UPWARDLY MOBILE

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&
Kenwood TM-V7E

LONDON SHOW ISSUE

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2m Mobile

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

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<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>TS-690S</td>
<td>HF + 6m transceiver</td>
<td>£1199</td>
</tr>
<tr>
<td>FT-416G</td>
<td>2m 5W handy</td>
<td>£199</td>
</tr>
<tr>
<td>FT-650/PS</td>
<td>24-56MHz transceiver</td>
<td>£1299</td>
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<tr>
<td>938V</td>
<td>2m handi S22</td>
<td>£59</td>
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<td>GEE-890</td>
<td>2m handi S20/22</td>
<td>£55</td>
</tr>
<tr>
<td>AR-303</td>
<td>Rotator</td>
<td>only £39</td>
</tr>
<tr>
<td>FT-10R/A06</td>
<td>2m handi</td>
<td>£199</td>
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<td>FT-5200</td>
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<td>£429</td>
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2m handi

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<tr>
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<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>R5</td>
<td>Cushcraft</td>
<td>save £60 £239</td>
</tr>
<tr>
<td>R7</td>
<td>Cushcraft</td>
<td>save £70 £319</td>
</tr>
<tr>
<td>SQ-144</td>
<td>2m Swiss quad</td>
<td>£35</td>
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<tr>
<td>GP-23</td>
<td>2m colinear</td>
<td>£35</td>
</tr>
<tr>
<td>88F</td>
<td>2m 8/8 mobile</td>
<td>£13</td>
</tr>
<tr>
<td>12SE</td>
<td>12m mobile whip</td>
<td>£13</td>
</tr>
<tr>
<td>15SE</td>
<td>15m mobile whip</td>
<td>£13</td>
</tr>
<tr>
<td>17SE</td>
<td>17m mobile whip</td>
<td>£13</td>
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Priority Reference Code MA003
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 you yourselves 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' earphone) selling via promotions in weekend newspapers for up to £1.50!

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!
Receiving

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 (hihi!) and decided to plan an update of my station. The h.f. rig was seven years old, the v.h.f.-u.h.f. 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-8900R v.h.f./u.h.f. rig arrived as part of the plan. At last, a new 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 MOANM loaned me one so I got back on the air, thanks John. The

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 weon 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 GA4ASR of 'VHF Report' would be very interested to hear about it.

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 Lawrence 2E1/F1F (aged 17)
Essex

Editor's comment: All noted Matthew, thanks for writing. Any other comments on this subject readers? I'd be pleased 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. Fair enough, using the size 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 chump, 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 on to 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 'Emers' 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 to reply:

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-100GO!TM, the 'Rolis Royce' of the range comes fully equipped with very conceivable accessory plug.

The FT-8000 mobile, aimed at the Cost Conscious mobile market, is competitively priced with a built-in "packaged" mobile market, is competitively priced with a built-in very conceivable accessory plug.

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-239. In doing so, Yaesu is providing a much better signal path for those uh.f. signals, which, on the FT-8000 receive-side, go all the way up to 1.3GHz! Barry Cooper G4RKO Yaesu UK Ltd.

lacking information

Dear Sir

Under the 'Receiving You' heading in January's issue of PW was an article by Roy Maskrey G4TBD 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 want to arrive home to find one has bought a "pup".

Like Roy, I have retained my old receiver which, believe it or not, can see lips curling is a one transistor and one i.e. 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 any other magazine. We reserve the right to edit or shorten any letter. The views expressed in letters are those of the Editor and not those of Practical Wireless.

Send your letters to the PW Offices, marking it for the PW, and the Editor will be more than happy to include them in his selection.

John Noble
Kent
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Practical Wireless, March 1997
COMMUNICATIONS

The accessories specialists

SERENE BASE ANTENNAS

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<thead>
<tr>
<th>Antenna</th>
<th>Description</th>
<th>Price</th>
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<td>TSB-3001</td>
<td>AL 144MHz/3.4dB (1.4m)</td>
<td>£29.95</td>
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<td>TSB-3002</td>
<td>AL 144MHz/5.5dB (2.8m)</td>
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<td>TSB-3001</td>
<td>GF 144MHz/7.5dB (2.7m)</td>
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<td>TSB-3015</td>
<td>GF 144MHz/5.11dB (5.4m)</td>
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<td>TSB-3008</td>
<td>GF 144MHz/5.11dB (2.8m)</td>
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<tr>
<td>V-2000 Diamond</td>
<td>6m/27cm, 2.1/2.6/4dB (2.5m)</td>
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<td>GP515 Comet</td>
<td>6m/27cm, 2.6/3.6dB (2.4m)</td>
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HANDHELD ANTENNAS

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<tr>
<td>T-2602</td>
<td>2m/10cm/23cm (2/3.5/5.5dB) flexible antenna with wideband receive (14' long BNC)</td>
<td>OUR PRICE £22.95</td>
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DB-770H

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<tr>
<td>DB-770H</td>
<td>High gain 2m + 70cm telescopic antenna with wideband receive.</td>
<td>OUR PRICE £24.95</td>
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TELESCOPIC MASTS

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<tr>
<td>MT-3001</td>
<td>1/2diameter telescopic mast. Starting at £21.95</td>
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HF ANTENNAS

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<tr>
<td>R-10</td>
<td>10m half wave vertical (8mm optional)</td>
<td>£295.00</td>
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<tr>
<td>AV-3</td>
<td>14-21MHz vertical 4.3m long</td>
<td>£360.00</td>
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<tr>
<td>AV-5</td>
<td>2.5-14-21-28MHz vertical 7.4m long</td>
<td>£169.00</td>
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<tr>
<td>AFPA-1</td>
<td>8 Band Vertical</td>
<td>£229.00</td>
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<td>AS-3</td>
<td>4.2-3MHz Yagi</td>
<td>£269.00</td>
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<td>Carolina Windom</td>
<td>2'40-10m (80m)</td>
<td>£98.95</td>
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<td>Carolina Windom</td>
<td>30-10m (120m long)</td>
<td>£84.95</td>
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<tr>
<td>CBL-30</td>
<td>3.1 balun (100MHz)</td>
<td>£24.95</td>
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<tr>
<td>Comet CARH-9</td>
<td>5m half wave mobile antenna. Gain 2.15dB</td>
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SECTIONAL MASTS

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<td>1'/8 dia</td>
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<td>1'/4 dia</td>
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<td>2'/4 dia</td>
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DELUXE GSRVS

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<tr>
<td>DELUXE GSRVS</td>
<td>Multi-stranded plastic coated heavy duty antenna wire. All parts reusable.</td>
<td>£49.99</td>
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ACCESSORIES

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<th>Accessory</th>
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<td>Nissei RS-402</td>
<td>125-825 MHz (200W)</td>
<td>£69.95</td>
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<td>Nissei RS-102</td>
<td>1.8-150MHz (200W)</td>
<td>£69.95</td>
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<tr>
<td>Nissei RS-502</td>
<td>1.8-525MHz (200W)</td>
<td>£129.95</td>
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<tr>
<td>MFJ-259</td>
<td>144-44MHz (60W)</td>
<td>£34.95</td>
</tr>
<tr>
<td>VECCTRONICS VC-300DLP</td>
<td>UK's best selling ATU. 300V (PEP), dummy load, VSWR meter, 3 way ant, switch &amp; balun for open wire feeders.</td>
<td>£149.95</td>
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- MA-399 Mobile holder. Fits all hand held radios. Sticks onto dashboard of car.
- QS-200 Air-vent h/held holder
- QS-300 Desk top h/held holder
- MA-399 Mobile holder. Fits all hand held radios. Sticks onto dashboard of car.

**QUALITY USED EQUIPMENT QUALITY USED EQUIPMENT QUALITY USED EQUIPMENT QUALITY USED EQUIPMENT**

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<td>IC-729</td>
<td>As new</td>
<td>Communications receiver</td>
<td>£699.95</td>
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<td>IC-735</td>
<td>VGC</td>
<td>Communications receiver</td>
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<td>IC-751</td>
<td>Excellent condition</td>
<td>Communications receiver</td>
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<td>IC-471</td>
<td>70cm all mode base</td>
<td>Communications receiver</td>
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<td>IC-8700</td>
<td>Wideband receiver</td>
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<td>IC-R70</td>
<td>SW receiver</td>
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<td>IC-R71</td>
<td>Miniature h/held scanner</td>
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<tr>
<td>IC-R71</td>
<td>Miniature h/held scanner</td>
<td>Communications receiver</td>
<td>£199.95</td>
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**OPTO SCOUT 3.1Mk2**
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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 Commaught 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 operation. 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 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 G3SRC 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 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 interested, why not come along and have a go?  

Colchester Radio Amateurs Honour G3FJ

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 G3FJI 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 for the Novice Licence Amateur Radio Examination, with similar success.

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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.

Colchester Radio Amateurs Honour G3FJ

(L to R) Colin Smith GOLIN (Chairman of Colchester Radio Amateurs), Frank R. Howe G3FJF (Hon. Secretary of Colchester Radio Amateurs) and Peter Chadwick G3RZP (Ex- RGB President and member of the RGB Council.)

Zoe says:

"keep the News and those Club magazines coming!"
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 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. JO01 or J003 etc., it would 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 £0.50 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 9RX. Brief details may also be obtained on Packet via G3OOL @ GB7BNM or via E-mail from warc@tinannan.demon.co.uk

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 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.

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

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? You hear 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 (hand-pressed) magazine and newsletter editors. David Williams G5HY, of Kenwood (UK) thought so too! So, a new competition was born!

