now taking the inner beam pattern of the combined antenna, the power drops away faster when moving away from the centre line, showing that the beamwidth is now narrower. Taking car headlight as an example, 'stacking' turns the headlamps into spotlights and would allow us to see further. But at the expense of only being able to see what is directly ahead of us. As we turn the bend you see the hedge, but not the oncoming cyclist in the road.

On the plus side though, stacking (one above the other) antennas, gives a reduction of the vertical beamwidth without the same reduction of horizontal beamwidth. In DX terms, more power is pointed towards the horizon, but the horizon is still as 'wide'. Conversely when baying (side-by-side) antennas, the horizontal beamwidth is reduced without changing the vertical pattern.

Power splitter

But to stack or 'bay' two antennas together, some form of power splitter (a power combiner on receive) is needed. But first how do we define a power splitter? It's a 'device' that splits the incoming power to two (or more) output ports while keeping the required impedances correct for each port. Look back at Fig. 8, where my power splitter has three ports A, B and C. Ports B and C receive 50% in the power input into port A, but all ports still have a nominal 50Ω impedance. Clearly we have some form of impedance transformer action taking place.

If the impedance is doubled the power must be halved, but the two new impedances in parallel give the original impedance so the input part is easy. Let's take our 50Ω original cable. If instead of one 50Ω resistor we put two identical 100Ω resistors in parallel, each 100Ω resistor dissipates half the power. But we now have the problem of matching that 100Ω back down to

the 50Ω needed for the output ports. This is where the transmission line transformer comes into play.

I don't have the space to show the mathematics for the following formula, but it's simple to use. If we have two impedances Z1 and Z2 and we want to create a transmission line transformer for them, we need a section of line an exact electrical quarter-wave long with the characteristic impedance Zt. Where Zt is:

$$Z_t = \sqrt{Z_1 \times Z_2}$$

$$= \sqrt{50 \times 100} = \sqrt{5000}$$

$$= 70.71\Omega$$

And although this gives a figure of 70.71Ω for the characteristic impedance of the transformer section, if we use 70 or 75Ω impedance coaxial cable it should be good enough.

So having found the impedance of the coaxial cable, how do we use it? Well refer to Fig. 11 where I've shown only the two driven elements and the power splitter using 70Ω coaxial cable. The phasing lines should be an **odd number** of quarter-wavelengths long ie. 1, 3, 5, etc.) and are shown as having a length L.

The two lines are combined into a coaxial T-piece feeding the 50Ω line to the transceiver. The use of N-type coaxial plugs and sockets on a 1.2GHz is strongly recommended to reduce losses to the minimum. Another thought to be kept in mind is that the two phasing lines are operating under a calculated mis-match - and **must be kept away from all other metallic objects** otherwise they will not work as designed.

The power splitter also works in reverse on receive, so you need only build one for transmit or receive. You can also buy manufactured power splitters for the various bands which you may suit you in this instance. But build-or-buy, you can play around with the various combinations of antennas on your system to find the method that

suits you Harold. Let me know how you get on.

Tip Of The Month

This month's 'Tip-of-the-month' again concerns the MFJ Antenna Analyser. When winding your own loading coils for antennas or for filters it's often difficult to know the exact inductance after you have made the coil, usually to some odd calculation. How can you check it easily without an inductance bridge?

The answer is simply to connect the coil in series with a 1% capacitor and check the frequency at which the series combination capacitor and inductance has fallen to 0Ω. Then carry out a little calculation, based on the formula:

$$L = \frac{1}{(2\pi F)^2 \times C}$$

$$L = \frac{1}{39.5 \times F^2 \times C}$$

What is the inductance of the coil shown in Fig. 12? Using the formula above and a resonance point of 16.1095MHz and with a series capacitance of 220pF? (Answer at the end of the column). But for those who would like to use other tables of coil values, the coil is six turns spaced over 22.5mm and with an internal diameter of 12.5mm (mean diameter 13mm).



Fig. 12.

Answers
I'm not quite sure myself about the plug - but it definitely isn't a 50Ω version.
It's probably a 75Ω socket as the ordinary plastic of the insulation isn't as good as the Teflon (different dielectric constant)
Did you get 0.443μH for the coil's inductance? The technique isn't scientific, but it's better than guessimation - isn't it?

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Reactivating An Ancient Receiver



By Walter Farrar G3ESP

Walter Farrar G3ESP brings back to life an ancient HRO receiver that hadn't been used for some 30 years, but was in fact, still complete!

A radio amateur friend had passed away and I offered to dispose of his equipment, (the widow was going to bin it!). Nothing special about that, perhaps, but in this case, the equipment had lain untouched on garage shelving for 22 years and had not been used for at least 30!

Among the gear was an HRO receiver, of pre-war vintage, the valves having glass envelopes and UX bases, with coil units covering 0.48 to 30MHz. This HRO looked terrible!

The case had peeling paint and was rusty in parts. Lifting the hinged lid exposed the above-chassis innards, coated with dirt and spider-webbing. Bare metal (valve top caps and clips, coil cans, aluminium valve screens) all showed corrosion and oxidation.

However, the HRO appeared, to my un-tutored eye, to be complete. Turning it upside down and removing the bottom panel exposed the sub-chassis 'works' and although not factory-fresh, it was reasonably clean. Question - would it work? Answer - Not without some careful pre-testing!

Connections Cleaned

Firstly, much of the muck inside was shifted and oxidised connections cleaned up. I had no details at all of the circuitry. All I knew was that the valves (6C6, 6D6, et al.) required 6.3V for the heaters. My only available source was d.c. from my variable voltage power supply unit, so I gingerly applied this and, lo and behold, the front-panel pilot bulb and S meter glowed.

So far, so good. A closer look sub-chassis showed that there was a wire-wound resistor across the 6.3V input with a centre-tap going to chassis. This device

was known in its day as a 'humdinger', its purpose being to reduce mains hum, so obviously I needed a non-earthed 6.3V a.c. source. Not possessing an old fashioned power supply, I borrowed one.

Reading amateur radio texts had told me that old electrolytic capacitors are likely to explode if volts are applied. Also that big, old tubular waxed capacitors can fail and that insulation on the wiring can be defective. There were several of these tubulars, all rated at 600V working and two large aluminium-cased electrolytics labelled 10 μ F 50V working.

I isolated these tubulars (couldn't take them out as they were rivetted in) and applied 2V d.c. with a milliammeter in series. The needle shot upscale a little, then slowly fell back.

Encouraged by this, I increased the voltage in small steps to 20V. No violence ensued, so I put them back in circuit.

Dim Glow

The earlier test with 6.3V only had shown a dim glow on certain heaters. But to make sure, I set about removing all the valves to check heater continuity. I referred earlier to screening cans and the first one I removed brought the valve with it as it was such a close fit. The cans had three equally-spaced ridges lengthways and it was no problem at all slightly to distort the cans to make them fit less tightly.

One screening can refused to move and one valve refused to leave its socket, so these were left in situ rather than risk force and possible damage. They were subsequently freed by a squirt of WD40 on the pins and pressure from below exerted on those pins.

Anyway, the heater glow was visible on those valves and all the other heaters had continuity. So, everything was cleaned up and replaced.

With power off an ohmmeter check on the h.t. connections showed no short circuit, so I decided to apply both l.t. (low tension: 6.3V a.c.) and h.t. (high tension: 225V d.c.). I put the headphones on, applied l.t. then as I applied h.t. a click was heard, so something was happening!

Further Investigation

However, the HRO did not receive, so with further investigation I checked d.c. (bias) voltage on all the grids (top caps)

and found that one showed zero. Swapping two valves about didn't change the fact, so further investigation was needed.

The circuitry included four switches, three on-off toggle types and one push-pull type. The latter was in the S meter wiring, so not important to the actual electronics (did that word exist when the HRO was made?). The toggles all moved, but did not make contact, but a squirt of WD40 soon put that to rights.

With an antenna attached and power applied once more, signals were heard! They were greatly distorted, however, but recognisable as amateur radio c.w. (though sounding like a buzz-saw).

Having switched off I found three of the tubular waxed capacitors warm and melting. An enquiry to a *PW* advertiser resulted in an order for 20 more modern tubulars to replace all the old Sprague capacitors (better to be safe than sorry!). This done, and having also replaced the two electrolytics, as a precautionary measure, power was again applied. It worked!

I plugged in the medium wave coil unit (0.48-0.96MHz) and very many signals were received from several countries, using about 2m of wire as an antenna. Nothing melted!

However, when the b.f.o. switched in, the tone was rough, though not as rough as with amateur signals on other bands. Putting temporary extra capacitance on the smoothing of the power unit caused slight improvement, but I could not proceed further due to lack of high-capacitance high-voltage electrolytics.

Circuit Diagram

Meanwhile, I had acquired a circuit diagram of the old HRO. This helped me to identify the valves and switches and to discover an adjuster inside the case for zero-setting the S meter with no signal input. Since my only test equipment consists of one small analogue multimeter and one small digital meter, I was not in a position to check and do further adjustments.

However, I had enjoyed working once again with 'real' radio (or wireless?), the HRO having been brought back to life and now saleable to an enthusiast with test facilities. (Since these notes were written, the receiver has been sold).



Non-Linear Scales

By Andy Gayne G7KPF

Andy Gayne G7KPF gets out his computer to make power scales easy to draw.

Note this article has kept to empirical units of inches and thousandths parts of an inch, as most CAD packages deal with these units easily.

The annual construction competition at Kidderminster & District ARS usually entices me to warm up the soldering iron. One year I decided to have a go at building an r.f. dummy load and power meter from an old magazine article. The finishing touch on this project was to re-scale the analogue meter.

The article gave the appropriate power levels for a decimal division linear scale, however I decided that markings such as 0.18W or 1.62W on the linear scale were not particularly useful. The answer, of course, was to redraw scale of the meter using a non-linear approach.

But to achieve any sort of accuracy then it would be necessary to resurrect my knowledge of basic trigonometry to create the various points on the new scale. And basic trigonometry was something I had not really used since my college days some 15 years previously.

Computer Aided Design

My intention was to use a PC based computer aided design (CAD) package to draw a scale, which I could then print out using a good quality laser printer. The new paper scale could then be glued onto the existing metal scale of the meter.

Although I ended up using a CAD package to create the new scale, you could use the following technique described below to manually mark out a scale. Although if you did mark it out by hand, some loss of accuracy will be inevitable.

On examination of the meter that I'd recovered from the junk box, I found the scale was a 90° arc, which would make the maths a little easier. The first task was to decide what the graduations would be, so some experimental calculations were made to find a reasonable spread of readings.

The power meter was effectively a linear (deflection) voltmeter connected across a dummy load. And for my purposes a full scale deflection of 10V was to be equivalent to 2W. So for any other power reading the volt reading could be calculated using:

$$V = \sqrt{\text{Power} \times \text{load}}$$

From the experimental calculations, the power readings, shown in Table 1, were decided upon as being a useful spread, giving the calculated voltage readings of column two. These were then converted to degrees of arc from the zero point by multiplying the volts by 9, derived from dividing the maximum deflection divided by the full scale reading (90°/10), giving the figures in column three of the table. I'll describe columns four and five later.

The Trigonometry

Now for the trigonometry. Many CAD programs allow the user to draw lines at any angle, but some programs won't allow that angle to be specified. So I ended up having to calculate two sides of a triangle so that a line could be drawn from the origin.

Now with a defined vertical and horizontal movement, that's something that CAD programs can manage to measure quite easily. The principle of operation is shown in Fig. 1, a vertical line is drawn an arbitrary length, in this case 2in (measured in thousandths of an inch).

Across the top, at right angles to

the first line, is drawn a reference line. Measure from the origin to a point 2in (2000×thousandths of an inch) up the vertical line (the Y axis) and 2in to the left on the horizontal reference line (the X-axis), and mark a point.

If you join this point to the origin, then the angle A will be 45°. If this is then repeated to the right of the origin line, then we have the zero and full scale points on the meter arc 90° apart (scale centre+45° and scale centre-45°).

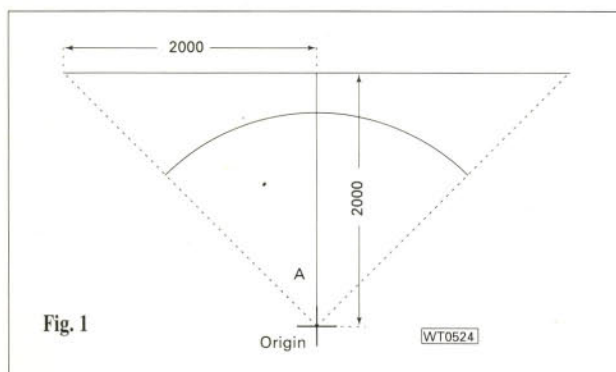
Due to the origin line being in the centre of the scale, the figures in column three of Table 1 need to be adjusted to measure from this point. This new centre reference is achieved by subtracting the figure in column three from 45° if it's less than 45, or subtracting 45° from the figure if the (column three) figure is greater than 45°.

The manipulations result in the adjusted figures, shown in column four of Table 1, which can then be converted to X-axis deviation figures using the formula: $X = \tan(A) \times 2000$. There is a Tan (Tangent) button on most basic scientific calculators. So, as an example, for the 1.5W which equates to a scale value of 8.66V. This is to be multiplied by 9 giving an angle of 77.94°. Then subtract 45° and we have new angular figure of 32.94°, which we tap in 32.94. Press the Tangent key, then multiply the result by 2000, giving a figure of 1296 thousandths of an inch.

A line can now be drawn from the origin point 2000 thousandths vertically and 1296 thousandths through to the right on the horizontal line, as shown in Fig. 2. This process is then repeated for the remaining points, giving the results shown in column five of Table 1 and the drawing shown in Fig. 3.

The radius of the arc, to represent the scale, is not important, although for best accuracy it is a good idea to make the arc the same radius as the existing meter scale, so that the new scale can be aligned over the old one.

Fig. 1: Marking out a scale is easier than you think. See text for the method.



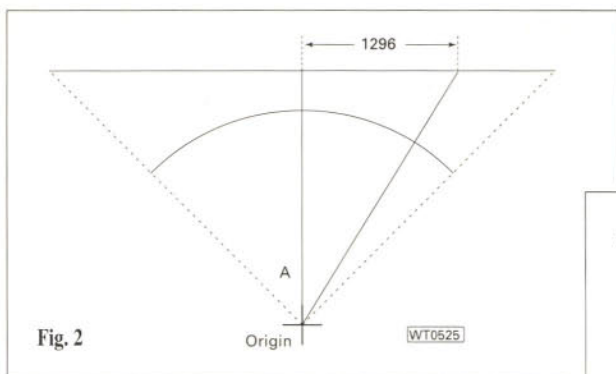
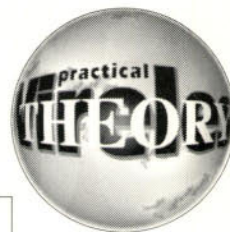


Fig. 2

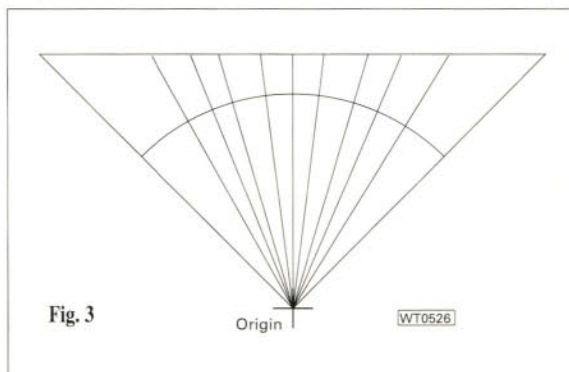


Fig. 3

Fig. 2: Starting to mark out the 1.5W point. See the text for detail.

Fig. 3: After the various points are calculated and drawn.

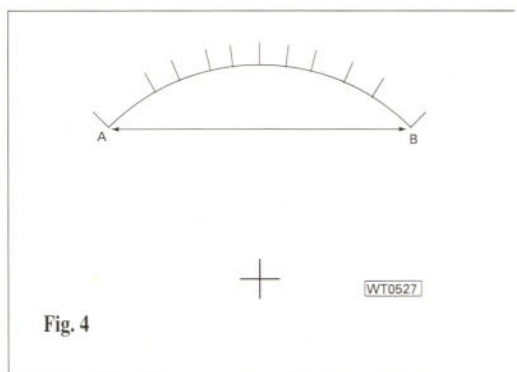


Fig. 4

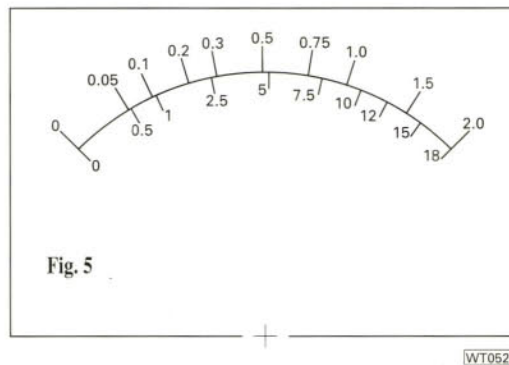


Fig. 5

Fig. 4: Drawing the short scale markers is next. See the text for a better explanation.

Fig. 5: After adding the figures to the scale it should look like this. My example has a second 18W scale added.

Table 1

Power (W)	Scale (V)	Arc (deg)	Adjusted (deg)	x axis (Thou)
2.00	10.00	90.00	45.00	2000
1.50	8.66	77.94	32.94	1296
1.00	7.07	63.63	18.63	674
0.75	6.12	55.08	10.08	355
0.50	5.00	45.00	0.00	0
0.30	3.87	34.86	-10.14	-358
0.20	3.16	28.44	-16.56	-594
0.10	2.23	20.07	-24.93	-930
0.05	1.58	14.22	-30.78	-1191
0.00	0.00	0.00	-45.00	-2000

The alignment can be accomplished by measuring with a ruler from the pivot point of the meter needle to the arc, but why not use trigonometry again, seeing as we are getting back into the swing of it?

Measure the distance between points A and B as shown on Fig. 4. In my case this dimension was 115/16in or 1.9375in. The radius of the arc is then given by the formula:

$$R = \frac{1.9375}{2} \times \frac{1}{\sin(45^\circ)} = 1.37\text{in}$$

The above formula for finding the radius of the arc only works for a 90° deflection meter. For any other type of meter, the 'Sin(45°)' part of the equation must be modified to be half the arc of the meter.

Defined Radius

On the CAD package I use, it's difficult to draw an arc of defined radius, but it is easy to draw a 1.37in circle, so this is drawn about the origin. A line is then added from points A to B as in Fig. 4, then this line is 'pulled' into an arc to match the radius of the circle, the circle is then deleted leaving a perfect meter arc.

Small marker points are then drawn on top of the lines generated in Fig. 3, then the original lines are deleted. Text is then added against each marker point and the scale is complete.

It's a good idea to add a vertical and horizontal line of, say, 2in length outside the scale so that when printed these can be checked for the correct dimension, and if either is wrong then appropriate adjustment can be made in the CAD program output routine, if your

program allows it, for a corrected reprint.

The project I built had a second scale for 0 to 18W, perhaps you would like to try and calculate the figures for this second scale just to see if your trigonometry is now in working order!

I've included a copy of my scale, Fig. 5, to show how smart it can look, and it didn't take that long. So a little work on the PC can give you meter scales to be proud of.

PW

Struck Off.... Almost!

By Ben Nock G4BXD

Ben Nock G4BXD tells the story of how his efforts to provide vintage Amateur Radio equipment 'props' for a 'period medical drama' TV programme led to a very interesting few days and a very few seconds....!

Struck off...the radio mast that (almost) never was. The 50ft mast built by the 'prop' department complete with 'dummy' h.f. beam antenna. Ben Nock G4BXD discovers the secrets of making a TV drama.

It all began when the telephone rang one day. Upon answering it a voice asked if I had any old radio sets. "Yes" I said. "Did I want to loan them to a television company"? "Possibly" I replied.

And so that was how my Scottish adventure started...with the telephone call from someone connected with the RSGB. Apparently, the question of locating some old radio sets had been bouncing around between the television company, the RSGB and a certain magazine Editor located in Dorset!

I did indeed have old radios, as readers of *PW's* 'Valve & Vintage' column will already know, and would be quite happy to loan them out, assuming certain conditions could be met. After the initial telephone message I received a further call, this time from the producer of the show.

After confirming just what it was that they wanted I suggested I send some photographs of typical gear so that they could see for themselves. The requirement was for equipment of a late 1940s early 1950s nature, something that a Radio Amateur of the time would have been likely to have.

Basic Story

I was told that the basic story line was of a Radio Amateur living in an isolated location, slowly going blind. But his eyesight was to be saved by the dashing young Doctor featured in the series, who was passing by on a walking holiday.

After a week or so, the producer rang to say they would be happy to select several of the radios, along with a few tools of the period, and could I send them up.

The 'location' for the TV programme was half-way between Glasgow and Edinburgh. With self-interest and the preservation of the vintage radios in mind, I suggested that I had better accompany them and see that they were set-up correctly.

After a suitable 'fee' was decided upon I proceeded to assemble the sets and prepare for the long journey

north. Though a fair way away, the trip from the Midlands to Glasgow is not too bad at all. Once past the eternal road-works at Junction 21 on the M6 the road opens out, the traffic reduces and the trip is fine.

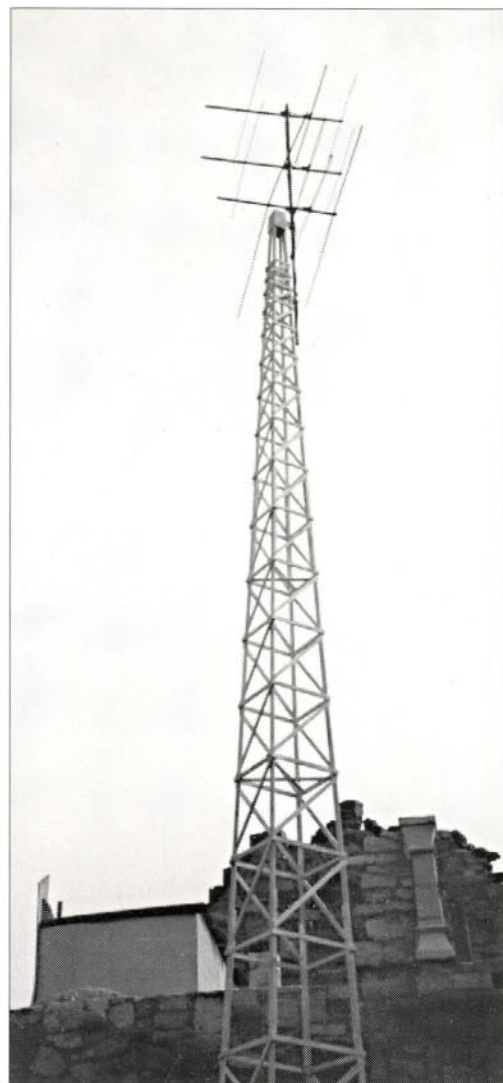
Gretna Green

Driving past Gretna Green (very fast I might add as my YL Gloria was with me!) the countryside begins to fold back. Vast expanses of open fields, rolling hills and lots of sheep. Up past Carlisle the views of the southern uplands are spectacular and blessed with superb weather, the drive was most enjoyable.

An overnight stop in Glasgow itself was surprisingly most enjoyable too. There was plenty to see and do, and the nightlife down Sauchiehall street was most interesting.

The following morning saw us in the television company's 'prop' store awaiting the producer and the scenery crew. It was interesting to see the props from earlier shows and programs. The chair that a certain famous actor had sat in, the model of an airfield, used for goodness knows what...all manner of strange but familiar things.

After the crew had loaded logs of wood (real wood!) out of the prop store into their van, we proceeded in convoy with the producer to the site of the 'shoot' (that's a bit of movie makers speak I picked up!).



Tannochbrae Country

Located in the 'Tannochbrae' country, miles from the main road, the house was approached up a long dirt track. As a corner was rounded the sight of a tall, nearly 50ft, mast, came into full view.

What a Radio Amateur's dream. Isolated country, no neighbours, a great big antenna mast with an h.f. beam on top...it seemed like heaven!

Continued on page 45

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IC706 BEFORE & AFTER TABLE

STATUS	F1 S/N for 12dB Dev 2.4 kHz @ 1 kHz	AM S/N for 12dB Mod 50% @ 1 kHz	SSB S/N for 12dB @ 1 kHz	CW S/N for 12dB @ 600 Hz
BEFORE	0.22 µV	0.60 µV	0.20 µV	0.17 µV
AFTER	0.15 µV	0.54 µV	0.12 µV	0.11 µV

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heil sound



"As reviewed in RadCom" August 1996

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Yet another year passes by...

Last month I read with amusement a piece on how a company was "proud" of the fact to have lost the distributorship of one of the largest Amateur Radio manufacturers in the world. I must admit, if I had been fortunate and honoured to be appointed such a respected mark - and lost it, I probably wouldn't shout about it, let alone be "proud". Nowt as strange as folk, as they say.....

I've been fishing around my vault (The showroom used to be an old Barclays Bank and its now the store room), and I've listed a selection of kit that you can save more than a few bob on. They are all new (or ex dem, where specified), and come with full manufacturers warranty.

For those of you that are on the "WEB", check out our site. It is updated each day and contains special offers and our famous "Used Equipment list" which is at least six weeks more up to date than any advert.

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MYDEL P-133 PC

With all the talk of Internet this and WEB that, (have you noticed how often email or web addresses appear in adverts these days?), I thought it was about time Martin Lynch & Son configured a PC suited to the Radio Amateur who wants to join the ever growing popularity of "PC Communications".



AS
REVIEWED
IN RADCOM
MARCH
ISSUE

MyDEL P133 Specification:

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- 16MB RAM
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The mast, unfortunately, turned out to be another film prop! Constructed from wood with guy wires holding it up, the 'Tri band beam' type antenna on top was also a 'dummy'!

The house chosen could only be described as a part derelict castle. The owner though was restoring it to its former glory bit-by-bit. We could see the new bits of wall added in recent years, showing white against the weathered grey of the old stone.

Painted Stone?

