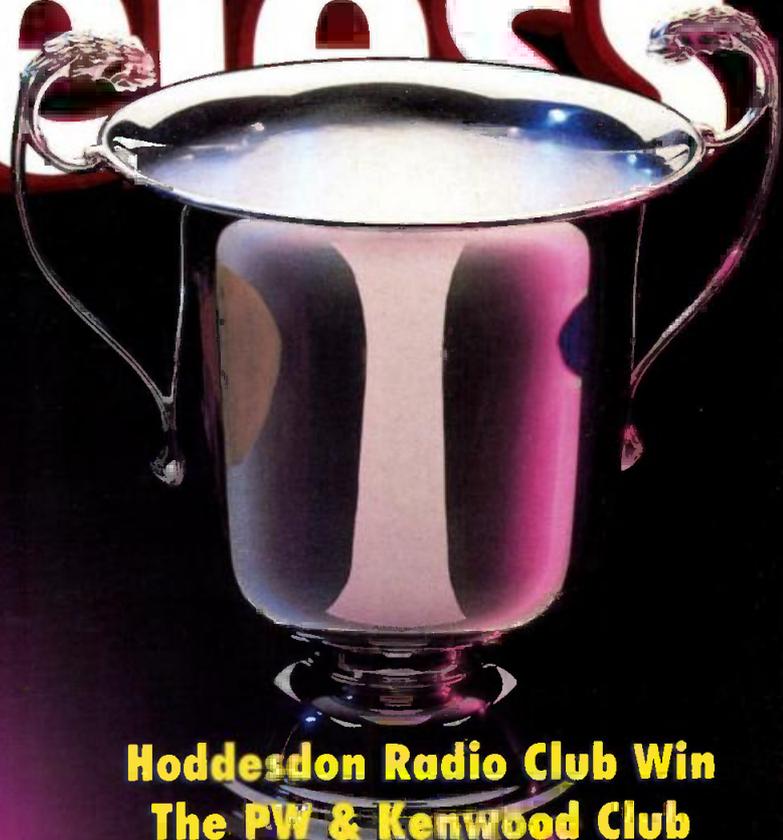


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REVIEWED

**The AKD 'Target' HF-3
Communications Receiver
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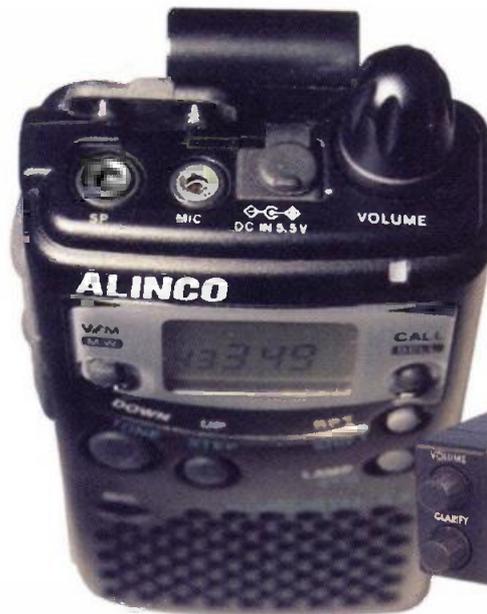
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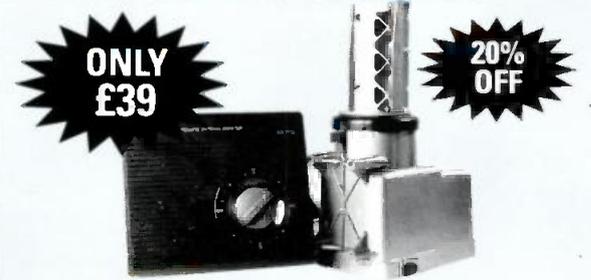
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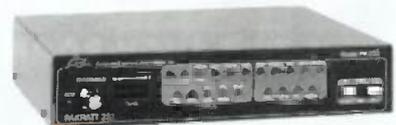
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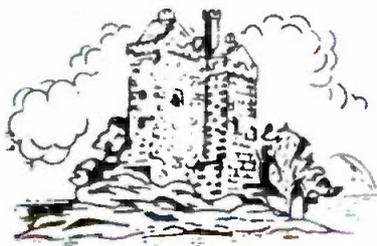
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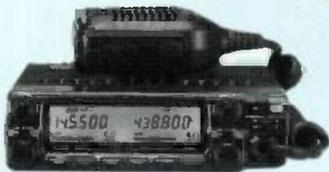
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PW "Rugby" Transmitter and PW "Daventry" Receiver



Designed by Dave Howes for Practical Wireless, these projects enable you to enjoy building quite sophisticated equipment for "forty". 80M versions

have also now been developed. A decent superhet receiver and SSB transmitter are a constructional challenge for most amateurs. These projects make them a practical proposition. PCBs, kits, parts and hardware are available from us, along with technical support from the author. Daventry kit: £69.90, Rugby kit: £79.90 (hardware extra).



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73 from Dave G4KQH, Technical Manager.

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EDITOR'S

Keylines

Rob Mannion's viewpoint on the World of Amateur Radio

If you've read the 'Receiving You' pages from the October issue, I've no doubt you'll have noticed the letter from Nigerian radio enthusiast **Andrew Gani-Ikilama**. Andrew, like many others in developing countries, needs support in getting going in the hobby and as I mentioned in my comments at the end of Andrew's letter, I'm planning to recruit the help of you (and particularly) that of your club this month.

I would like to suggest that Amateur Radio Clubs all over the UK (and anywhere *PW* is read of course!) 'adopt' radio enthusiasts (or clubs where they exist) in developing countries. This would mean sending surplus radio components and other 'bits and pieces' (which most of us have in abundance but which can be extremely difficult to get in Africa and Asia) to the 'adopted' radio enthusiasts.

Airline Help

My idea to help and encourage budding radio enthusiasts in developing countries can only work if we can get the help of an airline. With that in mind I've written directly to **Lord King**, Chairman of British Airways asking for his airline's assistance. I hope to have news on the matter in time for my next 'Keylines'.

In the meantime...would you and your club like to join in and help enthusiasts who want to join in and enjoy radio, but don't have the benefit of the enormous quantities of radio 'bits & pieces' that we have (and which although perfectly okay, often get dumped or left in store) hidden away? If you would like to help, please drop me a line.

Together we can help others to enjoy radio in the same way we've been helped ourselves. The only difference is...these 'bits & pieces' will be flown thousands of miles before completing their journey on the back of someone's bicycle!

Award For Irish Entries

As many readers will remember, I've been trying to support and initiate an appropriate award for Irish entries to the long-established *Practical Wireless* 144MHz QRP Contest. I had hoped to attract a sponsor to support

the award so we could present it every year to the highest scoring EI or GI entry to the contest in the same way the

'Tennamast Trophy...in Memoriam To Frank Hall GM8BZX' is awarded to the highest scoring Scottish station.

However, as I've not been able to attract a sponsor, I propose to make a gift of the award myself. I'm delighted to be able to do this because I am always made very welcome indeed in Ireland...North and south of the border between EI and GI.

So, in a small way I'd like to repay the kindness extended to *PW* and myself from Radio Amateur friends in Ireland by presenting the trophy in time for the 1997 QRP contest. But although I have an idea of the form of the award however, it needs and deserves a name.

Can you help name the new trophy? Personally, I feel that **Dr. Neill Taylor G4HLX** who has run the contest since its inception, should be honoured. Perhaps you've got an ideal name for the award? If so, let me know, as it would be an excellent way of marking Neill's hard work over the last 14 years and encouraging our friends in EI and GI for their efforts in the past and spur them on to keep trying!

I look forward to hearing from you with your suggestion for a suitable name for the trophy.

Write Carefully - Please!

In a recent 'Keylines' editorial I (on behalf of **Zoë Crabb**) made a request for readers to write their free 'Bargain Basement' adverts out carefully, and now it's time for a similar request! This time it concerns letters aimed for publication in 'Receiving You'.

Your (and let's face it - it is your column) letters intended for 'Receiving You' are coming in thick and fast. We're never short of letters from readers and the editorial team is delighted to get them. However, we often have great problems in reading



your handwriting! *Practical Wireless* itself and the hobby in general requires feedback and interest from readers.

Because of this we're delighted to receive your letters but we ask you to carry out the following simple procedures: If the letter is aimed at 'Receiving You' - **please make this very plain on the letter.**

Also, please bear in mind that we cannot publish anonymous letters. I feel frustrated when unsigned letters arrive because often the writer has valid and interesting points to be made. I can't reply to unsigned letters...so please sign them so I can at least reply to you. If you don't want your letter to appear in print (but want to have your say anyway)...it won't be published without your permission. That I promise.

We publish the minimum address of correspondents, and if requested to do so, we'll only mention the county of origin. But to do so we must have your full name and address. Have the courage of your convictions, trust us and write that letter!

Finally on this topic, I come to the most difficult aspect of all regarding your letters - **deciphering them!** Typed letters are fine and handwritten letters are just as good (often far less 'mechanical looking' than computer generated fonts) provided we can read the handwriting.

So, please ensure you write as clearly as possible. Please print your name, callsign and address in block capitals so we can get back to you to query anything. This is essential nowadays as many people are 'Particulars Withheld' in the *RSGB Callbook* which is often our only way of cross-checking possible combinations of deciphered names and callsigns. Thank you...and please keep writing into *PW*!

Traders' Table

By now you'll have noticed our new advertising feature 'Traders' Table' which is providing the most up-to-date listing of second-hand equipment

possible in the magazine. The feature is aimed at helping readers and traders alike by having a much later advertising 'closing date' than is possible for display adverts.

We hope that you're able to find the equipment you need via this new advertisement section. It's aimed to help the reader who wishes to buy from a known trader (bringing benefits such as finance, part exchange and warranties, etc.). And of course 'Traders' Table' compliments our very popular 'Bargain Basement' readers' advertising.

Many of our advertisers sell second-hand items. As 'Traders' Table' establishes itself we hope to include more advertisers, we value and support all our advertisers and as space becomes available, there'll be room for everyone who wishes to take advantage of the innovative feature.

Buyer's Guide

We're introducing another new feature in *PW* this month - in the form of a 'Buyer's Guide'. Compiled by **Donna Vincent G7TZB**, the 'Buyer's Guide' will provide a month-by-month listing of what new equipment is available, average prices, what it does, brief specifications and other information to help you decide what item of equipment suits you best.

Donna hopes to make the guide as comprehensive as possible and we hope you'll find it useful. We've had many requests to provide this form of listing and look forward to your comments.

Haydon Communications

I'm sorry to say that due to a typesetting error in the **Haydon Communications** advertisement on page 6 of the October issue, the price of the IC-T7E was incorrect. The correct price should have been £295 and not as published. Please contact the advertiser direct for any queries on this matter.

Rob Mannion
G3X7D

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

RECEIVING You

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

Letters Received Via The 'Internet'

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

New Society - Comments From Belgium

Dear Sir

I respectfully disagree with your 'Keylines' editorial in PW of August 1996. I am the President of the Flemish Radio Amateur Society (VVRA). The Society was founded in 1981 as alternative to the Union Belge des Amateurs (UBA) who see radio amateurism rather as an elite group (which is their fullest democratic right). We want to make radio amateurism more popular, (in Belgium there are only about 5000 licensed amateurs out of a population of 10 million). We hope to achieve this goal by our interactions with the Belgian government to make the radio exams more reasonable in degree of difficulty, to allow youngsters to use a transmitter (under

supervision), to obtain more privileges for Novices (who today can only work on 144MHz and in 'phone), to install a new license with a 5w.p.m. c.w. test, to discontinue the requirements of a Belgian approval for equipment coming from EU countries.

I recently retired as a senior manager in a very large American company and I know the major driving force to make a better product is competition. Trying to be better not only serves the shareholder but certainly benefits the consumer.

A second amateur society in Great Britain can only result in a better product, even when the present (RSGB) product is superb already, which I do not doubt.

**Dr Guido Clinckemaille
ON7CI
President VVRA. Belgium**

Dear Sir

May I be allowed to say that I agree with all that has been said on the future of amateur radio ('Keylines'. August PW). There was a time some years ago when I might have thought quite differently following a sad experience with the RSGB - my first and only encounter with the society in 60 years.

I suspect it had something to do with the fact that I was not an RSGB member, just another someone with a lifelong interest in the radio hobby. The advice and information I was seeking eventually came from another radio society outside the UK. But that's another story.

So far as I know, nothing has been published on the present and future agenda of UKRS. All I know comes from 'ear wiggling' on the amateur bands, which leaves much to be desired. There appears to be a wide difference of opinion as to

who best can serve the UK amateur fraternity and some remarks made by individuals over the air would have been best kept to themselves.

**Richard Williams
Oxon**

Dear Sir

In your recent letter to me in reply to my comments on your August 'Keylines', you queried my objection to RSGB subs which I mentioned when writing to you. So may I explain some of the basic reasoning for my comments?

My initial introduction to radio was in the early 1940s when I joined the Kingston Radio Society as a very junior member. I can remember the masses of encouragement from existing G2s. The most important factor then was, that the aid and assistance given, especially to the younger and less fortunate amongst us,

was free. Education and encouragement was considered more important.

Later on I served my time at Woolwich Arsenal. Again, I was deeply affected by the willingness of the skilled amongst us to give freely of their time, knowledge and skills to teach a group of often quite obnoxious young men crafts those now old men have to this day.

Then the army called and yet again I met with this wonderful willingness of the skilled man to share his gifts with the less fortunate amongst us with a freedom which can only be described as almost a form of love.

This has left me with the view that I should always be willing to be at least as generous myself towards the young and student among us. We seem to have lost that 'to give and not to count the cost' approach, which so benefited the country and, indeed the world.

Today, everything is measured by profit and added value, by a 'fairness' which beggars the imagination. How can it be fair for a person with a 'below-the-bread-line' income to pay exactly the same tax or subscription as someone receiving a salary of perhaps several thousand pounds each week? This becomes even more obscene when that tax or subscription is being used to help pay the inflated 'wages' within some organisation.

Some amongst us do pay subscriptions to minority-interest professional groupings. We do it for 'professional' reasons, not 'minority' interests. And we do it freely of choice.

But amateur radio is not a minority interest, it has to do with communication which is world-wide. It has a great deal to do with freedom as

Communications With Novices

Dear Sir

I refer to a previous letter 'Snobbery against Novices' from Chris 2E1DTV in which he was of the opinion that Novices were ignored by fully licensed Radio Amateurs. You can't force people to speak to you and I don't think that he should be too annoyed about the 'Eighty Metre Brigade'. In fact, I am erecting a new h.f. vertical and I don't intend to include that band in my plans!

I was wondering why I didn't meet any Novices on the bands that I use. So, I made enquiries on the various licensing conditions and formed the opinion that Novices have a slim chance of having contacts with fully licensed Amateurs for the following reasons:

Novices are restricted in power and they do not have the use of the bands that are most frequently used by fully licensed operators for communication. I refer to 7 and 14MHz in the case of Class A and 144MHz for Class B. Novices have a limited use of sections of other frequencies and Class B Novices are limited to above 30MHz.

Although Novices can use a small designated section of bands, including 50, 432MHz and the GHz frequencies, I, like many others, do not have equipment to make a contact on any of these bands nor do I intend to. As regards 28MHz, there is a remote possibility of a contact, but I would be relying on the odd occasion that the band is open on short

skip throughout the UK.

I do believe that one should be able to speak or communicate with bona fide amateurs, regardless of race, creed, religion and licence status and would suggest that the use of the term Novice was unfortunate. The term 'Novice' should have substituted with Class C and regarded as a stepping stone.

The image that 'Novice' conjures up to some is not unlike that of 'Amateur' in some respects and could convey an image of incompetency. I must immediately add that nothing could be further from the truth when you think of the amount of study that has gone into the City & Guilds examinations.

I recently did have an exchange of messages with a Novice on packet (not quite an actual QSO) and would look forward to a few more. I would urge all Novices to have an enjoyable learning experience on the radio, for after all, the hobby should be fun, but would also advise them to widen their scope and go a step further and aim for Class B or the full Class A licence.

The chances of making contacts will increase, not only with fellow Radio Amateurs, but the rest of the world and it is for these reasons that I would encourage my own junior ops. to do likewise.

**Kenneth Allen G14RSI
Western Education & Library Board
Co. Tyrone**

well, but that is another argument.

More to the point, amateur radio will only remain what is has for so long been just as long as it is available to one and all. Currently it is fast becoming the playground of the rich, by which I now sadly have to mean those with a reliable income and/or lots of spare cash.

For several million amongst us this last is simply not true. I would not carp over the subs were it not that the RSGB seems to me to be more concerned about its own financial success and ego than with the welfare of the members or providing a service to them. As I noted, today it is even an 'authority' in our world.

If you really want me to continue I will. But though I know I do reflect the ideas of many fellow-amateurs I am like 'a voice in the wilderness' when compared to the sounds of authority from on high on both sides of the now apparently imaginary fence surrounding our little world.

Dick Railton GW6RXA
Carmarthenshire

Morse Language?

Dear Sir

Without wishing in any way to belittle his special interests, may I refer to Mr Breingan's letter (Sept '96) and simply put forward a different point of view. The argument that Morse is an international language is true in a very limited sense and I agree that it is possible to pass Morse or less standardised messages to persons in many bands. But is it communicating? It all depends on how the word is defined. I realise that really expert telegraphists could discuss almost anything at length, but I doubt whether the average person does more than exchange the barest details.

If I were in touch with someone in a far-distant country, unless he wished to discuss aerials, I would not be particularly interested in knowing he had 270 feet of wire slung between two coconut palms. What use could I make of that? I would much rather know what he did with the coconuts! And if

he did not have a good command of English, I do not think the list of Morse abbreviations would get very far is discussing his coconut harvest!

The pro-Morse/anti-Morse argument has gone on for years and has become very tedious. It is well known that the radio communications agency are in favour of scrapping the international Morse requirement and it seems to me that if they were convinced, from their point of view, that the UK Morse test was really necessary, they would have told us all to shut up a long time ago.

The agency is there to request and they should make up their minds and do just that. Perhaps the recent survey will enable them to do so. Suppose the bands were opened up, would not the increased activity eventually produce operating techniques to cope with the livelier conditions, adding skills and extra interest to the hobby? Perhaps communicating would then take on a new meaning.

W. Parkin G8PBE
Cheshire

This Month's Star Letter

History Repeats Itself

Dear Sir

In 1949 when I was a sixth former in a hill-country school in Ceylon (now called Sri Lanka) I had access to *Practical Wireless* in the school reading room. I avidly read each issue and even tried out F. J. Camm's circuits.

Then came the Beaverbook-orchestrated price war in Fleet Street and the cost of English periodicals shot up alarmingly. *PW* soared from 6d to 9d a copy, a 50% price rise.

The school librarian, who was also my house master, called a crisis meeting. There had to be cuts and *PW* was axed.

So one Saturday each month, I walked seven miles across undulating country to the army town of Diyatalawa to buy a copy of my favourite magazine. Leave of absence was readily granted by the house master, who called me a 'real sport'. Little did he know that the 'sport' was doing a roaring trade making purchases for those unable to obtain permission and/or unwilling to walk seven miles each way.

I bought anything from sweets to gramophone records (78r.p.m.) and also those banned comics charging a commission, cash with order! My modest commissions more than paid for *PW*. They covered the cost of a hot spicy meal in one of those cheap and dingy eating houses.

Had the school matron only known, she would

have been horrified 'hot beds of cholera and typhoid', she would call them. But, oh what a welcome change to stodgy hostel?!

Now, in the first year of my retirement, history repeats itself. As a result of budget cost, Hounslow Public Library has discontinued *Practical Wireless* - fancy that!

Once again I have to walk, not seven miles, but three quarters of a mile to W. H. Smith in Hounslow High Street to buy my radio magazine and at what a price! £2.20 per copy, a 5500% price increase on 1949 prices - would that my pension increase by the same scale!

To compound the situation, there are no commissions to be made - not from my neighbours! That leaves little change for a meal out. The High Street burger bars may be a far cry from Diyatalawa's grubby cafes, but having weathered the perils of cholera and typhoid, am I pushing my luck with CJD (Creutzfeld-Jacob disease)?

Oh, if only I could stay put in my shack and download *PW* on packet! Maurice De Silva G0WMD Middlesex

Editor's comment: A fascinating story Maurice! Specialist magazines such as *PW* are often difficult to get (unless you place a firm order) at 'High Street' newsagents, etc. It may save you much time and frustration if you take out a subscription and you'll certainly save money from your pension, but unfortunately you won't get the exercise any more!

CB Radio On 6MHz

Dear Sir

I was interested to read David H. Wright's letter concerning 6MHz CB. Also, sorry to hear that this gentleman finds illegal 'Pirate' transmissions between 6.5-6.700MHz of more interest than amateur radio, or as he says: "I now spend more time listening away from the amateur bands than transmitting on them"! Does he write with tongue in cheek I ask myself?

As for his comments about the '45 metre' operators sounding like and using amateur language. I wonder? Mr Wright seems to indicate that a station calling 'CQ 45 metres' sounds like an amateur. I disagree!

All radio amateurs know exactly what frequency that are transmitting on and certainly what band they are in and do not call CQ 10, 15, 20 or any other metres wavelength for that matter! In my book, CQ the frequency or CQ 'X' metres is a sure fire giveaway of 'so called slick pirate lingo'.

Mr Wright does not include his callsign but from his text it suggests that he is a licensed amateur, this may well be the case and seeks to omit it because he raises an issue that he may not wish for any 'out of licence' response.

However, Mr Wright, if you are prepared to stick your head up above the trenches, and write into a magazine such as *PW*, you should really be prepared to fully identify yourself in your full glory with callsign.

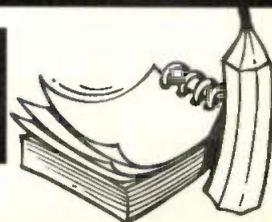
I do not listen out of band. I am quite happy with the full amateur licence spectrum, which is quite enough for me! I do not suggest that you should contain yourself to just the amateur frequencies as far as RX is concerned, but I am surprised that you do not know what happens on 6 metres! Again, 'tongue in cheek' I think, unless you are a new radio amateur?

Tim Cattley G0CWZ, Salop

Editor's comment: In defence of Mr Wright, I also spend more time listening than transmitting, and also do most of my listening 'off the bands'. When working at home, I'm usually listening to Radio Netherlands and the other official broadcasting stations on the 49 metre band (I find listening in to other Amateurs too tempting and would often be joining in rather than working on the magazine!). That's how I often come across the 'CB like' activity, particularly when tuning from 49m to prepare to operate on the 7MHz Amateur Band. To be honest, I don't think we can avoid it and as the activity on these frequencies is international, there's not much the Radiocommunications Agency's Radio Investigation Service could do about tacking the activity outside the UK.

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

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



NEWS 1996

Compiled by Donna Vincent G7TZB

Radio Helps Children In Need

The Mid-Sussex Amateur Radio Society (MSARS) together with 20 other clubs from around Britain are joining together to operate special event stations in aid of this year's BBC Children In Need Appeal. The MSARS station, **GB0KIN** will be operational on h.f. and v.h.f. over the weekends of 15/16th and the 22/23rd of November.

At the time of going to press the GB callings have yet to be confirmed but all stations taking part have been asked to use the

word NARCINA as a means of identification. All stations are asked to 'call in' and boost the number of contacts.

To date the clubs taking part in the event are: Blackwood, Braintree, Caravan & Camping, Dundee, Grantham, Hastings, Horsham, Keighley, Leicester, Lowestoft, N. Bristol, N. Wales, North Wakefield, Otley, Preston, S. Notts, Thames Valley, Warrington, Wigan, and Worthing. Any other clubs who wish to take part will be more than welcome to join in. For more details contact **G3CLF** on (01903) 521152 or on Packet **GOGMC@GB7ZZZ**.

Kyle's The Key Man For 1997

Well known Northern Ireland Radio Amateur **Ian Kyle G18AYZ** is to be the next President of the Radio Society of Great Britain. Ian will succeed the 1995 President, **Peter Sheppard G4EJB** and will be installed during a ceremony which is planned to be held in Northern Ireland in early 1997.

Ian who is aged 67 retired after working in radio communications engineering for many years. He's married to **Jean** and they have two children, **Alaistair** and **Lynn**



Ian Kyle G18AYZ, the Radio Society of Great Britain's President Elect for 1997.
Photo courtesy of Terry Barnes G13USS

(both are radio amateurs!) - and lives in Lisburn, County Antrim.

An active Radio Amateur, Ian Kyle is well-known for his interests in v.h.f., microwave 'hill topping' and enjoying himself on the higher bands. One of his major responsibilities at the moment is the GB2RS News Service.

New Prefixes Included

As from 1 January 1997 the UK Morse test will contain passages with both 'G' and 'M' prefixes for UK call signs. This follows the introduction of the M-series call signs. The information sheet *Amateur Radio QSO-Format Morse Tests*, which is sent out to all candidates who book their Morse tests through the Radio Society of Great Britain, has been amended accordingly.

Leading Scottish Station

On the night of 16 August 1996 the **Cockenzie & Port Seton Amateur Radio Club** held their 3rd Annual Junk Night, which proved to be a great success. During the evening £477 was raised from the entrance fee, refreshment and raffle money, which when added to other money raised by the club throughout year amounted to a grand total of £727. This money was donated to the Club's adopted charity, the British Heart Foundation.



Also during the evening it was announced that the Cockenzie Club had been placed **Leading Scottish Station** in the *Practical Wireless QRP Contest*. For the second year running the club were presented with the **'Tennamast Trophy In Memoriam of Frank Hall**

Beth Hall pictured centre presenting (l-r) **Alex GM6VIU**, **Colin GM0CLN** and **Bob GM4UYZ** with the **'Tennamast Trophy In Memoriam of Frank Hall GM8BZX'**.

GM8BZX' in honour of their success. The presentation was made by Mrs **Beth Hall**, widow of the late Frank Hall.

Martin Lynch Upstages MicroHenry!

Determined not to be continually up-staged by his son - nicknamed 'MicroHenry' - Martin Lynch has pulled a master stroke and arranged a birthday party young Henry can't compete with. MicroHenry can't compete because he's not got 'enough years in' as Dad Martin is celebrating his 40th birthday while poor young Henry is still in a single figures!

Striking a double blow, Martin Lynch is celebrating his birthday and almost 20 years in the Amateur Radio retail trade and inviting everyone to his 'Open Day' on Saturday 2nd November 1996.

Martin, recalling almost 20 years 'in the trade' reflects on how much has changed and the widespread nature of his business. And in fact the widespread nature of the customer base was demonstrated during August when Andy Wyspianski - the Customer Services Supervisor called a customer in Belfast to tell them a radio was ready.

The customer's wife answered and while Andy was explaining the reason for his call, he heard a 'thud' from the other end. Not getting an

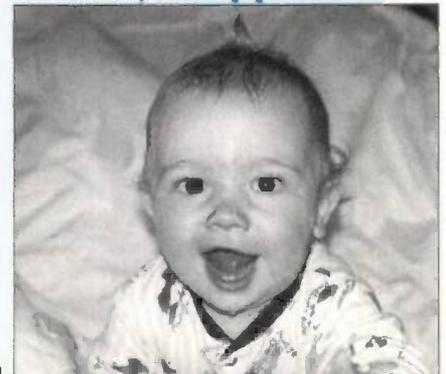
answer from the lady, Andy dialled 999. Contacted by the Metropolitan Police in London, the Northern Ireland police and an ambulance were despatched and after forcing their way into the house, found the lady slumped unconscious on the hallway floor. She'd suffered a burst ulcer, fallen down and knocked herself out! Operated on that night, she is now recovering well.

Martin Lynch says "So 'howzat' for customer service to the extreme"! (Well MicroHenry, Dad did at least got the last word!).

Rob Mannion G3XFD



In 1973 the 'young' Martin was challenging his elders, now 'MicroHenry' is challenging Dad!



RADIO DIARY

Compiled by Zoë Crabb

1996

November 1: The Bangor & DARS annual surplus equipment rally is to be held at Hamilton House, Hamilton Road, Bangor, Northern Ireland. Rally starts at 7pm sharp. Great bargains, so don't miss it! **G13YMY** at (01247) 466557.

November 3: Donegal (Tír Conaill) ARS are holding their Annual Radio Computer and CB Rally in Jackson's Hotel, Ballybofey, Co. Donegal, Ireland. Admission is £1 only. More details from **Gerard Dykes EI8HO, Secretary, 30 St Benildus Avenue, Ballyshannon, Co. Donegal.**

November 3: The 6th Great Northern Hamfest (formerly the Barnsley Amateur Radio Rally) will take place at the Metrodome leisure complex in Barnsley Town Centre. Doors open at 10am. The venue is all on one level, two halls, with excellent facilities for the disabled. The event will feature all the usual trade stands, covering amateur radio, computers (hardware & software), electronics, components, kits, clubs, repeater groups, Novice, specialist interest groups and a large Bring & Buy. Morse tests on demand from 1200 to 1500 (candidates must bring the appropriate documentation). A variety of refreshments will be available, i.e. full meals in the licensed restaurant, bar meals in the bar (where else!), snacks/drinks in the main hall. Talk-in on S22. Disabled car parking in leisure complex, all other parking in surrounding car parks. Admission to Hamfest is £1.50. Follow the large brown Metrodome signs (and Hamfest signs where appropriate). More details from **Ernie Bailey** on (01226) 716339 or mobile on (0836) 748958.

November 3: Thames Valley Electronics Rally is to be held at Kempton Park Racecourse, Staines Road East, Sunbury On Thames, Middlesex. Doors open 10.30am to 4.30pm. There will be refreshments and a bar available. Admission is £1.50 for adults, OAPs £1 and children up to 14 years old free. The entire event is on one level. There will be retailers, accessory suppliers, antenna suppliers, a Bring & Buy stall, etc. More information can be obtained from **HD Promotions** on (01494) 450504.

November 9: AMS '96 will take place at Bingley Hall, Stafford County Showground, Weston Road, Stafford. This event has **NOT** been cancelled and must not be confused with other similar events at this venue. AMS '96 is a computer and electronics sale, with an increasing Amateur Radio content. The event regularly attracts over 90 trade stands. For more information, log onto the web site at promotions@sharward.keme.co.uk or contact the organisers for further information at: **Sharward Promotions, Knightsdale Business Centre, 30 Knightsdale Road, Ipswich, Suffolk IP1 4JJ. Tel: (01473) 741533, FAX: (01473) 741361.**

November 10: Midland Amateur Radio Society - Birmingham's Eighth Radio & Computer Rally at Stockland Green

Leisure Centre, Slade Road, Erdington, Birmingham. Doors open 10am to 4pm. Admission £1. Large free car park, free Christmas draw, trade stands, local clubs and special interest exhibits. Further information from **Peter G6DRN** on 0121-443 1189. Trader details from **Norman G8BHE** on 0121-422 9787.

November 16: The London Amateur Radio & Computer Christmas Rally is being held at the Lee Valley Leisure Centre, Picketts Lock Lane, Edmonton, London N9. Doors open 10am to 5pm. New, pre-Christmas one-day event. Trade shows, Bring & Buy, on-demand Morse tests, talk in on 2m & 70cm, facilities for the disabled, priority admission for disabled visitors, bars, restaurants, ample free parking. (01923) 893929.

November 17: The Bishop Auckland Radio Amateurs Club (BARAC) rally will take place at Newton Aycliffe Leisure Centre. More details from rally organiser **Mike Shield** on (01388) 766264.

November 24: The Red Rose Rally is being held at Horwich Leisure Centre, Victoria Road, Horwich, Nr. Bolton off J6 M61. There will be a cafe, bar, Bring & Buy, RSGB stand, special interest groups, parking for 300 cars, free cash draw every hour, children's activity room up to seven years, supervised by parent. Doors open at 10.30am and admission is £1, free for children. Talk-in on S22. **Albert G7RZW** on (01204) 62980.

December 8: The SDX Cluster Support Group Radio, Electronics & Computer Rally is being held at the Maryhill Community Centre Halls, Maryhill Road, Glasgow. The halls are located approx. 1 mile from junction 17 of the M8 motorway and five minutes walk from St. Georges Cross underground station. As well as the normal traders, radio, electronics, computers, antennas, etc., a series of lectures are planned for the day. There will also be a RSGB Forum, which will be attended by members of the RSGB General Council. A cafe will be run throughout the day, serving hot/cold drinks and light snacks. Talk-in will be provided by Strathclyde Raynet on S22. Fees: Adults, £2, UB40 holders, £1.50, Senior Citizens, £1.50 and children under 14, free of charge with adult. **John Dundas GM0OPS** on 0141-638 7670 or packet @ GB7SAN, GB7SDX.

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

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

If you have any queries about a particular event, please contact the organisers direct.

Editor

**Practical Wireless & SWM in attendance*

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PRACTICAL WIRELESS SUBSCRIPTION

This month Elaine Richards G4LFM bases her column around questions which have been asked by you in your letters.

NOVICE Natter

For Radio Beginners Of All Ages

Interference

Nearly all of us have suffered a bit of trouble with interference at some time or another and Duncan Baker from Reading is no different. I haven't too many details to go on, but obviously something is causing interference to his radio.

At certain times the signals that Duncan is listening to are wiped out. Basically anything electrical can cause interference, anything from fluorescent lights to central heating systems and televisions to electric drills.

If your neighbour is into d.i.y. and it's his drills, electric sander or band saw, then you'll hear a nasty buzzing sound over the

radio. Irritating clicks can be things like the starters of lights or the timer on a central heating system.

Unfortunately, even the electrical mains can carry the interference. Obviously, it's going to take a bit of detective work to find out what it causing the trouble.

If the interference is external to your house then you may never find out. But first, it's worth making sure that your antenna is as far

away from any sources of interference as possible. By this I mean away from things like power lines and TV antennas. Also make sure you are using the right connectors and they are fitted correctly.

If you do decide that the interference is reaching your radio via the mains then you can fit a mains filter unit. It's very important that you follow the fitting instructions carefully because if they are badly fitted

they can cause even more problems than if you had left well alone!

If you can trace the cause of the trouble then there are plenty of books around with helpful advice on how to get rid of it. Even if you can't work out where it is coming from, all is not lost.

With interference that's fairly permanent, then you could try a noise blander or a d.s.p. filter. Try contacting some of the advertisers in *PW* to find out which product will help you most of all.



For interference that just won't go away you could try investing in a d.s.p. filter.

Beacons

Jonathan Wright has written in asking about beacons, what are they, who runs them, etc. And to start replying Jonathan, simply speaking beacons in the h.f. bands are used as propagation indicators and are controlled by the International Amateur Radio Union (IARU).

So, let's take a look at the most popular DX band, 14MHz or 20m first. And in fact there aren't that many beacons here, probably because it's a 'popular' band. And there are always stations on the air to give you an idea of what propagation conditions are like.

All the beacons are on the same frequency, 14.100MHz but they take it in turns to transmit. Each beacon transmits for just one minute in every ten. So, if you tune into 14.1MHz you may not hear anything as there are a couple of minutes when no-one transmits and also you won't be able to hear all the beacons all the time.

There are beacons in Japan, Argentina, Israel, California and Portugal amongst others. Each

beacon runs 100W into some kind of omni-directional antenna.

The cycle starts with 4U1UN/B followed by W6WX/B, KH6O/B, JA2IGY, 4X4TU/B, OH2B, CT3B, then a minute's gap and finally LU4AA. However, the whole beacon picture gets more crowded when you move up to 28MHz.

There are a lot of beacons on the 28MHz band and they operate on different frequencies, but all around 28.2 - 28.225MHz region. It can be difficult to tell which beacons are on the air and which have ceased because they do get taken off the air for maintenance or just because the person running them no longer wishes to keep up the work.

Anyway, if you spend a bit of time listening you will soon work out which are active. If you want to try and use beacons to tell you which areas of the world are workable at any time, it would be a good idea to get a listing of the current beacons on the band you are interested in from the RSGB.

When you move up to the v.h.f. and u.h.f. bands, then the picture

changes again. There are a lot of beacons on both the 144 and 432MHz bands all over Europe.

Most listeners in this country will probably be interested in the beacons on the Continent as they will let you know whether you are likely to work into certain countries or not. Rather than spending time calling 'CQ DX', you could try listening around the beacons to see which countries can be heard and then tailoring your operating to match. Again, the RSGB can help you with a full list of who's got a beacon on which frequency.

There are beacons in the microwave band too, but these are often used for tasks such as aligning equipment. These bands require specialist knowledge and I would strongly suggest that you talk to members of your local radio club about their experiments before you start trying any of your own.

For details of current beacons, contact: **The Radio Society of Great Britain, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE.**

Log Keeping

In these days of computers, is it worth bothering with old-fashioned log book-keeping anymore? asks Richard France in Cheshire. Well, in reply Richard, that depends on your situation and your views on computers!

If you have a computer available, then obviously there are lots of advantages to having your log filed on disk. It's easier to look back and check whether you've worked a station before and what details you wrote last time.

However, paper log books don't crash and can even be used during a power cut! Mind you, even if you do use a logging program, as an amateur, you are legally obliged to be able to produce hard copy of the log and you have to keep the log separate to anything else.

It's probably not a bad idea to have a copy printed out for reference either. There is something special about sitting down and leafing through your log

Learning Morse

Learning Morse is not easy for anyone and often seems to be a cross between a foreign language and shorthand! **Brian Waller** wants to know what's the best way to learn Morse and what will the Morse test be like. Let's look at the Morse test first.

Your examiner will want you to pass, they're not sat there waiting to pounce on your every mistake with great enthusiasm and doesn't take great delight in failing another hopeful. The examiners are perfectly nice human beings, it's the people arriving for the test that give them these ogre-like characteristics!

It's a very short test, less than 10 minutes. You have a three minute sending test, during which if you make any mistakes you can correct them. I would say that if you are even unsure whether it was a mistake or not I would correct it anyway. That's because you can't afford to make any uncorrected errors in your sending.

The receiving test is six minutes in length and you don't

have to be perfect to pass, you can have up to four mistakes and still pass. The RSGB organises the tests and you'll get all the details on the application form.

Each of the test centres in the UK hold tests every couple of months and you can often sit a test at some of the larger rallies. But your test must be booked in advance.

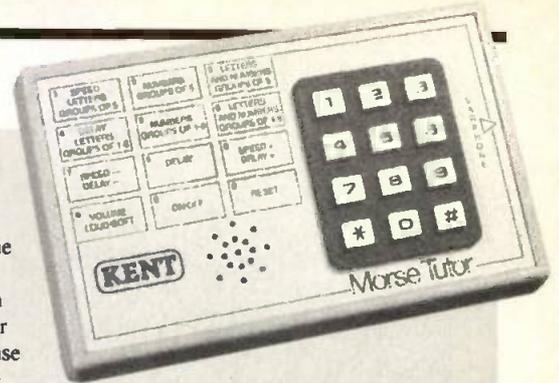
Now to actually learning Morse. There is no formula for learning Morse, different people find different ways to learn. All I can say is there are no short-cuts, it's hard work and you can't expect to get it right if you only set aside 10 minutes a week!