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

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

The panel of judges (as last year) are: Dave Wilkins G5HY, myself, (Zoe 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 you!

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 place on S17 every last Thursday in the month at 8pm throughout the year, under the auspices of Les GW3SON. Listen out for GWOARA on 2m. Other club members are also welcome to join in.

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

Committee Change

The Aberystwyth & District Amateur Radio Society now have a new committee, consisting of Chairman - David Williams GW4TUC, Secretary - John Woodward GW6DK, Treasurer - Chris Davies GW7HAE, Ordinary Members - Bob Southwood GW7GNC and John Barrett GW7JJP, Membership Secretary - Wyn Williams GW4TUD.

Katy GWOSFO 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 GW5RZ 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 7pm at 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 place on S17 every last Thursday in the month at 8pm throughout the year, under the auspices of Les GW3SON. Listen out for GWOARA on 2m. Other club members are also welcome to join in.

Editor of PW, Rob Mannion G3XFD, receiving a FADARS hat from Dennis G0SLL at his recent club visit to the Folestone & District Amateur Radio Society, Sitting down, behind the hat, is Stan G6DNW. Photo by Barry G0CRC

Practical Wireless, March 1997
DX-70 TH  High Power 8 W + HF Transceiver
A superb compact, all mode 140MHz transceiver covering all HF bands plus 6 metres. Excellent receiver with narrow filters fitted as standard.

**DR-140 2 Meter Mobile**
- 51 memories
- Programmable Time Out
- Alpha numeric display
- 50W FM output
- CTCSS encoder
- Electronic squelch

**DR-430 70cm Mobile**
- 51 memories
- Programmable Time Out
- Alpha numeric display
- 35W FM output
- CTCSS encoder
- Electronic squelch

**DR-M06 6 Meter Mobile**
- 100 memory channels
- CTCSS encoder (50 tones), decoder as an option
- Time-out timer
- Output 10W
- Modifiable to cover 430-600MHz

**DR-150 2 Meter Mobile**
- Extended receive
- DX-70 TH  Output: 517MHz
- Dual display
- Programmable encoder
- Dual VFO
- CTCSS encoder (50 tones)
- Search and Scan facilities
- Squelch timer
- On air cloning facility

**DR-605 Dual Band Mobile**
- 60W FM mobile - 50-440MHz, low output - nice to use!

The dealers listed in the advert have the full support and backup of the Alinco factory for spares and after sales service.
ALINCO
AT A DEALER NEAR YOU!

DX-70 HF + 6 mtr Transceiver
Alinco’s standard compact 100W HF plus 10W 6 metre transceiver with narrow receive filters fitted as standard. Unbeatable value for money!

EDX-1 HF Antenna Tuner
The EDX-1 is a coaxial tuner with built-in SWR and Power meters. The ATU is rated at 120W and covers 160-10 meters including WARC bands.

EDX-2 Automatic Random Wire Antenna Tuner
Quickly matches random wire antennas, mobile whips, verticalls, inverted Ls. Wired for DX-70 or Icom 706 but can be used with any HF Transceiver.

EDX-70T


DJ-65 Dual Band Handheld
A brilliant twin band handheld that does everything including spectrum display of adjacent channels. The receiver has a superb front end that does not suffer with breakthrough like other handhelds and has CTCSS-DTMF built in as standard.

DJ-S41C VHF Handheld
A micro-sized handheld at an unbelievable low price. Ideal for the newcomer or repeater operation.

DJ-191 2 Meter Handheld
A new slim line 2 meter handheld that is easy to use and has an enormous clear display.

DJ-180 2 Meter Handheld
The controls are laid out so that you will not have to spend hours studying the manual. A highly visible LCD display means you will not need a magnifying glass to read it!

DJ-190E Low Cost Handheld
A powerful super slim 2m handheld with a huge easy to read display.

DJ-191E 12V cable for handhelds.

DJ-191E

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N Ireland
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UK distributor

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Dry cell case £12.95

ESC-29
Soft Case £14.95

EOD-61
Rapid Charger for DJ-65 and DJ-190 £14.05

EBC-37
12V cable for handhelds £14.95

EME-12
Headset and single headphone for all handhelds £49.95

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From 10-11 October

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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 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 balance out the attraction.

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

**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 conductor in my very basic explanation.

As soon as another electron (a
Resistor colour code

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<thead>
<tr>
<th>Numbers</th>
<th>Tolerance</th>
<th>±%</th>
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<tbody>
<tr>
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<td>None</td>
<td>20</td>
</tr>
<tr>
<td>Brown</td>
<td>Silver</td>
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</tr>
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<td>White</td>
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</table>

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

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. 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.

Fig. 3: A selection of resistor types.

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.

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.

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

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!

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

Practical Wireless, March 1997
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(1000 channel with hyperscan) just £359.99 with antenna and guide
or £299.99 alone inc p&p*

- 1000 memory channels (100 channels x 10 banks)
- 10 limit search banks; 100 monitor channels
- 50 channels/sec & 50 steps/sec scanning speeds; large orange backlit
  lcd display; rotary or keypad frequency control.

size: 232mm w x 210mm d x 90mm h.

modes: am, fm and wfm.

step sizes: 5kHz, 12.5kHz and 50kHz (wfm).

comes with telescopic antenna and owners manual.

we are offering with each purchase of the pro 2042 at a cost of £359.99 inc p&p*, both a copy of the 5th edition
uk scanning directory (rrp £18.50) and a choice of either

our skyscan dx v1300 discone antenna (rrp £49.95) or our skyscan desk 1300 discone antenna (rrp £49.00).

to take advantage of this special offer or for more information, call either rod, richard or mary on:
0121-460 1581 or 0121-457 7788

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

free p&p applies to mainland uk deliveries only.

frequency coverage

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<tr>
<th>freq (mhz)</th>
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<td>AM</td>
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specifications

- 10 memory channels (10 channels x 10 banks)
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<td>108.00-136.995</td>
<td>12.5kHz</td>
<td>AM</td>
<td>760.000-1300.000</td>
<td>12.5kHz</td>
<td>FM</td>
<td></td>
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specifications

- frequency range: 1mhz to 2.4ghz
- sensitivity (typical): 800uv @ 10mhz 500uv @ 30mhz 225uv @ 150mhz
  640uv @ 450mhz
  1mv @ 850mhz
  <10mv @ 1.3ghz
  <200mv @ 2.4ghz

- maximum input power: ±15dB (50mV), 1.26V RMS
- input impedance: 500ohm
- timebase stability: +/-1ppm 25-35°C
- timebase ageing: 1ppm per year typical
- timebase accuracy: +/-1 count in LSD
- gate time: fast 0.25 seconds for 1kHz resolution. slow 2.5 seconds for 100Hz resolution
- power: internal nicad batteries x 4 AA, 700mAH or mains
  adapter/charger, 240VAC input, 12VDC output, centre positive
- size: 100 x 87 x 28mm

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.

rrp £135.95

srp price £89.95

£5 p&p
New From Lake Electronics

Not on 10MHz yet? If not, you may be interested in the latest transceiver from Alan Lake G4DVW.

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 man - 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 fascinating 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 rest 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 Marmion G3XFD

Copies of F. J. Camm - The Practical Man 1895-1999 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 £10.50 inc. P&P. Please send your cheques (Payable to Gordon. C. Cullingham) to: 4 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 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 1998 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 Lambilda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE.

The ISWL On Air In 1997

Chris Carrington, Publicity Officer of the International Short Wave League (ISWL) reports that the club's callsign GX4HJC will be active during 1997 by the following operators:

February
Roy Smyth G4CBG (Using GN4BJC/P)

March
Nigel Dyche G0RWH

April
Brian Smith G0BER

May
David Beale G0DBX

June
Mike Rutland G0VXD

July
Paul Wemtrip G5SLD

August
Fred Connor G4FMI

September
Dick Rogg G2BRR (Using G4BJC)

October
Roger Provans G0RUG

November
Bill Griffiths G0WUHJ

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 (G10618), ISWL Club Callsign QSL Manager, 'Kenwood', London Road, Louth, Lincolnshire LN11 8QH.

Practical Wireless, March 1997
Radio Amateurs On Track

By Bruce McCartney GM4BDJ

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 LY2RAW, 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 deposing 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, Jurges and LY3NNC, entered a grand building...'

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, Jurges 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...
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 QQV06/411 being used with the anodes strapped together in the driver stage of a 3.5MHz linear will stay with me for a while. LYICQ 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 Anykščiai 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.

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 Anykščiai 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 Birstonas and LY94BDX a day early.

The Summer Camp at Birstonas 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!

Peaceful looking Anykščiai station between (rare) trains
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.

February 16: The North West Radio Club will be held at the Harworth Leisure Centre, Harworth, near Doncaster. The venue is the Harworth Sports Centre, and the event will run from 10am to 5pm. There will be many traders and plenty of interesting exhibits, including a large number of radio and computer equipment.

