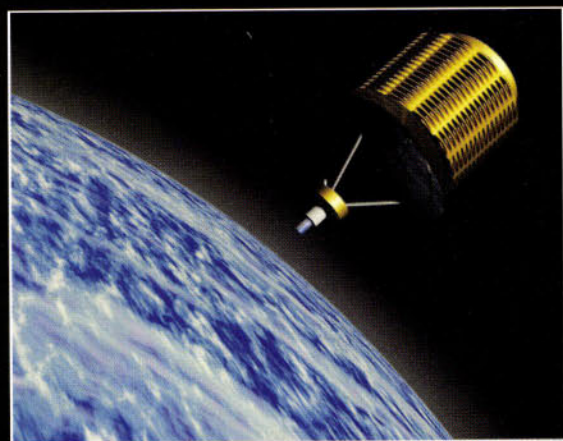


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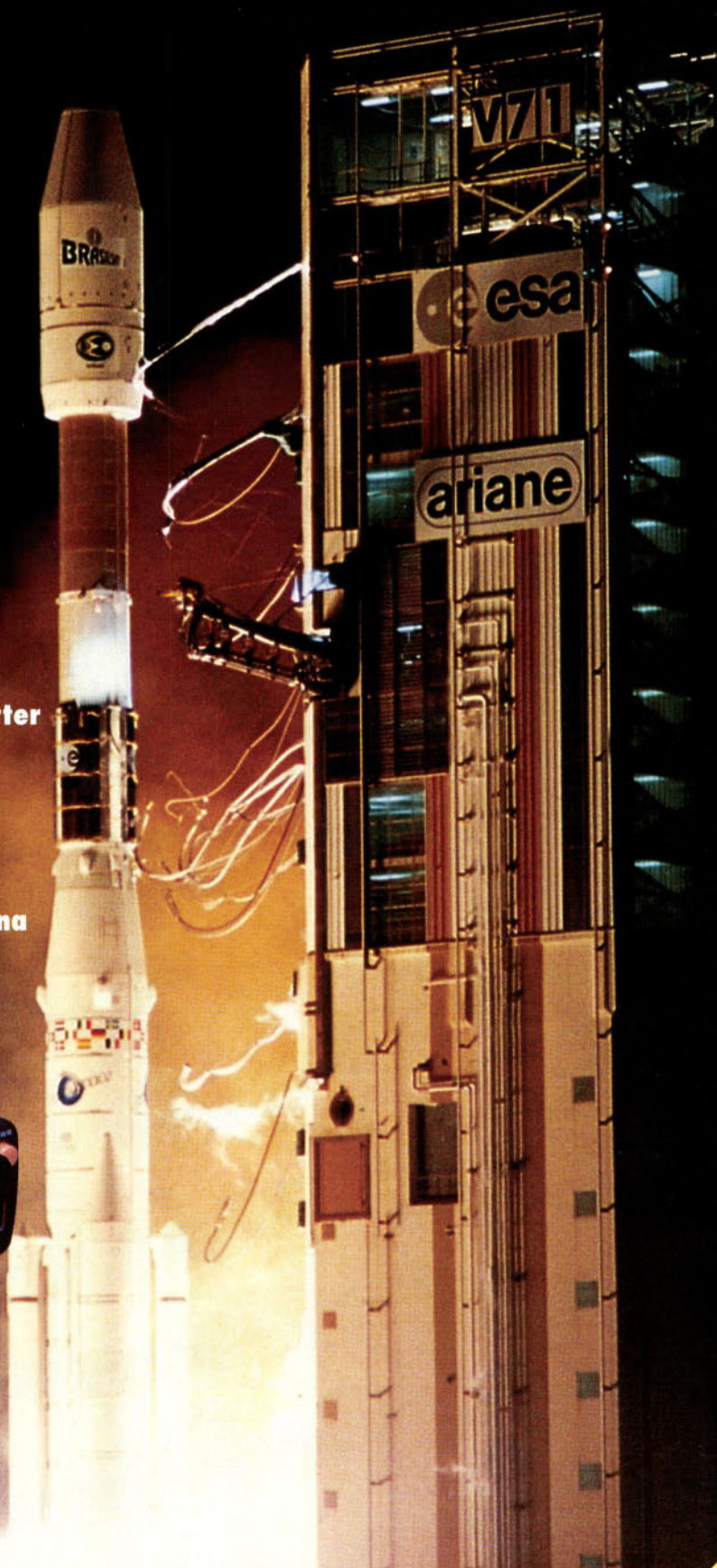
Discovering Radio Broadcasting By Satellite

Build

- The Rugby 7MHz SSB & CW Transmitter Part 2
- A Superbeam Antenna For 24MHz

Reviewed

- The Chelcom 3-Band Windom Antenna
- The Alinco DR-605 Dual-Band VHF/UHF Mobile



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 - 70 cm RX: 410-500 MHz TX: 430-440 MHz
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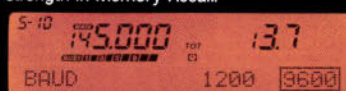
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practical Wireless

OCTOBER 1996
(ON SALE SEPTEMBER 12)
VOL. 72 NO 10 ISSUE 1075
NEXT ISSUE (NOVEMBER)
ON SALE OCTOBER 10

EDITORIAL & ADVERTISEMENT OFFICES

Practical Wireless
Arrowsmith Court
Station Approach
Broadstone
Dorset BH18 8PW
☎ (01202) 659910
(Out-of-hours service by answering machine)
FAX (01202) 659950

PW's Internet address is:

@pwpub.demon.co.uk You can send
mail to anyone at PW, just insert their
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go to press.
Published on the second Thursday of each month by PW Publishing Ltd.
Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW. Tel:
(01202) 659910. Printed in England by Southernprint (Web Offset) Ltd.
Distributed by Seymour, Windsor House, 1270 London Road, Northbury, London
SY20 4BH. Tel: 0181-479 1999. Fax: 0181-479 8507. Telex: 831294S. Sole Agents
for Australia and New Zealand: Gordon and Gotch (Asia) Ltd, South Africa:
Central News Agency. Subscriptions (UK AND E22 EUROPE £25 OVERSEAS
(by ACP) £27, payable to PRACTICAL WIRELESS, Subscription Department,
PW Publishing Ltd, Arrowsmith Court, Station Approach, Broadstone, Dorset
BH18 8PW. Tel: (01202) 659930. PRACTICAL WIRELESS is sold subject to the
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library or pictorial matter whatsoever. Practical Wireless is published
monthly for \$45 per year by PW Publishing Ltd, Arrowsmith
Court, Station Approach, Broadstone, Dorset BH18 8PW.
Royal Mail International, c/o Yellowstone International, 87
Barlows Court, Hackensack, NJ 07601, UK. Second Class
Postage paid at South Hackensack, Send USA address
changes to Royal Mail International, c/o Yellowstone
International, 2788 Regal Boulevard, Elk Grove Village, IL
60007-5037. The USPS (United States Postal Service) number
for Practical Wireless is: 007075.



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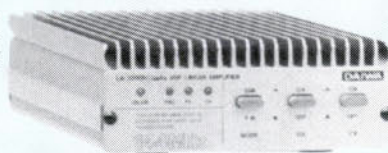
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FT-990DC	£1999	£1599
FT-736R	£1999	£1399
FT-50R New	£329	£299
FT-840	£959	£789
FT-2500	£399	£329
FT-51R	£529	£399
FT-290RII	£599	£499
FRG-100	£599	£429

TS-870
£2399
£1969



KENWOOD - Oct. Deals *

TS-870	£2399	£1969
R-5000	£1059	£885
TH-79	£479	£409
TH-22	£254	£219
TS-790	£1959	£1649
TM-733E	£729	£629
TM-251E	£419	£355



IC-706
£995

ICOM - Oct. Deals *

IC-706	£1195	£995
IC-775DSP	£3699	£3099

ALINCO - Oct. Deal



DX-70
£895

DX-70	£995	£895
DR-130	£329	£289

* THESE DEALS END ON 31st Oct.

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Reviewed
This Issue



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Auto switching
1-6Watts input



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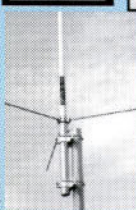
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W-5A	5 Amp 12V current/volt protected	£29.95
W-10A	10 Amp 12V current/volt prote	£49.95
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W-20AM	20 Amp 3-15V variable	£89.95
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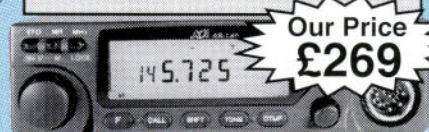
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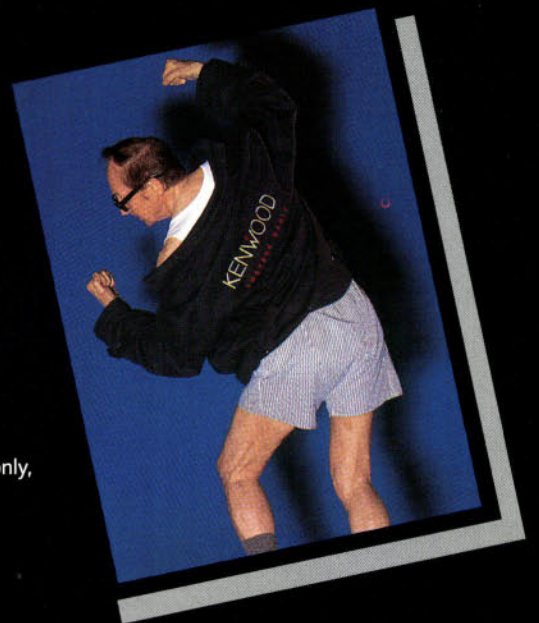
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TSB-3303	GF 144/70, 3/6dB (1.1m)	£39.95
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AV-5	3.5-7-14-21-28MHz vertical 7.4m long	£169.00
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Immaculate **£729.95**

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TS-440SAT	VGC	£749.95
TS-430S	VGC	£599.95
FT-900AT	Immaculate	£949.95
TS-530SP	VGC	£499.95
FT-980	VGC	£799.95
IC-738	As new	£1199.95
IC-735	VGC	£699.95
IC-725	Immaculate	£599.95
IC-751	VGC	£729.95
TS-50S	As new	£649.95
TS-940S	Immaculate	£999.95

DJ-G5	Ex demo	£329.95
TH-78E	As new	£329.95
TH-77E	Dualband h/held	£199.95
DJ-580	As new	£329.95
DJ-560	Dualband h/held	£199.95
Standard C-520	As new	£229.95
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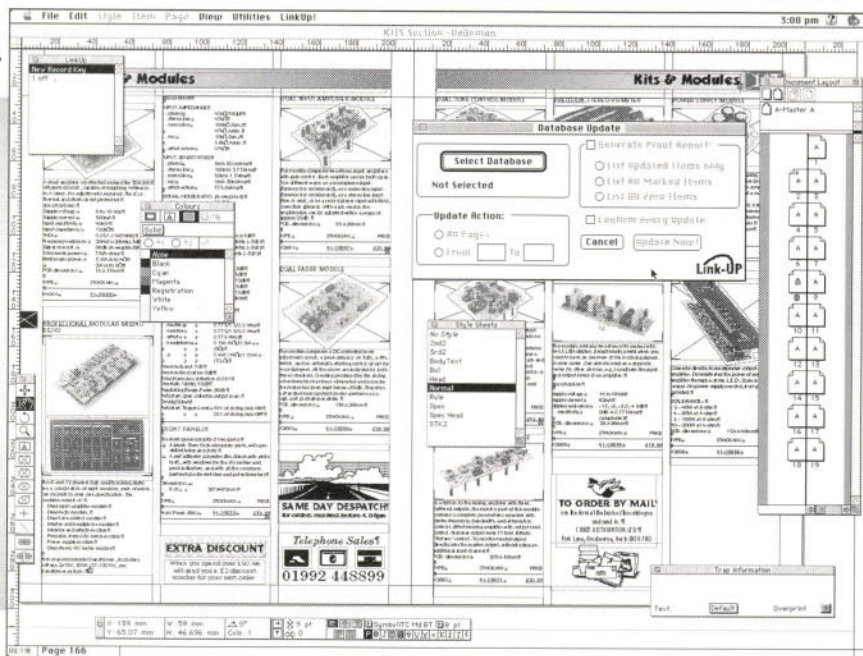
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EDITOR'S

Keylines

Rob Mannion's viewpoint on the World of Amateur Radio

My 'Keylines' editorial on the formation of the United Kingdom Radio Society (UKRS) in the August issue of the magazine did what it was intended to do...it expressed my opinion and generated a great deal of feedback from readers. My opinions - written on the very page where **I can express my personal opinions** - were (and still are) sincerely held.

Everyone who wrote to me personally (whether agreeing or disagreeing with my opinions) has by now received a personal reply. However, by their very nature, I'm unable to reply to the anonymous letters, although in many cases the authors had valid points to make despite being penned in vitriol. All I can do is to acknowledge them via 'Keylines' and assure the writers their letters were read.

The most disturbing aspect of the 'feedback' from one or two people, manifested itself in the form of anonymous telephone calls. Fortunately these only lasted a week or so, although they were not appreciated...especially as they came during the middle of the night.

I don't suppose the misguided individuals involved represent any organisations. They certainly cannot expect to sway opinion either way!

And finally on this aspect of the matter, I can assure readers that I'm not intending to become 'Particulars Withheld' in the *Callbook* or 'Ex-

Directory' on the telephone in future. I also intend to continue to be very approachable at the office, at rallies and shows to everyone

(we're all entitled to our opinions, so I'm always prepared to listen to yours!).

To close on this topic, I must also stress that all incoming news and information to the *PW* 'Newsdesk' is treated on its own merit. If the Editorial team thinks a possible news item will be of interest to readers...we'll run it - regardless of whether or not it clashes with our own opinions!

Helpful Friends

During the very enjoyable 39th Longleat Rally (yes, it's their 40th anniversary in 1997!) many helpful friends were concerned to see me on the various occasions I stumbled while walking on the grass. I received many offers of help and assistance to get up on my (wobbly) legs.

I thank everyone involved, and also for the kind assistance offered by several radio amateurs who saw me in difficulty at the Woburn RSGB rally. The added hazard at



Woburn is the liberal sprinkling of deer 'exhaust' on the grass! (Fortunately I managed to avoid it every time I fell!).

One reader jokingly suggested I needed a breakdown crane! Unfortunately however, our cartoonist Worthington must have been in earshot at Longleat (or had his spies in action) as he got to hear of my plans to have my next 'set of legs' fitted with gyro-stabilised caterpillar tracks. Hence the cartoon with Worthington's interpretation of an 'All-terrain equipped G3XFD'!

My new 'caterpillar tracked feet' will be available for the next rally season and I hope to enjoy the 40th Longleat rally with the many readers and friends who attend. It's a superb day out, an extremely friendly gathering and one which still has the old fashioned friendly feeling in abundance. The Bristol Group must be congratulated for an excellent regional rally.

I feel that the general trend at rallies seems to be falling attendances, and an increase of computer 'junk' sales. But this is not so at Longleat as radio predominates. And (most importantly) it's a very 'social gathering' where we all have a chance to chat and see old friends. Well done everyone!

To round off on the 'mobility' theme, and in answer to several enquiries (following my erratic progress on the grass at Longleat and Woburn) I'm pleased to report that my club visiting will soon be made even easier.

So, if you're waiting for a *PW* 'Club Talk', don't worry...I'm soon to be equipped with 'tailor made' transport (no...it's not a locomotive or tram...just an adapted car) which

will make my travelling so much more comfortable. In other words, I should be even more mobile and looking forward to seeing you all at **your club!** (There are several dates available for mid to late 1997).

The 934MHz CB Band

Many radio amateurs operated on the 934MHz CB band before they obtained their own 'A' or 'B' amateur radio licence. And many still operate on the band, enjoying its fascinating propagation and good-mannered operating standards.

Unfortunately, the Radiocommunications Agency has confirmed that the (long expected) withdrawal of the 934MHz will take place on 31st December 1998. The frequency allocation is being taken over by (you've guessed it!) cellular telephone services.

The 934MHz CB band is deservedly referred to as being 'The Gentleman's Band' (apologies to lady operators!). Its loss will mean that anyone interested in radio communications who prefers the challenge of u.h.f. operating with the minimum of formalities (let's face it, getting on air with Amateur Radio can be a daunting prospect for some people, despite their keen enthusiasm and dedication) loses out.

So, as I know that the various Government departments read *PW* very closely, I ask them to reconsider. Surely it could be possible to grant a small part of the u.h.f. spectrum to replace 934MHz?

I ask the DTI and RA to consider my request because many new Radio Amateurs have joined our hobby via CB radio and not all of them wished to operate on 27MHz. Please don't abandon a dedicated group of operators. They should also be allowed to continue to play a part in the future of 'amateur' (non-professional) radio communications.



That's the new 'All-terrain' Editorial model...he's thinking of fitting armour plating in time for his next 'Keylines'!

Rob Mannion
G3XFD

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

RECEIVING You

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

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

Keylines & UKRS

Dear Sir

Re: UKRS ('Keylines' Aug '96). You say, in effect, that the RSGB is the long-established national society, and so there is no room for any other organisation. Well, in the field of motoring we have the AA and the RAC, each pursuing similar aims, with no detriment to the services provided by either.

In amateur radio in Britain, the ISWL has been around for as long as I can remember, and the G-QRP Club has recently celebrated 21 years of very useful activity. Joining the latter in 1984 gave me a new lease of amateur radio life and enabled me to make the acquaintance of lots of sympathetic people because this organisation catered for an aspect of our hobby with which the RSGB had not been particularly concerned.

The RSGB isn't everyone's cup of tea, otherwise more licensed amateurs would belong to it. You yourself refer to the 'London Radio Society', (actually I think the original name was 'Wireless Society of London'), so you must realise that this belief is prevalent.

You state that the RSGB is getting away from its former attitudes, but it is taking a long time about it! In 48 years as a licensed amateur I have been a member of the RSGB, but twice fell out, because I felt like an outsider, a second-class member, living as I do some 200 miles north of the action.

Another feeling I had, was and is, that the RSGB conducted itself like a professional body, which to my mind seems out of place in amateur radio. Let us give the UKRS a chance, a breath

of fresh air will be welcome.

If it succeeds in strengthening our hobby, all well and good. If it should fail to get off the ground, the organisers can say that at least they tried!

**Walter Farrar G3ESP
Pontefract**

Dear Sir

I thought I should send you an E-mail. I enjoy *Practical Wireless* every month since I bought my first copy in April 1967. I read your 'Keylines' Editorial on the RSGB, which included your plea that there should only be one body representing UK radio amateurs. I read your article with amazement.

Up till now we have one body. I was a member many years ago. I was disillusioned at how inept the RSGB is at handling the public at large. In my view the RSGB is still in the same situation.

Today when they advertise in *PW* in order to attract new members, they publish their address, but no 'phone or FAX numbers. If you look on the Internet, traders and radio clubs have their own world wide web site. Where's the RSGB WWW site?

I would have expected a forward-looking organisation to at least publish a 'phone number where I could call and use my credit card to join instantly. The RSGB already has a database of all UK amateurs (via the work for the *Callbook*), so it is easy to verify that the address given is QTHR.

The evidence as seen as a non member of the RSGB is that in the days of packet radio and the Internet, here is a society which still relies on the post (which is on strike today!). This tells me that they ARE out of date and out of touch.

The RSGB does have more resources than many of the radio clubs on the Internet, so there really is no excuse. Maybe you are right that a single organisation should represent UK radio amateurs. Maybe it is time for a new approach from a different organisation.

**Stuart Gebbie G8YQN
Surrey**

Dear Sir

The Editor Rob Mannion G3XFD put his finger on the real problem with amateur radio in his August 'Keylines'. The percentage of the UK population active as radio amateurs is very low, compared with other developed nations. The reason is simple.

For over 70 years, the authorities, aided and abetted by the RSGB, have limited access to the airwaves by a combination of restrictive exams (the dreaded Morse test) and 'stand-offish' attitude to anyone interested in types of radio (like CB), which were not deemed to be the 'right stuff'.

Add to that the unintentional 'put-down' on new enthusiasts by calling them 'Novices' and you have a recipe for institutionalised stagnation of the sort of highlighted recently by the forced changes in Rugby Football. While the RSGB has been protecting the purity of its bit of ether, the world has moved on.

Now, anyone can legally get on the air using mobile 'phones, CB or by working for a firm with radio controlled vehicles, so the privilege of radio transmission is available to many millions of UK residents without needing to be feudally subservient to the RA or RSGB.

That's why people don't

bother to become licensed amateurs. Speaking personally, I have been an active s.w.l. and involved in h.f. propagation research for nearly 30 years, but have never wanted to get a 'ticket' because I didn't see why I should waste time learning Morse (which I would never use), although I was already well versed in radio technology.

I have never been able to work out why the Morse test should guarantee operator technical competence essential to protect the h.f. bands from pollution! Perhaps GW4YKL's presidency shows a wind of change is finally blowing through the RSGB. Let's hope it hits S9+ and blows away the QRM from decades of old 'farts'!

**Anthony Hopwood
Worcestershire**

Dear Sir

I have just finished reading the Rob Mannion G3XFD's 'Keylines' Editorial in the August edition and I would like to raise my voice in support of his views. I have read many messages about this new society on the packet network and have drawn my own conclusions about the society and its grievances with the RSGB.

The only way forward is to unite under one banner, if the RSGB is not functioning correctly then I am sure that others will support any attempt to improve it. I hope you will all re-join the RSGB and attempt to air your views and make your suggestions from inside the society, after all, if you don't get the support needed then we can only assume that your ideas are not as commonly held as you seem to feel.

One or two people should leave their ego's

This Month's Star Letter

PW Data Chart

Dear Sir

A few minutes ago my friendly neighbour brought in the August issue of *PW* and made my day! However, there's a small thing that has been 'itching me' from earlier occasions and which again comes to my attention.

The poster! The new Data Chart...it's something that I appreciate! Who can keep all formulas in his head? I can't! But, dear *PW*, do you sincerely think that the wallspace in a common hamshack is inexhaustible?

So, why don't you, please, edit the data so that I can cut the poster in

four equal pages to be put in a file for easier reference? I'll give you a star in heaven for that! But, despite what I've said....please keep sending the posters whatever way you decide to publish them!

**G. Robert Wingstedt
SM5GW
Sweden**

Editor's comment:
Thanks for the 'feedback' from Sweden Robert. Everyone on the *PW* team would be pleased to hear from readers on this subject (format, and what you'd like to see) and we hope you - like Robert - have found the Data Charts useful.

Taxi In Reverse

Dear Sir

It was with a degree of pleasurable anticipation that I opened the August edition of *PW* to 'Club Spotlight' page 17, and was instantly afflicted with a mixture of disbelief and hilarity. It was a far cry from my normal reactions on opening the magazine. What caused this, I hear you ask?

Well, there was my Vintage Taxi, large as life and twice as solid, with a delightful and accurate article, but with the photograph printed in reverse, of all unlikely things. Comments from colleagues ranged from 'I didn't know that you had an export model' to the observation by the XYL that it made us both look thinner!

The expose did have a positive effect, however, it galvanised me into writing a cheque for a year's subscription to *PW*, remembering how, as a child in the 1940s, I would walk a couple of miles to the nearest Public Library to read it for free (it was published by Newnes Press then, if my memory serves me right).

Congratulations to Zoë Crabb on her recent nuptials. It's probably because she was away on honeymoon that the photograph was printed back to front!

Max Freedman G0WHW
Essex

Editor's reply: Sorry about the 'reversal' Max. Obviously the Art Department drives on opposite side of the road to the Editorial Dept! Incidentally, do other *PW* Subscribers get a discount when riding in your vintage Taxi?

behind and get back to enjoying this hobby. Do I mean you? If the cap fits!!!!
Martin Lovatt GM0JCN
(@ GB7EDN)
West Lothian

Dear Sir

Many congratulations on your August 'Keylines' Editorial. All that you say in perfectly true, this being the best piece of amateur radio journalism I have seen for many a year. In all walks of life, one meets these 'new brooms' which, after causing some dust to rise, usually sink without trace.

I recall that some years ago a newly-arrived whiz-kid advertised a new QSL Bureau at a greatly-reduced annual fee. After making a few telephone calls in an attempt to poach information, he realised that he had no idea of what was involved and no more was heard of him.

My guess is that this new society's press release is a thinly-disguised snide reaction by some of the moaners one sometimes hears complaining about the RSGB without any in-depth

knowledge of the issues involved, plus of course those with sufficient application to learn Morse code.

Surely all facets of our hobby are catered for by the RSGB, ISWL and the monthly magazines and other periodicals. As these people speak of an overwhelming demand and it will be interesting to see how many victims are prepared to invest time and money with them. They would be well advised to have a re-think and pledge their loyalty to our existing National Society, which has been held in high esteem on both the domestic scene and internationally for many years.

E. G. Allen G3DRN
London

Dear Sir

RSGB Versus Who? Your 'Keylines' views, August 1996, were 'very interesting'. I have not had the opportunity to read the aims of this new society, your quotes were from a press release, but surely we cannot close our minds to new ventures and I always welcome enterprise, it

is the very essence of living to me.

A look at the statistics (ugh!) show important discrepancies, UK licensed amateurs in 1995: 68,800 (source 1995 *Callbook*), RSGB membership in 1996: 29,805 (source 1996 May *RadCom*).

I do not know how many of the RSGB members are s.w.l.s, affiliated radio clubs, etc., so these figures can only be compared generally and are not like-for-like.

Obviously there are countless s.w.l.s and radio enthusiasts in the UK, figures can only be guessed at. All are potential society members, although we know not all wish to join clubs, societies or whatever, but with competition they will have a choice! I cannot quote the circulation figures for *Practical Wireless*, but again your readers must represent a significant proportion of amateurs.

So, there is quite a large population out there of amateurs, both s.w.l.s and licensed, who have not, for whatever reason, joined the RSGB. However, the fact that the RSGB can only poll its members on policy and regulations does not make in my view, for a fair representation of amateurs in the UK.

The negotiating rights of the RSGB with the RA as you said, would not change, in the foreseeable future anyway. So, again "you pays your money and takes your choice"....or rather you can't!
Chris Smith G3MPF
Lancashire

Editor's note: Zoë Crabb and I have tried to create a 'balance' of views in the letters published this month which refer to the August 'Keylines'. Those published reflect the same ratio of 'Fors & Againsts' received in the office, addressed to 'Receiving You'. Please keep writing with your comments, and see 'Keylines' for additional comments. As for the RSGB Website try <http://www.rsgb.org>

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*.

Amateur Radio In Nigeria

Dear Sir

Going through some files I abandoned since 1988, I discovered a map filled with amateur radio call sign prefix map. It was published by *Practical Wireless* in heaven knows which year, but given to me that year by an elderly missionary with the Baptist mission.

That discovery rekindled my interest in amateur radio and I have gone ahead to apply for a licence. I have also bought all the *PW* issues I can find, March, April, July 1995, April and May 1996. Each of them is a gem to me and an Encyclopaedia of knowledge. I have also bought some *CQ* and one *QST* magazine, but they are not as interesting as *PW* to me.

I thoroughly enjoy 'Novice Natter' as it simplifies a lot of things for me. The simple Morse Sounder is one I'd have completed building by now, but I don't have and cannot find a Morse keyer. I am very interested in Morse code and will be happy to receive a key and/or tutor from an benevolent would-be mentor. I won't mind any old transmitter or receiver too for that matter.

Another feature I always read first is 'Packet Panorama'. This is because I enjoy using computers a lot. *5N0PAG* is a great help on this one. I look forward to setting up the ultimate computerised station soon.

Since I enjoy tinkering around my home and having good results not needing outside technical help for all manner of

results, I find 'Antenna Workshop' quite educating. In fact, I am building the dipole antenna and I must say that the text is as good as having the Rev. George Dobbs G3RJV here with me. Please give him my thanks.

Let I forget my big thanks also goes to *PW* for the *PW* 'Antenna Reference Data Chart' in the May 1996 issue. With the rate of inflation in my QTH, I would have maybe not afforded it as easily as you made it. I promptly put it up on the wall of my QTH.

My father owns a MARC NR-82F1 RX with my new found love in amateur radio, he has also applied for a licence, even though he's blind. I find it a challenge and so I'm trying everything I can to study Morse code.