Your local radio club will probably run classes and it can be helpful to learn in a group. The classes will probably follow a set course, with extra help as

and when students need it.

Alternatively, you can listen to the slow Morse transmissions from the RSGB. Another way to learn is to use gadgets like Morse tutors or computer programs.

No one way is better than other and one of the benefits of belonging to a radio club is you can probably borrow a Morse tutor or a



Morse tutors like these are a valuable aid in learning the Morse code.

teaching program from the club. Unfortunately, only lots of regular practice will win the day Brian. But if I had to learn Morse all over again, I think I would choose to join the local radio club class.



book, looking back over the months or years - how many old friends do you see recorded, how many are no longer on the air, off doing different things these days - a great way to bring back memories. I'm not sure a computer disk can have the same effect.

I must admit I like the flexibility of the computer log, it's frustrating knowing you have spoken to someone before but not being able to remember when and so not being able to find the details in the log. At least the computer can find out these details quickly for you.

Another use for the computer is tracking down the contacts you have made that will enable you to claim an award or two. In a paper log this can take some time.

So, I think it is a case of using the method that suits you best, but there are benefits and drawbacks with both. There are a good range of logging programs available, many of my amateur acquaintances use Turbolog and I've also heard that Fastlog is good.

If you are into contests then you may find Super Duper worth looking at. The latter two programs are available over the Internet if you are interested.

The Amateur's Code

I was looking something up, just as I was finishing the column and came across something I haven't seen for ages - The Amateur's Code. I seem to remember coming across this when I was studying for the RAE, but that was some years ago now and you tend to forget things if you're not reminded regularly. So, here's a reminder:

"The Amateur is considerate...He never knowingly uses the air in such a way as to lessen the pleasure of others.

The Amateur is loyal...he offers his loyalty, encouragement and support to his fellow radio amateurs, his local club and to the Radio Society of Great Britain, through which amateur radio is represented.

The Amateur is progressive...He keeps his stations abreast of science. It is well built and efficient. His operating practice is above reproach.

The Amateur is friendly...Slow and patient sending when requested, friendly advice and counsel to the beginner, kindly assistance, co-operation and consideration for the interests of others. These are the marks of the amateur spirit.

The Amateur is balanced...Radio is his hobby. He never allows it to interfere with any of the duties he owes to his

home, his job, his school or his community.

The Amateur is patriotic...His knowledge and his station are always ready for the service of his country and his community".

The code was written by **Paul Segal W9EEA** back in 1928 and although it refers to the amateur as 'he', it is equally applicable to the lady operators on the air today.

I know not everyone on the bands sticks to this code, but if we all tried a bit then perhaps the bands would be a better place. But that's probably wishful thinking!

Well that's all for this time, so until next month cheerio and happy 'nattering', don't forget I love receiving your letters so keep them coming together with your photos to me at PO Box 1863, Ringwood, Hants BH24 3XD.

Elaine G4LFM

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

CLUB Spotlight

Compiled by Zoë Crabb

Hoddesdon Wins The Spotlight Trophy!

Winners of the first 'Spotlight' trophy competition are The Hoddesdon Radio Club. The HRC *Newsletter* scored a total of 48 points (out of a maximum of 50) to earn the distinction of winning *PW's* first Club Magazine competition.

Summing up the winning entry's adjudication, the Editor G3XFD said that "Overall, the judging panel were very impressed by the crisp 'newsey', informative, friendly, thoughtfully planned and well-produced Hoddesdon magazine. It's an excellent read and Hoddesdon should be proud...although they should take care the 'clip art' 'Printer's Devil' doesn't take over completely!

The trophy - a magnificent silver cup which will be held for a year, will have a separate small plaque attached to the plinth, recording that year's winner. The silver cup itself, kindly donated by Kenwood Electronics UK Ltd., will carry the following inscription: 'The Spotlight Trophy. Awarded To The Radio Club Magazine of The Year by *Practical Wireless* and Kenwood UK.' and will be presented at the 1996 Leicester Show on Saturday 19th October.

David Barlow G3PLE first suggested the idea to *PW* Editor Rob Mannion G3XFD and Zoë Crabb ('Club Spotlight' compiler), and very soon Kenwood Electronics UK Ltd. Dave Wilkins G5HY, an active radio club member himself, was fully supporting the idea. Finally, another keen radio club member, Anglia ITV's 'weatherman' Jim Bacon G3YLA, joined the group to complete the panel of judges.



Club magazine entries were received from Hoddesdon (48 points), Cockenzie & Port Seton Amateur Radio Club in Scotland (40 points), Silverthorne Radio Club (40 points).

Competition was close as you can see, and the trend continues because the Southgate Amateur Radio Club (39 points) and the Chiltern DX Club (39 points) were running 'neck & neck' too!

Not to be outdone, both the North Ferriby United Amateur Radio Society entry (38 points) and the Yeovil Amateur Radio Club's score (38 points) were also a close run thing!

The Cornish Radio Amateur Club (34 points) entry was closely followed by the Bristol Amateur Radio Club's (32 points) score. And finally (but certainly not the least) the Brighton & District Amateur Radio Society (26 points) completed the first year's entries.

Interesting Comments

There were some interesting comments from the judges on the adjudication sheets with each entry, and they must surely encourage participants. For example Zoë Crabb (commenting on the Cockenzie & Port Seton entry) said "Very informative events column, I like the 'Amateur Anagrams'. An informative read, nicely spaced out and not cluttered".

Looking at another entry, Jim Bacon G3YLA (Commenting on the Silverthorn Radio Club's magazine) said "A nice newsletter with a good details panel. I like the humour and 'the celebrity shack chat' section"!

Highlighting the fact that many club magazines are often produced by 'one man (or woman!) bands', David Barlow G3PLE was appreciative of the Brighton & DARS's magazines efforts. "What an improvement (two issues submitted), they deserve a mention and need encouragement - carry on like this and we'll see them again next year. Well done"!

Dave Wilkins G5HY, commenting on the Yeovil club's entry said "An interesting read...nice to see a technical element too. Good mix of club news and operating news. It continues the Yeovil club's reputation for home-brewing".

Rob Mannion, rounds off with some encouragement to the editors of all club magazines (whether or not they've access to a computer, graphics and lots of 'clip art'). "It doesn't matter if your magazine is only two sheets and is hand typed. If it's good, well balanced and reflects the effort of the person or team involved well, it deserves a chance. Some of this year's entries did not come via 'word processing packages'....but they still produced excellent efforts. Take heart, be encouraged and let's see what your club's up to"!

So there you have it! Enter your magazine next year and you could be accepting the 'Spotlight' trophy at the 1997 Leicester Show, following in the successful footsteps on the Hoddesdon Amateur Radio Club.

Ynys Mon Radio Users Group

As from the end of August, the Ynys Mon Radio Users Group have changed their meeting dates from the last Wednesday in every month, to a three weekly venue, at the Llangefni Scout Hall, opposite 'Kwik Save', from 7.30 to 10pm. There is an entrance fee of 50p. There are refreshments, a raffle and a Bring & Buy sale (radio and computer gear only!) every month.

So, why not go along - you will be made most welcome. And if you like them, you can join for the sum of £1 only!

The Group will also be holding a special event station on the 19/20 October to work the JOTA and the callsign will be GB4LSG. On air times are from 0800hrs (Saturday), to 2000hrs (Sunday).

More details available from Tony Anziani GW4ZWN on (01407) 832197.

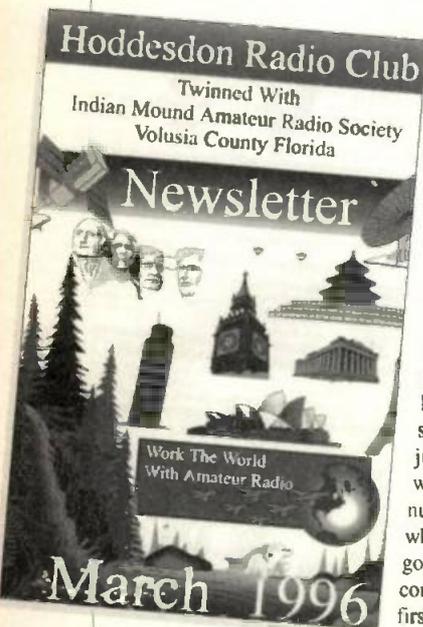
North Bristol ARC

The North Bristol Amateur Radio Club are going to be able to run RAE classes this autumn. Meetings take place at Self Help Enterprise 7 (SHE7), Braemar Avenue, Northville, Bristol, and club rooms are all on one level, so access for the chair-bound is fairly easy.

The club have on-going Morse tuition every Friday (which is club night) on the same premises. Anyone interested should call Dick Elford G0XAY on (01454) 218362 or Eric (Chairman), on (01454) 615271.

High Quality Entries

The panel of judges were very pleased at the high quality of the entries. There were some innovative newsletters and magazines. And - speaking generally, Rob Mannion G3XFD said on behalf of the judging panel, 'We were all pleased at the number of entries (10) which was particularly good considering the competition was the first'.



Worthing's Ragchew

Although too late to be entered into the competition for the Spotlight Trophy, Stan Williams G3LQI, Editor of the **Worthing & DARC's** magazine, *Ragchew*, has sent in a copy of the magazine. Each issue is compiled by Stan, produced on a Compaq 386 computer, master copy printed out on a Deskjet 520 and then it's taken along to the local copy-shop.

The magazine is then ready for collection within a day of so. Stan then collates all the pages, adds the cover (printed on his Adana 8x5 letterpress) staples it together and hand folds them all. The 100 copies are then delivered to the Secretary of the club for distribution.

Stan is a landscape gardener and says that printing has strictly been a hobby. He says the letterpress is rarely used in these days of computers but he still takes great joy in using it.



Life At Loughborough

Interested in amateur radio, short wave listening, electronics or computers? Then why not pay a visit to **The Loughborough & District Amateur Radio Club**.

Meetings take place twice a week at **Hind Leys Community College, Forest Street, Shephed**. Monday's, 7.30pm for construction, repairs, station operating and informal conversation and Tuesday's, 7.30pm, for talks, demonstrations, visits, radio direction finding, social events and quiz's, etc.

Club members come from all walks of life and have different interests, ranging from amateur television, radio control model helicopters and submarines, weather satellites, computers used with radio, equipment building and just operating. Radio TV and electronics for some members is a profession and for others just a hobby. The club also have a number of junior members.

Although most of the members hold a radio amateur licence, enabling them to transmit, for some there is interest in short wave listening. If you are thinking of studying for a Novice or Amateur Radio Licence A or B, maybe the Loughborough Club can help you.

Why not go along to one of the meetings on a Monday or Tuesday evening. Find out more by contacting **Ian G8SNF** on (01509) 218259.

Lothians Radio Society

The **Lothians Radio Society** meet in the **Orwell Lodge Hotel, Polwarth Terrace** at 7.30pm on the 2nd and 4th Wednesday of the month. Membership is open to all those with an interest in amateur radio, s.w.l. and electronics.

Club members have wide interests encompassing every aspect of amateur radio, including digital communications, short wave DX, construction, microwaves, television and satellites and are willing to help those who are taking up the hobby for the first time.

The Society can offer tuition for those wishing to take advantage of the Novice licensing scheme. There is a full programme of talks, demonstrations, equipment sales and visits throughout the winter months commencing on September 11th.

As this year is the 50th year of the Society, the society are planning a number of commemorative events, including a special event callsign to be active

during the year commencing in October. A certificate may be claimed for working or hearing four club members using the call, any band, any mode. Details can be obtained by sending as s.a.e. to the club information officer **Tommy Main GM4DCL**.

Lothians Radio Society are particularly keen to hear from former members who were involved in the early years of the club as they wish to compile a history to be included in their magazine *Lothians Radio Amateur*.

Further details about the club and its activities can be obtained from **Tommy Main GM4DCL, 15 Polton Road, Lasswade EH18 1AB. Tel: 0131-663 8501** day and evening or **GM3HAM@GB7EDN**.

Repeater For Wincanton

The **Wincanton Amateur Radio Club** is pleased to announce that their application for a 70cm repeater has been successful. They have been informed by the RSGB that their application for GB3TC has been approved by the RA and MoD and the RSGB will issue an NoV for this repeater when it is ready to become operational.

The repeater will be located in the Wincanton area and will probably operate on channel RBI (which is the channel they applied for). It is intended to provide coverage for users on the A303 trunk road and will use directional antennas pointing up the A303 towards London in order to achieve this.

The repeater will be owned and operated by the

Wincanton Amateur Radio Club, which was started approximately four years ago. The club already has the majority of the components required for the repeater and they will be obtaining the last few items when the frequency of operation is confirmed.

Further details of the repeater (including confirmation of the frequency and the estimated date of going on the air) will be issued when available. The Wincanton Amateur Radio Club members owns a number of Maxon 70cm crystal controlled transceivers and are intending to order crystals for these to operate on the repeater frequency.

Anyone else with a Maxon requiring

crystals for the RBI frequency should contact the club, as they may be able to include them in a 'bulk buy' of crystals. Contact **Tim Stellar G6RCT** on (01935) 442315 during works time if you have any further queries.

Oops!

In last month's 'Club Spotlight', in the story on the Christian Radio Conference it should have read that regular WACRAL Nets are held on **Sundays on 3.747kHz** not on Saturdays as stated! Apologies for any inconvenience caused by this error.

Arden Forest Direction Finding Group

A group of amateurs in the Worcestershire, Warwickshire and West Midlands area have joined together in an informal group to enjoy 'Fox Hunting' and would like to extend an invitation to any readers who would like to take part in this aspect of amateur radio. The group are at present holding two events per month, using the 144MHz band.

The events have been held in the geographical area covered by the north-west quarter of OS map 151. These hunts have so far been in the evening and last about an hour and a half followed by a convivial half hour in a convenient hostelry.

Should members wish, events can be organised on other bands, such as 1.8 or 3.5MHz and at other times. There are no qualifications for entry to the group, except to have an interest in this section of the hobby or a wish to find out more about 'Fox Hunts'.

Whilst it is useful to have your own equipment, this is not essential, as equipment can be borrowed from the organisers or you could team up with another amateur who has some equipment. The group are not attached to a particular club or society and are therefore totally independent.

Should any readers in this part of the Midlands be interested in taking part in these events, contact **J. Porter G4OHJ, 77 Westholme Road, Bidford on Avon, Alcester, Warwickshire B50 4AN** for more information.

Echelford Events

The **Echelford Amateur Radio Society** meet on the 2nd and 4th Thursday of each month at **The Hall,**

St Martins Court, Kingstone Crescent, Ashford, Middlesex at 7.30pm. Up and coming events are: October 10 - Channel islands occupation by Richard Walker G4PRI, 24th -

Auction sale, November 14 - Security devices by David Bowman G8VXB.

More information about the society is available from the secretary **Robin Hewes G3TDR, QTHR,** on (01784) 456513.

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FC-757AT

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On Target With AKD



The AKD Target HF-3 Communications Receiver

By Rob Mannion G3XFD

Rob Mannion G3XFD has tried out the AKD Company's latest product - a budget-priced h.f. receiver. Read on to see what he thinks of this latest British-made product....

I first heard of AKD's plans to introduce a general coverage h.f. receiver to their range of products last year. The Stevenage-based company revealed their plans to me and I must say that I was very pleased to hear the news.

The next stage was when I saw the early pre-production model of the new receiver on the AKD stand at the Picketts Lock Show in March. What I was able to see then impressed me very much, the receiver front dial and everything on view looked

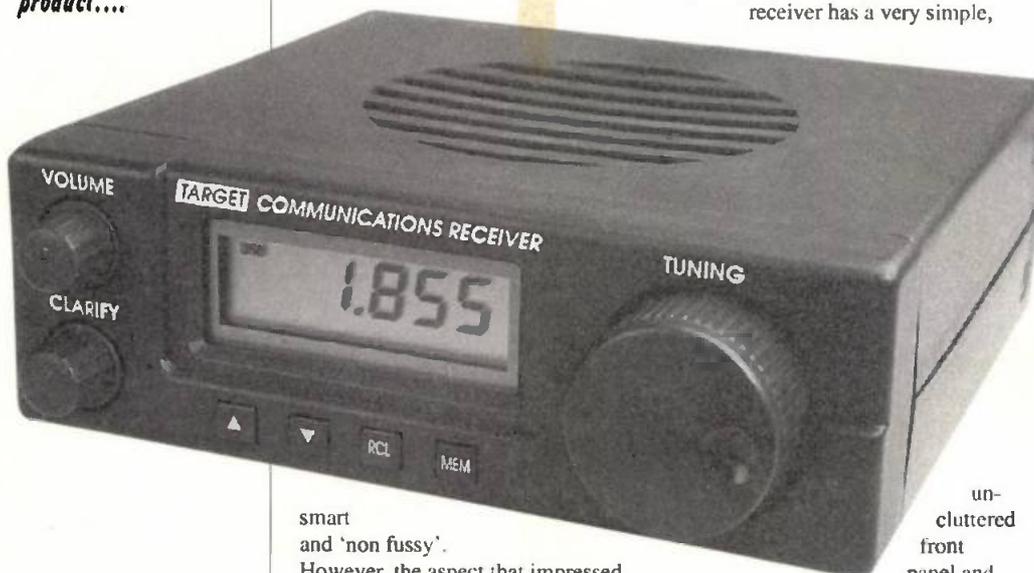
they could keep to their planned price) and the 'Target' receiver will be on sale for around £160.

When the unit arrived in the office **Tex Swann G1TEX** (Technical Projects Sub-editor and our Photographer) was amazed at its smart charcoal grey plastic case, lightness and general neatness. In appearance - except for the top-mounted loudspeaker - the receiver looked somewhat like a high quality car radio.

As you can see from the heading photograph, the Target HF-3 receiver has a very simple,

The manufacturers claim a bandwidth of 3.8kHz for s.s.b. reception and 6kHz for a.m. (see comments by **Tex Swann G1TEX**). Demodulation in the a.m. mode is quasi-synchronous and s.s.b. is handled by a product detector.

So, having taken a first look at the receiver it was time to try it out on air. And although I don't enjoy the crowded bands during contests, I was fortunate enough to begin my listening on the HF-3 in the run-up and during a major event in early September.



smart and 'non fussy'. However, the aspect that impressed me the most was the planned price - to be around £160.

All then went quiet and I began to wonder how things were going...until **Val Wagstaffe** of AKD contacted me in early September. The news was that a pre-production receiver was on its way to the *PW* office for me to try out. I felt honoured because it's not often I get the chance of trying British-manufactured ready-to-go equipment.

On Target

I'm playing with words when I say that AKD seem to be 'on target' with their new receiver. They've kept their promise (I was doubtful if

un-cluttered front panel and l.c.d. type display. It's delightfully simple to use and absolutely ideal for the beginner in radio or someone who enjoys simplicity.

Despite its simple uncluttered look the HF-3 hides a good specification 'under the bonnet'. The design incorporates a general coverage 30kHz to 30MHz double conversion superhet with a 45MHz first i.f. (with crystal filter) and a second i.f. of 455kHz using ceramic filters.

Tuning is by a synthesiser providing 1kHz steps, with 'fine tuning' provided by a 'Clarifier' control. The main tuning control (flywheel loaded) also controls the rate of tuning (see 'On Air' section).

On The Air

The acid test for any rig has to be on the air so I switched the HF-3 on, and started listening. However, I was in for a surprise because even with a very short length of wire plugged into the receiver, it produced an interesting signal immediately.

Obviously when the HF-3 was set-up, the AKD test team had committed a frequency to the receiver's memory. In this case it was the RAF's h.f. **VOLMET** transmissions on 4.717MHz (u.s.b.). It was received loud and clear and it made me jump as I was not prepared for the HF-3 to be tuned into such a strong signal! So, I then proceeded on to Amateur Bands listening complete with the latest information on weather conditions on airfields all over the UK!

The 7MHz band is where I always check out a receiver's capability and I was soon receiving some interesting DX, as the various DXpeditions were preparing 'for the real thing' over the weekend (I started my tests on Thursday prior to the h.f. contest).

Operation of the HF-3 is very simple. There's only two reception 'mode' push control buttons on the front panel. One button rosters up through LSB to AM and to USB. And the other button rosters down thorough from USB to AM and LSB.

The mode selected is indicated on

The AKD Target HF-3 Communications Receiver

Manufacturer's Specifications

Receiver type:	Double superhet, 1st i.f. 45MHz, second i.f. 455kHz.
Frequency range:	30kHz to 30MHz
Tuning:	1kHz steps
Clarifier range:	±800Hz
Frequency tolerance:	±100Hz
Bandwidth:	3.8kHz (s.s.b.), 6kHz (a.m.)
Sensitivity:	1µV
Audio output:	2W
Antenna input impedance:	70Ω
Tuning (Four rates)	10kHz, 100kHz, 1MHz and 10MHz per rev.
Power supply:	12V d.c. 300mA (power supply provided)

Inside view of the AKD Target HF-3 receiver emphasises the neat design of the entire unit.

the large l.c.d. type display. The frequency read-out (which turned out to be reliably accurate) also displays the frequency, with a very large segmented S-meter immediately below.

I soon became very adept in selecting 'band changes' by quick rotation of the nicely loaded flywheel weighted tuning control, which feels almost like the old Eddystone tuning. In fact I found (without even realising I was doing

it) that I could literally just flick the control from 3.5MHz to 7 or 14MHz at will. Once on the band you require, the naturally slow operator's (yes, I am slow!) adjustments ensures that the receiver stays in the frequency area selected.

When a band change is required, a quick flick of the wrist takes you there. All very simple and effective.

Volume is controlled by the usual combined VOL/On-Off rotary control. There's a separate Clarifier control (see comments later) and memory entry and recall buttons.

Listening to s.s.b. transmissions was no problem and although the band was busy during the evening, the HF-3's design selectivity coped well. I found that the sensitivity and selectivity were surprisingly good (for a budget priced unit).

However, the fact that the receiver's synthesised tuning 'switches' in 1kHz steps (with noticeable 'stepping' on c.w.) and s.s.b. took a little getting used to. The only real problem came when I was listening to a c.w. signal right near the point where the synthesiser would be 'stepping' to the next 1kHz up or down frequency and I

was using the clarifier.

In use, the receiver 'clarifier' tunes the receiver over a relatively small range - ±800Hz - to permit the operator to tune in a c.w. beat note or s.s.b. signal to provide clear speech on s.s.b. The problem I discovered was that when the clarifier was at about three-quarters of its range, there was some form of frequency 'squiggle'. This caused some form of frequency 'pulling' on c.w. and s.s.b. reception and made the signals sound very odd!

Fortunately, after using the receiver for a while I found the frequency 'squigglings' (I can't think of a better word to describe the effect) was minimised by careful tuning with the main control to avoid excessive use of the clarifier tuning control.

Sensitivity & Selectivity

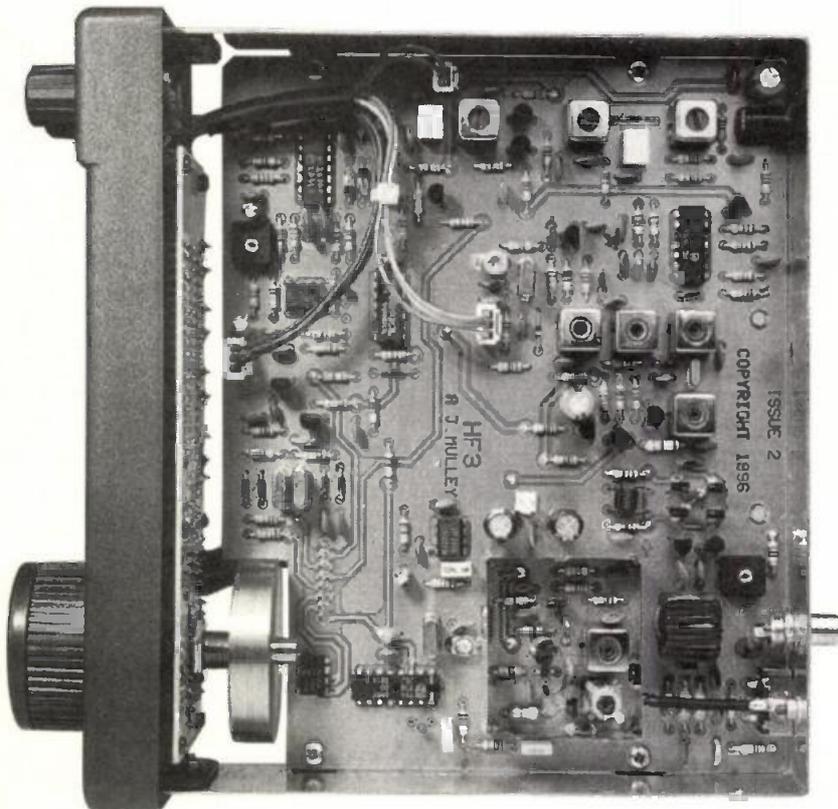
Sensitivity and selectivity on the HF-3 proved to be excellent for use on the Amateur Bands. And although the receiver is aimed at the beginner, providing as it does a complete 'ready-to-go' package, I would be more than happy to incorporate it into a home-brew portable station.

I found that for listening on the h.f. broadcast bands, the selectivity and received audio bandwidth were just about right. However, despite the nice large speaker which is built into the top of the cabinet, both Tex G1TEX and I thought that the audio was a little 'tinny' sounding (which may be of course be a direct result of the filtering).

It was on the h.f. broadcast bands where I found the rear panel mounted r.f. attenuator control to be useful. The receiver seems to be so sensitive on h.f. that the signal levels from Radio Netherlands (Hilversum, etc.) could overload. The attenuator helped a great deal in that respect.

Sensitivity on the medium wave band (500kHz to 1.6MHz approximately) seemed adequate but appeared to be markedly lower than h.f. (This is often the case and is a deliberate design policy with manufacturers). However, I was very surprised at how poorly received the 198kHz (Droitwich, BBC Radio 4) long wave transmissions were.

Reception on long waves and medium waves seemed to be



effected by a mains generated signal which limited sensitivity. And bearing in mind the excellent sensitivity on h.f. (where, quite frankly it's most important in my opinion) I was really surprised at the performance on the lower frequencies.

Final Score

So, what's the 'final score' for the HF-3? What's my opinion after trying it? Well, answering briefly, I can recommend the AKD Target HF-3 to anyone looking for a budget-priced, general coverage receiver.

Personally, I think AKD have done remarkably well for the price. And bearing in mind that it is a budget-priced receiver, there's only one essential facility that's been left off...and that's dial illumination for the l.c.d. type display. I really think it's needed and including illumination would help the operator very much indeed.

However, in rounding up, I should say that the purchaser gets a lot for the £160. They'll get a double conversion general coverage receiver, ready-to-go mains power supply, a suitable antenna and a helpful booklet.

I think there'll be a lot of HF-3s appearing in Christmas stockings and on birthday gift lists soon. And it won't be just beginners either, because many operators like to have a workshop set or something for portable work. Now they can, by buying a British-engineered



The smooth tuning action on the HF-3 is aided by a relatively large loaded flywheel, seen here mounted on the top left of the tuning sub-assembly panel.

ready-to-go receiver. Well done AKD and I've no doubt this receiver will appear in many 'marks' and Mark 1 is a good start!

My thanks for the loan of the review receiver go to AKD, at Unit 5, Parsons Green Estate, Boulton Road, Stevenage, Hertfordshire SG1 4QG. Tel: (01438) 351710, FAX: (01438) 357591. The AKD Target HF-3 receiver will be available from Amateur Radio dealers for £160.

PW

A few notes on the sensitivity of the new AKD Receiver from Tex Swann G1TEX, Technical Projects Sub-editor Practical Wireless.

These tests are not definitive as there were several computers in the same room, but should be viewed as representative of the quality of the set.

Like Rob G3XFD, I was pleasantly surprised that the HF-3 coped well with high levels of signal. I did however, feel that for amateur use an add-on audio filter would be needed to counteract the 'wide-band' i.f. filter.

On a.m. use, the set is very capable and produced good sounding audio tone from the in-built speaker. But I felt that the i.f. bandwidth was just a little on the wide side for s.s.b. use.

Perhaps an option for a narrower filter for example?

I was disappointed when listening to long wave signals as the receiver did not seem as sensitive as on h.f. To test this I used a very quick check with a signal generator. These are the rough and ready results I found: At 50kHz the minimum discernible signal (m.d.s.) on a.m. was about 1.5µV with about 10µV giving a good clean signal. Using both l.s.b. and u.s.b. the m.d.s. was about 0.5µV.

In general, the sensitivity rises to a best m.s.d. of 0.8µV (a.m.) at about 1.5MHz. It also had a very good m.d.s. of 0.1µV for s.s.b. The sensitivity curves were of similar values up to about 20MHz. The overall sensitivity at 25/30MHz was just a little lower where m.d.s. for an a.m. signal was 1.5µV. The m.d.s. figures for s.s.b. were around 0.5µV, which is still very good.

What was very good (bearing in mind the bandwidth, which seems to have been optimised for broadcast stations) was the steep sided selectivity curves.

Very quick and ready tests were carried out with the set tuned to 5MHz. Signals on adjacent channels of some 10mV at ±12kHz were inaudible. This represents a factor of some 80dB rejection.

Signals of 100mV or greater more than ±15kHz away from the tune point of 5MHz could not be heard. But they caused a 'two bar' indication on the S-meter reading with harsh background noise.

G1TEX

After seeing a copy of Rob G3XFD's review Roger Wastaffe of AKD sent us the following comments:

Tests show sensitivity is more than adequate at long and medium wave. However, the antenna supplied was a 10m wire. Whilst this is satisfactory for general h.f. use, once cannot expect too much on the long wave. The quality of ground is also important on l.w., especially when there is mains borne interference from computers.

The comment regarding the dial illumination is valid. We work hard to keep prices down, especially on our 'Entry Level' product and we did not consider this to be essential. We are already looking into the addition of this facility on future models with enhanced facilities, of which this will be one.

Roger Wastaffe

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Broadcasting On A Shoestring



By Jim Lee G4AEH

Professional broadcaster Jim Lee G4AEH says that almost anyone can start their own a.m. or f.m. radio station - read on to find out how.

Heading Photo: Cross Counties Radio's on air studio. The PC is used for storing, scheduling and playing the station's adverts. (Photo courtesy of Heartland Evening News)

I was 14 when I first had the desire to be on the radio. The influence came from the 'pirate' stations like **Radio Caroline** and **Big L** (Radio London).

The DJs seemed to be having a great time. However, having met and worked with one or two of them since, it seems that the storms, the sea sickness and infrequent pay packets meant that pirate radio on the ships wasn't all that great.

Although I got my amateur licence when I was 17, there weren't that many radio stations to try my luck with in those days. It actually took another 11 years before I made my professional radio debut with **Mercia Sound** in Coventry in 1980.

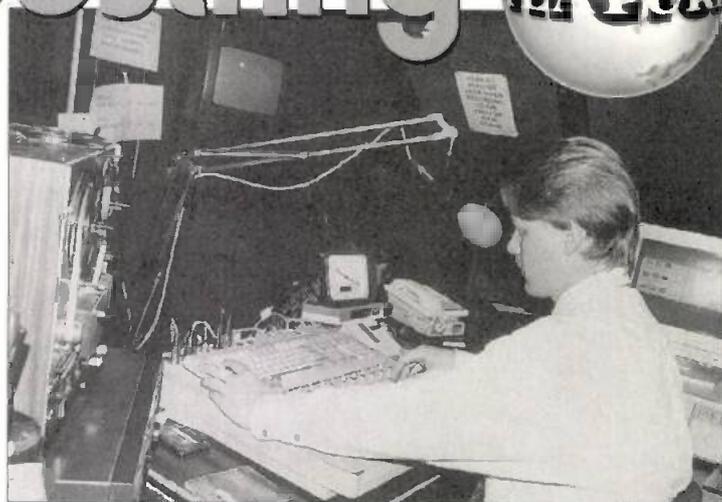
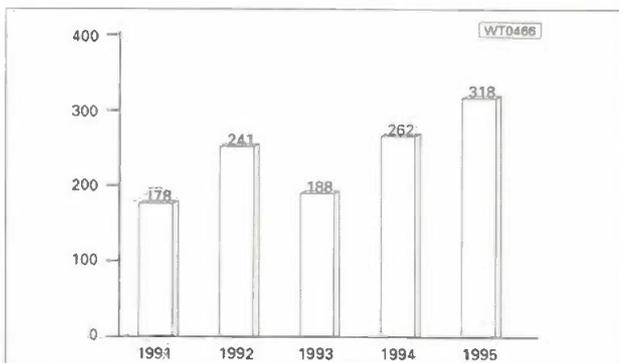
It's a very different story these days. Even medium sized cities boast at least two or three local radio stations. It still takes a lot of luck to make the break into broadcasting. However, if the 'big boys' won't take you on, it's now a lot easier to set up your own station with a **Restricted Service Licence (RSL)** issued by the **Radio Authority (RA)**.

Licence Evolved

The RSL evolved from the 'special event' licence first issued in the early 1980s, some 20 years after the call for 'free radio' first went up. In the days of the BBC monopoly, if you didn't like the radio services on offer, you had two choices.

You could either put up with them or you could set up your own. The problem was, that putting up with it was legal, doing your own thing wasn't!

Fig. 1: This shows the number of Restricted Service Licences issued from 1991 to 1995.



Not to be deterred, the pirate operators believed that they could get around the legal problems by taking to international waters. Their ships were fitted out in foreign ports with antennas, transmitters and essential studio equipment like microphones, mixers, record-players and buckets. Of no acoustic or artistic use, the buckets were essential if the sea sickness pills didn't work!

When the pirates first dropped anchor off the coast of Britain in the early 1960s a radio revolution began. However, despite their popularity with young people previously starved of decent radio, the government felt the need to act.

Complaints of interference, copyright infringements and the natural British urge to regulate everything, meant the pirates' days were numbered. The government couldn't realistically clamp down on the pirate broadcasters themselves, because they were in International Waters.

However, the passing of the **Marine Offences Act** in August 1967 effectively cut off the ships' supply lines. This saw all but the rebellious **Radio Caroline** heading for the nearest port. But the fact that the pirates revolutionised British broadcasting and created a new awareness of the radio there is no doubt.

Reorganised Networks

In the pirate ships' wake, the BBC reorganised their networks. They created **Radio 1**, staffed by former pirates like **Tony Blackburn**, **Simon Dee** and **Kenny Everett**. Then BBC

Local Radio was introduced with the first station opening in **Leicester** in 1967.

To appease the 'free radio' supporters upset by the pirate's demise, the government for its part, promised commercial radio. Perhaps not what the campaigners had in mind the opening of **LBC** in London in 1973 which saw the start of commercial radio on the mainland. **Manx Radio** on the Isle of Man began broadcasting legally about the same time as **Radio Caroline** in 1964.

Since the arrival of LBC, there has been an explosion in radio services from both the BBC and the commercial sector. The BBC has introduced 40 local stations and added a fifth network.

The commercial sector now has more than 140 local and three national stations with more to come. By 2005 it's estimated that there will be nearly 400 stations competing for advertising revenue.

Gain Access

Until the **Citizens Band (CB)** licence was introduced in 1981 there was no easy way for individuals to go 'on-air'. To gain access to their privileged frequency allocation, radio amateurs have to pass a **City and Guilds** examination and an optional Morse test allowing h.f. operation.

Once on-air the radio amateur still has to maintain and operate in compliance with the strict requirements of the **Wireless Telegraphy Act**. However, there's a

Continued on page 28

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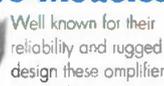
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Broadcasting on a Shoestring

Continued from pag. 25

radio broadcasting licence for anyone who meets the criteria.

Until the introduction of the RSL, licences for broadcasters were not so plentiful. Full time licences still require the bidders to go through a very rigorous competitive procedure.

Once a franchise has been advertised, very large sums of money are needed, typically hundreds of thousands of pounds, for premises, studios and transmitter sites. There are technical standards to be met and the government's regulator, the Radio Authority (successor to the Independent Broadcasting Authority

Special Broadcast Stations

In amateur radio we're used to hearing special call signs from events as diverse as carnivals, scout jamborees and even the Olympic Games. In Britain it's now increasingly common to hear a special a.m. or f.m. broadcast station from all sorts of events including Premier League football matches and drive-in movies.

Last year's VE celebrations in Hyde Park were covered by an RSL station operated by the British Forces Broadcasting Service (BFBS). You may recall the recent *PW* competition (June 1996) involving the Air Tattoo at RAF Fairford which had its own RSL station, **Wings 96** on medium wave providing coverage of the displays and traffic news around the airfield.

In the run up to Christmas in 1991, there was a chain of **90 Radio Cracker** stations run by interdenominational youth groups up and down the country. Numbers have trailed off now but over the years Radio Cracker has raised many thousands of pounds for Third World charities, but has also paid out many thousands for the privilege.

Average Cost

The average cost of setting-up a 28 day

RSL station is about £4000 and that's a sore point with many RSL operators including **Peter Laverock G8GHQ**. Peter, currently a news producer with **BBC Radio Suffolk**, was granted the first ever special event licence in 1982 for **Radio Greenbelt** at Knebworth.

With the help of his local MP, the trouble-free reputation of the Greenbelt Festival and his BBC background Peter was able to convince a wary government to create a new category of licence. They charged him £900 for the privilege.

As **Radio Greenbelt** goes into its 15th year of broadcasting, now from Corby, Northants, they are forking out even more money. There's no discount for repeat operations.

Peter G8GHQ describes this as 'scandalous' particularly in the case of the Radio Cracker chain. For the last five years Cracker has raised thousands of pounds for charity but each f.m. operation has set them back

£2260 in radio licence fees alone.

Peter Laverock has made several complaints to the RA about the fee system, comparing the £18 cost of his amateur licence which allows him access to a multitude of frequencies with up to 400W of power. While he agrees that a high first fee should be a test of an applicant's seriousness, repeat operations should be heavily discounted.

Replying to those complaints, the RA told me that the fees (see **Table 1**) cover the cost of paperwork and finding clear frequencies. The fee, the majority of which goes to the DTI, is the same if the proposed station is on air for one day or 28 days.

Peter G8GHQ was also told by the RA that the fees also guarantee that interference problems will be dealt with within five working days. "If that's the protection it buys, it's not worth having", says Peter whose August Bank Holiday operation could be over by the time the RA came to fulfil that promise.