February 18: The 12th West Midlands Radio Club's Rally will be held at the National Exhibition Centre, Birmingham. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

February 22: The Bournemouth Radio Club will be held at the Bournemouth Centre, Talbot Road, Bournemouth. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

February 24: The Tyneside Amateur Radio Society will be holding their rally at the City Tower Centre, Newcastle upon Tyne. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

March 9: The 12th North West Radio Club's Rally will be held at the Victoria Hall, Chester. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

March 23: The Plymouth Amateur Radio Club will be held at the Plymouth Hoe, Plymouth. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

March 30: The South West Amateur Radio Club will be held at the Exeter Cathedral, Exeter. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

April 6: The North West Radio Club will be held at the Cheshire Hall, Chester. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

April 27: The London Amateur Radio & Computer Show will be held at the ExCel Centre, London. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

May 11: The South West Amateur Radio Club will be held at the Bournemouth Centre, Bournemouth. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

May 18: The West Midlands Radio Club will be held at the National Exhibition Centre, Birmingham. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

June 1: The Bournemouth Amateur Radio Club will be held at the Bournemouth Centre, Bournemouth. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

June 8: The London Amateur Radio & Computer Show will be held at the ExCel Centre, London. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

June 29: The 40th rally at Amateur Radio Bally. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

July 13: The South West Amateur Radio Club will be held at the Exeter Cathedral, Exeter. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

July 27: The Colchester Radio & Computer Rally will be held at the Colchester Leisure Centre, Colchester. The rally will run from 10am to 5pm, and will include many traders and interesting exhibits.

Editor's Note:

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

If you have any queries about a particular event, please contact the organisers directly.
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 dipole. But there are also some uncommon ones such as parasolas, 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 f24.

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**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. section that features radio related items that start after the r.f. output socket of your rig: be it cable, feeder, accessory or antenna.

Tune & Feed

An antenna tuner and s.w.e. meter with an unusual coil system in 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 kit 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 thick.

Available from Lake Electronics, 7 Middleton Close, Nuthall, Nottingham NG16 1BX. Tel: 0115-938 2509 the TU4 kit costs £68 (E88 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 P1 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) 2543458 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 7UW. Tel: (01505) 503824 or FAX: (01505) 503824.

There are many radio amateurs who live in flats with little outside access, or in housing estates with outside antenna restrictions. In cases like this, operating on h.f. is never going to be easy. Hately Antenna Technology think they have the perfect answer to these problems in their Electromagnetic Delay-line Radiator (EMDR) antenna.

Available as either an 8.5m long (EMDR-1) or the 15.5m long EMDR-2 versions they are capable of being used at power levels up to 100W within the 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 Hately Antenna Technology, 1 Kenfield Place, Aberdeen, Scotland AB13 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, Chipstone, Nr Mansfield, Notts NG21 9ER. Tel: (01623) 6431302 or FAX: (01623) 25407.

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8 pages of antennas
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 point forward 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 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 would produce two nulls for each signal, one at X and one at (X+180)°.

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 3m 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 (i.e. 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.
ME DIRECTION FINDING FROM THE ATTIC!

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° (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!
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 - 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 ration 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 nor 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.

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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A problem common to many amateurs living in modern houses is simply how to get a multi-band antenna into the postage stamp size back gardens that are now so common. If, at the same time, you could also dispense with the heavy pole at the bottom of the garden, and hence get less hostility from the neighbours, so much the better. It would also be an advantage if it can cover several bands.

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 'tilled 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 1.5m and will operate on all WARC bands up and including 28MHz. At 14MHz version will go into 16m 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 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, but 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 figures 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 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 everything in between.

Table 1: Dimensions for the major h.f. bands

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<th>Band (MHz)</th>
<th>L1 (m)</th>
<th>L2 (mm)</th>
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<td>7.0</td>
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<td>500</td>
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<tr>
<td>10.0</td>
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</tr>
<tr>
<td>14.0</td>
<td>7.143</td>
<td>214</td>
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Table 2: Test results of a 7MHz antenna on that and higher h.f. bands

<table>
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<th>MHz</th>
<th>s.w.r.</th>
<th>MHz</th>
<th>s.w.r.</th>
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Fig. 1: The T2FD in operation. The antenna will work at other tilt angles, but 30° is optimum.

Fig. 2: How to create your own T2FD antenna. See the Tables 1 and 2 for the dimensions of L1 and L2.
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/P:259 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 GC6ZGC 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 sockets. However, when you’re being berated 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 Alfond 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 (λ/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 λ/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 0.67.

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 0.67. 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=V²/R, where R=50Ω the voltage is 50V, so, at the left hand feed point, where the two inner pins, 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 GOEZM in Nottingham. Harold uses a pair of VK quad loop antennas on his 1.2GHz ATV set up, one for transmit
Fig. 5: a simple antenna matched to feeder but what happens when a second antenna is added? (See text).

Fig. 6: A stacked antenna pair. What is the impedance at point X, and what does that do to the matching? (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-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. 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 the common feedpoint (X) there is an impedance of only 250Ω (50Ω in parallel with 50Ω), causing standing wave ratio (s.w.r.) problems. To cure this we need a coaxial feeder of 250Ω (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 feed point. 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 lossless 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 a 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 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. 7: The matching arrangement of the antenna shown in Fig 5.

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

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).
the maximum, this is defined as the where the power has fallen to half of the original antenna. At the points changing the vertical pattern.

beamwidth is reduced without by -side) antennas, the horizontal 'wide'. Conversely when baying (side - more power is pointed towards the horizontal beamwidth. In DX terms, reduction of the vertical beamwidth tone above the other) antennas, gives a oncoming cyclist in the road.

bend you see the hedge, but not the expense of only being able to see what moving away from the centre line, the power drops away faster when beam pattern of the combined antenna, beamwidth. Now taking the inner taking place.

form of impedance transformer action objects otherwise they will not work as

and 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 Z1. Where Z1 is:

\[ L = \frac{1}{2} \times \frac{Z_1}{Z_2} \]

And although this gives a figure of 70.71Ω for the characteristic impedance of the transmitter 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 i.e. 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 transceiver. The use of N-type coaxial T-piece feeding the 50Ω line to the transceiver. The use of N-type coaxial plugs and sockets on a 1.2GHz coil in series with a 1% capacitor and check the frequency at which the series combination capacitor and inductance has fallen to 5Ω. Then carry out a little calculation, based on the formula:

\[ L = \frac{1}{2} \times \frac{Z_1}{Z_2} \]

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 50Ω resistors in parallel, each 50Ω 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.

I don't have the space to show the mathematics for the following formula, but it's simple to use. If we have two 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 5Ω. Then carry out a little calculation, based on the formula:

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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 got 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?

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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 annexeched on garage shelves for 22 years and had not been used for at least 10.

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 30 MHz. This HRO looked terrible!

The case had peeling paint and was rusty in parts. Lifting the hinged lid exposed the sub-chassis inside, coated with dirt and spider-webbing. Bare metal (valve tops 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 of all of the circuitry. All I knew was that the valves (6C6, 6N2, etc.) required 6.3V for the heaters. My only available source was d.c. from my variable voltage power supply unit, so I 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 resulted, 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 three equally-spaced ridges lengthways on each valve. Each ridge was found to glow. But to identify the valves and switches and to do 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 5 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 high-capacitance electrolytic capacitors and the 600V working 10μF 30V transistorised power supply, I borrowed one.

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

However, when the 40 meter switch was in, the tone was rough, though not as rough as with amateur signals on other bands. Swapping two valves about didn't change anything, but found that one showed zero. Swapping two valves about didn't change the fact, so further investigation was needed.

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 5 meter with no signal input. Since my only test equipment consists of a small analogue milliammeter 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).
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.

![Fig. 1: Marking out a scale](image)

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). 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 it (column three) figure is greater than 45°.

These were then convened to X-axis deviation figures using the formula:

$$X = \tan(\theta) \times 2000$$

For best accuracy it is a good idea to convert to X-axis deviation figures using the formula:

$$X = \tan(\theta) \times 2000$$

There is a Tan (Tangent) button on most basic scientific calculators. So, as an example, for the 1.5W point, the (column two) figure is 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 to this new coordinate projected 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. 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: 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.

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....!

Almost!

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 the famous old town of Gretna Green (very fast I might add as my YL 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, as a model of an executive chair 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 'shoo' (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
**NEW! IC-706DX**

**HIGH PERFORMANCE ON 2m!!**

The Lynch workshop has been at it again. How do you improve an already perfect design? There is only one criticism levied at the IC-706 - its 2m receive performance.

The engineers at Martin Lynch & Son have installed a specially modified muTek low noise 2m preamp inside the IC-706. The results transform the 2m performance beyond belief. Because of the complexity of the installation, the modification is only available at "Best Buy" price.

Cost: £100 inclusive of all fitting charges and VAT.

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**Microphones**

- **Yaesu MD-100** Base microphone
- **Yaesu MV-1BB** Fist Microphone
- **Icom IC-SM9** Base Microphone
- **Icom IC-SM20** Base Microphone
- **Kenwood MC-60A** Base Microphone
- **Kenwood MC-65** Base Microphone
- **Kenwood MC-90** Base Microphone
- **Kenwood MC-43S** Fist Microphone

Cost: £110.00

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**Rotators**

All available on FREE FINANCE!!