We could also see the hardboard wall going up, being painted to look like stone. Another TV trick of the trade.

Once the location housing the radios was pointed out, the crew helped to lift the sets in. An AR88, a CR100, a home-brew transmitter of the period, a 1930s wooden wireless, bits of test gear, headphones, a Morse key and some tools completed the list.

The YL and I then proceeded to 'dress the set' (that's another film and TV phrase that all suppliers use!). The setting of the radios was again a dream shack.

There were great big thick walls, no problem with noise coming in or going out. (Nothing to disturb the YL while she watched such riveting, mind expanding programs like 'Coronation Street').

No Electricity

The only problem encountered was with the lighting, there was none and

in fact there was no electricity up to the house! The TV crew were going to have to rely on generators for all their power.

A small portable generator was already in operation for the temporary lighting and power tools needed by the set designers. A quick request to the boss and a light on a long lead was soon installed in the 'shack'.

As can be seen from the photo, I took great care in setting the station up as I think it would have looked. I also have to acknowledge here the valuable assistance of my lovely YL, Gloria.

I repeatedly stepped back and took the view the camera would see, just to arrange things correctly. The only problem I had was in forming that little square box with the hands, the one you see all directors doing when trying to frame a shot!

Whilst I positioned and re-positioned the radios the other set designers were busy making walls were there were none. They were even painting fake bricks onto hardboard, building an entire stable in the court yard, even hiding a load of building sand under a tarpaulin, with a bit of straw around the base to make it look like a pile of hay.

Eventually, the set designer and I were happy with the arrangement. Then we all retired to the courtyard for a well earned 'cuppa' and a chat about other great programs the designer had worked on.

The sun shone, the open aspect all around gave spectacular views of the

country side but not of the lake that was going to be in shot next to the castle. It transpired that the lake to be used was miles away and, in good TV and film tradition, it would either be 'pasted in' later, or joined with expert cuts in camera angle.

Day Of Airing

And so it came to pass, that eventually (after much waiting) the day of 'airing' came. Great excitement filled the Nock household, videos rolled and friends 'phoned.

I had been warned that it was only going to be a 10 second shot of the sets (if that long!). As it was, I think it was more like a **five second shot**, from about 30ft away, through the woollen jumper of the main character!

I waited to hear the made-up technical terms and jargon spouted by the supposed Radio Amateur, as in good TV tradition they are usually all wrong as we all know. But as it transpired there was no mention of 'ham', not even bacon. A passing remark about listening to the Voice of Russia and that was it, gone, over, and no more radios anywhere!

Even the 50ft mast, so lovingly created by the 'props' department made only the briefest of long shot appearances. But at least no one could question the accuracy of the beam antenna!

All that huffing and puffing, the petrol expended, the dents suffered to the equipment when they were shipped back, all for the merest glimpse. The whole event, as nice as it was at the time, really opened my eyes as to how TV programmes are made.

It was a great shame that more was not made of the Amateur Radio connection. An opportunity for some good Public Relations was wasted. But, in good old 'show biz' parlance, the show must go on, and it did.....without us. Oh well, here's to the next time. I really enjoyed the experience and I'm open to offers at any time!

PW



Ben G4BXD even risked a short visit to Gretna Green's famous 'Marriage Room' but he's nowhere in sight!

What it was all about. Gloria sits in the 'period' shack in front of 'The radio that (almost) never was', set-up and ready for the eventual five second appearance in the programme.



Carrying On - The Practical Way

By Rev. George Dobbs G3RJV

This month the Rev. George Dobbs G3RJV says he's providing "A Short Guide to Harmonic Filters for Transmitter Output" and a..... "Complete d.i.y. Kit with just a couple of 'simple sums' to do so you can 'roll your own' filters"32.

In a recent column, I added another little circuit, the FF-7, to the range of QRP, easy to build, transmitters. And as a result I had a comment from a reader.

The reader suggested that I had indulged in 'over-kill' with the low pass filter, which was almost the same physical size as the transmitter. Although I agree the low-pass filter could have been squeezed into less space, I would have still stuck to the seven-element design.

By their very nature, QRP transmitters radiate less power, but the output from such a transmitter does require adequate filtering. Usually to keep the circuit compact, these transmitters have a final stage run in Class C and being driven hard with r.f. power.

The 'driven hard' approach is a recipe for high harmonic output and a well

designed low pass filter is essential. And for many years I have used low-pass filters calculated from a series of figures produced by Ed Wetherhold W3NQN, and published in two articles in PW's sister publication *Short Wave Magazine* in December 1983 and January 1984.

Adviser To ARRL

Ed Wetherhold has been the American Amateur Radio Relay

League (ARRL) Adviser on passive filters for several years. He's published many fine articles on audio and radio frequency passive filtering.

I believe that the two articles in *Short Wave Magazine* still represent the best source of information for the design of good low-pass filters for r.f. amplifiers.

The SWM articles are comprehensive. But here I just want to share enough of the information to enable readers to build useful filters to add to their home-made transmitters.

There's very little

special offer of a specialised 'worked examples' book and calculator very helpful. See page 20 January 1997 PW. Editor.

The W3NQN designs are based upon a seven elements: four capacitors and three inductors. They are designed for 50Ω input and output impedance and use standard capacitor values.

I think the W3NQN approach is very useful because many calculations and computer programs for filter design give very odd values of capacitance. These then have to be made up from series and parallel values.

The diagram, Fig. 1, shows a seven-element low-pass filter. And so you can start building one for yourself...it's time to look at some numbers!



Practical Values

To start with some practical values, I've provided Table

A G3RJV 'Roll Your Own' filter.

1, which is a very short extract from a large list of filter parameters in the original W3NQN articles. I have taken the practical values for the nine h.f. amateur bands which have given me the best results over the years.

Alongside each band are values for the seven elements in the filters with values on pF for capacitors and μH for inductors. The characteristics of each filter are described in terms of the ripple cut-off frequency (F-co) and the frequencies of the 3dB (F - 3dB) and 30dB (F - 30dB) attenuation levels.

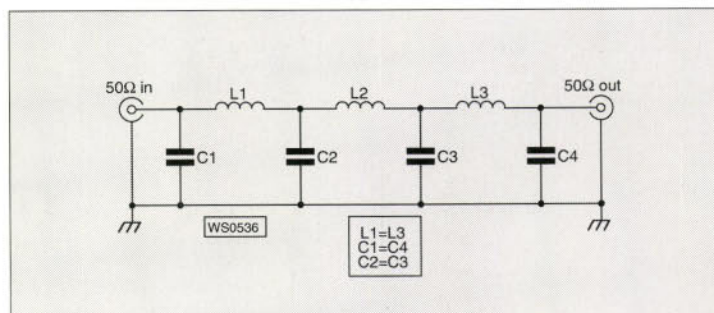
The capacitors are all 'easy' values. I generally use polystyrene capacitors for my filter building.

The inductors are all wound on toroidal cores in the popular Micrometals range. These are available from CirKit, Bonex and Maplin.

The Inductors

The inductors are all wound on toroidal cores in the popular Micrometals range. These are available from CirKit, Bonex and Maplin.

Fig. 1: A seven element low-pass filter design (see text).



Translating the inductance value to practical inductors is very simple. The formula, in Fig. 2, is given to calculate the number of turns. It does require knowledge of the inductance at 10 turns for the required core. (These values are given in Table 2).

Again I have reduced the W3NQN information to the 2 mix and 6 mix toroids, the ones that are of most use for this application. The formula is easily executed with a pocket calculator and the resultant figure is rounded to the nearest complete number of turns.

The wire gauge is not critical. Simply use the gauge that will fit well on the core. The target is to wind an even coil on the core to occupy about three-quarters of the available space. If the opposite ends of the winding are too close this will introduce extra capacitance.

Power Levels

The information, in Table 3, shows the smallest core that may be used for particular r.f. power levels. It's interesting because for transmitters of 10W or less, T37 cores are suitable, making the filters very compact.

Also, please notice that **larger cores** are required for the lower frequency bands. This again is an extract from the W3NQN data which used a very conservative maximum a.c. flux density to determine the minimum core size. (So use this table to choose a core suitable for the required power handling of the filter).

Practical Designs

The information I've provided in Table 4 gives practical designs for a series of low pass filters over the nine Amateur bands for transmitters of 10W or less power output. The constructor simply has to read off the values and make up the filters.

All of the designs mentioned have provided filters that I have used to good effect in the past. Should you require filters for use with higher powers, take the information from the tables to choose a suitable core and work out the appropriate number of turns for that core. In effect it's a 'complete d.i.y. filter design kit'!

I keep a range of low pass filters in the shack, each one mounted in a small tin, for testing purposes. So when I'm playing with transmitter circuits, I have a low pass filter I can put into use for testing the output.

The more frugal constructor could use such a set of filters for several transmitters and not build filters into each of them. You couldn't really be more economical than that could you?

PW

$$N = L_{10} \sqrt{\frac{L}{L_{10}}}$$

Fig. 2: Formula used to calculate number of turns provided (see text).

Table 1

Band (MHz)	F-co (MHz)	F-3dB (MHz)	F-30dB (MHz)	C1, 7 (pF)	C3, 5 (pF)	L2, 6 (μH)	L4 (μH)
1.8	2.16	2.76	4.0	820	2200	4.442	5.608
3.5	4.125	5.11	7.3	470	1200	2.434	3.012
7.0	7.36	9.04	12.9	270	680	1.380	1.698
10.1	10.37	11.62	15.8	270	560	1.090	1.257
14.0	14.40	16.41	22.5	180	390	0.773	0.904
18.068	18.93	22.89	32.3	110	270	0.548	0.668
21.0	21.55	27.62	39.9	82	220	0.444	0.561
24.98	25.24	28.94	39.8	100	220	0.438	0.515
28.0	31.66	40.52	58.5	56	150	0.303	0.382

Table 2

Core		Size					Range
Mix	colour	T37	T44	T50	T68	T80	MHz
-2	Red	0.40	0.52	0.49	0.57	0.55	1-7
-6	Yellow	0.30	0.42	0.40	0.47	0.45	7+

Table 3

Core		Power level (Watts)				
Mix	Colour	0 - 10	10 - 25	25 - 50	50 - 100	100 - 200
-2	Red	T37	T44	T68	T68	T80
-6	Yellow	T37	T37	T37	T44	T50

Table 4

Band MHz	C1, 7 pF	C3, 5 pF	L2, 6 turns	L4 turns	Core type	Wire size	
						mm	s.w.g.
1.8	820	2200	30	34	T50-2	0.315	30
3.5	470	1200	25	27	T37-2	0.4	28
7.0	270	680	19	21	T37-6	0.5	26
10.1	270	560	19	20	T37-6	0.5	26
14.0	180	390	16	17	T37-6	0.56	24
18.068	110	270	13	15	T37-6	0.56	24
21.0	82	220	12	14	T37-6	0.56	24
24.98	100	220	12	13	T37-6	0.71	22
28.0	56	150	10	11	T37-6	0.71	22



Table 1: Short extract of filter parameters taken from W3NQN's original articles (see text).

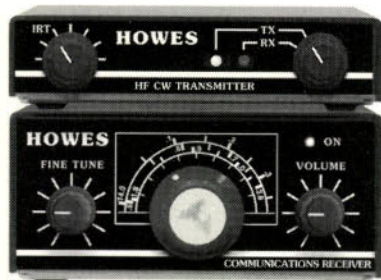
Table 2: Table indicating the inductance at 10 turns (rounded to the nearest complete turn) for the required core (see text).

Table 3: Core requirements for various power levels (see text).

Table 4: Detailed information for the construction of practical low pass filters (for power levels of no more than 10W) for the nine h.f. Amateur Radio bands (see text).

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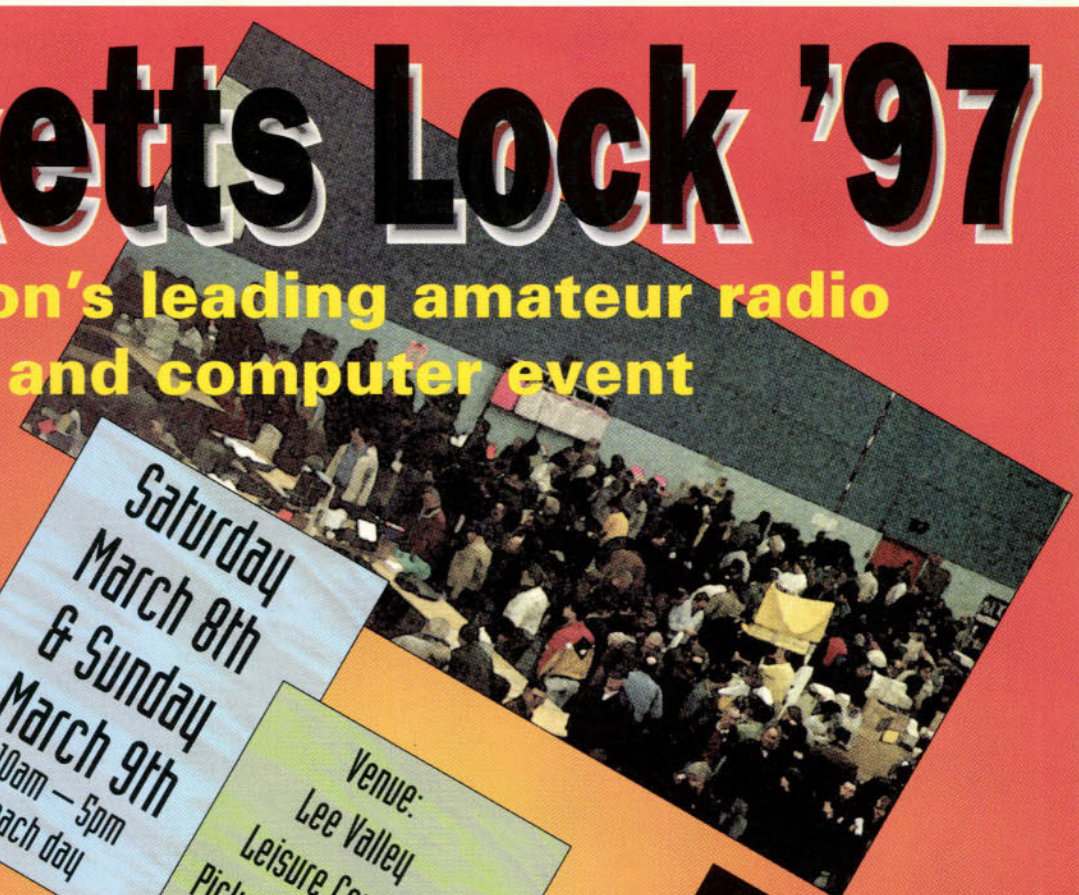
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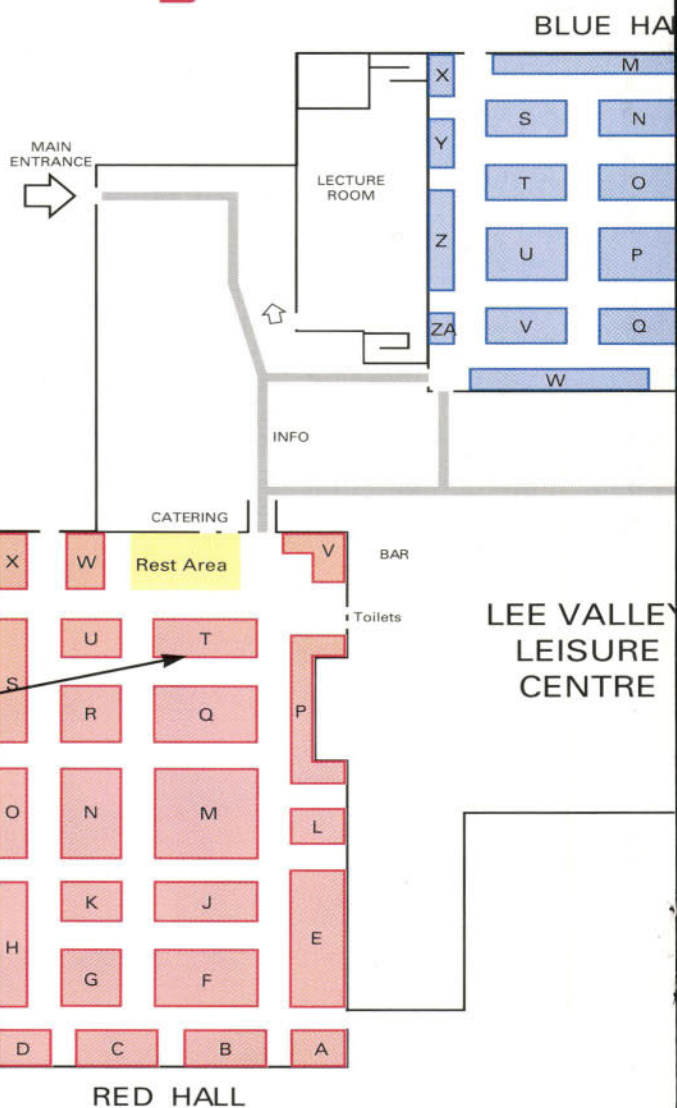
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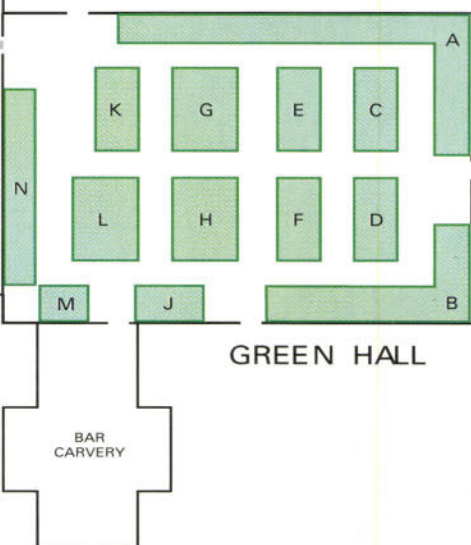
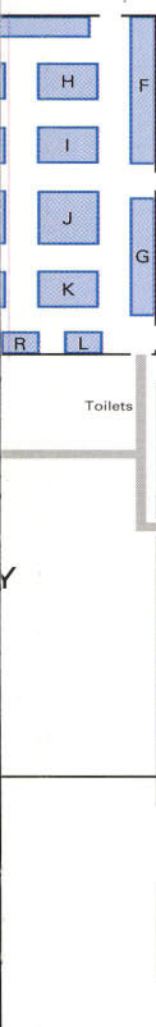
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Finding Your Way To Picketts Lock

It's that time of year again and many of us will be heading for Picketts Lock for the annual show. But if you've not been there before, just how do you find your way? Rob Mannion G3XFD describes how you can get there, suggests places to stay and some ideas of where to eat.

The annual show at Picketts Lock not far off the M25 in north-east London has become a very popular event. Depending on your luck with the variable traffic conditions on the M25, driving there is very straightforward. Access to the Picketts Lock centre is then very easy from Junction 25 on the M25.

Leaving the M25 you join the A10 road heading into London. However, you only have to travel a very short distance before taking a turning off to the left towards Ponders End and you'll end up on the A1055. With the main line railway on the right you'll eventually pass Ponders End station (on the right as you head towards Picketts Lock) before you approach the Lee Valley Leisure Centre (Picketts Lock) complex itself.

Going into the complex itself, the multi screen cinema is the first thing you'll see from the road, as you approach the car park entrance. To the right on the far side of the railway there's high density housing (high-rise flats and a considerably built-up area, whereas to the left, the surrounding golf course, camping site (large and remarkably peaceful and ideal for overnight use) and the country park provided a surprising semi-rural atmosphere.

The route I've suggested avoids driving through Enfield. But if you're coming by public transport you'll have to pass through the town itself.

Anyone travelling by train to the show will have to start the London end of their journey from Liverpool Street and get off at Edmonton Green station and transfer to the W8 bus service. This runs on a very regular schedule and terminates literally at the show's front door.

For anyone coming from abroad, via the Channel Tunnel rail service or Heathrow, the journey is quite straightforward. From Heathrow the 'Underground' train service runs to the centre of London and the journey to Liverpool Street is simple. The same applies for passengers arriving at Waterloo International via the Eurostar service.

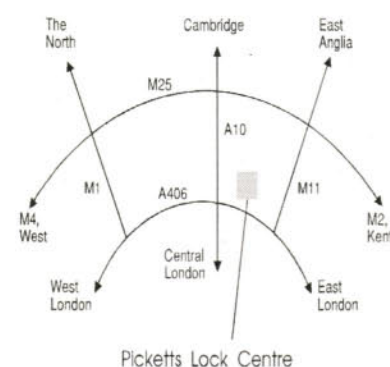
Facilities & Access

Facilities in the Picketts Lock centre include various food outlets and a bar. Wheelchair access is also good, as is general access for the disabled.

For anyone wanting to 'eat out' I've done some research and several nearby restaurants have been recommended. These include the 'Bella Pasta' at 2 The Town, Enfield. For reservations contact Joy Fairbrother on Tel: 0181-367 7514. And another restaurant that's been recommended to me is the 'Italian Touch' at 21-22 Station Parade, Cockfosters, Hertfordshire. For reservations here please call Franco on Tel: 0181- 447 0947.

Staying Overnight

Many people travelling to weekend Amateur Radio shows stay overnight to make the most of the event. And for those planning to do this during the



**Lee Valley
Leisure Centre**

Picketts Lock show are fortunate because there are several alternatives for accommodation and one is definitely in the 'budget' price range.

If you've got a caravan, motor caravan or tent...the campsite immediately behind the Leisure Centre could not be more convenient. Complete with an on-site shop the camp site extends to many acres and (quite honestly because I've walked my dog through to the Lee Navigation on many occasions) you'd think it was deep in the countryside.

To book a pitch for your tent, caravan or motor-caravan (**note:** commercial vehicles are not permitted, and the site management only accept motor-caravans fully fitted with windows) you should telephone the Site Manager Mr Cartledge on 0181-803 6900. Charges are £5 per adult per night, children (five to 16 years old) are charged at £2.10 per night. Electricity is available at £2.20 per night. (For other enquiries the main telephone number

for the Leisure Centre itself is 0181-345 6666).

If your budget extends to a Hotel stay you could take advantage of a special offer that's being made by the Cheshunt Marriot Hotel at Broxbourne. This Hotel is eight miles or so northwards up the A10 from the show and it's where the PW & SWM team stay...as do many other people connected with the show. It's very comfortable, has a good swimming pool and has the benefit of a large shopping centre nearby complete with Marks & Spencer, Tesco, etc.

Prices per night for the Hotel are as follows: Special rate for a single room is at £49 including full English breakfast and VAT (Normal price £68). A double room costs £54 including full English breakfasts and VAT. The Hotel has also recently been awarded a 'Category 1' within the National Accessibility Scheme for the high standard of facilities provided for the disabled.

For further details on the Hotel, booking and enquiries contact: **The Marketing Manager Joanne Leyton** on (01992) 451245. Alternatively you can write to: **The Cheshunt Marriot Hotel, Half Hide Lane, Broxbourne, Hertfordshire BN10 6NG** or FAX: (01992) 440120.

Finally, if you do stay at the Cheshunt Marriot Hotel I've got a bit of advice: You can save yourself time by leaving the A10 at the (very well signposted and very obvious) exit to the shopping centre I've already mentioned. Then (unless you need the shopping centre facilities) you can use the link road which passes under the A10 and provides easy access to the Hotel. This route saves a mile or so and several complicated road junctions.

So, I hope the information I've provided will help you...especially if you've not been to Picketts Lock before. And as usual I'm looking forward to seeing readers there!

PW

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The Cheshunt Marriott Hotel is very pleased to offer preferred hotel rates for all exhibitors and visitors to the London Amateur Radio Show, Picketts Lock, Lee Valley Leisure Centre

**Friday 7th & Saturday 8th
March 1997**

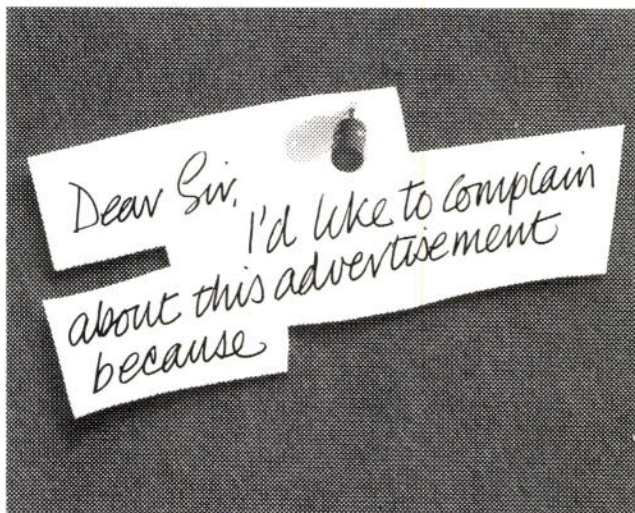
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PX TS-50	Kenwood	HF mobile.....	£699
PX IC737	Icom	HF 100W.....	£1060
LX FTONE	Yaesu	HF 100W.....	£675
LX FT890AT	Yaesu	HF 100W.....	£1250
LX IC-706	Icom	HF + 2/6m.....	£779
AX FT767GX	Yaesu	HF 100W.....	£1450
AX FT990	Yaesu	HF 100W.....	£1650
AX IC765	Icom	HF 100W.....	£1699
RX FT980	Yaesu	HF 100W.....	£625
RX FT101	Yaesu	HF Valve.....	£260
RX FT102	Yaesu	HF Valve.....	£325
RX FT747	Yaesu	HF Mobile.....	£450
RX FT107M	Yaesu	HF 100W.....	£275
RX TS690	Kenwood	HF/6m.....	£1175
RX TS440	Kenwood	HF 100W.....	£750
RX IC726	Icom	HF 100W.....	£850
RX IC761	Icom	HF 100W.....	£995

VHF/UHF TRANSCEIVERS

PX FT4700	Yaesu	2mtr/70cm.....	£329
PX FT2700	Yaesu	2mtr/70cm.....	£279
PX FT290RII	Yaesu	2mtr port.....	£375
PX FT221R	Yaesu	2mtr m/mode.....	£295
PX FT2500M	Yaesu	2mtr mobile.....	£279
PX TS711E	Kenwood	2mtr m/mode.....	£459
LX DJ580E	Alinco	2mtr/70cm.....	£245
LX TH21E	Kenwood	2mtr port.....	£100
AX FT790R	Yaesu	UHF port.....	£310
AX TM-732E	Kenwood	2mtr/70cm.....	£525
RX DJ160	Alinco	2mtr/70cm.....	£155
RX DJ560	Alinco	2mtr/70cm.....	£335
RX FT76	Yaesu	70cm port.....	£155
RX FT212RH	Yaesu	2mtr FM.....	£175

RECEIVERS

PX SW8	Drake	HF Gen. RX.....	£445
PX R2000	Kenwood	HF Gen RX.....	£375
PX FRG7700	Yaesu	HF Gen RX.....	£295
PX AR8000	AOR	Scanner.....	£299
PX AR2800	AOR	RX M/base.....	£359
PX AR1500ex	AOR	Scanner.....	£225
PX AR3030	AOR	HF RX.....	£475
PX HF150	Lowe	HF Gen RX.....	£375
PX FRG100	Yaesu	HF Gen RX.....	£449
PX MVT8000	Yupiteru	Scanner.....	£269
PX SW-7600	Sony	Portable RX.....	£139
PX PRO2006	Realistic	B/Scanner.....	£239
LX ICR-72	Icom	HF RX.....	£675
LX FRG7700	Yaesu	RX + mem.....	£299
AX PRO-80	Sony	S/wave RX.....	£120
AX 2001D	Sony	S/wave RX.....	£169
RX HF225	Lowe	HF Gen RX.....	£385
RX AR1500	AOR	H/H Scanner.....	£165
RX ICF-7600	Sony	Port RX.....	£120
RX NRDS535	JRC	HF Gen. RX.....	£850
RX FRG8800	Yaesu	HF Gen. RX.....	£395

PX = Chandlers Ford HQ 01703 - 251549
RX = Reg Wards 01297 - 34918
LX = SMC Leeds 01132 - 350606
AX = ARE London 0181 - 9974476

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PLEASE MENTION TRADERS' TABLE WHEN ENQUIRING ABOUT ANY ITEMS ON THESE PAGES!