Despite the relatively high cost, hundreds of keen enthusiasts are making applications for RSLs. In 1995 the RA granted 318 licences making a total of 1,174 since they took over the administration from the Home Office in 1991 (**Fig. 1**).

Student Radio

Student radio stations are frequent applicants for RSL stations, particularly at the start of the academic year. Student radio pre-dates the RSL by many years.

Normal operation would be via an inductive loop or 'leaky co-ax' which restricts the transmission area to the campus. With a maximum e.r.p. of 25W on f.m., the RSL allows them coverage of several miles radius, albeit for a maximum of 28 days.

Brunel University's **B-1000 (Fig. 2)** in West London was on air with an RSL for the third time in September. It's an invaluable outlet for station members to get themselves heard over a wider area, according to station manager **Phil Emery**. It's good public relations exercise for the university as well which makes a donation to the £4000 or so it takes to put the station on air.

The 28 day period can be extended in very special circumstances (at no extra charge) and even spread out over a 12 month period. That means that football clubs like Manchester United and Blackburn Rovers (see *Short Wave Magazine* September and October issues for an indepth look at football radio stations. Copies available for £2.60 from *PW* post sales dept on (01202) 659930).

Motor racing circuits like Silverstone and Brands Hatch have

Table 1: Restricted Service Licence Fees

RSL Fees	Radio Authority		DTI Licence Fee	Total Fees
	Application Fee	Licence Fee		
AM (medium wave) e.m.r.p.				
Less than 50mW	£100	£60	£225	£385
50mW up to 1W	£100	£120	£500	£720
FM (VHF) e.r.p.				
Up to 1W	£100	£180	£850	£1130
Above 1W up to 25W	£100	£350	£1810	£2260

Notes

- The application fee is non-refundable
- The Radio Authority fee is payable, with the application fee, at the time of the application.
- The DTI (Wireless telegraphy Act) fee must be paid prior to the issue of the licence.
- AM RSLs may be issued for a non-continuous sequence of 28 nominated dates to cover defined events (e.g. sporting fixtures). Fees for such licences will be subject to an additional fee, representing 25% of the total licence fee payable for each period of 28 days within which these dates fall, beyond the first 28 days. (e.g. In a nine month season, a football club would pay 8 x £155 extra)

for Radio) has to be convinced that the bidders are fit and proper to hold a licence. Their programme proposals are vetted (believe it or not) and their finances scrutinised.

The wave of deregulation at the end of the last decade saw the introduction of the RSL. After years of lobbying by radio enthusiasts, the radio spectrum was at last open to the more casual broadcaster.

The government had found itself

another 'nice little earner' allocating frequencies it had always denied were available.

An RSL is usually valid for a maximum of 28 days and broadly falls into two categories. These are trial services and special events.



Fig. 2: Radio Brunel has recently taken to the air for the third time.

RSLs for commentaries on match and race days. They have to pay 25% extra for each month of operation and are restricted to a.m.

Trial Services

I mentioned that there are two broad categories of RSL. The second is the trial service.

The RSL is increasingly used by groups looking to apply for full-time licences. The station B-1000 at Brunel University certainly has such aspirations. It's a motive shared by **Calderdale Sound** in Todmorden (Yorkshire) and **Cross Counties Radio (CCR)** which was on air in Hinckley and Nuneaton (Leicestershire/Warwickshire) this summer.

A licence for Hinckley is expected to be advertised next January. **Jason Faulkner** gave up a full-time job and formed the company behind CCR 18 months ago to concentrate on an application.

Jason spent his time lobbying local groups and politicians for support and gathering the opinions of potential listeners. The RSL operation was intended to impress prospective advertisers and investors with the station's professionalism.

In an inspired move, CCR formed a partnership with the local paper, the **Heartland Evening News**. The paper's proprietors also admit to ambitions to move into broadcasting and were keen to take part.

Not only did CCR benefit from free publicity in the paper, but had a ready made news source while the paper's sales team generated thousands of pounds in advertising and sponsorship.

David Blaxhall took redundancy to concentrate on building up **Calderdale Sound** in Todmorden Yorkshire. The terrain around Todmorden (It's in the Penines), a town of about 14,000 people makes it a poor reception area.

Five TV and three f.m. relays are necessary to cover the town. Editorially it also falls between the transmission areas of both **Radio Leeds** and **Radio Lancashire** and is not served well by either claims David.

Like most enthusiasts who go down the RSL route David Blaxhall is committed to being as professional as possible. A professional studio built into a spare bedroom set David back over £8,000.

For a month, twice a year his home is not his own. A lot of people coming and going at all times of the day or night would be a potential

source of annoyance to less tolerant neighbours. His f.m. transmitter cost £500 from a DTI approved source and a professionally made jingle package from Dallas cost 'a bargain' £250.

No spare bedrooms for Cross Counties Radio in Hinckley though. They persuaded a local landowner to postpone the demolition of a redundant mill so it could be used as an office and studio.

Redundant or not, planning permission was necessary for a change of use from mill to radio station and the insurance for the 28 day operation cost nearly £1000! Something else to think about.

The equipment for RSL stations comes from a variety of sources. To cover costs the more experienced stations hire out their equipment in 'down' time. Cross Counties Radio hired their studio and stereo transmitting equipment from the operators of **Wire FM** in Warrington. The complete package cost £1500 and even included a Radio Data System (RDS) facility.

How To Get Going

So, while there's still a distinct lack of sunspots and the Sporadic-E season is drawing to a close lets say we set-up our own RSL? Let's call it **PWFM**.

The first thing to do is contact the Radio Authority. From the information pack supplied by the RA you find that there are not one but four licences to apply for.

As well as the RA licence, there's a Wireless Telegraphy Act licence plus two licences to allow the playing of music. If you're going to broadcast more than 12 hours of music per day on **PWFM**, that will set you back £30 per day (plus VAT) with **Phonographic Performance Limited (PPL)**. That's £423 for 28 days.

The **Performing Rights Society (PRS)** also wants £43.50 (including VAT) per day although you'll get a 33% discount if you pay up in advance. So, if our cash flow doesn't permit pre-payment that's another £1218 and you still haven't got the transmitter and studio equipment!

The constructors in our midst could build the transmitter. The Radio Authority guidelines **don't actually state you can't use a home-brew transmitter**. It merely asks that an undertaking is given that 'transmission equipment including antennas (sic), complies with the technical conditions laid out in Appendix II' of the guidelines.

The guidelines state that controls which 'affect the technical characteristics of the transmitter

For an information pack containing everything you need to apply for an

RSL write to:

**Soo Williams, Radio Authority,
Holbrook House, 14 Great Queen
Street, Holborn, London WC2 5DG.**

should not be accessible from the exterior'. So no fiddling with power levels!

Obviously operation is restricted to the normal a.m. (531 - 1602kHz) and f.m. (87.7 - 108MHz) broadcast bands. The permissible power levels are 1W effective monopole radiated power (e.m.r.p.) on a.m. and a maximum 25W e.r.p. on f.m.. There are other conditions relating to frequency stability, bandwidth and spurious emissions, which as radio amateurs we should have no problems with.

You could be visited at any time by the Radiocommunications Agency and/or the Radio Authority. **Peter Laverock G8GHQ** remembers the man from the then Radio Investigation Service (RIS) turning up at the first Radio Greenbelt with a car full of test gear.

The RIS man was checking that the signal from the 'leaky' coaxial antenna actually decayed, as required by the licence, at the site boundary. "In fact unless your tent was pitched on top of the cable", says Peter, "you'd have been lucky to hear anything."

In later years scaffold poles and T antennas were employed before Radio Greenbelt moved to f.m. The year that a violent storm blew away tents leaving thousands of concert-goers at risk from hypothermia was the one and only time that Peter broke the rules. To help the emergency services the power was increased above permitted levels because lives were at risk.

For a successful application you have to make sure that you have no 'disqualified persons' on the team. They include advertising agencies, political parties, convicted radio pirates (banned for five years) and the BBC, which - er - means I'll probably have to drop out!

That just leaves the rest of you to find around £5000 and then you can join the professional broadcasters of the world! **PW**

*Jim Lee says
"Why don't you
put your rally or
show really on
the 'map' by
getting your own
restricted service
licence?"*

Carrying On - The Practical Way

By Rev. George Dobbs G3RJV

The Rev. George Dobbs G3RJV presents his latest unsophisticated idea - in the form of a useful 'utility' audio oscillator.

Isn't it funny how words can change their meanings in common use? Some people when observing my test bench equipment and the methods I use, would perhaps be tempted to say "That's not very sophisticated". To which I could honestly reply "You're quite right"!

The word 'sophisticated' derives from the word sophist, the ancient Greek professional teacher. It was a profession better known for quibbling than reasoning! So to 'sophisticate' was to tamper with for the sake of argument.

So I'm more than pleased to ignore sophistication for the sake of elegant simplicity! My approach continues with the little project I'm describing this month - a useful 'Utility' audio generator.

On My Shelf

I have a decent function generator on my shelf in the shack here in Rochdale. It's capable of producing sine, sawtooth and square waves across a calibrated range from 0.1Hz to 500kHz.

But more often than not, when I need an audio source for test purposes, I use the little utility board I'm describing and the function generator remains on the shelf to impress visitors!

As Fred Bonavita W5QJM once said of an 'over technical' explanation given by a fellow radio amateur: "I only asked for the time

and you told me how to make a watch"! (And following Fred's lead in spirit and action sometimes I just wet my finger and put it on the audio circuit I want to test).

Audio Oscillator Circuit

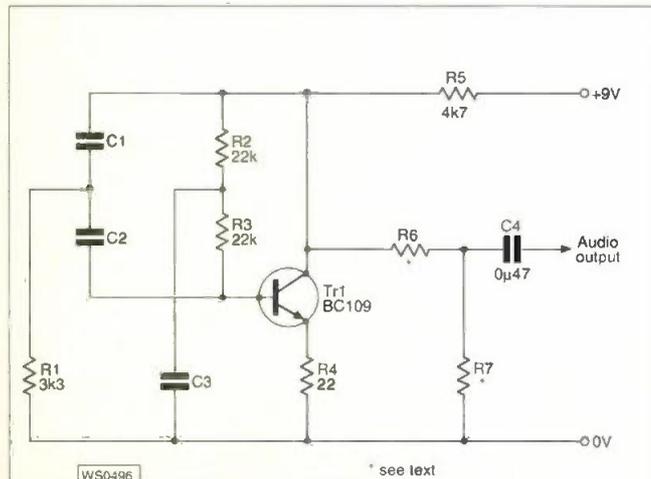
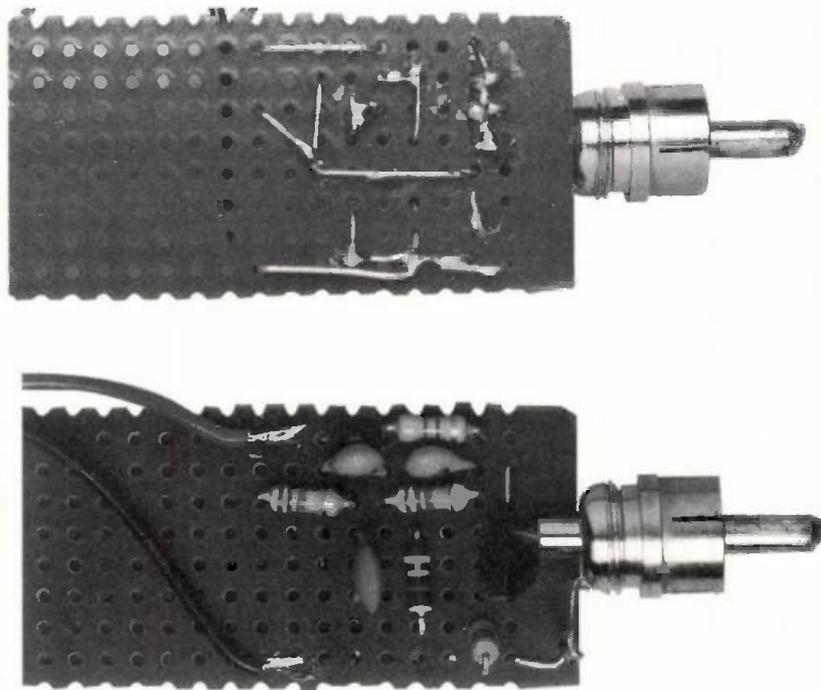
There are many uses for a little audio oscillator around the amateur radio shack and almost as many possible circuits to do the job. To do the job, a

phase shift between the base and collector, so such a phase-shift filter simply has to add another 180° of shift. An RC network (R1/C1/C2 and R2/R3/C3) provides the required phase shift controls the frequency at which the in-phase feedback occurs.

The frequency of the oscillation can be altered by changing the values of the feedback network components. The values shown in the audio oscillator circuit, Fig. 1, produce

Fig. 2: Illustrating 'Perfboard' construction technique. The phono socket is at the collector of Tr1.

Fig. 1: Circuit of the 'utility' audio signal generator. In reality the attenuator could be built on a phono socket



transistor can be made to work as an oscillator if some of the signal from the output circuit is fed back, in phase, to the input.

I've seen relaxation oscillators, often based upon the ubiquitous NE555 chip, commonly used as a simple audio source. This technique produces a square wave, ideal for many applications, but not delightful to the ear.

The circuit I've shown is based upon the Twin-T oscillator. It uses a phase shift network between the base and the collector of a single transistor.

In the common emitter configuration there is already a 180°

about 500Hz (for 1kHz try 0.01μF for C1 and 2 and 0.022μF for C3).

(I favour a slightly low frequency for audio circuit checking. It's just simply better on the ears). With the circuit values of Fig. 1, the output should be in the order of 1V r.m.s.

Output Attenuator

The circuit has an added output attenuator suitable for most applications. To use the oscillator 'as is' the output can be extracted with a coupling capacitor of around 0.1 to 0.5μF, at the collector of Tr1.

The output attenuator circuit,

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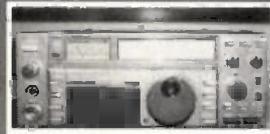
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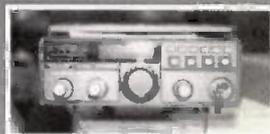
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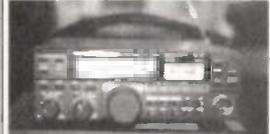
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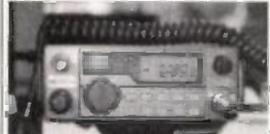
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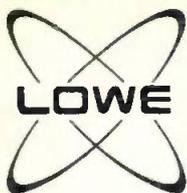
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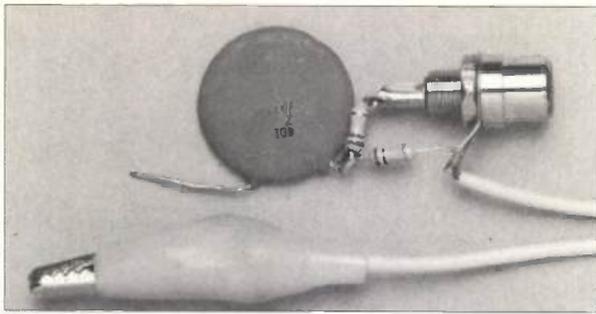
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R6/R7, allows a low level signal from the oscillator to be used in testing audio circuits. The circuit is a basic resistive divider and values can be calculated for a desired output.

It's possible to make a selection of attenuators. But in practice the one I use has 10kΩ at R7 and 100kΩ at R6 giving an output of about 10mV. (Actually it's feasible to make attenuators down to about 1μV output. Though it's not common with most commercial audio oscillators).

Built On 'Perfboard'

I built my prototype audio oscillator on a piece of 'perfboard'. This is the form of board with a matrix of 0.1in holes, similar to Veroboard but without the copper tracks.

'Perfboard' is simple to use, like

conventional p.c.b. material. In practice the component leads are pushed through the holes and excess leads (or off-cuts from leads) form the interconnections between the parts of the circuit.

A suitable layout for the oscillator is shown in the photographs, Fig. 2. This enables the circuit to be built in a area of some 22mm square (I've shown both sides to illustrate the 'wiring up' method'). The 'perfboard' is extended from the power supply end of the circuit to allow a PP3 battery to be attached to the spare board area with an elastic band.

The output from the oscillator goes to a phono plug, with its plastic cover removed. There's no on/off switch, you just need to snap the battery in place to use the oscillator.

Phono Socket

The attenuator is built on a phono socket of the single screw fixing type, as illustrated in the photograph in Fig. 3. Using this arrangement, several attenuators could be built to plug into the oscillator.

A short length of wire terminated with a crocodile clip provides the ground connection. The free lead from the coupling capacitor acts as a probe.

The audio oscillator provides a simple and cheap little item of test equipment that can serve many useful roles in the shack. Mine is usually pulled out whenever I built an audio circuit. The only problem is I can never find a PP3 battery when I want to use it!



Fig. 3: For simplicity the attenuator can be built straight onto a phono socket and various ratios made. (see text).

Cheerio from George, see you next month!

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

Practical Wireless 1996 144MHz QRP Contest

Results

It's time again for our dedicated adjudicator Dr. Neill Taylor G4HLX to present the results of PW's very own 'fun' 144MHz contest, which wouldn't be the same without his efforts!

Sunday 16th June 1996 seems to have been a hot sunny day in all parts of Britain. It allowed portable stations taking part in the 14th annual PW QRP Contest to make the most of the good v.h.f. conditions that prevailed in many areas.

As the results tables show, the overall winners this year are the Warrington Contest Group G3CKR/P. This group comprised E. Gedvilas G8XVJ, G. Schoof G1SWH and D. Leong G4WDL.

Erik Gedvilas had been one of the group who won in 1995, from the same site near Leek in Staffordshire (IO93 square). But this year an even higher score was achieved, using an amazing array of antennas: four 17-element Yagis plus two of 18-elements.

As well as the prestigious Winner's Cup, the group win the first prize of a Yaesu FT-10R hand-held 144MHz transceiver, kindly donated by Yaesu (UK) Ltd.

Second Place

The runners-up in second place are the 'North Wales Wafflers' GWONWR/P, who were also in the number 2 position back in 1994. They win a 12V, 2.5W Solar Laminate Panel kindly donated by Key Solar Products.

Tennamast Trophy

The Tennamast Trophy in Memoriam to Frank Hall GM8BZX, awarded to the leading Scottish station, has been won by the same group as last year, the Cockenzie and Port Seton Amateur Radio Society GMOCLN/P. (But this year they increased their lead over other GM stations).

Near The Top

Some of the other groups near the top of the table have been hovering there for several years, but it's particularly pleasing to see Dave Hewitt, operating as GW8ZRE/P, taking the title of Leading Single Operator.

Dave has been a loyal supporter of the QRP Contest: since 1985 when, as GJ8ZRE/M, he was placed 187th. Over the years he has entered from a variety of locations (including as EA6/G8ZRE in 1992!), and in 1994 set a new record with the first ever GW to 7X (Algeria) contact on 144MHz.

Recent years have seen Dave nearing the top of the table. And although in the notes with his log he comments "I felt there was stiff competition on the band this year", Dave will no doubt be pleased to find that he has at last become the top Single Operator.

The second placed Single Operator is Peter Lowrie G17JYK/P, who achieves 11th place overall, the highest that a GI or EI station has ever reached in the 14 year history of the contest.

Editorial note: Please see 'Keylines' editorial this issue for an announcement

especially for the contest. By the way, they used an interesting transceiver - a Racom R2-CW, a QRP 144MHz rig from the Czech Republic which they say has an excellent receiver.

Contest Certificates

All the groups I've mentioned will be receiving Contest Certificates, as will the leading station in each locator square (see table).

The full detailed results list will be posted shortly to all entrants who sent stamped addressed envelopes with their logs, (You can also get a copy by sending an s.a.e. now to the PW Editorial office, or look out on your local Packet BBS for a bulletin from G4HLX.

If you have Internet access, you'll find the full results list on the PW QRP Contest page, along with an archive of results from earlier years. Point your browser at <http://www.rmplc.co.uk/ed>

Practical Wireless 144MHz QRP Contest 1996

Pos.	Call sign	Points	Pos.	Call sign	Points
1	G3CKR/P	12160	42	G3MAE/P	1387
2	GWONWR/P	9108	43	GW0SYG/P	1386
3	G1ORC/P	6989	44	GO7YM/P	1260
4	GW1VDF/P	6132	45	G0TAR	1216
5	GW8ZRE/P	5122	46	G1JDP/P	1200
6	G8NUA/P	5010	47	GW0VJS/P	1185
7	G7OCJ/P	4611	48	G0RRR	1173
8	G4SR5/P	4446	49	G0RRC/P	1168
9	G0BPS	4396	50	GM4YEQ/P	1156
10	G00GS	4350	51	GM7SXJ/P	1140
11	G17JYK/P	4266	52	G7AXE/P	1026
12	G4RSE/P	3950	53	GW4SZV/P	975
13	GW7LQD/P	3888	54	GM0AYR/P	954
14	G7AQU	3657	55	G8WYR	900
15	G00VA/P	3458	56	G0LJD/P	900
16	G4HRS/P	3129	57	G0LAR/P	893
17	G0LBO/P	3048	58	G7MWP/P	852
18	GW4IDF/P	3013	59	G8AVO/P	848
19	G0PJY/P	2668	60	GW1CXK/P	738
20	GMOCLN/P	2530	61	G3LRS/P	715
21	G3BP/K	2415	62	G0JVR/P	675
22	G0GR/P	2232	63	G70MO/P	598
23	G4NVM/P	2200	64	G8NJQ	585
24	G6VWR/P	2200	65	G0TOU/P	576
25	G8DDY/P	2121	66	PE1EWR	564
26	EI9HQ	2047	67	G7NRO/P	564
27	G4RUL/P	1805	68	G0DLR	495
28	G0CRW/P	1787	69	G7KNQ	492
29	G7NPH/P	1764	70	G0VYJ/P	456
30	G0TMT	1672	71	G7MMQ	429
31	G0WQX/P	1656	72	GM4VX/P	378
32	G0ADH/P	1653	73	G2HR/P	376
33	GM0IXN/P	1602	74	EI2HW/P	372
34	G1WKS/P	1548	75	GW7EVG	338
35	G7SPT/P	1513	76	GW0VPR/P	168
36	ON1BCJ	1513	77	GM4VYQ/P	112
37	G7WFM/P	1496	78	G7RVW/P	106
38	G60I	1479	79	GM0HLV/P	88
39	G5ZG/P	1463	80	G7UJU/P	80
40	G0SRC/P	1411	81	G3XBM/P	12
41	G/DJ2QV/P	1406			

Leading multi-operator stations

Pos	Name	Call	Score	OSO	Squ	Loc	Ant	a.s.l.(m)	TX/RX
1	Warrington Contest Group	G3CKR/P	12160	320	38	IO93	4x17Y +2x18Y	455	LTS2 TS-990S FT-480R
2	North Wales Wafflers	GWONWR/P	9108	253	36	IO82	2x17Y	560	FT-290R
3	Oldham Radio Club	G1ORC/P	6989	241	29	IO93	2x9Y	635	FT-290R
4	Heraford VHF Contest Group	GW1VDF/P	6132	219	28	IO82	13x10Y	810	FT-290R
6	Torbay ARS	G8NUA/P	5010	187	30	IO80	17Y	350	TS-711
7	John Rudd & Kevin Porter	G7OCJ/P	4611	159	29	IO92	10Y	140	FT-290R2
8	Stroud Radio Society	G4SR5/P	4446	171	26	IO81	2x16Y	315	FT-221R
9	Dragonslayers QRP Club	G0BPS	4396	157	28	JO01	2x9Y	200	R2 CW
10	S.J. Maipass & A.R. Cooper	G00GS	4350	179	27	IO82	14Y	250	FT-290R
12	South Essex ARS	G4RSE/P	3950	158	25	JO01	19Y	55	IC-271E

Leading single operator stations

Pos	Name	Call	Score	OSO	Squ	Loc	Ant	a.s.l.(m)	TX/RX
5	Dave Hewitt	GW8ZRE/P	5122	197	26	IO83	7Z	275	TR-751E
11	Peter Lowrie	G17JYK/P	4266	158	27	IO74	13Y	150	FT-290R
13	Mike Baguley	GW7LQD/P	3888	162	24	IO82	2x9Y	360	FT-290R2
14	Frank Carter	G7AQU	3657	159	23	IO92	19Y	90	TR-9000
15	Tony Crane	G00VA/P	3458	133	26	IO91	13Y	295	TR-751E
17	Julian Ross	G0LBO/P	3048	127	24	IO84	9Y	800	TR-751E
25	Peter Thompson	G8DDY/P	2121	101	21	IO90	2x11Y	240	FT-221R
26	Declan Lennon	EI9HQ	2047	89	23	IO63	13Y	300	FT-290R
30	Mark Tuttle	G0TMT	1672	76	22	JO02	4x9O	40	FTV250
32	Bob Razay	G0ADH/P	1653	87	19	IO91	9Y	180	FT-221R

regarding EI/GI entrants to the competition.

The leading fixed station the Dragonslayers Contest Group G0BPS, which includes two Dutch operators PA3AQO and PBOAOL, who came over to Folkestone

uweb/sites/ntaylor/pwqrp.htm

Weather Important

The weather on the day of the contest, so important to the smooth setting up and running of a portable station, seems to

have been generally hot across the British Isles. Reports from entrants were consistent.

I received comments such as "weather conditions were superb" from GW7LQD/P and "the weather was perfect with

no wind at all coming in off the Irish Sea with the exception of a gentle cooling breeze which was very welcome" from G17JYK/P.

From Scotland came GM4VYQ/P's "the weather was superb with enough of a

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breeze to keep the edge off the sun's heat and assist with burning of the skin"!

On the other hand "the unremitting sun and wind in an exposed location was becoming too uncomfortable" arrived from **G4MD/P**, who closed down early and forwarded his log as a checklog.

Propagation Conditions

Views on propagation conditions were not so uniform. Some areas apparently getting a better chance than others of DX contacts.

Received comments such as "Band conditions were totally amazing" came from **G17JYK/P**, and **G3CKR/P** reported they enjoyed "very good conditions to ON, PA and DL. The beacon from ON was S9+30dB".

From **G0RFC/P** came the report that they found "conditions much better than usual". But "conditions didn't seem to be very good in the south" according to **G8DDY/P** (Isle of Wight).

For some operators, propagation seemed to be at its best either before the contest started or after it had finished: "Conditions seemed very promising...at 0840 I heard an HA5 on sideband but within minutes of the contest starting continental activity all but ceased"! reports **G4RUL/P**. Whereas at **G0BPS** "the opening to LA, SM and OZ happened after the contest"!

Those who did experience enhanced propagation were pleased with what they worked. "The best DX for me was JO30, not worked before in the contest" writes **G00VA/P**. While "the highlight of the day", for **G17JYK/P** was "when I was called by GM0HTT in the Orkney Isles, IO89". (Both these contacts were over 500km, and indeed quite a few stations achieved contacts

Leading Stations

Overall Winner

Runners Up

Leading Single Operator

Runner-up Single Op.

Leading Fixed Station

Leading English Station

Leading Welsh Station

Leading Scottish Station

Leading N. Ireland Station

Leading Eire Station

Warrington Contest Group

North Wales Wafflers

Dave Hewitt

Peter Lowrie

Dragonslayers QRP Club

Warrington Contest Group

North Wales Wafflers

Cockenzie & Port Seton ARC

Peter Lowrie

Declan Lennon

G3CKR/P

GW0NWR/P

GW8ZRE/P

G17JYK/P

G0BPS

G3CKR/P

GW1VDF/P

GM0CLN/P

G17JYK/P

E19HQ

over similar distances.

Best DX

The best DX of the contest was probably the QSO by the winners, **G3CKR/P** in IO93 square, with DL8SCL in JN48, a distance of 946km.

Lucky **G0JVR/P** (in IO70) seems to have been the only station to have enjoyed what may have been a short burst of sporadic-E at around 0925, working EB1FIF and EB1ENA in IN63 and IN62 squares respectively, the latter at 806km distant.

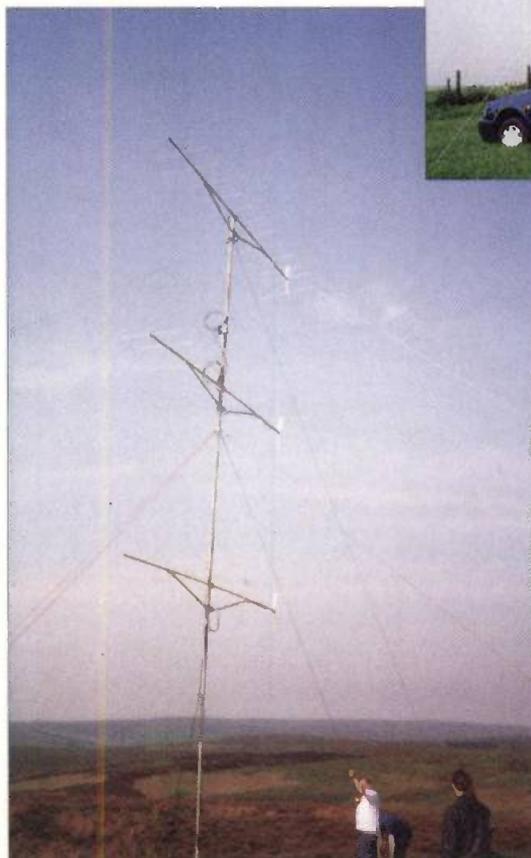
Finally, only **G1JDP/P**, in IO94, was fortunate enough to work LA6HL in JO28 square.

Level Of Activity

As well as the propagation, there are differing views about the level of activity. For example, **G00VA/P** notes that there was "plenty of activity, quite like ten years ago"! From Wales **GW8ZRE/P** commented that it was "nice to see so many GI and GM stations on the band".

However, **G0ADH/P** found it hard to believe one station who made the comment that activity was "a bit quiet". **G0ADH/P** added "I nearly suggested that I should pop round and help him mend his receiver"!

(G4HLX comment): *Perhaps I should add at this point that it can be*



disheartening as an operator if you hear other stations apparently doing somewhat better than yourself. This is just what happened at G2HR/P: "we found conditions this year were very

good, but there didn't seem to be many stations to work. Other stations seem to be running up huge amounts of contacts and, by lunch time, we felt like the driver at the back in a formula one race"!

Signals And Standards

Generally, the quality of signals and the standards of operating remained at the high level that we have become used to. However, **G00VA/P** remarks on a common problem: "Most stations seemed to prefer to call CQ exactly on top of other stations! Twice I called one station only to be answered by

Mike Baguley **G7LQD** crossed the border to operate as **GW7LQD/P** near Chirk in North Wales for his entry in the 1996 Contest.

Holding on to their antenna and their lead! The Cockenzie & Port Seton Amateur Radio Club (**GM0CLN/P**) were again the leading Scottish station and have been presented with the Tennamast Trophy In Memoriam to Frank Hall **GM8BZX**, which is awarded annually.

another"! The recommendation from **G00VA/P** is to "spread out, don't call on exact 'channelised' frequencies. Before calling CQ, ask if the channel is in use on all four points of the compass and have a very good listen"! (Those last five words are indeed the key to successful contest operation. **G4HLX**).

Maik DJ2QV, is used to being at the other end of DX contest contacts from the UK. But while being an exchange student at the University of Sheffield, he entered the contest as **G/DJ2QV/P**. He found that "activity in the UK

Leading stations using a single antenna

Pos	Name	Callsign	Antenna
5	Dave Hewitt	GW8ZRE/P	ZL-special 7-element
6	Torbay ARS	G8NJA/P	Tonna 17-element
7	John Rudd & Kevin Porter	G7OCI/P	Maspro 10-element
10	S.J. Malpass & A.R. Cooper	G0OGS	14-element Parabeam
11	Peter Lowrie	G17JYK/P	Cushcraft 13B2 Boomer
12	South Essex ARS	G4RSE/P	MET 19-element
14	Frank Carter	G7AQU	19-element
15	Tony Crane	G00VA/P	Tonna 13-element
16	Horsham ARC	G4HRS/P	15-element
17	Julian Ross	G0LBO/P	Tonna 9-element

was really big. I sometimes wish I could hear all these stations in a regular IARU-Region 1 contest!"

Special Mention

Worth a special mention are the efforts of **Derek G6OHLV/P**. He scaled the summit of Ben Stack to be the most northerly station submitting a log.

Derek reports "I spent four hours climbing the hill and about four hours basking in the sun operating the station. The gentle breeze keeping the midgies at bay turned gusty shortly after 1300.

I thought it prudent to come down before I was blown down! I was delighted with the distant contacts I had.

There was a surprise visitor at about 1200, a hill walker. He couldn't understand why anyone would want to take the antenna and radio gear to the top of a hill and I couldn't answer that question!"

Enjoyable Novelty

It's maybe hard to identify just what it is that makes low power v.h.f. contest operation so enjoyable, but for many the novelty doesn't wear off.

For example, **G7KNQ** writes "I have been participating in this contest for seven years now, and I am always amazed at the distances I can achieve with just 3W".

From **G0LAR/P** came "the knowledge that you are a new square for someone is a welcome thought, often resulting in the same being true in reverse, which is just reward after working hard to make a contact with more distant stations".

Finally (especially for the next contest!) it obviously takes a lot to prevent QRP

contesters from enjoying themselves! The eventful report from **G0PJY/P** says "we all had a great day, despite the fact that I got chased by a bull, dived over a fence and ended up in casualty with a twisted knee!"

Dates Coincided

As in 1995, the date of the contest coincided with the second session of the RSGB 144MHz Backpackers' Contest. This year, however, the start times were co-ordinated and the required contest exchange was the same for both events, thanks to the co-operation of the RSGB VHF Contests Committee.

The co-operation made it possible for operators to submit their complete logs to the PW QRP Contest, and the first four hours of the log to the Backpackers' Contest, and a number of stations did this. The co-ordination of these two contests seems to have worked well, and will continue in the future.

The duration of the QRP Contest was reduced this year to seven hours instead of the normal eight. Many entrants commented on this change - only one opposed it, several were neutral about it, but the vast majority appreciated the change, (some enthusiastically). So we will retain the seven-hour duration,

Leading stations in each locator square

Square	Name	Call sign	No. entrants in square
IO52	Pat Keogh and Michael Kiely	EI2HV/P	1
IO63	Declan Lennon	EI9HO	1
IO70	Cornish Branch RAFARS	G0RFC/P	3
IO71	Cleddail ARS	GW0SYG/P	2
IO72	Aberporth ARC	GW4SZV/P	1
IO74	Peter Lowrie	G17JYK/P	1
IO75	Ayr Amateur Radio Group	GM0AYR/P	1
IO76	Mid Argyll ARS	GM4VYQ/P	1
IO78	Scottish Welsh Alliance	GM4VX/P	2
IO80	Torbay ARS	G8NJA/P	2
IO81	Stroud Radio Society	G4SR5/P	5
IO82	North Wales Wafflers	GW0NWR/P	7
IO83	Dave Hewitt	GW8ZRE/P	6
IO84	Julian Ross	G0LBC/P	1
IO85	Cockenzie & Port Seton ARC	GM0CLN/P	3
IO86	Menstrie Morse Group	GM0IXN/P	1
IO90	Horsham ARC	G4HRS/P	3
IO91	Tony Crane	G0OVA/P	5
IO92	John Rudd & Kevin Porter	G70CP	8
IO93	Warrington Contest Group	G3CKR/P	7
IO94	Hambleton ARS 'B' Group	G3MAE/P	4
JO00	Alastair Turner & Peter Hutchison	G4RUL/P	1
JO01	Dragonslayers ORP Club	G0BPS	12
JO02	Mark Tuttle	G0TMT	3
JO11	Jan Claerhout	ON1BCJ	2

0900-1600UTC, for next year's contest.

Generally Good

The standard of entries, from my (the adjudicator's) point of view, was generally good, with a few notable exceptions. Log-keeping seems to have been mostly accurate, although failure to log a /P suffix continues to be the most common error.

Entrants who fail to submit the covering information in the format required by the rules **cause me unwelcome extra work**. Because of this the most serious offenders will find that their score has been reduced by a 5% penalty for failing to supply, for example, a list of the locator squares worked.

Entries submitted on the forms downloaded from the Internet page were the easiest to use. Although I don't expect all entrants to be able to access these, it ought to be possible for anyone to read the published rules and write down the required information in the format and in the order that it's asked for.

"Can we E-mail entries in future"?, asks **G4RUL/P**. In fact one station (after checking with me) did that this year, although in the end it was the duplicate copy that was sent by post that I actually used.

I see no problem in the practice of E-mailing becoming more widespread, provided that the log sent electronically conforms to the required format. More detail of

this option for submitting entries will be given with the 1997 rules.

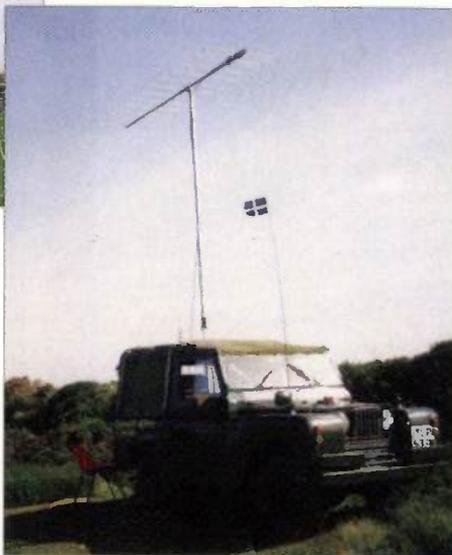
No G4HLX?

"No G4HLX this year"?, commented **G0OVA/P**, and a few others who had noticed my absence. And I'm sorry to say it's true that for the first time in 14 years, G4HLX was not active in the contest, due to unexpected equipment failure shortly beforehand.

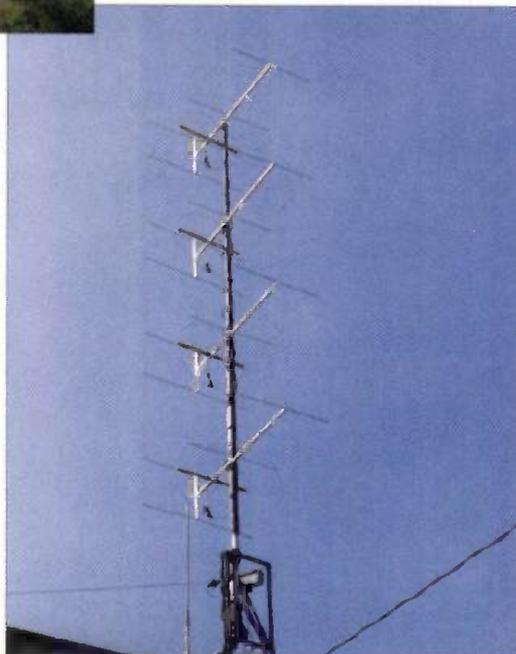
However, I was able to listen, although I missed the exchange of a few words with the QRP Contest regulars. Rest assured that the station will be back on air, to "give a few points away", by the time of next year's contest, which is set for **Sunday 15th June 1997**.