- **Yaesu G-250**
  - 200Kg cm
  - £149

- **Yaesu G-450XL**
  - 500Kg cm
  - £289

- **Yaesu G-5000A**
  - 500kg
  - £309

- **Yaesu G-450**
  - £159

- **Yaesu G-6600**
  - £669

- **Yaesu G-650XL**
  - £399

- **Yaesu G-800SDX**
  - 1100Kg
  - £459

- **Yaesu G-900**
  - £329

- **Yaesu G-2800SDX**
  - 2500Kg
  - £1279

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**Power Supplies**

Watson W10AM
20 Amp 13.8V, Twin meter, 3 outputs
- £299.95

Daiwa PS-304mk2
25 Amp 13.8V, Single meter, 4 outputs
- £199.95

Daiwa PS-400X Latest 40 Amp 13.8V, Twin meter, 4 outputs
- £169.95

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**hell sound**

"As reviewed in RadCom"

August 1996

**Heil Proset-5**

Professional Quality Boom Headset, dual padded earphones, flexible mic boom, includes HC-6 "Full range" insert for superb speech quality. Requires AD-1 cable ADAPTOR for ICOM. £125.95 incl. VAT

**Heil Proset-4**

Identical to Proset-5, but includes HC-4 "DX" microphone insert. Meal for charging through the plugs. £125.90 incl. VAT

**Heil HC-4** Replacement microphone insert for existing fist or base microphones. With 10DB peak at 2KHz and the low end rolled off sharply at 50KHz, 1200Hz per octave, the HC-4 is the ultimate DX mic insert. £125.95 incl. VAT

**Heil HC-5**

Identical to HC-4, but High Articulation, offering superb SSB quality, rolls off sharply under 50KHz and above 2100Hz, peaking at 2.4KHz, "HiFi" SSB Audio. £125.95 incl. VAT

**Heil AD-JN7**

Adapter leads to interface the preset Heilvoiceboom microphones to 8 pin Yaesu, Icom or Kenwood transceivers. £115.95 EACH

---

**SGC Smart Tuner**

The only choice for a fast tuning ATU that you can use mobile or base station. Only £379

**MyDel antennas**

Built exclusively for MARTIN LYNCH, the new wire antenna is trapped for 80 through to 10 metres, uses heavy gauge multi strand plastic-sheathed wire, heavy duty 1 KW traps and totals only 20 metres in length. It's very easy to install, takes minutes to tune, guarantees an SWR of less than 1:5:1 on spot frequencies throughout the entire 5 bands. A far better alternative to the old G5RV antenna.

Impedance: 52 Ohm. Overall length: 25m. Power Handling: 1KW. Max SWR: 1.5:1. Weight: 2.5kg. Input socket: S0238. MEGATRAP

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**E-MAIL: sales@martin-lynch.co.uk**

**WEB SITE: http://www.martin-lynch.co.uk**

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Cost: £100 inclusive of all fitting charges and VAT.

Basic IC-706 £339 or New IC-706DX with high performance 2m preamp installed £393
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-demon, 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 .

Just a small selection of high grade used stock

<table>
<thead>
<tr>
<th>Model</th>
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<tr>
<td>Kenwood TS-505 HF Mimi 100W mobile/base</td>
<td>£699</td>
<td>£499</td>
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<tr>
<td>Icom IC-751A HF base station, 100W</td>
<td>£749</td>
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<td>Kenwood TS-1405 100W HF base/mobile</td>
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<td>Kenwood TS-4305 100W HF base/mobile</td>
<td>£595</td>
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<td>Kenwood TS-120V 10W Ham Band transceiver</td>
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<td>Kenwood TS-9505DX 150W HF base DSP as new</td>
<td>£2695</td>
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<td>Yaesu FT-1000, 200W 2RX one owner the best</td>
<td>£2295</td>
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<td>Icom IC-901 High quality dual bander</td>
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<td>Yaesu FT-290Rmk2 3.5W 2m multimode port</td>
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<td>Yaesu FT-730Rmk1 1W 70cm multimode portable</td>
<td>£279</td>
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<tr>
<td>Kenwood IC-765 100W base station, large display</td>
<td>£1495</td>
<td>£1295</td>
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<tr>
<td>Kenwood TS-711E 25W 2m base staion, c/w PSU</td>
<td>£695</td>
<td>£595</td>
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Mobile Whips For Spring HF Operating

PRO-AM ANTENNAS

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<th>Model</th>
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<tr>
<td>PHF-160 Enormous 160M Centre Loaded Whip</td>
<td>£54.95</td>
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<tr>
<td>PHF-80 Almost as big 80m Centre Loaded Whip</td>
<td>£59.95</td>
<td></td>
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<tr>
<td>PHF-40 The nuts nuts on 40m, at a mere</td>
<td>£999</td>
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<tr>
<td>PHF-20 The way to DX, (safely) on 20m</td>
<td>£19.95</td>
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<tr>
<td>PHF-15 You guessed it, the same but on 15m</td>
<td>£19.95</td>
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<tr>
<td>PHF-10 'I'll give you one guess'</td>
<td>£19.95</td>
<td></td>
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<tr>
<td>AB-5 5 bander 10-80 in one antenna. It works!</td>
<td>£99.95</td>
<td></td>
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<tr>
<td>BB-2 Massive Spring mount for LF Whips</td>
<td>£49.95</td>
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<tr>
<td>116-NP gutter mount with 3/8 thread</td>
<td>£16.95</td>
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<tr>
<td>142-ADP Body mount with 3/8 to SO239</td>
<td>£9.95</td>
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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".

MyDEL P133 Specification:

- Fast Intel P133 MHz Processor
- 1.2Gb IDE Hard Drive
- 16MB RAM
- 2Mb Video Card
- 16 Bit Sound Card with speakers & microphone
- 14" SVGA Colour monitor
- Internal 530000bps FaxModem
- 8 speed CD ROM
- Windows 95 installed
- Keyboard & Mouse
- BT Internet Software on CD including Microsoft Internet Explorer

Each machine is configured ready to go with Windows '95 allowing you to buy any "95 Windows software available. We also supply BT Internet software on CD ROM which gives you instant Internet access allowing you to view the "World Wide Web", an "email" address to send and receive messages from anywhere in the world, join "newsgroups" interested in Ham Radio (or practically anything you like!) plus lots more, all for the cost of a local call!

- Full access to the World Wide Web
- Email facilities with your own "email" address
- Full access to Microsoft "NetMeeting", allowing full Audio and Video (RX), Video TX with additional video card and camera, anywhere in the world!
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**MAGELLAN GPS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
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<tbody>
<tr>
<td>GPS-2000</td>
<td>£139.00</td>
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<tr>
<td>GPS-3000</td>
<td>£194.00</td>
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<tr>
<td>GPS-4000</td>
<td>£239.00</td>
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<tr>
<td>MERIDIAN XL</td>
<td>£249.00</td>
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<tr>
<td>TRAILBLAZER</td>
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<tr>
<td>NAV DLX10</td>
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</tr>
<tr>
<td>SKYBLAZER</td>
<td><strong>£POA</strong></td>
</tr>
</tbody>
</table>

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**GARMIN GPS**

<table>
<thead>
<tr>
<th>Model</th>
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<td>GPS-38</td>
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<td>GPS-40</td>
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<tr>
<td>GPS-MAP 220</td>
<td>£1188.00</td>
</tr>
</tbody>
</table>

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- Car adaptor
- Extension antennas
- Car antennas
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**SCANNERS/TRANSCIEVERS**

<table>
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<td>AOR-8000</td>
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<td>YUPITERU MVT-7100</td>
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<td>WELZ WS-1000E</td>
<td>£310</td>
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<td>AOR AR-1500EX</td>
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<td>YUPITERU VT-125</td>
<td>£169</td>
</tr>
<tr>
<td>YUPITERU VT-225</td>
<td>£230</td>
</tr>
</tbody>
</table>

**ALINCO DJ-S41**

UHF Transceiver.
Compact size.

**YAESU FT-50R**

VHF/UHF dual bander.

**ICOM IC-T7E**

70 memories dual bander.

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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 shot.

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 upon 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 wooden 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 tens stressed to the equipment when they were shipped back, all for the merest glintse. 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 mere 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!

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.

Continued from page 40
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”.

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 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 mathematics involved - about four ‘pokes’ of a calculator is the most required to produce information for a buildable filter!* I will also give a chart for ‘off the shelf’ low-pass filters, which can handle up to 10W or r.f. power, suitable for every h.f. amateur band.

*A readers who are intimidated by radio mathematics will find our 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!

A G3RJV ‘Roll Your Own’ filter.

Practical Values

To start with some practical values, I’ve provided Table 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-cc) 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

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

Practical Wireless, March 1997
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 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 larger 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. You should 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?

![Fig. 2: Formula used to calculate number of turns.](image)

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

<table>
<thead>
<tr>
<th>Band (MHz)</th>
<th>F-co (MHz)</th>
<th>F-3dB (MHz)</th>
<th>F-30dB (MHz)</th>
<th>C1, 7 (pF)</th>
<th>C3, 5 (pF)</th>
<th>L2, 6 (μH)</th>
<th>L4 (μH)</th>
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<tr>
<td>1.8</td>
<td>2.16</td>
<td>2.76</td>
<td>4.0</td>
<td>820</td>
<td>2200</td>
<td>4.442</td>
<td>5.608</td>
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<td>3.5</td>
<td>4.125</td>
<td>5.11</td>
<td>7.3</td>
<td>470</td>
<td>1200</td>
<td>2.434</td>
<td>3.012</td>
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<td>7.0</td>
<td>7.36</td>
<td>9.04</td>
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<td>270</td>
<td>680</td>
<td>1.380</td>
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<td>10.1</td>
<td>10.37</td>
<td>11.62</td>
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<td>18.068</td>
<td>18.93</td>
<td>22.89</td>
<td>32.3</td>
<td>110</td>
<td>270</td>
<td>0.548</td>
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<td>21.0</td>
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<td>220</td>
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<td>150</td>
<td>0.303</td>
<td>0.382</td>
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</table>

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

<table>
<thead>
<tr>
<th>Core Colour</th>
<th>Mix Colour</th>
<th>T37</th>
<th>T44</th>
<th>T50</th>
<th>T68</th>
<th>T80</th>
<th>MHz</th>
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<tr>
<td>2 Red</td>
<td>0.40</td>
<td>0.52</td>
<td>0.49</td>
<td>0.57</td>
<td>0.55</td>
<td>1-7</td>
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<td>6 Yellow</td>
<td>0.30</td>
<td>0.42</td>
<td>0.40</td>
<td>0.47</td>
<td>0.45</td>
<td>7+</td>
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**Table 3:** Core requirements for various power levels (see text).