AKD

UNIT 5
PARSONS GREEN ESTATE
BOULTON ROAD
STEVENAGE, HERTS SG1 4QG



★ THE START OF A WHOLE NEW RANGE ★

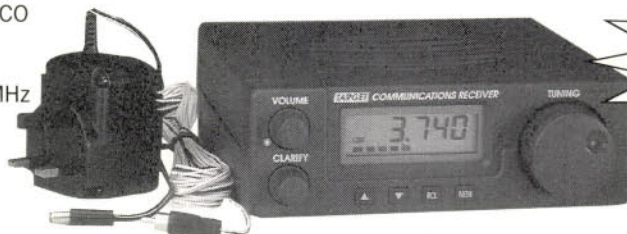
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Made in England by AKD

A communications receiver at an affordable price

The receiver is fully synthesised employing a phase lock loop VCO to ensure stable and accurate signal reception

- ★ Frequency range 30kHz-30MHz
- ★ CE approved
- ★ 1kHz steps with clarifier
- ★ Audio output 2 watts
- ★ Headphone socket



£159.95 incl VAT

Add £6 P&P

includes 12V power supply and aerial

- ★ Band width SSB = 4.0kHz
AM = 6kHz
- ★ Modes USB/AM/LSB

AKD HF Converter

Model HFC1/BNC

The HFC1/BNC Converter is designed for use with various scanners and is supplied with BNC termination (12V DC). The converter uses a SBL1 (double balance mixer) with a low pass filter on the input which cuts off around 65MHz. The insertion oscillator is at 100MHz making it easy to translate the receiver frequency by simply tuning the scanner within the range 100MHz to 160MHz. This will enable reception between 100kHz to 60MHz. No RF pre-amp has been employed to ensure good "large signal handling capacity" is achieved.

Model HFC1/FRG

This Converter supplied as HFC1/BNC but with adaptor to allow Converter to be connected to the FRG9800/965 (8 - 9.6V).

Price **£52.40** inc. VAT + £1 P&P.



TVI PROBLEMS?

Are you having trouble receiving a watchable picture on your TV? If so, the cause may be aerial-borne interference. For many years AKD has manufactured a low cost range of in-line interference suppression filters that are easily inserted into the aerial system to help reduce the effects of interference from local taxi radio, CB, amateur radio, airport radar, etc. Each filter is terminated in standard aerial co-ax plug and socket and requires no external power. Fitting could not be more simple. No technical knowledge is needed. There are 13 standard stocked filters in our range, but individual filters can be tuned to reject interference at specific frequencies if required. If you are not sure which filter type to order or have any questions regarding interference phone our helpline on 01438 351710 and ask for John who will be pleased to assist you in making the best choice of filter.



BRITISH MADE
TRANSCEIVERS CE approved
£193.74 incl VAT (Add £6 P&P)

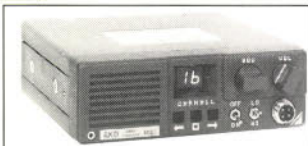
2 MTR MODEL 2001 144.500-145.975

PTT tone burst. Listen on Input. Facility 25kHz. Spacing 25/5 watts.



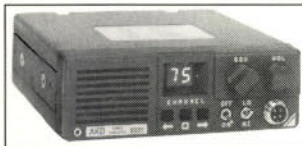
4 MTR MODEL 4001 70.250-70.4875

12½kHz Spacing. Power. 25/5 watts.



6 MTR MODEL 6001 50.010-51.990

20kHz Spacing
25/5 watts.



70 CMS MODEL 7003 432-500 to 434-975MHz

25kHz Steps. Power 3 watts. PTT tone burst. Listen on input.

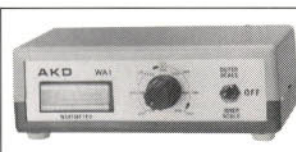


WAVEMETERS KEEP YOUR STATION CLEAN

WA1

The VHF Absorption Wavemaster for the 2 metre band. Range 120MHz to 450MHz. Meets licensing requirements. Can also be used as a field strength meter within its range. Requires PP3 battery (not supplied).

£34 incl VAT. Add £1.50 P&P



WA2

The VHF Absorption Wavemaster for the 4 & 6 metre bands. Range 50MHz to 70MHz. Meets licensing requirements. Can also be used as a field strength meter within its range. Requires PP3 battery (not supplied).

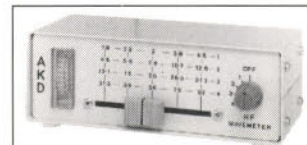
£34 incl VAT. Add £1.50 P&P



WA3

The HF Absorption Wavemaster covers the range 1.8MHz to 92MHz. Ideal for the law abiding operator. Requires PP3 battery (not supplied).

£58.45 incl VAT. Add £2 P&P



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WIN!

A YAESU FT-8000R DUAL-BAND FM MOBILE TRANSCEIVER

**WORTH OVER
£500!
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UK LTD**

1 PRIZE: FT-8000R &
a three year
subscription to
Practical Wireless.

**2
&
3** PRIZES: A one year
subscription to
Practical Wireless.

Questions

- Q1: How many memories does the FT-8000R have?
a: 100 b: 80 c: 108
- Q2: What happens if a speaker is plugged into the VHF jack?
a: Nothing b: Internal speaker cuts off
c: Internal speaker continues to operate
- Q3: Where on the FT-8000R is the cooling fan situated?
a: The back b: The side c: The front

FT-8000R Entry Form

Answers

Q1: A ☐ B ☐ C ☐
Q2: A ☐ B ☐ C ☐
Q3: A ☐ B ☐ C ☐

Editor's decision on the winner is final and no correspondence will be entered into. Please do not include other correspondence in with your entry. Closing date for entries is Friday 2 May 1997.

Name

Callsign

Address

Postcode

☐ If you do not wish to receive future mailings as a result of entering this competition please indicate.

How To Enter

All you have to do is answer the three multiple choice questions above and then tick the appropriate answer boxes on the form left.

Then send your entry to: **FT-8000R Competition, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.**

Alternatively you can drop your entry into the **Yaesu Competition 'bin'** on the **PW Stand T** in the **Red Hall** at the **London Amateur Radio Show**.

Then sit back and wait to see if you're the lucky winner! Good luck and who knows it may be you we present the FT-8000R to later on in the year at the Longleat Amateur Radio Rally.

CHECK OUT OUR IN DEPTH REVIEW ON PAGE 73

London Amateur Radio & Computer Show

Show News

The London Amateur Radio & Computer Show takes place over the weekend of March 8 & 9th at Picketts Lock, London. Here is a 'taster' of who and what you can expect to find at the show read on to discover the radio delights that will be on offer.

Martin Lynch & Son - Block S



Martin, his wife Jennifer and the rest of the 'Lynch Mob', have moved this year from their normal pitch to a new position in the **Blue Hall**. "The original spot was too small to accommodate the enormous new range of new and new products, so we had to move", said Martin.

The entire Standard range of v.h.f. products will be on show, including the new C-5908D, triple band (2/6/70) remote head mobile. In addition, the micro miniature handies, including the C508 dual-bander will also be available.

Also on display will be the company's latest MyDEL P-133 Computer, which has been especially configured for use by radio amateurs and listening enthusiasts. The new PC is based on a Pentium 133MHz processor and comes already configured with Windows '95, 8 speed CD ROM, Sound Card and lots more.

An interesting feature of the P-133 is that Martin has pre-installed BT Internet software which allows full Internet access including World Wide Web facilities, E-mail services, the new 'NetMeeting' facility allowing you to talk (and even send and receive video!) all over the Net. The MyDEL costs £1499.95, with an additional £150 per annum payable to BT.

In addition to all this Martin will have all the new products from Yaesu, Icom and Kenwood as well as a wealth of fully checked used equipment, which together with all his new and existing products, should ensure that his stand is well worth a visit!



Association For International Broadcasting - Block G Red Hall

The Association for International Broadcasting (AIB) will be making their second appearance at the London show and will be promoting international radio and television. The AIB will offer visitors the chance to hear some of the rich-mix of programmes available via short wave and will be representing international radio stations including BBC World Service, YLE Radio Finland and Radio Canada International.

The latest programme schedules from a wide range of global radio stations will be available free-of-charge, together with other promotional material from stations world-wide. The complete range of Roberts Radios will be on show, from simple analogue (or dial-and-pointer) sets to state-of-the-art digital receivers.

To help visitors discover the range of stations and programmes, AIB will be supplementing the extensive range of free programme schedules with specialist publications about world radio. They will also be running two Prize Draws on each day of the show. The top prize in each draw is a brand new short

wave radio, and there will be other gifts ranging from T-shirts to high-quality pen sets from radio stations world-wide.

Icom (UK) Ltd - Block S Red Hall



Dennis Goodwin G4SOT and the 'team' will be exhibiting the full range of Icom equipment including the IC-756 h.f. transceiver, the IC-R8500 wide-band receiver and the IC-R10 scanner. They will also be launching the IC-207H dual-band f.m. mobile.

The IC-207H features a detachable front panel, CTCSS as standard and 9600bps packet operation. Maximum power output on the IC-207H is 50W (v.h.f.) and 35W (u.h.f.) with 108 memory channels and computer clone compatibility with optional software. The price of the IC-207H is expected to be in the region of £450.

Why not pop along to the Icom stand for a full demonstration of the new IC-207H, together with the chance to see the rest of the Icom range and meet the team?

Haydon Communications - Block Z Blue Hall

If you stop off at the Haydon Communications stand you'll find plenty of interest including a new range of heavy duty G5RV antennas and a selection of telescopic masts. In addition to this, Mike will have all the leading manufacturers' products on offer, many at bargain prices.

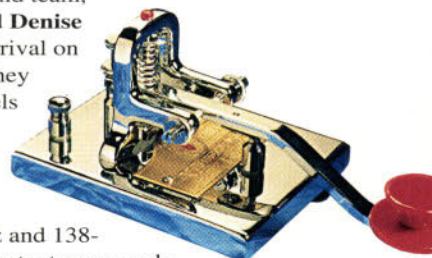
For the listening enthusiast there will be a selection of Q-Tek antennas available, as well as scanners from the Icom and Yupiteru stables at discounted prices. Mike will also be exhibiting the full range of Optoelectronics products. Finally, if you like 'natty' inventions check out the newest addition to the Haydon range in the form of a waterproof hand-held case from Serene.

Eastern Communications

The Eastern Communications stand team, **Tim G4CTT**, **Trica G1ANZ** and **Denise G8GGZ** will be awaiting your arrival on **Stand J** in the **Red Hall** where they will be exhibiting the latest models from their exclusive product ranges.

Among the items on display will be the Autek RF5 antenna analyser, covering the 35-75MHz and 138-500MHz bands. It also features Instant s.w.r. mode that allows the RF5 to automatically find the frequency of the minimum s.w.r.

Other products on show will include the Vibroplex range of Morse keys such as the new Straight Morse Key, a range of Sigma wire antennas, Delta switches and filters, Mosley USA beam antennas and much more. There will also be some 'special



show offers' on selected products, so make sure you pay Tim and his team a visit.



Waters & Stanton Electronics

As usual, Waters & Stanton Electronics will be situated in the **Blue Hall** on **Stand W** where they will be exhibiting a variety of products from several manufacturers. Things to look out for include the new ADI AT 600 dual-band hand-held transceiver, the Cushcraft R7000 multi-band vertical antenna and the MFJ-418 miniature Morse tutor.

There will also be bargain buys from the Alinco product range, in addition to a selection of products on display from the Optoelectronics, Watson and Yupiteru stables. Make sure you stop by and see for yourself.

Lowe Electronics Ltd - Block F Red Hall

Lowe Electronics will be offering a wide variety of products for the amateur radio enthusiast on their Stand. For example, the new Lowe Electronics professional series of earphones and microphones will be on display, as will their night vision scopes, which were previously only available to commercial customers.



The night vision 'scopes are particularly useful for outdoor pursuits such as sporting activities, camping and perhaps even RAYNET groups. The NV100 compact with Illuminator is just one on the products in this range and features clear optics with wide field of view, optimum blend of light amplification and includes a slide-on infrared illuminator for bright viewing in complete darkness.

Other products will include a GPS active antenna, designed for use with the GPS45. This compact antenna comes complete with a magnetic base, 5m of cable and a BNC plug and costs just £39.95.

And that's not all! The HF250 Europa receiver and MIC 10C28 frequency counter will also be on show along with many other lines from the Lowe range.

C.M. Howes Communications

The new Howes TX2000 will be making its first public appearance on **Stand L** in the **Blue Hall** and is described as a 'new generation' low power (QRP) c.w. transmitter. It gives up to 5W output (adjustable) on the 1.8 to 14MHz bands with reduced power on the higher frequencies (about 2W on 21MHz and 1W on 28MHz).

Band changing is by means of plug-in output filter modules (one band filter supplied with TX2000). This is a similar 'plug-in bands' concept to the transmitter's companion DC2000 receiver.

The transmitter requires an external v.f.o. input, or it can be linked to the receiver for transceiver operation by the LM2000 linking module. The TX2000 features



include key shaping, antenna relay, voltage and gain stabilisation, mis-match tolerance, and a meter drive output for power monitoring.

The TX2000 electronics kit costs £24.90 (including one band filter kit) and the HA23R hardware pack is £16.90. Additional band filter kits cost £6.90 each.

South Midlands Communications

Graham Taylor and the SMC crew will have many products of interest on their stand in the **Red Hall**. These will include the Daiwa range of mobile antennas ranging in price from £28 to £33, magnetic antenna mounts and a selection of new u.h.f. transceivers suitable for conversion for Packet radio use. Also on show will be an l.c.d. electronic barometer, world clocks and several items at special prices.

Kenwood Electronics

The Kenwood Electronics stand will be 'manned' by **David Wilkins G5HY** in the **Red Hall, Block N**. The latest offering from Kenwood, the TM-V7 will be on display as will the full Kenwood range of hand-helds through to h.f. transceivers.



Kenwood have recently announced the availability of free computer control software for their TS-570D h.f. transceiver. The radio control program has been uploaded to the Kenwood Internet Home page and users are invited to point their browser at <http://www.kenwoodcorp.com/software/ts570.html> to download it.

Why not make the Kenwood stands one of your stop off points - you never know there maybe some news of new radios on the horizon!

Nevada Communications - Block H Red Hall

Mike Devereux G3SED and his team will be pleased to welcome you to their stand where they will be displaying many products from their ever increasing range. In particular, you'd be advised to look out for the latest SGC products from America, as well as the full range of Alinco products for which Nevada are now the Sole UK distributor.

Other items will include the Rexon transceiver range, selections from Timewave and Drae in addition to products from all the leading manufacturers. So there will be plenty to feast your eyes upon and plenty of bargains to be 'snapped-up'.

Yaesu UK Ltd

Why not go along to **Stand Q** in the **Red Hall** where you will be able to sample the latest delights from the Yaesu range? You will of course be able to see the FT-8000R mobile transceiver (as reviewed in this issue) along with the full Yaesu range.

Barry Cooper G4RKO and his colleagues will be on hand to demonstrate the radios to you and answer your questions. They may even have news of new models due for release this year.

So, why not take a look and see for yourself, perhaps you'll find what's been missing from **your** shack.

NEW FROM PW PUBLISHING!

FERRELL'S CONFIDENTIAL FREQUENCY LIST - 10TH EDITION

This popular, well read, frequency list compiled by Geoff Halligey continues to go from strength to strength and is now in its 10th Edition. This 'Top Secret' confidential listing covers 1.6 - 30MHz and it's spirally bound A5 format makes for easy reading and reference.

Included within its 350plus pages are frequencies covering all modes, utility services and for the first time NAVTEX. Also featured is the reverse frequency list showing every known frequency against each callsign, who's using what frequency and mode.

Ferrell's Confidential Frequency List is one book that every listening enthusiast should own and at £19.95 it's well worth every penny.

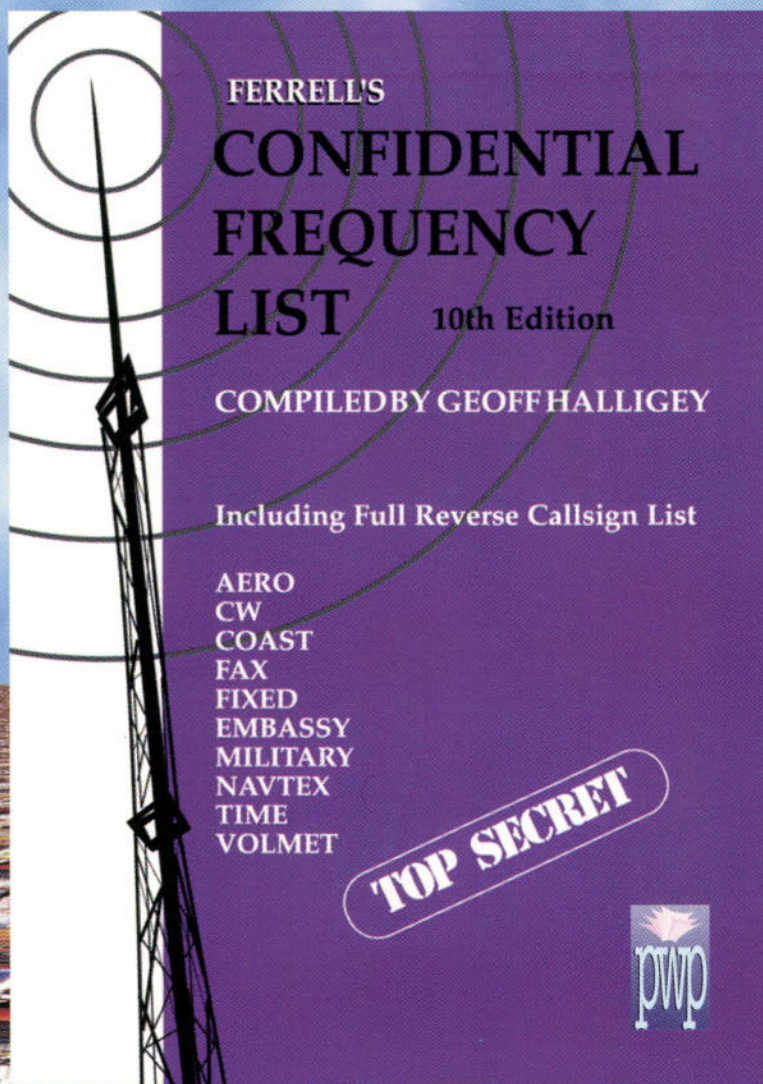
**BUY YOUR COPY OF
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CONFIDENTIAL
FREQUENCY LIST AT
THE LONDON SHOW!**

PW & SWM SUBSCRIPTIONS!

BOOK BARGAINS!

DISCOUNTS & SPECIAL OFFERS!

DON'T MISS US - REMEMBER TO STOP BY STAND T IN RED HALL



London Amateur Radio & Computer Show

Of Special Interest

Large Amateur Radio events such as the popular show at Picketts Lock provide an ideal opportunity for the 'Special Interest' groups to promote their activities, recruit new members and share their particular speciality. We've listed some of the regular exhibitors and whatever their interest, they'll make you welcome...so make sure you look them out this year!

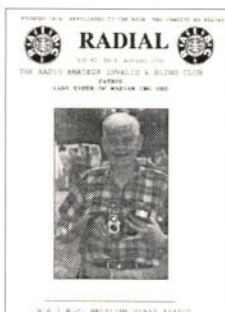
The Radio Amateur Invalid & Blind Club

The RAIBC is a very long and well established group specifically aiming at encouraging and assisting disabled radio enthusiasts. Founded in 1954 the RAIBC helps members in many ways: from providing a 'Help Line' telephone service right round to basic engineering assistance and much needed 'muscle power' (in the shape of dedicated volunteers) to erect antennas and maintain equipment.

Many amateurs who regularly attend rallies take advantage of the RAIBC's fascinating 'Junk Sales'. One of the best known being at the Longleat Rally and it's where you can find some fascinating radio 'bits & pieces' and support a good cause at the same time.

The RAIBC's magazine *Radial* keeps members in contact, informed of activities and interest and for blind members (approximately half the club's members are blind) it's available on tape. They were recently awarded a grant of more than £6000, from the National Lottery, which is to be used to purchase new recording equipment for this important service.

For further details you can contact **Margery Hey** on the RAIBC 'Helpline' (01953) 454920 (Telephone & FAX service). **Nick Chambers G0IRM** (a 'White Stick' operator himself) is the Blind/Int. Liaison Tapes Manager and is available on 0181-428-3344.



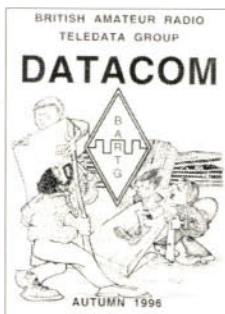
British Amateur Radio Teledata Group

This group BARTG - more familiarly known simply as 'BARTaG' is yet another of the long established 'special interest groups' that's attracted a firm and faithful following. Members are kept in touch by their well-known 'friendly approach' club magazine *Datacom* which, like other specialist group magazines, is very well produced.

Tracing their origins back to the days of mechanical teleprinters, 'BARTaG' has exhibited at Picketts Lock for a number of years. Current and prospective members are very welcome at the stand and - speaking on behalf of the group - **Ken Godwin G0PCA** told *PW* that they'll have a range of books, other publications, constructional projects and plenty of advice on hand during the show.

Ken also tells us that another service (vital with all the different aspects of data communication) will be available in the form of advice from other enthusiasts. It's very helpful when you're able to talk your problems through with like-minded enthusiasts!

For further information on BARTG you can either meet them on their stand on telephone on (01634) 271548 or FAX on (01634) 271448.



AMSAT-UK

This group aim high - high enough in fact for them to operate as The Radio Amateur Satellite Organisation for the UK. The AMSAT-UK's high profile activities (sorry AMSAT-UK we couldn't resist the pun!) are in the technical forefront of Amateur Radio activity, and the dedicated enthusiasts - apart from

their own stations - are involved in designing and working with equipment operating in the harshest conditions imaginable (space of course!). The group is traditionally well represented at the London Show and there's always a welcome for anyone interested in this very specialised aspect of the Amateur Radio hobby.

Oscar News - the official journal of AMSAT-UK is designed (and exceptionally well produced) to keep members in touch. Much more than a specialised 'club magazine' the journal is in effect a regularly produced high quality booklet which is read and respected throughout the world.

So, if you're keen to 'get going on satellites' and to join in with the complex background organisational efforts involved in 'Amateur Radio In Orbit, you can visit the stand at the show or contact: **The Hon. Secretary Ron Broadbent MBE G3AAJ** at AMSAT-UK, 94 Herongate Road, Wanstead Park, London E12 5EQ. Telephone (Office hours) 0181-989-6741 or FAX (24 hours) on 0181-989-3430.



Royal Naval Amateur Radio Society (RNARS)

You don't have to be 'afloat' to be a members of the RNARS! Membership is open world-wide to those who have, or have had, connection with the Royal Navy, Commonwealth Navies, Naval Reserves, the Merchant Navy or foreign Navies. This group attracts a fascinating cross-section of 'mariners' and their stands at shows often look as if they're about to put to sea as there are so many 'Navy Types' around.

As you would expect, the *RNARS Newsletter* is a good read - packed with old timer's stories and sea-going exploits from around the world. If you've got any connections with the sea or the Navy...it's worth joining just to read the newsletter! There's a welcome waiting on RNARS stand at the London show and for further information on the Society you can 'pipe' **A. G. 'Wally' Walker G4DIU** on (01705) 361276 (a Portsmouth number of course!). Alternatively you can write to him at 103 Torrington Road, North End, Portsmouth, Hampshire PO2 0TN.