My father and I shall appreciate a response when we send out CQ on air soon.
Andrew Gani-Ikilama
5N0682
Lagos

Editor's comment: Thanks for all your comments Andrew. Everyone on the *PW* team wishes you and your father the best of luck. Look out for 'Keylines' in the November issue of *PW* where I plan to recruit help for people like yourself...with the organised support of other radio enthusiasts. So watch my ('Keylines') space carefully!



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

NEWS 1996

Compiled by Donna Vincent GTTZB

PW News - Could Do Better!

Last month the newsdesk reported in the story 'May RAE Results-Could Do Better?' on the standard of RAE candidates and informed readers that if they required a full report on the multiple choice question paper 7650-001 for the May 1996 exam they should contact Roger Bone at the City & Guilds. However, this was incorrect as copies of the report are in fact obtainable on receipt of an s.a.e. from **Lynette Ranger** at the **RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Tel: (01707) 659015**. Apologies for any inconvenience caused by this error.

More RAE Course News

If you're still deciding about whether to enrol on an RAE course or not and live in the Kent area, news of **Len Buck G0DLR's** course should interest you. The details are as follows:

An RAE course commencing in the first week in October will take

Triode Tubes

Svetlana Electron Devices Inc. of California, USA, have recently announced the development of four triodes designed for use in high-end audio amplifiers. The new triodes have graphite anodes rated at 125W dissipation and the manufacturer's claim that in single-ended operation they produce significant power output with excellent 'sonic' characteristics.

The four 'tubes' in the series are heated directly from thoriated tungsten filaments in the same tradition as the 845 and 211A but the size and filament power is lower. They are aesthetically

pleasing with their cylindrical hard glass envelopes, white ceramic bases and softly glowing graphite anodes.

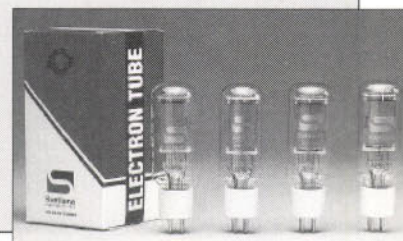
All four triodes are offered with four amplification factors designed to give circuit flexibility together with a variety of sonic choices as follows:

Triode No.

- SV572-3** For clean sound without feedback.
- SV572-10** Triode Sound, easy to drive, high power.
- SV572-30** High efficiency, over 40% single ended.
- SV572-160** For push-pull Class

AB or Class B applications over 300W power output.

For more technical data and further information contact Svetlana direct at **3000 Alpine Road, Portola valley, CA 94028, USA. Tel: (415) 233-0429, FAX: (415) 233-0439** or E-mail: **103243.242@compuserve.com**



place at **21 Willow Walk, Culverstone, Meopham, Kent DA13 0QS**. Candidates will sit the exam at **The North West Kent College of Technology, Dartford** and G0DLR is able to make special arrangements for people working shifts.

For more details and to enrol telephone **(01732) 823483** or write to the above address.

Catch Kanga In The Web!

Kanga Products now have a World Wide Web (WWW) site which contains information on all the Kanga kits and it's also the 'official' site of the G-QRP Club WWW pages.

It's classed as being the official site, as although there are others with QRP information, Kanga's contains a copy of the club information directory, etc.

To catch Kanga in your web mail **WWW.kanga.demon.co.uk**

Lucky Winner

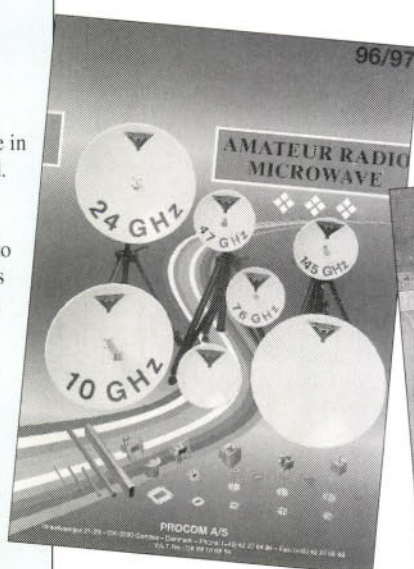
Jim Douglas G4ZXR, pictured here with his amateur radio station, was the lucky winner of the **ADI AR-146 144MHz f.m transceiver** competition which featured in the May issue of *Practical Wireless*. Jim reports that he has already made many contacts with the AR-146 and is pleased with its performance. As you can see the AR-146, which was kindly donated by **Waters & Stanton Electronics**, has pride of place in the centre of Jim's set-up.



Microwave Catalogue

Danish company **Procom Antennas A/S** are very active in the Amateur Microwave field. They produce a range of products from parabolic antennas and dishes through to switches and coupling flanges covering from 10 to 145GHz.

Procom have recently published a catalogue featuring their microwave range. This catalogue is obtainable free of charge from **Communication Technical Services Limited, Unit 15 The Gatwick Metro Centre, Balcombe Road, Horley, Surrey RH6 9GA. Tel: (01293) 822602**.



Sizzling In The Sun At SMC Open Day

All roads seemed to have led to the **South Midlands Communications 'Open Day'** on Saturday August 17. But despite the holiday season traffic jams with the nearby M3, M27 and M271 motorways being choked with traffic, around 500 people visited the School Lane, Chandlers Ford site between Southampton and Winchester. The SMC staff - keeping cheerful and helpful despite the temperature (higher than 30°C at mid-day) coped very well with them all.

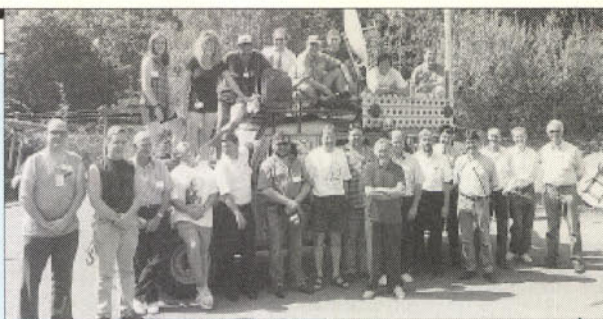
Visitors to the SMC Open Day found that the event was in fact a very successful 'mini' rally. Hosted by **Graham Taylor G8HVV** and **Val**, the open day could not have had better weather. It came complete with an Amateur Radio 'Car Boot' sale, Live Amateur TV demonstrations from a 'pedestrian operated' state of the art 'peepie-talkie' station, various trade stands - including **Siskin Electronics** manned by none other

than **Phil Bridges G6DLJ**, and **Dennis Goodwin G4SOT** from **Icom (UK) Ltd.** The *Practical Wireless* and *Short Wave Magazine* stand staffed by **Dick G8VFH** and **Peggy Ganderton**, and an information and recruitment stand operated by representatives from the newly-formed **United Kingdom Radio Society**.

The main marquee provided shelter from the blazing sun and the venue for the busy food stall which was being operated to raise funds for Leukaemia research. Altogether, what with the many hundreds of bargains on offer from SMC, and the 'car booters' many of us left for home with more than we arrived with! Rather taken aback from the success of the event, SMC are now considering running it again next year.

For myself, I know we can't bank on the weather, but with the 'mini rally' approach and friendly 'everyone's available' style - if SMC have a 1997 'Open Day' it's bound to be a success.

Rob Mannion G3XFD



Question: How many people can you get in, on and around a 'Camel Trophy' LandRover?
Answer...the entire SMC 'Open Day' team! (Yes, there is a Land Rover under there somewhere!).



Graham G8HVV & Val Taylor and everyone on the team were kept busy during the SMC 'open day' where approximately 500 people attended in scorching weather on Saturday 17 August.

Royal Praise

The weekend of October 18 & 19th marks the 25th Anniversary of the **Leicester Amateur Radio & Computer Show**. **Frank Elliott**, one of the organisers, recently received a signed message from **Prince Philip**, Patron of the Radio Society of Great Britain, praising the hard work of all the committee members without whom the show wouldn't have taken place. The message reads:

BUCKINGHAM PALACE.

The Committee of the Leicester Amateur Radio Show deserves high praise and warm congratulations on its 25th annual exhibition in the Granby Halls. Annual events do not happen on their own, they require a great deal of hard work and the sacrifice of much time by volunteers.

I am sure that all members of the Radio Society of Great Britain join me in thanking the Leicester Radio Society for this long series of popular events and wishing it many more successful years in the future.

**Patron
The Radio Society of Great Britain.**

The *PW* Editorial team would like to wish the Leicester Amateur Radio Show Committee all the best with their 25th exhibition and would like to remind readers that *Practical Wireless* and *Short Wave Magazine* will be in attendance.

prepared all the food and drove through the night from Diss in Norfolk. The effort was worth it, because the food was superb,

it was the best prepared and presented food I've ever seen at any Amateur Radio event!

Chris says that with the good response from the first year, he must organise another for 1997. "But next time it won't clash with any other rallies, and I'm aiming at late July". So, if you're interested in attending, lecturing or supporting the event in any way, let Chris know as soon as possible.

You never know, perhaps 'Haslemere' could become the south east's own 'Rochdale' in years to come! For further details contact **Chris Rees G3TUX** on (01428) 641771.

Rob Mannion G3XFD

Party Success

Chris Rees G3TUX of the QRP Component Company had all the elements for a successful 'Summer Party' on Saturday August 3. Chris held the first 'Summer Party' for QRP enthusiasts at the *Our Lady of Lourdes* church hall in Haslemere, just south of Guildford on the Surrey, West Sussex and Hampshire borders. It proved to be an excellent venue, and considering the specialist minority interest, it was also well supported.

Enthusiasts travelled from all over the south, with one keen type from Cornwall and one Dutch visitor! **Mike G0VFK** came up from Penzance and **Robert Van der Zaal PA3BHK** made another one of his very regular appearances in the UK!

The 'airy' open type of hall, screened from the sun by the famous Surrey pine-trees, provided

a very pleasant location for an interesting event. Supported as it was by a good selection of kit manufacturers, Chris told *PW* he was expanding the event in 1997. "Perhaps we'll arrange lecturers and provide more specialist activities" he said, threatening to include a 'Sending Morse with your left foot' competition (with an appropriate giant-sized Morse key!).

Chris was well supported by his wife **Elisa** and whole family. His parents drove up from Milford-on-Sea in Hampshire to provide support, but the 'prize for the most determined 'family effort' must surely go to sister **Ann Bonson**. Ann (an illustrator by profession)

Martock Receiver

Somerset based kit manufacturers **Walford Electronics** have been busy designing again and as a result are pleased to unveil their newest kit, the **Martock**. The Martock is a simple direct conversion receiver designed to suit those wishing to build their first amateur band receiver.

The kits for the Martock are available for any single band between 1.8 and 14MHz. Features include double tuned r.f. filters, sharp switch selectable audio filters for s.s.b. and c.w. together with an audio gain control and output for 'walkman' type earphones. Power is supplied from a 9 or 12V battery.

The Martock is supplied as a base kit plus parts for the chosen band together with all the hardware and front panel for the open style of construction as shown in the photo. The current price is **£36 plus £1 P&P** which is a special launch price.

For more details on the Martock Receiver kit please send an s.s.a.e. to **Walford Electronics, Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ** or telephone **Tim Walford** on (01458) 241224.



Elaine Richards G4LFM's news includes details of a summer party, seasonal jobs and the 'Rag Chewers Delight' - read on to find out more.

NOVICE

Natter

For Radio Beginners Of All Ages

I've recently heard of an organisation that started with its roots in amateur radio and has since helped many people. Back in 1989 **Ken Kirk-Bayley GJ0KKB** was talking on the air to **Kirby Palmer 9XSKP** in Rwanda, no that's nothing really unusual except that 9XSKP had a tale to tell from the Mugonero Hospital.

Apparently, the hospital's only steriliser had broken down and no further operations were possible. It was World War II surplus and had been repaired many times, but now had finally broken beyond repair.

At this point **Dr Robert Smithwick W6JZU** joined the conversation and he arranged for an engineer in Chicago to make a replacement for the broken gasket over the weekend from the dimensions transmitted over the air. The part was shipped out to Rwanda and operations were able to begin again.

Robert Smithwick was a member of the **Medical Amateur Radio Council (MARCO)** whose aims are to promote goodwill and fellowship among amateur radio operators world-wide who are professionals in the healing arts,

or who have an interest in the medical, dental or allied fields. After the conversation a new aspect to the group was born to help hospitals in countries that need it.

Ken Kirk-Bayley didn't sit back either. Shortly after the **Bush Hospital Foundation** was started in Jersey to raise funds for specific projects in countries such as Rwanda.

What I find most amazing is that these projects started with one conversation using amateur radio and the resulting ripples touch so many people's lives. It just goes to show how effective

amateur radio can be when it swings into action.

If you would like more information on either of these groups, then contact: **MARCO, c/o Dr Robert Smithwick, 25215 La Loma Drive, Los Altos Hills, California, 94022, USA.** Or the **Bush Hospital Foundation, at Rozel Cottage, Rozel, Trinity, Jersey JF3 5BN.**

If there are any other stories like these as to how useful amateur radio can be, let me know. I'm sure others would like to read about it.

Scottish Group

I don't mention things that happen North of the border anything like often enough, so here's news of a group based in Scotland.

GMORSE is the callsign of the **Morse Enthusiasts Group Scotland (MEGS)**, which was formed in January 1991 to encourage Morse code working at all levels of ability.

The MEGS group hold Practice Morse Nets each Monday and Thursday evening from 1930 until 2030BST on 3.53MHz. These Nets are intended to improve the Morse working capacity of members and 'CQ MEGS' calls are made at a speed of 12w.p.m. and the calling station is then left to decide on the working speed.

During these times, a listening watch is also maintained on 28.5 and 144.275MHz with 'CQ MEGS' calls being made at intervals using A1A and F2A modes respectively. Tailor-made skeds are also offered.

Calls are also welcomed from non-member stations. These are not intended for the expert operator, but it's hoped they will provide an incentive for the beginner to improve his or her operating standard.

A number of aids to learning and using Morse are also offered to MEGS members, including their popular Morse tape service. This service provides C90 cassette tapes of both plain language and QSO format practice Morse at the speed requested by the member. There is no charge, other than

postage for this and for all other services provided by MEGS including faster Morse practice.

There are also GB2CW Morse transmissions 15 to 30w.p.m. on 3.527MHz every Thursday from 2045 local time. Full details from **George Allen GM4HYF, RNARS 3520, QTHR.**

The MEGS is a non-profit making organisation and exists solely to promote the teaching and use of Morse code. Life membership is available and is open to anyone anywhere who is a Morse enthusiast.

Members outside the UK will be expected to defray the postage costs on the biannual newsletter. Membership is now more than 260 strong, 'Who said Morse was dying out'?

The group have a Special Event Station birthday party for their mentor - Samuel Morse every year on April 27th. This year it was held at Auchengillan, courtesy of the West of Scotland ARS. They also have a stand at several Scottish rallies as well as opportunities for members to get together.

Have you recently graduated to using a paddle key to send your Morse and can bear to part with your pump key? If so, why not consider donating it to MEGS so they can loan it out to youngsters just taking up Morse?

It's great to see a special interest group thriving. Well done!

Jamboree-On-The-Air

The 39th Jamboree-on-the-Air (JOTA) will take place this year on the weekend of October 19/20.

The JOTA is designed to let members of the Scouting movement to talk to other members using the greetings message facility allowed by amateur radio. Of course, they contact lots of other people not involved in Scouting too!

It is a world-wide event running from midnight on the

Friday/Saturday to midnight on the Sunday/Monday, although few stations work right through preferring to pick a period during this time to operate. Having operated in JOTA many Scouts and their leaders have decided they like amateur radio as a hobby and have gone on to take their licence and operate in their own right.

If you have a station running this year, send me a report and some photos and I'll see how many stations I can mention in the forthcoming issues.

And even if you are not

involved with a station, keep an ear out over that weekend as there will be plenty of new stations on the air. If you hear a station looking for a contact so that their Cubs and Scouts can pass on their greetings messages, please answer them.

Some of the young people taking part are very young and a contact with a friendly, patient amateur may be all it takes to get them interested in the hobby themselves. It takes very little of your time, but means a lot to them, thanks!



Awards

What are awards, who organises them, who wins them and why? What a lot of questions. Well, let me tell you what I found out about awards recently.

There are a lot of awards available to both the radio amateur and the short wave listener. Sometimes you are fortunate and can buy a book listing various awards on offer with their rules.

The Radio Society of Great Britain stock two, more details later. Otherwise you seem to have to be in the right place at the right time to hear about them.

I thought I would wander around the Internet (fount of all knowledge!) and see what I could find. An hour and a half later I gave up in disgust.

I used every search option I could and every combinations of the words 'amateur radio' 'awards' 'club society' and even a few groups that I know do awards but not much luck. So, if there's anyone out there who knows of a source of information of lots of awards then let me know.

Awards are run by national groups, local clubs and even individuals. They are often created to coincide with a specific event or year of commemoration but sometimes you can look back over several years in your log book to see if you qualify.

You usually need to have worked or heard a certain number of stations that have a specific callsign or live in a particular area or perhaps several different areas. Once you have the appropriate number then you can apply for the award.

The applications can vary, rarely do you need to send QSL cards, but you do need to send in a log that has been checked for accuracy by a local radio club. The cost of these awards varies too from only a few IRCs or American dollars to a lot of IRCs or American dollars! Actually, the cost of the award is often related to how ornate or usual the award is.

Let me give a couple of examples: Firstly there is The Icelandic Radio Association 50 Years Award. As you can probably guess, this award celebrated the 50th anniversary of the Icelandic Radio Association and your contacts must be made in the year of 1996. Here are the rules:

- 1: It is available to licensed amateurs and s.w.l.s.
- 2: Contacts must be between 0000Z 1 January 1996 and 2359Z 31 December 1996.
- 3: All bands and modes may be used.
- 4: You need to contact at least two TF (Icelandic) stations but /TF stations don't count - in other words they can't be visitors to the island.

5: Contacts don't need QSLs, send a list showing all QSO details like station worked, date worked, time, band, mode and report.

6: The first award issued to each DXCC country will be endorsed as such and single band or mode achievement can also be endorsed.

7: The cost of the award is eight IRCs or \$5.

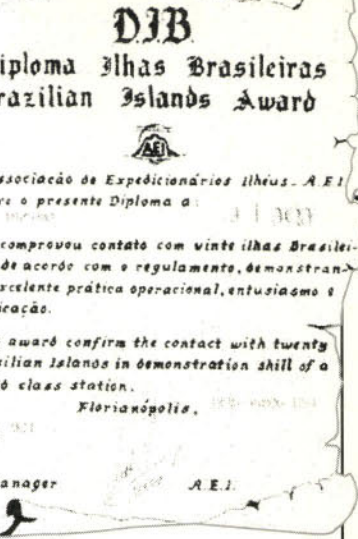
8: Applications must arrive by December 1997.

9: Apply to: **IRA Awards Manager, Brynjolfur Jonsson TF5BW, PO Box 121, IS-602 Akureyri, Iceland.**

Awards vary in difficulty too, there are awards that require very little in the way of achievement and these are useful for those just starting out in the hobby as it's nice to get one or two certificates easily. Then there are the more difficult ones that take a while to achieve, and finally of course, there are the near impossible ones!

Islands on the Air (IOTA) is one of the fastest growing award schemes, but to have a go at these you need to know what qualifies as an island. That's where the two RSGB books come in.

The *Islands on the Air Directory* tells you the island prefixes all around the world and gives information on what constitutes an island for the



This award is available for contacting Brazilian Islands. If you want details, send 2 IRCs to Florianópolis/SC, 88010-970, Brazil.

award scheme. It also gives you other details about the award scheme you'll find useful. The book costs £7.25 from the RSGB.

Then there is the *IOTA Anniversary Booklet*. This tells the story of the Islands on the Air scheme started 30 years ago by Geoff Watts. This book also costs £7.25 from the RSGB.

If you run an award scheme, drop me a line with the details and if you are trying to get an award let me know how you are getting along. I'll do some more about awards in a few months.

The 7MHz Band

This month I want to look at the 7MHz band or '40 metres'. The 7MHz allocation is a very special band with very distinctive characteristics that change with the time of day.

One of the key differences between this band and the others is the way it's 'shared' with commercial broadcasting stations. This is not too much of a problem during the day, but at night the broadcasters have a major impact.

The band extends from 7.0 to 7.1MHz with c.w. only below 7.040 and 'phone above 7.040MHz. For those with interests in the data modes these are to be found between 7.035 and 7.045MHz.

Although it's an exclusive allocation we do end-up

'sharing' the band with international broadcasters (who are in fact trespassing). This is because amateurs have the primary allocation in this band in accordance with the Geneva Convention.

From a propagation point of view, the 7MHz band is the first of the h.f. bands that can reliably break through the highly absorbent D layer. You will remember from previous 'Novice Natter's' that the D layer soaks-up daytime signals so preventing them from reaching the reflective E and F layers.

At 7MHz the situation changes and short distance skips are possible during the day. This gives the band a reliable daytime range of around 800km and thus makes the band great for regular links into Europe.

At night, the situation

changes dramatically and the 7MHz band can be used for world-wide DX operation via the reflective F2 layer. This is particularly useful at our present low point in the sun spot cycle as it's still open for DX.

There's always a snag and in this case it's the high powered broadcast stations that present the challenge. Trying to pick-out DX in amongst broadcast stations demands very good front-end performance from your receiver coupled with effective filters.

A few of the stations likely to cause problems are Eritrea 7.02MHz, Iraq 7.025MHz, Bangladesh 7.079MHz, Free Tajikistan 7.089MHz and Indonesia 7.099MHz. You will probably find one or two more stations as this is a popular slot for unregulated clandestine

stations.

Despite all these problems, 7MHz remains a personal favourite of mine for QRP working. I find I can reliably get into Germany with less than a 1W and a simple antenna system.

That's all for this time, 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

Manchester Memories

Harold Jeffrey G0VJZ, Hon. Sec. of the Manchester & District Amateur Radio Society, has sent in an interesting account of the history of the society. Read on and see how the society was formed and how it's doing today.

The Manchester & District Amateur Radio Society was founded in 1911 as the Manchester Wireless Society and is considered to be one of the oldest Radio Societies in the country. The Society was granted an experimental licence by the then Postmaster General and had a callsign of 5MS when the BBC had callsigns on 2LO and 2ZY for London and Manchester respectively and the London Wireless Society was 5MX.

The Society, as far as can be ascertained in its early days, met in cafes and public houses in the city centre. The trouble with that arrangement was that members could not construct or operate their equipment, but could only discuss the theory of radio.

Another distraction was, of course, the temptation to slip away for a 'swift half!' By the start of the 1914-18 war the Society was well established, but then declined due to the members going into military service.

When the war was over, the Society reformed and in 1922, because of the success attained by W. R. Burne, a member of the society, who gained the first prize in the then recent transatlantic receiving test, Y. W. P. Evans, the Hon secretary of the Society suggested that an effort be made to get in touch with the American Amateurs by means of a special transmitter to be made and

Channel Of Communication

The Radio Officers Association of Europe has been formed to act as a channel of communication and reunion for the many serving and former Merchant Navy Radio Officers and shore staff. To mark its foundation a Special Event Station will be run on October 5/6th at the Poldhu Amateur Radio Club in SW Cornwall. The callsign for the event will be GB0ROA.

Further details are available from Paul Durkin, 73 Maple Drive, Burnham on Sea, Somerset TA8 1DH.

erected by the members.

A formal application was made to the Postmaster General for permission to use an input of 1kW and for special areas to be designed. In March of 1922 permission was granted, and work began on the construction at a cost of £120.

Later in the year, the society met at Heaton Park, a high spot in North Manchester, to try for the American contact. Whether they were successful in their venture is not known.

Then, in 1924, the Society's callsign was changed in common with current legislation to G5MS. And, in 1925, it was registered under the Society's name and meetings were then held at the Houldsworth Hall, on Deansgate in Manchester City Centre.

Membership grew as

interest in radio expanded and at the beginning of the 1930s, the Society began to take an active part in the demonstrations and special events organised by various corporate bodies. Further experimental projects were put in hand, including attempts to contact Australia, but little is known of the outcome, other than that there was a great amount of enthusiasm created for these 'radio adventures'.

At the onset of the 1939-45 war, Amateur Radio was again disrupted and the Society's activities were curtailed due to the government's decision to impound all amateur transmitters. Some members of the Society began being drafted into the radio listening service monitoring enemy transmissions, and older members of the Society

met occasionally to keep the pot boiling as it were.

After the war, when members came back from the forces, the Society reformed for the second time, but could not meet at their old headquarters. So, in 1948, members met at the Brunswick Arms in Piccadilly, Manchester.

However, the new venue was considered rather small and unsuitable for young members. So, in 1950, it was decided to move from the city centre, to more suitable accommodation at the King George VI Club, which was situated on North Road, Moston.

With a membership of 200, two large rooms were full at any given meeting and there were lots of home-brew projects. Also a Rally Exhibition was held annually.

At this time, Henry

Shields G3GB had the idea of starting the North Manchester Radio Club. So he contacted G2ALN, G2AKR, G3RP and other local amateurs and the club was formed with meetings being held at the Dommet Street School on a once a month basis. The first meeting being

held there on Friday 23 February 1951 with 13 members, the club holding the callsign G3HOX.

The last recorded meeting of NMRC was about 13 July 1951, and later it amalgamated with the Manchester Wireless Society to become the renamed Manchester & District Amateur Radio Society. It would appear that the G5MS callsign was at that time allowed to lapse and the G3HOX callsign was adopted by the amalgamated Society.

With the number of members, the club became very active, so that by 1963, new club premises were sought and the club moved to Newton House Community Centre, Newton Heath, Manchester. Membership fluctuated over the years, but maintained an average of about 50 with a turnout of 25 to 30 members per week. The Society was able to install a complete radio room and to have rooms for meetings and projects.

During the ensuing years, the Society had its ups and downs, but maintained a steady membership of around the 50 mark. Many special event stations were organised and the society co-operated with a local Scout Group.

The then Secretary of the Society, Don Shaw G3JIB, organised the Jamboree on the Air and training for the communicator badge and other events were the local school fairs and carnivals. As times changed and premises were demolished due to modernisation, the Society moved to its present premises in 1990, at the Simpson Memorial Community Centre, Moston Lane, Moston, Manchester.

The Society has three rooms, a meeting room, and a lecture theatre where the Radio Amateurs Exam



Special Event Station GB2CFP with His Worship the Mayor of Oldham and G2ALN, G0ICY and G0SAD.

Christian Radio Conference

The **World Association Of Christian Radio Amateurs And Listeners (WACRAL)** invites all radio amateurs and short wave listeners to attend their 1996 residential conference, planned for the weekend of the 4-6th October at the Forest Lodge Conference Centre, Kidderminster. This is the time to meet with other practising Christians and to enjoy an exciting and varied programme of radio events, endless rag-chews, simple services and general fellowship.

This year's star lectures include 'Satellites on a shoestring', 'Bows, arrows and amateurs', 'Frequency management for FEBA' and from an eminent BMS eye surgeon, 'Mission and river blindness'. A 'QRP for Christians' presentation and simple construction competition has been arranged, with a supply of the one inch square ONER transmitter kits laid on to order.

All OMs, YLs and XYLs will be encouraged to take part and to try to beat the national record build time of just eight minutes! The members' AGM is to be on Saturday with the ever popular and hilarious 'Silly prices surplus sale' scheduled for that evening.

Non-members are especially welcome to attend, together with wives and husbands. The complete weekend fee, inclusive of all meals and accommodation in rooms for singles, couples and families, many ensuite, is £65 per person. To book, or for more information, contact **G4EZU (QTHR)** on (01474) 533686 or call in on the regular WACRAL Nets on Saturdays on 3.747kHz at 8am and 2pm.

(RAE) subjects are taught and the City & Guilds RAE exam takes place. Since 1990, the Society has participated in a large number of events, some of which were the Special Event Station **GB2CFP** to commemorate the 200 years of the Failsforth Pole, a local landmark.

In late 1995, the Society decided to try and reinstate their old callsign **G5MS**. The **RSGB Archivist** was approached, but could only confirm that the Society held the callsign until the mid 1920s and that it was later held in 1970 by **H. M. Swann**.