I hope that everyone else will also be getting their station equipment into order, ready to make that day as enjoyable and rewarding as the 1996 *Practical Wireless* 144MHz QRP Contest. My thanks to all who supported this contest, by submitting an entry, sending a checklog (G0ROT and G4MD/P), or just coming on the band to work some contest stations on the day.

Neill Taylor G4HLX



John Rule G0JVR/P (single operator station) remembered to fly his Cornish Stannary flag while operating from Tregonning Hill in Cornwall.



An impressive home-brew antenna array! Mark Tuttle G0TMT used four 'Quagi' 144MHz antennas (Designed by Kevin James G6VNT and published as 'A Quick Quagi' in *Practical Wireless* September 1995 issue) for his entry.

On behalf of the PW Editorial team and everyone who took part in the contest, I would like to thank Neill Taylor G4HLX. Without the tremendous efforts Dr Taylor puts into the contest every year, we would all be bereft of an occasion that generates the true spirit of Amateur Radio. (For further comment please see 'Keylines' Editorial page).

Rob Mannion G3XFD, Editor *Practical Wireless*

The 1997 QRP Contest takes place on Sunday 15th June.

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THE AMATEUR RADIO EXCHANGE CENTRE

Seems that Icom Japan have been burning the midnight oil. Not only have they bought you an amazing HF and six metre transceiver but there's talk of a new HF +6m 1kW linear amplifier (ICPW-1), a new mini dual bander (ICW-32E) and a new scanner (ICR-10E)

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AC Version
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RRP £2339 Lynch Price: £1999
Deposit: £399, 24 payments of £89.16. Cost of loan: £323.84

YAESU FT-290R11
2m all mode 2.5w portable transceiver + FL-2025 25W Amp
RRP £ 758 Lynch Price: £539
Deposit: £59, 12 payments of £44.08.
Cost of loan: £48.99

FT-290MKit also available by itself for £479.

YAESU FT-690R11
6m all mode 2.5w portable transceiver
RRP £ 649 Lynch Price: £539
Deposit: £59, 12 payments of £44.08
Cost of loan: £48.99

YAESU FT-3000M
75w 2m FM transceiver
RRP £ 479 Lynch Price: £389
Deposit: £39, 12 payments of £32.14.
Cost of loan: £35.72

YAESU FT-51R 2/70
Dualband handle, computer programmable
RRP £ 539 Lynch Price: £399
Deposit: £49, 12 payments of £32.14.
Cost of loan: £35.72

YAESU FT-50R
The world's smallest dualband 2/70 handle
RRP £349 Lynch Price: £299
Deposit: Too low to financial

YAESU FT-736R
Quad band all mode VHF/UHF transceiver, (2/70 fitted)
RRP £1999 Lynch Price: £1399
Deposit: £299, 12 payments of £101.02. Cost of loan: £112.28
or Deposit: £299, 24 payments of £55.11. Cost of loan: £222.64

ADD 6M FOR ONLY £199!

PRICE WATCH



ICOM IC-736
HF BASE STATION
The IC-736 from Icom is the only HF base station to offer so much in the way of features, for so little price. Just look at what the IC-736 has to offer.

- A full 100 watts on all the HF amateur bands 160-10m (incl WARC)
- A full 100 watts on 6 metres
- A built in AC power supply - no noisy external power supply needed!
- Built in high speed auto ATU - no need for more external boxes!
- Dual antenna inputs, auto

switching
• Dual display showing second split operating frequency
RRP £1969 Lynch Price: £1599
Deposit: £299, 12 payments of £119.39. Cost of loan: £132.70
or Deposit: £299, 24 payments of £65.13. Cost of loan: £263.12

ICOM IC-775DSP
200W HF twin RX HF Flagship transceiver
RRP £3699 Lynch Price: £3099
Deposit: £499, 24 payments of £130.26. Cost of loan: £526.24

ICOM IC-706
100W HF, 100w 6m, 10w 2m all mode mobile transceiver
RRP £1195 Lynch Price: £999
Deposit: £99, 12 payments of £82.65.
Cost of loan: £91.87

NEW ICOM IC-821H 2/70
dualband 35/45w base station.
RRP £1595 Lynch Price: £1429
Deposit: £199, 12 payments of £125.96. Cost of loan: £125.56
or
Deposit: £199, 24 payments of £61.62.
Cost of loan: £248.95

ICOM IC-2350H 2/70
Dualband dual rx mobile transceiver
RRP £649 Lynch Price: £469
Deposit: £69, 12 payments of £36.73.
Cost of loan: £40.83

ICOM IC-7E
Dualband 2/70 miniature handle transceiver
RRP £329 Lynch Price: £299
Deposit: Too low to financial

PRICE WATCH



KENWOOD TS-870S HF DSP
100W HF transceiver
RRP £2399 Lynch Price: £1969
Deposit: £269, 12 payments of £146.94.
Cost of loan: £163.33
or
Deposit: £369, 24 payments of £80.16. Cost of loan: £323.84

KENWOOD TS-790 2/70
Multimode base station
RRP £1969 Lynch Price: £1699
Deposit: £299, 12 payments of £128.57. Cost of loan: £142.84

KENWOOD TS-505 HF 100W
MOBILE TRANSCIVER
RRP £1059 Lynch Price: £889
Deposit: £89, 12 payments of £73.47.
Cost of loan: £81.66

KENWOOD TRC-80
Commercial grade 100W HF transceiver
RRP £1169
Deposit: £169, 12 payments of £91.84. Cost of loan: £102.08

KENWOOD TM-255E 2M 45W
All mode transceiver
RRP £ 949 Lynch Price: £799
Deposit: £89, 12 payments of £65.20.
Cost of loan: £72.47

KENWOOD TM-251E
2M 50W WITH 70CM RX transceiver
RRP £ 419 Lynch Price: £359
Deposit: £59, 12 payments of £27.55.
Cost of loan: £30.62

KENWOOD TM-733E 2/70
Dualband remote head transceiver
RRP £ 729 Lynch Price: £629
Deposit: £69, 12 payments of £51.43.
Cost of loan: £57.16

KENWOOD TM-742E
Tripleband 2/70, (6M option), R/H transceiver
RRP £ 879 Lynch Price: £749
Deposit: £79, 12 payments of £61.53.
Cost of loan: £68.39

KENWOOD TM-79E
2/70 Dualband handheld transceiver
RRP £ 479 Lynch Price: £409
Deposit: £49, 12 payments of £33.06.
Cost of loan: £36.74

KENWOOD TM-22E
2M slimline handle transceiver
RRP £ 254 Lynch Price: £219
Deposit: Too low for financial

KENWOOD TM-42E
70cm slimline handle transceiver
RRP £ 289 Lynch Price: £249
Deposit: Too low for financial

ICOM - more new

NEW IC-756 HF+6m plus bandscope
NEW ICPW-1 HF Linear + 6 metres

NEW ICW-32E Dual band handle
NEW ICR-10E Pocket scanner

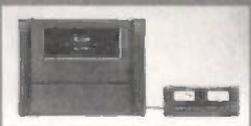
IC-756. The latest HF Transceiver from ICOM!



TAKE A LOOK AT THESE FEATURES

1. 100 Watts 1.8-60MHz
2. DSP IF at 15KHz
3. 4.9" Multifunction LCD Display including Spectrum scope
4. Dual watch in same band
5. Message memory keyer
6. Twin pass band tuning
7. Size: 340mm (w) x 111mm (h) x 285mm (d)
8. Weight: 9.3Kg
9. Internal Auto ATU for HF + 6m
10. Price: TBA1 (circa max £2200)

ICPW-1 HF Linear + 6m



See the whole range of new products at Leicester!

SETTING the STANDARD

For those of you who bought Standard products in the past, the manufacturer needs no introduction. For those who have heard about the legendary reliability, the advanced (often class leading) technology in design and construction and the excellent used equipment values, the reports are true.

Only Standard distributed through Martin Lynch & Son is offered with a 'NO LEMON' guarantee*. Put simply, in the unlikely event of any Standard transceiver failing three times with the same fault in the first twelve months, the unit will be replaced with a brand new replacement.....

Standard C-508. £229.95 The world's smallest dual bander?

2m & 70cm, 250mW output. Only 160g in weight. Unsurpassed sensitivity, 0.1581 microvolt. (12dB SINAD). 8 tuning steps. 60 channel memory. 39 CTCSS tone included.

Standard C-108 / C-408. C-108: £169.95, C-408: £179.95

Simple, basic, 230mW output on 2m (C-108) or 70cm, (C-408). Only 130g including batteries! 20 channel memory. Built in tone burst & superb sensitivity.

Standard C-568. £449.00

A class leading act? Unlike the usual dualband handle, amongst other pace setting features, the new C-568 covers the 23cm band on receive together with 35mW of TX power! The feature list goes on and on. Contact the sales desk for a full descriptive leaflet.

Standard C-5908D. Circa: £800.00

Coming very soon, the C-5908D is a TRIPLE BAND 2/6/70 mobile FM transceiver. Remote head, 45 watts on 6m, 50 watts on 2m and 35 watts on 70cm. Further details follow shortly.



supermodels than the motor show!

Lynch 40th (yes 40th) Birthday Party at the store on 2nd November!

140-142 NORTHFIELD AVENUE,
EALING, LONDON W13 9SB

0181-566 1120

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Official Sponsor of
HF & IOTA '96.

YAESU FT-8000 DUAL BANDER

The latest design from the Yaesu stable. A small compact HIGH POWER dual band mobile, offering these features:

Wide Band RX, 110-550 / 750-1300MHz.

NEW

Smart Search sweeps a band and loads active frequencies in dedicated frequency banks.

108 Memory Channels, storing repeater offset, Optional CTCSS, Packet Speed & Power level. Digital DC Voltage display.

Dual receive on same or cross band, plus cross band repeat facility.

Full 50 Watts out on 2m, 35 Watts on 70cm.

1200 or 9600 Baud Packet available per memory channel with easy interface via a dedicated input socket.

ADMIS-1D Windows programming software, available September

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

■ 5 YEAR WARRANTY IS AVAILABLE ON ALL MAIN PRODUCTS LISTED



■ FOR THE LARGEST SELECTION OF USED EQUIPMENT IN EUROPE, CALL OUR FAXBAK SERVICE - TODAY



full range of AEA products available

NEIL SOUND

"As reviewed in RadCom"
August 1996

Heil Proset-5 Professional Quality Boom Headset, dual padded earphones, flexible mic boom, includes HC-5 "Full range" insert for superb speech quality. Requires AD-1 cable ADAPTOR for YAESU/KENWOOD/ICOM. £119.95 incl. VAT

Heil Proset-4 Identical to Proset-5, but includes HC-4 "DX" microphone insert. Ideal for punching through the pileups. £119.95 incl. VAT

Heil HC-4 Replacement microphone insert for existing fist or base microphones. With 100dB peak at 2KHZ and the low end rolled off sharply at 500HZ, (120dB per octave), the HC-4 is the ultimate DX mic insert. £28.95 incl. VAT

Heil HC-5 Identical to HC-4, but High Articulation, offering superb SSB quality, rolls off sharply under 350HZ and above 3100HZ, peaking at 2.4KHZ. "Hi-Fi" SSB Audio. £28.95 incl. VAT

Heil AD-1/K/Y Adapter leads to interface the proset Headset/boom microphones to 8 pin Yaesu, Icom or Kenwood transceivers. £11.95 EACH

NEW AE-550 - Low Cost 2M FM Transceiver

- 25 Watts
- 5/10/12.5/20/25kHz steps
- 144-146MHz (extendible)
- Compact size: 140mm (w) x 125mm (h) x 41mm (d)
- Easy to use - DOESN'T MAKE TEA!
- 10 (YES, ONLY 10) memory channels
- Programmable calling channel

Remember the days when you could buy a rig for two metres that didn't require a maths degree to operate it? Probably not. It's that long ago. Enter the no frills, no messing AE-550. Simple to use - great in operation. Even better price...

£199.95 incl. VAT. p&p £10

See us at the Leicester show on
18/19th October.

ATTENTION
ALL THOSE WITH A MARTIN LYNCH T-SHIRT -
WEAR IT TO THE SHOW AND GET ANOTHER £1
OFF YOUR PURCHASE OF £10 OR MORE!

new products corner

WATSON WDB-30

Attention all those with a dual band handie - YOU'LL WANT ONE OF THESE!

Watson have done it again. We bet you would use your dual band handie a lot more if the output was 25-30 Watts. This simple-to-use FM amplifier connects between your rig and antenna (or duplexer) and it will auto TX and sense which band you are on! Remote mount it in your car or shack and forget about it!

ML PRICE: £149.95



DANMIKE DSP-NIR

Manufactured by Danmike of Denmark, the DSP-NIR is a premium grade noise reduction unit directly competing with the DSP-599+



INTRODUCTORY PRICE £329.95



TIMEWAVE & MFJ DSP FILTERS

DANMIKE DSP-NIR NEW DSP	£329.95
MFJ-784B All mode Tunable DSP	£249.95
DSP 9+ All mode DSP at only	£189.95
DSP 59+ As above but more features	£249.95
DSP 599zx NEW! Hyper speed processor, alpha display and more	£349.95

NEW PRODUCT FROM KENWOOD

DSP TS-570S

In response to their award winning TS-870S, Kenwood bring you their new TS-450S replacement - the TS-570S with DSP!!



Make sure you call into the Leicester show for the transceivers first showing!

EASIWAVE BY ICOM

The latest commercial 2 way handies operating on UHF. One licence at only £30 and ideal for business use indoors or out. Easy to operate with the absolute minimum of buttons. Supplied with wall charger and NiCad batteries.

ONLY £199 INCL. VAT.



Info

■ Martin Lynch can also offer finance terms upto 36 months. Deposits from a minimum of 10%. We welcome your part exchange against any new (or used!) product, provided its clean and in good working order. Call the Sales Desk today. APR. 19.9% Payment protection is also available.

■ All units are brand new and boxed and offered with full manufacturers RTB warranty. All prices quoted for cash/cheque or Switch/Delta card.

■ For credit card please add 2.5% to total value. Finance on all products is also available. (Subject to status).

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■ WEB SITE: <http://www.martin-lynch.co.uk>

■ E-MAIL: sales@martin-lynch.co.uk



■ Martin Lynch is a licensed credit broker. Full written details are available on request. Finance is subject to status. E&OE. £10 p&p on all major items.

The LEICESTER Show



...and counting

Believe it or not the Leicester Show celebrates its 25th anniversary event this year! For those of us who remember the early shows, Rob Mannion G3XFD takes a look back at a show that's become a traditional autumn treat for radio enthusiasts from all over the UK and Europe.

Although I attended some of the earliest Leicester Shows myself, to get the real 'flavour' of this now truly traditional event, I've had to recruit the help of 'Mr Leicester Show' himself...Frank Elliot G4PDZ.

But - bearing in mind we've got many readers who don't live in the UK - I'd better explain a little about the show, where it's held and how you can get there if you're visiting Britain. Even at this late stage you could find time to get to the show...it would be worth it if you could!

Leicester, is in the eastern English Midlands, approximately 160km (100 miles) or so north of London. For visitors to the UK thinking of travelling by air for a visit, Leicester is only a short distance from the busy East Midlands Airport. This major regional airport has services to and from many parts of the UK and mainland Europe.

Another vital aspect for the Leicester show is that the city itself is not so far off being in the centre of England. Because of this it's got excellent road and rail communications to the rest of the country.

The M1 - for example - links the city to the south and west very effectively via the M42 and M5 and even from our office here in Dorset I can get to the Granby Halls in around three hours. And many years ago I bought a very heavy Eddystone 888 second-hand receiver and carried it to Leicester station before travelling home on the train (via London) in just over four hours. However,

nowadays, many clubs run coaches or share cars. It's feasible even if you're coming from Holland, Belgium or France now the Channel Tunnel is open! (You can even get through trains from the Tunnel to destinations throughout Britain!).

But now it's time to take a look at the history of the Leicester show itself. And Frank reminds me that the first event was held at the Granby Halls between October 26 and

28th 1972. It was run for the Amateur Radio Retailers Association (AARA) by Les Hellier G3TED and Tom Darn G3FGY. Following G3TED's death, his son (also called Les Hellier) took over the responsibilities along with Fred Hopewell G4PGC.



Frank Elliot G4PDZ on the Elliot Electronics stand during the 1984 Leicester Show.



The main hall during the 1983 show with the SMC stand prominent in the centre of the photograph.

Leicester Radio Society

From 1982 the event was run by the Leicester Radio Society with private financial backing. The existing show committee was formed after that exhibition with the six members who have run the event ever since. They have no direct association with any other club although the proposal was to enlist stewarding aid from the local clubs and in return pass any profits to those clubs.

Frank says that "Three of the original committee are still doing it albeit with the aid of a 'Zimmer' frame! These are myself Frank Elliot G4PDZ the Organiser/Secretary, John Theodorson G4MTP the Chairman and Geoff Dover G4AJF the Treasurer.

"I think it was in 1989 when the show was getting so popular, we were able to persuade the Leicester City Council to allow us to spread into the skating area. This increased the area by a third bringing the total number of stands to over the hundred mark".

Continuing with the story behind the successful show Frank explained that "The aim of the committee is still to be predominantly Amateur Radio or at least be associated with Amateur Radio. It is increasingly difficult to distinguish but we try hard"!

Rounding off our conversation Frank told me "One of the highlights as far as I'm concerned is the signed message we've received from His Royal Highness Prince Phillip, the Duke of Edinburgh*", and each year being able to meet so many of the stalwarts of Amateur Radio. And hopefully, many of the original exhibitors will be at this year's show".

*This letter featured in 'News 1996' (page 13) of the October issue of PW.

Thanks for the chat Frank. It was fascinating to hear some of the background of the Leicester Show. Personally I think it's an excellent social event and also provides marvellous opportunities to launch someone off on the radio.

Leicester was (for example) where I was able to help a certain young James Reed (now GWUODM) get his first receiver from the 'Bring & Buy' some years back. His treasured Heathkit RA1 founded his equipment collection. He then progressed to his RAE and is now at Medical School (he chose one with an active Amateur Radio Club of course!). All because his Dad was kind enough to bring him to the Leicester show!

Do come and join the fun. If you're just entering the hobby...please come and have a chat. We'll do our best to help you too achieve the best results and you never know, you could find the bargain needed to launch you off into the radio hobby.

So, everyone on PW wishes 'Happy 25th Birthday' to the event and we're all very much looking forward to meeting friends old and new on Friday and Saturday 18 and 19th of October. See you there!

PW



The Leicester Amateur Radio Show
Committee invite you to the

**25th
Anniversary**

**AMATEUR RADIO,
ELECTRONICS &
COMPUTER SHOW**

at the

GRANBY HALLS, LEICESTER

on

Friday & Saturday

18th & 19th October, 1996

Friday 10.00am - 6.00pm. Saturday 10.00am - 5.00pm

Admission: Adults £2.00

Concessions for Children and O.A.P.s



- ★ **NOW EVEN BIGGER AND BETTER**
- ★ **MORE THAN A HUNDRED EXHIBITORS**
- ★ **BRING & BUY**

Enquiries to Frank G4PDZ

on: 0116-287 1086

LEICESTER

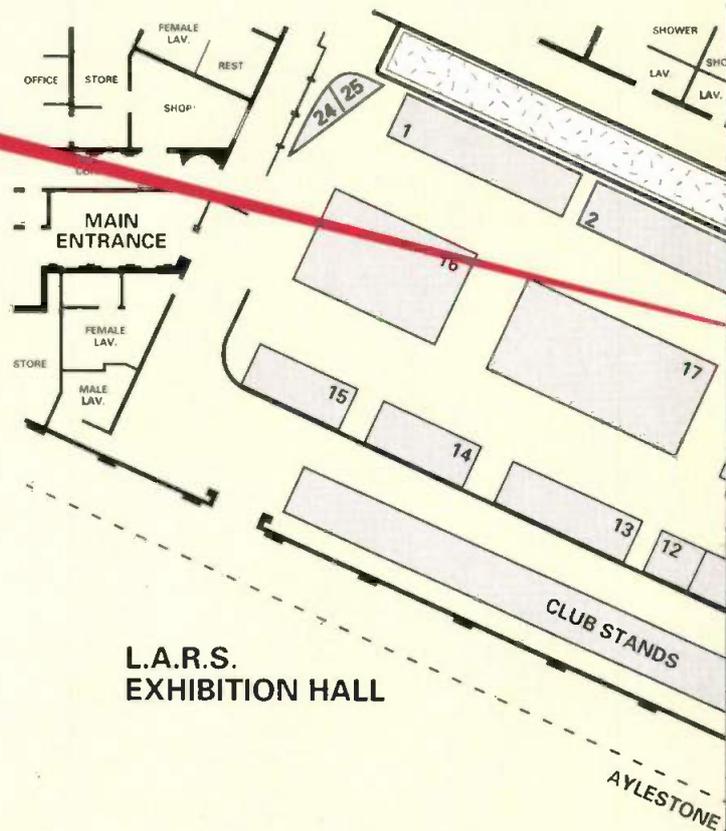
Sales Hall

1/2	Gemini Electronics
3	Taurus Auctions
4	Harwood Trading
5	Amstrutt
6	LMW Electronics
6a	Lake Electronics
7	K.M. Publications
8	South Midlands Communications
9	JPE
10	Timestep
11	Sandpiper Communications
12	Weirmead
13	Display Electronics
14	Strumech Engineering
15	Combitek
16	Waters & Stanton
17	Mutek
18/19	JMG Electronics
20	Office Land
21	J.A.B. Electronics
22	Multicomm 2000

22a	G3TUX QRP Component Co.	45
23	H. Morgan Smith	46
24	Satellite Surplus	47
25	Martin Lynch & Son	48
26	Barenco	49
27	J. Birkett	49a
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30	Syon Trading	51
31	Capital Products	52
32	Moonraker	53
32a	Wilson Valves/Am. Radio Shop	53a
33	Mainline Electronics	54
34	G. S. Electronics	54a
35	Nevada	55
36	L & S Components	56
37	A1 Electronics	57
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39	Len Cooke Enterprises	59/60
40	M & B Radio	61
41	ARE Communcations	62/63
42	S.G.S. Electronics	64
43	Brial Services	
44	Coltec Electronics	

Exhibition Hall

1	RSGB
2	Icom (UK)
3/4	Practical Wireless & Short Wave Magazine
5	Linear Amp UK
6	Haydon Communications
7	AOR (UK)
8	2J Sound
9	Venus Electronics
10	Ham Radio Today
11	Howes Communications
12	Poole Logic
13	Trio-Kenwood
14	Eastern Communications
15	Videoquip
16	Lowe Electronics
17	Yaesu UK
18	Tennamast
18a	Radiocommunications Agency
19	Field Electrics
20	R.A. Kent
21	Mailtech
22	*
23	Rich Electronics
24	U B M
25	U B M



ER 1 996



R. Barrett
 A. J. Peddon
 R.A.S. (Nottingham)
 Computer Junk Shop
 Oasis Computers
 Link Electronics
 Westlake
 Radiotronics
 *

Tables

Ham Radio
 Products
 T K Electronics
 T & M Milman
 Agile Tools
 NoNuts

* Stand allocated
 but not confirmed

All details correct
 at time of going to
 press

Mirage Designs
 Strikalite
 Eagle Antenna Co.
 3R Cardware
 S.E.M.
 G. C. Arnold Partners
 Badger Boards
 RN Electronics
 DeeComm
 Megasys Ltd
 Loutronics
 Bonex

L.A.R.S. SALES HALL



With the 25th Leicester show just around the corner here's brief round-up of who and what you can expect to find at show. If you can't make it to the Granby Halls on October 18/19th this will give you a taster of what you can expect to find on the dealers shelves after the show. And as the Leicester show is traditionally the time of year when new products are launched there should be plenty to choose from!

Low Electronics - Stand E16

As well as the usual range of products the Low Electronics team will be exhibiting a new range of hand-held transceiver accessories at this year's show. These accessories are earpiece/microphone units which will be known as the LEP400K and the LEP500K.

The LEP400 and 500K have been designed to overcome the problem of the need to hold a hand-held up to your mouth and then press the push-to-talk. Previously the only way around this was to use VOX or a boom microphone.

These new units from Lowe consist of a lightweight ear hanger earphone coupled with a choice of a slim boom microphone or a lapel/clip mic that can be clipped to clothing at a convenient point. The first models are for use with Kenwood transceivers but models for other radios will be available soon.

If you visit the Low Electronics stand there will also be the chance to see the new DX Peeper automatic DX cluster alarm unit and the WinRadio receiver on a PC card. Why not stop by and see for yourself or contact Lowe on (01629) 580800.

Tennamast (Scotland) Limited - Stand E18

Norrie and Rose Brown will be pleased to welcome you to their stand and as always will have a range of their masts, towers and associated bits and pieces on display. However, one thing that will no doubt stand out as being different this year will be the change of name.

As of 1 September 1996 Tennamast became a limited company and are now trading as Tennamast

Icom UK Ltd. - Stand E2

Icom UK are about to launch some new models for the autumn season. These are expected to be the IC-756 an h.f. d.s.p. 50MHz 100W transceiver, the IC-W32E dual-band hand-held and the IC-821H dual-band base station. In addition to these Icom are also the IC-PW1 an h.f. 50MHz linear 1kW amplifier.



It's hoped that some, if not all of the new models will be ready in time for the Leicester show and so will give all visitors to the Icom stand plenty of variety to choose from. So, why not stop by Stand 2 in the Exhibition Hall to find out more about the latest models in the Icom range or contact them direct at Sea Street, Herne Bay, Kent CT6 8LD, Tel: (01227) 741741.

(Scotland) Limited. Norrie and Rose have been joined by two new Directors, **Matthew Dodds** and **Bill Strachan GM3ZRT** who are two Ayrshire businessmen.

Tennamast will continue to produce their wide range of masts and towers for the communications industry as well as their innovative boat cradles, which have earned them a strong reputation in the yachting world. They will continue to offer their 'friendly' service and look forward to seeing friends old and new at the Leicester show or at 81 Mains Road, Beith, Ayrshire, Scotland KA15 2HT.

and is already a favourite amongst Morse enthusiasts.

Also on display will be two keys ideally suited to the traveller or portable operator. The 'Minky' and 'Twinky' DK1WE miniatures are a miniature pump and a vertical action twin lever paddle key respectively.

For the first time Chris will have supplies of Schurr Morse keys from Germany on display, in addition to all his usual bits and pieces for the QRP enthusiast. If you can't wait until October 18 & 19th to see Chris why not contact him on (01428) 661501.

The QRP Component Company - Stand S22



Chris Rees G3TUX will be displaying some new Morse keys and paddles on his stand

in the Leicester Sales Hall. The first of these is the Swedish Pump key, which is said to have a unique soft action

Sandpiper Communications - Stand S11

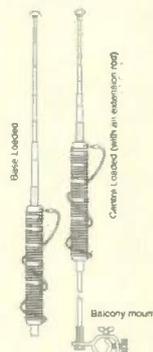
Sandpiper Communications have two new antenna products available for the Leicester Show. There's a new range of heavy duty dipoles for the 3.5, 7, 10, 14 and 28MHz bands with a 1kW power limit on 14 and 28MHz. The dipoles for the three lower bands are only 9.5m across with a power limitation of 200W s.s.b.

Covering h.f. to v.h.f. the PI280MKII antenna system can be adapted to suit

all bands from 3.5 to 144MHz. Using a combination of extension rod, a selectable loading coil and a telescopic top section (shown in the illustration) you can make an antenna that can be used on the popular bands.

The optional base mount allows the user to fit the antenna to a luggage rack for mobile use. Or you could fit it to a balcony rail if you're operating from a hotel room. You can have 'two to eighty' wherever you go.

For more information on Sandpiper's range of antennas why not contact Chris at Unit 5, Enterprise House, Cwmbach Industrial Estate, Aberdare, Mid-Glamorgan CF44 0AE. Tel: (01685) 870425.



Eastern Communications - Stand E14

Eastern Communications who are the European agents for Vibroplex Morse keys will be exhibiting the full range on Stand 14 in the Exhibition hall. Over the last year Vibroplex have been busy improving their keys by using new tooling and heavier plating.

As a result of public demand for a Vibroplex straight key and after much discussion between **Tim Thirst G4CTT** of Eastern Comms and **Mitch Mitchell Jr WA4OSR**, owner of Vibroplex, the first Vibroplex Straight Key will be on display. The new Straight key will be available in a Deluxe Chrome Version or in a Standard Black Crackle finish.

Also on display will be a new Autek antenna analyser, the RF5 which is a v.h.f./u.h.f. version of the RF1. This unit is designed to make the testing of wire and beam h.f. antennas very easy to do. The RF5 features an instant s.w.r. mode which automatically finds the frequency of the minimum s.w.r.

There will also be the chance to see a new range of low pass filters and lightning arresters from Delta Engineering and a selection of wire antennas from the Sigma range and h.f. beams from Mosley. For more information you can contact Eastern Communications on (01692) 650077.

C.M. Howes Communications - Stand E11

Dave Howes G4KQH and his team will be exhibiting the full range of Howes kits and active antennas and no doubt of particular interest will be the PW Rugby transmitter and matching Daventry receiver. Visitors to the Howes stand will have the opportunity to examine the Rugby's works and see for themselves exactly how easy it can be to build an s.s.b. transmitter.



Together with the kits for the Rugby and Daventry you will also be able to purchase the kit for the newly introduced DC2000 shortwave s.s.b. and c.w. receiver. With a price tag of only £22.90 this should ensure that plenty of budding constructors will be busy building throughout the winter months!

If you'd like to know more then why not take time out to speak to Dave G4KQH either at the Granby Halls or by calling him on (01327) 260178.



The LEICESTER Show



Show News

Admission: £2.00

Times: 10am-6pm/10am-5pm

Concessions for OAPs and Children

You can meet the Editor's

Join old friends

Find the bargains

See the latest rigs

Sell at the 'Bring & Buy'

Renew your subscription

Buy your books

Meet the dealers

Kenwood Electronics UK Ltd. - Stand E13

There's news from **Dave Wilkins G5HY**, Sales & Marketing Communications Division of Kenwood UK, that new models are on their way.

Kenwood's new TS-570D is aimed at replacing the popular mid-priced TS-450S and TS-450SAT models. Dave told *PW* that the new TS-570D's price will be of interest in that it's £1499.95 including VAT. He states that "the new transceiver is therefore priced significantly below that of the outgoing TS-450SAT, but with greatly improved features and full digital signal processing (DSP) included".

Brief specification details of the TS-570D include Kenwood's (manufacturer's claim) exclusive 16-bit d.s.p. technology "providing extremely effective interference reduction. High quality transmit and receive audio reproduction". Kenwood also claim a 'world first' with the TS-570D's c.w. 'auto tuning'. Other important parameters are long transmission times due to improved heat dissipation techniques and automatic antenna tuning.

Look out for the latest information on all Kenwood's products on their Stand or contact them direct on (01923) 816444.

Martin Lynch & Son - Stand S25

Martin Lynch and his 'family' will have samples of the latest amateur radio products from the Standard Corp. Martin has recently been appointed as the sole distributor in the UK for Standard equipment and the Leicester Show will see him exhibiting four new products from the Japanese range.

The Standard C508 is said to be the smallest dual-bander ever! It offers coverage of the 144 and 430MHz bands, weighs less than 160g, produces 250mW of power and is claimed to be smaller than a packet of cigarettes!

Another compact offering takes the form of the C-568 which offers coverage on the 1296MHz (23cm) band on receive and is capable of transmitting 35mW of power. This is classed as 'not just another hand-held' and has many leading features.

The remaining two Standard models are the C-108/408 which are matching miniature 144 or 430MHz hand-helds offering 30mW of power, 20 channels and toneburst. Finally, there's the C-5908D which is due for general release in early 1997.

The C-5908D is described as the first dedicated mobile transceiver to offer three v.h.f./u.h.f. in one unit. Features include wide band receive, 45W on 50MHz, 50W on 144MHz and 35W on 430MHz.

In addition to all this Martin will be exhibiting the range of AEA and Heil products together with Danmike, Yaesu, Kenwood, Icom, Alinco and a vast array of second-hand equipment.

Make sure you stop at the Lynch Emporium and if you can't wait until the show to meet the 'family' why not drop into the showroom at 141-142 Northfield Avenue, Elaing, London W13 4SB?



Waters & Stanton Electronics - Stand S16

If you visit the W & S team, who normally reside at 22 Main Road, Hockley, Essex, you will be assured of plenty of choice, as to coincide with the Show's 25th Anniversary, they have expanded their stand in the centre of the Sales Hall. This means that their display will include all the brands they deal in as well as their Alinco exhibition unit.

Products on display will include the new Alinco DR-605 dual-band mobile transceiver and the miniature DJ-S41 u.h.f. hand-held. There will be a reduced size display model of the Cushcraft R7000 7-band vertical antenna together with the new Diamond GSV 30A power supply.

The latest products in the MFJ, Ameritron and Watson ranges will also be on view as well as plenty of accessory and ancillary items for you to choose from. **Jeff Stanton and Peter Waters** are looking forward to welcoming you to their stand so make sure you take a look at what's on offer.

South Midlands Communications - Stand S8

If you're looking for a reasonably priced u.h.f. p.m.r. radio suitable for 1200baud packet use then look no further than the **SMC** stand. **Graham Taylor** and the team will be offering single channel units from just £35, as well as a variety of two and seven channel models.

There will also be the chance to purchase a new Daiwa PS400SX 40A p.s.u. which measures 216 x 110 x 280mm, weighs only 8.5kg and costs just £169. And that's not all!

There will be a new mobile antenna on view in the shape of the Comet CA-HV h.f./v.h.f. The Comet can be used on the 7, 14, 21, 28, 50 and 144MHz bands and is claimed to be the ideal antenna for use with the IC-706.

So, what are you waiting for? With all these offers together with the all usual SMC products you can't fail to find a bargain!

For more details on the full range of products stocked by South Midlands Communications telephone (01703) 255111.



Nevada Communications - Stand S35

Portsmouth based company **Nevada** will have a selection of new products on show, which have not been exhibited prior to the Leicester Show.

Nevada have recently been appointed distributors for the Raxon brand of hand-held transceivers. The new Raxon RL-115 144MHz hand-held transceiver costing just £189 will no doubt be of interest to amateurs both 'old and new'. Features of this 'palm sized' transceiver include 72 memory channels, built-in DTMF, auto repeater offset, has six types of scanning and eight auto patch memories.

There will also be the chance to see the recently advertised Timewave DSP 599zx d.s.p. noise filter. The manufacturers claim that this is the most powerful noise and QRM filter to be released for the amateur market. In addition to standard features, the DSP-599zx also includes a digital voltmeter and tone generator and at £349 is surely worth a look!

As well as all this the Nevada team will be showing the complete range of SGC equipment, owing to the fact that they have just been appointed distributor for SGC. The range will include the new PowerClear Digital Signal Processing Unit, which is said to be unique in that it is a complete stand-alone self-contained bolt-on unit complete with its own built-in speaker, amplifier and mounting bracket.

So, if you call at the Stand 35 in the Sales Hall you can be assured of a warm welcome and plenty of 'goodies' to choose from! When not at rallies and exhibitions Nevada can be contacted at (01705) 662145.



BOOK STORE



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TEL: (01202) 659930 (24 HOURS)

FAX: (01202) 659950 (24 HOURS)

OR USE THE ORDER FORM ON PAGE 82

The books listed have been selected as being of special interest to our readers. They are supplied direct to your door. Many titles are overseas in origin.