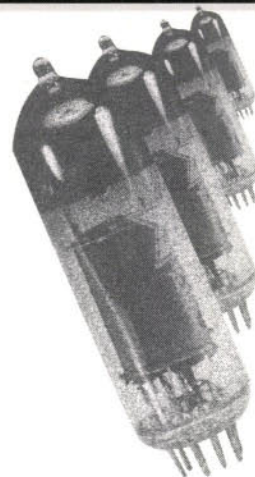
Worked All Britain Wards (WAB) Group

The WAB group doesn't really need an introduction to readers because it's activities and awards schemes (based on the geographical and administrative divisions of the UK) open to s.w.l.s and transmitting Amateurs is very popular world-wide. But on the other hand - did you know that the WAB Group are very busy fundraisers? Amongst the good causes the group raise money for are other groups including the RAIBC. Money raised has gone to assist less fortunate Radio Amateurs and the WAB continue fundraising efforts.

For further information on the WAB Group you're welcome to visit their regular stand at the London Show. Alternatively you can write for details on their 'Book', awards and the newsletter to the **WAB Membership Secretary Brian Morris G4KSQ**, 22 Burdell Avenue, Sandhills Estate, Headington, Oxfordshire OX3 8ED.

PW

Valve & Vintage



By Phil Cadman G4JCP

It's Phil Cadman G4JCP's turn to 'look after' PW's vintage wireless shop this month...and this time he's commenting on a recent and rather controversial TV programme commemorating Marconi's work and looking at power supplies

Welcome to 'V&V'! Someone once said "I like the past, I always know what's going to happen there". But sometimes it's possible to know what's going to happen in the future too. The TV programme *Making Waves*, shown on BBC2 on 14 December last, was a perfect example!

The programme featured **Rob Furness**, a modern telecommunications expert working for the 'Orange' (Hutchinson Telecom) cellular telephone service, making a pilgrimage to Newfoundland in the hope of recreating Marconi's first attempt at transatlantic radio communication.

Help was at hand from several Newfoundland amateurs and from our own **Douglas Byrne G3KPO**. Douglas was to provide the transmitted signal from his QTH on the Isle of Wight.

On the summit of Signal Hill, the site used by Marconi, a replica of Marconi's original detector, was connected to a wire suspended from a modern kite. A replica kite had been tried but it seemed to prefer the ground rather than aerial flight (pun intended).

Now, it doesn't take a genius to realise that Rob's simple detector would be incapable of separating Douglas's signal from the plethora of high-powered transmissions found in the short-wave bands. Not to mention the fact that such a detector could not make a c.w. (Marconi used spark, of course) transmission audible.

But it seemed no-one had told Rob or the BBC. Disappointment all round was, I'm afraid, inevitable.

Power Supplies

With this month's delve into the past I'll continue my look at h.t. power supplies. Last time I described the half-wave circuit. This time it's the turn of the full-wave rectifier circuit.

The diagram, **Fig. 1**, shows the kind of full-wave rectifier circuit found in practically all quality valve equipment of moderate current requirements. If the h.t. demand is particularly low then you'll probably find a resistor in place of the h.t. smoothing choke, L1.

Most valve mains transformers have tapped primaries and it's most important to select the correct tap. If you're in any doubt always select the highest voltage tap.

'Under-running' valve equipment isn't harmful if done for short periods whereas selecting a voltage tap lower than the incoming mains voltage could result in overheating and a risk of fire.

If you use silicon diodes rather than a valve rectifier then my warnings from last time about peak inverse volts still apply. My rule-of-thumb in this case would be to choose a diode with a peak inverse voltage (p.i.v.) rating at least four times the r.m.s. voltage of half the secondary. For example, with a 300V-0-300V secondary, use 300V x

4 = 1200V p.i.v. diodes.

It is **not a good idea** to replace a faulty valve rectifier with silicon diodes. **It can be done** but without appropriate modifications to the power supply the equipment may well suffer significant damage.

In Fig. 1, the rectifier valve is shown as an indirectly heated type with an external wire joining its cathode to the heater. Most indirectly heated rectifier valves have this connection made internally. Unfortunately, this puts the rectifier heater winding at full h.t. potential. So please bear this in mind when working on live equipment because, as a rule, heater windings are at or near earth potential.

The use of a dedicated heater winding is driven by the need to minimise the heater-cathode voltage within the rectifier valve. It's quite difficult to manufacture heater/cathode assemblies which can withstand high heater-cathode voltages and maintain good heater efficiencies.

Despite the difficulties, some low-power indirectly heated rectifier valves do have sufficient heater-cathode insulation to enable them to use an earthed heater supply. The EZ80 and EZ81, the 6X4 and the octal 6X5, are examples. Half-wave rectifier valves for use in a.c./d.c. sets also fall into this category.

Smoothing Filter

The circuit comprising C9, L1 and C10 is known as the 'smoothing filter'. Directly connected to the rectifier output (the rectifier valve cathode) is the reservoir capacitor, C9.

Next comes the smoothing choke, L1, and finally the smoothing capacitor, C10. Because it's the input (reservoir) capacitor which the rectifier 'sees' first this arrangement is referred to as a capacitor-input filter.

Capacitors C9 and C10 will often be housed in the same aluminium can in what's known as a multi-section capacitor. Multi-section capacitors utilise a common negative foil and electrically separate positive foils to achieve two or more capacitors in a common can. This saves both cost and space.

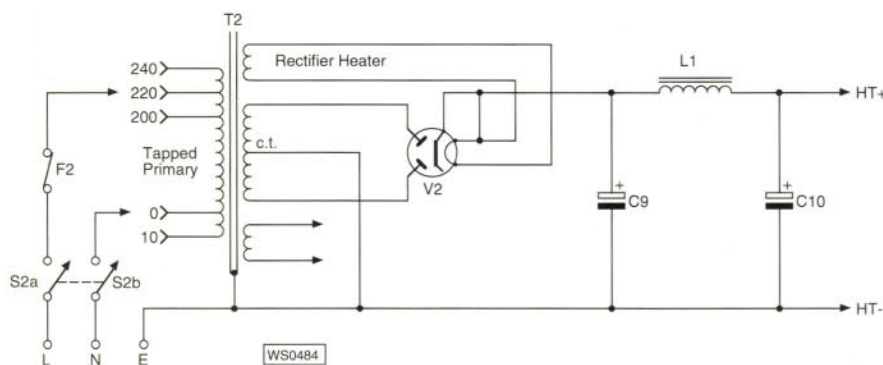


Fig. 1: Full-wave rectifier circuit with a capacitor-input filter (see text).

You'll always find curious bits of text lithographed onto the casings of multi-section electrolytic capacitors. For example: '350V Working 425V Surge, Red outer 100 μ F, Yellow 100 μ F, Green 200 μ F, Blue 50 μ F 25V, Black common, Can not isolated'.

The 'Can not isolated' means that the aluminium can that surrounds the foils is electrically connected to the common negative terminal (the 'Black' terminal) actually within the capacitor. Actually, this is true of almost all aluminium electrolytic capacitors and not just multi-section types.

The colours relate to the capacitor's solder tags which are often colour-coded for identification. The 'Outer' label associated with the 'Red' section indicates that this section's positive foil is closest to the can wall.

Consequently the 'Red' section can dissipate more heat than the other sections and so sustain a higher ripple current. Given the choice you should always use this section as the reservoir capacitor and use the 'Yellow' and 'Green' sections for smoothing and/or decoupling.

All the sections have the same voltage rating **except** for the 'Blue' section which is labelled 25V. But why only 25V?

Well in answering the 25V question it's because equipment with an audio output stage usually requires a bypass capacitor for the stage's cathode bias resistor. A 50 μ F, 25V component is ideal.

In the valve era, even low voltage electrolytic capacitors used to be relatively large and not always easy to mount. The obvious solution was to put the bypass capacitor in the same can as the other electrolytic capacitors.

Choke Input Filter

Capacitor-input filters are appropriate whenever the h.t. current drawn by the load is relatively constant. This is because their regulation (that's the change in output voltage with change in load current) is poor.

Fortunately, most low-power valve

equipment operates in class A (constant current). So in this case capacitor-input filter supplies are quite adequate.

High-power audio amplifiers and s.s.b. transmitters, which tend toward class B operation, are another matter. In class B (and to a lesser extent, class AB) the h.t. current drawn is very much dependant on drive level. So much so that the h.t. current at full output can be many times its quiescent value.

The diagram, **Fig. 2**, shows another full-wave rectifier circuit but this time with a choke-input filter. It's called 'choke-input' because as there's no reservoir capacitor the first component in the filter the rectifier 'sees' is the smoothing choke. And this time I've shown a directly-heated rectifier valve.

Once above a certain output current, all rectifier valves become either directly heated or have internal heater-cathode connections. This means you don't have a choice about having a separate heater winding.

The choke-input filter's most useful characteristic is its good regulation, ideally suited to equipment that has a varying h.t. demand. But they have another advantage: choke-input filters do not place the same peak current demands on the transformer and rectifier as do capacitor-input filters.

Somewhat surprisingly, the d.c. output from a choke-input filter is only 0.9 times the r.m.s. voltage present at the input to the filter (when used within its working range). However, under no-load conditions the d.c. output will rise to 1.4 times the r.m.s. voltage just as it does with the capacitor-input filter. You'll often find a bleed resistor across the output of a choke-input filter to stop this happening.

To find out where the '0.9' comes from you have to do a Fourier analysis of a full-wave rectified sine-wave. Then you see that it's made up from a d.c. level equal to 0.9 times the input r.m.s. voltage plus a succession of even harmonics of decreasing amplitude. The choke simply filters out all the harmonics leaving just the average d.c. level.

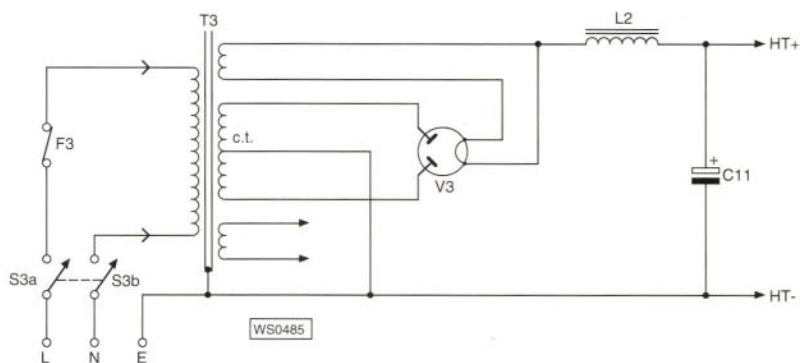


Fig. 2: Full-wave rectifier circuit with a choke-input filter (see text).

Economical Sources

The most economical sources of h.t. transformers and chokes are rallies, junk sales and surplus equipment dealers. Scrap chassis can be particularly lucrative sources of power supply components with the exception of electrolytic and paper capacitors. They deteriorate with age so I advise you to avoid them and buy new capacitors!

New transformers are available from: **RS Components, via their retail outlet Electromail, PO Box 33, Corby, Northamptonshire NN17 9EL. Tel: (01536) 204555, FAX: (01536) 405555** can supply a h.t. transformer, 250V-0-250V at 75mA plus heaters, **stock code 196-072**. RS also have a single-ended valve audio output transformer, stock code 217-567. But beware, they are expensive!

Maplin (now Maplin MPS), PO Box 777, Rayleigh, Essex SS6 8LU. Tel: (01702) 554000 can supply an h.t. choke, two h.t. transformers and a 20W push-pull output transformer. See their latest catalogue for details. Maplin can also supply transformer kits for those who want to 'roll their own'.

Electromail and Maplin also have a wide range of capacitors and hardware suitable for use in h.t. power supplies.

Dealing exclusively in wound components, **A.E. Sowter Ltd., PO Box 36, Ipswich, Suffolk IP1 2EL. Tel: (01473) 252794** have a large selection of 'off-the-shelf' h.t. transformers, output transformers and chokes. They will also wind custom designs. They're good, with a wide range but are expensive.

If anyone knows of any other source of new transformers then please let me know.

Regenerative Receivers

For those of you who can't get enough of regenerative receivers, the *PW* Book Store has two new titles on the very subject. The first is *Secrets of Home-built Regenerative Receivers* by C. F. 'Rock' Rockey W9SCH. Published just last year it covers regenerative receiver design, ostensibly for those unfamiliar with t.r.f. receivers.

The book begins by describing the earliest methods of detecting radio waves then moves on to regenerative detectors and the challenges of regenerative detector design. Practical aspects of regenerative receiver construction follow, including

hints on how to use modern j.f.e.t.s in place of valves.

The undoubted usefulness of Rock's book as a practical guide is tempered by its American origin. The circuit diagrams are typically American in style and so are the component symbols. This may confuse beginners used to European styles. There is one good point (at least I think so!) as all the measurements are in feet and inches!

Old hands will probably find the book too light, covering much of what they already know. However, I'd recommend it, with the reservations I've stated about 'Americanisms', to beginners who want to know more about regenerative receivers. It may also be useful to novice instructors as a source of material for practical projects.

The second book *Those Great Old Handbook Receivers* will appeal to all nostalgia buffs interested in old receivers. Within its covers selected sections from the 1929 and the 1934 *ARRL Handbooks* are reprinted verbatim. Kicking off 1929 is a tube chart (and even I don't recognise most of the type numbers) followed a section covering how radio signals are sent and received.

The final section from 1929 covers receiver design. And there's not a superhet in sight!

On to 1935 and here sections cover high-frequency receivers, ultra-high frequency (what we now call v.h.f.) receivers and power supplies.

The publishers make the point that *ARRL Handbooks* from the era covered are extremely rare. These reprints allow anyone with an interest in the design and construction of early amateur receivers access to information normally available to only the lucky few who have copies of the original Handbooks.

I have to admit, this is the book I prefer. I particularly applaud the publisher's choice of years. Domestic receiver design changed markedly between the end of the 1920s and the mid-1930s and it's fascinating to see how the rapid change in receiver technology was reflected in amateur radio designs.

Closing Time

Ah! it must be closing time as I can hear the rumble of the shutters coming down. So, until it's my turn 'in the shop' again, I'll say cheerio and best wishes.

In the meantime, let me know what you're getting up to in 1997. Remember to send your letters and E-mails to me either via the *PW* offices, via E-mail to **phil@oldpark.demon.co.uk** or direct to: **21 Scotts Green Close, Scotts Green, Dudley, West Midlands DY1 2DX.**



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The KENWOOD

TM-V7E Dual Band VHF & UHF FM Transceiver

By Leighton Smart GW0LBI

*Regular author
Leighton Smart
GW0LBI takes a break
from his other duties
on PW to take a look
at a new mobile rig.*

I've reviewed and operated a small number of v.h.f./u.h.f. dual-band rigs over the last couple of years. So, I thought I'd seen the best of what is available, what with computer control, built-in spectrum analysers, etc.

But it seems that every time a technological step forward is taken, there's another prepared to overtake it! Kenwood have yet again come up with another 'gem' in the shape of the TM-V7E 144/430MHz f.m. mobile transceiver.

Remarkably Compact

On opening the box when the rig arrived from the PW offices, I saw that the TM-V7E is a remarkably compact unit. It's also somewhat pleasing to the eye with its large blue (very different and clear) l.c.d. readout, and is manufactured to a high quality.

The TM-V7E measures 140mm (wide) x 54.5 (height) x 205.5mm (deep), making it small enough to fit in most cars, and not to be too obtrusive. The heatsink is also quite small, especially when you consider that the maximum power output is a big and mean 50W!

The rig comes supplied with all the mobile user needs to get on the air (apart, that is, from an antenna). This

includes mounting bracket and screws, d.c. power lead, microphone, and even a spare fuse.

Looking at the front panel of the rig itself, I immediately took a liking to it. This is probably due to the large (and unusual) blue display, which makes it easier to 'see where you are' while on the move.

The display is completely detachable, and can be mounted separately from the rig when used in conjunction with a 'detachable front panel kit'. Otherwise the display can be detached for security purposes.

There are no less than two connection facilities on the front of the radio, one for the microphone, and another for data connection, each of these being on either side of the display.

The case is finished in a pleasant black sheen and is a soft grey around the display. An

internal speaker mounted under the top casing of the radio.

The front panel of the rig to the left of the display has controls for Call, VFO mode, and

Memory Recall mode.

Below the display can be found the concentric tuning control which is combined with a MHz button, a row of four multi-

function buttons, a very small **CONT SEL** button and concentric volume and squelch buttons for both 144 and 430MHz.

Finally, to the right of the display are found the **PWR**, **MENU**, and **Programmable Memory** mode buttons. Incidentally, the 'built-in' Menu enables the rig to be 'personalised' to the operator's preferences.

Kenwood have also included a 'Band Scope' spectrum activity display. This is the first time Kenwood have included it on any transceiver and it will prove useful for checking what's happening on the bands.

The MC-45 microphone supplied with the TM-V7E is a sleek little unit, with **UP/DOWN** buttons, and four buttons marked **1750**, **VFO**, **MR**, and **PF**, which can be used for various functions. The rear of the microphone contains a **Lock** button.

The rear panel of the TM-V7E contains the antenna connector of the 'N' type. It also carries connections for the 13.8V d.c. power lead and dual 8Ω jack plug sockets for the speaker leads.

Detailed & Comprehensive

The instruction manual supplied with the TM-V7E is one of the most

Unusually, the Kenwood TM-V7E demountable front panel 'sits' within part of the main assembly. This provides protection and stability for the removable front panel and also presents a neater looking unit when detached.



detailed and comprehensive I've ever seen. Personally, I'd rather read through a manual a few times before even connecting a transceiver up to give me some idea of what I'm dealing with, then going step-by-step through setting-up and operating with the manual to hand.

Having read through the manual a few times, I was quite impressed with the features included in the rig. It takes the reader through all stages of operation of the TM-V7E, from 'getting acquainted', basic operation, through to use of memory channels, dual and multi function controls, DTSS, Paging operation, Scanning, and more.

In fact, after studying the manual, I found it astonishing that so many different features could be included in such a small piece of equipment! Just goes to show how technology marches on, I guess!

However, if you're one of the many people who don't like reading manuals (naughty, you should because it's a good one!) Kenwood have provided a 'built-in guide'. This offers several pages with basic instructions on how to activate many of the features. What more could you ask...a rig that tells you (almost!) what to do!

Basic Operation

As the rig has **so few controls** with **so many functions**, I took some time to familiarise myself with them. Lest I become confused!

The most basic steps such as switching on, adjusting squelch, etc. are purely straightforward. After pressing **BAND SEL 'PTT'** appears above the v.h.f. or u.h.f. frequency to indicate which band you have selected.

To select a frequency within the chosen band you use the Tuning control or the microphone **UP/DOWN** buttons.

To select required output power you press the **LOW** button, (one of the four multi-function buttons). Each time this is depressed the power level changes.

Setting-up for repeater operation is pretty straightforward, but I must admit that I had to refer again and again to the instruction manual! Of course, this is only necessary whilst getting used to the radio. Once the operator is familiarised with the set, it will be a matter of course. This also applies to the many other functions on the TM-V7E.

On The Air

After connecting up the TM-V7E, operating it on the air and getting to know the controls was no great difficulty. Although as I was

unfamiliar with the radio I found I had to refer to the manual a few times!

As the design of the TM-V7E, and its 'compactness' makes it an ideal mobile transceiver I decided to give the rig an 'airing' on one of the many hills in the south Wales valleys. I chose Mynydd Gelligaer, only a few kilometres from my QTH. I reviewed the rig during the New Year period, and although much of north Wales, England and Scotland were buried in deep snow, south Wales had escaped it.

We did however suffer from extreme daytime temperatures, down as far as -3°C , but with the wind-chill it dropped to around -12°C ! What the temperature was on the hills though is anyone's guess - suffice to say I felt a little 'chilly' up there and really did consider signing /FM (/Frozen Mobile)!

Switching on the rig in the car, the large blue display (Kenwood claim this is a first) is easy to read. Even in the very bright daylight associated with cold clear days on Welsh mountainsides!

The TM-V7E has no shortage of power. The three power ranges available are Low (5) Mid (10) and High (50W) on 144MHz and 35W on 430MHz).

Listening around the 144MHz band, I was disappointed to find very little activity. However, I did hook up with **Steve GW0SGL/M** on a simplex channel whilst he was travelling near Cardiff, a distance of approximately 30km or so, separated by some reasonably large hills.

Steve reported that the audio was crisp and of good quality despite the mobile flutter and the fact that I was using the low power (5W) level. An increase to 10W brought a slightly better report, but the high (50W) level left me 'fully quietening' with Steve.

The received audio was very good, even as Steve's signal dropped to around S2 - 3 the audio was loud enough from the TM-V7E speaker to be heard with my

engine running. (I had to do this - it was absolutely freezing up there!).

Later, I made a pre-arranged contact with **Dave GW0JUI** in Pontypridd on the 144MHz band. To give the rig a more realistic test, I drove from the hilltop down into the Rhymney Valley, thereby putting significant obstacles in between us, in the form of three valleys and mountains!

Once down on the valley floor I found that I had to use the 10W power level on this band to be heard by Dave. At this level, my signal was around S5, but I received a good audio report, although with some background hiss. After I increased to full power, (50W), he reported a steady S6 signal, with loud and clear audio.

The 430MHz Band

I then decided to try the TM-V7E on the 430MHz band. After driving back to my original location on Mynydd Gelligaer, I had a long listen around the 430MHz band. But despite several calls on the band I couldn't raise anyone!

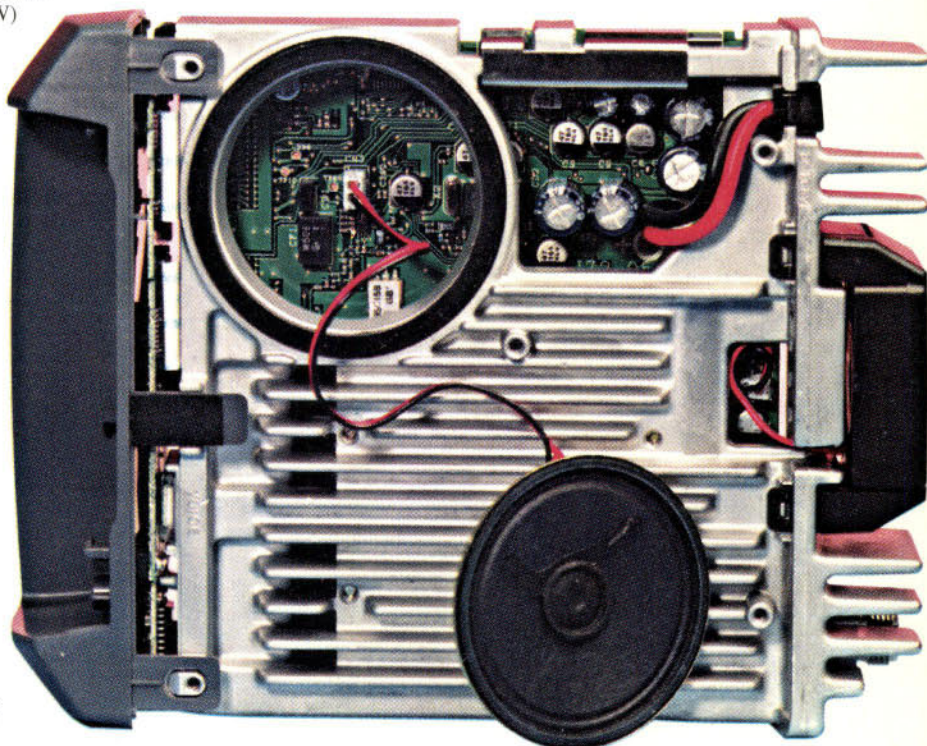
I also put a number of calls through the 'MG' repeater, all to no avail. I then decided to make my way home as the temperature at the time was still way below zero, and even with the engine and heaters running, my fingers were still numb!

However, I was disappointed with not being able to have at least one QSO on 430MHz. So a 'phone call was made to **Steve GW0SGL**, and a 'sked' was made.

Steve borrowed a 430MHz 'handie', while I set-up the rig at



Top view of the transceiver with casing removed. The remarkable and finely engineered aluminium one piece casting (note integral housing for the speaker) provides extensive and effective heat-sinking



Below: Underside view of the TM-V7E. The dimensions of the transceiver can be gauged by the comparative size of the of the standard antenna socket.

Manufacturer's Specifications

GENERAL

Frequency range:	144-146MHz v.h.f., 430-440MHz u.h.f.
Mode:	F3E (f.m.)
Antenna impedance:	50Ω
Temperature range:	- 20 to +60°C
Power supply:	13.8V d.c. (negative ground)
Current consumption	
Transmit:	11A or less (v.h.f.) 10A or less (u.h.f.)
Receive:	1A or less
Frequency stability:	Within ±3ppm
Size:	140 x 54.5 x 205.5mm
Weight:	1.2 kg

RECEIVER

Circuitry:	Double conversion superhet
Intermediate freqs.	
(1st/2nd)	(v.h.f.) 38.85MHz/450kHz (u.h.f.) 45.05MHz/455kHz
Sensitivity	(for 12db SINAD) v.h.f. or u.h.f. 0.16μV or less
Selectivity	(at - 6db) 12kHz or more
Selectivity	(at -60db) 28kHz or less
Squelch sensitivity:	0.1μV or less
Audio output:	2W or higher
Audio output impedance:	8Ω

TRANSMITTER

Power output:	(v.h.f.) 50, 10, 5W (u.h.f.) 35, 10, 5W.
Modulation type :	Reactance
Spurious emissions:	- 60db or less
Max. freq. deviation:	±5kHz
Audio distortion:	3% or less
Microphone impedance:	600Ω

Many Functions

There are very many more functions on this rig than I have space here to describe, even in the broadest sense. It really is a beautiful little set, and I only wish that I'd had more time (Christmas and the New Year tend to get in the way of radio) to play with it a little longer, and to put it through its paces a little.

Its design makes TM-V7E a valuable addition to any amateur's shack or car, and I can see this little rig being one of the leaders in v.h.f./u.h.f. mobile operation. The only slight complaint I have is that some of the buttons on the front of the rig are smaller than I'd like. But then again, they're okay to use as long as your fingers are warm! (Mine certainly weren't on the my mountain expedition).

The TM-V7E really is a beautiful little set. But as I've said I only wish that I'd had more time to play with it a little more, and to put it through its paces a little more thoroughly. But what I did manage to do was to enjoy myself very much!

My thanks go to Kenwood Electronics (UK) Ltd., of Kenwood House, Dwight Road, Watford, Hertfordshire WD1 8EB, Tel: (01923) 816444, FAX: (01923) 212477 for the loan of the review transceiver. The TM-V7E is available from Kenwood appointed dealers for around £649.95.