Thus began a long trail of searching through local reports, but to no avail. Until that is a Past President of the **RSGB**, a friend of the Society's President **Barrie Langfield G3IOA**, was able to confirm that **H. M. Swann** was silent key, although his widow was still alive and living in Windermere.

Up And Running

The **Brize Norton Amateur Radio Club (G0RBN)** is now back up and running. The club have a new Chairman and Licence Holder, however, they are missing a vital 'something' - members!

The club presently meets on a Tuesday evening, but this may be changing due to the recruitment of a number of Novices who attend the Air Training Corp on Tuesday evenings. A special event station was recently run at a local country fair and other similar events are being planned. However, some events have had to be cancelled, due to lack of volunteers.

For more information, contact **Dave G7SRB** on (01993) 846975, or E-mail: 101766.1413@Compuserve.com

Mrs Langfield was approached and asked if the Society could have **G5MS** as their callsign again. She was only too pleased to grant permission and after submission of the necessary documentation to the Radio Communications Agency on 10 April 1996, **G5MS** was back on air, a truly historical event.

The Society is grateful to the **RSGB**, *The Manchester Evening News*, *The East Manchester Reporter* and past and present members of the Society for their help in researching this article.

Harold would also like to say that the Society runs RAE, Novice RAE and Morse classes all year round, free of charge, and that the Society are a registered examination centre for all City & Guilds examinations.

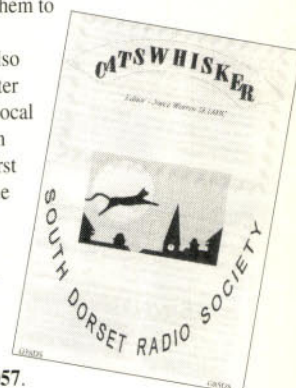
Find out more by phoning **Harold Jeffrey G0VJZ** on 0161-338 4412.

South Dorset Radio Society

John Rose has now taken over Secretaryship of **The South Dorset Radio Society**. The Society is a relatively small club, with a good mix of members, a convivial social calendar and boasting many kinds of expertise. Guests and non-members are always welcome at all the functions, (with an ulterior motive of course!), and the club encourage them to become members in due course.

Many members of the club also belong to the South Dorset Repeater Group, because there is a strong, local network using the 430MHz station **GB3SD**. The club meets on the first Tuesday of every month, the venue being the game building at the 'Victoria Inn', Knights in the Bottom, Chickerell, Weymouth.

Should anyone require any more information, **John Rose** would like to hear from you. He can be contacted on (01305) 832057.



Dragon Disaster

Remember reading in the May issue of 'Club Spotlight' about the **Dragon Amateur Radio Club** and the setting-up of the **GB4BEA** station on the Beaumaris foreshore? Well, disaster apparently struck on the Saturday night/Sunday morning 18 & 19th May when gale force winds struck the rain sodden marquee and demolished it.

Luckily no-one was hurt and neither was any equipment damaged. But it was found that the re-erected marquee would not be safe. Nothing daunted, the club members set-up the special event station in a bread van, kindly loaned by a local businessman and they carried on, despite the cold, damp weather.

Through it all, the lads enjoyed themselves and the event showed that there was a determination to carry on and it pays to keep a good relationship with the local community. The club have now made arrangements to go back to Beaumaris on the 10/11th August to repeat the event, hopefully in a caravan, (but minus the gale force winds!).

Yeovil's Celebration Of Half Century Operation

The **Yeovil Amateur Radio Club** had its inaugural meeting on 17 October 1946 and this year, on the same month, same date of inauguration, the commemoration of 50 years of operation culminates in a free buffet supper for members and local dignitaries, an exhibition of radios and transceivers spanning the 50 year period and the operation of h.f. and v.h.f. special event stations. Also during the month of October, the club will continue to operate the special event stations and will publish a booklet of technical articles, articles of historic interest and a brief history of the club.

The club was formed by

Mr Kirkland G8FP and the first committee were **Sid Rickets** (Chairman), **Frank Parkhurst** (Treasurer) and **Dave Hover** (Secretary). Amongst the founder members, **Dennis Hayward G3OMH** and **Don McLean G3NOF** are still fully active in club affairs.

Despite the many venues that the club has occupied over the 50 years, nine in all, there has been complete continuity in activities and membership. Membership is currently 63.

Yeovil ARC has several claims to fame. The most notable being a 90 mile QSO with the first transistorised transmitter using a point contact transistor. This was also described in *RSGB Bulletin*, April 1954.

The club's annual QRP Convention held over the past 12 years, proves to be as

popular as ever. Visitors come from all over the UK and also from across the channel.

From 1976 onwards, the club has provided RAE tuition under **Rob Micklewright G3MYM** and continues to achieve very high success rates. Many B class licensees graduating to class A status after being tutored into the finer arts of keymanship by **Eric Godfrey G3GC**. The **NRAE** is also well catered for, under the able guidance of the Senior Novice Instructor for the County, **George Davis G3ICO**.

As well as the formal tuition aimed at the various radio examiners, informal tuition and advice is given in the form of lectures by various club members each week.

Over its half century of operation, the club has participated in many of the local events, with Special Event Stations being set-up on public display at such venues as The Mid-Somerset Show, the Fleet Air Arm at Yeovilton, Yeovil Festival of Transport and more recently, the D-Day and VE-Day commemorations, the National Trust Centenary and 125 years of the British Red Cross, (whose Yeovil headquarters also serves as the club QTH).

The club continues to provide active support to the emergency services via **RAYNET**, now using v.h.f. and u.h.f. equipment rather than the top-band rigs as in the early days.

DAYTON HAMVENTION '96

Holiday Report

Rob Mannion
G3XFD looks back at the PW trip to what's claimed to be the largest Amateur Radio rally in the world! - The Dayton HamVention 1996 which took place between 17 and 19th of May.

A classic view of the Empire State building in New York. Rob G3XFD could have done with the bike in the foreground and was tempted to borrow it after taking the photograph! However, the express lifts at \$5 per person, take the strain of getting you to the top of the 1930s art-deco building.

On the (wooden!) flight deck of the aircraft carrier USS *Intrepid* tied up as a floating museum in downtown New York. Several British aircraft are on display, but all were lifted on board...including one of the famous 'Blackbird' supersonic types.



In previous years, the *PW* HamVention Holiday party has travelled to the USA via several different routes. We've flown into Dayton via Boston, and Charlotte (North Carolina) but this year there was a real treat in store as the port of entry was to be New York.

The *PW* party, with friends from Ireland, Holland, all over the UK and Northern Ireland,

stay in New York being kept informed throughout the journey via the 'formidable' lady courier who (despite suffering from laryngitis) kept up a non-stop commentary on where-to-buy-and-shop, etc. She was quite a character!

Hotel In Broadway

Our Hotel, the Edison, was literally 200 metres off Times Square, right in the centre of Broadway. At night, the *PW* Party were able to experience the colourful 'night-light life' and an excellent range of restaurants.

During our stay, the *PW* 'Dayton Team' **Dick Ganderton** **G8VFN** (Editor of *Short Wave Magazine*), **Kathy Moore** (Subscription Manager for *PW* and *SWM*) and myself even managed to try the food Thailand style in one of the many 'ethnic' restaurants. In fact, a New York

flew from Gatwick to New York (Newark, New Jersey) and experienced one of the quickest entries I've ever had into the USA.

Following our 'whizz through' Customs & Immigrations our bus courier was late! Despite that, we were soon travelling via the Lincoln Tunnel onto Manhattan Island for our three night

cab driver told me that there are over 2000 restaurants in greater New York, with 200 different 'styles' to choose from in 'down town' New York itself!

My friendly cab driver (he was from Puerto Rico, the American-owned Island in the Caribbean) as a Spanish speaker himself...suggested a list of 'Hispanic' style 'eateries'. The trouble was that his list alone would have kept me in New York for at least six months!

Although I've visited New York many times before, I've never had three days to play the full 'tourist' part. On our first full day **Pat Ryan** (who had joined us from his home in Athlone in Ireland) and I enjoyed a 3-hour 'Circle Line' cruise right round Manhattan Island on which most of New York 'proper' stands.

Pat and I thoroughly enjoyed the trip round New York, we'd experienced excellent weather and blue skies. When we arrived back we had an excellent lunch (they gave us too much to eat of course).

We spent the rest of the afternoon on board the USS *Intrepid*, a Second World War aircraft carrier. She forms a floating museum (privately owned!) and has an interesting selection of aircraft on board, along with many video-cinemas showing her illustrious career in the war against the Japanese in the Pacific.

The audio-visual facilities in the museum provided a fascinating (if at times gruesome) reminder of the sacrifices paid by the Allies during the 1939-1945 conflict, particularly fighting the fearsome single-minded Japanese war-machine. I came away with some sombre thoughts, especially as I had met some of the wartime crew that day, themselves acting as elderly tourists on board their old ship.

Under & Over



Boy it's hot in here! Dick Ganderton G8V FH (Editor of *Short Wave Magazine*, Rob Mannion G3XFD and Kathy Moore (Subscriptions Manager for *PW* and *SWM*) busy at the HamVention 1996 'booth'.



I'd passed under the George Washington road bridge during my trip round Manhattan Island, and enroute to provide a *PW* 'Club Talk' in Hackensack, New Jersey, I passed over it! **Bill Hughes N2XEU** of the Metroplex Club in New Jersey had collected me from the Hotel and drove me to their club room....in Hackensack which turned out to be above a 'Fire House' (Fire Station to us).

As a *PW* reader Bill had read that we were going to Dayton via New York. Hence the invitation came to provide a club talk! I thoroughly enjoyed the evening, met many old friends and made some new ones and experienced a 'call out' as the volunteers rushed to an emergency in their very large fire engine.

Altogether my visit to the Metroplex club was a fascinating affair. It was good to see yet another aspect of Amateur Radio in the USA. Bill also proved to be an excellent 'Taxi' driver and one of the few 'Cabbies' who spoke English!

Needless to say, I got back to my hotel feeling very tired, but it was a very enjoyable evening. Thanks for your hospitality Bill, and that of your club.

Empire State

On Wednesday, I enjoyed a trip up to the top of the Empire State building. It was very enjoyable and I saw many hand-held 144MHz transceivers in use. One young operator was talking to his schoolfriends in Buffalo, some 70 miles away!

On the Thursday morning we flew from Newark International airport straight into Dayton, leaving a wet New York behind us (the weather had changed). It was quite a surprise to leave the aircraft at Dayton because it was very warm indeed, and it stayed that way during the rest of the week.

Our Hotel, the Holiday Inn at

Englewood on the outskirts of Dayton, had good air-conditioning and a swimming pool. During the rest of our stay both were put to good use!

Hara Arena

The Dayton HamVention is held at the Hara Arena, and this year (and for the next two years) the event has been moved because of sporting events. And personally, I think it's the change of dates from late April that led to less people attending this year, (like rallies here in the UK, if it's too hot, some people stay away).

Dayton is not just a shopping trip, it's an experience. I enjoy meeting readers from the USA and I know many friendships have been made between our 'HamVentioners' and other visitors. That's what Amateur Radio is all about isn't it?

Despite the fact that there seemed to be less people attending this year, the 'gate' topped 32,000 between Friday and the Sunday. However, the giant Flea market - with 2000 plus spaces available, also seemed to be different this year. Instead of many hundreds of single 'stall' holders, I noticed that there were many larger pitches, taking up more room, but with fewer actual 'sellers'.

However, I still managed to buy some 'miniature' 807 valves, some interesting books and some prepared microscope slides (yes, you can find virtually anything there!).

Stand Busy

Our stand (or 'booth') was very busy indeed. We were kept on the go chatting to old friends, renewing subscriptions and catching up on the last year's news and discussing *PW* projects and ideas.

Canada is within reasonable travelling distance of Dayton, but this year we saw fewer of our friends from Ontario and other regions. I found out that was because the 1996 HamVention clashed with a major holiday weekend (Queen Victoria's birthday!) where Canadians traditionally open up country homes, or just go off and enjoy the 'backwoods'.

As usual, we didn't see much of the readers who were with us, they just disappeared off into the throng and enjoyed themselves. However, most of them came to see if we were all okay and to make sure the *PW* team appeared on video, several brought their cameras. So because of their generosity, if you want to experience a little of the 'Dayton' flavour on video...contact me at the *PW* office and see for yourself.

So, it was a very tired but happy group of people who headed back to Gatwick via Dayton to Newark and over the Atlantic. We were all lighter in pocket but heavier in baggage!

PW



Two wheels and 2kW (yes...two kiloWatt) 'Motorcycle Mobile' at the Dayton HamVention. Bob Curry KC3VO relaxes in the evening sunshine on his Honda motorbike. The trailer carries the petrol-engine generator to power the rig. Bob, from Maryland, is a very well known h.f. mobile operator and regular visitor to Dayton. Reliable sources report that the coronal discharge from the 2kW entering the mobile whip has to be seen to be appreciated!

Here's to next year!

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PW "Daventry" Receiver

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HOWES DC2000 Electronics kit: £22.90
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NEW! HOWES DC2000

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The ease of construction, the sensitivity and the low quiescent current consumption make this a great little receiver for both the first time builder and for holiday and portable use! It covers a single band at a time, but uses the same interchangeable band modules as the DXR20, to give the choice of any HF band on a simple plug-in basis. Choose from 160, 80, 40, 30, 20, 15 & 10M amateur bands. Also suitable for BM11 and BM54 HF air-band modules.

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73 from Dave G4KQH, Technical Manager.

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RADIO Diary

Compiled by Zoë Crabb

1996

September 15: The 1996 BARTG Rally will be held at the Sandown Exhibition Centre, Sandown Park Racecourse, Esher, Surrey. The rally will be located in a large, spacious hall with plenty of free parking. This rally, organised by the British Amateur Radio Teledata Group, is of general interest to all radio amateurs, most aspects are catered for as well as an emphasis on Data Communications. Doors open 10.30am to 5pm. Admission is £2 for adults and £1.50 for OAPs. There will be on-site catering with hot and cold meals, snacks, beverages and a licensed bar. There will also be a Bring & Buy, many exhibitor and special interest groups, see the latest in radios, computers, aerials, kits and lots more. Find out more from **Andy G3ZYP** on Tel/FAX: (01394) 420704.

***September 21:** The Scottish Amateur Radio Convention is being held at the Cardonald College, Glasgow. The West of Scotland Amateur Radio Society is hosting the convention, with the support of other local societies. Find out more details by contacting **Ron King GMBOW**, Organisational Secretary, on 0141-773 2882.

September 29: The Three Counties Radio Rally is to be held at the Three Counties Showground, Malvern, Worcestershire. There will be trade stands, radio and computer dealers, parts and accessories, Bring & Buy and refreshments. There will also be free car parking. The venue is the Wye Hall and entry to the showground is via the 'Brown' gate only. Doors open 10.30am to 5pm and admission is £1. **Eddy Cotton** on (01905) 773181.

September 29: The Harlow & District Amateur Radio Club Rally is to be held at the Sports Centre, Harlow. Doors open at 10.30 (10am for disabled visitors). Easy access off junction 7 the M11, A414 signposted to the rally. Talk-in by G6UT on S22 and SU22. The large ground floor main hall will feature a selection of traders, both old and new with products ranging from complete radio/computer systems through to software, electronic components and second-hand equipment. There will also be a special interest area and a large club room. Bring & Buy stall. Morse tests on demand will be available (two passport photos required). Refreshments will also be available. All car parking is free, plus there is disabled parking near the entrance. For more details 'phone **Len G7UFF** on (01279) 864973 or the rally manager **Mike G7BNF** on (01279) 865092.

***October 6:** The Great Lumley Amateur Radio & Electronics Society will take place in the Community Centre, Gt. Lumley, Chester-le-Street. Doors open at 10.30am for disabled visitors and 11am for others. There will be trade stands, a Bring & Buy and much more. **Barry G1JDP** on 0191-388 5936.

***October 12:** The G-QRP Club Mini Convention is being held at St. Aidans Hall, Sudden, Rochdale. Admission is £1 and doors open at 10am. Talk-in on S22. There is a large social area, lectures on QRP subjects, Bring & Buy, surplus, junk, components, kit traders, food and drink all day including the famous pie and peas. **Rev. George Dobbs G3RJV** on Tel/FAX: (01706) 31812.

October 13: The Kidderminster & District Amateur Radio Society are holding their rally at the Stourport on Severn High School. Doors open at 10am. There will be the usual traders, Bring & Buy, refreshments and ample car parking. Talk-in on S22. **G8JTL** on (01384) 894019 or **G0RJP** on (01299) 822206.

October 13: Computercations '96 Computer/Radio Rally is to be held at Hillhead Camping, Kingswear Road, Hillhead, Brixham, Devon. Overnight camping, car boot sale (weather permitting), trade stands, professional flight simulator demonstration, Bring & Buy, refreshments, unlimited free parking, talk-in on S22 by G7FDC, special event station GB2CPU. **Mr. Bill Trezise G6ZRM** on (01803) 522216.

***October 18-19:** The Leicester ARS (25th anniversary) is being held at the Granby Halls, Leicester. Doors open at 10am each day (9.30am for disabled visitors). All major companies will be in attendance plus a large Bring & Buy stand run by the Leicester Radio Society. Morse tests will be available on demand, but two photographs plus proof of identity will be required. There are ample car parking facilities. Talk-in on S22 and SU22 callsign GB2GH. **Frank G4PDZ** on 0116-287 1086.

October 20: The North Monaghan Hobby Radio & Computer Exhibition will be held at The Four Seasons Hotel, Co Monaghan. Doors open at 11.30am and close at 5.30pm. All the usual retailers will be in attendance along with a large display of computer equipment and a Bring & Buy. Refreshments will be available all day in the adjoining restaurant along with full facilities for QSLing via the brewery! Admission is £2 and half the price for under 14s. Talk-in on S22 from 10.30am. Facilities will be provided for disabled access. **Stephen Hand** on (08) (013657) 51479 evenings or write to: **PO Box 3, Monaghan** for an info. pack.

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 disabled facilities. 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, ie, 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, parking. (01923) 893929.

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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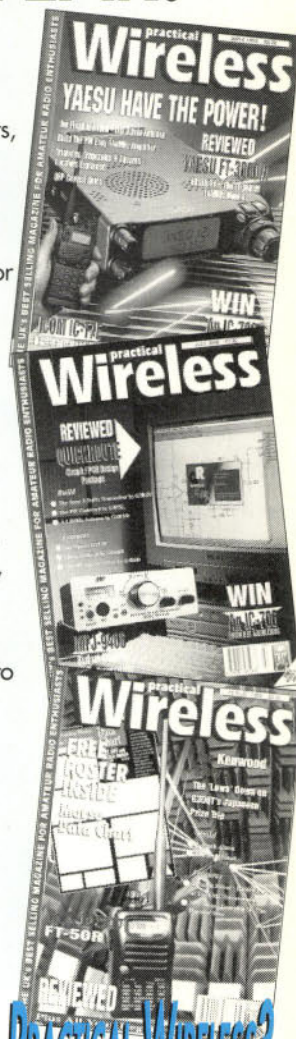
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Satellite Radio -

By Simon Spanswick

An increasing number of international radio stations are starting to use satellite to send programmes to listeners world-wide in addition to conventional short wave. Simon Spanswick, presenter of the BBC World Service programme Waveguide - back on the air this month - explains how to go about listening to the world from satellites 36000km above the earth.

I suppose that 'dyed in the wool' DXers may say that listening to international radio stations in hi-fi quality is not for them. But if you want to listen to programmes, rather than search through the ether for the weakest signals, getting the best reception is what it's all about. That is particularly true for listeners to BBC World Service some of whom seem to find that the short wave signal fades away just at the most crucial point in the programme - truly frustrating.

Because of signal fading the BBC World Service and a good number of other international broadcasters, have been using satellite delivery to send programmes across Europe and further afield for the past few years, riding on the back of the success of satellite television. In Europe, anyone with an Astra satellite dish can receive international broadcasters (see Fig.1), and if you have equipment for Eutelsat, there's plenty of other stations waiting for you.

Broadcasting Satellites

Broadcasting satellites orbit above the equator, at a height of about 36000km out in space. They orbit the earth at approximately the same speed as it spins, and therefore appear to be constantly at the same point in the sky. Hence the name geostationary is applied to them (there are other orbits, such as highly elliptical or low earth, but these are not generally used for broadcast signals).

Each satellite acts as an amplifier in space, receiving signals from an up-link station, changing the frequency, for example to the Ku-band used by broadcasting satellites like Astra over Europe, and retransmitting the signals down to earth through large antennas. The satellite electronics are powered by solar panels and each satellite has thrusters which allow it to be kept at precisely the right orbital position.

Today's satellites have a life of

around 12 to 15 years. This life span is roughly the length of time that the fuel for the thrusters last and the electronics, solar cells and antennas to function in the hostile environment of space.

Back on earth, a satellite dish is needed to catch the low power satellite signals and focus them on to a low noise block (LNB) mounted on an arm in front of the dish. An LNB, also known as a low noise amplifier or low noise converter, amplifies the signal and converts it to a frequency of between 900 to 2000MHz.

Alignment of the satellite dish is crucial to make sure reception is good. The larger the dish, the more important it is to have the alignment perfect.

The signal is then transferred to a satellite receiver along a coaxial cable, and from a receiver to the television set through an r.f. or SCART lead. Finally it is fed to a hi-fi system from two phono plugs.

Getting Started

If you have not yet succumbed to the marketing techniques of Sky Television and are still dish-less, you will want to know what you need to start tuning to satellites orbiting the earth. The essential basic ingredients for a dish of delights from the sky are:

- a south-facing wall or chimney breast with an unobstructed view to a few degrees above the horizon.
- satellite antenna - commonly known as a dish.
- satellite receiver.
- television set.
- hi-fi with a spare stereo input.

There are two ways to proceed once you have decided to install satellite equipment. One is to ask a dealer to install the system for you. The other is to do it yourself.

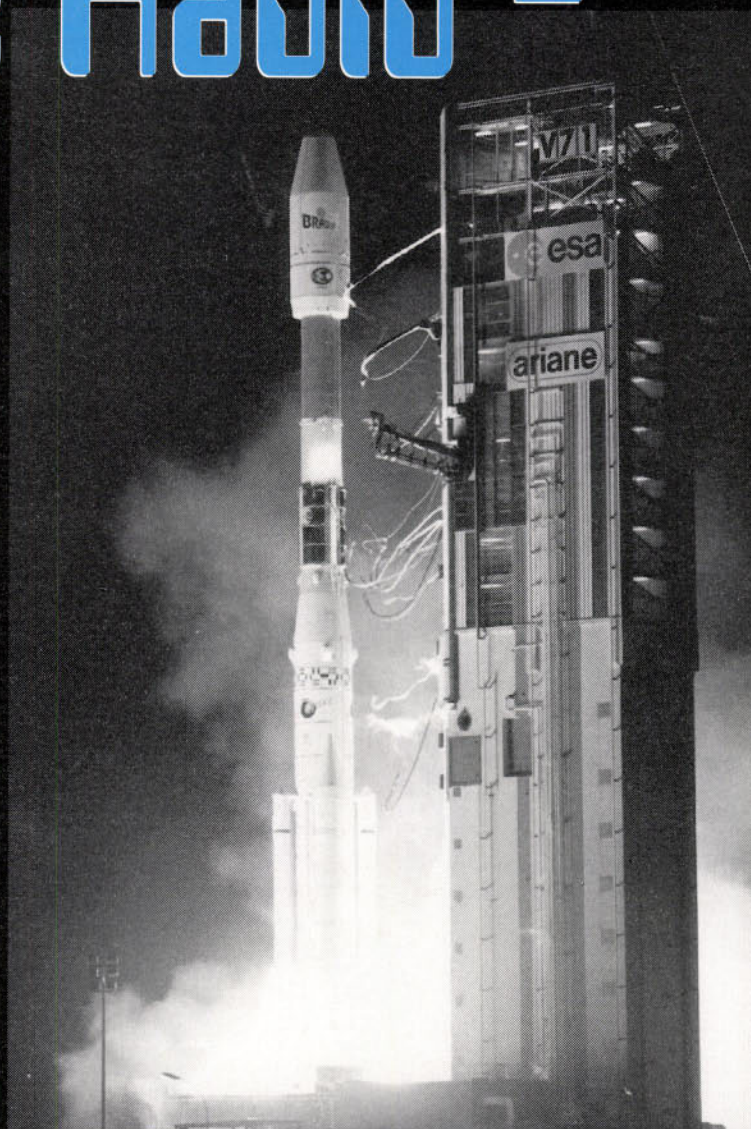
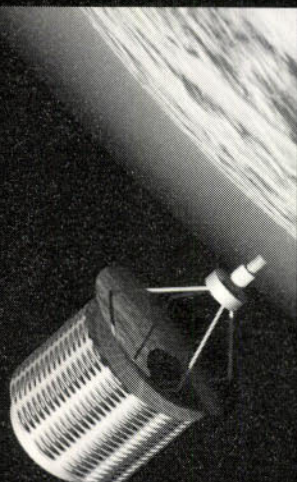


Photo courtesy of Ariane Space



Station	Satellite	Location	Transponder Frequency [GHz]	Audio subcarrier [MHz]
BBC World Service	Astra 1B	19.2°E	11.553	7.38
Deutsche Welle	Astra 1A	19.2°E	11.229	7.92
Radio Budapest	Eutelsat II f3	16°E	11.575	7.02
Radio Exterior de Espana	Eutelsat II f6	13°E	11.221	7.56
Radio Netherlands	Astra 1C	19.2°E	10.936	7.74 or 7.92
Radio Sweden	Astra 1C	19.2°E	10.964	7.38
Radio Vlaanderen Internationaal	Astra 1C	19.2°E	10.921	7.38
Swiss Radio International	Astra 1A	19.2°E	11.332	7.56
Vatican Radio	Eutelsat II f1	13°E	10.987	7.39
VoA Europe	Eutelsat II f1	13°E	11.162	7.38 and 7.56
World Radio Network	Astra 1B	19.2°E	11.538	7.38
YLE Radio Finland	Eutelsat II f1	13°E	11.162	8.10

As a regular reader of *PW* you may be used to constructing. Providing you do some research and follow instructions closely, putting up a dish is not too daunting.

Whichever route you follow, you will want to check the market for what is available, decide how flexible you want your system to be and what your budget is. I think that the recommendation for buying a car at an auction applies here - set a limit and don't go above it.

Something to be decided at an early stage is whether you think you will only want to tune to signals from a single orbital position (like Astra at 19.2° east), have a system that enables you to see two satellite locations, or whether you will want to scan the skies and pick-up stations on all the satellites you can see from your location. This dictates whether you buy a fixed, dual or motorised system. Of course, more complicated motorised systems cost more than a simple fixed one.

There are lots of bargains to be had from dealers who will sell Sky Television based fixed systems, but it's likely to be tied into a subscription to one of the Sky packages. Add the monthly subscription up and you'll discover the annual cost is up to twice the cost of the hardware!

If you choose a fixed dish system for Astra, you can expect to pay somewhere in the region of £180 to around £500, depending on the size of dish (a 600mm parabolic dish for is needed for use in most of England and Wales, and an 800mm dish for the far west and north) and the sophistication of the receiver you choose.

To increase the flexibility of your fixed system you can have a second LNB mounted on an extended arm. This effectively points the first LNB at one satellite, probably Astra and a second at another, maybe Eutelsat's Hot Bird.

Installing a second LNB is an inexpensive solution to providing access to more channels. The extended arm costs around £20, and a second LNB from £30 to £200 depending on which frequencies it works at and its quality.

A motorised system will give you a range of satellites depending on
Practical Wireless, October 1996

your view southwards to the horizon. If you only have a limited view of the sky to the south do not contemplate a motorised system. It will be a waste of money.

A motorised system is more complicated to install, the dish will be larger, signals from satellites not designed to cover the UK, or principally used for telecommunications, are weaker and the cost of the equipment is greater. The least you will pay is £500, realistically you can expect to pay more than £1000.

Radio Via Satellite

If you want to concentrate on radio reception instead of simply watching television via satellite you must make sure that the receiver you buy covers all the audio subcarriers needed. On Astra, the audio subcarriers for analogue services usually are in the range 6.50 to 8.48MHz.

Check that there is a connection for your hi-fi or other amplifier at the rear of the set (usually left and right phono plugs). If you do not buy a set with separate audio connectors, you will have to use the TV's loudspeaker, reducing the flexibility of how you listen to satellite radio.