LISTENING GUIDES

AIRBAND

AIR BAND RADIO HANDBOOK 5th Edition. David J. Smith.	192 pages. \$8.99
AIR TO GROUND RADIO FREQUENCIES. Ken Davies	96 pages. \$4.99
AIRWAVES 96.	100 pages. \$8.95
AIRWAVES EUROPE.	124 pages. \$9.50
CALLSIGN 96.	144 pages. \$8.50
FLIGHT ROUTINGS 1996. Compiled by T.T. & S.J. Williams.	140 pages. \$6.60
HIGH IN THE SKY. Davis Barker & McKenzie	166 pages. \$6.95
INTERNATIONAL AIR BAND RADIO HANDBOOK. David J. Smith.	192 pages. \$9.99
THE AIRBAND JARGON BOOK. Ron Swinburne.	72 pages. \$6.95
UNDERSTANDING ACARS	
3rd Edition. Aircraft Communications Addressing and Reporting System. Ed Flynn	80 pages. \$9.95
WORLDWIDE AERONAUTICAL COMMUNICATIONS FREQUENCY DIRECTORY	
2nd Edition. Robert E. Evans 260 pages. \$19.95	
WORLDWIDE AERONAUTICAL HF RADIO HANDBOOK. Martyn R. Cooke.	124 pages. \$6.95

BROADCAST

A GUIDE TO THE WORLD'S RADIO STATIONS BP355. Peter Shore.	266 pages. \$5.95
POP WENT THE PIRATES. Keith Skues.	\$15.95
RADIO LISTENERS GUIDE 1996. Clive Woodyear.	81 pages. \$3.95

DATAMODES

GUIDE TO UTILITY STATIONS. 14th Edition. Joerg Klingenfuss.	604 pages. \$35.00
GUIDE TO WORLDWIDE WEATHERFAX SERVICES. 16th Edition	
Joerg Klingenfuss	436 pages. \$25.00
INTERNET RADIO GUIDE 1st Edition. Joerg Klingenfuss	350 pages. \$22.00
POCKET GUIDE TO RTTY AND FAX STATIONS. Bill Laver.	57 pages. \$3.95
RADIO DATA CODE MANUAL 15th Edition. Joerg Klingenfuss	604 pages. \$28.00

DXTV

DXTV FOR BEGINNERS. Simon Hamer.	31 pages. \$3.95
GUIDE TO DX-TV. Keith Hamer & Garry Smith.	36 pages. \$3.95

FREQUENCY GUIDES

1996 SUPER FREQUENCY LIST. Joerg Klingenfuss.	\$25.00
FERRELL'S CONFIDENTIAL FREQUENCY LIST	
9th Edition. Compiled by Geoff Hallihey.	544 pages. \$17.95
PASSPORT TO WORLD BAND RADIO 1997.	528 pages. \$15.50
UK SCANNING DIRECTORY. 5th Edition.	540 pages. \$18.50
VHF-UHF SCANNING FREQUENCY GUIDE. Bill Laver	192 pages. \$12.95
WEATHER REPORTS FROM RADIO SOURCES. Philip C. Mitchell.	32 pages. \$6.00
WORLD RADIO TV HANDBOOK 1996 (50th Anniversary Issue).	608 pages. \$17.95

GENERAL

EAVESDROPPING ON THE BRITISH MILITARY. Michael Cannon.	\$19.50
THE COMPLETE SHORT WAVE LISTENER'S HANDBOOK 4th Edition	
Hank Bennett, Harry Helms & David Hardy.	321 pages. \$18.95
SHORT WAVE COMMUNICATIONS. Peter Rouse GU1DKD.	187 pages. \$4.50

MARINE

MARINE SSB OPERATION. J. Michael Gale.	96 pages. \$11.95
MARINE VHF OPERATION. J. Michael Gale	48 pages. \$7.95
SHORTWAVE MARITIME COMMUNICATIONS. B. E. Richardson.	195 pages. \$16.50
SHIP TO SHORE RADIO FREQUENCIES. Ken Davies.	95 pages. \$5.99
SIMPLE GPS NAVIGATION. Mik Chinery.	96 pages. \$9.95

SATELLITE

AN INTRODUCTION TO AMATEUR COMMUNICATIONS SATELLITES	
BP290. A. Pickard.	102 pages. \$3.95
AN INTRODUCTION TO SATELLITE COMMUNICATIONS BP326.	
F. A. Wilson.	230 pages. \$5.95
NEWNES GUIDE TO SATELLITE TV. Derek Stephenson.	371 pages. \$18.95
SATELLITE BOOK - A Complete Guide to Satellite TV Theory and Practice	
John Breeds.	280 pages. \$32
SATELLITE EXPERIMENTER'S HANDBOOK 2nd Edition.	
Martin Daviddoff K2UBC.	313 pages. \$14.50
SATELLITE HACKERS HANDBOOK. Colin A. Grellis.	120 pages. \$18.75
SATELLITE TELEVISION. A Layman's guide. Peter Pearson.	73 pages. \$11.00

SATELLITE TELEVISION INSTALLATION GUIDE. 5th Edition. John Breeds.	76 pages. \$15.00
SPACE RADIO HANDBOOK (RSGB). John Branegan GM741HJ.	242 pages. \$12.50
WEATHER SATELLITE HANDBOOK. 5th Edition. Dr Ralph E. Taggart WB8DQT.	192 pages. \$15.50
WRTH SATELLITE BROADCASTING GUIDE. 1996 Edition. Bart Kuperus.	366 pages. \$17.95

SCANNING

AN INTRODUCTION TO SCANNERS AND SCANNING BP311. I. D. Poole.	152 pages. \$4.95
SCANNER BUSTERS 2. D.C. Poole	100 pages. \$6.00
SCANNERS 2 INTERNATIONAL. Peter Rouse GU1DKD.	261 pages. \$9.95
SCANNERS 3 PUTTING SCANNERS INTO PRACTICE.	
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AMATEUR RADIO

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ALL ABOUT VERTICAL ANTENNAS. W. I. Orr W6SAI & S. D. Cowan W2LX.	192 pages. \$8.50
ANTENNA IMPEDANCE MATCHING (ARRL). Wilfred N. Caron.	195 pages. \$14.50
ANTENNAS FOR VHF AND UHF BP301. I. D. Poole	104 pages. \$4.95
ARRL ANTENNA BOOK 17th Edition.	732 pages. \$21.95
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CUBICAL QUAD ANTENNAS 3rd Edition. William Orr W6SAI and Stuart Cowan W2LX.	\$8.50
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G-QRP CLUB ANTENNA HANDBOOK.	
Compiled and edited by P. Linsley G3PDL & T. Nicholson KA9WR/GWOLNQ.	155 pages. \$7.25
HF ANTENNA COLLECTION (RSGB). Edited by Erwin David G4LQI.	233 pages. \$10.99
HF ANTENNAS FOR ALL LOCATIONS (RSGB). Les Moxon G6XN.	322 pages. \$14.65
MORE OUT OF THIN AIR (PWP).	112 pages. \$6.95
PRACTICAL ANTENNAS FOR NOVICES. John Heys G3BDQ.	52 pages. \$6.30
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W1FB'S ANTENNA NOTEBOOK (ARRL). Doug DeMaw W1FB.	123 pages. \$7.50

BEGINNERS (INC RAE)

AMATEUR RADIO FOR BEGINNERS (RSGB). Victor Brand G3JNB.	65 Pages. \$3.50
AN INTRODUCTION TO AMATEUR RADIO BP257. I. D. Poole.	150 pages. \$3.50
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Clive Smith G1FZH and George Benbow G3HB.	88 pages. \$8.75
THE NOVICE RADIO AMATEURS EXAMINATION HANDBOOK (BP375)	
Ian Poole G3YWX.	150 pages. \$4.95
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Fifth Edition.	Ray Petri G0OAT. \$13.95
RAE MANUAL (RSGB). G.L.Benbow G3HB.	127 pages. \$8.75
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SHORTWAVE RADIO LISTENING FOR BEGINNERS.	
Anita Louise McCormick K8KGL.	176 pages. \$9.95
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John Case GW4HWR.	101 pages. \$6.75
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RECEIVING STATION LOG BOOK (RSGB).	£3.50
RSGB PREFIX GUIDE.	£5.00

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ARRL UHF/MICROWAVE EXPERIMENTER'S MANUAL.	Various Authors. 446 pages. £14.50

OPERATING AND HANDBOOKS

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ARRL HANDBOOK FOR RADIO AMATEURS 1996 (ARRL).	1200 pages. £25
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YOUR PACKET COMPANION.	Steve Ford WB8IMY. 170 pages. £5.95

PROPAGATION

AN INTRODUCTION TO RADIO WAVE PROPAGATION BP293.	J.G. Lee. 116 pages. £3.95
LOW PROFILE AMATEUR RADIO - OPERATING A HAM STATION FROM ALMOST ANYWHERE (ARRL).	Jim Kearman KR1S. 124 pages. £7.50

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TEST EQUIPMENT CONSTRUCTION BP248.	R.A. Penfold. 104 pages. £2.95
W1FB's DESIGN NOTEBOOK (ARRL).	Doug DeMaw W1FB. 195 pages. £8.50

DATA

ARRL ELECTRONICS DATA BOOK.	Doug DeMaw W1FB. 260 pages. £8.95
ELECTRON TUBE LOCATOR.	George H. Fathauer. 350 pages. £19.95
ESSENTIAL CHARACTERISTICS (TUBES & TRANSISTORS)	
(Original Publishers General Electric) Re-published by Antique Electronic Supply (Arizona).....	475 pages. £9.95.
HANDBOOK OF RADIO, TV, INDUSTRIAL & TRANSMITTING TUBE & VALVE EQUIVALENTS.	60 pages. £2.95.
PRACTICAL ELECTRONICS CALCULATIONS AND FORMULAE BP53.	
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PRACTICAL ELECTRONIC DESIGN DATA BP316.	Owen Bishop. 327 pages. £4.95
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Norm Dye & Helge Granberg.....	235 pages. £19.95
RADIO VALVE GUIDE BOOKS 1-5	£2.95 each
RCA RECEIVING TUBE MANUAL (Original Publishers Radio Corporation Of America)	
Re-published by Antique Electronic Supply (Arizona).....	384 pages. £10.50
RCA TRANSMITTING TUBES	
(Original Publisher Radio Corporation of America) Re-published by Antique Electronic Supply (Arizona).....	318 pages. £9.95.
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Joseph D. Moell & Thomas N. Curlee.....	325 pages. £21.95
TRANSISTOR DATA TABLES (BP401).	178 pages. £5.95

PROJECTS

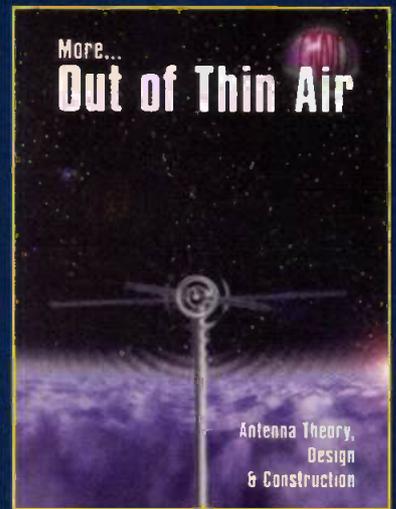
COIL DESIGN AND CONSTRUCTION MANUAL BP160.	B.B. Bahani. 106 pages. £3.95
HOW TO DESIGN AND MAKE YOUR OWN PCBs BP121.	R. A. Penfold. 66 pages. £2.50
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SHORT WAVE SUPERHET RECEIVER CONSTRUCTION BP276	R.A. Penfold. 80 pages. £2.95
SIMPLE SHORT WAVE RECEIVER CONSTRUCTION BP275	R. A. Penfold. 88 pages. £3.95

ORDER NOW ON (01202) 659930
OR PLEASE USE THE ORDER FORM ON PAGE 82.

"Well, another month and good luck to all of you sitting RAE courses. Don't forget to make sure you have 'up-to date' books to hand, as things are constantly changing. For those of you interested in listening the new *Passport To World Band Radio 1997* looks interesting and is only £15.50! Why not come and see us at the Leicester Amateur Radio & Computer Show on October 18 & 19th, we'll be on Stand 3 in the Exhibition Hall - you may even see me!"

73 Michael

Profiled this month are five antenna titles from our comprehensive book list. All these and more will be available for your perusal on Stand 3 in the Exhibition Hall at this year's Leicester Amateur Radio & Computer Show on October 18 & 19th at the Granby Halls, Leicester.



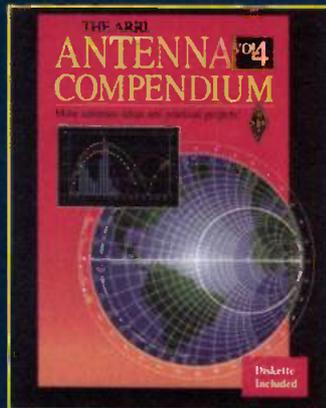
More Out of Thin Air (PWP)

This book comprises a collection of antenna theory, design and construction articles and has been born from the original *Out of Thin Air* which was launched originally as a 'one-shot' booklet way back in 1981. *More Out of Thin Air* contains articles on Antenna Theory and Constructional projects for h.f., v.h.f. and u.h.f. antennas as well as reviews and articles on associated equipment.

Although this publication has been revised and improved upon from the original *Out of Thin Air*, within its 112 pages is still contained some of the old favourites. These include some of the now 'famous' Fred Judd G2BCX antenna designs which undoubtedly compliment the new material.

For those of you thinking that you don't need *More Out of Thin Air* because you have the original, think again! This is one book that no serious antenna enthusiast should be without and after all at only £6.95 you should be able to find it a deserving space on the bookshelf!

The ARRL Antenna Compendium Vol. 4



More antennas - ideas and practical projects is the line written immediately under the title and to be truthful this book is certainly packed full! This, as the title suggests, is the fourth volume in the already popular series and contains 38 previously unpublished articles.

The ARRL Antenna Compendium Vol. 4 covers a wide range of antenna related topics. These cover right through from intensive maths, heavyweight discussions to fun antennas such as a balloon supported Field Day loop.

For the first time in the series *Compendium Vol. 4* comes complete with a free disk. The disk contains source data used to model many of the antennas featured within its 204 pages, as well as the resulting pattern plot files created by the authors.

to model many of the antennas featured within its 204 pages, as well as the resulting pattern plot files created by the authors.

In short, the *ARRL Antenna Compendium Vol.4* is a must for every antenna enthusiast at £14.50 is well worth every penny! If you decide you'd like to complete the set the *ARRL Antenna Compendiums 1, 2 & 3* are also available for £9.50 each.

Joe Carr's Receiving Antenna Handbook

The 'blurb' on the back of this book says it all really "Your receiver is only as good as your antenna!"

Don't be misled by the title of this book, it contains more than just where to hang the end of the long wire. The word receiving is in the title, but the theory

is so well put across that there is something for all of us to learn.

There are 13 chapters that take you through from basics to fairly complex mathematics about antennas. They chapters deal with safety and basics of transmission, real world antennas and the compromises sometimes needed to get them to work and then transmission lines.

Then antennas are dealt with by type groups, quick, dipole and its relatives, longwire and other wire

Profiles

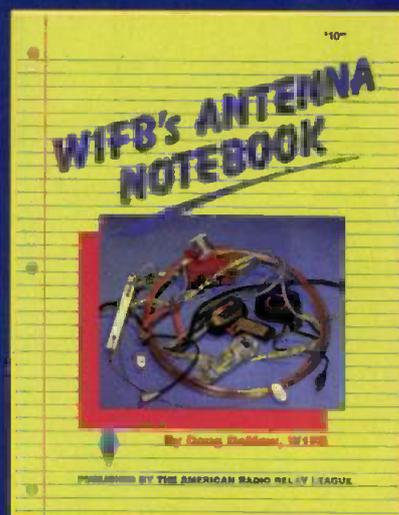
WIFB's Antenna Notebook (ARRL)

Doug DeMaw WIFB, is well known and respected in the amateur radio field. He has been telling amateurs for years how they can improve their stations. And in this notebook he turns his ideas towards the antenna, let's face it whichever rig we believe in, our stations are no good without an antenna!

Printed in the fashion of typewritten notes around good, clear hand drawings, the nine chapters deal with antennas basics, dipoles, single wire antennas, vertical antennas, high performance wire antennas and limited space or 'invisible' antennas. There is one chapter that deals with receiving antennas.

The final chapters deal with matching techniques as with simple antenna measurements. Doug also shows you how to make some of your own antenna test equipment to keep costs down to a minimum.

The apparent simplicity of this book belies the amount of information contained in it. After all notebooks are for capturing the essence of information without necessarily containing all the extra words that make it pretty sounding. In a nutshell a good book at a good price - £7.50.



The ARRL Antenna Book 17th Edition

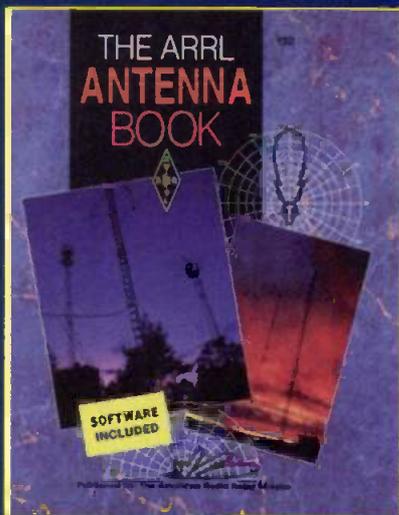
When beginning a hobby, or even when continuing one, the best bit of help anyone can have is the benefit of a good library. However, a good and wide ranging library can cost a great deal on money so which book do you buy?

When cash is in short supply it's a must to get books that contain as much good data as possible, thus achieving 'good-value-for-money'. The ARRL Antenna Book is such a book, it gives good value for money. It may not be as cheap as some, but when it comes to having the information in it, this book is tops.

Twenty eight chapters deal with all aspects of the knowledge of antennas and the various types (multi-band, multi-element, broadband, log periodic Yagis, cubical quads, h.f., v.h.f., u.h.f.) the list goes on for some time. There are chapters also on calculations and testing of antennas, how to feed them from the transmitter and how to support them.

If you use an IBM PC or a 'clone' there's a 3.5in disk full of computer programs that can help with antenna related calculations.

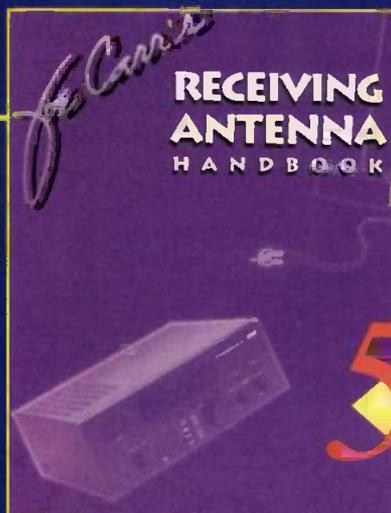
This book really is one you should buy - even if it's the only book. It may prove to be the only one you need to buy. It won't break the bank either at just £21.95 for over 700 pages of information.



antennas. Vertical antennas, directional ones, receiving loop antennas and low frequency antennas are dealt with before a chapter called 'Odds and Ends'.

Odds and Ends deals with pre-amplifiers, active and indoor antennas as well as 'Clandestine, Stealth And Disguised Antennas'. Finally, the last chapter deals with antenna analysers.

All-in-all, a superb book for anyone interested in antennas as many 'transmitting' antennas are described in detail in this 189-page book. At just £17.50 this is affordable too!



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ACCESS

The LEICESTER Editor's Corner



The Editors of both Practical Wireless & Short Wave Magazine will be in attendance on the PW Publishing Stand in the Exhibition Hall at the Leicester Show, so why not stop by and meet the men behind your favourite radio magazines.



Rob Mannion G3XFD, Editor of Practical Wireless invites you to come and have a chat at the Leicester show.

I never cease to be amazed at how quickly the years fly by nowadays! No sooner has one Leicester show disappeared

over the horizon it only seems to be a few months before the next year's is approaching. Perhaps it's me...but life certainly does seem to be speeding by!

However, it doesn't matter that life seems to be speeding up...I've got plenty of time to meet with you and to chat about *PW*, your ideas, suggestions and complaints. So how about spending a little time talking things over with the editorial team at the show? It's our chance to meet you and 'put a face to the name, to those of you who write into or telephone the office.

Personal Correspondence

Personal correspondence is very important to me. I value your letters and often I get behind with my replies mainly because I wish to reply personally.

Because we've got a very small editorial team I've often got to squeeze letter writing between the main job of producing the magazine. But I persevere and (fortunately) readers are very understanding. So, please be patient...you'll get a reply as soon as I can get round to it.

The many E-mail enthusiasts often ask me why I reply (which I do whenever it's possible) via what they call 'snail mail'. Well, in reply I've got to say that although it may seem 'old fashioned' it's because I can sign the letter and make it more personal and not via some telephone line!

But in defence of E-mail I've got to say that computers 'stimulate where others can't reach' by encouraging non-letter writers to write. The urge to sit at that keyboard overpowers the 'I don't want to write a letter' attitude and they spout reams of E-mail.

Don't forget not only can you meet our Editors by visiting Stand 3 in the Exhibitor Hall, but you'll also be able to buy copies of *PW* & *SWM*, take out subscriptions and browse through our comprehensive selection of radio related publications. So, make sure you don't leave the 1996 Leicester Show without having paid a visit to the Practical Wireless & Short Wave Magazine stand.

This means that in addition to all our usual mail, I've got loads of Internet material to read through (to which they all require an 'instant' reply!). But I promise that I do read it all and whenever you need or require a reply...you'll get one!

However, if you want to by-pass the hold-up in the letter writing...come and chat! I'm looking forward to meeting you at our usual stand on Friday and Saturday 18 and 19th of October. See you there!

Rob G3XFD

Dick Ganderton G8VFH, Editor of Short Wave Magazine will be on the stand at this year's Leicester Show and he too invites you to come and have a chat.

Once again time has flown by and it's Leicester again - I'm convinced that time accelerates as I get older!

I always look forward to meeting *Short Wave Magazine* readers face to face at the large number of rallies that I attend each year. For one thing it gives you a chance to let me know what you like, or dislike, about what we are covering in the magazine. I find that I can glean a lot of useful information in a face to face discussion with my readers.

This year **Graham Tanner**, *SWM*'s very popular 'SSB Utility Listening' columnist is joining us on the stand for the entire show. If you have any questions for Graham he will be only too willing to try to help you.

Finally, a visit to our stand will enable you to influence the 'look and feel' of your favourite listening magazine.

Dick G8VFH



SMALL isn't the

The Alinco DJ-S41 430MHz Transceiver

By Ken Smith G3JIX

Ken Smith G3JIX and some of his young radio club friends say that 'small isn't the word' when it comes to describing Alinco's little 430MHz hand-held transceiver.

To judge from all the small v.h.f. and u.h.f. hand-helds that continuously enter the Amateur market, you might expect a saturation level of operation going on in these bands.

We don't notice that this is the case and we're always being exhorted to 'use it or lose it'. The tiny Alinco DJ-S41 'handy' for 430MHz might very well increase the activity on that band, with its economic price tag of £149.

I took out two of the DJ-S41 radios for young Novices to operate. They 'sounded them out' at a Kent village fete.

The rigs provided a great time for the lads running around the field - after they had tried to figure out the operating manual - all written in Japanese!

Though to be fair, the distributors, Waters & Stanton, say an English version will be available soon. (This will be in addition to the few notes in our language that came with the rigs).

Many Functions

There are only a few buttons...but many functions on the DJ-S41! And to start, briefly pressing the two tuning control buttons **Up** and **Down** on the left front side, steps through the channels.

The buttons are different sizes, which makes for convenience. It's especially useful while operating in the dark, or for partially sighted operators.

Holding down one of the buttons for a second or two starts the scan function. All channels on receive from 415 to 470MHz are scanned.

The transceiver holds a busy channel for about five seconds. You hear a 'tinkle' as each 10MHz point passes and a 'beep' at each 5MHz.

You can turn off the 'beeps' if required, by pressing the **Monitor** button while turning on the power switch. If you try to transmit

WORD

on a channel outside the legal band, 'OFF' appears on the dial display and no damage is done.

If you operate the **Monitor** button while pressing 'F', then all the keys are locked. This is so that no accidental pressing of buttons will change anything.

You can set the channel step size by pressing 'F' together with **Up**. Then selecting the frequency required with further presses of the **Up** or **Down** controls.

A touch on the push-to-talk (p.t.t.) control resets the frequency read-out. (Channel spacing in the UK is currently 25kHz but 12.5kHz may become the norm. These frequencies and a number of others are easily set on this rig).

Repeater Shift

Operators can easily set-up the repeater shift (+1.6MHz in the UK), by pressing 'F' and the **RPT/Shift** button on the right hand side. The **Up** and **Down** buttons then enable selection of the shift frequency.

Pressing **RPT/Shift** again toggles through +, - or 'No Shift' sequentially. A brief touch on p.t.t. returns the transceiver to normal read-out again.

A brief press of **RPT/Shift** while transmitting, toggles between low power (50mW) and normal power (340mW).

One omission on the transceiver was soon felt, and that was the lack of a tone burst at 1750Hz to open repeaters. However, the lads operating at the village fete soon found that **GB3EK** about 20km away could be 'whistled up' easily.

(I understand that a modification may be forthcoming from the

makers to enable 1750Hz tones to be sent). The 'tinkle' sound sent or heard when you press the **Up** or **Down** button while transmitting would be ideal if it was replaced by the repeater tone.

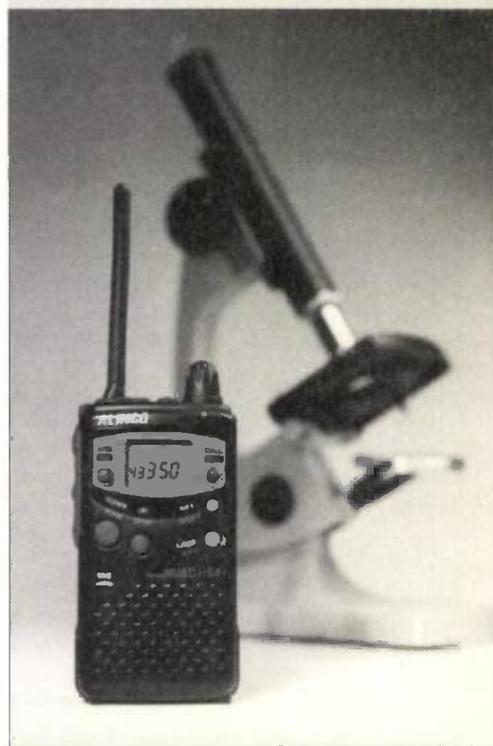
On the other hand, CTCSS tones are built into this tiny transceiver. For example, **GB3EK** on 434.05MHz opens when the 103.5Hz tone is sent.

To use CTCSS, the operator sets the tone by pressing the 'F' button, then while holding it, pressing the **Down** button. The CTCSS tone frequency can then be selected by operating the **Up** and **Down** buttons, and as before, briefly pressing the p.t.t. switch resets the normal frequency read-out.

Memory & Miscellaneous

Let's now look at the memory and miscellaneous buttons. These include another button on the right hand side which operates the dial lamp (use sparingly!) for visibility at night.

The same button operated with 'F' activates the auto power-off function. (The operator can also set



ALINCO DJ-S41 430MHz TRANSCEIVER

Continued from page 53

Top end view of the DJ-S41 (see text for details on control and antenna comments). Whilst the small size of the Alinco DJ-S41 is clearly demonstrated by comparing the 'AA' batteries fitted in the unit.



Novices in action! Richard 2E1DKM and Alan 2E1ELB try opening the rather distant 430MHz local repeater with the DJ-S41s. They both succeeded and had a QSO through it (see text).

the auto power off time to 30, 60 or 120 minutes with the Up/Down buttons.

Also incorporated in the DJ-S41 are 20 memories. These are labelled 0 to 19, plus a call ('C') channel. These can be set up to contain all the information on well-used channel frequencies, plus any repeater shift and CTCSS tone that may be relevant.

A mere flick of the V/M/MW button on the left of the dial places the rig into memory mode. The Up/Down buttons then step through conveniently to the number of the memory required and away you go!

The 'c' (Call) memory is instantly accessed by a call button on the right of the dial. Your most used channel (local repeater?) is very conveniently stored in this one. The same button used in conjunction with 'F' toggles an alarm bell to alert you when a station appears on that receive channel.



Receiver Sensitive

The receiver appears to be very sensitive. Solid simplex signals were maintained from hill-top to hill-top (line of sight) up to 19km away, by G7JRZ and myself simply hand-holding a pair of DJ-S41s.

The fixed, but foldable antenna, appears at first sight to be a very compact and neat arrangement. However, I ended up regretting the inaccessibility to the r.f. output.

Novices especially have a great deal of fun building and operating simple home base antennas which teaches them a lot.

Although I tried coupling the feeder to the base station collinear antenna by winding a layer of wire around the DJ-S41's rod antenna, I don't think much coupling took place, although the signal did get out with a little more range.

Power Output

Power output levels are such that you'll obtain 340mW with 4.5V d.c. (i.e. three type AA cells in the cradle). If you use rechargeable NiCads, the power will drop to 300mW.

By applying an external d.c. supply at 5.5V maximum to the top mounted socket, the power output will be at the full 420mW capability of the DJ-S41.

I wondered about the uses and the market to which the makers had aimed this rig. Naturally, the Novice market is an obvious one, but I think the

limited experimental possibilities as mentioned above, restricts the possibilities there a little.

The price is perhaps a little high for the average younger Novice licensee (we desperately need a really low cost 430MHz radio for these youngsters).

On the other hand, £149 appears very reasonable, especially when you consider the high quality and fine surface mount construction, together with the many functions of this little transceiver.

The DJ-S41 would seem to be ideal as a second portable radio for point-to-point operation at say, mobile rallies, etc. The tiny lightweight construction, with the convenient power supply, requiring only three dry cells to put it into action, seems to beg slipping it into your shirt pocket, so that you hardly know it's there.

Options & Accessories

Finally, you'll find options and accessories available from the distributors. These include speaker microphones, headsets, soft case, NiCad battery packs and chargers.

The availability of speaker and microphone jacks on the top means that Packet operation is possible with appropriate leads.

One surprising little function with the microphone sockets is 'clone' operation. This feature means that if one DJ-S41 (the 'master') has been fully programmed, then switching a 'slave' radio to 'clone' after connecting their microphone sockets together will instantly enable the 'slave' to take up all the programming of the 'master'.

My thanks for the loan of the two review transceivers go to Waters & Stanton Electronics of 22 Main Road, Hockley, Essex SS5 4QS, Tel: (01702) 206835, FAX: (01702) 205843 who can supply the DJ-S41 for £149.

PW

Manufacturer's Specifications

General	
Frequency Range	430-439.995MHz
Modulation	F3E (f.m.)
Power source	3.6-4.5V internal batteries 5.5V (external regulated source)
Current drain	TX 280mA (@5.5V d.c.) TX 260mA (@4.5V d.c.) RX 33mA (approx) Squelched
Dimensions	55(W) x 100(H) x 28(D)mm without projections
Weight	185g (Approx) with three AA drycells
Transmitter	
Output Power	420mW (approx) (@5.5V d.c.) 340mW (approx) (@4.5V d.c.) Variable reactance ± 5kHz (maximum)
Modulator	
Deviation	
Receiver	
Configuration	Double conversion superheterodyne
IF frequencies	1st 23.05MHz 2nd 450kHz better than -15dBμ (12dB SINAD) >100mW (@8Ω and 10% distortion)
Sensitivity	
Audio output	
Typical battery life	
Power set high (300mW)	14h (NiCad) 40h (AA Alkaline drycells)
Power set low (50mW)	22h (NiCad) 60h (AA Alkaline drycells)
Available Accessories	
EBP-25N	3.6V 700mAh NiCad pack
EDC-73	NiCad battery charger (220V a.c.)
ECD-72	NiCad battery charger (117V a.c.)
EME-12	Earpad type earphone
EMS-9	Speaker microphone
EME-4	Earphone microphone
ESC-27	Soft carry case
EDH-18	Vehicle adapter with 5.5V regulator
EBC-6	Mobile bracket

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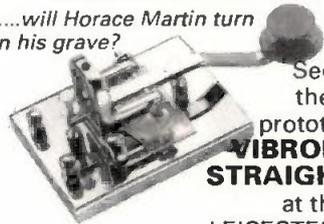
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TR-9130.....	£325
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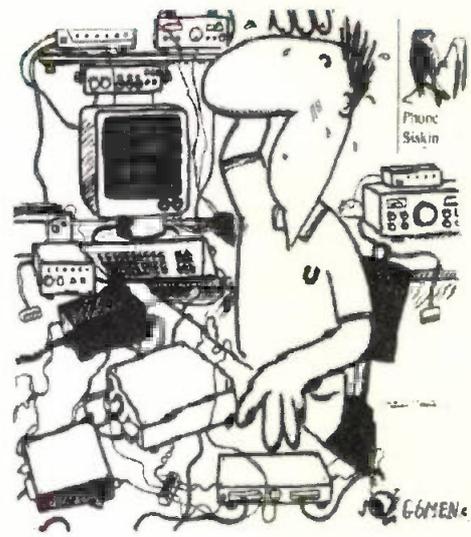
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WRYT & TUNE

A Variometer Tuner

By Anthony Langton GM4HTU

The '19 Set' had a variometer antenna tuner and Anthony Langton GM4HTU has found it still can outperform other a.t.u.s in some circumstances.

Fig. 3: Rotor winding completed, ready for mounting in the stator unit.

I have a local Net that meets on 3.5MHz, but the antenna tuner I had only worked effectively on 7MHz and above. So, I decided it was time I joined in, instead of just listening and rather than alter something which worked well I opted to build a separate tuner for this one band.

My first step was to find out what was needed to tune the antenna system onto 3.5MHz. I measured the impedance of my doublet antenna system on the 3.5MHz band. I found it to be equivalent to 3kΩ in parallel with 100pF at 3.5MHz and 1kΩ in parallel with 135pF at 3.8MHz.

As a typical balanced feeder tuner, the circuit was the traditional one for balanced feeders (see Fig. 1). Inductor L1 and C1 form a variable coupling circuit to provide a 50Ω load for the transmitter. L2 and C2a/b resonate the system to the required frequency.

Using a 50+50pF unit as C2a/b, I wound L2 accordingly. The design worked well when using a low power test oscillator, but a few calculations, taking the high impedance involved into account, hinted that I might have trouble when using higher power.

With an r.f. output of 100W, the voltage across a 50Ω load will be about 70V r.m.s. When the 50Ω load is transformed up to 3kΩ the voltage needed to produce the same power, rises to about 550V r.m.s.

I was using a receiving grade variable capacitor for C2a/b so, I worked out that the voltage generated might be too much. As you can imagine, the shower of blue sparks appearing across the capacitor plates as I keyed the transmitter was not unexpected!

The obvious solution was to use a

capacitor with a higher voltage rating, but this is neither cheap or easy. Transmitting grade variable capacitors are available from a few specialist manufacturers, but they are expensive. Also when you look at the manufacturing work involved, you can see why. I toyed with idea of building my own unit, but when I worked out what was needed, I abandoned the scheme.

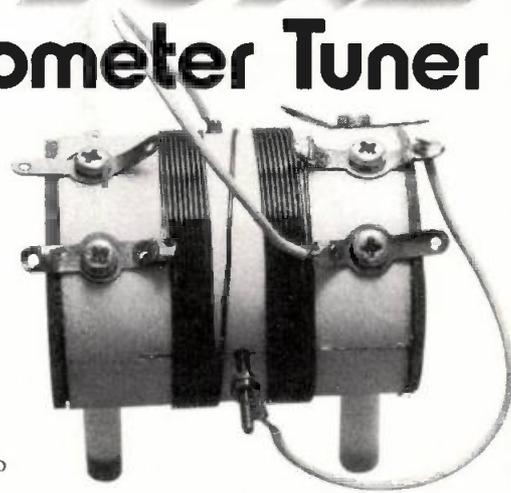
An alternative was then considered, leave out the capacitor. If it's not there, it cannot fail and there is already about 100pF present in the system in distributed form. Whilst a high voltage coil is easy to build, this one had to be variable.

A roller coaster would have been too expensive or very difficult to build. Ferrite cores were out because of saturation problems. A stack of iron dust toroids was considered as the most likely solution. Then I remembered the variometer, which of course has no core to saturate and no sliding contacts.

Old Idea

The variometer is an old idea, from the earliest days of wireless when variable capacitors were not readily available. The unit comprises one fixed coil that is the primary (L1), and a variable coil (L2). The secondary coil L2 is a large diameter unit with a smaller, variometer, coil (rotatable) inside the larger.

In effect the variometer is a variable coupling/ratio transformer. (Refer to the drawing of Fig. 2, where the basic diagram is shown). The turns ratio of L1 to L2 is actually physically fixed. But L2 consists of two separate windings that effectively can vary in a stepless way the apparent number of turns of L2.



The overall action of a variable L2 has the effect of altering the step-up ratio of the L1/L2 transformer action as well as its residual inductance. The textbooks tell us that the total inductance of the system is :

$$LT = (La + Lb) \pm 2M$$

where LT is the total inductance formed from individual inductors La and Lb.

The coupling factor M is the mutual inductance between the two coils and may increase or decrease the overall inductance dependent on the coupling. The value of M (absolute value and whether it positive or negative) depends on whether the rotating coil is aiding or opposing the coupling.

Mutual inductance isn't something that I'm very familiar with. So, to get an idea of the values which could be obtained, I built a system using a sliding inner coil in place of the seemingly more complex rotating one. I used an inner core which was a close fit inside the fixed one, reasoning that close coupling would give a higher mutual inductance.

I used Nylon screws to ensure concentricity and a smooth sliding bearing. Because the inner coil could not be rotated, the full effect was not available. But in spite of that limitation I obtained an inductance range of 3 to 1 which proved more than I needed.

My initial intention was to position the inner coil with a nylon cord, in the

Fig. 1: A 'traditional' balanced output a.t.u. using a twin stator capacitor unit that causes arc-over at 100W output.

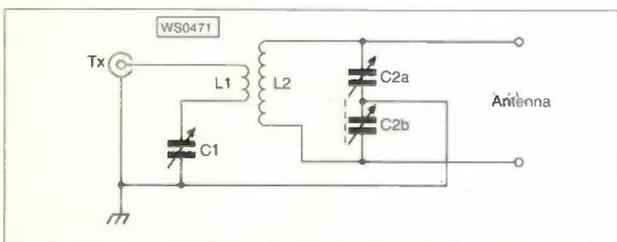




Fig. 4: Looking into the variometer unit. The rotor coil is at right angles (nil coupling) to the stator.

manner of an old wireless dial. However, routing of the cord around the chassis became so involved it would have challenged Ariadne!

I ran out of both pulleys and patience before I decided to try the rotating system. Now that I had a better idea of what mutual inductance was, and what variations could be obtained. I ended up with the following system I'm going to describe.

My System

My system consists of the following items: The outer fixed coil former is a 55mm length of 38mm (internal diameter) pvc pipe. The inner (or rotor) former is made from a 20mm length of cardboard tube, which has an outside diameter of 30mm.

Two thin screws (M2.5 or 8BA) are mounted opposite each other, on the diameter, in the centre of the cardboard tube. Then they act as both

supporting shaft and connections from the winding.

The outer (or stator) coil former was drilled on the diameter, in the centre, as the cardboard tube.

But to facilitate assembly the former was sawn through axially on the diameter for two thirds of its length.

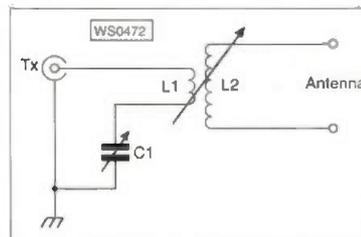
Wound First

The inner coil part of L2 is wound first and consists of 11 turns (5+5 +1), wound in two sections of five with the middle turn stretched to clear the mounting screws. The ends of the windings are taken and soldered to the heads of the mounting screws (inside the tube). The photograph Fig. 3 shows this step.

When you have finished the inner coil assembly it has to be mounted inside the outer. The two halves of the outer former should be held apart while the inner assembly is dropped in as far as the bearing holes.

Wooden endcaps are then fixed in the ends of the outer former to keep it circular and the sprung halves are held together by the windings of the stator. The stator winding part of L2 consists of two groups of nine turns of 0.7mm wire (one group each side of the centre line). The connecting turn is wound in a stretched format as with the inner coil.

One end of the inner winding is connected to one end of the outer winding to complete the connection. The primary winding L1 is also wound in 'split turns' method with



two plus two plus one stretched winding over the stator part of L2.

The photographs, Fig. 4 and 5, show the completed L2 coil before winding on the primary (L1) coil. Not shown on either photograph is a nylon rod, which is screwed onto one of the rotor coil screws to provide an insulated coupling to the operating dial.

Remember, there's about 500V 'floating about' here! Nylon stand-off pillars keep the whole thing away from the chassis.

The coupling coil was wound with pvc insulated wire, again symmetrically either side of the shaft. The primary capacitor/coil combination C1/L1 is in the low impedance part of the circuit so voltage breakdown is now no longer a problem.

Tuning Sharp

The antenna system is still a high impedance affair, so the tuning is quite sharp. But I've found that the variometer proved a useful technique to get round the variable capacitor breakover problem.

On the plus side of course its low cost and surprising ease of construction will, I hope, encourage other experimenters to find uses for this idea from the earliest days of radio.

So get varying. It works well!