<table>
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<th>Core Power level (Watts)</th>
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<td>Mix Colour</td>
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<td>Red</td>
</tr>
<tr>
<td>Yellow</td>
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</table>

**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).

<table>
<thead>
<tr>
<th>Band (MHz)</th>
<th>C1, 7 (pF)</th>
<th>C3, 5 (pF)</th>
<th>L2, 6 turns</th>
<th>L4 turns</th>
<th>Core type</th>
<th>Core size</th>
<th>Wire size</th>
<th>s.w.g.</th>
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<tr>
<td>1.8</td>
<td>820</td>
<td>2200</td>
<td>30</td>
<td>34</td>
<td>T50-2</td>
<td>0.315</td>
<td>30</td>
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<td>3.5</td>
<td>470</td>
<td>1200</td>
<td>25</td>
<td>27</td>
<td>T37-2</td>
<td>0.4</td>
<td>28</td>
<td></td>
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<tr>
<td>7.0</td>
<td>270</td>
<td>660</td>
<td>19</td>
<td>21</td>
<td>T37-6</td>
<td>0.5</td>
<td>26</td>
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<tr>
<td>14.0</td>
<td>180</td>
<td>390</td>
<td>16</td>
<td>17</td>
<td>T37-6</td>
<td>0.56</td>
<td>24</td>
<td></td>
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<tr>
<td>18.068</td>
<td>110</td>
<td>270</td>
<td>13</td>
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<td>0.56</td>
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<tr>
<td>21.0</td>
<td>82</td>
<td>220</td>
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<td>150</td>
<td>10</td>
<td>11</td>
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**Practical Wireless, March 1997**
**NEW Transmitter Kit!**
Up to 5W CW output (adjustable) on 160 to 20M bands (reduced output up to 30MHz). The HOWES TX2000 operates on a single band at a concept similar to its companion DC2000 receiver. It requires a separate VFO input or links to the receiver with the LM2000 linking module for transceive operation. Runs on 13.8V DC. Very clean, harmonics typically -50dBc or better. TX2000 Kit: £24.90. Includes one band filter kit. Additional band filter kits: £6.90 each. HAZ2R hardware pack (pictured top): £16.90.

**Matching Receiver - Great for beginners!**

**Top Value Receiving ATUs**
(60-90MHz ATUs also available)
CTU8. Covers 500kHz to 30MHz. Matches antenna impedance and helps reduce spurious signals and interference with extra front-end filtering for the receiver. 50239 sockets. Factory Built: £49.90. Kit (including case and all hardware): £29.90.
CTU9. As CTU8 plus balun, bypass switch and terminal posts. The fully featured Rx ATU! Factory Built: £69.90. CTU9 Kit (including case and all hardware): £39.90. Please add £4.00 P&P. or £1.50 P&P for electronics kits without hardware.

**HOWES KITS**
contain good quality printed circuit boards with screen printed parts and popular with great performance!

**ACCESSORY KITS**

- **JP** 3 Automatic Speech Processor: £16.90
- **PAP** 3 Mic Amp with active filtering: £8.90
- **CQ2** Quality Electrol Mic with VISID: £13.90
- **CD4** Scanners Prisms: 4 to 1500MHz: £19.90
- **CSL4** Internal SSB & CW Filter for our R73: £10.90
- **PSC2** "S Metric" for direct conversion: £10.90
- **CSR1** 50MHz/Power Indicator: 30W 1-2001MHz: £13.90
- **ICR1** Crystal Calibrator: 6 intervals + ident: £16.90


**Enjoy your radio more with great projects from HOWES!**

**ACCESSORY KITS**

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Since its introduction in 1990, the LONDON AMATEUR RADIO & COMPUTER SHOW has rapidly grown into one of the biggest events of its kind.

With well over 100 exhibitors, all the major importers, special interest groups, a huge Bring & Buy stand, morse tests on demand, disabled facilities, bars, restaurants and even a lecture programme, it's the event with something of interest to every radio and computing enthusiast.

However, there's more to it than that, and the extra ingredient is something which many other events lack: atmosphere.

Those of you who have seen The Show before will already know what we mean, because from the moment you walk in the door there's something about Picketts Lock that just feels good.

If you're only going to visit one event this year, make sure it's this one.

RadioSport Ltd, 126 Mount Pleasant Lane, Bricket Wood, Herts AL2 3XD

FOR FURTHER DETAILS, PHONE BRENDA ON 01923 893929 OR FAX 01923 678770.
Your Guide to the
London Amateur Radio
Saturday March 8 & Sunday March 9

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Exhibitor Block
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ARE Communications G
Association For International Broadcasting C
BEC P
Bill Macdonald Ltd F
Capital Products E
Cheshunt & District ARC W
Coltec Electronics W
Compelec L
Display Electronics P
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Eastern Communications J
Garex Electronics D
Gemini Electronics L
Harp Shareware W
Holderness R J S
Icom UK Ltd N
Kenwood Electronics UK G
Linear Amp UK F
Lowe Electronics Ltd R
Multicomm 2000 H
Nevada T
Practical Wireless & Short Wave Magazine K
Rich Electronics V
RSGB M
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London Amateur Radio & Computer Show

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 straight-forward. 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 airport, the journey is quite straightforward. From Heathrow the 'underground' train service runs to the centre of London and the journey to Picketts Lock show are fortunate because there are several alternatives for accommodation and one is definitely in the 'budget' price range.

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 Leisure Centre itself is £5 per adult per night, children (five to 16 years old) are charged at £2.10 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 Marriott Hotel at Broxbourne. This Hotel is eight miles or so northwards up the A10 from the show and its where the PW & WM 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, Tescos, 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 I' 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 Marriott Hotel, Half Hide Lane, Broxbourne, Hertfordshire EN10 6NG or FAX: (01992) 440120.

Finally, if you do stay at the Cheshunt Marriott 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!

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
CHESHUNT Marriott HOTEL

Halfhide Lane, Turnford, Broxbourne
Herts EN10 6NG
Tel: 01992 451245  Fax: 01992 440120

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

£54.00 per twin/double
£49.00 per single

Inclusive of full English Buffet Breakfast and VAT, and complimentary use of our swimming pool, gym and jacuzzi.

PRACTICAL WIRELESS PCB SERVICE

Printed Circuit Boards for Practical Wireless constructional projects are available from the Practical Wireless PCB Service.

The boards are made in 1.5mm glass-fibre and are fully tinned and drilled.

When ordering PCB's please state the article title, magazine cover date and the board number.

Mark your envelope Practical Wireless PCB Service.
Cheques to be crossed and made payable to: Badger Boards.

Please print your full name and address in block capitals and do not enclose any other Practical Wireless correspondence with your order.

Send orders and remittances to: Badger Boards, 87 Blackberry Lane, Four Oaks, Sutton Coldfield B74 4JF.
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Most advertisements are legal, decent, honest and truthful. A few are not, and, like you, we want them stopped.

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We're here to put it right.

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This space is donated in the interests of high standards of advertising.

Practical Wireless, March 1997
YOUR GUIDE TO SECOND-HAND EQUIPMENT

WATERS & STANTON
01702 206835

Please note second-hand items come with full 2-month parts & labour guarantee, unless otherwise stated. If you spot something you fancy...don't delay or you could miss it!

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Please mention Traders’ Table when enquiring about any items on these pages!

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NEVADA
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Please mention Traders’ Table when enquiring about any items on these pages!
### ARC EARLESTOWN

<table>
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#### HF TRANSMITTERS
- **Yaesu FT-900AT** boxed - £990
- **Kenpro KT-22** - £1999
- **Icom IC-M5** - £1999
- **Yaesu FT-470R**

#### HANDHELDS
- **Realistic DX-160** - £275
- **Trio R-600** - £375
- **Lowe HF-225** - £329.00
- **Drake R-8E**

#### RECEIVERS
- **Kenwood TS-140S** c/w AT-230 - £650
- **Kenwood TS-450S** c/w PS-30 - £630
- **Kenwood TS-140S** c/w AT-230 - £560
- **Kenwood TS-820S**

#### MOBILE/BASE VHF/UHF TRANSMITTERS
- **Yaesu FT-726** c/w 2m/70cmSAT - £750
- **Kenwood TS-711E** c/w + misc - £575
- **Kenwood TS-700U** boxed - £750
- **Kenwood TS-702S** - £575

#### MOBILE/BASE HF EQUIPMENT
- **iCOM IC-730S** 100W HF Transceiver c/w AT-100 Auto ATU and Share Desk mic. - £699.00
- **Kenwood TS-50S** 100W HF General Coverage Transceiver £599.00
- **Kenwood TS-752E** 70cm Transceiver £299.00
- **Kenwood TM-250** 2m Transceiver £225.00
- **Tokyo HX-240** 2m Transverter £1125

#### SHORTWAVE SHOP

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- **Icom IC-730 100W 80 - 10M Band Transceiver**
- **Yaesu FT-707 100W 80 - 10M Amateur Band Transceiver**
- **Kenwood TM-701E 2M 70cm Mobile Transceiver**
- **Realistic DX-160 10W Mobile Transceiver**
- **Kenwood TS-700U 2M 70cm Transceiver**
- **Kenwood TS-820S 15W 2m Transceiver**
- **Trio R-600 10W 2m Transceiver**
- **Lowe HF-225 10W HF Receiver**
- **Kenwood TS-140S 5W 2m/70cm Transceiver**
- **Drake R-8E**

### SMC GROUP

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- **Realistic DX-160 2W Mobile Transceiver**
- **Trio R-600 2W 2m Transceiver**
- **Kenwood TM-701E 2W 70cm Transceiver**
- **Kenwood TS-700U 10W 2m Transceiver**
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- **Kenwood TS-140S 5W 2m/70cm Transceiver**
- **Drake R-8E**

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**PLEASE MENTION TRADERS’ TABLE WHEN ENQUIRING ABOUT ANY ITEMS ON THESE PAGES!**
THE START OF A WHOLE NEW RANGE

Target HF receiver for the shortwave listener
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
- 1kHz steps with clarifier
- Audio output 2 watts
- Headphone socket

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.