Each television channel has several audio subcarriers. Two for the stereo sound (left and right are on separate subcarriers) and perhaps another two for a different language soundtrack (like Eurosport where the commentary is in English in stereo, plus German and Dutch), or for one or more radio stations.

When a television station leases a channel (or transponder as it is called on the satellite) from a company like Astra, the audio subcarriers come in the package. Many TV stations then sublet the audio channels they do not need to radio operators.

Satellite receivers vary in price

and sophistication. If you have a fixed single satellite dish you can choose a receiver at the lower end of the price scale. But if you want a cheap receiver you will probably find that tuning radio stations is complicated and that some of the subcarriers you want are missing. Older receivers sold cheaply will not be able to tune to the frequencies used by the newest Astra satellites.

For dual satellite reception you must make sure that the receiver's frequency coverage is compatible with the LNBs on your dish. It must also be sophisticated enough to allow you to switch between both LNBs.

If you choose a motorised system, you should select a receiver that has a built-in positioner, in other words the piece of equipment which controls the movement of the dish between one satellite and the next. The alternative is to have a separate positioner box, adding to the clutter alongside your TV set!

Products Tested

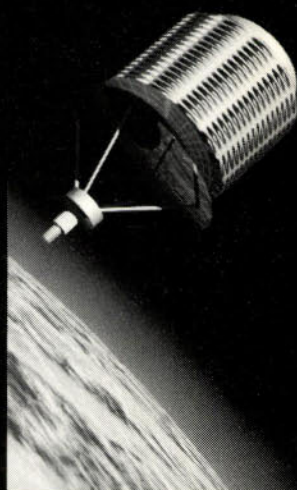
Whenever I talk about buying a short wave radio receiver, I recommend that potential purchasers choose one of the main manufacturers whose products are well tested and have had good reviews. The same applies in the main to satellite receivers.

Big companies like **Pace** have good reputations, so good in fact that Pace's founders recently became millionaires when the company was floated. Look out for the **Pace MSS1000** at around £450.

If you want to stick with a manufacturer that has a good line in both short wave and satellite products, look at the range from the American **R. L. Drake** company. The £540 **ESR-**

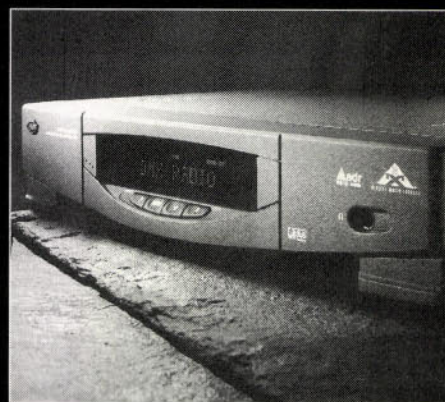


Fig. 1: Some of the international radio stations available from space.



The Pace MSS1000 integrated satellite receiver decoder and the Pace MSS300 stereo satellite receiver.

Photos courtesy of Pace



Continued on page 24

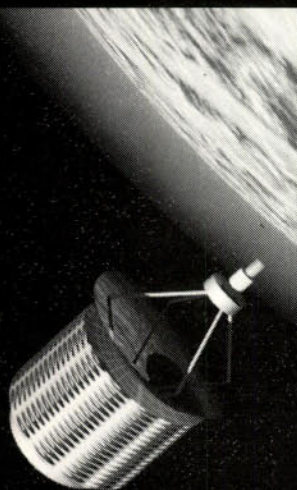
An Introduction

Satellite Radio - An Introduction

Continued from page 23

The new flat-plate Galaxis Future 1 antenna.

Photo courtesy of Galaxis



Astra's Luxembourg headquarters in Betzdorf.

Photo courtesy of Astra

A dual-feed satellite dish positioned to receive Eutelsat's II-F1 and Hot Bird 1 transmissions.

Photo courtesy of Eutelsat



800XT has 800 programmable memory channels.

Even if you start off with a fixed system, the ESR-800XT is 'future-proof' should you upgrade to a motorised system later. As the name implies, the top-of-the-range **ESR-2000XT** also from Drake, which is available at around £1000, offers 2000 memory channels!

There are many other receivers on the market, and it's worth checking specialist satellite magazines for the latest news of models and prices. And many dealers will have special offers on extensive ranges of equipment, from dishes to receivers to LNBs.

If I have one particular thing to recommend for people thinking of installing a fixed single satellite system, it's the new flat-plate **Galaxis Future 1 antenna**. Measuring just 15 x 8in, the makers claim it will perform as well as a conventional 600mm dish antenna in much of Europe and the UK.

The **Galaxis Future 1** should be appearing in UK dealers this year. It will be at a slight premium over parabolic antennas, but with a huge saving on the space it takes up.

Whetted Your Appetite?

So if this feature has whetted your appetite, what should be your first move? As I said earlier, d.i.y. installation of a simple fixed dish system is relatively straightforward.

You will need things like a compass and protractor to work out where in the sky your dish should point. And you will need a friend indoors watching the television who is either in earshot or on the other end of a telephone as you sit on a

ladder or a flat roof to tell you when the picture is perfect which means that the dish is aligned correctly.

You can also fit a dual-feed system without too much more difficulty, but with a greater amount of patience from you and your colleague inside! A motorised system is a bigger job altogether and needs more planning and more time to get it right.

If you do plan a d.i.y. installation, I recommend that you read the *WRTH Satellite Broadcasting Guide* which takes you through all the elements of installation. It then explains what you will be able to see and hear when everything works. (copies of the *WRTH Satellite Broadcasting Guide* are available from the **PW Book Store** for **£17.95 plus P&P**).



And then of course you can always pay the expert to come and do it for you! It could be money well spent.

The Future's Digital

At the moment a majority of the equipment on the market is designed for analogue reception, and most of the channels on the air are analogue although the future is digital. Astra's latest satellites are already digital, which means you will need new equipment to receive the radio and TV signals.

Next year, Sky TV will launch a 'digital bouquet' of channels and the BBC has said that it's investigating using Astra's digital services to deliver new channels to British viewers. All this means that you will have to have a new digital-

capable black box at some point in the future, as well as the conventional analogue equipment I have been talking about so far.

If digital satellite broadcasting takes off in a big way, the consumer electronics industry will have a field day.

Further Ahead

And looking further ahead, digital radio could be delivered to handheld radio sets direct from satellite before the end of the century. Two systems are proposed one of which is scheduled for launch in 1998-99.

Washington DC-based **World Space** is building three satellites. These will beam digital radio and data to portable radio sets in Africa, the Middle East, much of Asia and

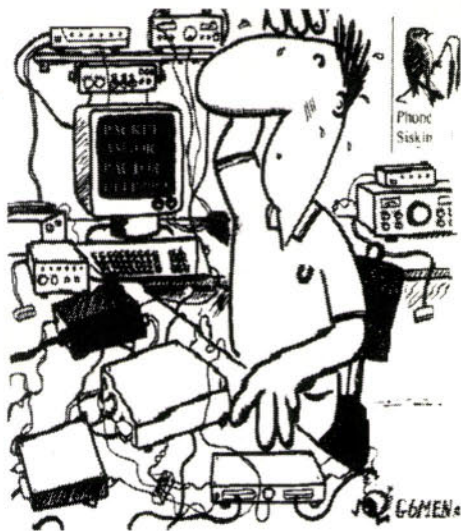
South America in the L-band (1452-1492GHz).

And the European Space Agency's Archimedes mediaStar project using the terrestrial digital radio system, Eureka 147, is also on the drawing board for launch by the end of the century. A revolution awaits radio listeners and enthusiasts world-wide!

I hope you've enjoyed this introduction to satellite radio and that it's opened up a whole new meaning to satellite broadcasting for you. Satellite can bring much more than television into your front-room!

PW

"STILL SCRATCHING YOUR HEAD ABOUT CAT INTERFACING?"



Computers have certainly changed the face of Amateur Radio over the past few years haven't they? Yet many Amateurs are not making full use of C.A.T. interfacing facilities offered by many modern transceivers.

The Siskin Multi-Cat simply connects between your existing transceiver's C.A.T. socket and PC serial port allowing keyboard/mouse control of the radio. For example if you are logged onto the local Packet DX Cluster your radio could automatically QSY to the next incoming DX hot-spot making DXCC a breeze! If your PC is downstairs and the radio is upstairs, no problem! An extra long RS-232 cable will permit control of the radio directly from the PC.

The Siskin Multi-Cat has been developed in close co-operation with Yaesu UK, Kenwood UK and Icom UK, so hence functions with most C.A.T. ready radios.

The Multi-Cat is supplied COMPLETE with ready-made computer/transceiver cables plus DOS, Windows and Logging software.

Price: £69.95 + £6.50 carriage

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Carry On Cruising...

Bryan Coleman GO1CN reports on an interesting facility on board the Queen Elizabeth II which will (if you really need encouragement) entice more Radio Amateurs to try 'carry on cruising'.

Thanks to the efforts of Chief Radio Officer **Jim Barlow G3VOU**, Amateur Radio operation is an added attraction on board Cunard's RMS *Queen Elizabeth II*. Jim, a Radio Amateur himself for very many years, has with the generous support of Kenwood UK Ltd., gained Cunard's approval for the installation of an h.f. Amateur Radio station in the ship's radio room.

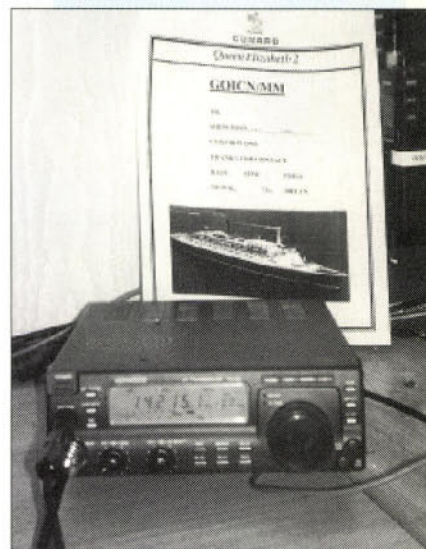
The h.f. station is provided for the use of licensed Radio Amateurs at any time upon request, which in my case was readily forthcoming. Kenwood have provided the latest TS-50S transceiver, a P33 mains power supply unit and an AT300 automatic antenna tuning unit. This is used in conjunction with a 20m vertical wire antenna.

I first put the station 'on air' on Saturday 18th November 1995 while enjoying myself as a passenger. Several QSOs were completed with UK based stations who were sent a special printed QSL acknowledgement.

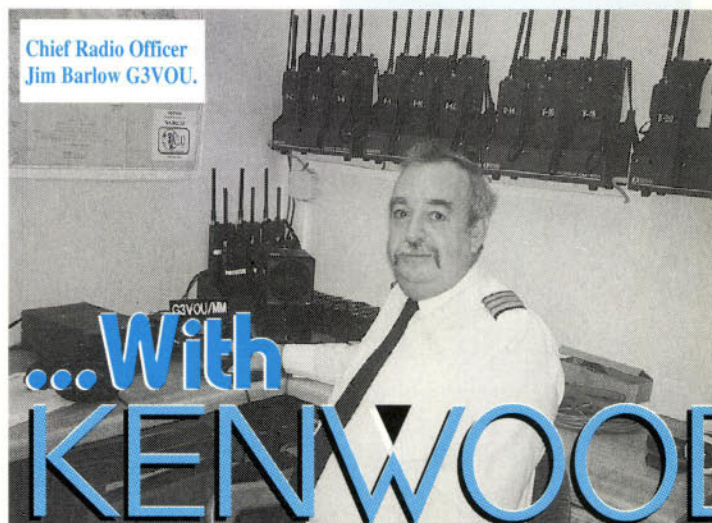
Thanks Jim G3VOU for all your efforts, and thank you also to Kenwood UK Ltd., for your generous support. And lastly, I thank the lady herself...the *Queen Elizabeth II* for being such a beautiful ship and comfortable cruising QTH.

PW

The Kenwood TS-50, donated by Kenwood UK Ltd., on board the QE II with the special QSL card to mark the occasion the new station first went on the air on Saturday 18th November 1995.



Chief Radio Officer
Jim Barlow G3VOU.



The PW Rugby 7MHz SSB &

By Dave Howes G4KQH

Dave Howes G4KQH continues his description of the Rugby, his design for a companion s.s.b. and c.w. transmitter for the PW 'Daventry' receiver. This month he presents the construction stages of the project.

This month I'm describing the assembly stage and setting up of the transmitter. You can make your own p.c.b. from the drawings, or you can obtain one from the address at the end of the article. A full kit of parts to build the Rugby is also available.

Start assembling the module by fitting the terminal pins to all the external wiring connection points (these all have circles around their holes – see parts location overlay in Fig. 2.1). Push these fully home into their holes with a hot soldering iron and a little solder.

Next fit the resistors, followed by the axial inductors and the Toko coils. When these are all soldered in place, fit the capacitors followed by all the semiconductors except D11 and Tr12 and then the other miscellaneous parts except the coils that need winding.

Electrolytic capacitors, diodes and transistors must all be fitted the correct way round as indicated on the parts location drawing. Transistors Tr10 and Tr11 need to be fitted with insulated spacers under their bodies. Tr11 also has a push-on heatsink.

Where the ground plane has no etched away 'spot' around a component lead, it's essential to solder the component to the ground plane as well as the track on the wiring side of the board.

Don't forget to solder the screening cans of the Toko coils to the p.c.b. ground plane before moving on to fit the capacitors. Otherwise some of the capacitors can get in the way of doing this.

Also take care when soldering the trimmer C19 to the ground plane not to melt the vanes or body of the device. Some capacitors have only one p.c.b. hole for them. Their other "leg" is soldered to the ground plane only. Keep all component leads as short as possible.

Power Amplifier

The Rugby prototype has a heatsink mounted on the p.c.b. for the power amplifier (p.a.) transistor. This is adequate to cool the device for normal s.s.b. and c.w. use. However, if you intend to use high levels of

speech processing or a high duty cycle mode (RTTY, etc.), you will need to add extra cooling.

Before you fit Tr12 and the heatsink to the p.c.b., fit a solder tag to the heatsink with an M3.5 6mm bolt. The photograph, Fig. 2.2 (of the p.c.b. installed in the case) should give you an idea of how this is done.

Once the p.a. assembly is installed, the solder tag is linked with an off-cut component lead to the p.c.b. ground plane. This is to ensure that the p.a. heatsink is earthed.

The p.a. transistor is mounted on the heatsink with an insulating mica washer and an insulating bush. (This is to prevent the M3 fixing screw touching the transistor's metal tab).

The bias supply temperature compensation diode, D11, is fitted so that its body is in direct thermal contact with the body of Tr12. You can use a little thermal paste to help the heat conduction if you have some.

Note: it's absolutely essential not to forget to solder the '+' lead of D11 to the ground plane. If you forget to do this, and attempt to transmit, you may well damage the p.a. transistor.

Transformers & Toroids

When you have fitted all the other parts to the p.c.b., it's time to wind and fit the two transformers and the four toroids. Transformers T1 and T2 are identical, and to start, take 100mm each of 0.32mm (28s.w.g.) red, yellow and blue wire and twist the three wires together.

Next, wind the twisted wires in and out of the core three times. The ends of the wires are then stripped of their insulation and inserted into the holes on the p.c.b. in the right order.

The p.c.b. parts location overlay, Fig. 2.1, shows the wire colours by their initial letters (b = blue, etc.). Keep the transformer leads very short and neat (not more than about 2 or 3mm long).

All the toroids are all wound with 0.56mm enamelled copper wire. The turns should be wound tightly around the cores and spaced out evenly so that the leads will go straight down into their p.c.b. holes.

Inductor L14 has 15 turns, L15 and

L17 have 12 turns and L16 has 11. Making a good job of winding the output filter coils (L15 to L17) is important with regards to getting the best output from the transmitter. We want the power going to the antenna, not into the p.a. heatsink!

Don't forget to scrape the enamel insulation from the leads with a sharp knife before fitting them into the p.c.b. for soldering.

Thorough Check

When you've finished assembly of the p.c.b. module, make a thorough check that all the parts are in the right places. Then once again ensure that all the diodes, electrolytic capacitors and the transistors are the right way round.

Next, hold the board up to a bright light to make sure there are no gaps where there should be solder joints. As everything is on one p.c.b. in this project, it is relatively simple to remove the unit from the case once you have installed it, if any rework is needed.

However, it's much nicer if the project works first time! A few minutes spent checking now, can save a lot of time and trouble when it comes to testing later.

Rugby Alignment

The Rugby has been designed for home construction, so the need for alignment and test equipment has been kept to a minimum. So, you can safely carry out a basic mechanical alignment as I've set out here, before installing the module in its case, and do the final adjustments when the module has been fully wired up in situ.

Do not use anything other than a proper insulated trimming tool to adjust the Toko coils. Use a metal screwdriver and you'll have to buy new coils - so buy a proper tool instead!

Using a calibrated matchstick for measurement (these traditional instruments are quite acceptable!), set the core of L3 so that it is just less than 1mm below the top of the screening can.

PW Daventry 7MHz Receiver

The companion project, the PW Daventry receiver, was published in the October and November 1995 issues of *Practical Wireless*. (Back issues available from the PW Book Store for £2.30 including postage. Tel: (01202) 659930).

CW Transmitter - Part 2

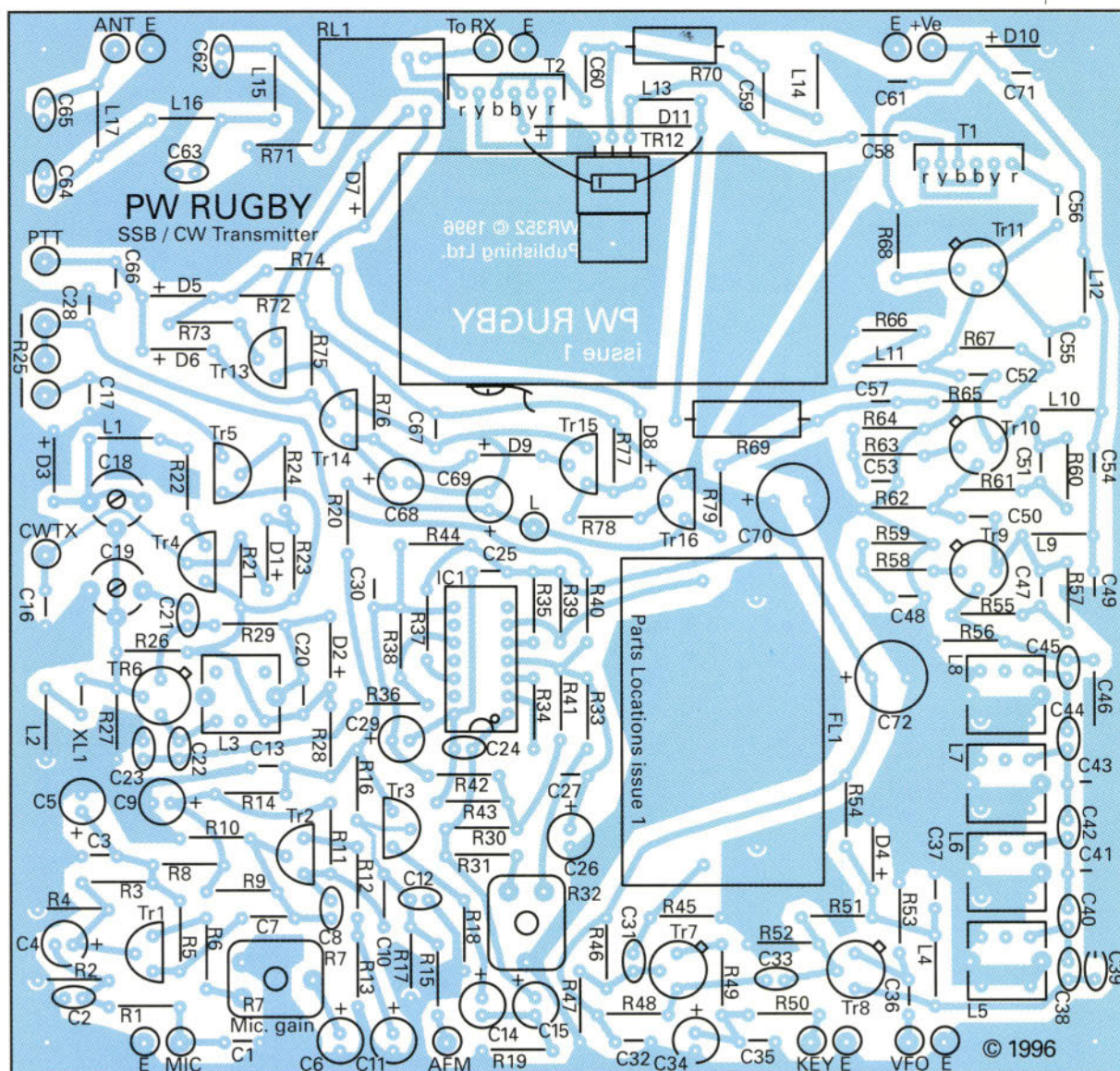


Fig. 2.1: The p.c.b. overlay diagram for the PW Rugby 7MHz s.s.b. and c.w. transmitter.

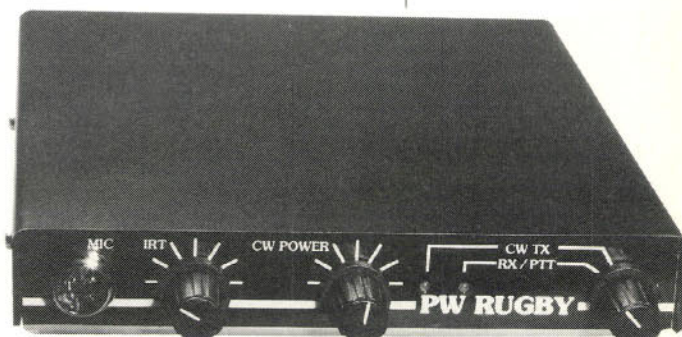
Set the cores of L5, 6, 7 & 8 to 3mm below the top of their screening cans. Set C8 so that the vanes are just meshing slightly and C19 so that its vanes are about one third meshed. Set R32 to half travel and R7 to three quarters of the way round (clockwise). Your module should now only require fine adjustment after installation.

Screened Case

The Rugby, like any transmitter, will need to be installed in a screened metal case. It will also need one that Practical Wireless, October 1996

can allow the heat to escape, so an aluminium box is recommended. (Some ventilation holes over the p.a. stage and driver heatsinks would help with cooling).

It's very important when wiring up the unit in the case, that only the screened v.f.o. signal input lead is allowed to run down the right hand side of the module. All other wires must be run around the left hand side. This is to help avoid the transmitter's output getting coupled back into the low level amplifiers.



Continued on page 28

The PW Rugby 7MHz SSB & CW Transmitter - Part 2

Continued from page 27

Fig. 2.2: The p.c.b. track diagram.



Final Testing

When the p.c.b. module is fully wired up, you can carry out the final testing. To start, connect a suitably rated power meter with a 50 Ω dummy load on its output to the transmitter's antenna socket.

Next, connect up a suitable 13.8V power supply unit (p.s.u.). Fit a 5A in-line fuse if the p.s.u. does not have a protected output.

You'll also need to connect the v.f.o. input of the Rugby to a suitable oscillator or the buffered output from the Daventry receiver. If you are using a signal generator for this, set its output level controls to 0dBm (1mW).

To set up the carrier oscillator, either connect up a frequency counter to the junction of R36/R38. Or you

could tune a receiver to just below 10.7MHz with a short pick up wire connected to its antenna socket.

Now turn R25 (the **CW Power** control) to minimum, switch to **CW TX** and adjust L3 for maximum oscillation. Then adjust C19 for 800Hz above the specified upper sideband (u.s.b.) carrier frequency for your crystal filter.

(Important Note: if you are going to transceive with the Daventry, you will of course need to ensure matched carrier frequencies in both the receiver and transmitter).

Next, switch back to receive, and operate the p.t.t. to switch to **SSB TX** mode. Then adjust C18 for the filter's specified u.s.b. carrier frequency.

There may be some interaction between C18 and C19, so you'll need to repeat these two adjustments a couple of times to ensure both c.w.

and s.s.b. carrier frequencies are spot on tune. Once this job is done, disconnect the frequency counter, if you were using one.

To adjust the band-pass filter inductors, L5, 6, 7 & 8, set the v.f.o. frequency to the middle of the band. Then switch to **CW TX**, and turn up the **CW Power** control until your power meter shows a little r.f., and simply tune the four coils for maximum output.

Again, the controls may interact a little, so go through the procedure a couple of times. Keep the output power down to a couple of watts as you do this, so as not to heat up the p.a. too much.

Carrier Balance

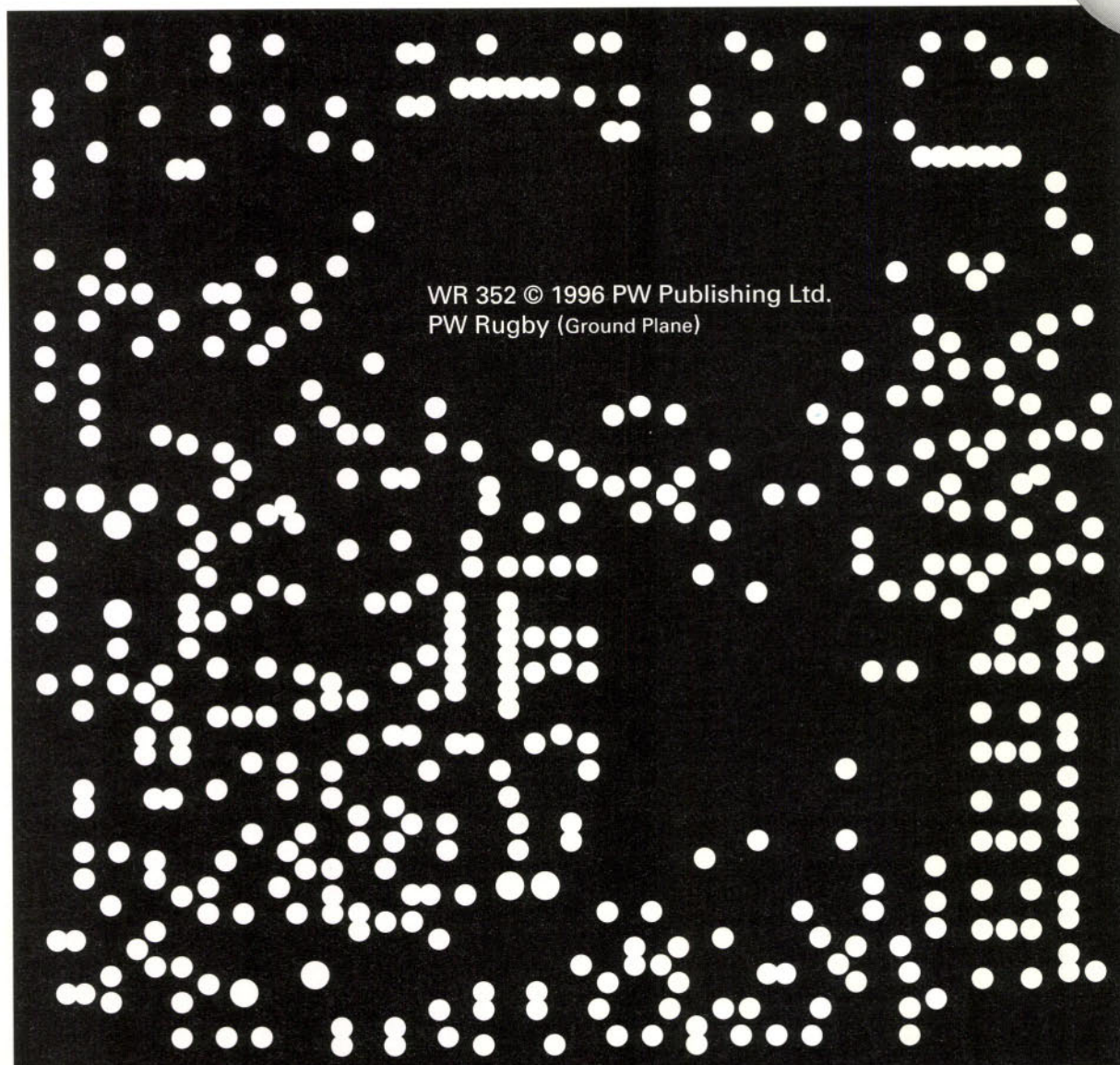
Only the s.s.b. carrier balance and Practical Wireless, October 1996

Shopping List

The full shopping list for the PW Rugby 7MHz transmitter is available from the Editorial offices in Broadstone, on receipt of a self-adhesive self-addressed label and First class stamp.