PW

Some Short Notes

At 3.5MHz, my antenna system is equivalent to 3kΩ in parallel with 100pF. From the formula:

Using $f = 1/2\pi\sqrt{LC}$ some 21μH will be required to bring the system to resonance at 3.5MHz.

At 3.8MHz, the antenna is equivalent to 1kΩ in parallel with 135pF, so at 3.8MHz only 13μH will be required for resonance.

The inductance has to be capable of at least a 13 to 21μH swing.

I found that the individual coils have the following values:

Rotor inductance = 4μH

Stator inductance = 15μH

Complete variometer unit

Minimum inductance = 11.5μH

Maximum inductance = 28.0μH

From $LT = (La + Lb) \pm 2M$

M must be approximately 4.5μH

Rotor: 5+5+1 turns of 0.7mm wire on a 30-mm diameter former

Stator: 9+9+1 turns of 0.7mm wire on a 42mm diameter former

Coupling: 2+2+1 turns of 1mm (pvc covered) wire wound over stator

For a (primary) 50Ω load, V = 71V.

For a (secondary) 3kΩ load, V = 548V.

Fig. 2: The much simpler variometer a.t.u. Secondary winding L2 is a double inductor unit with variable coupling.

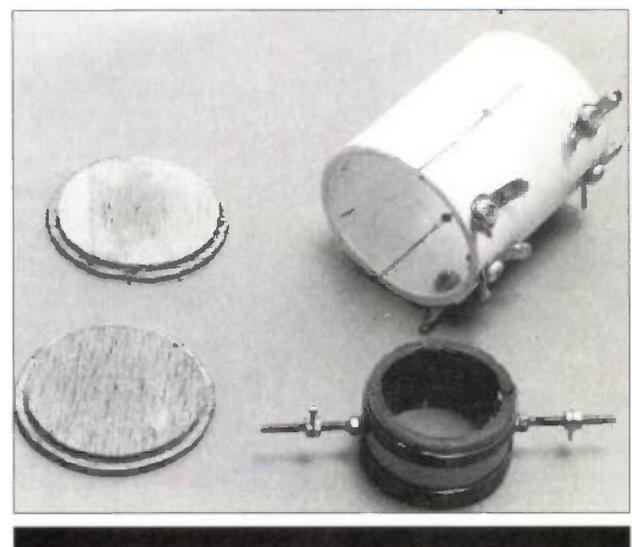


Fig. 5: Showing the split winding of the stator with endcaps in place. The primary winding, L1, has still to be wound over the top

John Heys G3BDQ describes his new three-band compact indoor transmitting antenna based on a π -match system.

Antenn

I often receive letters from amateurs who are frustrated in their efforts to put up outside antennas for h.f. work. Many seem to live in flats, or have restrictions (official or XYL generated) on outside poles and wires. Some don't even have the benefit of a roof space.

Commercially made loop antennas are not cheap (when available). Their design usually incorporates a single turn of thick copper pipe tuned by a motor-driven very high voltage working variable capacitor.

Single turn loops usually have a (very) limited bandwidth. They require re-tuning, even when changing frequency by just a few kHz on the working band.

Considerable thought and a few hours construction work has resulted in this design for a small loop (or frame) antenna which will operate on the 7, 10 and 14MHz bands. The antenna shows no directional properties on sky-wave transmission or reception, has adequate bandwidth (all the c.w. section of the 7MHz band) and uses cheap easily available parts.

Although just a small diamond shaped construction, the antenna has let me work into all parts of Europe on both c.w. and s.s.b. on its three operative bands. Reports I've received have been between S5 and S9+ in the 14 countries that were worked in just a few hours.

During the period reported the antenna stood on a large cardboard box on the upstairs landing outside my shack. I was also using transmitter powers between 50 and 90W. To date I have been unable to locate a description of a similar antenna in my extensive library of antenna books.

Design & Construction

The 'Pile-Oop' antenna is based upon the well known 'Pi-section' or 'Collins Antenna Coupler'. When used as an a.t.u. the coil will radiate very little and if no external antenna is connected, the r.f. voltages across the tuning capacitors will be very high.

The voltages reduce greatly when an antenna is connected. Fig. 1 shows the circuit for my antenna. An external antenna is not needed as the coil L1 consists of about 3.1m of wire wound into two turns, which has the characteristics of a very short in length but large diameter inductor.

The large-diameter inductor 'leaks' r.f. and so, there will be radiation from the coil. The radiation (loss) of power from the circuit has the side-effect of reducing the r.f. voltages present. The reduction of r.f. voltages means that the main tuning capacitor C1 can be an airspaced receiver type, as it doesn't need wide plate spacing.

Capacitor C2 matches the antenna into a 50 Ω coaxial cable feeder and the r.f. voltages across it will be small so, this too

on the inside of the surface of the board.

One form of balun may be made by coiling up the coax for about 20 turns

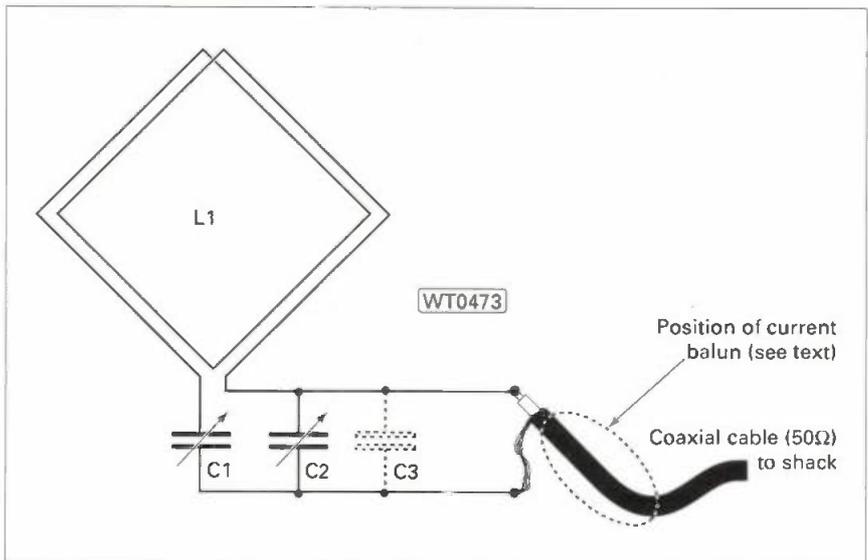


Fig. 1: The circuit of the 'Pile-Oop' antenna. Capacitor C2 is a 150pF variable, and C3 is a 500 + 500pF variable type. For details of C3 and the balun, see text.

may be an airspaced receiver type. The details all mirror the normal 'Pi' antenna coupler.

On the 7MHz band some extra capacitance is provided by C3, a 1000pF mica capacitor. This may be 'croc-clipped' into circuit when needed or, it may instead be replaced by a dual section version of C2. This can be adjusted to minimum capacity for 10 and 14MHz operation.

In my prototype antenna, C1 is a 150pF variable which was originally a part of an 1154 aircraft transmitter. I obtained it from Birketts of Lincoln. The output capacitor C2 is a 500 + 500pF unit salvaged from an old valved broadcast band receiver. (Similar variable capacitors are also available from John Birkett in Lincoln although many amateurs have one or two in their 'junk box').

The Current Balun

The key to the 'Pile-Oop' antenna is the current balun which is positioned between C2 and the coaxial feeder, which leads to the equipment. Without this balun the antenna will not tune up properly or work as intended. I know this from experience!

There are several designs for current baluns, which by the way, behave as r.f. chokes to prevent the return of r.f. currents on the outer surface of the coaxial cable braid. They only allow r.f. currents to flow

(120mm diameter) which are held in place with electrical tape. A balun like this will use up a lot of coaxial cable (around seven and a half metres of it).

Another variety of current balun which I've tried successfully however, uses eight split ferrite beads. They beads I used were type No. SFB1 (available from Ferromagnetics of Mold, Clwyd) which will fit nicely over UR58c/u coaxial cable.

I finally chose a balun type that used four ferrite rings of 'Fair-Rite' type 43 material in a stack. The stack was fixed together with a Cyano-acrylate ('super') glue. Through this stack I wound seven turns of the UR58 coaxial cable, which were held in close to the rings with 200mm (8in) nylon cable ties.

The rings, which are intended for reduction of EMC radiation from cables. I got mine from the RSGB at a very competitive price, but I've also seen them at rallies as well. The rings are very good and can handle 100W into the antenna without heating up.

Coil Made

The coil L1 is made of two turns of 1.5mm (16s.w.g.) bare copper wire spaced at 40mm on the frame. Plastic end-pieces keep the wires away from the wooden cross members.

The four pieces of plastic used for the end-pieces were sections of round insulating

a Workshop

material from the inside of UR67 coaxial cable. All the details of the construction are given in Fig. 2.

I found that the coil L1 has an inductance of some 5.75 μ H (as measured on an Autek r.f. analyser). This will tune the three bands when using C1.

I used wood in the construction for simplicity and I wouldn't advise using any metal panels or chassis. (That is except for the short length used to connect the frames of C1 and C2 together). The inclusion of other metal parts within the frame could create tuning problems.

I've found that there is some hand-capacity effect when tuning C1 and C2. So, to minimise this change in tuning (as the hand is brought nearer these components) it's best to have insulated extension spindles for the tuning knobs. I've found that an extension of 80-90mm will suffice.

Testing Stage

During the testing stage an s.w.r. meter must be connected between the transmitter and the current balun. The transceiver should be tuned to the c.w. mid-band point of 7.020MHz, and the power turned down to 10W. Place the antenna on a card or plastic box away from large metal objects, but within reach for tuning.

Next set C2 to maximum capacity and slowly tune C1 until the lowest s.w.r. is obtained. At this point C1 will be set to approximately 120pF. It is unlikely that an s.w.r. of unity (1:1) will be obtained at this stage, so connect the extra capacitor, C3.

By readjusting C2 and C1, one combination should enable you to find an s.w.r. reading of 1:1. Swing tune the transceiver by ± 15 kHz and take notes of the s.w.r. (but without adjusting the antenna controls).

The s.w.r. will change as you swing through the centre frequency. But it shouldn't rise by much, going up say 1:1.5 or less. Now retune back to 7.020MHz and slowly increase the transmitter power. Tiny adjustments of C1 may be needed to keep the s.w.r. to a minimum.

The tuning technique I've suggested can now be repeated on the 10 and 14MHz bands with C3 removed from circuit. A neon bulb will strike easily all around the loop when the power level is 50W or more.

There should be no striking of the neon along the coaxial cable away from the balun. Touching the coaxial cable between the transmitter and the balun should have no effect upon the loop tuning. If the tuning is disturbed it indicates that the current balun is not effective enough. Then some of the

coaxial cable can be coiled for several more turns below the balun.

Amazed At Results

I was amazed at the results and the ease with which I made contacts when using the 'Pile-Oop' antenna. I seldom called CQ (which I normally avoid anyway) but instead listened for strong CQs from others or waited the end of QSOs before jumping in with my callsign.

Don't mention your antenna or power until a report has been received. Experience has taught me that incoming reports are often 'tailored' to fit one's working conditions.

My log shows many daytime (usually morning) QSOs on 7MHz with stations more than 500km away. German stations seem to favour 7MHz c.w. With the result

there are many to work. The antenna may be positioned away from the shack if, after setting up for minimum s.w.r., it is moved with care.

Standing the antenna on a chair or box near a large window is idea. Amazingly, the antenna still works well 'through the house' towards stations away and some way from the nearest window.

During daylight hours I found that I could achieve from six to ten QSOs per hour on 14MHz. I must admit I did not try too hard for any 'real' DX.

Perhaps someone else who tries out a copy of the 'Pile-Oop' will have the thrill of making inter-continental contacts with it. I would like to hear about any such success. My 'Pile-Oop' is 'nosey-neighbour' proof and doesn't provoke any TVI. My local radio friends are now urging me to go ahead and produce a 'Top Band' version. PW

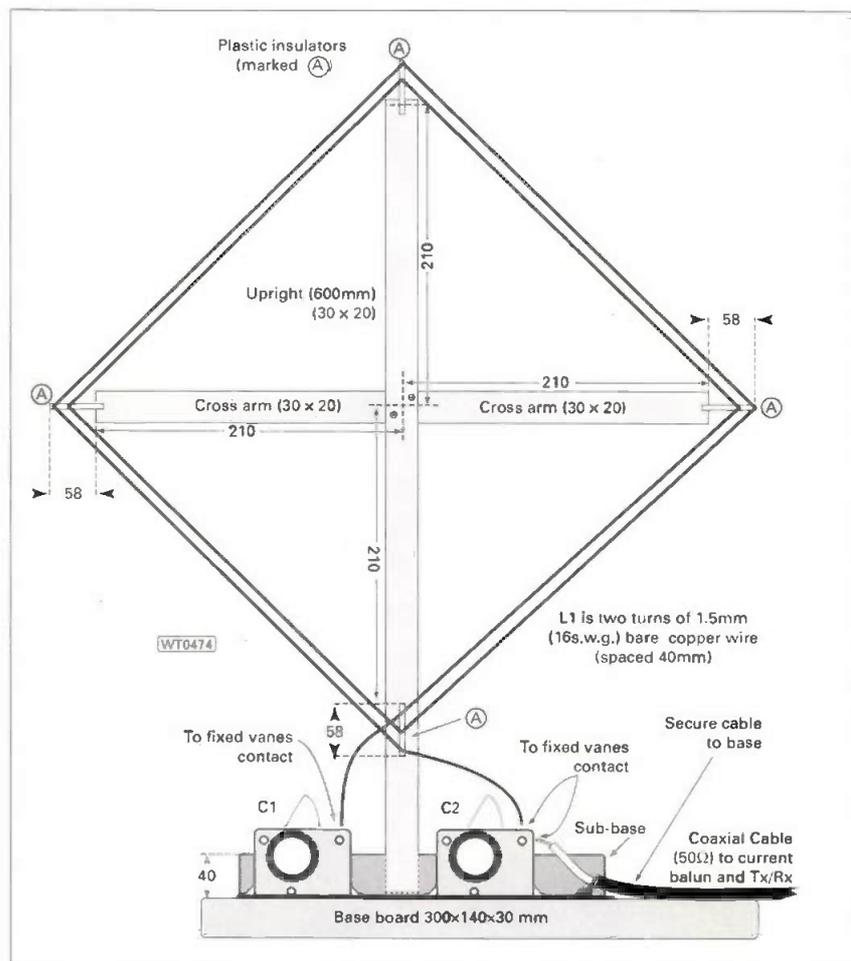
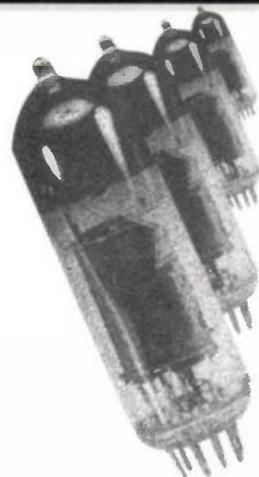


Fig. 2: Looking 'front-on' to the antenna with all the needed dimensions indicated (measured in millimetres).

Valve & Vintage



By Ben Nock G4BXD

THIS MONTH IT'S BEN NOCK G4BXD'S TURN TO 'LOOK AFTER' THE PW VINTAGE 'WIRELESS SHOP'...AND AS USUAL THERE'S A DISTINCT 'MILITARY' FLAVOUR AS BEN COVERS HIS FAVOURITE SPECIALITY.

Fig. 1: Dr. Peter Walker G4PLW's QL radio truck. It's a very impressive piece of hardware, and once the radios are in. An Aladdin's cave for enthusiasts! (see text).



It's my turn to submit a few ramblings in this section of the magazine again. So, to use a 'vintage' expression... 'off we jolly well go'! And I'll start by mentioning the May Vintage show at the National Exhibition Centre in Birmingham.

The NEC event turned out to be an interesting meeting. Many old friends were seen and some new contacts made. One interesting meeting I had was with Dr. Peter Walker G4PLW.

Peter is busy restoring a Bedford QL radio truck, Fig. 1. He wants to use it after his retirement as a mobile museum and educational facility. Peter has a scientific background in addition to his work as a General Practitioner and wants to use the vehicle and the space it provides to visit schools and the like, showing the radio history and providing scientific experiments to young and, presumably, old alike.

COMPLETE PROJECT

To complete the project, Peter is looking for a few items. These include large reels of D8, a 19 set high power AT1, a 10 line terminal board. Also required are the high power aerial insulators used in the roof and, if at all possible, a 53 set complete! (Make it two, as I want one!).

So, if anyone can offer help in this worthwhile project, please contact Peter G4PLW direct on (01438) 871350. I'm sure he'd be delighted to hear from you.

'PROFESSOR' UNWIN

Do you remember 'Professor' Stanley 'Jollyfo Jollyfo' Unwin from BBC TV years ago? Well, I had the pleasure of meeting Stanley at the BATC rally in April last.

It turns out that the 'Professor' was in the RAF and worked on sets like the 1082/83 during the war. That explains a lot as to the way he ended up talking 'Professor Unwinness' on BBC TV! My best regards to you Sir!

THE HELLSCHREIBER

The Hellschreiber shown in the photograph, Fig. 2, was a German method of sending text. In effect it's slightly similar to RTTY, but more closely resembling FAX transmissions.

The Hellschreiber system was (and still is) less prone to interference than RTTY. The image to be transmitted is first scanned and the received printout (or today's v.d.u. screen image) is easily deciphered using the wonderful powers of the human brain and eye.

Even a noisy Hellschreiber image can easily be recognised by eye on the printout. Whereas in RTTY, the interference would cause the system to miss one or more letters.

Timo and others run a 'Hell' Net on Wednesdays, 1100UTC on 14.116MHz l.s.b. (The Hamcom interface can be used with a program by LAOBX which mimics the operation of the Hellschreiber exactly).

BUYING MILITARY GEAR

I often get asked just where you can start buying old military gear. However, in answer to the question the many ex-government equipment shops that once abounded with such stuff are long gone (unfortunately). So today, you'll have to seek it elsewhere.

Rallies of course are one option, as are the occasional auctions of such gear that take place now and then. But there are a couple of inherent problems with these particular routes.

Firstly there are the 'of course it's working fine' brigade. This problem

includes those rally stallholders who swear on the sacred god Voltan that the bit of rubbish you're buying works! All too often we end up disappointed, but by that time it's too late to take it back.

Then there are the auctions. Again you might have to chance the reliability and honesty of the seller's descriptive licence. You can have the added frustration, as happened to me recently, of having items you bid and paid for, stolen from under your nose, and the nose of any security provided.

It's difficult these days to recommend any one source of equipment. But if you have good service from one trader then it may pay to keep in with them.

If you're unable, or unwilling, to fix any faulty sets then the answer is to always try them out before paying. However, it's something not always easy to do at rallies in the open I guess!



Fig. 2: The German Hellschreiber machine, showing the keyboard. The motor on the left forms part of the image scanning system.

In any event, I hope you find what you're looking for. Good hunting and see you next time. Cheerio for now, and don't forget that I can be contacted via the PW offices, or at: **The 'Radio Room', 62 Cobden Street, Kidderminster, Worcestershire DY11 6RP.** (Please enclose a stamped self-addressed envelope if you need a reply).

OLD SETS

As a collector of old sets, I think it's always useful to learn where and when they were used. We all know of the more famous sets and the part they played in the Second World War. But few people know just how long some of the sets were used by the services and where they were employed.

A book entitled *The Vital Link* by Philip Warner details the history of the Royal Signals between 1945 and

1985 and makes very interesting reading. The book provides various references to the different sets and the locations where they were used. (I've listed some of those mentioned in Table 1).

The list is by no means exhaustive, but it does show that the old 62 set was still in 'mainline' use as late as 1957 if not later. It probably served in a training role for much longer.



Fig. 3: The Victory Museum, near the Belgian/Luxembourg border, with a Douglas Dakota aircraft in the background.



Fig. 4: The VRKS v.h.f. manpack set, with a few self-defence items (see text).



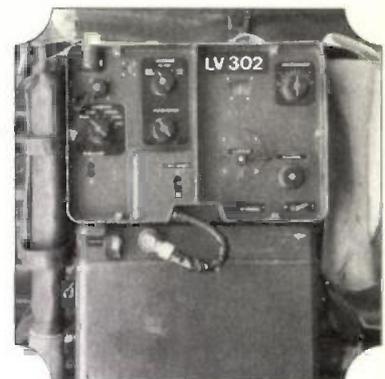
Fig. 5: The VRHAG collection of clandestine transceivers, used by Finnish guerrillas (see text).

Book reference:
The Vital Link, The Royal Signals 1945-85
by Philip Warner.

Table 1

1949 Suez	No. 19, 10, sets
1950 Korea	No. 53, 19, 62, 18, 31, 88
1953 Kenya	No. 53, 19, 22, 62, 31, 88, 46, A510
1954 Malaya	No. 53 sets
1955 Cyprus	AN/TRC3 & 4 sets
1955 Yemen	No. 19 plus high power unit, 53 set
1956 Egypt	SWB8 TX, AR88 RX, 62 sets, BE201
No.	B44, No. 19, 62 1962
1957 Cyprus	Larkspur program started
1962 Brunei	C11, R210, C42, A13
1963 Borneo	D11, R230, D13
1963 Aden	C11, C13
1967 Aden	C42 No3 (full crypto protection to voice)
1972 Northern Ireland.	C42, A40, 31, A41, C11, B70
1980 New Hebrides	D13, VRC321
1980 Rhodesia	Clansman sets, first operational use, VRC321
1982 Falklands	Clansman sets, SatCom links
Heliograph finally declared obsolete	

Fig. 6: The Finnish Army LV-302 v.h.f. 'manpack' equipment. Pouches at the sides hold the aerials, microphone and extension cables for repeater working. (This example is from the G4BXD collection).



AROUND EUROPE

Do you need somewhere to visit whilst travelling around Europe? If you do, how about the Victory Memorial Museum, situated on the E25/E411 from Brussels to Luxembourg, just before the border crossing, see Fig.3.

The publicity 'blurb' on the museum states that it's "the most important Second World War military museum in the world". (Their words not mine!). But it is worth a visit if you're close. Don't

forget to tell them Ben sent you.

And as we're on 'mainland' Europe, so to radios in the north. This is because I've heard from Timo Ekko in Finland, who sent me a number of very interesting photographs.

Firstly, there's the VRKS, a Second World War 'manpack' of German origin (used, according to Timo) by the Finnish forces around 1942 to 1944. Covering 33.8 to 38MHz, this all valve set gives an output of 500mW. Fig. 4.

The valves are 2V directly

heated types with an h.t. of 120V, obtained from battery supplies.

The receiver is a superhet and the transmitter is a two stage design. Timo says that the construction is very robust, similar to the FUG10 series of sets.

Next we have the VRHAG M4/7. A collection of miniature sets used for clandestine operations in Finland, and apparently designed by Ham Holger OH2NX, who is still with us.

The sets operate on about 3.5 to

4.5MHz, regenerative receiver, the transmitter running about 600mW, (c.w. only) to a V dipole. The sets weigh about 1.6kg with the accessories weighing about 5.6kg.

Then there's the LV-302, Fig. 5 and 6, a Finnish Brigade v.h.f. manpack. This unit works between 47 and 57MHz, runs off a 7.2V battery in the base and has 101 channels. Two of these sets can be linked together over 80 yards to form a repeater system.

Cheerio from Ben, see you in February.

VHF REPORT

This month David Butler G4ASR continues his review of this summer's Sporadic-E season paying particular attention to propagation on the 50 and 144MHz bands.

In the last three months I've given details of Sporadic-E (Sp-E) activity that affected the v.h.f. bands from April through to July. Although many operators have commented on the lack of Sp-E particularly on the 144MHz band there was still some life left in the 50MHz band.

Daily openings were recorded during much of August and although the intensity of them was very much reduced there were still a number of surprises to be found on this 'magic' band. According to my DX Cluster records there were 35 European countries worked from the UK during August and that doesn't include the seven standard UK prefixes.

Even among the 'mundane' European countries there was still DX to be found. On August 11, for example, the stations of JX7DFA, OX3LX and TF3T were all worked from the UK.

Incidentally, OX3LX (Greenland HP15) also had openings into the UK on August 6 and 10. On August 6 he worked a number of OH and LA stations and heard beacons in VE8, LA7, OH1 and OH9.

The Greenland station was also heard in the UK at 2016UTC, by G1SWH (IO83). On August 10, between 1830-1945UTC he was spotted operating on 50.110MHz by G4HBA (IO80) and GW0PLP (IO72). Bob Taylor G1WEX (IO82)

Interesting Waining

Comments that his interest in the 50MHz band had been waining somewhat due to lack of activity. However, he recently managed to catch a few European Sp-E openings contacting stations in EH, ES, I, LA, SM and YL. Bob runs just 10W into a 3-element Yagi.

Ken Osborne G4IGO (IO80) reports that the maximum usable frequency (m.u.f.) rose to 80MHz on August 10 and on the following day briefly peaked to 144MHz. For long periods on August 11 the f.m. broadcast band 88-108MHz was wide open to LA and SM.

Around midday on the 50MHz band Ken noted a great deal of short skip propagation to DL, ON, OZ and PA. Stations in over 60 locator

squares were heard at this time.

Over 30 countries were heard by Ken during the day, the best being JX7DFA, OX3LX and TF3T. He mentions that it was interesting to watch Icelandic television at 65MHz in full colour for over two hours during the afternoon event.

Regarding television carriers, Ken notes that he often receives signals on 48.24, 48.25, 48.26, 49.74, 49.75 and 49.76MHz from a north-easterly direction.

The TV reception always occurs between the end of July and continues through to the end of August. The signals become audible around 1900UTC and tend to fade out some hours later, normally from 2200UTC.

The tone of the signals is not pure, usually T8 with a ringing sound. (Incidentally, to hear these tones it is necessary to use a narrow-band s.s.b. receiver tuned to the individual video carrier frequencies). Although the signals would appear to come from transmitters located in Scandinavia (LA, SM) and the Baltic States (ES, LY, YL) Ken suggests they actually emanate from central Europe (DL, OK, SP).

Signals Bent

Ken suspects that the signals do not arrive via the great circle bearing but are bent, by as much as 40°, during their passage via the ionosphere. He wonders whether this is a form of field aligned irregularities (f.a.i.). This propagation mode is usually observed by stations located in southern Europe (EA, F, I, YU, etc.) and often affects frequencies as high as the 144MHz band.

Ken wonders if anyone else has noticed this propagation mode on the 50MHz band at any time. Certainly I can confirm that I have noted these type of signals from TV transmitters during the summer period. Does anyone else have further observations?

Further Reports

Now back to further reports regarding the 50MHz band. Propagation to areas outside of

Europe was not particularly good during August. The path to the middle-east was virtually non-existent, with only the beacon 5B4CY (KM64) being reported.

Traffic to Africa was also very much on the decline although the stations of CT3FT, CT3HJ, EH8BPX and EH9IB did have a few openings into the UK during the month. What really surprised me, and no doubt others as well, was that the transatlantic path was open to VE and W on a number of occasions during August. These E-layer openings occurred on August 5, 12, 13 and 16 and are the latest I have ever recorded on this path in over 20 years of monitoring such events.

Geoff Brown GJ4ICD (IN89) reports that the 50MHz band was open to Puerto Rico from 1930UTC on August 5. The station of KP4EIT (FK58) was audible at his QTH for over 45 minutes.

Geoff was also pleased to catch the next opening on August 12. This event commenced with him at 2038UTC and the band was still open at 2333UTC. He worked many c.w. and s.s.b. stations located in call areas W1, W2, W3, W4, W8 and W9. Stations in VE1 and VE3 were also contacted along with FP5EK. The station of VP9MZ was heard briefly but regrettably not worked.

Bob Mobile WA1OUB (FN43) really enjoyed the opening on August 12. Between 1825-2156UTC he contacted 50 stations located in CT, EH, F, G, GW, HB9, I, ON and S5.

Some 14 Italian and 2 Slovenian stations were worked, the best DX being I8KRO (JM88) at 7125km. Bob mentions that this was a pleasant surprise and was the latest transatlantic opening he has ever participated in.

Over in locator square FN20, the station of W3IWU first heard signals from Europe around 1900UTC. He worked operators in CT, EH, F, G, GW, I, ON and S5. The most consistent being that of S57A.

Emil Pocock W3EP (FN31) mentions that signals were mainly weak at his QTH. However, he did manage to make contact with stations located in DL, EH, F, GJ, ON, PA and SM.

The next two transatlantic

openings, on August 13 and 16 were very weak events. I have very little information about them apart from the station of GW4VEQ (IO73) hearing W3JO (FM29) at 2238UTC on August 13 and GW7SMV (IO81) hearing the VO1ZA beacon (50.039MHz) at 2224UTC on August 16. Earlier that day, around 1400UTC, Spanish stations were working into VE and W4.

Antipodean News

News from 'down-under' indicates that their winter Sp-E season has already produced some interesting results. Steve VK30T reports that on August 7 stations in the VK3 call area had an opening to FK8GM in New Caledonia. Apparently, no one can recall working this 'double-hop' path in previous seasons.

In Japan JA1VOK mentions an unusual start to the season on August 4 when the station of JA0GLM (PM97) worked VK6JJ (OF88) over an 8000km path. The signals were quite weak, peaking 539 on c.w.

At the QTH of JA1VOK signals were also heard from Taiwan and Malaysia. This made him wonder whether the autumn trans-equatorial propagation (i.e.p.) paths had also started to open up.

The results from the Far East, Australia, North America and Europe typify what an unusual Sp-E season it has been on the 50MHz band this year. Conventional single and double-hop Sp-E openings during May were excellent with openings occurring on 75% of the available days.

Three Days in May

There were three days of transatlantic openings during May. This was very early in the season and it really did look as if this year was going to be a record breaker. In some ways it was.

Transatlantic openings were recorded on May 27, 28, 29, June 6, 7, 9, 10, 11, 16, 20, July 1, 2, 11, 13, 14, 16, 25, August 5, 12, 13 and 16. That's a total of 21 days when the band was open across the Atlantic. (In 1995 I recorded a total of 18 days when

these type of openings occurred).

However, 'conventional' Sp-E openings within Europe (and other parts of the northern hemisphere) were certainly very poor. The intensity and duration of events during June and July (acknowledged to be the peak of the season) was very disappointing.

One simplistic (but valid) way of gauging the intensity of Sp-E openings is to look for events at higher frequencies. Conditions on the 144MHz band certainly looked very promising with some five days during May when the band was open via this propagation mode.

However, that was virtually it and only two more events at this frequency were recorded in the following months. For the record, Sp-E events on the 144MHz band occurred on May 18, 19, 23, 24, 27, June 7 and 23.

At First Glance

Ken G4IGO remarks that at first glance the summer Sp-E season has been good. At the time of writing he had worked 53 DXCC countries in 1996, including four new countries, CY0, VP5, Z32 and 4L.

The list brings Ken's DXCC total for the 50MHz band up to 145. A further 17 new locator squares were worked in the summer to bring the total worked to 640.

Regarding band conditions, he notes that some operators seem to gauge it by the number of transatlantic openings that occur in the summer. Ken has observed that the number and duration of these events has been up this year but that Sp-E conditions generally have been quite poor. In his opinion the number and duration of events this year was down by a factor of 10 compared with that a decade ago.

The general level of Sp-E propagation has been dropping year on year. This is made even more obvious if all the frequencies up to the 144MHz band are taken into account.

The number, duration and intensity of 144MHz events has declined over the years. The number of days when the 88-108MHz f.m. broadcast band has been open has also reduced.

Ken reckons the trend is even noticeable on meteor scatter. He wonders if less meteoric material is being encountered by the earth with a subsequent reduction in ionisation.

Or perhaps the number of meteors is the same but their ionising effect is being reduced by some other factor. Maybe the same factor that is affecting propagation on the v.h.f. bands as a whole?

In the meantime Ken is slowly transferring 22 years of written data, covering frequencies between 48-

144MHz, into his computer. When that task is completed he will be in a position to prove his observations of declining ionospheric propagation modes.

However, Geoff GJ4ICD reckons that this year was probably the best for Sp-E propagation for some time but he does remark that it depends very much on your geographical location. Although short skip Sp-E has been down on previous years Geoff, located on the Island of Jersey, has enjoyed many openings to North America during the summer.

Openings to the Caribbean have also been higher with KP4A and KP4EIT being reported several times. Stations in TR8 and 5T5 were worked from Jersey and contacts were made from VP5 and V47 with a few stations in Europe.

Multi Hop Sp-E

In other parts of the globe multi-hop Sp-E contacts were made between 4L to JA and VS6 and from KL7 to JA. All this leads Geoff to the conclusion that 1996 was indeed a good year for 50MHz propagation.

Bob WA10UB reports that his records show an upward trend in 50MHz activity within Europe. This of course influences the number of events that are now being observed.

Another factor is the improving ability to detect openings by monitoring other indicators, for example TV and miscellaneous p.m.r. services, at slightly lower frequencies. Results of this monitoring can now be communicated instantly via the Internet or DX Clusters.

In fact, many 50MHz enthusiasts have become so efficient at this type of monitoring and reporting that openings not much longer than 5 to 10 minutes are being observed. This is a far cry from the days when, for example, the ZB2VHF beacon would suddenly appear as if by magic. Nowadays we know it will appear before we even hear it!

Propagation Theories

No matter what your point of view is regarding propagation theories I find it a fascinating subject. One of the discussion points this year is why there were so many long distance transatlantic openings and very few conventional single-hop Sp-E openings.

Ken G4IGO suggests that because there was less Sp-E propagation within Europe there was also substantially less noise from TV video carriers. Normally the interfering TV buzz causes so much noise that it is difficult to hear the weak transatlantic signals. This has not occurred this year and as a consequence even the very weak

transitory type openings across the Atlantic have been detected.

For the uninitiated there are still many countries in Europe that operate TV systems in the 49MHz region. When Sp-E propagation is encountered during the summer months their f.m. sidebands often encroach into the 50MHz band obliterating s.s.b. and c.w. signals.

Ken also offers another theory why more transatlantic openings were observed this year. In his opinion there are two distinct propagation modes that affect frequencies in the range 28-70MHz. These are Sp-E and E-layer propagation.

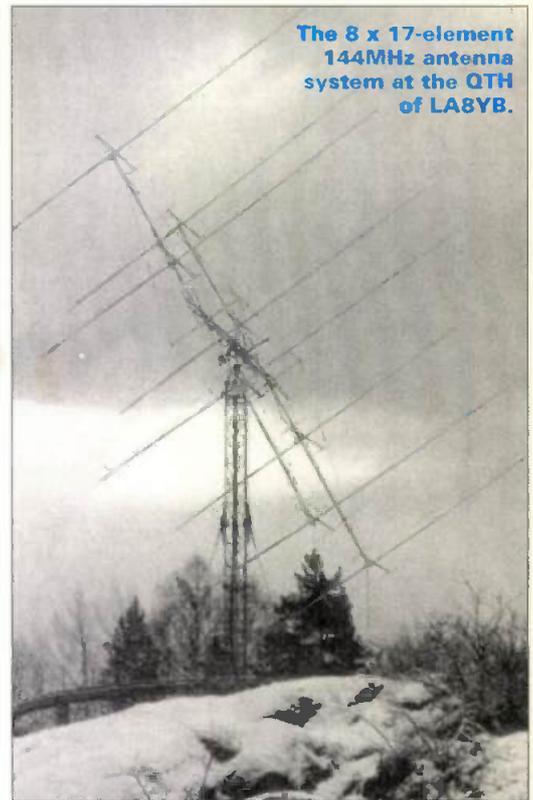
The Sp-E is a violent type of propagation in that the signals are often subjected to deep fading. Propagation is short lived and very mobile in direction.

On the other hand the E-layer mode is a slow gentle type of propagation where signals can be quite weak (or strong at times) but do not suffer from deep fades. The propagation can occur for long periods and can result in paths that are predictable to certain areas at specific times.

In previous years the prevailing Sp-E propagation has totally masked the (weaker) E-layer propagation. However, with declining single-hop Sp-E openings, the weaker E-layer modes have become more apparent.

Ken thinks that the E-layer

The 8 x 17-element 144MHz antenna system at the QTH of LA8YB.



involved is only just ionised at the 50MHz operating frequency. Because of this the skip distances achieved would have been at a maximum.

Conversely, if the layer had been highly ionised (creating incidentally more openings on the 144MHz band) then the skip distances would be much less. Ken surmises that the long distance openings were also due to an increase in layer height or possibly some type of chordal hop propagation.

Deadlines

Do you have any views on these observations. If so I'd like to hear about them. Please send any details, news and views (to reach me by the end of the month) to Yew Tree Cottage, Lower Maescoed, Herefordshire HR2 0HP. Alternatively you can contact me via E-mail at davebu@mdlhr1.igw.bt.co.uk or the DX Cluster @ GB7DXC, packet radio @ GB7MAD or telephone me on (01873) 860679.

END

BITS & BYTES - COMPUTING IN RADIO

Mike Richards G4WNC rounds up the latest news from the world of computing in radio.

In case you haven't noticed, version 3.0 of Netscape's Navigator is (at the time of writing) available for free download from the Netscape home site. I mention this because as WWW browsers go, I think the Navigator still holds its position as the best available.

Although Microsoft's Internet Explorer is improving rapidly, there is still some way to go to catch Netscape. For those who want to download, the Netscape home site can be found at <http://home.netscape.com>

Digital Signal Processing

Although I've not reported much on digital signal processing (d.s.p.) lately, there have been a number of developments and many readers have contacted me asking where they should look to find more information. Having spent much time searching around the Internet, it appears that the most up-to-date organisation, from an amateur radio point of view, is the **Tucson Amateur Packet Radio (TAPR)** organisation.

The Tucson Amateur Packet Radio group have a long association with the integration of amateur radio and digital electronics. From my recollections of the early days of Packet (circa 1982!), it was Tucson that produced the very first Packet TNC kits.

A recent visit to the TAPR d.s.p. pages on the Internet shows that they have maintained their lead at the front-end of amateur radio digital electronics. In addition to providing lots of information for experimenters, they also offer special discounts on the hardware required to build their projects.

Whilst the easiest access to TAPR is via their WWW site at <http://www.tapr.org/>, they can be contacted by more conventional means at: **Tucson Amateur Packet Radio, 8987-309 E. Tanque Verde Rd, #337 Tucson, AZ 85749-9399, USA.** Tel: 817-383-0000 or FAX: 817-566-2544.

If you choose to join TAPR (\$25 per year outside the US) you benefit from a subscription to the quarterly *Packet Status Register* newsletter

and qualify for 10% off all TAPR kits and publications. It's well worth it if you're into d.s.p. experimentation.