PW

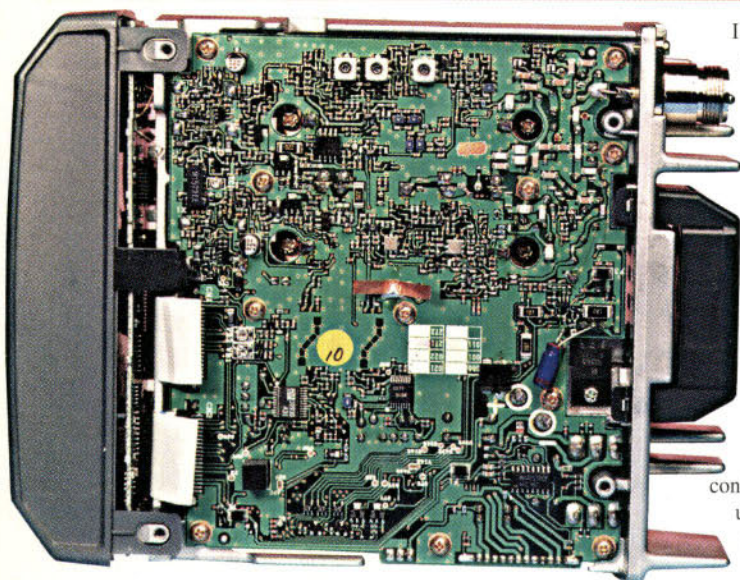
Kenwood TM-V7E Accessories

ACCESSORY	ORDER CODE	PRICE £
Voice Synthesiser Unit	VS-3	45.95
Remote Front Panel Kit (3 metres)	DFK-3C	34.95
Remote Front Panel Kit (4 metres)	DFK-4C	59.95
Remote Front Panel Kit (7 metres)	DFK-7C	89.95
Deluxe Mobile Speaker	SP-50B	27.95
Compact Mobile Speaker	SP-41	24.95
Mobile Mount	MB-201	14.95

home, and used my mobile dual-band magnetic mount antenna in the shack, firmly attached to my filing cabinet! Not in the least ideal I must admit, but at least it was nice and warm there!

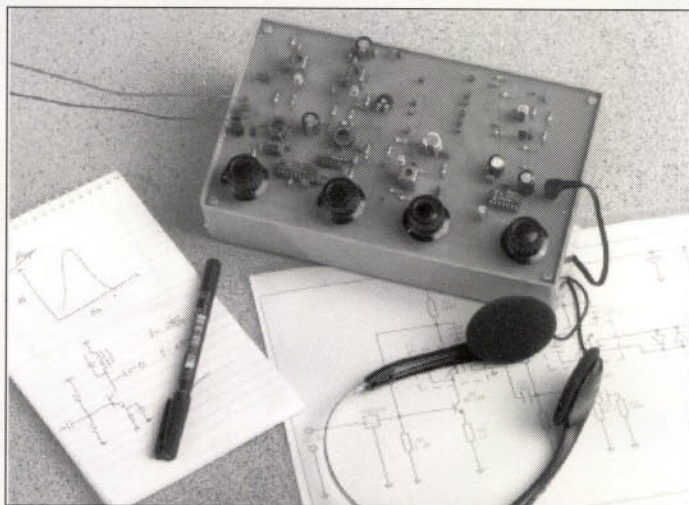
I soon 'hooked up' with Steve, and although his signal strength was very weak (he was using a 'handie', about 8km and two valleys away, after all) I was given a good report from him on the audio level of the TM-V7E.

My signal report at full power (35W) was not very good either (which isn't surprising in the circumstances) but nevertheless, a contact was made which served its purpose. At the very least, it showed that the TM-V7E can handle itself under very low signal conditions, although I would advise users to use a slightly better set-up than I used on 430MHz!



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VHF REPORT

This month David Butler G4ASR has details of recent v.h.f. openings, contacts with the Mir Space Station and DXpedition news.

Very little in the way of enhanced propagation occurred on the v.h.f. bands during December. There was however, a flurry of activity when the earth passed through the orbit of the Geminids meteor shower between December 11-14.

On the 50MHz band meteor scatter (m.s.) contacts were easily made with stations situated around 1000-1500km from the UK. Many m.s. enthusiasts were also making contacts on the 144MHz band.

Among the DX being worked from the UK were the stations of EA3DXU, EA3TI, HB9FAP, LY2BIL/P, SP20FW and SP8AOV. There was a brief tropo opening between southern England and the north coast of Spain on December 5 when the station of **G4FUF** (JO01) heard the EA1VHF beacon (144.868MHz) peaking 539 at 1200UTC. As is often the case though no other activity was heard at this time.

A longer period of enhanced tropo propagation occurred between December 8-11. Contacts were made on the 144, 430 and 1296MHz bands mainly, with stations located in DL and HB9 but at times propagation extended to OZ and SM.

On December 8 at 1600UTC the station of **GD4GNH** (IO74) heard HB9RDE (JN37) on s.s.b. peaking 51 on the 144MHz band. Most activity on this band was with stations located in central and eastern Germany.

However, **Dave Edwards G7RAU** (IO90) on the Isle of Wight was fortunate to contact SP1EOI (JO73) on s.s.b. signals peaking 53. He also worked DL8CMM (JO52) in the east of Germany.

At the QTH of **GW7SMV** (IO81) contacts were reported with DL stations located in JO30, 31, 41 and 51. Further north on the border of Wales, the station of **John Nelson GW4FRX** (IO82) heard the HB9HB beacon coming through at good strength during the morning of December 9. Another beacon spotter was **Andy Cook G4PIQ** (JO01) who noted OZ7IGY (JO55) peaking 529 at 2300UTC on December 10.

As is normally the case when the 144MHz band is open, the higher frequencies are as good if not better.

At the station of **G0FIG** (IO90) a number of excellent s.s.b. contacts were made on the 430MHz band during the evening of December 9. His contacts included OE5VRL/5 (JN78) and a string of DL stations situated in locator squares JO30 and JO31.

Tropo conditions on the 430MHz band were also good on the following day, December 10. **Eric Gedvilas G8XVJ** (IO83) reported activity from DG3LAV and DH2UD (both in JO44), DJ9BV (JO43), DL3EAG (JO31), OZ2LD (JO54), OZ5W (JO55) and SM7DEZ (JO65).

Over on the Isle of Man **GD4GNH** contacted DK5WO (JO30) and **Dave Storrs G8GXP** (IO93) found DC8AG (JO31), DF8IK (JO30) and PE1NHS (JO22). Dave is also active on the 1296MHz band and was pleased to make s.s.b. QSOs with PE1NHS (following a QSY from the 430MHz band) and DK5WO.

Propagation was also very good throughout the evening of December 11 with stations in south-east England hearing the SK4UHF beacon (JO79) on the 430MHz band and some were even receiving Swedish u.h.f. television in full colour. However, it appears that no 'real' two-way activity was to be found at this time.

Manned Space Station

A number of stations including G0JUL, G3BGM, G6HMS, G70JU, G7VLS and GM6MEN have all made contact with operators on the Russian manned Space Station Mir. Over the Christmas period, telephony contacts with **ROMIR** could easily be made on f.m. using the split-frequency pair 145.200MHz (down-link) and 145.800MHz (up-link).

However, it was announced from Mir that as of January 1 the f.m. voice up-link will be on 145.200MHz and the down-link will be 145.800MHz. This will make life easier for those of you without a reverse shift facility on your transceiver. When operating simplex (single channel working) the frequency 145.200MHz will be used.

Incidentally, at the recent International Amateur Radio Union (IARU) Region 1 Conference the

frequency 144.490MHz was allocated as an f.m. up-link frequency for the Shuttle Amateur Radio Experiment (SAREX) project. It's allocation at the top-end of the new beacon band was a compromise as this was the only common frequency available in all three world-wide IARU Regions. An exception was made for SAREX because it was seen as a high profile operation generating good public relations for Amateur Radio.

Channel Designation

Last time I mentioned recommendations made at the IARU Region I conference regarding a new channel designation system for use on the v.h.f. bands. For each band there will be a designator letter, F for 51MHz, V for 145MHz and U for 430MHz.

Each designator letter will be followed by two (for 51 and 145MHz) or three (for 430MHz) digits which will indicate the channel. If the channel is used as a repeater output it's designator will be preceded by the letter R.

In the 51MHz sub-band the channel numbers start at '00' for 51.000MHz and increment by one for each 10kHz channel. In the 145 and 430MHz sub-bands the channel numbers start at '00' for 145.000MHz (and '000' for 430.000MHz) and increment by one for each 12.5kHz channel.

For example, F51 is the simplex channel on 51.510MHz and RF79 is a repeater output on 51.790MHz. The old S20 becomes V40, the simplex channel on 145.500MHz and the old R0 is now RV48 the repeater output frequency on 145.600MHz. And if you think that's confusing wait till you operate on the 430MHz band!

For example the old u.h.f. RB1 becomes RU242, the repeater output on 433.025MHz. And the simplex channel SU20 is now U280 on 433.500MHz.

Maritime Mobile

Andy Adams GW0KZG reports that he will be active again maritime mobile (MM) on board the *R.R.S. Charles Darwin*. In January he set

sail from Tyneside, via Southampton, to Cartagena (IM97) in Spain.

On January 10 he was spotted by the station of **G4RGK** (JO01) operating on s.s.b. on 144.240MHz. On the following day at 1755UTC **GW0KZG/MM** was heard by the station of **G3NVO** (IO91) operating on the same frequency, but this time on c.w.

Andy was by this time located in the rare 'wet' square IN68, south of the Isles of Scilly. From reports received, his permitted free-time for amateur radio will be 0500-0700, 1200-1300 and after 1700, all these being local time depending on which time zone he is in.

Andy then plans to cruise through the Mediterranean area to the Arabian Gulf with the tour ending on April 20. He will be operating almost exclusively on the 144MHz band with equipment that has been considerably upgraded since his last /MM operation.

His system now consists of a Trio TR-9130 transceiver driving a Henry 2002 amplifier (3CX800A7) producing 400W output. The antenna system consists of two separately mounted beams, a 9-element and an 11-element Yagi. A Landwehr GaAs f.e.t. low noise amplifier completes the line-up.

As usual **GW0KZG/MM** will be fully equipped for meteor scatter operation using various keyers and p.c. based programs for transmitting high speed morse. On receive he will use the DF7KF DTR Digital Tape Recorder (an amazing accessory which I will describe in full detail in the May issue). With this set-up he hopes to improve on his total of 50 successful m.s. contacts so far.

Andy is also hoping to try some e.m.e. tests whilst in the Indian Ocean/Arabian Gulf area, subject of course to obtaining a high power permit. It also depends on whether the sky/moon conditions are favourable and to a great extent on whether the sea is calm enough to provide a stable platform!

The photograph, **Fig. 1**, shows Andy **GW0KZG** at the controls of his old maritime mobile station on-board *R.R.S. Challenger* before it was decommissioned. His new station now requires the space of two desks



Fig. 1: Andy Adams GW0KZG at the controls of his maritime mobile station.

and the top of a cupboard on which to place the equipment.

Don't worry if you don't work GW0KZG/MM on his first tour as Andy will be assisting with two cruises later in the year between July and September. The first will be to the west of the Shetlands oil fields (IP70, IP80) and the second between the UK and the Azores (IN and HN fields). His final cruise of 1997 will be in December in the north-east Atlantic, possibly another trip between the UK and the Azores.

Islands On The Air

Dennis PE1PZS passes on the news that he will be active from the Isles of Scilly (IN69) between July 5-19. He will be active on the 50MHz band with a Trio TS-60 transceiver, running 100W to either a 2-element or 5-element Yagi.

Dennis says his preferred operating frequency on the band will be 50.150MHz. He will also be operating on the 144MHz band with a Trio TR-9000 transceiver driving an amplifier to 400W output.

The antenna will be a 13-element Yagi. Look out for G/PE1PZS on 144.315MHz. He will be very active on tropo and hopefully via Sp-E if conditions allow.

Keep a look out for LA7DFA operating from Jan Mayen Island as JX7DFA. He will be active on the 50 and 144MHz bands (and h.f.) until the end of April 1997.

He can frequently be heard on meteor scatter around 144.160MHz. Another island in the Arctic Circle is Svalbard.

The station of JW7GW is now operational from Svalbard, a rare spot on the 50MHz band. He should be easy to work during the summer Sp-E season.

Operators of the 50MHz band should look west (290°!) for an expedition to St. Paul Island, Canada. The group headed by **Mike VE9AA** (of CY0AA fame) will be operating sometime during June with the callsign CY9AA. Further details can be obtained on E-mail via vc9aa@brunnet.nb.ca

Finally, I've received news from **Olli DH8BQA** of a summer expedition to Usedom Island (J074). The team

will consist of **Andrew DJ1SHF**, **Tom DK8EL**, **DH8BQA** and possibly **DL6NVC**.

They will be operational from J074 for about five days around the weekend of July 12-13. There is a possibility that the group will also be active from locator squares J063 and J073 in the period commencing July 1.

On the 144MHz they expect to run 400W into two 10-element Yagis and will be active in tropo and meteor scatter. If DL6NVC joins in the expedition, then they will also be operational on all bands from 430MHz through to 2.3GHz. Schedules for m.s. contacts can be made on E-mail via dh8bqa@amsat.org

Contests

Now I'll turn to news of some RSGB v.h.f. contests coming up soon. Two legs of the 70MHz cumulative contest will be held on **23 February** and **9 March**. Both dates are on a Sunday and each session runs between 1000-1200UTC.

By the way, a cumulative contest is a series of short events, consisting typically of something like five sessions each around two hours duration spread over a period of two months. Normally an entry consists of your three highest scoring sessions added together. So, if you miss a couple of events or if conditions are not so good then it doesn't really matter.

The first weekend contest of the year is the two-band **144/432MHz** event being held between 1400-1400UTC on **1-2 March**. There is usually good support for this contest and you'll find a number of high power (and low power) portable and fixed stations participating.

Put Sunday **23 March** in your diary if you're interested in the 70MHz band. The fixed station contest is being held that day between 0900-1300UTC. Note that this event coincides with one of the 70MHz cumulative sessions.

You may be interested to know that a Nordic (LA, OZ, SM) activity contest on the 144MHz band is held every first Tuesday of the month between 1800-2200UTC.

There is a fair amount of activity, certainly from OZ, and for stations located on the eastern side of England and Scotland a number of good DX contacts can be made. Exchange locator squares and reports.

The points are equal to the distance in km and each square gives a bonus of 500 points. Send your monthly log entries to **Ben Poulsen OZ1EYN**, **Lupinvej 15, DK-3650 Oelstykke, Denmark**.

If conditions are really good you could listen out for the Czech activity contest which is held every third Sunday of the month between 0800-1200UTC. Send your logs to **Jan Zika OK1MAC**, **Snet 9, 257 68 Doln, Kralovice, Czech Republic**.

Beacon News

Chris Tran GM3WOJ reports that the **GB3RMK** beacon on 50.060MHz was made operational again on December 22 after a lengthy overhaul by **John Wilson G3UUT** the IARU Region 1 v.h.f. beacon co-ordinator.

The beacon is running 40W into a folded dipole orientated east-west at a height of 270M a.s.l. It is on the Mount Eagle television mast (NTL & BBC), 10km north of Inverness in locator IO77.

The **GB3RMK** beacon is an excellent indicator of auroral propagation. Reception reports would be welcome either by Packet Radio to **GM3WOJ @GB7INV** or to **Chris Tran, Achnacaille, Lamington, Invergordon, UK**.

The untimely death of **Tiago Frederico CT1WW** in October 1996 saddened many of his friends around the world. Tiago was a very well known v.h.f. DXer who gave many operators their first contact with Portugal on both the 50 and 144MHz bands.

Tiago was also the owner of CT0WW, the 50MHz beacon that could always be heard booming into the UK during the Sp-E season. As a mark of respect, the society **Associação de Radioamadores da Costa de Prata** have commissioned a new beacon CS1ACP in order to follow the tradition of CT0WW. It is currently running 10W output into a dipole from locator square IM59.

During a Sp-E opening in January, CT0WW and CS1ACP (both operating on 50.030MHz) were heard in the UK. Reception reports of CS1ACP are very much appreciated and can be sent to **Associação de Radioamadores da Costa de Prata, PO Box 2250, 3080 Figueira Da Foz, Portugal** or via packet radio to **CT10Q @ CS1CRE.CTSR.PRT.EU**

Specialist Magazine

Readers of this column who are interested in all aspects of DXing on the v.h.f., u.h.f. and microwave bands may be interested in the *DUBUS* magazine. It is devoted entirely to v.h.f. and above and contains a mix of state-of-the-art technical articles,

specialist columns and operating news.

A recent edition of *DUBUS* contained technical articles on 432MHz earth-moon-earth (e.m.e.) polarisation rotation, a double-conversion no-tune transverter for 10GHz, a microprocessor antenna controller to track the moon and other galactic sources, a 24GHz super low-noise amplifier and a fail-safe attenuator for use when driving transverters. There are also specialist columns for tropo, Sp-E, field aligned irregularities (f.a.i.), m.s., moon-bounce (e.m.e.), 50MHz and microwave operators.

DUBUS is published four times a year in A5 format, each issue consisting of about 100 pages. Anyone who wishes to receive *DUBUS* should subscribe by sending their name, address and call sign, together with a cheque for £15 made payable to *DUBUS UK* to the UK representative **Roger Blackwell G4PMK**, **5 Tollgate Road, Culham, Abingdon, Oxfordshire OX14 4NL**.

Past technical articles featured in *DUBUS* between 1992-1994 and some previously unpublished material are now available in a handbook called *Technik IV*. Consisting of 400 pages the contents cover antennas, measuring equipment, power amplifiers, preamplifiers, receivers, transmitters and transverters.

To whet your appetite, the preamplifier chapter has designs for very low noise amplifiers (l.n.a.) for every band from 144MHz through to 24GHz. The power amplifier (p.a.) section has designs for all bands from 430MHz up to 24GHz including a 2kW amplifier for the 430MHz band and a 1.2kW amplifier for the 1.3GHz band, each using a single surplus tetrode valve.

There's even a description of how to combine two travelling wave tube (t.w.t.) amplifiers together to generate enough power for 10GHz e.m.e. operation. *Technik IV* costs £15 and is also available from Roger Blackwell G4PMK.

Deadlines

That's it again for another month. Don't forget to send me your list of locator squares, counties and countries worked for the 1997 table. Forward any news, views, comments or photographs to reach me no later than **Saturday March 1**.

Send them to me at **Yew Tree Cottage, Lower Maescoed, Herefordshire HR2 0HP**. You can also contact me via packet radio @ **GB7MAD**, the UK DX Cluster @ **GB7DXC** or E-mail via davebu@mdlhr1.agw.bt.co.uk. Alternatively you can telephone me on (01873) 860679.

END

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The YAESU FT-8000R Dual-Band FM Transceiver

By Richard Newton G0RSN

Christmas came early for Richard Newton G0RSN when he was given the chance to try out the FT-8000R over the festive season. Read on to find out how he got on.

View from above showing the cooling fan and p.a. block in the top centre. The small size of the transceiver can be judged by the relative size of the power supply leads.

The Yaesu FT-8000R is a dual-band f.m. Amateur transceiver covering the 144 and 430MHz bands, the handbook also claims that it will receive out of band. I did not test this or include it in the review.

The radio is of a compact design measuring only 140x40x152mm without knobs and weighing a meagre 1.0kg (approximately). The first impression of this radio is one of a rugged, smart and professional unit. Yaesu supply the FT-8000R with a fist microphone, a mounting bracket, d.c. power cable and a spare 15A fuse.

The rear connections on the FT-8000R are similar to most modern sets in that the coaxial antenna connection is a fly lead, this is terminated in an 'N' type socket. The power lead again is a fly lead terminating in the now standard clip-in type lead.

The rear panel also has a dedicated Data plug for packet operation. The radio supports both 1200 and 9600bps.

There are two speaker outputs, if a

speaker is plugged into the output labelled UHF then the internal speaker continues to operate. If a speaker is plugged into the jack labelled VHF this cuts off the internal speaker completely.

The cooling fan is also on the back of the radio. The fan is very important, as the radio puts out 50W on the 144MHz band and 35W on the 433MHz band when on high power.

There are mid and low power settings as well. These are 10 and 5W

Some of the panel's control buttons are only labelled when the l.c.d. display is on. This means the labels are very visible indeed at all times, unless of course the radio is off!

The l.c.d. display is excellent, its brightness can be controlled. The black writing on what Yaesu call their Omni-Glow orange background display really does work very well indeed.

The frequency readouts are very clear. A highly visible marker shows you which band is selected at any one time.

The Yaesu FT-8000R has 108 memories, 54 for each band. These memories store the usual information such as any repeater off-sets and CTCSS tones.

The memories also store the power level setting.

The FT-8000R has many advanced features. It's also supplied with CTCSS encode, however the CTCSS decode board is an optional extra.

The radio has versatile scanning facilities for scanning memories, v.f.o. or user programmed memories or portions of the bands. The scan can be set to either stop on a busy frequency or to pause for 5 seconds and then commence its search.

The emergency radio users such as RAYNET operators and controllers will no doubt find the easy to use One-way and Two-way cross band repeat function extremely useful.

Before I tell you how this radio actually fared 'on air' I would like to enthuse about the new innovation I found to be extremely useful. Yaesu call it 'Smart Search Operation'.

Smart Sweep

Smart Search Operation automatically 'sweeps' a band, or an operator programmed portion of the band, and

**"...Smart & Well
Balanced..."**

for both bands.

The FT-8000R's rear panel is uncluttered and well set out. It's clearly labelled and well designed. The sockets are well spaced for ease of access for those with even the 'chunkiest' fingers!

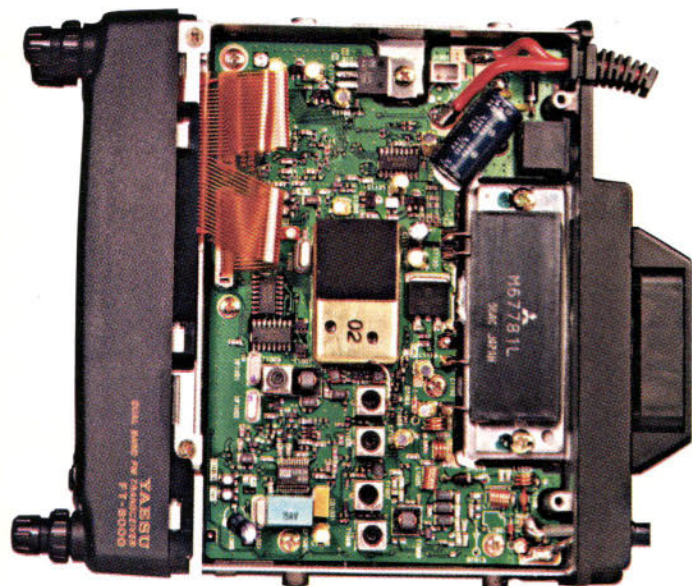
The handbook is well written and well set out. It uses easy-to-understand examples and takes the beginner through the basic set-up of the radio. Having been disappointed with Yaesu's handbooks in the past I must say that this one impressed me!

All Singing All Dancing

As you would expect the Yaesu FT-8000R has all the features that you would normally find on a modern 'all singing all dancing' mobile radio.

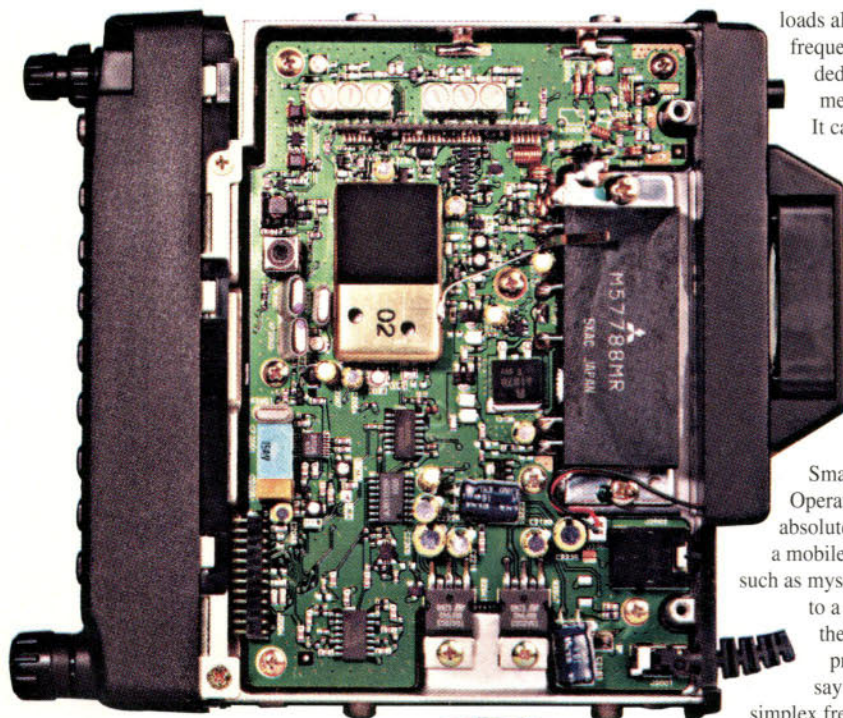
But it also has a few surprises. More about those later.

The front panel and controls on the FT-8000R are on the whole well positioned and very well labelled. Each band has its own volume and squelch control.



The Yaesu FT-8000R Dual Band FM Transceiver

Continued from page 73



Underside view of the FT-8000R. The plug and socket arrangement for the detachable front panel is shown in the bottom left-hand corner.



The supplied microphone—the MH-42A—incorporates the RJ-11 telephone style plug.

loads all the active frequencies into a dedicated memory bank. It can be set by the operator to do this sweep once or to continue the sweep until all 50 dedicated memories are full. I think the Smart Search Operation is an absolute godsend for a mobile operator such as myself. If you go to a new part of the country just programme in say the 144MHz simplex frequencies and the repeater frequencies into the programmable search limits.

At the touch of one button Smart Search leaps into action. You can see the hits being chalked up, then when you are ready you just use the tuning control to step through the active frequencies the radio has found.