Price £159.95 incl VAT Add £5 P&P includes 12V power supply and aerial
- Band width SSB = 4.0kHz
- AM = 6kHz
- Modes USB/AM/LSB

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 coaxial 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.

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

WEB SITE: http://www.kbnet.co.uk/akd
E-MAIL: akd@kbnet.co.uk
Tel no: 01438 351710
Fax no: 01438 357591

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

* THE START OF A WHOLE NEW RANGE *

Target HF receiver for the shortwave listener
Made in England by AKD
A communications receiver at an affordable price

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WEB SITE: http://www.kbnet.co.uk/akd
E-MAIL: akd@kbnet.co.uk
Tel no: 01438 351710
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WIN!

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

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

FT-8000R Entry Form

Answers
Q1: A □ B □ C □
Q2: A □ B □ C □
Q3: A □ B □ C □

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

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

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 1991.

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

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.

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 and all new 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 CS08 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 (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.

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.

Haydon Communications - Block 2 Blue Hall

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Eastern Communications

The Eastern Communications stand team, Tim G4CTT, Tricia G1ANZ and Denise G4GGZ 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 of 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 GPS44. 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 M1C 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 transmitters 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 i.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 N 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.
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.
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 aimed 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 Radar 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/Li. Tional Tapes Manager and is available on 0181-428-3344.

British Amateur Radio Teledata Group

This group BARTG - more familiarly known simply as 'BARTG' - 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, BARTG 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 aims 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 Run Broadbent MBE G3AAJ at AMSAT-UK, 94 Herongate Road, Wanstead Park, London E12 SEQ. 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 member 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 G4DIH on (01705) 361276 (a Portsmouth number of course!). Alternatively you can write to him at 103 Torrington Road, North End, Portsmouth, Hampshire PO2 OTN.

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 G4KSQL, 22 Burdell Avenue, Sandhills Estate, Headington, Oxfordshire OX3 8ED.

Practical Wireless, March 1997

PW
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 CW (Marconi bands). Not to mention the fact that such a detector, as a rule, heater windings are at or near earth potential.

Despite the difficulties, some low-power indirectly heated rectifier valves do have sufficient heater-cathode insulation to withstand high heater-cathode voltages and maintain good heater efficiencies.

With 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.

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.

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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 EZ200 and EZ80, 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.

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You'll always find curious bits of text lithographed onto the casings of multi-section electrolytic capacitors. For example, '300V Working 25V Surge, Red 10μF, Yellow 10μF, Green 200μF, Blue 50μF 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; this is usually within the capacitor. Actually, this is true of almost all electrolytic capacitors and not just multi-section types.

The colours relate to the capacitor's section labels which are often colour-coded for identification. The 'Outer' label associated with the 'Red' section indicates that this section's positive foil is nearest 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 'Outer' 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 50μF, 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 is 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 dependent 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.

**Economical Sources**

The most economical sources of h.t. transformers and chokes are rallies, junk shops and surplus equipment dealers. Scrap chasms 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 1ST. Tel: (01536) 204555, FAX: (01536) 405555 can supply a h.t. transformer, 250V-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. Sower 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 who can't get enough of regenerative receivers, the PW Book Shop Store has two new titles on the subject. The first is Secrets of House-built Regenerative Receivers by C. F. 'Rock' Rockett 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 t.r.f. receivers and the challenges of regenerative detector design. Practical aspects of regenerative receiver construction follow, including hints on how to use modern f.s.t.s in place of valves.

The book is an excellent source of Rock's book as a practical guide is tempered by his 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) 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, it would 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 are 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 seen 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 construction of early amateur receivers or at least the radio circuits. And there's not a superhet in sight!

The book is an excellent source of Rock's book as a practical guide is tempered by his 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) 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, it would be useful to novice instructors as a source of material for practical projects.

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

Cheerio from Phil, see you in June.

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Fig. 2: Full-wave rectifier circuit with a choke-input filter (see text).
TERMS AND CONDITIONS FOR PROVISION OF CELLULAR SERVICES

1. Definitions

1.1 "Service" means the provision to you of the cellular telephony service.

1.2 "Charges" means the charges payable by you in respect of the provision of the Service.

1.3 "Contract" means this Agreement between us.

1.4 "Customer" means you, the person who agrees to the terms of this Agreement.

1.5 "Account" means your record of an account with us.

1.6 "New account" means a contract with a new Customer.

1.7 "Existing account" means a contract with an existing Customer.

1.8 "Direct Debit" means a Direct Debit arrangement in place with a customer.

1.9 "Bank" means a bank or building society with which we have a Direct Debit arrangement.

1.10 "Building Society" means a building society with which we have a Direct Debit arrangement.

1.11 "Cash/Check" means a payment by cash or check.

1.12 "Credit Card" means a payment by credit card.

1.13 "Prepaid Card" means a payment by prepaid card.

1.14 "Cash Card" means a payment by cash card.

1.15 "Unknown User" means a payment by unknown user.

1.16 "Unknown User Card" means a payment by unknown user card.

2. Variation of Charges and Service

2.1 Your charges may be varied by us from time to time by giving not less than 14 days' notice. We reserve the right to increase or decrease your charges by giving written notice to you. We will notify you in writing of any change in charges at least 14 days before the change takes effect.

2.2 We reserve the right to change the Service at any time by giving not less than 14 days' notice to you. We reserve the right to alter the tariff structure at any time by giving not less than 14 days' notice to you.

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Please use the order form in this issue
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 FM 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) I.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 from 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 practical and comprehensive I've ever seen on a transceiver.
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, to use of memory channels, dual and multi function controls, DTMF, 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!) everything after setting up and operating with the manual to hand.

I'm not complaining, but a few times, I was quite impressed with the manual used by Kenwood. Even in large blue display (Kenwood claim this is a first) is easy to read. Even in very bright daylight associated with cold clear days on Welsh mountainsides.

The TM-V7E has no shortage of effective heat sinking (engineered aluminium one provides extensive and effective heat sinking).

Basic Operation

As the rig has so few controls with so many functions, I took some time to familiarise myself with them. Let me begin 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 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 'compaceness' 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 -3C, but with the wind-chill it dropped to around -12C! 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 (from 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 work up with Steve GW6GSL/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 slighty 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 GW0JU in Pontypridd on the 144MHz band. To give the rig a more realistic test, I drove from the hilltop down into the Rhydymwyn 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 GW6GSL and a 'sked' was made.

Steve borrowed a 430MHz 'handle', while I set-up the rig at Pontypridd on the 144MHz band. To give the rig a more realistic test, I drove from the hilltop down into the Rhydymwyn Valley, thereby putting significant obstacles in between us, in the form of three valleys and mountains!
Below: Underside view of the TM-V7E. The dimensions of the transceiver can be gauged by the comparative size 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: 1.1A 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

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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 you fingers are warm! (Mine certainly weren’t on 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.

I soon ‘hooked up’ with Steve, and although his signal strength was very weak (he was using a ‘handle’, 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!

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!

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.

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Practical Wireless, March 1997
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. However, a flurry of activity when the earth passed through the orbit of the Gemini meteor shower between December 11-14. During December 11-14 meteors showers occurred around scatter conditions. Contacts were easily made with stations situated around the Geminids between December 11-14. During December there was a high profile operation giving good public relations for Amateur Radio.

Channel Designation

Last time I mentioned recommendations made at the IARU Region 1 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 430.0000MHz) and increment by one for each 12.5kHz channel.

For example, F123 is the simplex channel on 51.125MHz and RF97 is a repeater output on 51.970MHz. The old SO becomes V40, the simplex channel on 145.500MHz and the old RO is now V48 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 U242, the repeater output on 433.025MHz, And the simplex channel SU20 is now U280 on 433.500MHz.

Maritime Mobile

Andy Adams GW1KZG reports that he will be active again maritime mobile (M/M) on board the R.R.S. Charles Darwin. In January he set sail from Tyneside, via Southampton, to Cartagena (HM9) in Spain. On January 10 he was spotted by the Henley ARS HF station operating on 140.200MHz.

On the following day at 1755UTC GW1KZG/MM was heard by the station of 3GNO (I091) operating on the same frequency, but this time on c.w.

Andy was by this time located in the 'bare' area of GIB, south of the Island of Scilly. From reports received by the Henley ARS HF station amateur radio will be 0500-0700, 1200-1300 and after 1700, all these being local time depending on which time zone one is in.