Latest SSTV Software

Hot news for this month is the release of the latest update to **John Langer's WB2OSZ EZSSTV** package for IBM PCs. The package EZSSTV is the shareware/demo version of his full featured Pasokon TV system.

The full version offering a full set of SSTV modes and a Classic interface that offers many advantages over the simple comparator interface used with EZSSTV. Version 3.0 of EZSSTV represents a major upgrade as the program has been restructured into a 32-bit application, so taking full advantage of the extra processing speed available from 386 and later processor chips.

The latest release is in contrast to the previous version, and many other packages, that restrict themselves to ancient 16-bit architecture. By reworking the software into a 32-bit application the program becomes both smaller and faster.

The other main advantage is the removal of the old 640k conventional memory limit. In a 32-bit application the processor can directly access all the machine's memory. In addition to the fundamental change to 32-bit, EZSSTV V3.0 boasts a range of new features designed to make the operator's life a little easier.

If you've used SSTV before you will have come across the problems of having to leave the main SSTV program to open-up a paint package to create or amend an image. The new EZSSTV overcomes this with a built-in basic paint program.

The basic paint program lets you create simple graphics and text within the main program. The use of colours has also been enhanced and EZSSTV now stores all images with the standard 16 million colours used by most modern PCs.

The resolution of the stored image has also been upgraded to 640 x 480 pixels, as opposed to the previous 320 x 240 pixels. If you have a SVGA monitor and suitable graphics card you can now use the 800 x 600 pixel screen resolution to display a full 640 x 480 SSTV image

Fig. 1: A sample screen dump from EZSSTV using the PCXDUMP utility (see text).



as well as the main program control icons.

I've shown a rather noisy sample screen dump in Fig. 1. This was received on the 14MHz band at the beginning of September. Incidentally, the screen dump was captured using a wonderful utility called PCXDUMP.

Capturing screen images from programs that directly address the hardware is always a rather unpredictable affair, but PCXDUMP is the most reliable I've come across so far. The program's not new, so it should be available from most shareware depositories.

Other changes for version 3.0 of EZSSTV are more modes (Wrasse 120, 180 + Scottie DX) plus a new high resolution mode with 480 scan lines instead of the usual 240 or 120. The available file types have also been expanded to include TIFF, JPEG, BMP and PNG.

Those of you with colour printers will be pleased to hear that drivers have been included for the Epson Stylus Colour and the HP DeskJet range. In order to use EZSSTV or Pasokon you will need a 486 or better PC with 8Mb RAM, colour SVGA display and a graphics card with at least 1Mb RAM and capable of displaying 800 x 600 resolution.

You will also need around 16Mb of hard disk space and, for the full Pasokon system, an empty ISA expansion slot and an unused interrupt. The comparatively high hard disk space requirement is due to the way in which EZSSTV creates temporary files during operation.

For more information contact any of the major shareware outlets and ask for the file ezsstv.zip. If you have Internet access the following sites will prove helpful:

<http://www.ultranet.com/~sstv>
<ftp://ultranet.com/pub/sstv>
<ftp://oakland.edu/pub/hamradio/pc/digital/atv>
<ftp://cs.buffalo.edu/pub/hamradio>
<ftp://ucsd.edu/hamradio/sstv>

That's all for this time, keep your letters, news and views coming to me Mike Richards G4WNC, 'Bits & Bytes', PO Box 1863, Ringwood, Hants BH24 3ZD. Internet: mike.richards@di.al.pipex.com

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- Disk C (Order Code DKC) - NuMorse 1.3.
- Disk D (Order Code DKD) - UltraPak 4.0.
- Disk E (Order Code DKE) - Mscan 1.3 and 2.0.

Printed Literature

- Beginners Utility Frequency List (Order Code BL).
- Complex Signals Utility Frequency List (Order Code AL).
- Decode Utility Frequency List (Order Code DL).
- FactPack 1 Solving Computer Interference Problems (Order Code FP1).
- FactPack 2 Decoding Accessories (Order Code FP2).
- FactPack 3 Starting Utility Decoding (Order Code FP3).
- FactPack 4 JVFAX and HAMCOMM Primer (Order Code FP4).
- FactPack 5 On the Air with JVFAX and HAMCOMM (Order Code FP5).
- FactPack 6 Internet Starter (Order Code FP6).

For the printed literature just send a self addressed sticky label plus 50p per item (£1.50 for four, £2.50 for seven and £3 for nine). For software send £1 per disk (£1.75 for two, £2.50 for three or £3 for four and £3.75 for all five) and a self addressed sticky label (don't forget to provide the disk!).

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HF FAR & WIDE

Leighton Smart brings you up-to-date with the activity on h.f. He's also discovered that 'Top Band' hasn't 'gone to sleep' during the summer!

I'll start this month's column by offering congratulations to **Charlie Blake**, a long time s.w.l. reporter to 'HF Far & Wide'. He's now the proud owner of the callsign **M0A1J**!

Well done Charlie! I bet it will seem just that little bit different now. You'll be able to reply to all those stations you used to hear 7MHz, on your favourite band. Although having said that, I get the impression that you will not let listening take a 'back seat' now that you've got a 'ticket' eh?

Unfortunately, Charlie is unable to transmit from home due to antenna restrictions where he lives. But I wonder if he's thought about loading the house rain guttering up as an antenna for 7MHz? Mine worked a treat here.

If your guttering is the plastic type, an 'invisible' wire running along it through the brackets will do the job. (No one would ever know!). Charlie says that most of his operating will take place from mobile and portable locations as well as the GB2BP (Bletchley Park, home of the British decoding in the Second World War) special station.

All the same, hope to hook up with you on 7MHz Charlie, and again, well done!

Top Band Comments

Oops! I have been 'taken to task' by **Mike Devereux G3SED** on my 'Top Band' comments. Mike, a well known 1.8MHz operator, takes exception to my remark printed in the September column (which was written in July) that "now that Summer is here Top Band has gone to sleep".

In support of 1.8MHz Mike provides a list of spectacular DX which he has worked over the past few months from his station located between Southampton and Portsmouth. These include South Africa, North America, and Asia, which definitely disproves my observation. Perhaps Mike, I should have said that "as far as my station is concerned, Top Band had gone to sleep", as I can't (with my antenna down in the Welsh valleys) hear anything

of the nature that you do!

Nevertheless, you are more than correct that with a decent antenna on the band, then the summertime DX is available!

So, I stand corrected. I'll just have to try and persuade the local farmer to 'lend' me a field and a couple of his trees so that I'll be able to hear and work all this exotic stuff Mike, regardless of the season! Thanks for correcting me. (It's a good job that my reporters keep me on my toes eh?)

Mike uses an inverted 'L' antenna with a 23m long vertical section and an 18m long horizontal section tuned against 70 (yes 70!) 40m long radials. Mike also has a horizontal dipole at approximately 30m high for transmitting on 1.8MHz, and often finds that a loop will receive the DX better than the large antennas due to the lower noise levels. (See Fig. 1).

News Snippets

Some DX news snippets from the RSGB's *DX Newsheet* now. From this it appears that **Teo EA6BH** will be operating as 3C1DX from Equatorial Guinea, using c.w. on 3.505, 7.005, 14.005, 21.005 and 28.005MHz, and s.s.b. on 14.195, 21.195, and 28.495MHz between 16/21 October.

John K4BAI will be active as 8P9HT from Barbados between the 15th and 22nd of November. He will also be active as 8P9Z in the CQ CW contest.

Per LA7DFA will not, it has transpired, be going QRT as JX7DFA in October. He will in fact be operational from Jan Mayen until April 1997 as he's signed on for another tour of duty there.

In Mauritius, **John EA2KL**, and **Luis EA3ELM** will be operating from the 23rd of October to the 30th, including the CQ SSB

contest, from the shack of 3B8CF. (QSL to their home calls).

Your Reports

I'll start your reports this time with some news of 1.8MHz. **Mike Devereux G3SED** near Southampton, as already mentioned has sent in a log of DX worked on 1.8MHz over the summer months.

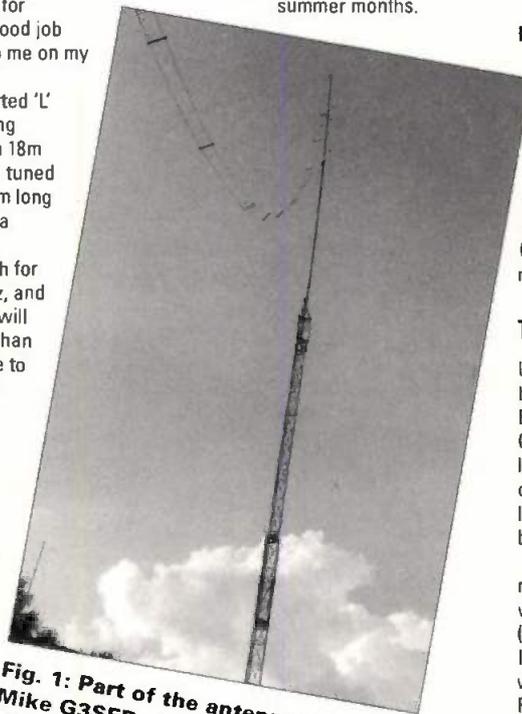


Fig. 1: Part of the antenna system Mike G3SED uses to chase DX on 'Top Band'.

These include s.s.b. contacts with SV3KH (Greece) at 2038, 7X5JF (Algeria) at 2350, TF3TF (Iceland) at 0113, Jack VE1ZZ in Newfoundland, (a regular on 'Top Band'), W2JB (USA) at 0106, ZS4TX (S. Africa) at 2017, 9M8FC (Eastern Malaya) at 2054, and LU8MMF (Argentina) at 0410.

Mike's c.w. accounted for ZS6UT (South Africa) at 0417, and VE30SZ (Canada) at 0421, as well as 5R8EY (Madagascar) at 2209, and J28JA (Djibouti) at 0045.

The 3.5MHz Band

Not so much going on the 3.5MHz band (judging by reports anyway!), but even so, s.w.l. reporter **Derek Blunden BRS171057** (Swindon, Wiltshire) reports s.s.b. reception of 9U5DX (Burundi) at 2219, ZP6VT (Paraguay) at 2230, and PY20CG (Brazil) at 2254.

Meanwhile, the report from **Eric Masters G0KRT** in Worcester Park (Surrey) comes from the time he was operating as GX3WIM at the Wimbledon and District Amateur Radio Club Summer Camp. Eric mentions a few QRP c.w. contacts with HA60J (Hungary) at 0126, 2E0AJS at 1754, and GW4PXQ at 2208, all with a maximum of 5W output.

The 7MHz Band

Up to 'forty' now, and the 7MHz band is the favourite of **Charlie Blake M0A1J**, (formerly RS96034). Charlie as already mentioned, is limited to mobile and portable operation. Nevertheless, his s.w.l. log for this band shows he's been busy!

Charlie reports s.s.b. reception of VK2CP (Australia) working F6ARC at 0526, T14CF (Costa Rica) in contact with IK2QPR at 0622, XE1VIC (Mexico) working OK1AYD in the Czech Republic at 0511. Also heard was VK5BC (Australia) in contact with G4EKL at 0642, ZL3NW (New Zealand) working DJ8YO in Germany at 0526, and YV5MKV (Venezuela) in contact with HB9AFI in Switzerland at 0509.

Yet another 'early bird' is **Ted Trowell G2HKU** on the Isle of Sheppey (Kent). Ted says he's been quite busy in the garden of late, and consequently has a shorter report than usual. Too much weeding and not enough keying Ted!

Ted's report is all c.w. with around 70W output, and includes contacts with ZL2AGY (New Zealand), 9H3WQ (Malta), LX/DL1HQE (Luxembourg) all at around 0500UTC. Operating later

in the day gave him a contact with OH0/DL1RNW (Aaland Island) at 2100UTC.

A little closer to my home now, and to **Carl Mason GW0VSW** in Skewen, West Glamorgan here in South Wales. Carl uses a G5RV dipole on 7MHz and other bands, with an output of around 100W, and offers contacts with VK7UJ (Australia) at 0603, C50A (Gambia) at 0616, and KT2I at Cape Cod at 2331UTC.

The 10MHz Band

The 10MHz allocation is a rarely mentioned band in the pages of 'HF Far and Wide', due to most months to lack of available space). However as our reporters show, it's not a band to be forgotten by any means!

Ted G2HKU for instance has sent a report of his 10MHz contact with ZL4SEA (New Zealand) which was operated by ZL4HB at 0500UTC, and Carl GW0VSW lists contacts with RX3RA (Russia) at 1807, LX2DX/QRP (Luxembourg) at 1828, VE1QSK (Canada) at 1831, and 8S2FRD in the city of Skelleftea (Sweden) at 0948UTC.

The 14MHz Band

The 14MHz band, as usual, seems to be where the bulk of the 'action' is, at least according to our reporters! And I begin with the usual propagation report from **Don Mclean G3NOF** in Yeovil, who says that "generally conditions have been similar to previous months. The best DX has been during the late afternoons and evenings on 14MHz".

Don's lengthy report includes s.s.b. contacts with A71DX (Qatar) at 2240, C50BI (Ghana) at 1820, D2PV (Angola) at 1843UTC (QSL to DL4KAI). He then logged FM5GU (Martinique Island) at 2222, JL6MSN (Japan) at 1513, TI4CF (Costa Rica) at 2334, VU2RX (India) at 1819, ZD7JP (St Helena Island) at 1908, 9G1MR (Ghana) at 2012UTC (QSL to IK3HHX).

Next, Don reports working 4S7DRG (Sri Lanka) at 1528, QSL to DL7DCU, 9Q5TR (Zaire) at 1920, TU2TP (Ivory Coast) at 1851, DXpedition station UR1000HA at 1833 (QSL to UT7DX), TR0B (Gabon) at 2011 (QSL to PD Box 177 Libreville), and finally HK4IQM (Colombia) at 2302UTC.

Now it's down to the city of Bristol, and **Gordon Foote G7NCR** who uses a monoband 14MHz receiver and a loft mounted receive antenna. Gordon sent no less than three logs this month,

which included his s.s.b. reception of HL10YF (South Korea), VR2KM (Hong Kong), UK8PC (Uzbekistan), 9N1CU (Kathmandu, Nepal), RK9XWD (Asiatic Russia), and ZS6HWH (South Africa), all at around 1700UTC. "What a moment for tea - time" says Gordon. (Quite right!).

Gordon's other reports include J410G (Olympic Games Special Event station, Athens) working GB0WSS at 1605, 8S0FRD (Sweden) working GOMTN at 1729UTC. Also heard was BV3CD (Taiwan) working EA5GSA at 1743, KG4HO/P2 (Guantanamo Bay) working HA9PP at 1145.

Next in the log was JA1CG (Japan) in contact with 0E1SY at 1413, HS1NGR (Thailand) in contact with G0GXT at 1737. Then it was 9A4A on a Croatian Island working our very own G3NOF at around 1900, 3X0HME (Guinea) working PY2VA in Brazil at 1855, and PZ6HOZ (Surinam) working SV3YY in Greece at 1500UTC.

Eric G0KRT, again as GX3WIM hooked up with RA4HGN (Russia) at 1507 with 5W. Later he worked VA3DX (Canada) and K3EGR (USA) while running a gigantic 50W. "High power" says Eric! Careful Eric, or you may find it catching Hi!

The 18MHz Band

A brief look at the 18MHz band now, where Ted G2HKU logs just one c.w. contact. It was in the shape of 9H3UF, on Gozo Island, the 'garden of Malta' at 1500UTC.

Don G3NOF however, found time to work s.s.b. with FG5HR (Guadeloupe Island) at 2228, HI9/I4LCK (Dominican Republic) at 2224, and NH6MG/TG5 (Guatemala) at 2332UTC.

And finally, Carl GW0VSW hooked up with 9U5CW (Burundi) at 1740, and A71CW (Qatar) at 1752, and SV2DFA (Thessalonin, Greece) at 1912UTC.

Sign-Off

Well that's it for yet another month, time to sign-off. As you are reading this in the October issue, (I'm writing this in August) I imagine the dark nights are coming in, those long dark winter evenings in the warm comfortable shack are approaching!

Hopefully conditions on the higher bands will have improved greatly by now, and that the lower bands will be relatively free of static crashes! So, keep up the good work, all the best DX.

PW Listening & Operating Watch List All times in UTC

Charlie Blake M0AIJ listens: 0500-0700 on 7.061MHz s.s.b. with an NRD 525 receiver & sloping wire antenna.

Steve Locke GW0SGL operates: 1100-1500 most days around 14.180MHz s.s.b. using a Kenwood TS-940 & TH7 beam antenna.

Don Mclean G3NOF operates: 1030 Saturdays on 3.685MHz on the International Short Wave League (ISWL) Net or 1030 Sundays on the Yeovil ARC net on 3.665MHz s.s.b. using a Kenwood TS-950 & trapped dipole antenna.

Leighton Smart GW0LBI operates: Most Sundays (and some weekday evenings) at around 1000-1300 on 1.933 or 1.949MHz s.s.b. using a KW 2000B transceiver and a long wire Marconi antenna.

Rob Mannion G3XFD listens and operates: Weekdays & weekends) 1800-1830 3.7MHz 100W s.s.b., & 3.530MHz QRP c.w. and the 10 and 14MHz bands using an Alinco DX-70 transceiver and trapped dipole/long wire antennas (Cushcraft R5 vertical antenna on 14MHz). Also at 2300 on either 3.530, 3.560 or 7.025MHz (c.w.) or 3.7MHz s.s.b.

Gordon Foote G7NCR listens: 1730-1930 & 2030-22.00 (weekdays) and 1430-1630 (weekends) on 14.250MHz s.s.b. using a Howes DcRx receiver and loft mounted wire antenna.

T. Ibbitson G0VTI operates: each evening between 1900-2000 on or around 7.020MHz c.w., or 14.035MHz c.w. using a Ten-Tec Scout at 50W.

David Kennedy G7GWF listens: on 7MHz using a Howes Lake DTR-7 Transceiver. No time or frequency is specified



Rob G3XFD says that it appears that 78% of the h.f. stations he's worked use TS-850's. Kenwood have recently announced a new h.f. rig, the TS-570D (see pages 42,43 in this issue) which will be priced midway between the TS-850 and TS-870. The TS-850 was reviewed in PW in the January 1994 issue and the TS-870 in the December 1995 issue

As usual, reports and information by the 15th of each month to: **Leighton Smart GW0LBI**, 33 Nant Gwyn, Trelewis, Mid-Glamorgan CF46 6DB, Wales. Tel: (01443) 411459.

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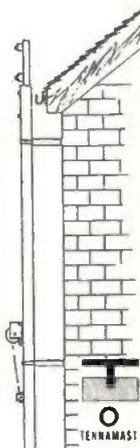
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BROADCAST ROUND-UP

This month Peter Shore has news that the BBC World Service is opening its new relay station in Thailand at the end of October.

Editor Rob Mannion G3XFD was horrified when it disappeared. Now it's back, although in a different form. I am talking about *Waveguide*, the weekly communications show on BBC World Service that ended a 16-year run when new schedules came in to effect at the beginning of April this year.

An eight-part series looking at the basics of listening came on the air on 16 September, presented by Simon Spanswick, who had been the programme's host for several years before the axe fell. While the old series was topical, with news from the BBC, frequency information, receiver tests and reports from around the world about international broadcasting, this new series is devoted to finding out about what makes short wave work, how to choose a radio and what causes interference.

The programme is on Sunday at 1550, with a repeat on Tuesday at 0750. Tune in, and then write in with your comments to: BBC World Service, Bush House, London WC2B 4PH. And as for the future - will the BBC continue to be the only international radio station of any note without a programme that keeps tabs on communications and broadcasting? Who knows. There certainly is no *Waveguide* equivalent planned, as far as my information goes. If you think there ought to be one, let the World Service know.

Station News

Ireland came back to short wave in September when RTE, the country's public broadcaster, hired time at the Juelich transmitting station of Deutsche Welle to transmit coverage of the finals of the All-Ireland hurling and the Gaelic football competitions. The broadcasts were carried between 1400 and 1700UTC on five separate frequencies: 9.815, 12.055, 13.82, 15.60 and 21.55MHz.

Radio Bangladesh is on the air with English to Europe from 1815 for three-quarters of an hour on 7.185 and 9.548MHz. It is preceded by the 30-minute Voice of Islam

programme. English is beamed to Asia at 1230 on the same frequencies.

Programme Delivery

There seems to be hope for short wave as the main means of international programme delivery. A survey carried out by Kim Elliott, host of *Voice of America's* (VoA) *Communications World* and coincidentally the station's Audience Research Officer, brought about 6,000 responses from listeners around the world. Special announcements were made during some VoA programmes asking listeners to write in with details of the time they heard the transmission and the frequency they were tuned to.

Kim randomly selected 4 000 of the replies and analysed the data. While he emphasises that this is not a very scientific study, the responses do provide a snapshot of who is listening, where, when and how.

A majority of the replies came from people listening on short wave, including 187 in Europe, even though the Voice no longer broadcasts directly on high frequencies to our continent. In all, 69% of respondents listen via short wave, 29% via medium wave.

Two per cent tune to VoA on f.m. or cable systems; 0.1% listen via satellite. All of which points resoundingly towards a long life for short wave. And anyone who tells you differently should be ignored!

Suddenly Silent

But what happens if you are a listener on short wave and you discover that the frequency that you have tuned to forever and a day is suddenly silent? As a result, you miss your favourite programmes from your favourite broadcaster. It happens when radio stations change their frequencies when we move from summer to winter as we did at the end of October.

Frequency engineers strive for continuity where they can - if sunspot numbers and ionospheric conditions allow, but sometimes



Voice of the Mediterranean is back on air!

even the longest lasting frequencies can vanish. That is the case with the BBC's 19 metre band channel of 15.07MHz.

A European agreement means that this (and in the next few years other BBC out-of-band channels) can no longer be used for broadcasting. So the BBC has upped sticks and moved to the other end of the band, stretching the hours that 15.575MHz is on the air. Let's hope that listeners got the message from the special frequency change announcements between programmes.

Back On Air

The Maltese station *Voice of the Mediterranean* is back on the air - now calling itself VoM - using short wave transmitters in Russia. The station came to grief when Deutsche Welle closed its relay transmitters on the island, leaving the small Maltese broadcaster without any way of reaching its audience.

Now VoM is back on the air, broadcasting in English to Europe on 12.06 and 9.765MHz at 1900-2000 every day of the week. In addition on Sunday at 0130 there is a three-hour broadcast in English and Maltese, directed for a reason that I have not yet worked out, towards Asia and the Pacific. The frequencies for this are 15.55 and 17.57MHz. Contact VoM at PO Box 143, Valletta CMR 01, Malta, or FAX: +356 241501.

New Relay Station

The BBC World Service will open its new relay station in Thailand at the end of October, just as the new winter frequency schedule comes in to operation. The station will start to operate with two 250kW transmitters, and will increase this to

four, presumably after the Hong Kong relay station is dismantled before China reclaims the colony in June 1997.

Radio Thailand broadcasts in English: 0530-0600 on 9.655, 11.905 and 15.115; 1230-1300 on 9.655, 9.885 and 11.905; 1400-1430 on 9.655, 11.905 and 11.955; 1900-2000 on 7.21, 9.655 and 11.905 and 2030-2045 on 9.555, 9.655 and 11.905MHz.

Some transmissions come from the high-power Voice of America relay station in Thailand.

United Broadcasters

Leslie Wright wrote to me from Higher Kinnerton near Chester to report that United Christian Broadcasters (UCB Europe) has just come on the short wave bands. United Christian Broadcasters has been available on satellite with a mixture of Christian contemporary music, interviews, and Bible readings.

Leslie has been involved in the electrical installation of the organisation's new premises in Stoke-on-Trent. You can tune in on 6.20MHz short wave, or on the audio subcarrier at 7.56MHz on the Sky Sports television channel. There is no information about the location of UCB's h.f. transmitter, but it may be in Ireland. Contact the station at PO Box 255, Stoke-on-Trent, ST4 8YY, FAX: (01782) 641121.

That's all for this time. Drop me a line if you would like to pass on any information to other PW listeners. Good DX.

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144MHz hand-held FT-208R microphone and chargers, £80. **430MHz hand-held FT-709R** with chargers, £80. Transverter 144MHz input, h.f. bands, 40W output, Tokyo HX240, £120. **430MHz 50W linear** BNOS LPM, 432-10-50, £75. **G3YJF**, Southampton. Tel: (01703) 894200.

Alnico DJ-580 hand-held dual-band 2m/70cm (144/430MHz), v.g.c., case, cigarette lighter lead, hands free mic., small hand microphone, all under a year old, £280 o.n.o. Tel: Romford (01708) 703865.

Alnico DJ-X1 scanner. 100kHz to 1299.9MHz, 100 memories, good condition, £200 o.n.o. Opto cub freq. counter, £100 o.n.o. Realistic PRO2006 25-520, 760-1300, £150 o.n.o. Cash only, buyer collects. Tel: Surrey 0181-647 7784 after 6pm.

Antenna RF Systems DX10. £50. Global 2000 a.t.u., £40. Tel: Devon (01752) 407458.

AOR3030 general coverage receiver with v.h.f. converter, covers 108 to 174MHz, boxed and manuals, in excellent condition, only eight months old, sell for, £475. John, Fife, Tel: (01592) 203279 anytime.

AR77, AR88, R1155, 1392 HRO and more. Telephone for details. Steve, Essex. Tel: (01702) 522929.

AR88 receiver, good condition, manual, speaker, £60. FT-726 with 2m (144MHz) module, not working, offers? Heathline Hunter h.f. amp, 80m to 10cm, £590. Buyers to inspect and collect. Derek G3NKS, Cheltenham. Tel: (01242) 241099 9am to 9pm only.

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C221 frequency meter, requires mains h.t. supply, hence, £7.50 plus carriage. Wanted for Kenwood R2000 v.h.f. converter board 118-173MHz. Len, Plymouth. Tel: (01752) 343074.

CapCo SPC300 a.t.u., good condition, £95 o.n.o. Paul, Hereford Amateur Radio Society. Tel: (01432) 353765.

Capco SPC300 a.t.u., £200, postage extra, also Datong v.f.l. converter, £25 and BARTG multimeter terminal unit, high tones, £30. Both these items post paid. Tel: NW London 0181-455 8831 anytime.

Collection of vintage domestic radios (valve and transistor), s.a.c. for full list, may exchange for Perdio Park Lane, Piccadilly, M101 66 or Barlow Wadley XCR30Mk2. L. Borthwick, 42 Eildon Road, Hawick, Scottish Borders TD9 8ES.

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Eko Mariner, a.c./d.c. valve, i.w., m.w., trawler band and six short wave bands, 190 to 23m, buyer collects, an excellent radio, P. G. Robins G8BSK, 290 Priory Road, St. Denys, Southampton. Tel: (01703) 552247.

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Five volumes Radio & TV Servicing, 1965-1970, v.g.c., £25. Large box of service sheets, mainly early transistor models, £25. Tel: Lincs (01472) 398819.

FT-101ZD (WARC and f.m.), £300. FT-102, £380. Wanted Denco IFT12 85kHz IFTs, Tibbert, 66 Horsley Road, Kilburn, Derby DE56 0NE. Tel: (01332) 883035.

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FT-840 h.f. radio, mint condition, boxed, mic., manuals, excellent radio, seven months warranty from Lowes, Bristol, genuine reason for sale, £600 o.n.o. GW0WVF or MW1AXS, QTHR. Tel: Gwent (01495) 246594.

FT-ONE, £575 o.n.o. FC102 a.t.u. with FAS1-4R, £175. MD1-C8 mic., £55. G5RV + 20m 103 coax, £20. Complete station, £750 + carriage. Collect. Steve GOHMM, Hull. Tel: (01482) 795646.

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Set of transceiver valves, total 23, includes pairs TT22 6146 90CT, cost, £210, sell for, £50. Radio pinched, so no use. Tandberg TP41, v.g.c., £30. Scena Vega 215, v.g.c., £30. Mike Turnbull, 11 Waverley Avenue, Monkseaton, Whitley Bay NE25 8AU.

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Solartron oscilloscope dual beam, model no: CT436. Technical manual and cables, £30. Tel: Bucks (01494) 520669.

Sony ICF2001D all band digital radio, complete with mains adapter, instructions, mobile, plugs, earphone, £200. No offers and buyer collects. Tel: Chester (01244) 310267 afternoons/evenings.

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G8BCA. QTHR. Tel: Suffolk (01638) 714051.

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TS-50 h.f. general coverage transceiver, excellent condition, boxed with mobile mount, £600. Yaesu NC29 base charger, £35. Tel: Aylesbury (01296) 747013.

TS-830S, c.w. filter, mic., manual, £475. VFO-230 external VFO, £100. ETM-9C memory keyer, £100. Vectorics VC-300DLP, £95. EP-925, new, £75. Heil HC-4, £20. Quad spkr, £35. Maldol 1:1 balun, £20. GW3TMP on (01352) 771520.

TS-950SDX top of the range model, £2650. MFJ 3kW tuner, £290. MC90 deluxe desk mic., £110. PK900, £390. All less than 40 hours use and in pristine condition, owner emigrated. G3KAF, QTHR. Tel: Stockport 0161-439 4952.

Two Grundig model TK830/3D tape recorders, both working, £50 c/w set service sheets, must collect. Tel: Stourbridge (01384) 444954.

Uniden 175XL scanner, 16 channel, 9 band, 66 to 512MHz, v.g.c., sell or exchange for general coverage RX, cash adjustment either way. GIACPP, QTHR. Tel: (01574) 275407.

Vintage radio, 1945 Vidor model 351 portable, working, operating from battery eliminator, collectors item, i.w.m.w.s.w., offers. Tel: Surrey (01252) 724551.

Vintage valve radio, ever ready portable, circa 1946, ideal restoration project, £8 o.n.o. Also Pilot super 10 record player, three valves, mint condition with instructions, £25. Geoff G6KPA, Stevenage. Tel: (01438) 722964.

Yaesu 6-channel 2m (144MHz) handy, £15. Pyc 2m (144MHz) 25W mobile, £20. Pyc Europa 2m (144MHz), £15. Pyc CS502 handy 2m (144MHz), f.m., £10. Clearone 2m (144MHz) base station, f.m., £25. Shure base mic., £10. Andy, Gwent. Tel: (01633) 420805 between 6-7pm.

Yaesu desk mic. M11, as new, £55. ERA Microreader c.w./RTTY decoder with tutor, £75. P.V.C. G0PGF, QTHR. Tel: 0181-505 0568.

Yaesu FL110 100W 3-30MHz amplifier, £130. FT-727R 144430 hand-held, small fault, £125. Watson Minimag WSM270, £15. WSM1900, £20, both new. Jandek 80m QRP c.w. radio, £45. Howes 3-50MHz a.t.u., £25. all mint. Tel: Norfolk (01953) 884305.

Yaesu FT-101ZD MkIII, WARC bands, fitted c.w. filter, fan, mic., FV-101Z external VFO, SP901P speaker, all manuals, £395. FRG-8800 h.f. communications receiver, 150kHz to 30MHz, manual, £295. All excellent

condition. G3HTA, QTHR. Tel: (01363) 773333.

Yaesu FT-101ZD, WARC, fan, mic., manual, boxed, good condition, £280. G4BRF, Cornwall. Tel: (01503) 272349.

Yaesu FT-707, mic., manual, very good condition, little used, £350. Tel: Wolverhampton (01902) 604586 anytime.

Yaesu FT-767, h.f., 2m, 70cm, new front knobs, £1000 o.n.o. offer, swap 70cm base station and h.f. radio, wanted 6m beam, 70cm beam, mini condition, mic., manual, leads or swap from 706 or Kenwood TS60S, Mick, Yorks. Tel: (01226) 742971 after 6pm.

Yaesu FT-790 MkI, all-mode 70cm, mint condition and complete with case, box and manual, £280. Buyer collects, may play for an FP-757HD, Ian, Walsall. Tel: (01922) 30668 after 5pm.

Yaesu FT-840 with f.m. board, in perfect condition, buyer collects, £720. Yaesu FT-840 with f.m. board, in perfect condition, £700. No offers. John, Derbyshire. Tel: (01283) 221870.

Yaesu FT-840, c.w. filter fitted, £550! Lowe PR-150 pre-selector, £150. Both as new, boxed with manuals. Tel: Penzance (01736) 788003 after 6pm please.

Yaesu FT-840, new, £650. MFJ Versa tuner, £110. W9DSP11 audio filter, £160. Microset PS30, £125. Astatic 575M-6 power mic., £35. Antron 99 vertical, £30. All new and boxed, still under guarantee. RS94569, Northants. Tel: (01536) 522007.

Yaesu FT-900AT, boxed, mint condition, reason for sale, looking for bigger radio, TS850 or TS940 with or without a.t.u. Peter M0AIG, East London. Tel: 0171-515 7353.

Yaesu FT-901DM TX/RX, mains operation, but has 12V converter unit, internal keyer and memory with FC-902 a.t.u., £450. Tel: Dover (01304) 822943.

Yaesu FT-980 h.f. transceiver, once the Yaesu base station flag ship radio, 30kHz to 30MHz, general coverage receiver, 100W transmitter, s.s.b. a.m., f.m., built-in p.s.u., good receiver, filters, £595. Terry G0ANW, QTHR. Tel: (01730) 261859.

Exchange

386DX40 multi-media PC tower. Pace 14400 modem, Galaxy sound card, 420Mb HD 3 1/2 & 5 1/4 floppies, New Chumtree colour monitor, New Epson printer, hundreds of software on CD ROM and disk swap for good receiver. Tel: Northants (01536) 522007.

Sommerkamp FT-150DX h.f. TX, 10, 20, 40, 80, 160m, fully checked since last used, looking for 2m (144MHz) s.s.b. TR-9000/9130 or w.h.y.? Might consider 70cm (430MHz) mobile or dedicated airband plus mods for PRO2022, AOR2002 scanner, J. Tyler, Warks. Tel: (01455) 291680 after 8pm (work shifts).

Trio 120V h.f. transceiver linear plus mobile controller for TNC or 2m rig, suitable for packet freq, w.h.y.? Buyer collects and inspects, plus carriage if absolutely necessary. Steve G0EVI, Lichfield. Tel: (01543) 251915 evenings.

Trio TS-830, Shure 444 desk mic., op manual, service manual, plus Trio TM 2550E 2m, f.m., MC423 mic., manual, boxed, exchange for TS4405AT or TS680S or w.h.y.? Must be gen. cov. Stuart, Glos. Tel: (01453) 752411.

Wanted

1995 edition Radio Amateur Callbook International Listings, Alex. Kent. Tel: (01732) 864920.

Akai 200XD or 400XD (cross field head) reel-to-reel tape recorder/recorders wanted. Will consider others (Sony, etc.) semi-professional reel-to-reel units, but they must have 7inch spool capacity. Contact Rob G3XFD, PW office.

Alinec DJ-180 circuit diagram wanted, also any info on mods or reviews and articles of this unit, photocopies will do. Tel: Glasgow 0141-632 5408.

AVO transistor analyser, must be complete and in good working order. Tel: W. London 0181-384 9199.

AVO valve tester, type CT160, meter required or complete unit considered. Help, where can I get a meter armature re-wound, somebody must know. Pete Shepherd, 25 Tonkins Close, Stafford Le Hope, Essex. Tel: (01375) 640618.

Belcom LS102L 10m (28MHz) mobile radio, must be working. John G0C1HQ, W. London. Tel: 0181-561 3837.

Can you help. I need a video copy of BBC showing of Emptie of the air, the men who made radio on August 24th, all replies on my answerphone will be acknowledged. Tony, Caterham. Tel: (01883) 624687.

Can you help? Desperately needed technical service info, for period high fidelity radiogram PHF20A (bachelors chest). All expenses gladly refunded. N. F. Whale, 62 Kensington Avenue, Colwyn Bay, North Wales LL29 9ST. Tel: (01492) 515673.

Cheap decoder, ie. ERA, etc., will consider anything, must be in good working order. Mike, Hants. Tel: (01730) 821059 after 7pm.

Circuit diagram for FDK multi-quartz 16 photocopy, any info gladly received, your price plus expenses. Tel: Hants (01252) 512388.

CW filter for Kenwood TS-520SE, part number YG-3395C, Niall G0VOK, Northwich. Tel: (01606) 871413 before 7pm.

Dish for PW Exe or similar, 12in to 18in. Parabolic reflector for 10GHz. Also Navico ARM1000S 2m transceiver. Steve G4MJW, Essex. Tel: (01376) 584799.

Early wireless sets, crystal sets, horn speakers, valves, etc., particularly by Marconi, Ericsson, Sterling, Tingey, etc., serious collector with private museum. Will pay well. Jim Taylor, Bournemouth. Tel: (01202) 510400.

Eddystone RX model 1000. Also Cossor oscilloscope model 1039M MkII. C. M. Lindars, Somerset. Tel: (01460) 76143.

Eddystone sets urgently needed to add to my collection, 960, 890, 930, 870, 870A, etc., and scrap sets for spares, please try and help! Peter Lepino, Surrey. Tel: (0374) 128170 anytime.

FDK 70cm transverter model expander 430, fully working or faulty with paperwork, also cheap 6m transverter and small beam. Colin, Norfolk. Tel: (01603) 270740 answerphone, may be in use, no canvassers please.

Ferrite rod aerials, must be half inch in diameter, no more or less and must be six inches long or more. Peter Tankard, Sheffield. Tel: 0114-266 5253 anytime.

FI-101ZD c.w. filter wanted by GW3COI, QTHR. Tel: (01758) 712675.

FT-707 complete, p.s.u. a.t.c., etc., also any decode software/hardware or Ham programs, trying to put together Ham radio CD. Tel: Isle of Wight (01983) 563905 or E-mail 100616.3176@compuserve.com

GEC BRT400 communications receiver, must be 'cosmetically perfect', but working condition unimportant, however, should be restorable. Ian Liston-Smith, Reading. Tel: (01734) 396806 anytime.

Hand-held mic. 50kΩ with p.i.t. for FT-200. Bert, London. Tel: 0181-989 3196.

Handbook and circuit diagram for telequipment D66A scope - buy, borrow and re-imburse. Stuart, Gainsborough. Tel: (01427) 611160 evenings.

Handbook for Trio R1000. Circuit for v.h.f. auto scanner, Censound model MJ666. Jim, Belfast. Tel: (01232) 659577.

HP478A or HP8478B thermistor mount, even if burned out! Phone from 1000 to 1800 or 2030 to 2300. Bob Mueller 49 2461614259 (Germany) or post: KFA/FF, D-52425 Juelich, Germany.

I need operating instructions and service manual for Marc NR-82F1 double conversion 12 band RX on loan or free. Andrew Gani, Box 6624, Surulere, Lagos, Nigeria.