Fig. 2.3:
Ground-plane
p.c.b. diagram.



microphone gain now remain to be adjusted. The microphone gain is simply set-up by monitoring with a separate receiver and an output power meter.

Don't forget that the power meter will 'under read' on speech. So it's best to 'whistle' into the microphone to get a crude idea of the actual power.

Tune the receiver off to one side of the transmission to ensure there is no 'splatter' on speech (turn R7 down if there is any hint of this). The microphone gain on the Rugby should suit most low impedance dynamic fist microphones for 'close talking' purposes.

The carrier balance control itself, R32, is set by monitoring the s.s.b. transmission with a receiver. But it's carried out with the microphone audio wire to the MIC terminal on

the p.c.b. disconnected.

You rotate R32 for minimum carrier. This is not a critical setting, and does not vary the level very much. And don't forget to put the microphone wire back on after you have adjusted R32!

Ready For Use

Your Rugby transmitter should now be set-up ready for use. However, before you connect the antenna and put it on the air, you should of course use your station's frequency and spurious checking equipment to make the required tests, and note the results in the station log in line with your licence conditions.

I hope you enjoy building the Rugby. It really is so much

nicer to tell the other station "the rig here is home-brew"!

PW

Kit For The PW Rugby Transmitter

Dave Howes G4KQH has produced a kit for the PW Rugby transmitter. The kit costs **£79.90** plus P&P and includes all the necessary electronics. For further details and information on the kits for the companion PW Daventry receiver, contact **C. M. Howes Communications, Eydon, Daventry, Northamptonshire NN11 3PT. Tel. (01327) 260178.**

The Chelcom 3-Band Windom Antenna

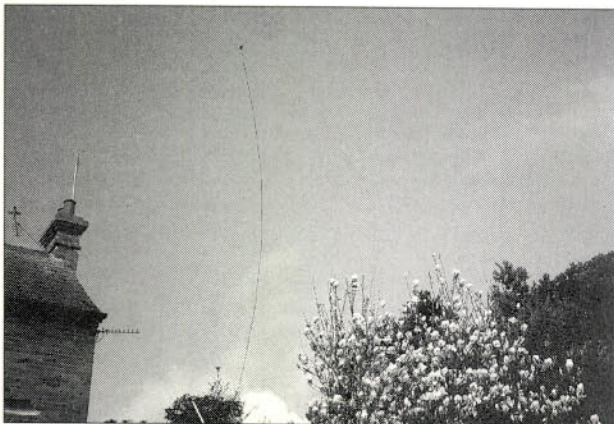


By John Heys G3BDQ

John Heys G3BDQ, as one of the PW authors specialising in antennas, has had an opportunity to try an interesting version of the long established Windom antenna.

A QSL card from the originator of the 'Windom' antenna Loren G. Windom W8GZ (sent to the late G8KS) from John G3BDQ's extensive collection.

Wire antennas are notoriously difficult to photograph, this view shows the low visual impact that the simple (but very effective) Chelcom Windom presents at G3BDQ's QTH (see text).



One of my regular contacts is Mike Baker G3TMB who lives in Southport. Last winter he mentioned that he had acquired a Chelcom Windom antenna and was getting really fine DX results with it, particularly on the 14MHz band. I was intrigued and soon arranged via PW for the loan of one of these antennas from Lowe Electronics to test and review for the magazine.

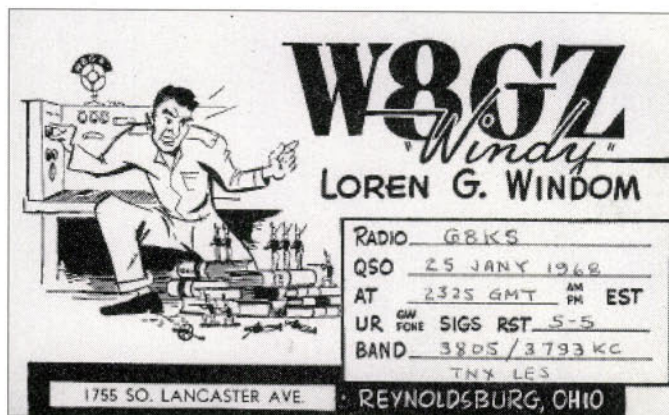
Within a few days, quite a small package arrived which held the antenna, completely made up and all ready to hoist into position. So, all I had to do was to get busy in the garden!

A Little History

I'll start with a little history on the Windom antenna, which is named after its originator, **Loren G. Windom W8GZ**. It was first described in the September 1929 QST magazine and for many years (and until Band I v.h.f. TV appeared in the UK) the Windom was a favourite with many amateurs.

Incidentally, the British Army also favoured the simple Windom antenna. A bent 'dog leg' Windom was one of my first antennas and I found it to be a very good radiator. Although designed as a half-wave antenna, it was also effective on its higher harmonic frequencies.

A single wire when used as a



feed line has an impedance of about 600Ω and a half wavelength of wire at resonance has a very low impedance at its centre. The impedance rises towards the wire ends and may be many thousands of ohms at its extremities.

The basic physics I've described mean that somewhere along the wire between its centre and either end, there will be an impedance of 600Ω. At these points there will be a good match to a single wire feed line.

The 600Ω impedance points are very approximately 1/3 of the distance from one end of the wire. If the match to the feeder is exactly correct, there shouldn't be any radiation from the feeder, but in practice this is almost impossible to achieve. The standing waves and radiation from the Windom's feeder was what bedevilled the early TV receivers working on the v.h.f. Band I.

Half-Wave

The antenna, as supplied, is a half-wave length long on 7MHz. It's 'broken' at approximately 6.7m from one end where a 5:1 balun is connected. The balun has a standard SO239 socket to which a 50Ω feeder is connected and the antenna can handle up to 400W.

The antenna top is described by Chelcom as 20.1m (66 feet) long but G3TMB has informed me that he measured his Windom and discovered that it was actually 21.3m long. I think this explains why the impedance where the 5:1 balun

connects must be around 250Ω.

The antenna is made with the new Flex-Weave copper wire. This is extremely flexible and does not kink. End insulators are also supplied.

The antenna comes with a descriptive sheet which shows the s.w.r. curves for a typical installation having the Windom mounted at 9m above ground, fed with 30.5m of RG58U coaxial cable and when using a transmitter output of 100W on the 7, 14 and 28MHz bands. They suggest that an a.t.u. will allow operation on other amateur bands.

The Chelcom s.w.r. curves suggest that on the 7 and 28MHz bands, the mis-match is 1.4:1 or better and on 14MHz it reduces from 1.6:1 at 14MHz to better than 1.4:1 at the h.f. band edge. Chelcom sensibly suggest that local variations of antenna height, the proximity of buildings or trees, etc., may result in s.w.r. readings at variance with those given.

Quick Job

The erection of the Windom was a quick job and took just minutes. The antenna replaced a 27m long doublet, which had open wire feeder. The Windom was held at one end by a pole on a chimney stack at 10.6m high. Its other end went to a 10m mast tied into an apple tree down the garden.

To limit the length of the coaxial cable needed, the shorter leg of the

Continued on page 33

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We've been shouting quite loud about Chelcom's range of antennas for a few years now but don't just take our word for it! Read John Hay's review of Chelcom's 40m Windom on page 30 and see what the pro's think too! The Chelcom 40m Windom is just one of a range of HF, VHF and UHF antennas made in the UK and distributed exclusively by Lowe Electronics. If you'd like more information, just send us four first class stamps plus your name, callsign, full address and telephone number and we'll send you our latest antenna fact pack!

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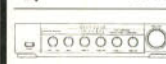
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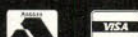
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The Chelcom 3-Band Windom Antenna

Continued from page 30

antenna was positioned at the house end. The feeder could then drop down vertically, run along the garage roof and eventually enter the shack window at the front of the house.

The total feeder length was 29m and used RG58U coaxial cable. The Windom can be arranged to slope downwards when only one reasonably high tie point is available.

My friend G3TMB's Chelcom Windom is only 7m high at the house end and it slopes down to a 2.1m fence post. Its quite low average height limits the antenna's DX effectiveness on 7MHz.

Before hauling up my antenna I weatherproofed the coaxial connectors on the balun. I've recently discovered the strong grey 'Elephant' tape which is now available from most hardware stores. It's very useful and stays put under all weather conditions and seems to keep out any moisture. Its surface is quite water repellent and to date I've not noticed any deterioration from exposure to sunlight.

World - Wide Coverage

My loaned Chelcom antenna runs NW/SE which means that on 14MHz where it operates as a full-wave radiator I get world-wide coverage. On 7MHz the antenna orientation favours DX to the NE and SW giving excellent results towards JA, UA0, South America and the Caribbean.

As the antenna is only about a quarter wavelength above ground on 7MHz it radiates a 'punchy' signal into the UK and Europe on that band.

However, the very low sunspot activity in the spring of 1996 limited 28MHz operation to Sporadic 'E' short skip working and also some local f.m. work on 29.6MHz. Signal reports on this band have been excellent and I feel sure that in a few years time, as the sunspot situation improves, the Windom will provide exciting DX contacts.

My transceiver has an internal a.t.u. so it was easy to test the Windom on other bands. The 10MHz WARC band provided many contacts with reports little different from those

received when using my all-band grounded long wire.

I also achieved some DX on the 18MHz WARC band and despite the poor conditions, a few 'windows' allowed the working of some good contacts. And a few sorties on 24MHz provided many short skip European and Middle Eastern QSOs through the summer months.

The best band for DX however, was 14MHz where S9 and 9 plus reports on s.s.b. were received from the Far East, Africa and the Americas. And if you're a reader of *PW*'s 'HF Far & Wide' column, you may have seen listings of some exotic DX that I worked on the h.f. bands when using the Chelcom Windom.

My friend G3TMB has sent me details of the stations he worked when using the antenna. In his letter he says "It outperforms my HF6V vertical by a long way, say 2 to 3 'S' points". He says he's a little disappointed with the results on 7MHz for although he gets good reports from around Europe, working DX is difficult.

On the 7MHz G3TMB's s.w.r. is high and he has to use an a.t.u. Personally, I think that this is entirely due to his antenna being so near the ground. This upsets the s.w.r. and gives high angle radiation. Anyone contemplating DX work with a Chelcom Windom must arrange that it is at least 9m above the ground and positioned horizontally.

Very Useful Antenna

Personally I think the Chelcom Three-Band Windom is a very useful antenna that will fit into most average sized gardens. Its performance on 14MHz and the higher bands is very good, even at low heights, but for DX work on 7MHz **it must be mounted well above ground.**

I've been so impressed by the Chelcom's performance and the fact that it matches so well into my transceiver on the three bands that I have decided to buy it. This is, I feel, the ultimate accolade for a product under review.

PW

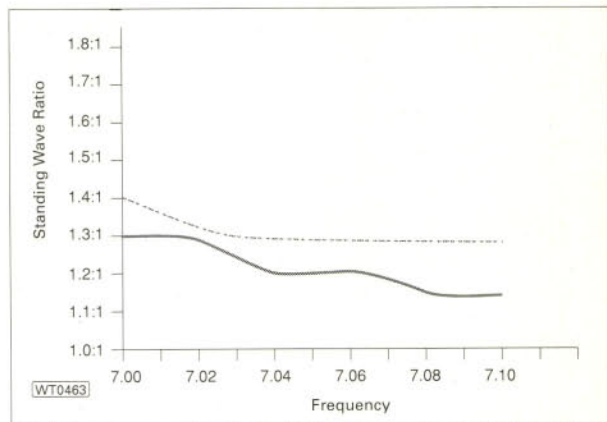


Fig. 1: Plot of the Chelcom Windom antenna v.s.w.r. measurements on 7MHz by G3BDQ.

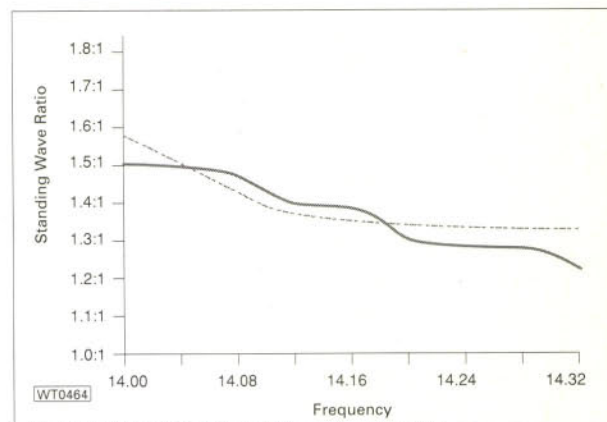


Fig. 2: The v.s.w.r. measurements obtained on 14MHz.

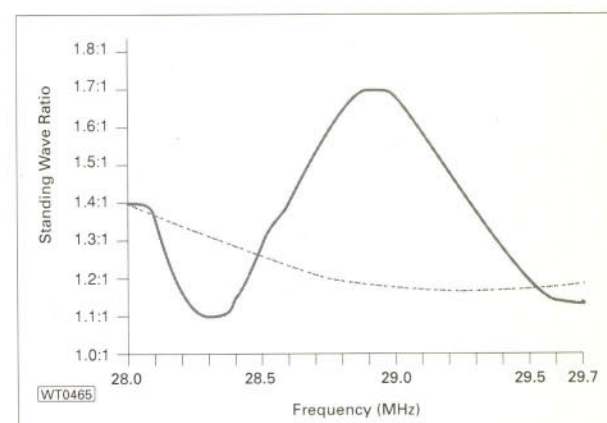


Fig. 3: The v.s.w.r. measurement plot on 28MHz (see text).

In all the above drawings the heavy line is the actual v.s.w.r. John measured, and the dotted line is the design v.s.w.r.

My thanks go to Lowe Electronics Ltd., of Chesterfield Road, Matlock, Derbyshire DE4 5LE for the loan of the review antenna which costs just £55 plus £5 carriage and packing.

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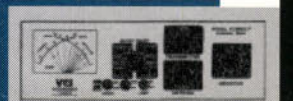
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Carrying On - The Practical Way

By Rev. George Dobbs G3RJV

The Rev. George Dobbs G3RJV describes a 'fun' transmitter (he says it's another transmitter in a funny box!) that can be built in an evening. So, read on and find out all about it!

You can build this month's project after you've enjoyed a tin of 'Fisherman's Friends' lozenges! George G3RJV says the empty tin makes an ideal case for a 7MHz QRP c.w. transmitter.

It is possible to enjoy many QSOs using a couple of Watts on the amateur bands. The results of dedicated QRP operators often appear little different from those of stations using conventional power.

One of the best ways of experiencing the fun of low power operation is to build a small transmitter. You can then use it in conjunction with the station receiver, or the receive portion of the station transceiver.

The designs are legion! Over the last several years the increased interest in QRP has generated a whole range of small transmitters most of which can be built in an evening for very little cost.

Because of the modest circuitry, many of these transmitters are physically small and can be built into a small case. It has become the delight of some constructors to house their transmitters in unusual containers.

Tuna Tin

I remember well the ARRL producing a design called the 'Tuna Tin' transmitter. This was followed by a matching receiver called the 'Herring Aid'!



Only this year many QRPs in the USA have been building a small transceiver called the '49er' into Altoids tins (Altoids are very strong mints made by Callard & Bowser here in Britain, but which I've only ever seen on sale in America!).

If American QRP enthusiasts can build into tins...so can we! And as somewhere in this series I planned to describe a 'one night' transmitter', so why not now! And what better than into a 'Fisherman's Friend' tin?

One version of 'Fisherman's Friends' (they're a Lancashire product, made in Fleetwood near Blackpool) is sold in a 40g tin. This allows for more than enough space to house a little transmitter. A transmitter for 7MHz housed in a 'Fisherman's Friend' tin is naturally called the FF-7!

The Circuit

The circuit of the FF-7 is shown in Fig. 1. It contains nothing that is especially novel, nor original, but represents an easy-to-get-going small transmitter.

The transistor, Tr1, is a simple crystal oscillator with a crystal in the base circuit and a tuned circuit (T1 and C1) in the collector. My version used a BC182 which requires the feedback capacitor C2 to maintain oscillation. (Higher gain transistors may oscillate without the inclusion of C1).

My prototype used a crystal on 7.030MHz, the international QRP Calling frequency on 'Forty'. Any crystal in the c.w. sector of the band would serve.

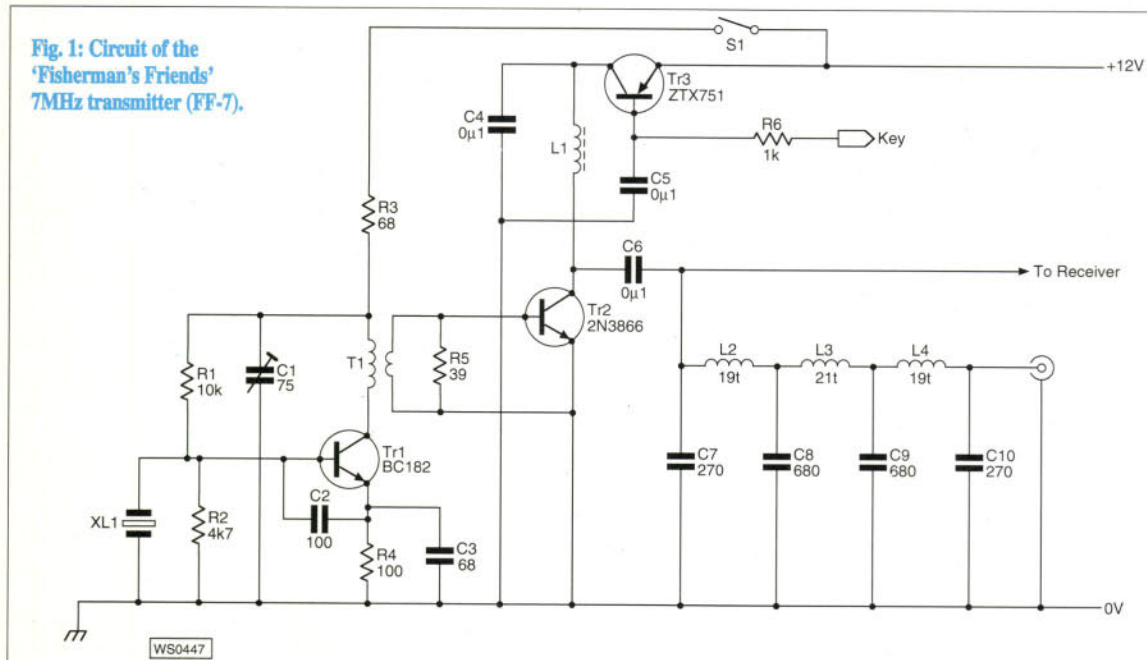
The transformer, T1, has a small coupling winding which feeds the power amplify stage, Tr2. This is a single 2N3866 transistor which produces some 1.5 to 2W of r.f. output.

The collector load for Tr2 is a home-wound choke, L1. This is formed by 10 turns of thin 0.28mm (32s.w.g.) enamelled wire wound through the centre of a ferrite bead.

The capacitor C6 couples the oscillator output to a 7-element low pass filter. A 7-element filter might seem a lot for such a simple low powered transmitter (In fact it takes up most of the space in the tin) but the output is very 'hygienic' with the second harmonic some 40dB down on the main frequency.

The transmitter is keyed

Fig. 1: Circuit of the 'Fisherman's Friends' 7MHz transmitter (FF-7).



using Tr3 as a d.c. switch. This may be considered a refinement. However, in practice the cleanest and easiest way to key a small transmitter is to switch the power to the power amplifier by means of a solid state switch. The extra cost is minimal.

Warning: Please remember to check polarity when wiring in Tr3. Don't forget it's a *pn*p transistor.

Tin Box

The transmitter is built 'ugly style' inside the tin box. You could use the bottom of the box as the groundplane but I added a piece of blank p.c.b. material cut to the size of the box. This makes construction a little easier as the majority of the circuit can be built outside the tin box, it's then inserted to make the final connection to the various sockets.

I've described 'ugly' construction before. It's that simple method of building a circuit by wiring it directly to a groundplane.

In 'ugly' construction all the components with grounded connections are soldered directly to the groundplane. The free ends of these components form 'stand-offs' for the mounting of the other parts.

Inductors T1, L2, 3 and 4 are wound on T37-2 toroid cores. Remember each pass of the wire through the centre of the core counts as one turn.

Transistor Tr2 requires a small star-shaped heatsink and must be mounted horizontally to fit into the tin box. I also added a little insulated tape under Tr2 to prevent the heatsink touching the groundplane.

When the circuit is completed, add the sockets to the tin box. The socket for the key (3.5mm jack) and a mounting socket for the crystal are placed at one end of the tin and phono socket, for the output, is mounted at the other end.

In the middle of the hinged side of the tin there's a centrally mounted 1000pF feedthrough capacitor for the 12V supply. In my prototype the p.c.b. groundplane was secured to the base of the tin with blobs of solder.

Oscillator On

When 12V is applied to the circuit the oscillator is on all the time. This means that a switch is required to turn the oscillator on and off between transmit and receive operations.

The switching could be done with a double-pole, double-throw switch. (The other half could then switch the antenna from the transmitter to the receiver). When the oscillator is switched on (prior to keying) this position may be used for 'netting'. (That's finding where the transmitter

is located in frequency on the receiver).

On applying the 12V, the oscillator should be audible on a receiver tuned to the crystal frequency. If your receiver does not 'hear' the signal, try using a small piece of wire as an antenna to the receiver and draping it close to the oscillator circuit.

Warning: The transmitter should not be keyed without a load on the power amplifier. A 50Ω resistor capable of handling 2W is the simplest 'dummy' load to connect to the output.

You may have a power meter which includes a dummy load, which is ideal for testing the transmitter. Otherwise measure the power output by connection a voltmeter (or oscilloscope) across the dummy load. Expect to see some 9 to 10V on a meter with a diode probe.

Key the transmitter and adjust C1 for the maximum output while listening to the transmitter on a receiver. The keying should sound clean.

However, you should not be misled by apparent oddities in the keying. This may be because the transmitter is so close that it may be overloading the receiver.

"Tin - tin - tin"

Lancashire saying

Literal translation ,

"It is not in the tin"

The only real test to get a signal report from another station (so get on the air!). The transmitter is now ready for use and should provide a lot of fun.

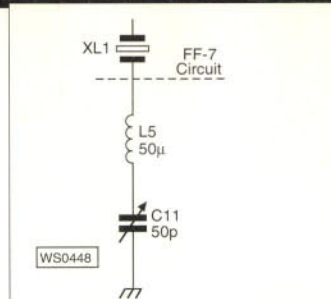
Fixed Frequency

One problem with a little crystal controlled transmitter, is the fixed frequency of the crystal. ('being rock bound' as the old timers called it!).

Fortunately, it's possible to shift the frequency of a crystal a little from its design frequency. This shift may be achieved by loading it with capacitance or, to get a greater frequency 'shift', by adding some inductance as well. The circuit then becomes a variable frequency crystal oscillator, often referred to as a VXO.

The diagram, Fig. 2, shows the additional components needed to turn the FF-7 oscillator into a VXO. A variable capacitance, C11, of about 50pF is required in series with an axial inductor of 50μH (L5).

The value of the variable capacitor



is not critical, almost anything around 40 to 75pF will serve the purpose. Too low a value will give a small frequency shift, too large a value will cause the oscillator to stop oscillating.

You can expect a shift of a few kilohertz, the actual frequency shift depends upon individual crystals. But even this small movement in frequency is often enough to move the transmitter away from other stations.

Finally, the diagram Fig. 3 shows a convenient, and simple, circuit to remove the need of switching from transmit to receive. The circuit consists of two pairs of diodes to limit the amount of signal reaching the receiver and a trimmer capacitor and inductor to control the level of signal.

The circuit in Fig. 3 follows a commonly used idea in QRP transceivers. It was first introduced by Roy Lewallen W7EL, in several of his backpacking transceiver designs.

The side marked 'From Transmitter' goes to the junction of C6 and C7 on the FF-7 circuit and the side marked 'To Receiver' goes to the receiver antenna input.

The receiver obtains its input signal via the low pass filter on the transmitter which adds a little more filtering to the signal. On transmit, the diodes D1-D4 protect the receiver input.

The amount of transmitter signal heard is adjusted with the trimmer. Its neat little circuit provides instant change-over from transmit to receive and monitoring of the transmitted signals. I think it's a worthwhile addition to the little transmitter circuit.

So, my advice is for you to pop round to the shop, buy a tin of 'Fisherman's Friends', enjoy them and then get busy building the FF-7 into the empty tin. See you on 'Forty'!



Fig. 2: Circuit modification to provide a small degree of frequency 'shifting'. Incorporating this circuit creates a 'variable crystal oscillator' (VXO).

PW

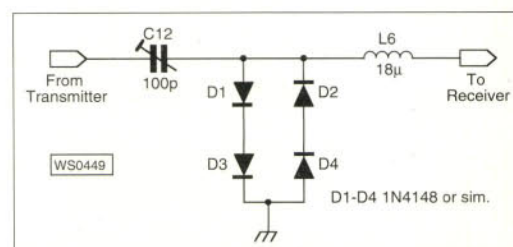


Fig. 3: Using diodes for transmit-receive 'change-over'. It's a simple process and George G3RJY says it's easy to use it with QRP equipment (see text).

Cheerio from George, see you next month.

The Alinco DR-605 VHF/UHF FM Transceiver

By Leighton Smart GW0LBI

As Leighton Smart GW0LBI has recently got himself a set of 'new wheels' PW realised he might be in the market for a mobile rig. That's how he got to try the new Alinco DR-605!

ALINCO



When I was last asked to review a mobile transceiver by the Editor, things were a little difficult. My only mode of transport at that time was a 12 - speed bicycle! (hard work in these Welsh valleys!). I did persevere, however, with the assistance of **Dave Griffiths GW0JUI**, who was in possession of the necessary four-wheeled vehicle!

However, this time I was able to 'air test' the Alinco DR-605 on my own. Because after passing my driving test I've bought my own 'mobile' shack!

Mobile and portable work is where I believe v.h.f. and u.h.f. operating comes into its own. My first and only amateur licence has been an A Class, and I didn't really see the potential of v.h.f. and above.

Things changed, however, after I took up rambling as a hobby. My little 144MHz hand-held was a real boon when my 10 year-old son Dewi and I found ourselves on the top of the local hills.

Now I've got a motor car, I must say that v.h.f. and u.h.f. operation is a real pleasure! There's a lot to be said about having good company on long journeys!

I think this just illustrates how wrong you can be about a form of radio that you have never actually experienced. Enough said, eh?

Budget Rig

The DR-605 is a dual-band 144 and 430MHz mobile transceiver, produced by Alinco as their 'budget' v.h.f./u.h.f. rig. It has two output power levels, these being 5 and 50W on 144MHz, and 5 and 35W on 430MHz.

The DR-605 is a neat looking radio. The case is finished in a pleasant black sheen finish, with just a small number of control knobs, a couple of buttons and a bright orange digital read-out, with the speaker mounted under the upper case.

What did surprise me was the size of the heatsink! The actual rig itself measures approximately 140 x 40 x 150mm, while the heatsink at the rear takes up about a third of that again. I doubt if there'll be problems with dissipating the heat generated from this little radio when it's pumping out 50W of r.f.!

With Mounting & Manual

The rig came complete with microphone, mounting bracket, power lead and a very informative and detailed 50-page instruction manual. This I found I needed to refer to again and again to get to grips with the varied functions on this little rig.

The controls on the front fascia of the rig include **Power (On/Off)**, the **VHF** and **UHF** band controls. These, like the others, have a dual function as volume controls on both bands.

There's also the multi-purpose **Function** button. This allows the operator to select the rig's operational modes, squelch levels, Tone Encoder Mode and a host of other applications, which are all controlled via the transceiver's processor.

Apart from the main dial knob, there are also four discrete buttons. These, like the other controls, have primary and secondary functions.