In a matter of minutes I had identified the local repeaters and some very interesting local Nets. When you have decided to keep a frequency you can then transfer it to a permanent memory location.

I had a lot of fun using Smart Search. I found it to be a wonderful way to check the bands for activity.

When you turn the Yaesu FT-8000R on it tells you what voltage it's being fed with. This is most interesting when using it in the car. It's also a reassuring check when in the shack. Some may call this a gimmick but I was quite impressed with this small, but useful attention to detail.

Mobile And Base

I was fortunate enough to have the FT-8000R for quite a few weeks. So I was able to use it mobile and as a home base station.

The radio has been designed for

ease of use, especially when mobile. The transmit power level can be toggled with only one button press. The reverse frequency on repeater use can also be checked with one press of a button.

It's difficult to get reports on a radio when mobile, because invariably you're usually talking via a repeater. Simplex contacts are often difficult or at least subject to things such as mobile flutter. So, all the reports I obtained were by use of the FT-8000R as a base set.

At home I put the FT-8000R on my W-2000 vertical antenna for 50, 144 and 433MHz. This antenna is about 8m above ground level. My home is on the outskirts of Bournemouth at about 30m above sea level.

Boxing Day Net

I used the FT-8000R from home to run a club 'Boxing Day' v.h.f. Net. The members who came up on the Net were **Steve G1YNY**, **Clive G4SLU**, **Terry G7VJJ**, **Bob G6DZM** and **Colin G3XAS** all gave the radio good reports on the transmitted audio.

We were joined by **Alan G4RUC** on the Isle of Wight who again gave the FT-8000R a favourable report. Just the 10W setting was enough to control the Net with all stations hearing me.

The stations were as far south as The Isle of Wight, as far west as Dorchester and as far east as Mudeford. A radius of some 42km.

Next I spoke to several stations on u.h.f., **Terry 2E1EJC** in Blandford reported the transmitted audio to be "very acceptable". **Barrie 2E1EXE** also gave me a good report, he was operating using a hand-held in Bournemouth.

I also had a contact with **Ian G0GRI** near Bradford-upon-Avon, Wiltshire. We first spoke on the 145MHz and exchanged favourable reports.

We then went to the u.h.f. bands. I called Ian using the 35W available to me on high power. I did not hear Ian's reply but when back on 145MHz Ian told me that he had heard me calling him. I believe that as the crow flies (apparently crows fly in a similar way to radio waves!) the distance between my location and Ian's is a trip of about 75 - 80km.

Well Balanced

In the past I have experienced radios

YAESU



Manufacturer's Specifications

GENERAL

Frequency range:	RX - 110-550MHz, 750-1300MHz (cell phone blocked) TX - 144-148MHz, 430-450MHz
Channel steps:	5/10/12.5/20/25/50kHz (v.h.f.) 5/10/12.5/20/25/50kHz (u.h.f.)
Frequency stability:	± 5ppm (-5°C to +50°C)
Repeater shift:	± 600kHz (v.h.f.) ± 1.6/5.0/7.6MHz (u.h.f.)
Emission types:	F3 (G3E), F2 (1200bps packet), F1 (9600bps packet)
Antenna impedance:	50W, unbalanced
Supply voltage:	DC 13.8 V ± 15%, negative ground
Current consumption:	Receive - Less than 1A Transmit - 11.5A (v.h.f.), 10A (u.h.f.)
Operating temperature:	-20°C to +60°C

TRANSMITTER

RF power output:	50/10/5W (v.h.f.) 35/10/5W (u.h.f.)
Modulation type:	Variable reactance
Maximum deviation:	± 5kHz
Spurious emissions:	> 60dB below carrier
Microphone impedance:	600-10kΩ

RECEIVER

Circuit type:	Double-conversion superheterodyne
Intermediate frequencies:	45.05MHz and 455kHz (v.h.f.) 58.525MHz and 455kHz (u.h.f.)
Sensitivity (12dB SINAD)	<0.18µV (Main receiver) <0.25µV (Sub receiver)
Selectivity:	12kHz (-6dB)/24kHz (-60dB)
Image rejection:	Better than 70dB
Squelch sensitivity:	Better than 0.13µV
AF output:	2W @ 8W for 5% Total Harmonic Distortion
Audio output impedance:	4-16W (Internal Speaker: 8W)

that are very sensitive as mobiles but are swamped in the shack on a high gain antenna. I have to say that I found the FT-8000R was extremely well balanced.

I live very close to a 'nest' of paging systems, I did not experience breakthrough once on either 144 or 433MHz. I also found the receive sensitivity very good both in the car and in the shack.

Performs Beautifully

All in all the FT-8000R is a well

thought out, well made, solid unit. It performs beautifully as a base station and lends itself to mobile operation with consummate ease.

The radio was a pleasure to operate and when put side-by-side with my own mobile transceiver, the TM-732, I found that both radios compared most favourably both on transmit and receive.

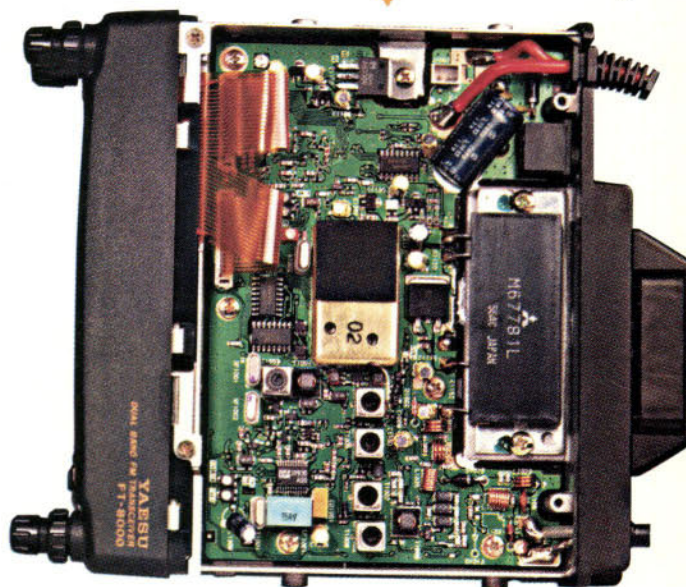
My thanks go to Barry Cooper G4RKO of Yaesu UK Ltd. for the loan of the FT-8000R which is available from all Yaesu approved dealers for around £549.

PW



WIN!

Turn to page 57 of this issue to find out how you can win the FT-8000R as reviewed by G0RSN. Barry Cooper G4RKO and the team at Yaesu have very kindly donated the review model as a competition prize, so what are you waiting for? - Get your entry in today!



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HF FAR & WIDE

Leighton Smart GWOLBI is back on air again after suffering antenna damage and is joining in the fun whilst compiling your reports

I'll start this month by saying how good it is to be back on the air. I lost my antenna a while ago during a rather nasty storm, and only recently was able to put up another 'half - decent' long wire.

Luckily, my neighbour, Bernard, is a decent sort, and he along with Dave GW0JUU assisted me in getting a line up over a 20m high Oak tree at the bottom of my neighbours' garden. This we did by using a 'Beachcaster' fishing rod and a 142 gram (approx 5 ounce) weight.

The antenna is about 70m in total length. But I've added a 20m coil to the far end of the wire to try to get the high current (maximum radiation) point at the highest part of the wire. It's not a great antenna by any means, but gets my r.f. out around the British Isles and Europe reasonably well on the three l.f. bands.

I mainly use the antenna on the 1.8MHz band which is my favourite band (you've no doubt guessed I'm more of a 'ragchewer' than anything else). And at this point I must say how pleasurable I find it during the cold winter evenings to get 'on the wireless' and have a natter whenever possible. So maybe I'll be able to get back to the *PW* Listening and Operating Watch again. And about time too eh?

Favourite Band?

Talking of favourite bands, I was talking to local DXer Steve Lockie GW0SGL recently, who told me that even though he operated mostly on the 144MHz band and above, (DX being his passion) his favourite band was 3.5MHz no less!

Steve has been featured in the pages of *HF Far & Wide* on many occasions in the past, with logs showing his consistent DX contacts over most of the globe on the higher bands. So I asked how does it work out that if 3.5MHz is his favourite band, when he doesn't use it as often? I asked

Well, it seems that although Steve came into the amateur radio hobby specifically interested in working DX, he says that he found that working on 3.5MHz was 'less demanding' than DXing on the higher bands. "I felt sometimes that it was getting a little tiresome for me, after hours of 'you're 5/9, QSL via buro', it

gets a little monotonous, so I go down to 3.5MHz and have a more normal sort of contact!" says Steve.

"After a few evenings on '80', I found that it was such a refreshing change that I began looking forward to meeting up with the same stations now and then and carrying on the conversation where we'd left off a few days earlier".

"These days, I get onto 3.5MHz every week or so, so I don't get on every evening because if I did, that would become tiresome too, and I need that refreshing change to keep my interest alive!"

"Mind you," says Steve "the DX is rather good down there too, at the right time of day!"

So it seems that a change is as good as the rest (even in a hobby so diverse as ours) to quote an old saying.

On the other side of the coin, it's surprising how many 'A' licensees, although equipped with h.f. gear, rarely surface on anything other

than spotting or stamp-collecting!

So, what's YOUR favourite band? It may be interesting to other

readers of *HF Far & Wide* (particularly new licensees) to learn what your favourite band is - and more importantly - why? Are you like myself, more of a l.f. band 'ragchewer' than a DXer? Or are you primarily interested in DX on the higher bands? Do you prefer the QRM of 14MHz to the relative calm DX of 18 or 21MHz? Are you interested in the propagation characteristics of 28MHz and carried out losts on the band?

Why not put pen to paper, and share your experience with other *HF Far & Wide* readers, you don't have to write a book, a few paragraphs will do, just enough to give others, especially those new licensees, your 'operators viewpoint' regarding the various h.f. bands we are allocated.

If there is a response from you, I'll feature one every month or two. Apart from that, I'm interested in

who is now the proud owner of new callsign **MM0AOF**, and sends in his first h.f. transmitting reports.

David says his operation has been all c.w. and 'fairly QRP' as he lives on the third floor of a tenement block with no r.f. earth. Well done David! And we look forward to more DX reports from you, I bet you're having a whale of a time. Keep up the good work!

Interesting Intruder

I've had some interesting feed-back following the query from **Walter Farrar G3ESP** in the January issue regarding two unusual stations he heard on the 3.5MHz band using the call signs CP1MS and L9CC. Since then I've received a 'phone call from **Ray Wilkins G0UKX** who assists with the 'Intruder Watch' team.

Ray says he has heard 'CP1MS' on a number of occasions on 3.5MHz, and also on the 7MHz band, but the call sign is not CP1MS, but

CP17! It appears

that this station has been cropping up from time-to-time on both 3.5 and 7MHz bands, and appears to emanate from South America, as witnessed by the Intruder Watch members.

You have been warned!

DX News

Some DX news now and I've read in The RSGB *DX Newsheet* that **Mark 9X4WW** in Rwanda is often active on 1827.5kHz c.w. (listening up) around

2100UTC. So let's hope that the situation in that country continues to improve.

On Kerguelen Island the VK0IR group will be operating as TW0K in February. Meanwhile in Cambodia **Mike XU6WV** is planning some 'serious' low band work during the winter, possibly from a waterside location in the south of the country.

In Africa, **Charlie KY0A** says he



The Ten-Tec 'Scout' transceiver as used by Terry G0VTI.

than 144MHz f.m.! I certainly know of quite a few radio amateurs who fall into this category, and often wonder why this is. After all, what can be worked locally on 144MHz f.m. is a snitch on 3.5MHz, if perhaps not so 'private'!

I guess that TVI may account for some of them, but surely not all? Still, I guess that's the one endearing thing about our hobby - there's so many aspects to choose from, that it's nigh impossible to get so bored that you give it up in favour of

hearing what you have to say about anything relating to the h.f. bands - what you think is good about them as well as what you think is bad!

I look forward to hearing from you.

New Callsign

News now from long - time s.w.l. reporter **David Henry** of Aberdeen,

will mount a 'big' effort from Namibia. It will take place in February on 1.8 and 3.5MHz.

The Oceania Amateur Radio DX Group (ODXG) is planning a major DXpedition in September 1997 and are inviting operators to join them. They're looking for 10 operators, including two YL operators. If you're interested...contact Bill VK4FW (QTHR).

(Please note that the DX Newsheet is issued weekly and details can be obtained from the RSGB, Lambda House, Cranborne Road, Potters Bar, Hertfordshire, England EN6 3JE).

Your Reports

I'm starting your reports off with 3.5MHz this time. And I must admit to liking a good late afternoon or early evening natter on this band.

My particular preference is for the 'key' on 3.5MHz, and have found that many of the contacts I've had here are not just the tiresome 'rubber stamp' variety either! There are times when GW0LBI has been on for (literally) hours in the past with perhaps one or two individual stations, very often on **v-e-r-y** slow-speed c.w., (nice and relaxing I reckon!) and actually learned something about the other operator, apart from just his/her name, QTH and rig!

Apart from that, I've also enjoyed 'earwiggling' on some very interesting contacts, both on c.w. and s.s.b. particularly between 'old timers'.

So starting off 3.5MHz this time is just a single report for this band from QRP'er **Eric Masters G0KRT** in Worcester Park, Surrey, who has been extremely busy with his college work. His 5W of c.w. hooked up with DK8TU (Germany) in the CQ Worldwide contest at 2112UTC. Good luck with your studies Eric!

Meanwhile, new licensee David Henry MM0AOF in Aberdeen has been having his first 3.5MHz contacts, all on c.w. with Manu ON4CCE in Belgium at 2145, and Graham 2E0AOI in Nottingham at 2105UTC. May this be the first of many contacts, David, and I look forward to working you soon.

The 7MHz Band

It's up to '40' now, and a long report from **Sean Gilbert G4UCJ** of Milton Keynes, who says that the 7MHz band has been open to the USA as early as 1800.

"Australia has also been audible early evening along with Japan" says Sean, "but the broadcast intruders are back so it's back to using the anti-heterodyne filters and reducing the audio bandwidth at my end to reduce the 'ringing' problems"!

Sean's log includes all - c.w. contacts using between 50 and 70W, with J6/KD6WW (St. Lucia Island) at 0241, VK2BEX/CY0 (Sable Island) at 0125, EM1KA (Antarctica) at 2318, CO8EI (Cuba) at 0153, ZS6QU (South

Africa) at 0154, HH2B (Haiti) at 0021, EX9A (Kirgizstan) at 2359, P40V (Aruba Island, Netherlands Antilles) at 0058, KC1XX (USA) at 0044, YW1A (Venezuela) at 0101, and HS0AC (Thailand) at 1904UTC.

Also from Milton Keynes comes **Charlie Blake M0AIJ**, who says that it hasn't been a very good month for him in the early mornings on 7MHz, due to some pretty heavy QRM on the band between 7.064 and 7.076MHz. "It's not consistent" says Charlie, "it tends to come and go, but I've also noticed it when operating the GB2BP station in Blechley Park four miles south." Well maybe you and your 'neighbour' Sean G4UCJ can get together to compare notes, Charlie?

Charlie has been negotiating with the local authority regarding permission for antennas, and has meanwhile been using a DRAE 40-10 Magnetic Loop on the 7MHz band. His transmitting report this month shows s.s.b. contacts with HB9ARC (Switzerland) at 0712, EA6/G4XDO (Majorca, Balearic Islands) at 0209, ZL4DJ (New Zealand) at 0203, and ZB2AZ (Gibraltar) at 0744UTC.

On the other hand, Charlie's s.w.l. log includes s.s.b. reception of 8R1Z (Guyana) working IV3FPS in Italy at 0614, CX3AL (Uruguay) in contact with CT1AR in Portugal at 0716. He also heard XE1NVX (Mexico) working DF7IB in Germany at 0744, and JA8VKE (Japan) in contact with UA9XMH in Russia at 0731UTC.

Down to Skewen in West Glamorgan now, and **Carl Mason GW0VSW**, who has, like myself, suffered antenna damage. However, Carl is back 'with a vengeance' but says he found conditions 'poor' during his operating periods. Included in his report are all c.w. contacts with 5B4/G0EOM in Limassol, Cyprus at 1915, UA6AGK (Russia) at 1838, and HB9ATE (Switzerland) whose signals were 59+ 30db at 1558UTC.

The 10MHz Band

I've noticed a few French stations using s.s.b. on the 10MHz band, which causes a few problems as it's just 50kHz wide! I've also heard some amateurs saying that UK operators are allowed to use 'phone here, but as it's such an extremely narrow band, what's the point?

A welcome back to Terry Ibbitson G0VTI of Wakefield who reports c.w. contacts on 10MHz with EA1AY (Spain) at 1756, and LA3HE (Norway) at 1745UTC.

And Carl GW0VSW lists SV9/DJ4TR (Crete) at 1135, and J68IO (St. Lucia Island) at 1937UTC (QSL to W8QID).

The 14MHz Band

Now for the 14MHz band report I'm starting with Terry G0VTI who uses a Ten-Tec Scout transceiver with 50W output and a G5RV/2 dipole antenna. He says that the antenna is "very close" to his house and is in an inverted 'V' configuration.

On 14MHz c.w. Terry hooked up with VE2OBK (Canada) at 1302, KA1ZEQ (USA) at 1324, as well as W8TE (Michigan, USA) at 1610 and WB1AGP (Maine) at 1608UTC.

Carl GW0VSW also worked a string of US stations on 14MHz, but also used c.w. to hook up with EA8/DJ00J/P (Canary Islands) at 1801, HAM4XR (Hungary) at 0931, and SP5BXY (Warsaw, Poland) at 0858UTC.

While back in Surrey, Eric G0KRT, using 5W of c.w. in the CQ WW Contest, hooked up with KB1SJ and K4VX (both USA) at around 1700UTC.

Wielding his shiny new call sign David MM0AOF had his first transatlantic contact with his first CQ call using 10W c.w. with WB2FXK in New York State, at 1550, along with a 20W c.w. contact with DL1FAG (Germany) at 1100UTC, amongst others.

Sean G4UCJ lists his c.w. contacts with 3V8BB (Tunisia) at 1427, 9Y4VU (Trinidad) at 1500, 8P9Z (Barbados) at 1717, VP2EEB (Anguilla Island) at 1602. He also listed 4V2A (Haiti) at 1142, and VE7VB (British Columbia, Canada) at 1652UTC.

The 18 & 21MHz Bands

The higher bands have seen an improvement of late with some openings to North and South America, although whether this is going to be a continuous trend is anybody's guess!

The 18MHz band seems to be offering some degree of reliable DX communication. I've noticed this just using my none - too - professional receiver and a piece of wire hanging out of the window - hardly a DX receiving station by any stretch of the imagination!

Starting with 18MHz, Carl GW0VSW reports working C56JJ (Gambia) at 0933 QSL to G0UCT, SP8CSL (Poland) at 1043, and NO3N (USA) at 1538UTC, all on c.w.

While on 21MHz, Eric G0KRT mentions his first QRP contact with the USA on this band in the shape of K4VX, at 1612UTC.

Finally, Terry Ibbotson mentions working PZ1AP (Suriname, South America) at 1611, again 'on the key'.

So there are some signs of life on the 21MHz band of late, as our reporters show! Let's hope it's a sign of things to come over the next 12 months or so, eh?

Signing-Off

Well that's it for this month folks...it's signing-off time! Thanks for all your support and information, which makes the column what it is.

I would appreciate some photographs of you and your stations, as my 'photo library' is now running extremely low! So get out your cameras and start snapping! As usual, reports and information (and photos!) by the 15th of each month to: **Leighton Smart GW0LBI, 33 Nant Gwyn, Trelewis, Mid-Glamorgan CF46 6DB, Wales. Tel: (01443) 411459 / (01443) 710749 (9am - 6pm).**

PW Listening & Operating Watch List

All times in UTC

Charlie Blake RS-96034 listens:

0500-0700 on 7.061MHz s.s.b. with an NRD 525 receiver & Sloping wire antenna.

Steve Locke GW0SGL operates:

1100-1500 most days around 14.180MHz s.s.b. using a Kenwood TS-940 & TH7 beam antenna, normally beaming to other countries.

Don Mclean G3NOF operates:

1030 Saturdays on 3.685MHz on the ISWL Net or 1030 Sundays on the Yeovil ARC Net 3.665MHz s.s.b. using a Kenwood TS-950 & trapped dipole antenna.

Leighton Smart GW0LBI

operates: Most Sundays (and some weekday evenings) at around 1000-1300 on 1.933 or 1.949MHz s.s.b. using a KW 2000B transceiver and a long wire Marconi antenna.

Rob Mannion G3XFD listens and

operates: (weekdays & weekends) 1800-1830 3.7MHz 100W s.s.b., & 3.530MHz QRP c.w. using an Alinco DX-70 transceiver and trapped dipole/Long wire antennas. Also at 2300 on either 3.530, 7.025MHz (c.w.) or 3.7MHz s.s.b. (Restricted operation on h.f. bands at moment at moment on 'jury rigged' long wire antenna draped over house roof. Waiting for better weather to erect new mast to replace the original trees (damaged in the autumn storms) used as supports for antennas.

Sean Gilbert G4UCJ operates:

around 1030 to 0200 (on and off) most weekdays and weekends on 7 and 14MHz, using a FT-307 transceiver at 70W maximum and a G5RV dipole antenna.

Terry Ibbitson G0VTI operates:

each evening between 1900-2000 on or around 7.020MHz c.w., or 14.035MHz c.w. using a Ten-Tec Scout at 50W.

David Kennedy G7GWF listens:

on 7MHz using a Howes Communications receiver and a Lake DTR-7 Transceiver. No time or frequency is specified.

END

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BITS & BYTES

This month Mike Richards G4WNC helps to solve a problem with one reader's SSTV package as well as passing on news of an interesting logging program he's discovered.

Stan Ames of Harpenden has written asking for help getting his DL4SAW SSTV package going. Stan uses a PC with a Tseng Labs 3000 video card and just doesn't seem to be able to get going with the program.

This is the first time I've heard of any difficulty with the excellent DL4SAW program. So, I suspect the problem is tied-up with Stan's PC configuration.

One of the first things to try in such cases is to re-boot the PC with a very basic 'boot disk'. If you don't have a 'boot disk' you can create one by putting a blank disk in drive A and then typing the following command from the DOS prompt. 'format A: /S' This formats the disk and copies the basic system files, i.e. IO.SYS, MSDOS.SYS and COMMAND.COM.

To re-boot your system you simply press the reset button or press **ctrl + alt + del** with the boot disk in drive A. The PC will then go through its start-up routine but use drive A: to load MSDOS rather than the normal drive C:.

Once the boot-up is complete you can change to the appropriate directory for the SSTV program and try it out. One of the problems with this very simple start-up is that it completely ignores any of the drivers, and may leave you with the mouse not enabled.

If the problem applies to you then copy AUTOEXEC.BAT and CONFIG.SYS files from drive C: to the new 'boot disk'. These files are used to customise the PC for all the software you normally run and can get quite complicated. Once you've copied over these files you need to edit each one using a simple text editor.

The first thing to do is add "REM" to the beginning of each line of both files. This effectively disables all the commands on that line.

If you now want to re-instate the mouse driver, read through each of the files (a print-out is extremely useful at this point) looking-out for anything that looks as though it could relate to the mouse. When you find it, remove the REM from that line. You'll probably have to do this in

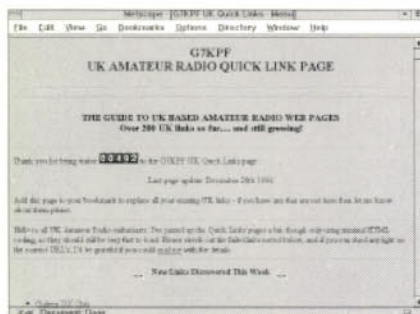


Fig. 1: Useful UK Ham Radio Internet Site (see text).

both the AUTOEXEC and CONFIG files.

Once you've made the changes, you will need to reboot the PC for the changes to be effective. When you've managed to create a minimum set-up that supports your program, you can tidy-up the AUTOEXEC and CONFIG files by removing all the lines that still have a REM at the beginning.

You can also add a few additional lines the autoexec.bat file to automatically start your program as well. First you need to change to the directory where the program resides using the change directory command, cd\ and then start your program.

To start the DL4SAW SSTV program on my system the following two lines would be required:

```
CD\SAWSSTV
GSHPC
```

A word of warning before you dig too far into AUTOEXEC and CONFIG files - never, never amend these files on your hard disk without making a back-up copy. You can get into a real mess if you're not really sure what you're doing.

Getting back to Stan's problem, if you have a Tseng Labs 3000 card with DL4SAW running satisfactorily, you might like to let Stan know. He can be contacted either via me, packet radio: **G40AV@GB7MSW** or E-mail at **StanAmes@aol.com**

Internet News

Andy Gayne has contacted me with details of what looks like a very

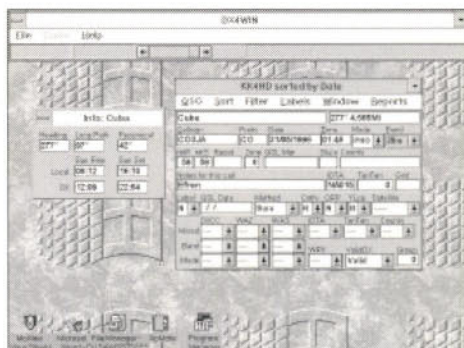


Fig. 2: Screen shot from the DX4Windows radio logging program.

interesting site for UK based amateurs. The site at <http://www.users.zetnet.co.uk/kama/hamlinks.html> provides a range of up-to-date links specifically designed with the UK amateur in mind - it's well worth a look.

If you're looking for the latest in Internet software, one of the very best places to look is the **Stroud Consummate Winsock List** located at <http://www.stroud.com>. This site is updated several times a week and always has the very latest releases. A visit here will get you bang up-to-date effortlessly.

New And Interesting

Whilst scouring around recently I came across a new and very interesting logging program called DX4Windows that's currently being distributed in demo mode. This is a very comprehensive package that supports all aspects of amateur logging from contesting through to rag chewing!