Andy 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 2002A amplifier 430MHz antenna producing 400W output. The antenna system consists of two separate 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 GW1KZG/MM will be fully equipped for meteor scatter operation using various layers and p.c. based programs for transmitting high speed Morse. On receive he will use the D7F7K DTR Digital Tape Recorder (an amazing accessory which I will describe in full detail in the next issue). Andy is by this time operating a portable station with a Henley ARS HF station.

The photograph, Fig. 1, shows Andy GW1KZG at the controls of his aircraft on-board the 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 (IP6), IP400. He will be very active in tropo and meteor scatter. If DL6VC 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 by E-mail via dhqba@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 some 50 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.

People may be interested to know that a Nordic (L, O2, SM) activity contest on the 144MHz band is held every first Sunday of the month between 1800-2200UTC.

There is a fair amount of activity, certainly from O2, 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.

If conditions are really good you could listen out for the Czech activity contest which is held every Sunday of the month between 0800-1200UTC. Send your logs to Jan Zika DK1MAC, Snet 9, 257 68 Dohn, Krakowice, Czech Republic.

Beacon News
Chris Tran GM3WJD reports that the GB3RJK beacon on 50.060MHz was made operational again on 31 December 2022 after a lengthy overhaul by John Wilson G3JUUT. The IUARU Region 1 v.h.f. beacon coordinator. The beacon is running 40W into a folded dipole orientated east-west at a height of 270M a.s.l. It is on the Monteguille television mast (INTL & BBC), 100km north of Inverness in locator JO07.

The GB3RJK beacon is an excellent indicator of auroral propagation. Reception reports would be welcome either by Packet Radio to GM3WJD or GB7JMV or to Chris Tran, Achnaicolla, 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 CT0WV, the 50MHz beacon that could always be heard booming into the UK during the 6p-e session. As a mark of respect, the society Associacao de Radioamadores da Costa de Prata have commissioned a new beacon CS1ACP in order to follow the tradition of CT0WV. It is currently running 10W output into a dipole from locator square IM59. During a Sp-E opening in January, CT0WV 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 Associaçao de Radioamadores da Costa de Prata, PO Box 2250, 3080 Figueria Da Foz, Portugal or via packet radio to CT100 @ CS1CRE CRSR.PRT.EU

Specialist Magazine
Readers of this column who are interested in all aspects of DXing on the v.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.) polarization 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.m., moonbounce (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 callsign, together with a cheque for £15 made payable to DUBUS UK to the representative Roger Blackwell G4PMK, 5 Togilgate Road, Culkham, 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 is 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 QSL or E-mail via davebu@mdfhr1.agb.it.co.uk. Alternatively you can telephone me on (01873) 860797.
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Learn all about electronics software - "Garcia" consists a data base of parts including 1200 of the most popular ICs and transistors (CMOS & TTL pinout). Computer interface data base of circuits and explanations. Minimum hardware is 386 or 2mb 4mb hard disc space left. Windows (supplied on 3.5 disk) £19.25.

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Would you like to stock our best selling titles like the World Radio TV Handbook & Passport to World Band Radio? If the answer's yes then telephone Michael Hurst in the PW Book Store on (01202) 659930 for the best quantity discounts.
Christmas came early for Richard Newton CORSN when he was given the chance to try out the FT8000R over the festive season. Read on to find out how he got on.

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 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 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’.

The Yaesu 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.

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.

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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.

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Smart Sweep

Smart Search Operation automatically ‘sweeps’ a band, or an operator programmed portion of the band, and

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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 GI YNY, Clive G4SLU, Terry G7YJJ, 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 handheld 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 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
Manufacter's Specifications

**GENERAL**

- **Frequency range:**
  - RX: 110-550MHz, 750-1300MHz (cell phone blocked)
  - TX: 144-148MHz, 430-450MHz
- **Channel steps:**
  - 5/10/12/20/25/50/100kHz (v.h.f.)
  - 5/10/12/20/25/50kHz (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:** 600-10kW

**RECEIVER**

- **Circuit type:** Double-conversion superheterodyne
- **Intermediate frequencies:** 45.05MHz and 455kHz (v.h.f.)
  - 38.25MHz and 455kHz (u.h.f.)
- **Sensitivity (12dB SINAD):**
  - <0.18μV (Main receiver)
  - <0.2μV (Sub receiver)
- **Selectivity:** 12kHz (-6dB)/24kHz (-60dB)
- **Image rejection:** Better than 70dB
- **Squelch sensitivity:** Better than 0.13μV
- **AF output:** 2W @ 8W
- **Audio output impedance:** 4-16W (Internal Speaker: 8W)

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.

Practical Wireless, March 1997

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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Special offer for readers of Practical Wireless

Next time use a hands-free car kit, sir
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 GWSUJ assisted me in getting a line up over a 20m high Oak tree at the bottom of my neighbour's garden. We did use by 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 f.m. around the British Isles and Europe reasonably well on the three I.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 pleasantly I find it during the cold winter evenings to get 'on the air'.

Some days, I get onto 3.5MHz every week or so, and 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 144MHz. I.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 I.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 enduring 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

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 f.m. band 'ragchewer' than a DXer? Or are you primarily interested in DX on the higher bands? Do you prefer the QRN of 14MHz to the relative calm DX of 18 or 21MHz?

Are you interested in the propagation characteristics of 28MHz and carried out losses 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

which is now the proud owner of new callsign MM5ADF, and sends in his first h.f. transmitting reports.

David says his operation has been all c.w. and 'fairly QRQ' as he lives on the third floor of a tenement block with no c.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 Ferrar G3ESP in the January issue regarding two unusual stations he heard on the 3.5MHz band using the callsigns CP1MS and L9CC.

Since then I've received a 'phone call from Ray WT9B 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 callsign is not CP1MS, but CP1T!

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 Newsletter 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 VK9IR group will be operating as TWOK 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 KY6A says he

Leighton Smart GWOLBI is back on air again after suffering antenna damage and is joining in the fun whilst compiling your reports.
will mount a ‘big’ effort from Namibia. It will take place in February on 1.8 and 3.5 MHz.

The Oceania Amateur Radio DX Group (ODXG) are planning a major DXpedition in September 1997 and inviting operators to join them. They're looking for 10 operators, including two YL operators. If you're interested... contact Bill VK4FW (ODXG)

(please note that the DX Newsheet is issued weekly and details can be obtained from the RSGB, Lamba 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 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 ‘tinsy rubber stamp’ variety either! There are reports when QRV going to be 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., twice and relaxing I reckon! and actually learned something about the other operator, apart from just her/his name, QTH and rig!

Apart from that, I’ve also enjoyed ‘egging 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 ORPe Eric Masters G9KRT in Winchester Park, Surrey, who has been extremely busy with his college work. His 5W of c.w. hooked up with DB4TU (Germany) in contact 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 ZE9GO in Nottingham at 2195UTC. 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-harmonic 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/S9GFWV (St. Lucia Island) at 0241, VK2BEX/CVO (Gable Island) at 0125, EM1KA (Antarctica) at 2118, C8EI (Cuba) at 0153, 28EU (South Africa) at 0105, IH2B (Tai) at 0021, E3X2 (Kigirahz) at 2359, P40V (Aruba Island, Netherlands Antilles) at 0025, KC1X (USA) at 0044, W1A4 (Venezuela) at 0101, and H5UC AC (South Korea) at 1940UTC.

Also from Milton Keynes comes Charlie Blake M0ALJ, 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 7.046 and 7.076MHz. "It’s not consistent" says Charlie, "it tends to come and go, but it also noticed when operating the G8BSP 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, EA8S4DXD (Majorca, Balearic Islands) at 0728, ZL1 (New Zealand) at 0732, and Z2AZ (Gibraltar) at 0744UTC.

On the other hand, Charlie’s s.w.i. log includes s.s.b. reception of RR1Z (Guyana) working 1V3FS in Italy at 0614, CX3AL (Uruguay) working in contact with CT1AR in Portugal at 0716. He also heard XEN1X (Mexico) working DF7IB in Germany at 0744, and JAGKE (Japan) in contact with UA9W in Russia at 0717UTC. Down to Skewen in West Glamorgan now, and Carl Mason GW0SWV, 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/DOKO (Equatorial Guinea) at 1015, UA9CQ (Russia) at 1038, 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 noticed 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 Ibbotson G0VTI of Wakefield who reports c.w. contacts on 10MHz with EATAY (Spain) at 1575, and LA3H3 (Novaya) at 1574UTC.

And Carl GW0SWV lists SV3O/J4TR (Cretan) at 1313, and J88IO (St. Lucia Island) at 1937UTC (QLS to W800).

The 14MHz Band

Now for the 14MHz c.w. report I’m starting with Terry G0VTI who uses a Ten-Tec Scout transceiver with 50W output and a 65/2V dipole antenna. He says that the antenna is “very close” to his house and is an inverted ‘V’ configuration.

On 14MHz c.w. Terry hooked up with VE20B (Canada) at 1302, KALZJE (USA) at 1324, as well as WB7E (Michigan, USA) at 1610 and WBAO/4 (Maine) at 1800UTC.

Carl GW0SWV also worked a string of US stations on 14MHz, but also used c.w. to hook up with EA0/D0JUP (Canary Islands) at 1801, S96MM (Hungary) at 1901, and S96PBX (Warsaw, Poland) at 0850UTC.

While back in Surrey, Eric G0KRT, using 5W of c.w. in the CQ WW Contest, hooked up with VA3DR (Ontario) at 0900, 9N1XH (New South Wales) at 0932, and K4XV (both USA) at around 1700UTC.