I must admit that I became a mite confused at times, what with the various array of functions available with the small number of controls! However, after a couple of days, I began to know the functions after 'getting used' to the procedures.

Antenna Connector

On the rear of the rig, the antenna connector is fitted at the end of a coaxial cable lead 185mm in length. The connector is the standard SO239 type, which made it easy for me to connect my antennas (no resoldering 'N' type connectors!).

Other facilities on the rear are the extension speaker socket and the data input socket. This is suitable for 9600bps packet operation.

The microphone is a small and lightweight unit. It's fitted with **Up/Down** scan buttons and a **Lock** control. (This facility enables the operator to switch out the scan buttons preventing accidental scanning or

frequency changing). The microphone is attached using the now popular 'push in and clip' method.

Setting-Up

Now I'm recalling the 'setting-up' stage. However, on reflection perhaps I should have subtitled this section 'Finding my way around'!

After the usual formalities of connecting up and switching on, I then had to carefully read through the handbook in order to find out how to set the band of operation, the squelch levels (on each band), power levels required, etc.

The manual, I'm pleased to say, takes the operator through a step-by-step guide to operation. This provides details of such basic things as switching on and connection for mobile operation. Then it's on to setting the **Tone Squelch** and the transmit offset for repeater operation on both 144 and 430MHz.

As a matter of fact I'm quite impressed with the amount of intelligent thinking that's obviously gone into the DR-605's manual. It's well illustrated, with plenty of diagrams to assist the operator when they set-up the radio.

The number of features on this rig would, as the 50-page manual implies, take a lot more space to describe in full detail. Suffice to say I found that, as a mere ragchewer I personally would not have used a significant number of them in day-to-day use. But I'm sure that there are v.h.f./u.h.f. enthusiasts out there who would!

On The Air

As I mentioned above, I'm more of a ragchewer on the air than anything else. So I made a 'sked' on 144MHz with a couple of friends of mine **Dave Griffiths GW0JUI**, and **Neal Jones GW0VQZ** (both living within 16km of my QTH, in the valleys) in order to have both an on-air test and a chat at the same time!

Both GW0JUI and GW0VQZ

reported good clean and powerful audio from the DR-605 with the power level set to just 5W. On receive, I found that the sensitivity was far in excess of my own v.h.f. transceiver, with audio and signal levels being markedly higher on the Alinco.

I used the Alinco on both low and high (50W) power levels. I did this even though I could work both Dave and Neal comfortably on low power, it was just to see how warm the rig became at the 50W setting, and how effective the large heatsink was!

I found that on high power, the DR-605's casing remained remarkably cool (even though I tend to transmit for reasonably long periods while on simplex ragchewing).

Repeater Operation

Later, I decided to test repeater operation. However, this wasn't as smooth as I'd anticipated!

I attempted to access my local repeater GB3BC, which is situated about 12km or so away. However, I just couldn't seem to 'open the box' at all.

I consulted the manual again, to make sure I was doing things correctly, all to no avail. In exasperation, I picked up my hand-held rig, and, with just 350mW and a 'rubber duck', opened the repeater without any problems. This narrowed things down to the DR-605E.

I was fortunate that the repeater was then activated by Nigel G7GGA/M near Bridgewater (Somerset), and Ted GW7KWG in Cardiff. After a few minutes, I tentatively called into both stations, and, after realising that I was in fact being heard, explained my dilemma regarding being unable to access the repeater.

Both Ted and Nigel then suggested that the repeater should be allowed to close down, and that I should try again. This was done, and the result was that the repeater remained silent and did not respond to my signals.

After Nigel had re-opened the repeater, I was told that they had heard nothing from me but the toneburst! It seems that when I depressed the **Toneburst** button, (which is the secondary function on the microphone's **Down Scan** button) and then released it to allow me to speak, the toneburst remained on, and my audio was not heard, thus 'BC' would not 'let me in'. (This happened on 'simplex' operation also, as I later discovered, using my hand-held as a monitoring receiver).

However, I found that I could access the repeater by giving a 'squirt' of toneburst, dropping carrier very briefly, keying up again and speaking into the microphone. This was not an ideal situation, but at least I was able to use the repeater.

My grateful thanks to Ted and Nigel for their extreme patience with me that evening!

A telephone call to the *PW* Editor resulted in a further call to the suppliers,

who after testing their other DR-605s found that this feature seemed to be standard. Although this was slightly disconcerting, it seemed to me that as long as repeaters could be accessed using the method I have described above, it should not detract from the rig itself, as I found that after a few days of repeater operation it came naturally.

Out Mobile

I used the rig on 430MHz whilst out 'mobile' on a local mountain top, Mynydd Gelligear. My first contact on this band was again a simplex contact, using 5W, with Andy G4SZM/M on the A5 near Avonmouth.

Andy gave me a good report, with clean audio, despite signals being fluttery as he was 'mobile' in the true sense of the word! Despite that, a good quality two-way contact was made.

Band activity was very low at the time that I was stationary on the mountain, so I decided to try the repeater channels. This time, I couldn't access any repeaters whatever I tried, including using 35W!

After about 25 minutes of attempting to open repeaters, I was about to give up when Roger GW8IVT/P opened the 'MG' repeater. I called in and had a lengthy ragchew with Roger, during which he gave a favourable report, but although we tried the same test with the repeater as I had tried on 144MHz, I just could not access any on 430MHz!

I found the repeater access problem very frustrating indeed, as I'm a little curious about the 430MHz. I would have liked to see if I could have worked any of the repeaters from my home QTH.

Attractive Transceiver

I must admit to having taken a liking to this attractive little transceiver. It has a nice array of functions which I guess will suit many v.h.f. and u.h.f. enthusiasts.

However, I must admit to being very disappointed about the problem of repeater accessing. I can't understand why the toneburst should remain on continually, unless the rig I received was from amongst a batch of faulty radios?

Although the difficulty was a minor problem on 144MHz, it was a major one on 430MHz, and posed a major problem regarding repeater operation on that band. To be fair though, it's the only black mark on what otherwise is a fine piece of amateur radio equipment.

My thanks for the loan of the review model go to Waters & Stanton Electronics at 22 Main Road, Hockley, Essex S55 4QS. Tel: (01702) 206835/2025843 who can supply the DR-605 for £495 with free carriage. There is also a selection of accessories available for the DR-605. For full details contact Waters & Stanton direct.



Manufacturer's Specifications

General

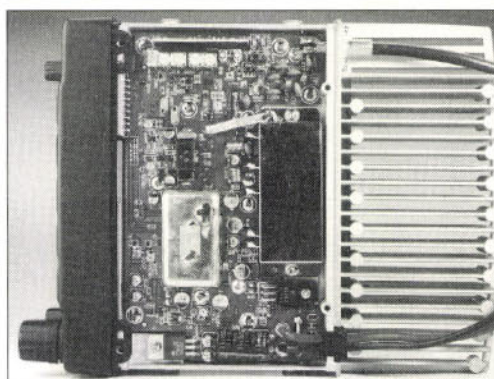
Frequency range	v.h.f. 144-145.995MHz u.h.f. 430-439.995MHz
Modulation	F3E (FM)
Antenna impedance	50Ω
Supply voltage	13.8V d.c.
Ground	Negative
Current consumption	v.h.f. (transmit): 11.5A Max @ 50W u.h.f. (transmit): 10A Max @ 35W Receive (v.h.f./u.h.f.) 1.2A Max
Freq. stability	±10 ppm Max
Dimensions	140 x 40 x 176mm
Weight	1.1kg
Channel	v.h.f. 51/u.h.f. 51. Total 102

Transmitter

Output:	v.h.f. 50W (High), 5W (Low) u.h.f. 35W (High), 5W (Low)
Modulator	Reactance type
Spurious	-60db Max
Max deviation	±5kHz
Microphone impedance	2kΩ

Receiver

Receiver circuitry	Double superhet
Intermediate frequencies	(v.h.f.) 21.7MHz & 450kHz (u.h.f.) 30.85MHz & 455kHz
Sensitivity (12db SINAD)	-16dbμ (0.16μv) or less
Selectivity	-6db: 12kHz Min, -60db: 28kHz Max
Squelch sens.	-20dbμ (0.1μv) or less
Audio output	2W (8Ω load)
Audio output imp.	8Ω.



After seeing a copy of GW0LBI's review, Jeff Stanton G6XYU of Waters & Stanton Electronics sent the following comment:

I agree with Leighton Smart's comment that repeater access using tone burst is slightly more fiddly than with previous Alinco rigs although in practice early buyers have quickly got the hang of it. Also of course tone burst access of repeaters is dwindling as the more reliable CTCSS system comes into general use. Alinco are planning a simple modification for easier tone burst use.

Jeff Stanton G6XYU

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EF40 4.00	UF89 4.00		6J5G 6.00		5814A 5.00	
EF86 10.00	UL41 12.00		6J5M 4.00		5842 12.00	
EF91 2.00	UL84 3.00		6J7 3.00		6072A 6.00	
EF183/4 2.00	UY41 4.00		6JB6A 22.00		6080 6.00	
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A 'Superbeam' Experience on 24MHz



By Vic Westmoreland G3HKQ

Vic Westmoreland G3HKQ describes his 'One Man's Experience' building a 'Supergain' wire beam antenna for use on 24MHz.

Just before I moved from my previous QTH, I became very interested in a 2-element wire beam designed by Dick Bird G4ZU/F6IDC. Although designed by Dick Bird, I believe it's a variant of the VK2ABQ, with extensive use of critical coupling first suggested by VK2ABQ and G6XN.

I built a very rough beam for 28MHz using varnished bamboo and wrapped it with insulation tape. The beam was used at a height of six metres with good results.

Then we moved to a small bugalow, with an equally small garden. There I hoped to have a small neat mast that did not distract too much from the garden.

My wife's first hobby is gardening (for me it runs a close second). So of course the garden was completed first and in the process plenty of old copper wire was laid under the turf.

Planning permission was sought to erect a mast with an 'aerial'. At the same time a visit was made to seven neighbours in the square where I lived, to carefully explain my plans.

Fortunately, no neighbours objected, and I noted this fact when I forwarded with my main planning application. I also discussed my application with my local councillor who also sat on the planning committee.

Permission was granted after only three months. I'm mentioning my approach to the Practical Wireless, October 1996

planning application as I believe they'll normally be granted provided you go into detail.

Economy Tennamast

In the meantime after looking through various advertisements in *Practical Wireless*, I finally chose a 7.62m economy mast from Tennamast in Scotland. Incidentally, I was very satisfied, both with the courteous responses from the firm and the quality of the finished mast.

The instructions on the Tennamast were very clear and the mast quickly erected. I fitted it with an AR40 rotator and a short aluminium extension which would support the wire beam.

My new mast, which could be bent over at right angles so that I could work on the beam from the ground, was 4.27m when vertical. It could then be quickly raised to 8.5m.

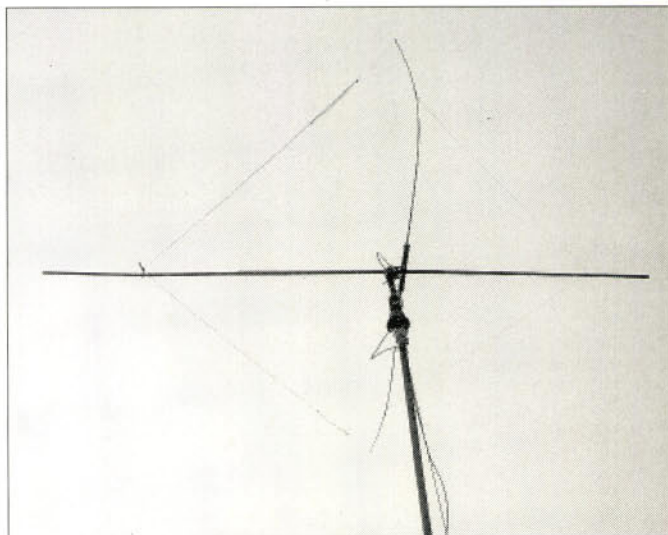
The band I was interested was 24.9MHz. In the original antenna Dick G4ZU says: "I hope you'll enjoy experimenting with this interesting design". So I decided to make provision to extend the boom in the event that I fitted a director.

Aluminium Boom

The boom I made from an aluminium tube, some four metres long. Across the boom approximately one third from the front-end, I fitted a section of aluminium channel secured by two U-bolts.

Could it be a coincidence that the old aluminium channel originally came from a G4ZU commercial beam made some 35 years ago? The channel supported two lengths of hollow g.r.p. tapering tubes. The tubes were 2.7m long and about 30mm diameter at the base. I believe the tubes were originally made as 'blanks' for fishing rods.

The rods were secured to the



The 'Supergain' 24MHz antenna.

aluminium channel by four electrician's metal clamps (not shown in the drawings for clarity). A small bracket was fitted in the centre to hold a 50Ω coaxial (SO239) socket.

The driven elements comprised of two lengths of 1.6mm (16s.w.g.) hard drawn copper wire. Each was 2.74m long and should be pushed through the hollow fibre rod and the excess allowed to extend from the end.

After assembly the wire that extended could be left as it was or bent back until the final length was obtained. The inner ends of the wires were soldered to the coaxial socket.

At the rear end of the boom, approximately 2.5m from the driven element, a hose clip was secured. The clip held a small porcelain stand-off insulator from an old TUSB capacitor. This method of mounting allows the support to slide along the boom to keep the reflector tight.

The reflector was one length of 1.6mm bare copper wire. I started with the element at 5.6m initially to cover two bands, so that it could be cut to the correct length on adjustment and tuning checks.

The ends of the wire reflector were bent back and fastened temporarily to the outside ends

of the fibre rods with strong nylon monofilament fishing line. This length had to be varied to obtain the best 'critical factor'.

I marked the centre of the reflector with insulation tape, and then pulled back under tension. It is important that the apex angle is between 90° and 130°. In my case, the final angle was 130°.

Bow Shape

The familiar bow shape was obtained as the fibre rods bent backwards. It certainly looked different from the normal 2-element beam, but I knew from previous knowledge that the beam was capable of giving excellent results.

I used a length of UR57 coaxial cable to feed the driven element. The joins were wrapped with tape to protect the joints from the elements.

At first I decided not to use a choke or a balun. The beam was then secured to the short aluminium extension and the mast erected to a height of 4.27m ready for checking.

It's my habit to keep all measurements of antennas, beams, etc. in a notebook. All

Continued on page 43

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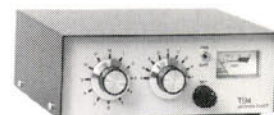
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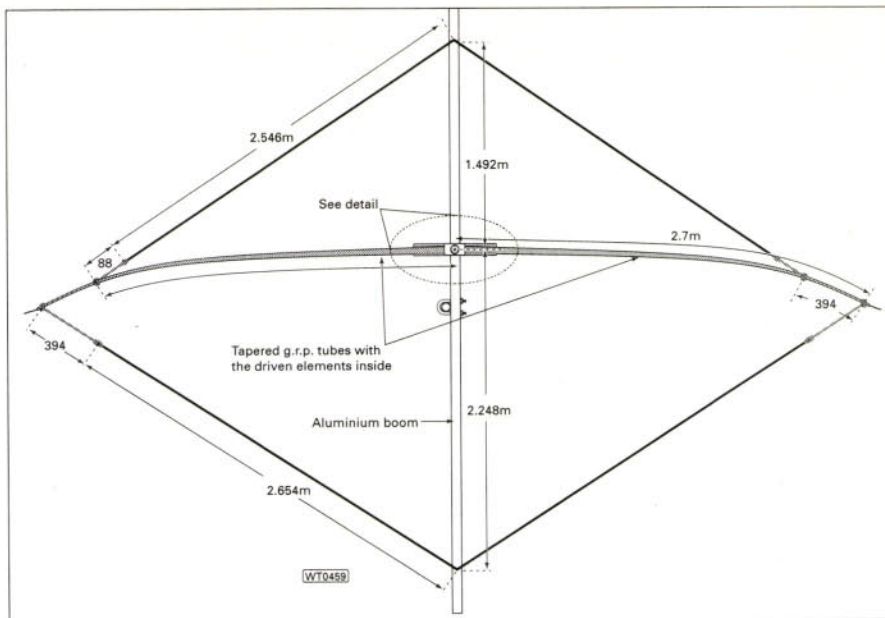


Fig. 1: Diagram showing details of the 'Supergain' beam described by G3HKQ with acknowledgements to Dick Bird G4ZU.

alterations and tests are recorded too.

Although my Kenwood TS-850S incorporates a s.w.r. meter, I also use a bi-directional in-line wattmeter (designed by David Stockton and bought as a kit). It's an excellent instrument, and makes an accurate s.w.r. meter.

My first results, using low power, gave an s.w.r. of 1.5:1. Lifting the beam to 8.5m, the s.w.r. reduced to 1.2:1. Checking the feed point impedance with a noise bridge, the reading was 38Ω. But the 'off air' comparative front-to-back ratio (while listening to the IK6BAK beacon) was most disappointing, with hardly any difference.

Started Checks

I then started a number of checks and changes over the next few days. I tried altering the driven element, the reflector and the 'critical' length of nylon fishing line, recording the results.

When the measurements approached what I considered optimum I started on the air. However, the results were fair and with the exception of the front-to-back ratio I was reasonably satisfied.

But I felt sure the reason for the only fair results was due to the fact that I was attempting to cover too great a difference in frequency. With this in mind I decided to concentrate on 24.9MHz and shortened the driven element and reflector.

During the course of a month, I had 20 QSOs where I was reported as a slightly weaker signal. There

were 16 QSOs where I was a stronger signal and eight QSOs of exactly the same signal strength (most QSOs were with W and VE amateurs using beams and higher power).

A short time later I changed the 2-element wire beam into a 3-element beam. I added a 'V' shaped director of 1.6mm copper wire. The two ends of the director were fastened to the g.r.p. tubes using nylon line.

I now found dimensions to be fairly critical. Especially the director and supporting monofilament length and where the lines were fastened.

I found the front-to-back ratio improved to two 'S' points, but it was still not as good as I thought it should be. The s.w.r. was 1.05:1 across the 24.9MHz band.

During a period of three months, of 140 QSOs on the 24MHz band, there were 40 QSOs where I was slightly weaker, 60 QSOs where I had a stronger signal and 40 QSOs where I had the same signal strength.

However, I think the most important check for any antenna are the number of replies to CQ calls. In this respect the beam certainly scored well and WAC was completed several times. During one QSO with W2QKN he said that he could only hear two stations, a Danish station and myself, my signal being far stronger.

Required Adjustments

The antenna certainly required time to make adjustments to the beam. But it finally paid off and the front-

to-back ratio improved to three 'S' points and I became highly satisfied with the beam.

I believe that there's still room for improvement, particularly in obtaining more even currents in the elements. But **how much** it could improve performance is anybody's guess!

Initially I was surprised at the short length of the driven element. But during preliminary discussions with **Norman Hester KS9C** he thought I would have to

reduce my driven element...and he was right!

In Norman's opinion, the 16s.w.g. hard drawn copper wire sleeved by the g.r.p. tube would have a marked effect in lowering the resonant frequency, and I found it to be true. If the driven element was laid along the top of bamboo or something similar it would have to be increased in length.

Simple Success

So, there it is, a 'simple' wire beam which I used with great success for about two years. Now, during the present sunspot period, the 24.9MHz band is only open for short periods.

The type of beam I've described can be scaled up or down for other bands. I recommend it for a cheap worthwhile beam and although it's only a mono-band beam, it fits very well in my small garden. It could fit in yours too!

PW

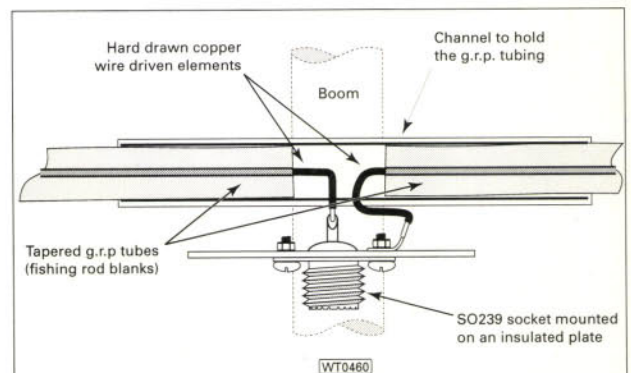


Fig. 2: Close up diagram showing antenna feed-point and connection details (see text).



References:

Dick Bird G4ZU/F6IDC, wrote the article, 'A Compact 'Supergain' Beam Antenna', which appeared in *Amateur Radio Action, Antenna Book No. 5.*

The article, 'A Bi-Directional In-line Wattmeter' by David Stockton G4ZNU appeared in *Sprat No. 61.* (Kanga Kit available).

Dick Pascoe G0BPS, poses the question - s.w.r. fact or fiction? Then he gives you his answer.

Antenn

Over the years, many amateurs and others seem to have developed a fixation for achieving the lowest possible voltage standing wave ratio (v.s.w.r.) on their antenna feed. Although normally v.s.w.r. is shortened to become s.w.r.

To many it may seem that an s.w.r. of unity (1:1) is the best way to improve the system antenna efficiency. But in practice, is this totally true?

Let's first look at what most people require from an antenna system. Most amateurs desire that the maximum amount of their generated signal is radiated.

To achieve maximum transmitted signals, the antenna system must act with the maximum efficiency possible! It must be accepted however, that in the real world, 100% efficiency is only a dream. But can we get close to it?

Now let's look a little more closely what happens when an antenna is energised from an r.f. source, as happens when it's coupled to a transmitter. When the radio is transmitting, standing waves appear on the antenna.

One way to visualise the standing waves is to get a length of rope about 7-10m long. Then you should tie one end off to a point on a wall about waist height and pull the rope fairly tight. Now 'snap' the end of the rope up and down once only.

I'm sure we've all done this as children and watched the 'wave' travel along the rope. By timing the 'new' wave at your end you can create a whole number of standing waves on the rope.

I've shown this 'wave' motion in Fig. 1. The wave movement that you see provides a graphical illustration of the electrical oscillation energy in an antenna. As the rope's 'free' end is moved, the strongest pull will be felt when the cord is at the extremity of the

swing (top or bottom of the hand movement).

At the top or bottom of the swing, as the hand is coming to rest, and about to reverse its direction the hand has no motion or energy. It's 'stationary at that point', and all the energy is in a form of a force at the other end of the rope.

Try Experiment

Try this experiment, tie off your rope and pull it tight. Wave your end up and down a few times (slackening off the rope tension as the wave builds up) to get a standing wave pattern. After you've set up a wave, at any time you feel like it, stop your hand moving at either the top or the bottom of your swing.

The wave will continue to move along the rope. The energy you've put into the rope cannot escape because the end of the rope is fixed. The energy in the motion will rebound, from the fixed end of the rope, back to you, and the rope will now try to move your hand!

The analogy shows how the current flows in an antenna. In this demonstration, the force being applied vertically 'by hand' represents the electrical force (or voltage) at the ends.

The energy could equally be fed to the cord from the centre or from any other place in the line (try it out for yourself, tie off both ends) so it will be seen that a resonant antenna can be fed at any point! If this antenna is fed at the end, it is said to be 'voltage fed', if fed at the centre it is said to be 'current fed' as shown in

antenna system that, there must be 'standing waves' on the antenna itself. Without these waves the antenna cannot work. As the energy moves about on the antenna, alternating between voltage and current forms, each interchange of current and voltage causes a quantity of energy to be lost in the form of electrical and magnetic forces.

The waves are 'pushed forward' by the next oscillation and so travel out into space, hopefully to be received by another station. The electromagnetic waves leaving the antenna represent a flow of energy or power.

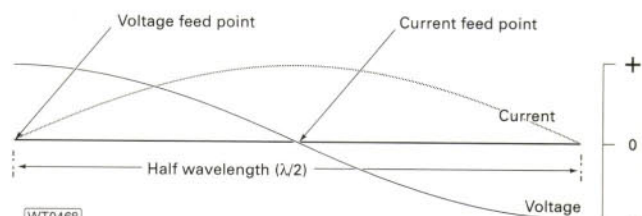


Fig. 2: A half-wave antenna with voltage and current levels.

As with a flow of current in a circuit, there are formulae to calculate power:

$$P = I \times I \times R \text{ (or } P = I^2 R \text{)},$$

where 'P' equates to the power level, 'I' the current flowing and 'R' is the resistance through which the current flows.

It may be relatively easy to measure the current flowing on the antenna, but how can the resistance be measured? Our antenna is not a closed circuit! This makes life more difficult. But our ever helpful hero leaps in and 'invents' a new fictional resistance!

The new fictional resistance is called **radiation resistance**. It has no bearing on things nuclear, but it's used to help define the radiation properties of antennas. The power radiated in watts is equal to the radiation resistance times the value of the current flowing squared ($P = I^2 R$).

The radiation resistance can be determined at any part of the antenna, but it's more usual to refer to it at the point of maximum current. In an electrical half-wave dipole, the radiation resistance is nominally 75Ω at the centre (or feed) point.

However, the nominal feedpoint resistance doesn't take into account any physical resistance of the metals used to construct the antenna itself. You may note a slight problem here. Most modern commercial transmitters are set for an impedance of 50Ω , but I'll deal with that problem later.

Fig. 2.

The ratio of the voltage (at any point) to the current (at the same point) is called the impedance. This will obviously change from being a high ratio at one end, to a low ratio at other places along the length.

Fundamental Requirement

It is a fundamental requirement of any

Impedance Matching

When a transmission line, be it coaxial cable,

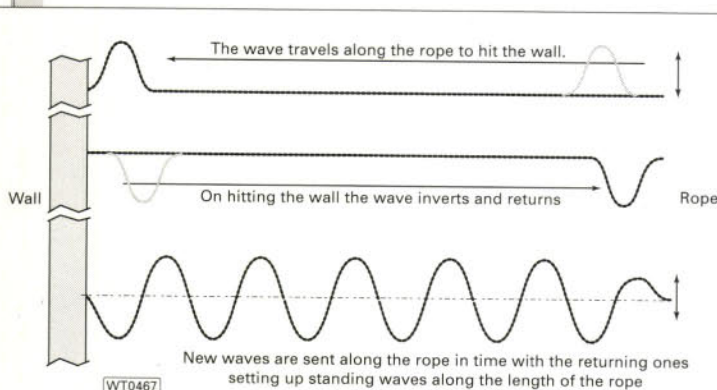
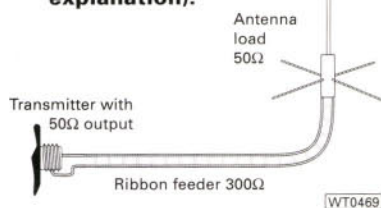


Fig. 1: The concept of standing waves (see text for more detail).

a Workshop

Fig. 3: A complete mis-match. Or is it? (see text for an explanation).



open wire or twin ribbon feeder, is terminated with a resistance equal to its own characteristic impedance (in most cases 50 or 75Ω) the power, supplied from the transmitter, is completely absorbed by the terminating resistance.

With perfect matching, there are no standing waves along the feeder, and the current is uniform along the feeder's length. The losses along the length of feeder are also at a minimum. Furthermore, the impedance at the transmitter end is the same as at the antenna end, irrespective of the feeder length.

If the terminating load (antenna) is not of the correct impedance then the line becomes mis-matched. Mis-match means that some of the power sent down the feeder isn't absorbed by the load. Some of the power is reflected back from the antenna feed point back down the feeder.

The reflected power causes interference pattern waves to build up on the line, remember the rope! The degree of mis-match is sensed by measuring the standing waves on the feeder. This measurement we call the standing wave ratio (s.w.r.).

The s.w.r. is the ratio of the maximum to minimum values of the standing waves on the line. The feeder may, or may not match the impedance of the transmitter, although it should if the correct feeder has been used.

If the feeder impedance doesn't match the rig's output impedance, then a further mis-match reflection occurs at the rig end. This reflection causes the power, partially reflected from the antenna mis-match, to be partially re-reflected towards the antenna again.

The reflection and re-reflection continue along the line until all the power has been absorbed in the load. Providing that the mis-match at the antenna end is the same as the mis-match at the rig end, then there are no feeder losses. Very confusing, isn't it?

Simple Example

Let us look at a simple example. Have a look

at Fig. 3, where you have a transmitter with a nominal impedance of 50Ω. This is using 300Ω ribbon feeder to feed an antenna with a centre feed point impedance that also 50Ω.