I've not got space to look at DX4Windows and do it justice this month, but I've included a screen shot here for you to see. Those of you with Internet access can download a copy from: <ftp.funet.fi/pub/ham/hf-log/dx4win108d.exe>.

Special Offers

By the time you get to read this I should be fully up-to-date with the back-log of orders that occurred earlier in the year. On the bright side, I've

received encouraging reports from a number of readers on the very good service being provided by the **Public Domain and Shareware Library (PDSL)**.

The PDSL have put together a very special offer to enable readers of this column to obtain a full set of disks at a very competitive price. The special library set of all five 'Bits & Bytes' disks is now available for just **£12** inclusive of P&P.

Using PDSL has many advantages, including ease of ordering as they accept all the major credit cards. This means you can order by 'phone for greater convenience and speed of delivery. So, in future, please direct all requests for the disk set to **PDSL, Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. Tel. (01892) 663298** and request library volume: **H008739abcde**.

Please note the software is only available as a full set of five disks as follows: IBM PC Software (1.44Mb disks): **Disk A** - JVFAX 7.0, HAMCOMM 3.1 and WXFAX 3.2; **Disk B** - DSP Starter plus Texas device selection software; **Disk C** - NuMorse 1.3; **Disk D** - UltraPak 4.0 and **Disk E** - Mscan 1.3 and 2.0.

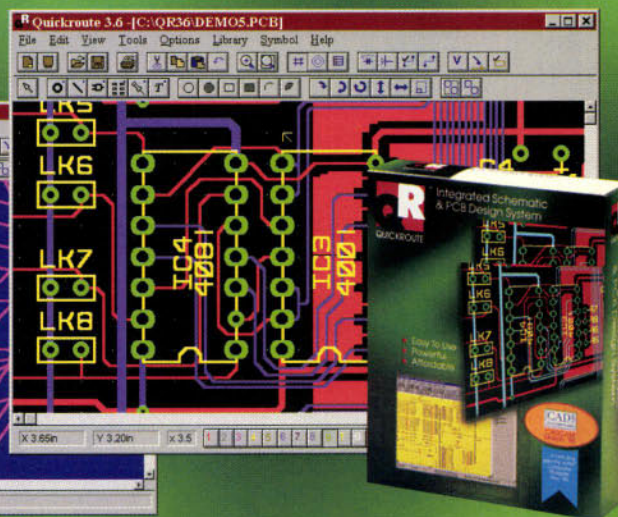
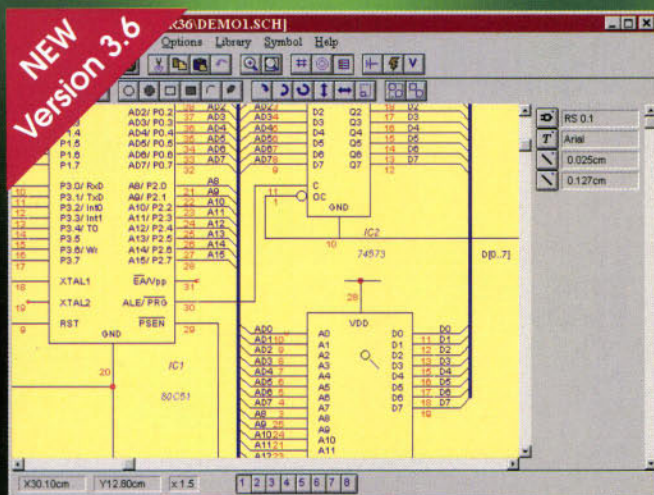
A lack of time means that my FactPacks are still temporarily suspended. But I hope to be able to offer a revised service in the near future!

That's all the computing news I have for you this time. So, until next month 'happy computing' and keep your letters coming to me, **Mike Richards G4WNC**, at PO Box 1863, Ringwood, Hants BH243ZD or you can E-mail me at: mike.richards@dial.pipex.com Don't forget you can also visit my Web site at: <http://dialspace.dial.pipex.com/mike.richards/>



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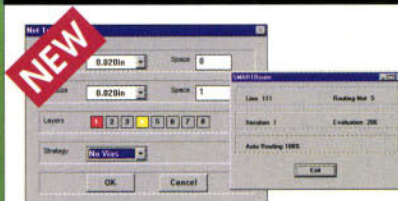
Take a look at Quickroute 3.6 Designer and you might be surprised! For just £149* you get easy to use schematic design (automatic junction placement, parts-bin, etc), "one click" schematic capture, autorouting on 1 or 2 layers, design rule & connectivity checking and a starter pack of over 260 symbols.

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Prices are Quickroute 3.6 Designer £149, Quickroute 3.6 PRO+ £399, SMARTRoute 1.0 £149.00, Library Packs £39 each. *Post & Packing per item is £6 (UK), £8 (Europe) and £12 (World). V.A.T must be added to the total.

NEW PLUG IN AUTOROUTER



**SMART
ROUTE**

SMARTRoute is a new 32-bit autorouter from Quickroute Systems rated in 'category A' by Electronics World (Nov 96). SMARTRoute plugs straight into Quickroute 3.6, automatically updating Quickroute's menus with new features and tools.

SMARTRoute 1.0 uses an iterative goal seeking algorithm which works hard to find the best route even on single sided PCB's. SMARTRoute allows you to assign different algorithms, design rules, track & via sizes, layers used, etc to groups of nets for total flexibility. SMARTRoute 1.0 costs just £149*.



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PACKET PANORAMA

Roger Cooke G3LDI rounds up the latest news from the Packet radio scene.

Some of you may have seen the bulletins and mail for **BOFARS** on the Packet BBS network. This is an acronym for **Boring Old Fellas Amateur Radio Society**, only I think I probably got one of the words wrong in there somewhere!

The name is simply a tongue in cheek means of having a bit of fun and is really quite harmless. I don't think **BOFARS** poses a threat to our more constitutional radio societies! It was formed by a group of three, I suppose they could be called a 'trio', 'triad' or even triplet!

Featured in Fig. 1 is the founding 'group of three' packeteers. Left to right is **Geoff G7SRI**, **Mike G0TCZ** and **Dennis G7WBG**.

The humorous contribution by **BOFARS** to Packet radio has really caught on. At the last count, there were contributors from 23 different countries with 292 members. Some sysops seem to object to this sort of thing, but personally I cannot see any harm being done. I am sure that if any section, or individual amateur, started sending questionable material, then the filter would soon find it!

Proposed Bandplan

Packet and Internet users will have seen the new proposed bandplan for the 144MHz band. This information stems from the recent IARU meeting and will take effect some time in the second quarter of 1997. The changes are as follows:

144.000 - 144.035	EME exclusive
144.035 - 144.150	CW
144.150 - 144.40	CW and SSB
144.400 - 144.500	Beacons
144.500 - 144.800	All modes
144.800 - 144.990	Digital Communications

The proposals will obviously mean a lot of changes, with BBS and Nodes changing channels, sorting out 1200baud channels in 12.5kHz channel spacing and also some 25kHz channels suitable for 9k6baud operation. Hopefully, it will encourage users to change to 9k6baud instead of 1200baud. More detailed information will hopefully be available in the near future.

Repeater Groups

I still receive a few Repeater Group Newsletters. The most regular is from the Gloucester Group. This group seem to have amalgamated all repeaters, voice and digital, into one group, with a membership fee of £7.50 per annum.



Fig. 1: Founder members of **BOFARS**, from l-r, **Geoff G7SRI**, **Mike G0TCZ** and **Dennis G7WBG**.

I wonder how other groups manage their repeaters. It would be interesting to know and to compare notes. In Norfolk, the voice repeaters are quite a separate entity to the Norfolk AX25 Group, which looks after the local packet repeater.

Internet Link

Some news now from **Mike VK2MJ**. This is a little old now, as I have had it on the stocks for several months but this is the first opportunity I have had to use it! Mike says:

"I have started an h.f./v.h.f. link to my local internet gateway. This is as far as I know the first of its kind in Australia.

"The idea of the link is to give amateurs who live outside of the major cities the same facilities as we have. So far it has been a success and have amateurs connecting from Broken hill Victoria Queensland and South Australia.

"I have heard stations from New Zealand and Spain, so UK stations could try to connect. Any UK stations could come through the internet gateways to **MACUNI VK2GMU** and then connect to me on the v.h.f. port. If any amateur wishes to connect to an Australian station they can read an Mheard list on my pms **VK2MJ-2** or leave a message for any Mheard station. 3rd party messages are allowed in Australia.

Mike continues "As far as I know you only have two internet gateways in the UK. In Australia we have 10 or 12; in Sydney we have three, two of which are accessible direct on 144MHz. If you would like more information please let me know.

"The gateway, **MJGATE:VK2MJ-1**, is

now fully operational 24 hours a day on 7.035 cross linked to 145.050MHz. Users of h.f. can now access **VK2GMU** the Macquarie university internet gateway either by connecting to **VK2MJ-1** and then use (x **VK2GMU**) to connect to the v.h.f. port on 145.050MHz or use (c **VK2GMU** via **VK2MJ-3**). **VK2MJ-3** is a cross port digi and is used like any other digi.

"The gateway can be used by v.h.f. users in the same manner as on h.f. but at this time only those with a full callsign can use the gateway. On v.h.f. **VK2MJ-1** will still operate as a node or digi on 145.050MHz as a direct link to **VK2GMU**.

"For information on the use of the internet gateway use the ? command or leave a note for the sysop. (SYSOPS please note, do not forward during peak hours).

Mike concludes: "The gateway is located in Hornsby 24km north of Sydney Australia. Any problems or suggestion's please leave a message on **VK2GMU** or **VK2MJ @ VK2AAB**

News For G3LDI

Although news for this column can be sent 'snail-mail', or telephoned to me on (01603) 570278, or via packet at **G3LDI @ GB7LDI**, it can now be sent via Internet at the following address: **mtaylor@uk.mdms.com**

I also intend to have FAX capabilities in a month or so. A peaceful 1997 and 'happy packeting'. 73 de Roger G3LDI.

Digital Journal Closing!

The following announcement will appear in the January issue of the *Digital Journal* (published by IDRA).

"This issue (Volume Number 45, Number 1) will soon be a collector's item. It's the first issue in the 45th year of Journal history and it is, from all indications, the last issue ever.

Those of us involved in the production of the *Digital Journal* magazine see no alternative but to shut down now. The publication of this issue was possible only because of a major gift.

There are simply no funds for future issues. Those few of you who recently renewed your subscription in response to our appeal will be entitled to a refund. It may or may not be a full refund for it can only be paid after all other IDRA obligations are settled.

You do not need to apply, but please do not expect a cheque before the end of February. No other refunds are anticipated at this time.

The 'phone and FAX numbers at IDRA headquarters will no longer be in service. Please address all correspondence to the IDRA at **PO Box 2550, Goldenrod, FL 32733**. We will try to respond in a reasonable time, but please be patient."

This surprising development came only weeks after the Journal announced a new bi-monthly schedule, a step mandated by the disappearance of many primary advertisers who had supported the magazine over many years. The lack of advertising revenue was matched, unfortunately, by a decline in the number of members willing to pay for hard copy of what they felt was available for no cost on the Internet. Sign of the times?

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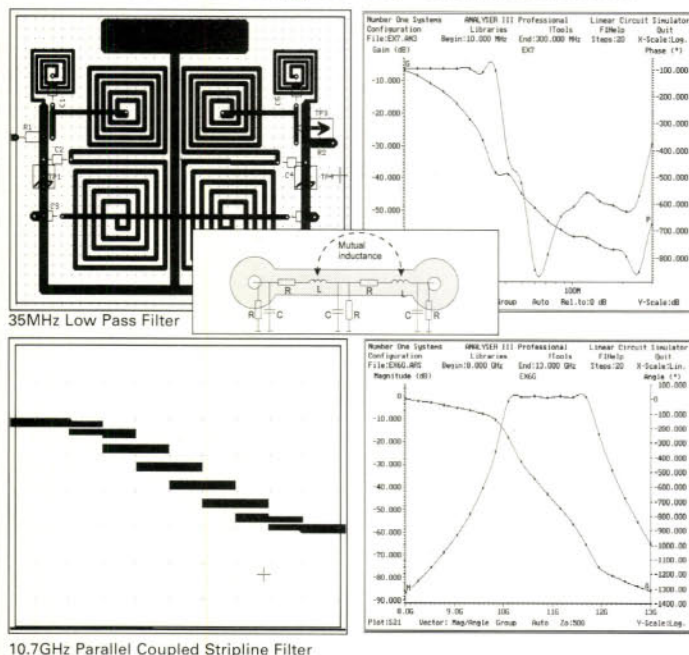
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BROADCAST ROUND-UP

A new director appointed to VoA, lots of station news and much more from the world of broadcasting this month. Peter Shore tells all.

Cuts, cuts and more cuts. Just before Christmas 1996, **Radio Canada International** (RCI) launched its annual pantomime of "We have no funding beyond 31 March, so we'll close down."

But after a range of protests from around the world, the Canadian Department of Foreign Affairs has agreed to fund the station with Can\$6 million and other government departments contributing smaller sums to maintain Canada's international radio voice. Sheila Copps, Canada's deputy Prime Minister, announced that RCI now has a long-term future as part of government strategy of providing information about Canada to the world.

Australia's international radio service still waits for news of its fate. A board meeting of the Australian Broadcasting Corporation was due to discuss **Radio Australia's** future on 9th December.

But while it announced a package of cuts which will save Aus\$27 million from ABC's budget - plus cuts of 560 staff and 60 senior management positions - the ABC board has postponed a decision on Radio Australia's future budget until the end of February 1997.

Voice of America (VoA) announced that its satellite music and news service, VoA Europe, would close at midnight UTC on New Year's Eve. Special short wave relays of the station were arranged to mark the final hours' transmission of the station - which is carried on 1197kHz medium wave for much of the day in Europe - and everyone was convinced that the closure would happen.

At the very last minute, VoA Europe was granted a reprieve. VoA is trying to sell the station to a private company, and the bidders asked that the station remain on-the-air to maintain continuity.

An announcement from VoA said it would keep broadcasting until mid to late January by which time a sale agreement will be in

place. It's likely that the station which succeeds VoA Europe will be called VoA Express, drawing on Voice of America programme resources but run and financed by a commercial company.

Europe is not insulated from the cuts. **Radio Vlaanderen International**, the Brussels-based international broadcaster from Belgium, has announced that it will close its Arabic, German and Spanish services at the end of October, and there will be a review of programmes in Dutch, English and French. More news on this story later in the year here in 'Broadcast Round-up'.

Available For Hire

Are you in the market for a short wave transmitter with good antenna arrays and just one careful owner? If so, **NRK** in Norway would like to hear from you.

The transmitting station at Fredrikstad, which is equipped with a 350kW sender, is available for hire. Moth-balled for the last few years since all NRK's short wave operations were consolidated at Kviteseid, the Fredrikstad site may be dismantled later this year unless someone hires a significant number of hours a day for broadcasting to the world from northern Europe.

New Director

President Clinton has appointed a new director of the Voice of America. **Evelyn Lieberman**, a deputy chief of staff to the President, took over from **Geoff Cowan** on 10 December. Lieberman described VoA as "the voice of democracy".

For background information and frequency news from around

the world, and a summary of some English-language programmes you can tune to: From Argentina, Radiodiffusion Argentina al Exterior (or RAE) has English to Europe at 1900 for an hour on weekdays. Tune to 15.345MHz. There is also a transmission for the Americas at 0200 Tuesday to Saturday on 11.71MHz.

Station News

The **Voice of Armenia** is on the air with English, weekdays at 1845 on 7.48, 4.99 and 4.81MHz, and then at 2130 until 2200 on 9.965 and 7.48MHz daily. On Sunday morning, there is a transmission at 0930 on 15.27MHz.

Your opportunities to listen to Ireland on short wave are now doubled. In addition to the broadcasts from West Coast Radio every Thursday that I reported in January's *PW*, you can now hear state broadcaster **RTE** on the h.f. bands.

From the transmitters of **WWCR** in Nashville, USA, RTE is broadcast on weekdays at 1000 for half-an-hour on 5.07MHz, and at 1100 on Sundays on the same channel.

There is a weekdays evening broadcast at 1930 on 12.16MHz. Contact RTE at Dublin 4, Eire, and **WWCR** at 130 **WWCR** Avenue, Nashville, TN 37218, USA.

Radio Albania in Tirana has English for Europe at 1715 for 15 minutes on 7.155 and 6.185MHz, and again for half-an-hour at 1930 on 7.27 and 6.27MHz, plus the medium wave channel of 1458kHz. Listeners in North America should try at 0145 for the quarter-hour transmission on 7.16 and 6.115MHz, and at 0230 for the 30-minute programme on 7.16 and 6.14MHz.

Radio Pakistan broadcasts to Europe in English at 0800 until 1120UTC on 15.47 and the variable channel of 17.54MHz including dictation-speed news for the last quarter hour of the transmission. Then there is an evening transmission at 1600 to 1630 on 9.515, 11.57 and 15.555MHz. Radio Pakistan also broadcasts in Urdu for Europe from 1700 to 1900 on 5.825 and 11.57MHz.

China Radio International has English at 2000 for two hours every day on 6.95 and 9.92MHz, and there are two separate programmes aired from 2200. The first, a half-hour broadcast, is transmitted from Switzerland on 3.985MHz. The other, which lasts 60 minutes, can be heard on 7.17MHz.

Listening Easy

Radio Netherlands makes listening easy for people in the UK. It's carried by the high-powered medium wave transmitter on 1440kHz from 2130 to 2325, and it's also on the Astra satellite via World Radio Network. Some programmes during March that might tempt you to tune in include the second part of the special 'From the Wireless to the World Wide Web' on Wednesday 5th at 2152, repeated Friday 7th at 2252.

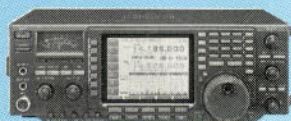
As Radio Netherlands celebrates its 50th anniversary in 1997, Pete Myers and Luc Lucas delve into the archives to tell the stations fascinating story. On Wednesday 26th at 2152 and Friday 28th March at 2252 you can hear 'The Marshall Plan' in which Marijke van der Meer looks at the achievements and the legacies of the European Recovery Programme that was started half-a-century ago.

That's all for this month, please let me know of interesting finds around the bands. Until next month, good listening.

END

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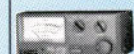
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DATONG FL2 FILTER	£69	KATSUMI ELEC/KEYER	£69	RACAL RA-1772 +	£995	YAESU FT-290	£199
DATONG RF Speech processor	£40	KENWOOD TH-28E	£149	REALISTIC PRO-2036	£179	YAESU FT-290	£225
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DRAE WAVEMETER	£15	KENWOOD TS-940S	£875	SIGNAL R-532	£139	YAESU FT-726 2/70	£645
ERA MICROREADER	£69	KENWOOD TS-930SAT	£639	SIGNAL R-535	£299	YAESU FT-790	£245
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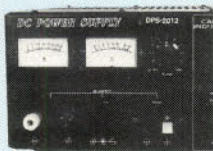


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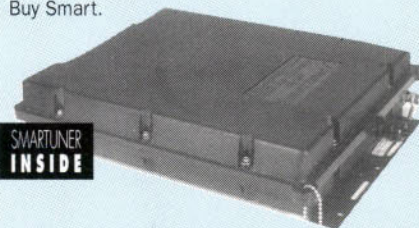
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AKD 2m (144MHz) rig, model 2001, boxed with mic. and manuals, as new, except for scratch on lid, £65. Mike G0IMG, QTHR. Tel: (01799) 527155.

AKD wave meter, £15. Altai multi tester, £15. Heathkit HW7 c.w. transceiver, £30. Grid dip oscillator, £20. Low pass filter, £15. Eddystone 'bug' key, offers. Codar RX, £10. Mr Gilbert, Swansea. Tel: (01792) 794423.

Alinco DR430 70cm (430MHz) mobile transceiver, new condition, boxed, etc., 35W high power, 3W low, ideal Novice radio, £210. 'Phone for full details. Bob G1WEX, West Midlands. Tel: (01384) 896879 daytime or 0121-602 0663 evenings (answer machine).

AOR AR800E 75MHz to 1GHz, a.m./f.m. selectable scanner with gaps, v.g.c., with NiCads, charger and two antennas, £125 boxed o.n.o. Sinclair Spectrum 128k + 2 with radio software and interfaces, £28 o.n.o. Andy, Gwent. Tel: (01633) 420805 between 6-7pm.

AOR AR800E scanner, 75-1000MHz with gaps, a.m./f.m. selectable, including antennas, charger, beltclip, soft case and NiCads, boxed, v.g.c., £125 o.n.o. Matsui 4099 150kHz to 30MHz, a.m./s.b., 76-108MHz, f.m. stereo, £75 o.n.o. Boxed, v.g.c., Spectrum +2, £15. Andy, Gwent. Tel: (01633) 420805 6-7pm.

AR88D, AR88L, £80 each. R109, £50. HF-225, all extras plus leather case, £350. Trio 9R59D, £50. Philips DC777 s.w. car radio, as new, £130. CR100, £45. Tel: Southend-on-Sea (01702) 522929.

Army Larkspur A41 manpack, complete in frame, etc., best offer or w.h.y.? Also Grundig Satellit 2000, £95. Wanted BC611 or SCR536. John G8BXO, 3 Westpark, South Molton, Devon EX36 4HJ. Tel: (01769) 573382.

AVCOM portable spectrum analyser (PSA65A), 2-1000MHz coverage, l.c.d. readout of centre frequency, battery or mains, little used, carry case, manual f.m. demodulator and speaker, v.g.c., £1000 o.v.n.o. Tel: Cheshire (01457) 762839.

Azden PCS-6000 2m (144MHz) 25W transceiver with wideband receive, plus airband, £175. Yaesu FRG-9600 v.h.f./u.h.f. scanning receiver with Raycom h.f. converter, £275. Yaesu FT-23R, no charger, £120. Capco 20m-10m loop, collect!, £120. Prefer write: 10 Basil Street, Stockport SK4 1QL. Messages (with great luck) on 0161-477 5303.

BC221AK, £35. B40/41 base tray, £10. Marconi RX AD118, manual, £10. Audio wattmeter, £10. Advance voltmeter, £10. RAF box kite, £35. No. 10 crystal calibrator, £15. 19 Set bits, Pye international RX, £15. Peter, Essex. Tel: (01255) 502195.

Capco magnetic loop antenna, 80m (3.5MHz), less control box, g.w.o., £49.99. 2m (144MHz) 7-element XYZL special antenna, boxed, £28.50. Calibration receiver, type 35A2, complete with five tuners, v.g.c., £94.99. Tel: Oxon (01869) 244166.

Citizen 120D+ dot matrix printer, boxed, condition as new, practically unused, 2000 sheets quality continuous paper, 11/240mm, £65. Balanced a.t.u., new verniers/roller coaster, approx 300W, cased, 10/160m, £75. Home-brew. G2FZU, Notts. Tel: (01636) 813847. No offers please, carriage extra.

Clearstone FM331A 3-ch ex-p.m.r. 114MHz RX, 85MHz TX, £12. Microphone (FT-290MkI), £10. Pye PFZUB 3-ch u.h.f. h/h, £10. Amstrad LQ350001 printer, p.s.u. faulty, £5. Pye P5000 spkr/mic., £10. Stephen G7EXZ, Wiltshire. Tel: (01722) 500995.

Complete 2m (144MHz) multi-mode station. Yaesu FT-290R with MuTek front-end, NiCads, charger, case, BNOS, 50W linear with receive pre-amp, Howes speech processor, desk mic. HB9CV, no split, buyer collects, £350. Rob, Mansfield. Tel: (01623) 459435 after 4pm.

Drake twins TX4C, R4C, perfect, boxed, manuals, MS4 sp.p.s.u., £525 o.v.n.o. R4C v/good, n/b, £250. MN2000 a.t.u., Denton 1.2K

linear, £350 pair. Offers for the lot. Tel: Beds (01525) 371152.

Eddystone 680X, 0.5-30MHz, £120. KW2000B with p.s.u., manual, £175. Murphy 62B, 0.15-30.5MHz, £60. R1155, £85. R210, 0.2-16MHz, £75. AR88 in cabinet, £120. Trio TS-120S transceiver, operating and service manuals, £260. Tel: Yorks (01482) 869682.

Eddystone 1650/9 ant. receiver, as new, offers. JRC NRD-525, £450. Tel: Edinburgh 0131-668 3578 9.30am to 4.30pm.

Eddystone, thinning out some doubles in my collection, several available, all in nice order and condition, s.a.e. for list, collection of larger items advised! Tel: Surrey (01372) 454832 or (0374) 128170 anytime.

Ferrograph model 2A/N half track tape recorder with manual, circa 1956. Very good working order, £20. Tel: Middlesex 0181-863 5150.

FL2000B amp, £250. Alinco DR2112 2m (144MHz) with quarter-wave whip + stainless steel collinear, £225. 100W 6m (50MHz) amp, £50. Realistic DX400 RCR, £50. Low pass filter LF30A, new, £25. Tel: Swansea (01792) 843166.

FRG-100 h.f. RX immaculate c/w manuals, boxed a.t.u., £375. R7000 RX immaculate c/w boxed remote control, £450. Alinco DR150E c/w boxed manuals, £250. FP-757HD p.s.u., boxed, good condition, £125. GOLDM, Gosport. Tel: (01705) 601174 evenings and weekends.

FT-101ZD MkIII, WARC, f.m., 500Hz c.w. filter, complete with operating and workshop manual, new p.a. valves plus spare set, g.w.o., £360. Tim Hague M0AFJ. Tel: (01908) 563600.

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Hallcrafters S120, v.g.c., buyer collects, £60. Eddystone 940, clean working condition, £90. Eddystone 770 v.h.f. receiver, clean, good condition, £170. J. A. Bird, 27 Manor Road, Bolehall, Tamworth, Staffs B77 3PF. Tel: (01827) 65641.

HMV radiograms: Model 521 (1931), £140. Model 570 (1935), £140. Model 581 (1936), £200. All in good condition and working. Tel: Derby (01332) 700658.

HW-8 QRP TX/RX with matching power supply, manual and *Hot Water Handbook* and original box, no modifications and in v.g.c., £120. Marconi marine Morse key, type 250 - 1195-01, £45. Pete, Bristol. Tel: (01454) 887461.