Wielding his shiny new callsign David MM6AOF had his first transatlantic contact with his first ever QRP Contact, 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 1247, 9Y4VU (Trinidad) at 1500, 8P8Z (Barbados) at 1717, VP2EEB (Anguilla Island) at 1632. He also heard AV4A (Hawaii) at 1142, and VETV (British Columbia, Canada) at 1852UTC.

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 - 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 GW0SWV reports working 5C5JJ (Gambia) at 0933 QSL to G0UCJ, SPBCS (Poland) at 1043, and NO3N (USA) at 1530UTC, all on c.w.

While on 21MHz, Eric G0KRT mentions his first QRP contact with the USA on this band in the shape of 4KX, at 1621UTC.

Finally, Terry Ibbotson mentions working PV1AP (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 photos (by the 15th of each month) of your cameras and start snapping! As usual, reports and information (and photos!) by the 15th of each month to: Leighton Smart GWOLBI, 33 Nant Lake Rd, DTR-7 Transceiver. Na time

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**Please mention Practical Wireless when replying to advertisements**
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 he 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 DLSSV 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 MS-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 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 to 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\DL4SAW\STTV
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 interesting site for UK based amateurs. The site at http://www.users.zoetnet.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.tunel.bitnet/ham/hf-log/dxwin/1080.exe.

That’s all the computing news I have for you this time. So, until next month’s edition, keep your letters coming to me, Mike Richards G4WNC, at PO Box 1063, Ringwood. Hants BH24 2ED or you can E-mail me at mike.richards@diapipex.com Don’t forget you can also visit my Web site at http://dialspace.dial.pipex.com/mike.richards/
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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.

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.

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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 Boeing Old Felice 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', 'triv' or even triplet!

Featured in Fig. 1 is the founding 'group of three' packeters. Left to right is Geoff G7SRI, Mike G0TCZ and Dennis G7WBG.

The humorous contribution by BOFARS to Packet radio has really caught the BOFARS to Packet radio has really caught the Packet BBS network. This is an Internet Link packet repeater.

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Featured in Fig. 1 is the founding 'group of three' packeters. Left to right is 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 the Mheed list on my kms VK2MJ-2 or leave a message for any Mheed 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, MIDGE:VK2MJ-1, is now fully operational 24 hours a day on 7.235 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 VK2GEMU) to connect to the v.h.f. port on 145.050MHz or use (c VK2GEMU 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 a mheed. 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 VK2GEMU."

"For information on the use of the Internet gateway use the T 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 suggestions please leave a message on VK2GEMU or VK2MJ @ VK2GAB"

---

News For G3LDI

Although news for this column can be sent "snail-mail", or telephoned to me on 01603 57278, or via packet at G3LDI @ G3LDI, it can now be sent via Internet at the following address.

maylor@uk.mdis.com

I also intend to have FAX capabilities in a month or so. A peaceful 1997 and "happy packeting." -3 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 for IDRA.

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 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 bimonthly 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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**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$8 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 500 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. Most ball for the last few years since all NRK’s short wave operations were consolidated at Kvels, 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 RAEE) 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 7.6MHz 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 from 1000 for half-hour on 5.07MHz, and at 1100 on Sunday on the same channel.

There is a weekend 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 1830 on 7.27 and 6.27MHz, plus the medium wave channel of 1489kHz. 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 The Marshall Plan’ in 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 6.55 and 9.52MHz, 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 2330, 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, Peter Myres and Luc Lucar 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 legacy 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.

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WS-1000 Smallest hand held scanner available £299.00

86 Practical Wireless, March 1997
**HOKA CODE3 GOLD**

**The Ultimate Monitoring Tool used by Professionals**

Anyone used to using our professional package, Code30, will be amazed at how we managed to achieve such high performance from so little hardware. Over a year of hard development work at our Netherlands HQ has resulted in this latest decoder product. Code3 Gold uses the very best of software DSP filtering and detection technology (borrowed from our professional Code30) and the very latest surface mount miniaturised electronics for the hardware interface.

“The performance is stunning, the compactness remarkable and the price is simply unbelievable!”

We are unique in the decoder market because we put all the DSP software onto the PC. This makes it much easier to fully combine sending 5 figure groups, Decode “Annex 10” Aircraft selcals, Morse, Hellscreiber, ARQ-S, ARQ-E, ARQ-N, ARQ-60/98, ARQ-E3, ARQ-SWE, ARQ-E3, ARQ-S, ARQ6-90/98, ARQ-E3, ARQ-SWE, ARTRAC, POL-ARQ, F7BBN Baudot, Twiplex, CCIIR242 TDM, CCIIR342 TDM, FEC-A, FEC-S, Autospec, Spread, HC-ARQ, TORG10/11, ROU-FEC, HNG-FEC, COQ8, COQ13, Piccolo Mk6, SYNOP (AAXX, BBXX with 10,000 stations) and GM/DSS-DSC.

This allows you to receive nearly every decodable system there is on shortwave and VHF. Diplomatic stations, Customs, Police, Military & Weather Stations, and digital reception (such as ACARS, FLEX, DMT, Packet, Baudot) is optimised for every possible combination of keying speed and bandwidth. All of this DSP filtering means your receiver does not need to have expensive narrow filters for RTTY. Simply use your wideband SSB setting for SW monitoring and AM or FM for VHF.

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Practical Wireless, March 1997
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AKD 2m (144MHz) rig, model 2001, boxed with mic. and manuals, as new, except for scratch on rear. £70. G3BEU, OXON (01792) 843166.

Philips DC777 s.w. car radio, as new, £75 o.n.o. with charger, selectable, £28 o.n.o, with radio software and interfaces. £50. Tel: (01084) 786682. Wanted: Jones 7500s hf v.h.f. scanner, condition as new. £45. Tel: (01131-688 3570 9-30 am). Wanted: Hitachi D50008 70cm (430MHz) hand held, with power supply and other extras, all boxed in mint condition. £250. Tel: (01623) 350878.

Sinclair Spectrum 128k + 2 a.m./f.m. selectable scanner with printer). £15, Eddystone ‘bug’ key, offers. £40. Tel: (01244) 821693. Wanted: Adscend 8600E, 2m, £125. Tel: (01769) 573382. Wanted: 602 25W transceiver. £15. 19 Set bits, Pye international service manual. £15. 19 Set bits, Pye international service manual. £15. 19 Set bits, Pye international service manual. £15. 19 Set bits. Wanted: Poly M2000B with a.t.u., £75. Wanted: Yaesu FT-277, no charge. £120. Wanted: Kenwood TR-890 transceiver. £320. Wanted: G8BX0. £125.

Trio 75-100MHz, CR100, £55. Wanted: Kenwood TS-850AT £250. Wanted: Kenwood R1000 receiver, 0-30MHz with separate a.u., £200 Transceiver £50 or instructions a/s. Wanted: Kenwood a.t.u. AT230, preferably boxed and instructions. GW4XKE, QTHR. Tel: (01225) 523599.

Kenwood R1000 receiver, immediate as new, boxed with all accessories, £250. Sorry, no offers. Tel: London 01-817 732. Kenwood TH-79 dual-band 2m/6cm (144/430MHz) hand-held, plus power supply and other extras, all boxed in mint condition. £250. Tel: Yorkshire area (01302) 358073.

Kenwood TM-235e dual-band boxed with NC55 mobile microphone and DFS-3B detachable front end panel kit. £475. Kenwood TH-229E, boxed, second hand, £165 o/n/o Graham G7MWO, Glos. Tel: (01453) 828474.

Kenwood TH-840s hf transmitter, fitted a/s.a. and general coverage, like new and boxed, £750 o/n/o Walsall 2S50A. Kenwood 2m 1144MHz (2n1 144MHz) icom transceiver. £300. Wanted: Kenwood TS-840A transceiver, 100Hz, 10Hz. steps, a.g.c.. narrow band. Wanted: Kenwood TS-840A transceiver, 100Hz, 10Hz. steps, a.g.c.. narrow band. Wanted: Kenwood TS-840A transceiver, 100Hz, 10Hz. steps, a.g.c.. narrow band. Wanted: Kenwood TS-840A transceiver, 100Hz, 10Hz. steps, a.g.c.. narrow band. \n
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You should state clearly in your advert whether the equipment is potentially fully built, horse-drawn or modified.

The Publishers of Practical Wireless also wish to point out that it is the responsibility of the buyer to ascertain the suitability of goods offered for purchase.
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Realistic DX302 receiver, £30. B29. Tel: (01557) 330271.

FT-1012D receiver, £105. B29. Tel: (01557) 330271.

Realistic SX500SE receiver, £70. B29. Tel: (01557) 330271.

Marconi marine RX, CR2001, good condition, working, £60. B29. Tel: (01557) 330271.

Telefunken type 592, 6dbm oscilloscope, £40 o.n.o. Amstred 208n, twin 2.5in screens, no told. Colour monitor, £50. Tamberg series 2000 stereo R to R recorder, £40. Two large 500mA FSD circles 6.5in dial, 220v scale, offer, buyer collects. Peter G3UHI, Kent. (01634) 250952.

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Yaesu FT-75/75G, boxed, £55.00. Yaesu FC-700 a/u/o. £120. Yaesu FT-221R 7m (144MHz) multi-mode, £25. Miller compact h.f. receive antenna, £45. Waspco 5-element 2m (144MHz) beam, £25. All mint condition. Gary GYVAU, Cheshire. Tel: (01928) 570707 (eve) or (046) 617688 (mobile).


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