Icom IC-202 s.s.b. portable, must be in good working order and condition, cash waiting or may consider good FT-290 (late model), Terry Jones G6MUQ, London. Tel: 0171-602 8209 evenings or 0181-788 5742 days.

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Overhead projector for RAE and Novice teaching at the Mid-Glamorgan Amateur Radio Group, must be cheap, if faulty, we can repair! Roger Luke, Mid-Glamorgan. Tel: (01656) 733729.

Phase locked loop i.c.s, type 562 for project, your price. John G8MMLK, QTHR. Tel: (01838) 200304 or FAX: (01838) 200641.

Philips FM92 U25 manual (u.h.f. mobile), buy or borrow copy and return. All costs covered, also someone to program an Eprom for 70cm. Tony Hall G0MQG on (01603) 744197.

Philips square tape video recorder, Douglas G3KPO, Isle of Wight. Tel: (01983) 567665.

Pin out details and voltages of GEC cathode ray tube, type 1374P, will remit postage. A. Coucman, 3 Manor Grove, Sittingbourne, Kent ME10 1LT.

R1000 photocopies articles, SWM alignment issues, 3 + 4 1982, QST test 12/1980, PW AGC mod 8/1981, HR mod 8/1982 and missing SWM issues Sept 1987, Dec 1988. Please write first. P. Hawkins, 4 Albert Road, Cinderford, Glos GL14 2HS.

RA117 Racal wanted, urgent, also I.f. unit and s.s.b. unit to fit, your price or swap Eddystone 7304 770R, choice of two, also Ajax marine TX/RX, 200W output, all good. John, Staffordshire. Tel: (01538) 385735.

Racal add on units to fit RA17L, I.f., s.s.b., urgently seeking antenna unit also. Will collect, anywhere. Racal case wanted to take RA17: and I.f. unit together. D. Collins, Staffs. Tel: (01538) 385735.

Racal RA63 sideband and RA37 low frequency adapters, also home-brew receivers, G2DAF MkII G3PDM and G4DTC 'ultimate'. Tony, Worcester. Tel: (01905) 641759.

Radio telephone as fitted to motorcycles and used by the emergency services from the 50s to 70s, v.h.f., a.m. or f.m., any make, ie. FCC, Cossor, Plessey, Pye, Ultra, etc. Fred Baker, 80 Pelham Road, Wimbledon, London SW19 1NY. Tel: 0181-241 5880.

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Setting-up info. for Western Electric DX33 tri-band Yagi, copy very much appreciated. Keith G3TLB, E. Sussex. Tel: (01892) 655527.

Tokyo HY power HT180 80m (3.5MHz) s.s.b. rig or Yaesu FT-7 or FT-7B h.f. mobiles, Must be in working order, would consider Icom IC-730 or Yaesu FT-77 if cheap! Mike G1HED, QTHR. Tel: (01926) 513073.

TS-700G with or without faults, 2m, all-mode. Tel: Cumbria (01229) 828114.

Valve C19 transmitter or transceiver for h.f. bands, non-working accepted if complete and unmodified, also crystals for Novice frequencies or w.h.y.? Geoff, Dorset. Tel: (01202) 698142 after 6pm.

Yaesu FP107E power supply, would like a cream coloured front one, but a grey one is okay, must be in good condition with no mods. Pete, Bristol. Tel: (01454) 887461.

Yaesu FT-747X or similar mobile rig, Mike Nixon, Worcs. Tel: (01684) 894035 day or (01684) 561687 evenings.

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PACKET PANORAMA

Roger Cooke G3LDI looks at the packet scene and starts off by continuing where he left off last time on the subject of libel on BBS systems.

I have recently received several letters from individuals on the subject of Libel on BBS systems, including one from Alex LA0GV/G4TTB. He makes some very interesting points in his letter.

In view of the outcome of an Australian case, in which an amateur BBS Sysop was fined \$40,000, I think we should all be more wary of our situation. 'The Law may be a Ass', to quote Dickens, but it's the only way that matters of libel can be settled, and if precedents have been set, as they appear to have been already, then those generating graffiti stand to lose the wall upon which they write their garbage.

I still stand by my original suggestion of years ago, that a good and compulsory password system is the way to control our network. Read this quoted passage from Alex LA0GV/G4TTB and make up your mind:

"The current situation seems to be that a person who PUBLISHES a libel is as responsible in law as the author of the libel, and this can clearly be applied with some justice and precision to a newspaper publisher or anyone else who presents a written publication. Since the insertion of the libel into the printed document required a conscious effort by an editor who would have had the opportunity to read the subject matter, discuss it with learned advisors, and come to a decision prior to print.

Position Of Responsibility

Alex continues: "In this case, a publisher would be in a position of responsibility, as he would have had fore-knowledge, and total control over the contents of the publication. Clearly the IT and Telecom revolution has produced a system of general access noticeboards, which can take in and relay a vast amount of material to a large and widely spread readership, at a considerably greater rate than any one person can read.

"Although the aged, long-wigged decision-makers may deem these noticeboards to be publications, which are very different in the way they are controlled to the established publishers of paper material. Input to

the noticeboard does not require any conscious effort on the part of the controller, let alone approval and subsequent action, since the author of an article can enter it directly, and reach a readership without further control.

"The new situation is so different to the old, that one wonders if the same laws can be applied by deeming that a PBBS be a means of publishing, and the Sysop the publisher. The use of well-tryed words to classify a new development is not really justified.

"For example, cars have replaced horses, but surely we don't think of them as 'horseless carriages'? Would a layman really insist that a London Taxicab be tethered to a lamp post while the driver stops for tea?

"In the same way, the electronic mailbox is not at all similar to a printed journal, the editor's role does not carry the same meaning, and open access is the key difference. The electronic systems need to be considered for what they are today, not what they have replaced in the past. This difference in evaluation must be legislative.

"In coming to terms with the existence of BBSs, the responsibility of the users for content and the operators for performance would be put onto a rational and practical basis, and would allow Sysops to sleep soundly at night. Unfortunately, I am not sure that the arguments directed to removing responsibility from an identifiable individual (however innocent), and passing it over to 'someone else, somewhere else', however culpable, are ever listened to sympathetically by lawyers, who insist that responsibility be placed firmly on those who can be reached." Thanks for that Alex, I'm sure readers of this column will find it very interesting.

The new rules do state that all locally entered bulletins be held for review. This includes compressed material, which should be inspected before release, and so on.

If the sysop were to carry this ruling out to the letter of the law, then he would have to spend most of the day in front of the computer. Obviously not a very satisfactory or practical solution.



Fig. 1: Gordon Brookes G7OEB world BBS database author.

However, a precedent is all that is required, and one has been set in Australia. Have you got £20000 to pay in fines? I haven't, and don't intend to either. It's about time for mandatory passwords, issued on a personal basis only. What do you think? Let me know.

Bulletin Problem

Sending a bulletin to other countries has always been a problem for a large number of users. Most seem to opt out of targeting the bulletin by sending it @WWW.

Thus, a message intended for the Sydney area of Australia wends it's way aimlessly around the globe, stopping at every BBS on it's way, to the annoyance of Sysops. There is no excuse for sending any message World-Wide.

By the time the message reaches every BBS, it will be long out of date anyway, plus some HF BBS (mine included) do not forward WWW mail. By far the better way of targeting bulletins is to have access to a listing of BBS world-wide, and use of the REDIST server, to target your bulletin accurately.

Gordon Brookes G7OEB, has produced an up-to-date listing of World-Wide BBS. This listing includes over 4000 BBS in approximately 145 countries.

There is no excuse now for not knowing where to send your mail. Every BBS should have a copy of Gordon's listing in its files for user access.

Not only does the listing give the call, HR address and full details, but

there are also over 550 files of other information, including PACTor/AMtor mailboxes, RTTY stations, QSL bureau listings, DXCC country and zone lists, IP BBS, repeaters and much much more.

There is even a directory dedicated to the REDIST server, so now there is really no excuse! Gordon must have put in months of work to collate all this information, and all credit to him for a great job. He maintains and updates the list too, as much as he can. I have installed it on the BBS here in Norwich and I hope my users make use of it.

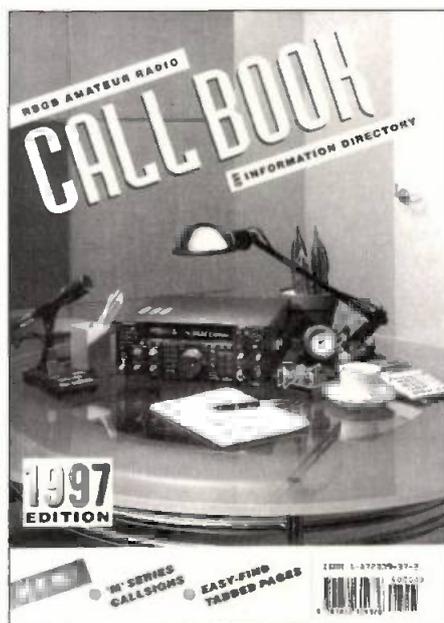
If you would like a copy, please send a formatted HD disk to Gordon G7OEB at 38 Mersey Street, St Helens, Merseyside WA9 2JX. Please include the customary s.a.s.e. and mailer with sufficient postage to obtain the return of your disk.

If your local BBS does not have the listing installed, then prod the Sysop, or send for it yourself and ask your Sysop to install it! Gordon is pictured at his station in Fig. 1.

That's all I've got for you this time so until January, happy packeting
73 de Roger G3LDI @
GB7LDI.#35.GBR.EU or The Old
Nursery, The Drift, Swardston,
Norwich. Tel: (01603) 570278.

END

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Wanted

WANTED FOR CASH Valve or solid state communication receivers Pre-1980. Preferably working and in good condition. Non working sets considered also domestic valve radios. Items of Government surplus wireless equipment and obsolete test equipment. Pre-1965 wireless and audio components and accessories. Pre-1975 wireless and TV books and magazines. Also, most valves wanted for cash. Must be unused and boxed. CBS, 157 Dickson Road, Blackpool, FY1 2EU. Tel: (01253) 751858 or Fax: (01253) 302979.

FERRITE ROD AERIALS. Must be half inch in diameter - no more or less. Must be six inches long or more. Contact Peter Tankard on Sheffield 0114-266 5253 anytime.

Educational

CITY & GUILDS RADIO AMATEURS EXAM. Pass your exam the easy way with an RRC home study course. For details write or phone THE RAPID RESULTS COLLEGE, Dept. JX400, Tuition House, London SW19 4DS. Tel: 0181-947 2211.

RAE: Pay-as-you-learn correspondence. £3 per lesson, includes tuition. Ken Green C.Eng. MIEE, Chylean, Tintagel, Cornwall. Tel 01840 212262.

HEATHKIT EDUCATIONAL PRODUCTS UK distributor/spares and service centre. Cedar Electronics, 12 Isbourne Way, Broadway Road, Winchcombe, Cheltenham, Glos GL54 5NS. Tel: (01242) 602402.

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The publishers of *Practical Wireless* wish to point out that it is the responsibility of readers to ascertain the legality or otherwise of items offered for sale by advertisers in this magazine.

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(01254) 59595

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Traders

YOUR GUIDE TO SECOND-HAND EQUIPMENT

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01702 206835

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 ICOM IC-728 HF transceiver inc FM £749
 ICOM IC-729 HF transceiver with 6m and FM £799
 ICOM IC-735 HF transceiver £649
 ICOM IC-735 HF transceiver £699
 KENWOOD TS-950SD HF 150W transceiver with NCW, NSSB £1699
 KENWOOD TS-680S HF transceiver with 6m (10w), 12v £699
 KENWOOD TS-440S HF transceiver £699
 KENWOOD TS-450SAT HF transceiver with internal ATU £949
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 MFJ 9030 30M CW 5w portable transceiver £129
 MFJ 9020 20M CW 5w portable transceiver £129
 MIZUHO MX-28S 10M QRP handheld transceiver £179
 TRIO TS-530SP HF transceiver £399
 TRIO TS-530S HF transceiver £369
 YAESU FT-301 Solid state HF transceiver £299
 YAESU FT-7B + DVFO HF transceiver with digital VFO £279
 YAESU FT-757GX HF transceiver £499

MOBILE / BASE STATION

ICOM IC-260 2m 10w multimode mobile £299
 ICOM IC-25E 2m 25W FM mobile transceiver £179
 AKD 4001 4m 25W FM mobile £149
 ALINCO DR-119E 2m 50w FM mobile £199
 STANDARD C7900 70cms 10 FM mobile £149
 AZDEN PCS-6000 2m FM mobile £179
 KENWOOD TW-2550 2m 25W FM mobile transceiver £169
 KENWOOD TR-751E 2m 25W multimode transceiver £499
 YAESU FT-290R 2m multimode portable transceiver £229
 YAESU FT-290R 2m multimode with Mutek front end £249
 YAESU FT-290RH 2m multimode portable transceiver £399

HANDHELDS / PORTABLE

ADI 145 2m Handheld £129
 ALINCO DJ-160 2m Handheld £149
 ALINCO DJ-180 2m handheld £149
 ALINCO DJ-580 2m/70cms handheld £299
 ALINCO DJ-G5 2m/70cms handheld Ex-demo £369
 AOR TR-720 Airband transceiver £199
 CTE CT-1600 2m handheld, thumbwheel £99

HAYDON COMMUNICATIONS

0181-951 5781/2

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TS-50S HF As new £3649.95
 TS-850S HF VGC £31099.95
 IC-725 HF VGC £3549.95
 IC-735 HF As new £3649.95
 TS-140S HF VGC £3649.95
 TS-404SAT 3 available from £3649.95
 FT-980 HF VGC £3549.95
 TS-530S Excellent condition £3429.95
 HF-150 RECEIVER As new £3299.95
 HF-225 As new + key pad £3349.95
 FRG-100 As new £3399.95
 R-5000 + VHF converter £3799.95
 R-2000 + VHF converter £3399.95
 R-8E As new £3749.99
 TS-430S HF TCVR VGC £3549.99
 FT-840 HF TCVR As new £3679.99
 NRD-535 + ECSS UNIT As new £31149.99
 NRD-525 +RS-232PCB! VGC £3699.99
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 SP-150 VHF-UHF base/mobile FT-726R 2m/70cms + 10m £3649.99
 FT-736R 2m/70/6m as new £31249.99
 TM 241E 50W FM mobile £3229.95
 DR-130 50W FM mobile £3219.95
 FT-290R VGC All mode £3299.95
 DR-510 HI-PWR dual band MOB £3329.95
 IC-260D 2m all mode £3269.95

HAND HELDS

DJ-580 As new 2/70 £3299.95
 DJ-560 Excellent 2/70 £3229.95
 TH-79E As new 2/70 £3299.95
 TH-77E As new 2/70 £3219.95
 TH-215E 2m/keypad etc £3149.95
 DJ-191 As new 2m £3169.95

SCANNERS

SONY PRO-80 As new £3199.95
 IC-R1 0.5-1300 MHz £3279.95
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 AR-2000 0.5-13000 MHz £3179.95
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 R-7100 BASE 25-2 GHz £3999
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 AX-7000 Standard base £3299.95
 WS-1000E H/HELD As new £3229.95
 AR-8000 As new £3319.95
 MVT-7100 As new £3249.95
 PRO-43 As new £3149.95
 MVT-8000 BASE 5-1300 MHz £3299.95

ACCESSORIES

FTC-901R TVRTR 2m £399.95
 FC-700 ATU £399.95
 AT-120 Tuner £369.95
 HX-240 Transverter £3129.95

LOWE ELECTRONICS

01629 580800

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icom IC726 HF Transceiver and 6m, £625.00
 Icom IC728 HF Transceiver £595.00
 Kenwood TS440S HF Transceiver / General coverage RX £650.00
 Kenwood TS50S Mobile HF Transceiver £600.00
 Kenwood TS530SP HF Transceiver valve PA £499.00
 Kenwood TS680S HF Transceiver with 6m £595.00
 Kenwood TS830S HF Transceiver, £595.00
 Kenwood TS850SAT HF Transceiver with auto ATU £1250.00
 Yaesu FT747GX HF Transceiver £495.00
DATA COMMS
 Kantronics KAM Multiomde TNC £185.00
 Kantronics KAM PLUS Multimode TNC V7.1 £299.00
 Kantronics KPC3 Single port TNC £115.00
 Kantronics KPC4 Dual port TNC v 5.0 £215.00
VHF/UHF TRANSCEIVERS
 Alinco DJ160E 2m handheld £160.00
 Alinco DJ180E 2m Handheld £160.00
 Alinco DRM06SX 6m FM Mobile Transceiver £215.00
 Icom IC24ET Dual band handheld transceiver £269.00
 Icom IC2SE 2m Handheld £150.00
 Kenwood TH205E 2m Handheld £150.00
 Kenwood TH28E 2m Handheld with 70cms RX
 Kenwood TH45E 70cms handheld
 Kenwood TH46E 70cms Handheld with ctcss
 Kenwood TH47E 70cm Handheld
 Kenwood TH75E Dual band handheld with speaker mic
 Kenwood TH78E Dual band handheld, £298.00
 Kenwood TM231E 2m Mobile, £195.00
 Kenwood TM451E 70cms Mobile with 2m RX £330.00
 Kenwood TM733E Dual band Mobile £495.00
 Yaesu FT11R 2m Handheld £195.00
 Yaesu FT203R 2m Handheld £149.00
 Yaesu FT2200 2M FM mobile transceiver £289.00
 Yaesu FT290R 2m Multimode base/mobile/portable £225.00
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 JRC NRD53S Top class receiver, £1000.00
 Kenwood R2000 HF Receiver with VHF Converter fitted £475.00

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0181-566 1120

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 ICOM IC24ET 2m/70cms FM handportable inc nicad/charger £199.00
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 ICOM IC2GXE 2 metre handheld £125.00
 ICOM IC2SE 2m FM handheld transceiver £125.00
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 ICOM IC725 HF all band transceiver with FM board £549.00
 ICOM IC725 HF all band transceiver with FM board £550.00
 ICOM IC726 HF/50MHz all mode transceiver £595.00
 ICOM IC729 HF/50MHz transceiver £729.00
 ICOM IC735 HF transceiver with general coverage £695.00
 ICOM IC735 HF transceiver with general coverage £695.00
 ICOM IC737 Latest HF transceiver with auto ATU £995.00
 ICOM IC751 General coverage HF transceiver £695.00
 ICOM IC765 HF transceiver general coverage £1495.00
 ICOM IC820H Latest 35W/45W 2M/70CM base station transceiver, 12V DC £999.00
 ICOM ICPS15 Power supply unit £99.00
 ICOM ICPS15 Power supply unit £125.00
 ICOM ICRI1 Smallest handheld receiver £225.00
 ICOM ICR7100 Latest 25MHz-1000MHz 1025MHz-2000MHz receiver £899.00
 ICOM ICR7100HF Latest 25MHz-1000MHz 1025MHz-2000MHz receiver - two months only £950.00
 ICOM ICR71E Communications receiver £595.00
 ICOM ICR72E General coverage receiver £495.00
 ICOM ICR9000 100KHz-2GHz receiver CRT display £2500.00

FOR YOUR SPECIAL DEALER RATES CALL PAUL ORCHARD ON 01202 659920

Table

YOUR GUIDE TO SECOND-HAND EQUIPMENT

ARC

01925 229881

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Yaesu FT-990 HF transceiver in excellent condition £1000

Yaesu FT-900AT HF transceiver £950

Yaesu FT-747GX plus VC-

300DLP/Manson EP-920 PSU £695

Yaesu FT-102 + FC-102/FV-102DM

£799

Yaesu FT-102 good condition £475

Icom IC-765 HF transceiver very good condition £1500

Kenwood TS-850SAT plus PS-52/SP-31 etc

Kenwood TS-850SAT plus DSP-100 £1575

JRC JST-135HP plus PSA etc

Drake line up - 4XB tx/R4B rx/TC2 tx

conv/MS-4 spkr/PSU/CC1 converter

console offers

HF RECEIVERS

Drake R-8E in very good condition £650

Icom IC-R7000 plus voice

synthesizer/remote control £750

Icom IC-R71 in good condition £650

Icom IC-R70 boxed £350

Yaesu FRG-8800 plus VHF Converter

£499

Yaesu FRG-7700 plus FRT-7700/FRV-

7700 £375

Yaesu FRG-100 including PSU £375

AOR AR-3000A in good condition £699

Kenwood R-5000 boxed £699

MOBILE/BASE STATIONS

Yaesu FT-726R VHF/UHF all mode

transceiver £699

Kenwood TM-742 including 10m

module in mint condition £625

Kenwood TR-9130 2m multimode £325

Kenwood TR-9000 including

microphone/lead/book £300

Yaesu FT-290R plus 30watt linear £299

Icom IC-2901 complete with

book/box/microphone/lead £300

Yaesu FT-790 complete with microwave

modules 30 watt linear/FP-80A PSU

£425

HANDHELDS

Kenwood TH-21 2m Handheld £99

Kenpro KT-22 complete with

antenna/charger/ncad/manual £80

Icom IC-04E 70cms Handheld £150

Icom IC-2E boxed £110

Icom IC-2SET boxed in good condition

£225

Icom IC-2SAT moded but requires a

charger £125

Standard C-150 2m handheld £150

Standard C-528 dualband handheld plus

accessories £275

SCANNERS

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accessories £150

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Coverage Transceiver. (Mint Condition)

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Icom IC-730 100W 80 - 10M Amateur

Band Transceiver £349.00

Icom IC-738 100W HF General

Coverage Transceiver with Auto ATU

(Mint) £1100.00

Yaesu FT-707 100W 80 - 10M

Amateur Band Transceiver c/w

matching ATU, memory unit and

Heavy Duty power supply £475.00

Icom IC-735 100W HF General

Coverage Transceiver c/w AT100 Auto

ATU and Shure Desk mic. £699.00

Kenwood TS-50S 100W HF Mobile

General Coverage Transceiver (Demo)

£829.00

HANDHELDS

Yaesu FT-470 2M/70cms Dual Band

Handheld £249.00

Kenwood TH-75E 2M/70cms

Handheld c/w speaker mic. £249.00

Yaesu FT-76R 70cms Handheld

£159.00

Alinco DJ-F1E 2M handheld £159.00

MOBILE/BASE

Icom IC-290E 10W 2M Multimode

(Very good cond.) £269.00

Kenwood TM-733E 2m/70cms Mobile

with removable front panel. (VGC)

£479.00

Kenwood TM-701E 2M/70cms Mobile

Transceiver (VGC) £329.00

Yaesu FT-290R1 2M Multimode 2.5W

output. £249.00

Trio TM-201A 25W 2M Mobile.

£179.00

Kenwood TH-22E 2M Handheld,

battery box, no charger. £139.00

ACCESSORIES

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Tokyo HX-240 2M to HF Transverter,

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£189.00

SMC SOUTHAMPTON

01703 255111

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PX FT757GX Yaesu HF 100W £525

PX FC757AT Yaesu HF A/ATU £295

PX FC700 Yaesu HF ATU £169

PX HT180 Tokyo HF 80mtr £289

PX IC737 Icom HF 100W £1195

PX IC726 Icom HF +6mtr £899

PX IC729 Icom HF +6mtr £1060

LX FTONE Yaesu HF 100W £675

LX FT890AT Yaesu HF 100W £1250

LX TS520SE Kenwood HF Valve £335

AX FT767GX Yaesu HF 100W £1450

AX IC765 Icom HF 100W £1699

RX JST10 JRC HF 100W £395

RX FT101 Yaesu HF Valve £260

RX FT102 Yaesu HF Valve £450

RX FT729 Yaesu HF Mobile £450

RX FT7 Yaesu HF Mobile £240

RX TS690 Kenwood HF/6m £1175

RX TS440 Kenwood HF 100W £750

RX IC726 Icom HF 100W £1850

RX 2K1 Icom HF L/Amp £1595

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PX FT290RU Yaesu 2mtr port. £375

PX FT690RII Yaesu 6mtr port. £375

PX IC900E Icom 2mtr/70cm £475

PX C500 Standard VHF/UHF £219

LX TH21E Kenwood 2mtr port. £100

AX FT790R Yaesu UHF port. £310

AX TM-732E Kenwood 2mtr/70cm

£525

AX IC2GE Icom 2m trans. £179

RX DJ560 Alinco 2mtr/70cm £335

RX FT76 Yaesu 70cm port. £155

RX FT212RH Yaesu 2mtr FM £175

RECEIVERS

PX AR2800 AOR RX M/base £359

PX AR3000 AOR 1klHz - 2ghz £599

PX AR1500 AOR Scanner. £225

PX HP200E Fairmate Scanner £179

PX FR101 Yaesu HF Ham £175

PX FRG9600 Yaesu VHF/UHF £389

PX ICF-7600 Sony Portable RX. £119

PX PRO2006 Realistic B/Scanner £249

LX ICR-72 Icom HF RX. £675

LX AR3030 AOR Scanner £485

LX FRG7 Yaesu HF Receiver £165

AX PRO-80 Sony S/wave RX. £120

AX HF150 Lowe HF Receiver £325

RX ICR1 Icom H/H Scanner £185

RX PRO43 Realistic Port Scanner £110

RX HF225 Lowe HF Gen RX. £445

RX NR1525 JRC HF Gen. RX. £725

RX FRG7700 Yaesu HF Gen. RX. £225

PX = SMC (Ch./Ford) HQ 01703 - 251549

RX = Reg Wards 01297 - 34918

LX = SMC Leeds 01132 - 350606

AX = ARE London 0181 - 9974476

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HF EQUIPMENT

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Base Mic. Only few hours on air.

£1295.00

Icom 735. HF + 6Mtrs. Boxed.

£1275.00

Yaesu FT707 c/w FC700 ATU £395.00

Yaesu FT102 VGC. Fm. Fitted

£475.00

Yaesu FT102 c/w FC102. ATU. VGC

£495.00 pair

Yaesu FT101E Mint c/w Frequency

counter £275.00

Yaesu FT101EE VGC £250.00

Yaesu FT1 c/w filters and Kenwood

MC50 Mic £395.00

Yaesu FT101Z as new £275.00

Icom AT180 Auto ATU £145.00

Yaesu FR101 HF Receiver £185.00

Grundig Satellit 00 as new £265.00

Datong UC/1 HF to VHF Receive

Converter £125.00

Tokyo HX240 2Mtr to HF Transverter,

3.5/7/14/21/28.Mhs £165.00

VHF/UHF

Kenwood TM251 2Mtr Mobile Ex.

Demo. Unmarked. 12mth. Guarantee.

£355.00

Icom IC 281H.2Mtr Mobile. 70cm

Rx. Ex. Demo. Unmarked. 12mth.

Guarantee £345.00

Trio TW4000 2mtr/70cm. Mobile

VGC £295.00

HAND HELD TRANCEIVERS

Icom IC32 Dual Band H/H £195.00

Icom IC02E 2Mtr H/H c/w speaker

mic and 2 batteries £135.00

Trio TH22E 2Mtr H/H £120.00

Disclaimer

Advertisements from traders for equipment that is illegal to possess, use or which cannot be licensed in the U.K. will not be accepted. While the publishers will give whatever assistance they can to readers or buyers having complaints, under no circumstance will the magazine accept liability for non-receipt of goods ordered, late delivery or faults in manufacture.

FOR YOUR SPECIAL DEALER RATES CALL PAUL ORCHARD ON 01202 659920

BUYERS GUIDE

AMATEUR RADIO

Welcome to The Practical Wireless Amateur Radio Buyers Guide. This has been compiled from information supplied by the various manufacturer's specification sheets. It is only intended as guide as to what you can expect to find on the dealer's shelves and to help you decide which radio will suit your needs.

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

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

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

	MODEL	COVERAGE	MODES	POWER OUT (W)	POWER SOURCE	CHARGER SUPPLIED	SIZE (HxWxD MM)	WEIGHT	MEMORIES	SPECIAL FACILITIES	RRP £approx	REVIEWED IN PW	MODEL	
HAND-HELD	Alinco													
	DJ-G5	V, U	F	5, 3.5, 1	B*	✓	138x57x275	350g	100	C, D, E	440.00	Sept 95	DJ-G5	
	DJ-S41	U	F		B	x	100x55x288	185g	20	C, D	149.95	Nov 96	DJ-S41	
	DJ-190	V	F	5, 3.5, 1.5	B, E	✓	151x57x27	300g	40	D	199.95	May 96	DJ-190	
	DJ-191	V	F	5, 3.5, 1.5	B, E	✓	151x57x28	300g	40	-	249.95	Dec 95	DJ-191	
	DJ-180	V	F	5, 2	B, E	✓	132x58x33	-	10	D, E	199.95	Feb 93	DJ-180	
	Icom													
	IC-T7E	V, U	F	4, 3	B, E	✓	122x57x29	320g	70	C, D	329.00	June 96	IC-T7E	
	IC-W31E	V, U	F	5, 7?	B, E	✓	125x57x31	340g	100	C, D	425.00	Oct 95	IC-W31E	
	IC-2GXE	V	F	7, 2.5, 1	B, E	✓	125x57x35	355g	43	-	255.00	-	IC-2GXE	
	Kenwood													
	TH-22E	V	F	5, 3, 2.5	B, E	x	116.5x56x24.5	290g	40	D	254.95	Mar 94	TH-22E	
	TH-28E	V	F	5, 2.5, 0.2	B, E	x	115.8x49x37.8	330g	40	D	319.95	-	TH-28E	
	TH-42E	U	F	5, 3, 2.5	B, E	x	116.5x56x24.5	290g	40	D	289.95	-	TH-42E	
	TH-48E	U	F	5, 2.5, 0.2	B, E	x	115.8x49x37.8	330g	40	D	369.95	-	TH-48E	
TH-79E	V, U	F	5, 3, 2.5	B, E	x	129.5x56x24.5	320g	80	AB, D, M	479.95	Dec 94	TH-79E		
Yaesu														
FT-10R	V	F	5, 2.8, 1, 0.1	B, E	✓	57x99x30	325g	3	C, D, K	249.00	Nov 95	FT-10R		
FT-11R	V	F	5, 1.5	B, E	✓	102x57x25.5		150	E	299.00	-	FT-11R		
FT-23R	V	F	5	B, E	✓	126x55x32		10	-	199.00	-	FT-23R		
FT-40R	U	F	5, 2.8, 1, 0.1	B, E	✓	57x99x30	325g	30	C, D, K	289.00	-	FT-40R		
FT-41R	U	F	5, 1.5	B, E	✓	102x57x25.5		150	E	369.00	-	FT-41R		
FT-50R	V, U	F	5, 2.8, 1, 0.1	B, E	✓	57x99x30	325g	112	C, D, E, K	339.00	Aug 96	FT-50R		
FT-51R	V, U	F	5, 1.5	B, E	✓	119x56x28		120	D, E	489.00	May 95	FT-51R		
FT-530	V, U	F	5, 3, 1.5, 0.5	B, E	✓	134x55x33		82	C, E	449.00	Apr 93	FT-530		
MOBILE	BRACKET SUPPLIED													
	Alinco													
	DR-MO6	V	F	10, 1	E	x	40x140x115	760g	100	C, D	339.95	Dec 94	DR-MO6	
DR-130	V	F	50, 5	E	x	40x140x155	860g	20	C, D	289.95	-	DR-130		
DR-150	V	F	50, 25, 10	E	x	40x140x129	800g	100	C, D, E	359.95	June 95	DR-150		

Keys

Coverage

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

- L 100kHz - 30MHz
- H 30 - 50MHz
- T 50 - 52MHz or 70 - 70.5MHz
- V 144 - 145.995MHz
- U 430 - 439.995MHz
- S 1200 - 1300MHz

Modes

- A AM
- F FM
- S Sideband
- D Data

Power Source

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

Special Facilities

- A Antenna Tuning Unit built-in
- AB Automatic Band Change
- C CTCSS

- D Double Conversion Superhet
- D+ Triple Conversion Superhet
- D++ Quadruple Conversion Superhet
- E Extended Receive
- G General Coverage Receiver
- K Keypad Options
- M Dot Matrix Display
- P 9600bps Packet Operation without mods needed
- S Channel Scope
- T Theft Deterrent Front Panel
- * Includes one extra coverage band

	MODEL	COVERAGE	MODES	POWER OUT (W)	POWER SOURCE	CHARGER SUPPLIED	SIZE (HxWxD MM)	WEIGHT	MEMORIES	SPECIAL FACILITIES	RRP £approx	REVIEWED IN PW	MODEL	
MOBILE	DR-430	U	F	35, 5	E	x	40x140x155	860g	20	C,D	389.95	-	DR-430	
	DR-605	V,U	F	50, 35, 5	E	x	40x140x176	1100g	100	C,D,P	495.95	Oct 96	DR-605	
	DR-610	V,U	F	50, 10, 5	E	x	40x140x162	1100g	120	C,D,PS	649.95	July 95	DR-610	
	Icom													
	IC-2000	V	F	10, 5	E	x	50x150x151	1200g	30	D	369.00	-	IC-2000	
	IC-2350H	V,U	F	50, 10, 5	E	x	40x140x204.5	1200g	110	D	495.00	-	IC-2350H	
	IC-281H	V	F	50, 10, 5	E	x	40x140x171	930g	60	D,P	399.00	-	IC-281H	
	IC-481H	V	F	35, 10, 5	E	x	40x140x171	930g	60	D	465.00	-	IC-481H	
	IC-2710H	V,U	F	50, 35, 10, 5	E	x	40x140x212.4	1400g	220	D	675.00	-	IC-2710H	
	Kenwood													
	TM-251E	V	F	50, 10, 5	E	x	40x140x160	1000g	40	C,D,E,P	419.95	June 94	TM-251E	
	TM-255E	V	F,S,D	40, 5	E	x	60x180x216	2700g	100	D,P	949.95	May 94	TM-255E	
	TM-455E	V	F,S,D	35, 5	E	x	60x180x216	2700g	100	D,P	949.95	-	TM-455E	
	TM-451E	U	F	35, 10, 5	E	x	40x140x160	1000g	40	C,D,E,P	459.95	-	TM-451E	
	TM-733E	V,U	F	50, 35, 10, 5	E	x	40x140x153	1200g	70	D,E,T	729.95	Sept 94	TM-733E	
	TM-742E	V,U,(HS/M)	F	50, 35, 10, 5	E	x	50x150x175	1500g	100	AB,D,E	879.95	-	TM-742E	
	TS-50S	L,H	A,F,S,D	100, 25	E	x	60x179x233	2900g	100	D+	1059.95	June 93	TS-50S	
	Yaesu													
	FT-2200	V	F	50, 20, 5	E	✓	40x140x160	-	50	E	419.00	-	FT-2200	
	FT-290RII	V	F,S,D	2.5	E	x	57x150x194	-	-	-	599.00	Dec 81	FT-290RI	
	FT-690RII	T	F,S,D	2.5	E	x	57x150x194	-	-	-	649.00	-	FT-690RII	
	FT-790RII	U	F,S,D	2	E	x	57x150x194	-	-	-	749.00	-	FT-790RII	
	FT-2500M	V	F	50, 25, 5	E	✓	50x60x160	-	31	C	399.00	Sept 94	FT-2500M	
	FT-3000M	V	F	70, 50, 25, 10	E	✓	40x140x180	1250g	81	D,E	479.00	June 96	FT-3000M	
	FT-7200	U	F	35, 15, 5	E	✓	40x140x160	-	50	-	559.00	-	FT-7200	
FT-7400H	U	F	35, 15, 5	E	✓	50x60x180	-	31	C	559.00	Sept 94	FT-7400H		
FT-8000R	V,U	F	50, 35, 10, 5	E	✓	40x140x152	1000g	110	D,E,P	549.00	-	FT-8000R		
FT-8500	V,U	F	50, 35, 10, 5	E	✓	40x140x155	-	110	E,P	749.00	Nov 95	FT-8500		
FT-5100	V,U	F	50, 35, 5	E	✓	40x140x155	-	94	C,E	679.00	May 93	FT-5100		
BASE STATIONS														
Alinco														
	DX-70	L,H,T	A,F,S,D	100, 40, 10, 4	E	x	58x178x230	2700g	100	D	895.95	Aug 95	DX-70	
Icom														
	IC-706	L,H,T,V	A,F,S,D	100, 40, 10, 5, 4, 2	E	x	58x167x200	2500g	102	D+,E,M,S	1195.00	Feb 96	IC-706	
	IC-728	L,H	A,F,S,D	100, 40, 10	E	x	94x241x239	4600g	26	D+,G	1089.00	-	IC-728	
	IC-736	L,H,T	A,F,S,D	100, 40, 5, 4	E	✓	111x330x285	10500g	101	A,D+	1969.00	-	IC-736	
	IC-775DSP	L,H	A,F,S,D	200, 50, 5	E	✓	150x424x390	16700g	-	A,D++	3699.00	-	IC-775DSP	
Kenwood														
	TS-60s	T	A,F,S,D	90, 23	E	x	60x179x233	2900g	100	D+	999.95	-	TS-60s	
	TS-870s	L,H,T,V,U,S	A,F,S,D	100, 25	E	x	120x330x334	11000g	100	A,D++	2399.95	Dec 95	TS-870s	
	TS-950SDX	L,H,T,V,U,S	A,F,S,D	150, 40	E	x	141x402x400	23000g	100	A,D+	3999.95	-	TS-950SDX	
Yaesu														
	FT-736R	L,H,T,S	A,F,S,D	25, 10	E	x	129x368x286	-	100	-	1699.00	June 88	FT-736R	
	FT-840	L,H	A,S,D	100, 25	E	x	93x238x243	-	100	C	959.00	Mar 94	FT-840	
	FT-990	L,H	A,F,S,D	100, 25	E	x	129x368x335	-	90	A	2199.00	Dec 91	FT-990	
	FT-1000	L,H	A,F,S,D	200, 50	E	x	150x420x375	-	100	A	3799.00	-	FT-1000	
	FT-1000MP	L,H	A,F,S,D	100, 50, 25	E	x	135x410x347	-	100	A,D++	2849.00	-	FT-1000MP	

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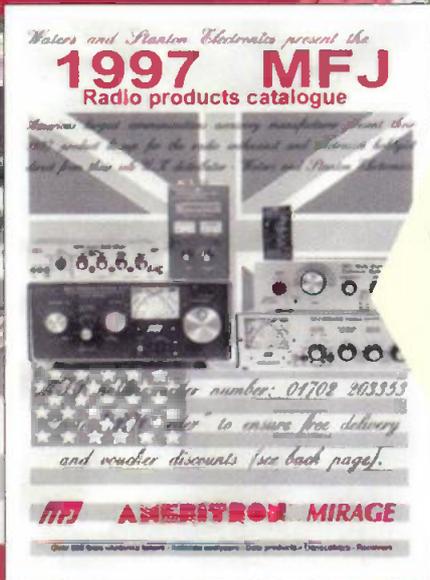
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