Icom IC-781 with matching speaker, Versa tuner, 5 3kW roller coaster tuner, ERA Microreader and leads, Shure 444D microphone, Vibroplex 'Brass Racer' bug key, all immaculate and boxed, £1750. G4FAV, West Midlands. Tel: (01384) 423571.

Icom IC-R70 receiver with c.w.-w. RTTY, s.s.b.-N, a.m., fitted f.m., notch filter, RIT, PBT, 1kHz, 100Hz, 10Hz, steps, a.g.c., narrow wide, a.f./r.f. gain, monitor on/off, etc., boxed, like new, £240. Tel: Warwick (01295) 670749.

Icom ICR-7000 v.h.f., 25MHz-2GHz, manual, boxed, like new, £550. Kenwood R-5000 + v.h.f., £600. Icom ICR-71E, g.w.o., manual, £400. NRD-525, boxed, mint condition, £550. Sony CRF-320 32 band digital world zone, £350. Sony 2001D with airband, £180, swap or sale above. Tel: London 0181-813 9193.

Jim QRP transceiver MX14S, 20m (14MHz) 2W s.s.b./c.w. with NiCad batteries and charger, £95. Derek, Caernarfon. Tel: (01286) 674455 evenings or weekends.

Kenwood AT250 automatic antenna tuning unit, as new, in original box with manual, £190 or will part exchange for a Yaesu wide-band transceiver, v.h.f. or v.h.f./u.h.f. FT-3000M considered. Derek, Caernarfon. Tel: (01286) 674455 evenings or weekends.

Kenwood R1000 receiver, 0-30MHz with separate a.t.u., £200 plus carriage, not boxed or instructions s/k sale. Wanted Kenwood a.t.u. AT230, preferably boxed and instructions. GW4XKE, QTHR. Tel: (01222) 512959.

Kenwood R1000 receiver, immaculate, as new, boxed with manual and all accessories, £250. Sorry, no offers. Tel: London 0181-785 9325.

Kenwood TH-79 dual-band 2m/70cm (144/430MHz) hand-held, plus power supply and other extras, all boxed in mint condition, £350. Tel: Yorkshire area (01302) 350873.

Kenwood TM-733E dual-band transceiver, boxed with MC55 mobile microphone and DFK3B detachable front end panel kit, £475 o.n.o. Kenwood TH-28E hand-held transceiver, boxed, £165 o.n.o. Graham G7MLW, Glos. Tel: (01453) 828474.

Kenwood TS-450S h.f. transceiver, fitted auto a.t.u. and general coverage, like new and boxed, £750 o.n.o. £800 with Manson 25A power supply. Tel: Mid-Glamorgan (01443) 772387 or (0973) 950385 anytime.

Kenwood TS-780 dual-band all-mode for sale with Diamond triplexer MX2000 mic., manual, boxed, mint, two owners from new, non smokers, sell for, £600 o.n.o. Swap for Kenwood TS-680S h.f. 6m (50MHz), Icom IC-729. Also for sale SP767, £50 o.n.o. Mike 2E1FCG, S. Yorkshire. Tel: (01226) 742971 after 1600UTC or weekend after 1900UTC.

Kenwood TS-850AT with DSP-100 additional s.s.b. and c.w. filters, as new condition, boxed with manuals, moving house forces sale, £950 o.v.n.o. Chris G0DQW. Tel: (01772) 685919.

Kenwood TS-850S, boxed, manual, £950. SP430 boxed, £25. MC85 boxed, £70 or ex TS-850S for FT-101ZD, MkIII with cash adj. GOONH, QTHR. Tel: W. Midlands (01384) 565614.

Kenwood TS-850SAT, 1.8kHz s.s.b. filter, SP31 matching speaker, £1050. Daiwa PS304 30A supply, £75. Daiwa CN101 s.w.r./p.w.r. meter, £35. Yaesu G1000SDX rotator with control, £300. Datong Morse tutor, £35. G0ULL, QTHR. Tel: (01924) 210117.

Yaesu FT-727 dual-band hand-held, FNB3 2 x FNB4, batteries, new cells, s/p mic., head set, VOX, NC15 desk p.s.u. charger, mobile mount, car adapter, charger, soft case, manual, will split, £260. Garry G0FOY, Cheshire. Tel: (01625) 530200.

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Yaesu FT-73 70cm (430MHz) hand-held NC29 rapid desk charger, 2 x FNB10, new cells, FNB-11 12V pack cell case, speaker mic., soft case, manual, boxed, £180. Garry GOFY, Cheshire. Tel: (01625) 530200.

Yaesu FT-757GX, boxed, £550. Yaesu FC-700 a.t.u., £120. Yaesu FT-221R 2m (144MHz) multi-mode, £255. Miller compact h.f. receive antenna, £40. Maspro 5-element 2m (144MHz) beam, £25. All mint condition. Gary G7VAU, Cheshire. Tel: (01928) 567707 (eve) or (0468) 616768 (mobile).

Yaesu FT-757GXII with Yaesu FP-700 p.s.u., £525. Yaesu FC-102, 1.2kW a.t.u., £180. Cushcraft R7 multi band vertical antenna, £175. Altron AQ6-20 multiband beam, £60. Kenwood MC-80 desk mic., £50. Gary, Coventry. Tel: (01203) 559702.

Yaesu FT-76 70cm (430MHz) hand-held, two NiCads, charger, soft case, boxed as new, £170. Netset PRO44 v.h.f./u.h.f. scanner, NiCads charger/p.s.u., boxed, as new, £80 plus free magmount aerial. Tel: Tamworth (01827) 58004.

Yaesu FT-767GX h.f./v.h.f. transceiver, has built-in 2m (144MHz) module, auto a.t.u. and power supply, comes with all manuals and is in excellent condition, can be seen working, £850. Brian GW0GW, Mid-Glamorgan. Tel: (01443) 836622 or mobile on (0976) 836999.

Yaesu FT-767GX with 50/144 432MHz modules, £1100. FT-726R with 50/144 432/SAT modules, £725. Dual-band 144/432 hand-helds FT-470 d.c. adapter, battery cases, soft case, £200. FT-530 NiCad, charger, battery cases, soft case, £250. Mick G4ITF, Portsmouth. Tel: (01705) 386184.

Yaesu FT-980, 0-30MHz transceiver with FC-757 a.t.u., boxed with instructions, v.g.c., £700. Kenwood TM2550A 144MHz with Watson 10A p.s.u., never used, £180. Timewave DSP9+, £110. Dewsbury Morse tutor + keyer, £35. Darren, Hull. Tel: (01482) 446592.

Yupiteru 7100EX 100kHz, 1695MHz, u.s.b., l.s.b., a.m., f.m., w.f.m., boxed, manual, soft case, c/w 3 antennas, unwanted Xmas present, charger, Ni-Cads, used for short time, £225. Brian, Nottingham. Tel: 0115-975 3658.

Exchange

Amstrad PCW8512 computer with printer - Centronics RS232C software - discs, Tasword Fleetstreet editor, g.w.o., exchange for g.w.o. r.f. signal generator h.f. or v.h.f. Marconi or Pye manufacture. Tel: Essex (01255) 820116.

Canon EOS650 telephoto lens + wide angle, flash, etc., fitted metal case, £350 or exchange for WS No.

52 RX/TX, must be complete and in good working order. Tel: Middlesex 0181-384 9199.

Commodore MPS 801 printer, Commodore disk drive 1541 with leads, exchange Morse RTTY reader, Eddystone 750 communications receiver, good condition, exchange for older type transceiver or separates. Tel: (01254) 832350.

Durst Complete b/w colour dark room, transformer 2.8 Lens C/100 TPA T/100 focus finder dish warmer, colour safe light chemical paper, exchange for R7IE or NRD-525. Vince, Huntingdon. Tel: (01487) 823879.

Icom IC-R7IE comms. receiver, v.g.c., swap for JRC NRD-535. Can deliver and collect. Tel: Reading area (01734) 812476.

Please have a look in your cupboards and drawers, has anyone out there got a BCC computer based weather satellite receiving station in exchange for 12 assorted p.m.r. hand-helds? Clive, Birmingham. Tel: 0121-788 8447.

RSGB Antenna Experimenters Guide for any volume of ARRL Antenna Compendium. G3JMO, QTHR. Tel: Redcar (01642) 486155.

Short Wave Magazines, 180 in total, some older and rarer editions, exchange for decent h.f. general coverage receiver DX-302 or similar. Disabled, hence no transport, any offers? Tel: Chester (01244) 310271 evenings please.

Tokyo HY power antenna coupler HC200 a.t.u., 80m to 10m (3.5 to 28MHz), built-in s.w.r. power meter, exchange for PRO2006 scanner or PRO2006 equivalent. Must be 25 to 1300MHz. John MIAUN, Staffs. Tel: (01902) 897839.

Wanted

1920s-1930s valves, radios, crystal sets, speakers, wanted urgently. Tel: (01642) 490269/(0410) 408475.

Any info. 504-A set tester by Supreme Instruments Corp., Mississippi/America and circuit capacitor analyser by A. H. Hunt, also wanted 455kHz c.w. filter, Collins or similar, 250Hz or 500Hz type. GW3PDW, QTHR. Tel: (01437) 891017.

ATU for Icom 706, urgent. For sale Icom 740 with f.m., £550. Tel: Derbyshire (01283) 221870.

Bearcat UBC-760XLT mobile/base scanner, early model, must be in excellent condition, will pay, £110. Francis, Leicester. Tel: 0116-223 9498 after 6pm.

Cabinet/enclosure for an Eddystone EC958 receiver, ie. 7in high front panel (4U). David, Nr. Rugby. Tel: (01788) 574099.

CFL-260 600Hz and CFL-230 300Hz filters, plus mounting PCB and NVA-515 speaker for JRC NRD-515 receiver. GOPHT, Loughborough (01509) 231289.

Cheap reliable 70cm hand-held, FT-43R preferred. FT-23R to sell/swap. Also want 2m/70cm 144/430MHz transverter, 5/10W in, 25/30W out. Small 70cm (430MHz) antenna appreciated too, such as lightweight 6-ele quad. Prefer write: 10 Basil Street, Stockport SK4 1QL. Messages (with great luck) on 0161-477 5303.

Copy of UHF Manual and schematic for Heathkit DX-YOU, will pay reasonable copying cost. James Berry, USA. Tel: 330 922 0158.

Digital read-out mod. unit for FRG-7 and fitting instructions if possible. Alex, Kent. Tel: (01732) 864920.

Eddystone 770S, 770U MkII, 770R MkII in very good condition, your price, will collect. Mike, E. Sussex. Tel: (01892) 852817.

Eddystone EB35, EB36, EC10 MkII receivers, must be in good condition and working order, urgently required. Jim McGowan, 20 Keats Avenue, Romford, Essex RM3 7AR. Tel: (01708) 340304.

Eddystone receivers, please look in your loft and make my day! Still seeking 960, 820, 358, 358X, diecast speakers, etc., will pay fair price, plus collection is possible, thank you. Peter Lepino, Surrey. Tel: (01372) 454381 or (0374) 128170 anytime.

For reception set R216, its front panel metal cover contains two elevating screws, also metal panel cover for supply unit containing a spares case and festoon lamps, any help please. Andrew Humphris, Warwick. Tel: (01926) 400876.

Handle and photocopy of owners' manual for Sangean ATS803A. Tel: Liverpool 0151-486 2606.

Heathkit GR78 and Eddystone 940 RXs wanted, good mechanical condition, prefer working order but faulty okay if price reasonable, could inspect/collect within 100 miles of Hull. Cash paid. David G4EBT, QTHR. Tel: (01482) 876702 anytime.

Icom IC-27E manual or operating instructions. Tony GOCFA, Swindon. Tel: (01793) 520734.

Icom IC-M12 marine hand-held. John G4BYV, Norfolk. Tel: (01362) 638142.

Information and circuit diagram of Realistic scanner 300ch PRO2004, suspect common fault, need to chat about it, also manual on Marconi VHF/UHF Mobile Test Set, type TF2950/5. Roger GW3XJC, Mid Glamorgan. Tel: (01656) 733729.

Instruction books for NEC TV FS-5906PIX and VCR N9033K, buy or borrow. All expenses refunded. Ron G4MNB, QTHR. Tel: (01793) 826325.

Kenwood loudspeaker, type SP430 (or SP23), early 'Radiospares' miniature plugs, chassis mounting laminated sockets, non-reversible, 9mm C to C, used on f.m. aerials, 100ft or so of 75Ω twin feeder. Alan G3MBL, Bury St Edmunds. Tel: (01284) 827379.

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Manual for CD711.2 O'Scope, buy, borrow. Viney, 7 Pentre Bach, Barmouth, Gwynedd LL42 1HT.

Mk123 set RX unit still wanted. Details of dial drive gearing would help as I now have suitable cap. G3JQL, 22 Alnwick Road, Newton Hall, Durham DH1 5NL. Tel: 0191-386 1116.

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6000. Grundig model 1400. Hugh McCallion, No. 8 Strathard Close, Coleraine, Co. Londonderry, N. Ireland BT51 3ES. Tel: (01265) 43793.

Service manual/circuit diagram for pictured receiver, identity unknown. Mark Higgins, 52 Gilby Road, East Court, 3310, South Africa. Tel: 27 363 24394.



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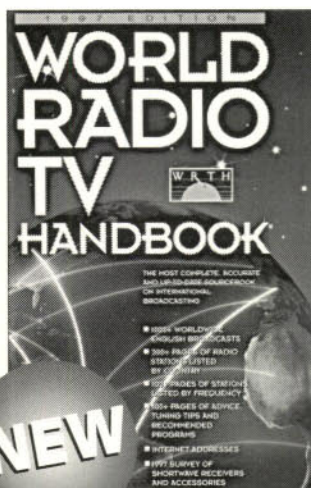
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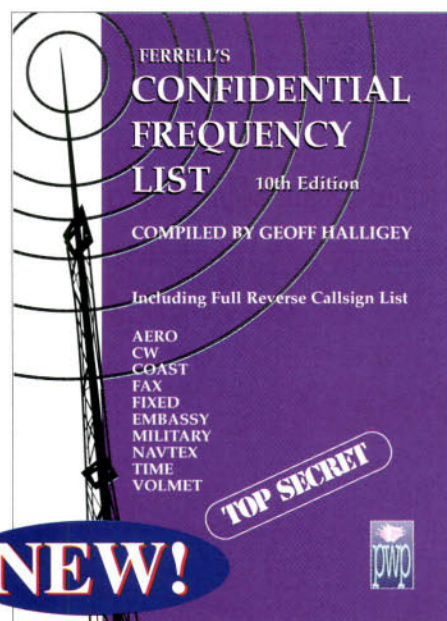
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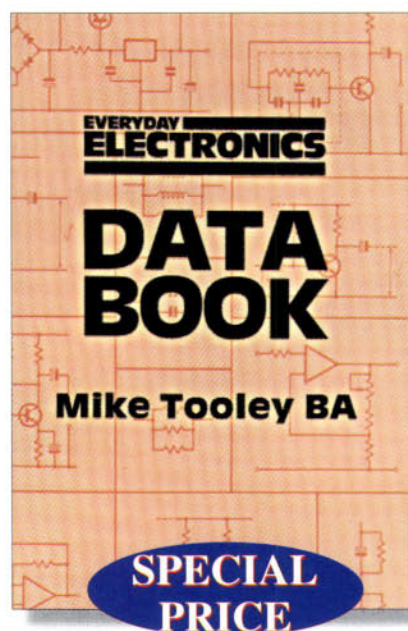
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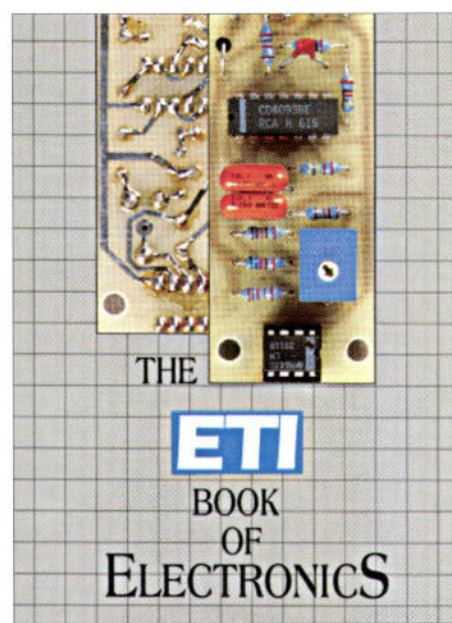
The book is also of a very convenient size, ideal for 'handy' reference use and for students with limited book space in their briefcases, etc. **Recommended.** Order this month and get the *EE Data Book* for the special price of **£7.95**.



The ETI Book Of Electronics

An unusual book this one - as it's a useful mixture of an introductory textbook and projects guide. Ideal for the raw beginner and the inexperienced who wish to learn while carrying out projects, it will provide good explanations and ideas.

Some interesting projects are included plus some 'chatty' explanations of basic electronic theory. Good diagrams and explanations are backed up with a 'light' reading approach. Good reading and helpful. **Recommended** at only **£10.95**.

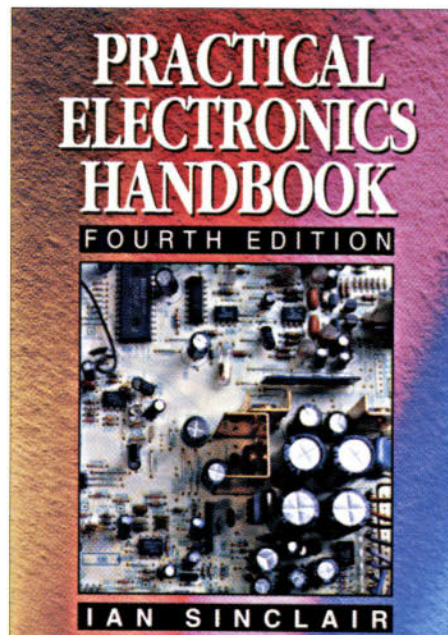


Practical Electronics Handbook

(4th Edition)

In effect this book is a reference

to order any of the titles mentioned on form in this issue or telephone M



source for components and how they work and typical circuits, etc. Ideal for the more experienced electronics enthusiast, it provides 'thumb nail' design data and enough information to provide useful building blocks for circuit design and construction.

There's also very good coverage on digital and general computer and microprocessor electronics and digital techniques, backed up with pin-out details for important integrated circuits. A very useful reference and design source book, particularly for those interested in digital electronics and computer work. **Recommended.** The *Practical Electronics Handbook* is available for **£13.95.**

Secrets of RF Design

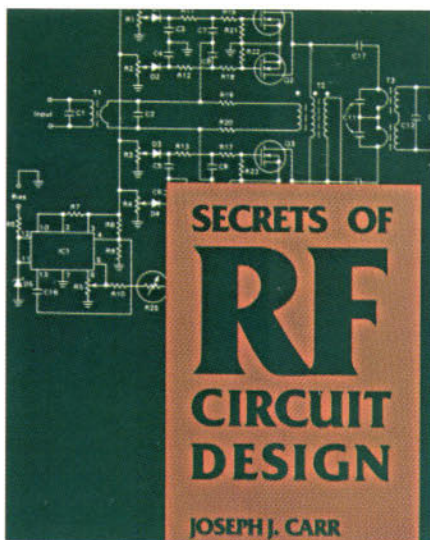
The author, Joe Carr, is very well known for his work in Amateur Radio and this book is a good

example of his output. Although the title of the book is rather misleading.

This is because rather than just being a 'circuit design' book...it's in fact packed throughout with circuits, projects and very practical ideas. Everything to do with r.f. is covered - from antennas to measuring devices and from receivers and transmitters to antennas.

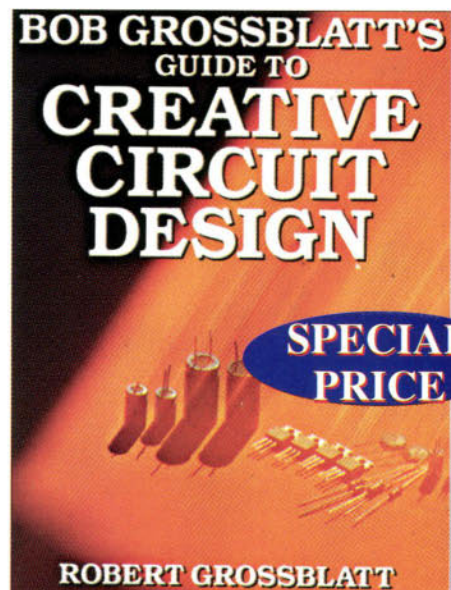
The author provides an excellent introduction to various components and techniques before leading the reader gently (and interestingly) into more complex r.f. techniques, circuits, ideas, projects and design suggestions. An excellent book - **very highly recommended** for any radio enthusiast's bookshelf.

Secrets of RF Design costs **£18.95.**



Bob Grossblatt's Guide To Creative Circuit Design

Here's another book with a somewhat misleading title. In reality it should be called 'Creative Digital



Circuit Design' because that's exactly what it covers. In effect the book provides a very good introduction for anyone starting off in digital electronics.

Although very 'American' in approach, anyone interested in introducing themselves to digital techniques would find it difficult to find anything better because of the author's style in describing theory, techniques and practical ideas.

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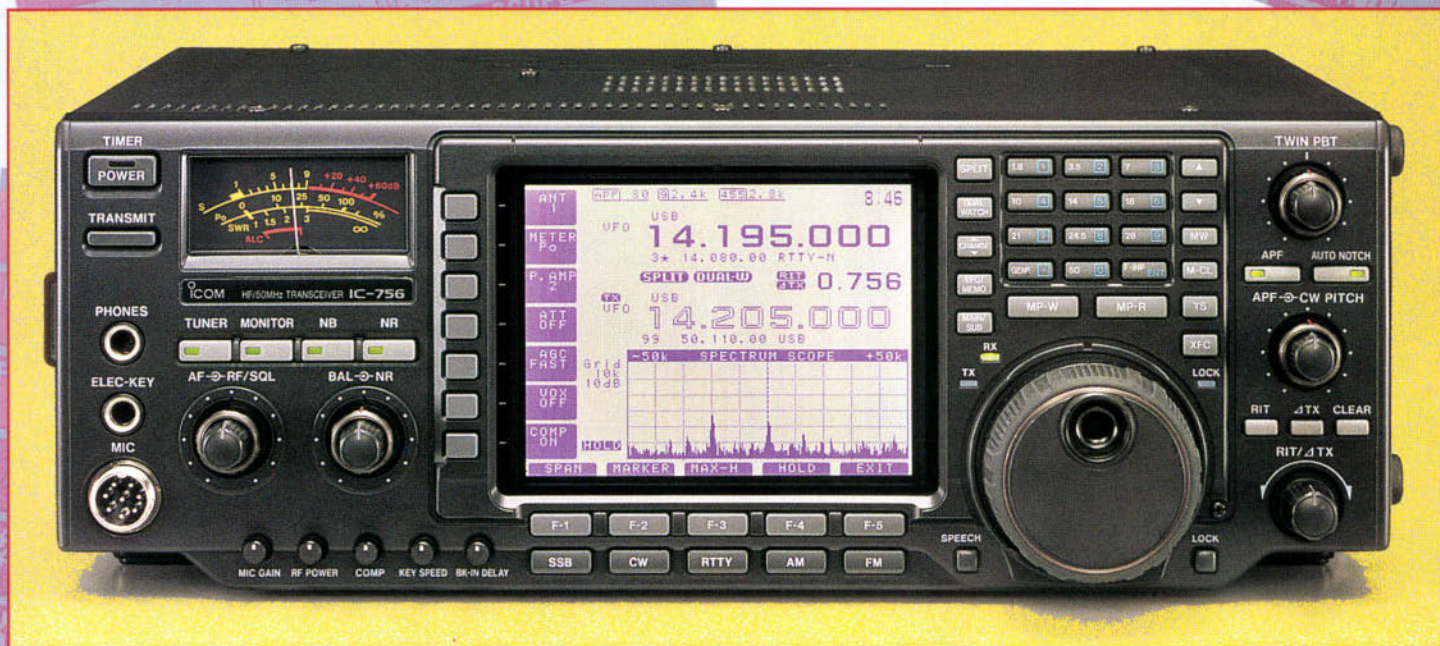
Index to Advertisers

A H Supplies.....	93	Lake Electronics.....	93	Radio Tech.....	31
Aerial Techniques.....	72	Langrex Supplies.....	79	RAS Notts.....	93
AKD.....	56	Maplin Electronics.....	6	RSGB.....	83
Cheshunt Marriott Hotel.....	53	Martin Lynch & Son.....	41, 42/3	Short Wave Magazine.....	99
Colomor Electronics.....	79	Monitoring Times.....	30	SMC.....	4/5
Comm Tech Services.....	76	Multicomm 2000.....	86/87	Sowter Transformers.....	79
Datong Electronics.....	31	NCT Enterprises.....	72	Specialist Media & Marketing.....	84
Eastern Communications.....	29	Nevada Communications.....	16/17	Spectrum Communications.....	69
Essex Amateur Radio Society.....	48	Norbreck Exhibition.....	30	SRP Trading.....	20
Fairhaven Electronics.....	93	Number One Systems.....	84	Sunrise Electronics.....	44
Hately Antenna Technology.....	31	Odyssey Phones.....	64	TAD Communications.....	76
Haydon Communications.....	11, 12/13	PCB Service.....	53	Tennamast.....	31
Holdings Amateur Electronics.....	93	Pervisell.....	69	Victor Brand (WACRAL).....	93
Howes, C M.....	48	Photo Acoustics.....	88	Vine Antenna Products.....	31
Icom (UK).....	IBC	Picketts Lock '97.....	49	Waters & Stanton.....	IFC/1, 2
J Birkett.....	93	PW Services.....	72	Yaesu.....	OBC
JPG Electronics.....	72	Pyramid Electronics.....	69		
Lab Centre.....	32	Quick Route Computers.....	81		

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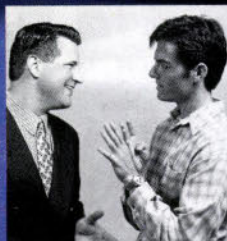
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