You'll see immediately that there is a mis-match at both ends of the feeder. The joins of the 300Ω feeder at the antenna and at the rig will cause problems. These problems can easily be solved by changing the feeder to one with a characteristic impedance 50Ω.

There is one way that this mis-match at the transmitter can be resolved, (Note the term *resolved*, not *cured*!). And that method is to use an antenna matching unit (a.m.u.), sometimes called an antenna tuning unit (a.t.u.).

It should be remembered though, by all who swear by their a.t.u.s (the 'my a.t.u. will tune a lump of wet string' brigade) is that the s.w.r. on a line is dependant on the amount of mis-match at the antenna to feeder **and** the rig to feeder.

If the only mis-match is at the antenna to feeder end, then nothing you can do at the transmitter end will alter the antenna feeder mis-match at all! All that you can do is to fool the transmitter into thinking that it's looking at a better match than it really is.

Perfect Match?

Whilst we are searching for the perfect match (s.w.r. of 1:1), let's take a look at the case of a perfectly tuned electrical half-wave dipole antenna. Let's assume the antenna's perfect for the band in use and fed from a commercial transmitter (output 50Ω) with a length of any commercial 50Ω feeder (see Fig. 4).

Ignoring mechanical losses, the antenna impedance at the feed point is (approximately) 75Ω. However, the feeder and rig have nominal impedances of 50Ω.

Using the standard ratio of impedances, to calculate s.w.r. gives:

$$\text{s.w.r.} = Z_t / Z_s \text{ (or } Z_s / Z_t)$$

where Z_s is the line impedance and Z_t is the antenna impedance, with the larger of the two numbers above the other to ascertain the s.w.r.).

Using the formula with ' Z_t ' as 75Ω and Z_s as 50Ω, we have an s.w.r. of 1.5:1. This s.w.r. figure means that when using a perfectly trimmed dipole we can get, at best only a 1.5:1 s.w.r.

By using an a.t.u. you cannot tune the antenna, but we can fool the transmitter into thinking that the load is perfect, enabling your

rig to deliver full power to the system. Most modern rigs almost certainly reduce the output power when the s.w.r. rises to save those expensive power amplifier transistors.

The use of an a.t.u. has other effects too. As the 'forward' power meets the mis-match at the antenna some power is radiated from the antenna and some becomes the 'reflected' power down the feeder towards the transmitter.

At the transmitter the reflected power meets the mis-match of the a.t.u. (due to its action) and rebound back up the feeder. The power doesn't vanish into thin air as you might suspect. The bouncing backwards and forwards continues until all the power is absorbed by the load (the antenna).

Many amateurs spend hours trying to get the s.w.r. on their antenna systems down below the 2:1 mark. How much more useful it would be to spend this time on the air.

The increase in radiated power after reducing the s.w.r. from 2:1 to 1.5:1 won't be measurable at the receiving end. Even at the awful (?) s.w.r. of 3:1, in excess of 90% of our transmitted signal will still be radiated from the antenna!

The fixation with s.w.r. is a relatively new

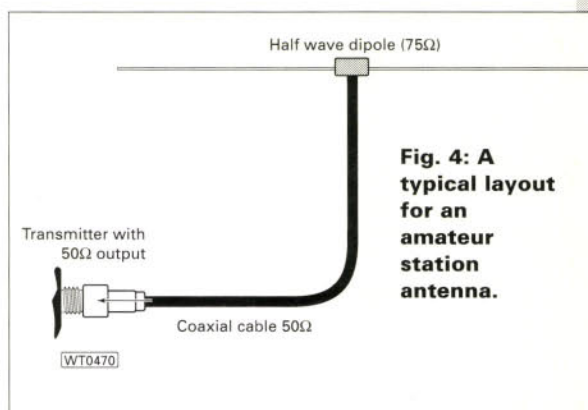


Fig. 4: A typical layout for an amateur station antenna.

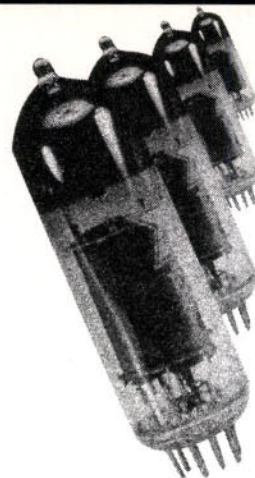
concept. In the olden days, before transistor power amplifiers, many amateurs would just tune for 'maximum smoke' (greatest power out). It helped that these valved transmitters had inbuilt tuning circuits!

As our sole intention is to get the maximum amount of our minuscule r.f. out into the wide blue yonder, wouldn't it be better to know the power going up the transmission line and the true power level reflected from the antenna.

Perhaps we should all consider using directional power meters instead of an s.w.r. meter. But that's another story I'll deal with later, See you in the April '97 issue.

PW

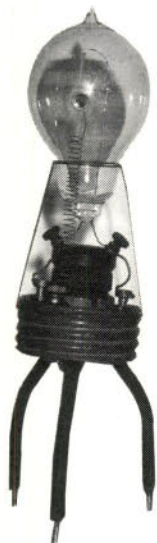
Valve & Vintage



By Charles Miller

A friendly face and smile, partly hidden by his favourite 'Boater' hat, tells us it's Charles Miller's turn to look after the vintage 'wireless shop' this month. Charles continues his fascinating look back at the mischief, 'dodgy dealings' and innovations in the early days of the radio valve.

Fleming's diode of 1889 started it all.....



By the time the 'Great War' ended in 1918, valve manufacture had become very big business indeed in both victor and vanquished nations. It was so big in fact that we must now narrow down our field of interest to the UK alone.

To attempt to cover international valve developments (there were hundreds of independent makers in the US alone) would require all the available space in *PW* for about two years. I don't think that would appeal to the Editor!

In Britain the valve industry had been built up entirely on Government work. Private citizens were not even allowed to buy valves, presumably on the grounds that they might be used by enemy agents in radio equipment.

As late as 1919 a popular magazine for home mechanics featured an article showing how a rudimentary diode could be made. This project used a car headlamp bulb and a sheet of silver paper!

The post-war situation was quite satisfactory for the valve firms whilst the tax-payer was footing the bills for large quantities of valves. But with the coming of peace they could envisage their profits disappearing like snow in springtime.

Fortunately for the shareholders, broadcasting of entertainment by wireless - something that had to be shelved back in 1914 - now stood a good chance of being revived.

If wireless broadcasting could be introduced on a large scale and became popular a new domestic market for valves would be created to save valve manufacturer's bacon. Interestingly, the chances are that had not the war intervened Marconi Wireless Telegraph Co. (MWT) would have started experimental broadcasts in 1914.

Unfortunately the broadcasting plans were aborted but over the next few years various attempts did take place, notably in America. But as far as this country is concerned the first documented broadcasting was the work of an army officer called **H. d'A. Donisthorpe**.

It was Donisthorpe who in 1917,

transmitted gramophone records to troops in a training camp near Worcester. This activity was, of course, highly unofficial, but in the following year the well-known author **William le Queux**, a properly licensed amateur, started regular speech and music broadcasts from his station 2AZ on the Hog's Back in Surrey.

Dedicated Audience

Working on low power at around 1000 metres, 2AZ gained itself a small but dedicated audience. But meanwhile on the Continent much larger experiments were getting under way, notably at The Hague in Holland.

The Dutch transmissions could be received in the UK and generated considerable interest. However, it wasn't until 1920 that MWT finally began to broadcast speech and music from its Chelmsford works.

It was the Marconi transmissions that really aroused public interest in broadcasting. Despite this it would take another two years to get the British Broadcasting Company established and the valve manufacturers could look forward to a rosy future providing the necessary valve.

At that time the major players were the British Thompson-Houston (BT-H.) which also used the trade name 'Mazda', the Edison-Swan Electric Co. (Ediswan), the Metropolitan-Vickers Electrical Co. (Cosmos) and the General Electric Co. (Osram).

Alongside the 'big boys' were the smaller concerns of A.C. Cossor, Ltd. This was an old family firm based on scientific glassware which claimed the honour of having produced the first cathode-ray tubes before the turn of the century.

There was also the Z Electric Lamp Co., which had as one of its directors that same young Stanley R. Mullard. This is the gentleman who I mentioned briefly in the last part of this series.

In this account I'll refer to him as S. R. Mullard. This will be to distinguish him from the firm bearing his surname Mullard.

Young S.R. Mullard soon branched

out into valve manufacture on his own account. Initially he used rented space in Z Electric's works making large transmitting valves, bolstered by a valuable contract from the Admiralty.

Potential Market

Soon, eyeing the potential market for receiving type valves being created by broadcasting, Mullard turned his attention to these. His wartime experience with the 'R' valve suggested to him that a more reliable, more easily manufactured and therefore cheaper variant would be a money-spinner. And in this respect he was quite correct.

By turning the electrode assembly of the 'R' through 90° and making it vertical instead of horizontal, it became possible to dispense with the old bulbous type of glass envelope. Instead, a tubular type was used, and along with being considerably more robust, it was also capable of being mass-produced.

For valve assembly work S. R. Mullard largely employed semi-skilled young women. They came cheap!

The final piece of salesmanship was the invention of a catchy name 'ORA'. This came from the initials of **Oscillates, Receives and Amplifies**. The success of the enterprise may be judged from the fact that around 1000 ORAs a week were being produced before the BBC had started operations.

The selling price of the ORA was 15 shillings (75pence), which was about half that charged by S. R. Mullard's competitors for the 'R'. His tactics soon compelled them to follow suit.

Even so, 'fifteen bob' was still a lot of money in 1921 when it represented half a week's wages for a lot of people. But at any rate, sales were so successful that in 1922 Mullard, Ltd. had to move to larger premises in Hammersmith and then again, two years later, to an even larger factory in Balham.

Reduced Running Costs

By now Mullard Ltd. had started to produce a new type of valve that gave enormously reduced running costs for

the domestic listener. Hitherto, valve filaments had always been run at white heat, giving them their name of 'bright emitters' which were very greedy in power consumption.

Coating the valve's tungsten filament with some sort of oxide promised adequate emission at only dull red heat. This had been achieved produced with lower voltage and current ratings, although unfortunately early experiments along these lines had been frustrated due to 'poisoning' of the filaments by gases produced in operation.

The coated-filament technique had finally been mastered in America by Western Electric. Eventually S. R. Mullard made what were called WECO valves under licence until (by what may or may not have been a piece of industrial espionage!) it was discovered that vaporised magnesium inside the glass envelope counteracted the 'poisoning'.

The result was a new range of Mullard valves that could be run economically from dry batteries as well as accumulators. In such a competitive industry, it was perhaps predictable that S. R. Mullard should soon become embroiled in court cases over alleged patent infringements.

You might have thought that its experiences in America would have tempered MWT's appetite for litigation, but no! 1922 saw them producing broad smiles in legal circles with an expensive attack on Mullard Ltd. Stanley Mullard was then involved in removing from Z Electric's works to Hammersmith and the last thing he wanted was to be tied up in the courts.

Fortunately for S. R. Mullard, he seems to have possessed the same fortitude under fire as dear old **Lee de Forest**. He promptly banged off a counter-attack to the effect that not only did the alleged patents not apply to his own valves but that they weren't valid anyway!

Sorting the legal arguments out took two years. During the legal proceedings S.R. Mullard contrived a spectacular effect by producing in court an alleged 'patent-free valve' that had been produced in a matter of hours, overnight.

The first hearing produced an honourable-even decision that the patents were indeed valid but hadn't been infringed. This ought to have satisfied both parties but instead they both appealed to a higher court which found precisely the same verdict!

House Of Lords

Still not content, MWT and S.R. Mullard went to the House of Lords, which decided that the patents weren't, after all valid. This appears to have been a technical victory for Mullard, but the good it did him was questionable. On the face of things he was doing very well, but perhaps things were not too rosy underneath.

Not long after the end of the court action, in late July, 1924, S.R. Mullard had a working lunch with some representatives of the Dutch Company Philips. And from then on the parallel with the later career of de Forest is remarkable.

At that first meeting, Mullard suggested that Philips should buy 30% of his firm. Philips was interested but said they wanted a half share, which apparently was acceptable to Mullard.

The price quoted was £5 per nominal £1 share, making the company worth, on paper, £230,000. Mullard was also able to point out that a couple of months earlier it had declared a dividend of no less than 75%.

In fact, nothing seems to have happened until October, when S.R. Mullard provisionally agreed to sell 50% of the firm for £60,000. (This was less than half what he had asked three months earlier).

Devaluation Curious

The rapid devaluation was curious in itself. But in any case Mullard was hardly in a position to make any deal at that time since he owned, with his wife, only 20% of the firm and seems to have neglected to tell the rest of the shareholders what he was up to.

The deal was not clinched and matters dragged on another three months until early in 1925 Philips handed over £65,000 for half of Mullard Ltd. In point of fact the Mullard shareholders didn't do too badly out of the deal but on the other hand they might have made a great deal more if S.R. Mullard had played a different game.

It's difficult now to visualise what exactly he must have had in mind concerning Mullard Ltd. I say this because if the company was as financially successful as appears to be the case, why did he return to Philips only a year later and ask the Dutch firm to buy the rest of the shares?

According to the auditors, Mullard Ltd. shares were by then worth more than £7. Yet a few months later S.R. Mullard was exhorting their holders to part for only £6 a go (but not advertising the

fact that he himself would receive £7).

The £6 offer seems not to have gone down too well and later S.R. Mullard suggested it be upped to £7. He then made the extraordinary suggestion to Philips that it would be better to conclude the deal as soon as possible before the next official declaration of profits showed Mullard Ltd. to be worth more! As if all this were not enough, the final deal by which Philips acquired Mullard completely was shrouded in arcane financial technicality.

At the time of the first transaction it was not what we would now call 'politically correct' for a foreign concern to take over a large British firm. So overtly, Philips were shown as owning only a quarter of the shares, the rest being technically owned by one of those Swiss banks we hear so much about.

Handover To Philips

When the final handover to Philips was made the shares were all registered in S.R. Mullard's name. This being a polite fiction that lasted for ten years until it presumably ceased to serve its purpose.

The work force at Mullard Ltd. seems not to have taken to its new Dutch bosses with any great enthusiasm. And in 1927 members of the senior staff sent S.R. Mullard a 'round robin' listing their grievances; whether it did any good or not is open to question!

As far as the valve-buying public was concerned, though, the take-over was largely beneficial. One of the earliest fruits of success being the new 'PM' dull-emitter filament which set new standards for economy and reliability.

A wide range of triodes was then produced. They had differing characteristics for various jobs in receivers and were available with either 2V, 4V or 6V filaments.

The 4 and 6V types were discontinued fairly soon but the PM2HL medium impedance 2V triode soldiered on for years. (Anyone reading this who is over a 'certain age' will almost certainly have used one or more in a home-constructed receiver!).

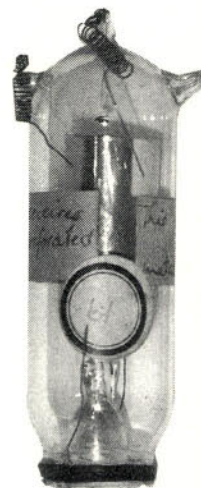
Talking of home-constructed receivers brings me to the 'wonder man' of home construction, John Scott-Taggart, who also was at one time a valve manufacturer. And I'll be taking a look at his varied career in the next exciting instalment next time it's my turn to look after 'Valve & Vintage'.



Then the valve gradually evolved...
(this is a Round Type C)



....and this one is a Round Type 'N'....



.....and finally this is Stanley Mullard's 'Litigation Valve' (the one that worked). You can read all about it and his legal adventures in the next thrilling episode!

(All photos courtesy of Rod Burman, Valve & Tube Supplies, Isle of Wight).

Cheerio from Charles, see you in January.

BITS & BYTES

- COMPUTING
IN RADIO

This time Mike Richards G4WNC has news of a logging program, a mapping program and starts off with details of a new version of HamComm.

There's a new version of HamComm on the streets.

Although it's not a major revision, version 3.1 includes a number of important changes and improvements that are well worth having.

The first set of changes relate to the way HamComm deals with AMTOR signals and the changes are mainly small bug fixes that many users won't even have noticed. One exception maybe the menu selection problem which caused intermittent failure when using upper-case letters. There has also been an improvement to the automatic frequency control when using very wide shifts.

A very important enhancement to HamComm is the addition of a PACTOR listen mode to enable reception of PACTOR ARQ and FEC modes. The snag with this is that this feature is only available in registered versions of HamComm. Perhaps this will encourage more people to pay the, very reasonable, fee and register this excellent program. Enhancements have also been made to the SHIP/SYNOP decoding system to ensure a wider range of reports are accurately translated.

Perhaps the most obviously useful addition from HamComm 3.1 is the vertical tune indicator on the left border of the main transmit/receive screen. This simple addition lets you check and adjust the tuning without moving away from the main transmit and receive screen. This is particularly useful for tracking a drifting signal without losing any data.

The tuning facilities have been further enhanced by some 'hot zones' on the status line. If you place the cursor over the centre frequency display and press the left mouse button, the display switches to the TUNE screen.

Other areas of the status line enable fast switching to spectrum and toggling of the signal polarity. Another useful extra is the facility to re-size the transmit or receive

window simply by dragging the separator line with the mouse. In previous versions of HamComm this could only be changed through the configuration file.

A modification to the TUNE screen lets you set the centre frequency of the decoder by pointing the cursor to the required frequency on the lower frequency scale. Finally, the configuration file has been dramatically enhanced and a huge range of features and actions can be customised to your personal preference.

If you do try experimenting with the configuration file, make a back-up copy just in case you get in a mess! Although I've now included this latest HamComm release in my reader's offers, it may take me a month or two to fully update the relevant FactPacks to reflect the new features. So, please be patient.

Logging Programs

There are lots of logging programs around, but the new offering from Zentek looks to be worth a try. The program is called Amlog 3 and has been designed to run under Windows 3.1.

I was particularly impressed to see that Zentek are supplying demo versions of the package at just £1. This means that you really can try before you buy.

Installation of the Amlog 3 software was made simple through the use of the standard Windows Setup program. However, the floppy disk files must have been highly compressed as the installation took around ten minutes.

Once installed, a separate program group is created to

simplify selection. The supplied demo version of Amlog has all the facilities of the full program, except the database is limited to just 50 records.

The help system provided with Amlog 3 was very effective and could be called by a single press of the right mouse button. The screen dump in Fig. 1 shows the main logging screen and you can see that all the normal fields were provided along with an additional field for entering notes.

One of the benefits of a computerised log book is the facility to rapidly search the entries. Amlog includes very flexible search facilities with the standard DOS wild cards, i.e. * and ? used when you don't have enough data for a precise search.

A novel feature was the inclusion of a separate memo database that had no connection with the main database. This could be used to store and search for all manner of notes and comments.

Next on the list of extras offered by Amlog were the timer and alarm facilities. The alarm was a simple to use feature that was great for reminding you of all

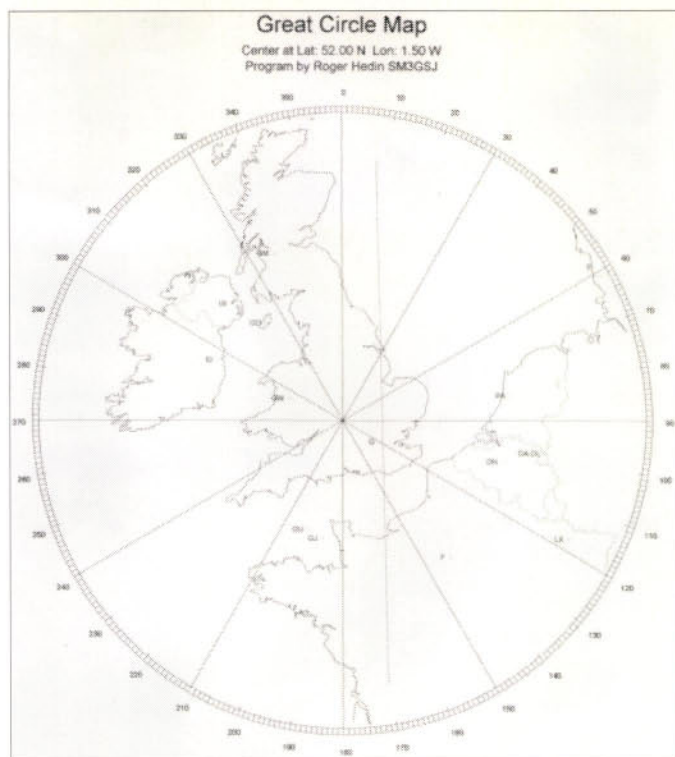
Fig. 1: The main logging screen of Amlog 3.

manner of events from the start of the local Net, to the time you promised to stop playing in the shack! However, the separate timer served no real useful purpose.

The final feature was the data buttons that gave access to an assortment of handy databases. In the full version these hold Bandplans, Raynet, Repeaters and RSGB data. Overall, Amlog 3 is certainly worth a try and at just £1 for the demo version and at only £19.95 for the full version, you can't go wrong. For more information contact Zentek at 132 Gladstone Street, Darlington, Co Durham DL3 6LE.

Mapping Program

Whilst searching through some popular shareware archives recently, I came across a new mapping program designed specifically with amateurs in mind. The program is called Great Circle Maps for Windows version 2.1. The



version number is somewhat misleading as this is the very first version available for Windows.

The good news is that the author, **Roger Hedin SM3GSJ**, has released the program as freeware, so it can be freely copied and used with no obligation to register. However, it's important to note that freeware programs must always be copied in the original format with all files included.

The particularly interesting point about this new Great Circle Maps program is its use of digital mapping techniques. This makes the program very flexible in terms of what is displayed.

To use the Great Circle Maps program you copy the files to an appropriate directory, create an icon and double click to run. You are then presented with an empty window showing a selection of menus at the top.

The first action is to enter the settings menu and configure the program to your own requirements. This involves entering your QTH location in latitude/longitude or Maidenhead format. This causes the program to put your QTH at the centre of the great circle map.

If you start the plot at this point the program will draw a full disk great circle map with coastline, rivers and lakes included. The time for this task varies according to your processor speed, but my 486DX33 managed it in about 3 minutes. This can be speeded-up by choosing less detail from the settings menu or choosing to omit rivers and/or borders.

Once the plot is complete, you can use the mouse pointer to select

a location and a click of the button will display the distance and bearing to that location. You can also go to the DX option on the menu and directly enter the latitude/longitude or Maidenhead locator for any station.

The program will then draw a line to that station and display the distance and bearing. Once completed you can choose to leave or erase the line before moving-on.

To illustrate the flexibility of the digital mapping you can zoom-in on the map by specifying the radius (in km or miles) that you want to view. So, if you're mainly interested in v.h.f. work to Europe you could restrict the map to say 500km from your QTH.

To further supplement the features I've already mentioned, the program can display meridians or fields and can also be set to show callsigns and a number of other elements. If you're into programming, the help file provides some guidance on how to enhance the mapping files with custom information. By using this programming option you could add new call areas.

The most impressive aspect of the Great Circle Maps program, other than its flexibility, is the quality of the printed and displayed map images. I've shown an example here **Fig. 2**, so you can see for yourself the excellent detail available.

Fig. 2: An example of the quality of the prints produced by the Great Circle Maps program.

Included with the files was a brief run-down on the digital map database used by the program. The database is called Micro World Data Bank (MWDB-II) and has been released into the public domain by **Fred Pospeschil** and **Antonio Rivera**.

Although the map information in the Micro World Data Bank dates back to 1985, it's still very useful - coastlines don't change a lot! The database has been created from the original World Data Bank that was compiled by the United States CIA as a comprehensive world mapping system.

The full system World Data Bank is extremely large and contains around six million geographic points and is supplied on five 9-track, half-inch magnetic tapes (150-200Mbytes) at a cost of US\$660! If you would like a copy, the easiest way is via Internet ftp and I found my copy at: **ftp.funet.fi/pub/ham/misc/gcmwin2.1.zip** I'm sure it will soon appear in many other shareware depositories.

SPECIAL OFFERS

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 £3.00 for nine). For software send £1 per disk (£1.75 for two, £2.50 for three or £3.00 for four and £3.75 for all five) and a self addressed sticky label (don't forget I provide the disk!).

That's all for this month so, until next time 'happy computing' and keep those letters coming to me Mike Richards G4WNC, 'Bits & Bytes', PO Box 1863, Ringwood, Hants BH24 3ZD.

Internet: mike.richards@dial.pipex.com

SPECIAL OFFERS

Here's the full list of reader's offers with all the latest software, including the new HamComm 3.1. Please allow up to two weeks for delivery.

IBM PC Software (1.44Mb disks)

Disk A (Order Code **DKA**) - JVFAX 7.0, HamComm 3.1 and WEFAX 3.2.

Disk B (Order Code **DKB**) - DSP Starter plus Texas device selection software.

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.

END

VHF REPORT

This month David Butler G4ASR reviews the summer Sporadic-E season which affected both the 50 and 144MHz bands.

If you read my column last month you'll recall that the intensity of Sporadic-E (Sp-E) openings on the 50MHz band was very much reduced during the month of June. Unfortunately this state of affairs also continued into July.

Although the band was open nearly every day, the openings, both in terms of intensity and duration, were markedly down on that normally expected. However, the usual European countries were still workable allowing contacts to be made up to 2000kms away.

Some of the more interesting countries included EU1AA and EU1AB (K033), LX1DM (JN39), OH0JET and OH0KCE (JP90), UX0FF (KN45), YL2PG (K017), YL3AG (K026), YO2IS (KN05), YO7VJ (KN14), Z32BU (KN01) and Z32MA (KN02). European activity was also spiced up by a number of expedition stations active during the summer period.

Those stations worked from the UK included CU7BC/P/CT (IN50), ES1II/8 and ES2RJ/8 (K018), ES3/SM0KAK (K019), ES5QA/6 (K037), ES9C (K028), HA/PA3GSM (JN97), HB0/PI4TUE (JN47), OH/DK2ZF (KP34), YL1A/A (K007), YO7VJ/P (KN13), 9A5Y/P and 9A6V/P (JN73). The Mediterranean area was obviously a very popular location with a number of operators who wished to combine a holiday with a spot of radio.

Among the sun-seekers were the stations of EH4BG/6 (operated by G3SDL from locator JM19), IA5/OE5EBO (JN52), ID9/IK2GWH (JM78), IG9/DK0FTG (JM65), IH9/DK0FTG (JM56 and JM66), ISOAGY/P (JM48), IS0/I2ADN (JN40 and JN41), IT9/IK1MDC (JM68) and SV5/DL9UDA (KM46).

As usual, there was a smattering of African DX in the form of CT3FT (IM13), EH9IB (IM85), EH8ACW (IL28) and EH8BPX (IL18). Around 1800UTC on July 25 the station of 5T5BN (IK28) was heard in Jersey and the south coast of England. The Mauritanian station was putting to good use the 50MHz equipment passed to him by **Eric 5T5JC** who went QRT in August 1995.

A few Asian stations notably 4X1IF, 4X6UJ (both in KM72) and 5B4/PA0ERA

(KM74) were worked from the UK during July. However, openings were generally quite weak to this area of the middle-east.

Nicholas 5B4AAI (KM64) sent me a packet message from Cyprus and reports that there is quite a lot of activity on the 50MHz band from the middle-east. He is QRV with an FT-690R MkII transceiver running 3W into a vertical dipole and has worked stations all over Europe, most stations being located in either G or PA.

Contacts have also been made with stations located in Scandinavia, eastern Europe and the ex-Russian republics. In previous seasons he has easily worked into southern Africa contacting stations like 7Q7JL, 7Q7RM and V51KC. During July of this year he was pleased to discover two stations, 5B4/PA0ERA and 5B4/PA2HJS operating from an apartment only 15kms from his QTH. The Dutch stations, running 100W into a beam antenna, were having a wonderful time working DX throughout Europe.

Nicholas also mentions that he is active on the 144MHz band with a Kenwood TR-9130 transceiver running 25W into an 11-element Yagi and on the 430MHz band with an Icom IC-471H, 75W and a vertical dipole. He maintains daily contact with 4X1IF and 4X6UJ to exchange information about activity on the 50 and 144MHz bands.

Thank you for the information Nicholas and sorry for getting your callsign wrong in the August edition. I incorrectly wrote 5B4AI instead of 5B4AAI, so apologies to both stations.

North & South Openings

In addition to contacts with the middle-east there were also a number of E-layer openings during July to North and South America on the 50MHz band. These multi-hop events, a total of seven from the UK, were recorded on July 1, 2, 11, 13, 14, 16 and 25.

One of the best openings, in terms of rare DX, occurred on July 1. It followed a few hours of fairly mundane propagation to the Mediterranean area, Spain and Portugal.

Around 1730UTC the station of ON4GG heard KP4EIT (FK68), followed by V47KV (FK87) and CY0AA (GN03). The first sign of anything being heard in the UK was when **Geoff Brown GJ4ICD** (IN89) heard CY0AA on 50.102MHz around 1745UTC.

Geoff also heard the expedition station V47KV (operated by W6JKV) at 1810UTC and KP4EIT at 1845UTC. According to the DX Cluster, other stations to hear V47KV included GW3JXN (IO72), GW0GEI (IO73), GW7SMV (IO81), G00FE and G3IBI (both in IO90).

But there was even better DX (in my opinion) to be found. Between 1910-1925UTC Keith G4FUF (JO01) heard the South American stations of YV4AB (FK50) and YV4BJT (FK50). Their s.s.b. signals were peaking up to S5 at times. This selective transatlantic opening lasted for over two hours, signals fading out around 2005UTC.

Incidentally, the **CY0AA** expedition to Sable Island was regrettably a wash-out due to the lack of E-layer propagation. The five lucky UK stations to get CY0AA in their log were G3WOS, G4BWP, G4IG0, GJ4ICD and GW4LX0.

Only four other European stations managed to work CY0AA the honours going to EH1YV, EH7KW, F5JJK and ON4ANT. Other DX of note worked by the expedition group included C6ANY, C02PL, CT3FT, EH8BPX, KP4EIT and V47KV.

Transatlantic Events

Two further transatlantic events, both of them brief, took place on July 2. The first at 1730UTC when G3NVO (IO91) heard N5JHV peaking 529 on c.w.

The second event of the evening occurred around 1950UTC with the stations of VE1PZ (FN85), VE1ZJ (FN85) and VE1ZZ (FN95) being worked by operators located on the western side of England and Wales in locator squares IO72, IO73, IO81, IO82 and IO83.

Another evening opening, this time between 2030-2230UTC, occurred on July 11. Again it was mainly stations located along the western side of

England and Wales (IO72, IO80, IO83) that caught most of the action. Many stations in the W1, W3, W4, W8, VE1, VE2 and VE3 call areas were worked with virtually all contacts being made on c.w.

The next transatlantic opening took place on July 13 between 2040-2330UTC, fairly late but at least it was a Saturday evening! Most of the contacts were in the W1, W2, W3, W4 call areas but **Roger Horne G4HBA** (IO80) managed to hear W7XU (EN13) peaking 529 over a path length of some 6700kms.

Yet again it favoured stations located to the west of the UK in IO80, IO81, IO82 and IO83 locator fields. A few stations located in southern England (IO90, IO91) also managed to make it across the pond.

What was probably the most intensive opening of the season occurred the very next day, Sunday July 14, between 1130-1500UTC. For a change this opening very much favoured stations located in the north of England (IO83, IO93, IO94) and southern Scotland.

Other stations located throughout the UK could also make some transatlantic contacts but these were very few and far between. According to the DX Cluster, contacts were mainly being made with DX stations located in the W1, W2, W3, VE1 and VE2 call areas.

To give you some idea of the intensity of the opening, the station of G6YIN (IO93) contacted 65 US stations in 70 minutes and that of **Neil Carr G0JHC** (IO83) managed to work 75 US stations in exactly one hour.

Incidentally the photograph, **Fig. 1**, shows Neil receiving the Harold Rose Trophy for excellent services as retiring Editor of the **UK Six Metre Group** magazine *Six News* from **Peter Sheppard G4EJP**, RSGB President 1996.

The novice station of **Steven Issatt 2E1DBZ** (IO93) also made it across working VE1YX (FN74) around 1200UTC. Steven was using an FT-690 MkII transceiver running only 2.5W into a 5-

element F9FT Tonna Yagi.

Initially Steven called CQ and was answered by a W3 station but contact was lost. The station of VE1YX was heard for about an hour, Steven receiving a 55 report on s.s.b. over the 4886km path.

Bob VE1YX, who has worked literally hundreds of UK stations in previous openings, reports that this was his first contact with a UK novice station. Well done Steven!

Conditions Good

Conditions were equally good in Scotland as the report from **John Edwards GM7NVA** (IO85) explains. For the past three years he has been trying without success to make a contact across the Atlantic on the 50MHz band.

At John's QTH any signals have generally been below the noise level. This was all to change during the opening on July 14.

At 1130UTC John was tuning the 50MHz band when he heard WA10UB calling CQ with a very strong signal. At first he didn't quite believe it but after checking the beam-heading he returned to the shack to hear the US station still calling CQ.

John gave him a quick call and was very pleased to receive a 58 report on s.s.b. to confirm his first ever transatlantic contact. After the initial euphoria had died down (it involved running around the garden punching the air apparently) he then went on to work KB1HY (FN31), W1GCI (FN42), VE1PZ (FN85), VE1YX (FN74) and VY2KX (FN86).

John's equipment for the 50MHz band consists of an FT-736R, 100W amplifier and a 5-element F9FT Tonna Yagi at 9m above ground.

A much smaller event was reported on July 16 when the station of GJ4ICD (IN89) spotted the VO1ZA beacon (50.039MHz) peaking 599 at 1525UTC. Very few contacts appeared to have been made, the only station consistently logged in the UK being that of WA10UB (FN43).

The opening finished around 1640UTC although the VO1ZA beacon was heard on occasions through to 1900UTC by a number of stations. An even briefer event, the last of the month and possibly of the summer season, was noted on July 25. At 2050UTC VE9AA (FN65) was heard by G3FPQ (IO91) but nothing else seemed to have been worked at this time.

Review Of 1996

So, that was the end of July. Although many operators reported that conditions were poor there were openings to five continents, Europe, Africa, Asia, North America, South America and some real

DX such as CY0, KP4, VE, VP5, V47, W and YV4. So, what was the Sp-E season really like and was it better or worse than previous years?

Peter Bowyer G4MJS (sysop of the Black Sheep C&DX Group European v.h.f. DX Discussion List on the Internet) mentions however that 'better' is a term so subjective that it's almost no use without qualification. Various correspondents define it in different ways, more openings, longer openings, more DXCC countries worked, more spots on the DX Cluster, etc.

Peter reckons that you can't possibly attempt to make a scientific study based on QSOs alone. The only way to do this would be to put everyone back in the same place they were last year, with the same amount of free time,

may rate his results as being very poor (for instance, G4ASR only working one USA station during the entire season!).

A lot depends on what you are looking for and whether you are in the right place at the right time. Roger reports that his personal views are that the quality and quantity of Sp-E events on the 50MHz band this summer have not been as good as some in previous years. He has however noted an increase in transatlantic openings but suspects that this may be due to an increase in the numbers of dedicated operators monitoring the band for these types of openings.

Keeping Records

As a keen DXer and v.h.f. columnist I

(sysop of the GB7DXC DX Cluster) to automatically download all DX Spots for the 50, 70, 144, 430MHz and Microwave bands as separate files on a daily basis and have them sent to me overnight via packet radio.

I then word process each file to clean them up into a standard format. Additionally I have been adding to this system backtracking some 20 years with information from other sources, such as my station propagation log and details from specialist magazine columns.

I have found this data to be an invaluable source of information. It covers not only the UK but large areas of Europe on all frequency bands from 50MHz through to 24GHz. Using this data there is no doubt in my opinion that Sp-E propagation within Europe (both at 50 and 144MHz) has been much suppressed this summer.

Traditional single-hop Sp-E propagation on the 50MHz band has been fairly unstable and of low duration. On the other hand the incidence of transatlantic openings, 17 days this season in the UK, has been very much on the increase. There may however be a number of reasons why this should be so.

Some operators suggest that observations of the weak, geographically selective events over the Atlantic path (and also to the east of the UK) may be some form of E-layer enhancement rather than the traditionally accepted Sp-E propagation. So it's possible that these events are more prevalent at solar minimum. Secondly, there's now a large number of dedicated observers on both sides of the Atlantic, backed up with DX Cluster, Internet and telephone warning chains.

On the 144MHz band the results have been abysmal. In the UK there were five openings in May, only two in June and none in July. On a purely subjective personal level I can report that I only managed to work one VE and one W on the 50MHz band this season and failed to catch any Sp-E openings on the 144MHz band. And I really do try very hard! I guess that sums up the season for me.



Fig. 1: Neill Carr G0JHC (left) receiving the Harold Rose Trophy from the 1996 RSGB President Peter Sheppard G4EJP.

with the same equipment and the same warning systems (DX Clusters, Internet). As this is impossible any mention of 'better' or 'worse' can only be someone's personal feelings.

Roger Horne G4HBA remarks that reporting about conditions on the 50MHz band is problematical due to the very nature of Sp-E. Propagation via this mode is rarely the same for two stations situated in the same locator square, let alone those separated by some hundreds of kilometres.

To put a value on the 'goodness' of a season's Sp-E openings is extremely difficult. One station may experience what he defines as excellent results (for example G0JHC working over 70 USA stations in one opening) and another

have been keeping records of Sp-E openings (and other propagation modes) for a considerable number of years. Since 1988 I have arranged with **G4PDQ**

Deadlines

That's enough for this time. Next month I'll be continuing the propagation theme with an analysis of the various E-layer modes encountered on the 50 and 144MHz bands this summer.

If you have any observations on this please forward them to me (by the end of the month) to **Yew Tree Cottage, Lower Maescoed, Herefordshire HR2 0HP**. You can also contact me via **packet radio @ GB7MAD, the DX Cluster @ GB7DXC** or E-Mail: via **davebu@mdlhr1.igw.bt.co.uk** Alternatively you can telephone me on **(01873) 860679**.

END

SCENE USA

Ed Taylor WT3U finds out about the man who invented, and gave his name to the Morse Code. He also looks at US Morse tests, and asks if we're being unnecessarily demanding in the UK.

Getting permission to go on the air in the USA is simple and inexpensive. If you follow the correct procedures, you can achieve this with the minimum of bureaucracy.

The costs of a reciprocal licence are minimal, at most, a few pounds. I will deal with the USA licensing now and explain what's required for Canada next time.

As soon as you arrive in the US with a reciprocal licence, you can start talking to some of the friendliest people in the world. They will invite you to their club meetings, and perhaps wine and dine you.

Just speak into your hand-held, in almost any city, and you are likely to be overwhelmed with hospitality. When they say, 'Have a nice day,' they mean it, and they all speak English (sort of)!

You'll need to do a bit of forward planning to get your US reciprocal licence, which is called a 'Permit to operate in the United States'. You'll need **Form 610A**, from the **Federal Communications Commission (FCC)**, which is straightforward, comprising two sides of a single sheet.

You follow the instructions on the back, and fill in the front. **Fig. 1** shows a reduced version.

The Form

The obvious source for form 610A is the FCC, and you can call for information. The **Radio Society of Great Britain (RSGB)** also keep copies.

However, I would recommend contacting the **American Radio Relay League (ARRL)**, the US national society, for their supplies. The ARRL keep up-to-date with the latest version, which changes periodically. They'll also send you other valuable information.

The address for the ARRL is **Regulatory Info, ARRL, 225 Main Street, Newington, Connecticut 06111, USA**. You need to request their packet on reciprocal licensing, and make sure you use Air Mail (surface can take weeks!). You can also E-mail them on: **reginfo@arrl.org**

Or for the cost of a short telephone call, the ARRL will respond straight

away. From the UK dial **001 860 594 0323**, a direct line to the appropriate department. Opening hours are 1300 until 2200, UK time, and a friendly, informed person will answer questions about paperwork.

When you are asked for 'MI' in item 1, this means 'middle initial'. Obvious when you know!

And be careful with dates, which are entered **Month-Day-Year**, for

example, 06-29-95. Note that a Permit will only be issued to you if your licence was issued by the same country as that of your nationality. So, items 3 and 6 on the form must agree. This can trip up someone who has been living in Britain for a long time but has remained a national of another country. You are not entitled to a Reciprocal permit if you hold an actual US licence. This is unfortunate, because the Permit gives you potentially the same rights as an Extra class licensee, but you might have earned a lower class of US licence. The process of

of the form explains where to send it.

American amateurs say that the FCC can be found at the 'Gettysburg Address'. Use Airmail, and include a copy of your UK licence (all of it).

By the way, it's sensible to keep a copy of your completed form. If you do not hear anything within about two months, you can phone the FCC at the number on the form (not the 800 number, which is only for use within the USA).

Have your photocopy in front of you. Bear in mind that the personnel are not licensed amateurs, although they are very helpful.

Ready To Operate

When you receive your Reciprocal Permit, you are ready to operate in the USA. Your callsign while in America is made up as follows.

First find out the 'Call Area' of the state you are transmitting from. See 'Scene USA, PW January 1996 (Back copies available for £2.50 by calling (01202) 659930) for a map.

If you're unsure, get a nearby amateur to tell you, in fact, if most of the local callsigns you hear have a 3 in them, for example, you can be pretty sure you are in Call Area '3'. Your callsign would then be W3/G0QRX, where G0QRX is your call in the UK.

There is no requirement to keep a log book, although it's nice to have a record of the stations contacted. You don't have to sign 'portable' or 'mobile', but you must mention your QTH (nearest city and state) during every QSO.

Class B licensees are not allowed to transmit below 30MHz. Otherwise, you can operate with the same limitations as if you were in the UK.

Of course, you must additionally follow the US regulations that apply to an Extra Class licensee. Remember that band plans are different and mostly legally enforceable, and some bands are unavailable 4m (70MHz), for example. To get detailed information, ask the ARRL mail you the **FCC Rule Book**, which is available at a small charge.

Even with equipment as simple as a 144MHz (2m) hand-held, you'll start to contact and meet radio amateurs in the

Fig. 1: Use form 610A to apply for a reciprocal licence.

operating and so on.

When should you start doing this? Allow plenty of time, at least three months in advance, if you can.

The FCC aim to get a Permit to you in 60 days, but it could take longer. The validity of the Permit is one year, so you lose nothing by applying as soon as possible.

By the way, your country must have a Reciprocal Licensing agreement with the United States for you to be able to apply. The ARRL's covering letter supplies a list of countries which have such an agreement, this includes the UK and most of the rest of Europe.

Little Trouble

You should have little trouble filling in your Form 610A when it arrives. But don't lose concentration, or your form might be returned because it's incorrectly completed!

Here are some points which you should check before you post your form.

climbing the US licensing ladder could be detrimental to your operating possibilities while in the USA.

Item 8 on Form 610A asks for your US mailing address. The FCC may send notices relating to the Permit (if you have violated the US regulations, for example), and they need an address at which you will eventually receive mail while in the USA.

If you don't know anyone in America, a hotel address is acceptable. Don't leave it blank, or you won't get your Permit.

Normally, items 9 and 10 will be the same (address to receive the Permit and home mailing address). Just enter the information twice.

Don't forget to add your signature and date (with correct format). The back

area you are visiting. Calling channels vary, so listen to where others are transmitting and what they're doing.

There are many repeaters in all cities and sometimes in remote areas. Channel spacing and input/output frequencies vary from place to place, so check locally, and be aware that the 144MHz band extends up to 148MHz.

You might want to buy the ARRL's *Repeater Directory* if you're planning more than just casual operation. This book lists over 20000 repeaters, and also gives the CTCSS (low frequency) tone that is used for access to some repeaters (a minority).

Note that it's not just a simple matter (as in the UK) of checking on a small number of repeater channels, in the USA, repeaters can be found almost anywhere on 144MHz. There is strict co-ordination of repeater frequency usage, although it may not seem that way when you first tune the v.h.f. bands.

When you tune in the fun really starts. After your first tentative words, contacts will flow!

You will undoubtedly get invitations from your new-found friends to operate from their shacks. I know from your letters that some of you have had trouble completing your tourist 'duties' because of the hospitality of American amateurs! Travelling companions who do not share your radio interests might be surprised at your sudden social success!

If you don't meet enough 'hams' on the air, you'll find that the packet of information provided by the ARRL contains a roster of US and Canadian participants in the International Travel Host Exchange (ITHE). All those on the list welcome visits from foreign amateurs and some may even provide accommodation. You can telephone these hospitable people beforehand or while in North America and arrange to get together with them.

Trips To America

Many of you have told me about your trips to America. Everyone seems to have had a good time, and some have made friendships which have lasted years.

I heard from **Colin G0NLM**, who found **Darrel KL7DN/W1** in Vermont through the ITHE. Colin and Darrel have visited each other's homes and become good friends. Colin is pictured operating from Darrel's station in **Fig. 2**.

Leslie G14RMA visited Florida with his 144MHz rig and talked to many

amateurs. He particularly mentions the US prices of rigs, generally lower than in the UK.

Tom G0GQJ has actually brought back equipment with him from America, saving money by doing so. He recommends declaring all items on entry

US amateurs for his reciprocal operation is not very good. This might be because many American amateurs don't have easy access to a QSL bureau.

Colin GM6HGW, was pleasantly surprised that a US Reciprocal Permit is issued without charge. This is true of the

US licences as well. The authorities consider it beneficial to have a large number of people trained and interested in technical subjects, who might also be ready to help with communications in an emergency. Colin had some great QSOs on 145MHz from a 30th floor hotel room, and was soon invited to join a Sunday

dinner, a birthday party, and a night out at a Country and Western club!

Colin always tries to return the hospitality he received in the USA. He hopes the level of service he experienced from the FCC is reciprocated by the UK.

I am grateful for the input from those who wrote about their experiences in the USA and sent photographs. I would like to hear from anyone who has visited and operated from Canada for the next 'Scene USA'.



Fig. 2: Colin G0NLM pictured operating from Darrel KL7DN/W1's whilst in Vermont.

to the UK, producing invoices from the places where they were bought. He says that the reasonable allowance for personal goods and the fair attitude of customs officers means that the duty payable is not too bad.

John G0FSP, another regular visitor to the USA, has bought rigs at HamFests. He reckons he must have had over 1000 QSOs, and made many friends in North America.

While travelling by plane, John suggests carrying all equipment as hand baggage, being ready to explain yourself to security personnel. You might want to be ready to show your Licence, Reciprocal Permit and any other 'official' material to allay suspicion.

Dave G8ZRE pictured in **Fig. 3**, was amused to find himself described on official forms as an 'alien' (a Martian?!). An amateur in Daytona Beach offered his family the use of a swimming pool and served very good afternoon tea (British style).

The only negative point he can find is that QSL card response from

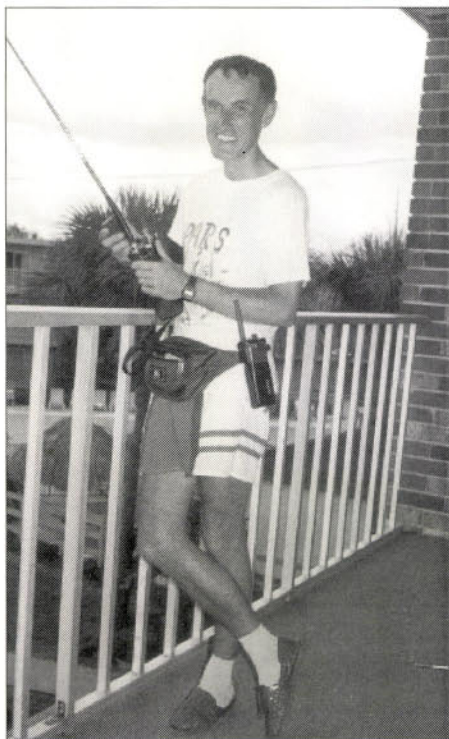


Fig. 3: Dave G8ZRE on the balcony at the Days Inn, Orlando.

More Morse

The piece on Samuel Morse in the July *PW* 'Scene USA' generated plenty of appreciative mail, thank you. I'll look out for other famous Americans to profile in future, any suggestions?

Ken G14CRQ pointed out that the code we use today might better be named after Friedrich Gerke, although he has no intention of trying to promote such a change! He asked Tony Smith to send me the following information.

Tony G4FAI is Consultant Editor of *Morsum Magnificat* the splendid magazine which prints articles about the history of Morse telegraphy (among other topics). Their Spring 1991 issue commemorated the 200th anniversary of the birth of Samuel Morse and it contained an article explaining Gerke's contribution to telegraphic communications.

To summarise, Gerke was the technical manager of the first European telegraph. He felt that the American code was not satisfactory for German communications and devised a simpler code.

Gerke made dashes all the same length (three dots) and groups of dots evenly spaced. Many of the American letter codes were retained.

As the telegraph spread, each State devised its own variations of Gerke's approach. This meant translation was needed, a great inconvenience.

In 1852 the International Telegraph Union adopted a unified system, which was eventually used in most of the world. This new code was called Continental Morse and was ideally suited for the new medium of wireless.

Most inventions are never finished. As soon as someone comes up with a bright idea, someone else improves it.

I'm happy to recognise Gerke's contribution to Morse code. Thanks to Tony for sending me a copy of his excellent article on the subject.

That's it for now. Don't forget the most popular h.f. contests in the world, organised by the American magazine CQ takes place on October 26-27 for s.s.b. and November 23-24 for c.w.

73, and keep your letters coming to me Ed Taylor WT3U, PO Box 261304, Denver, Colorado 80226, USA, or E-mail me at 102662.2222@compuserve.com. The deadline for January is the middle of October.

END

HF FAR & WIDE

Leighton Smart GWOLBI welcomes you to the column based on your h.f. activities. So come on in, read the reports, pick-up some tips and enjoy h.f. operating!

I'm writing this month's column in late July, during what has probably been the hottest week this year, with temperatures approaching the 90s. Phew!

However, the down side to all this is that 'Top Band' (1.8MHz) and '80' (3.5MHz) have been taking a right bashing from the usual summer atmospheric 'crashes and bangs'. These effects have resulted in a drop in reports for those bands.

Still, the summer 'static' didn't spoil the 'Annual GW Summer Party-On-The-Air' which took place on the 13th of July on 1.949MHz s.s.b. A great time was had by all, with around nine stations joining the party, which lasted until around 00.30 local time! I can't wait till the 'Annual GW Christmas Party On-The-Air' in December!

Active Again

I've finally managed to set-up a long wire antenna properly and have been active again mostly on 1.8MHz s.s.b. That's where I worked **S50HQ** in Slovenia with 30W p.e.p. (yes, a massive 30 watts!) s.s.b. who gave me a 5/9 report.

I did briefly try 3.5MHz when I worked **Rob G3XFD**, whose KW 2000B I'm using at the moment. I'm hoping to find time to get onto 3.5MHz more often so that I can have a chat with a few of you.

I must admit it's great to be back on the bands after a relatively brief spell of inactivity. It makes me wonder how I managed without a 'wireless' for so long!

Your Reports

Alas, space is limited this time around so I'll waste no more time and delve straight into your reports, starting with 3.5 and 7MHz.

I'm beginning this time with s.w.l. reporter **Derek Blunden BRS 171057**. He's been busy been burning the midnight oil to receive SU1SK (Egypt) and VO1BD (Newfoundland), on 3.5MHz s.s.b. A brief sojourn onto 7MHz between Derek's revision periods produced reception of DL4KBK/P at around 2000UTC.

Meanwhile, down on the Isle of Sheppey in Kent, long time reporter **Ted Trowell G2HKU** has been up with the

larks again. Ted made c.w. contacts on 7MHz with YV5JDP (Venezuela), SM5AUR/CE2 (Chile), ZB2AV (Gibraltar), CO3ZD (Cuba) and VK3VJ (Australia), all at around 0500UTC, using about 70W output.

Equipped with a G5RV dipole antenna and around 100W c.w. another early bird on 7MHz is **Carl Mason GW0VSW** from Skewen in West Glamorgan. Carl reports working AA1JY (USA) at 0519, OH0/DL1RNW (Aland Island) at 0557 and VK7UJ (Hobart, Tasmania) at 0603UTC.

The 14MHz Band

On to the 14MHz band now, and a letter has come in from new reporter **John Clavin G0WPA** in Leytonstone, London. John who has built his own rig, is pleased with his first QRP contacts which I2CTM (Milan, Italy), LZ1KOZ (Bulgaria) and RK9AWC (Asiatic Russia), giving John two new continents. All with just 5 - 10W s.s.b. and a dipole slung out of the window! Glad to see you're enjoying yourself John, and welcome to the column!

Next, it's on to our Bristolian listener, **Gordon Foote G7NCR**. Using his Howes DcRx monoband receiver Gordon lists s.s.b. reception of A61AN (United Arab Emirates) working EA5SX in Spain at 1900, 5N0HMA (Nigeria) working UR5GIG in Ukraine at 1632. He also logged VR2KF (Hong Kong) in contact with Steve GW0SGL in south east Wales, VE3ONK (Canada) working GMDIAR in Fife, Scotland, and lastly 9K2/YO9HPD (Kuwait) in contact with SV1CVV in Greece at around 1830UTC.

Reporting that "14MHz has been the best DX band" **Don Mclean G3NOF** in Yeovil provides his comment on the bands. "Best conditions have been after 1600, on the short path to Asia, followed later by a few African stations".

Don's list includes s.s.b. contacts on 14MHz with TI4CF (Costa Rica) at 2214, JF3NRI/4 (Japan) at 1621, JW8GV (Svalbard Island) at 0901 and TR8IG (Gabon) at 2218. He also worked VU2PAI (India) at 1749, 5H3DC (Tanzania) at 1800, 9G1BL (Ghana) at 1927, and 9N1RHM (Nepal) at 1727UTC, (QSL via PO Box 10801, Kathmandu, Nepal).

Charlie Blake RS 96034 has been listening from the Spanish Pyrenees during June and July, ostensibly while on a photographic holiday! (Are you sure

it wasn't a DXing holiday and you also took a camera along for good measure Charlie?).

Charlie used a Sony ICF - SW100 pocket receiver and a 4m 'clip-on' antenna to log s.s.b. reception of BV5GQ (Taiwan) working F5CCO in France at 1625. He also logged 9K2HN (Kuwait) in contact with GB800SA celebrating the 800th anniversary of Stratford-Upon-Avon at 1753, G0AHD calling CQ DX with no replies at 1950, TA5C (Turkey) working G4SOK, and 9N1RHM (Nepal) calling G3EBH at 1701UTC. 9N1RHW also called CQ UK, but got no replies!

Editorial note: I met Charlie at the Woburn Rally on Sunday 4 August and heard he's now got his 'A' licence. Well done Charlie! (He's also promised to keep on with his listening and reporting!). Rob G3XFD.

The 18MHz Band

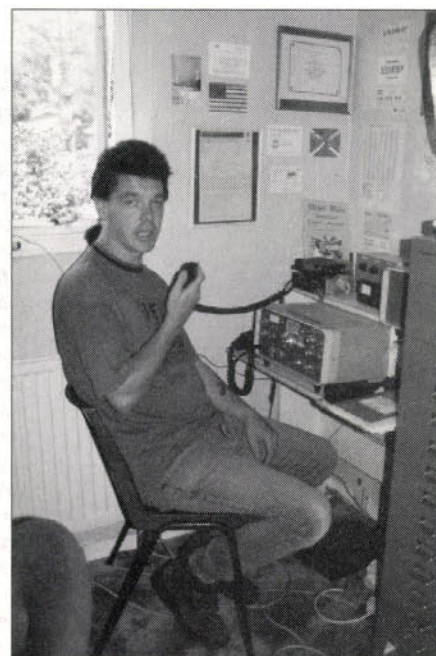
Ted G2HKU has been quite busy on the 18MHz band, his log showing 70W c.w. contacts with 9Q5MRC (Zaire) at 1100, 5N3/SP5XAR (Nigeria) at 1500UTC and ZP6CW (Paraguay) at 1900, despite, as Ted says "The early good conditions not lasting while I was on the air at least".

Meanwhile, Carl GW0VSW also used c.w. on the band and hooked up with YV6AZC/3 (Venezuela) at 2214, and KZ1H (USA) at 1701 amongst others. But the s.s.b. from Don G3NOF seems to have worked well.

Don's list including contacts with AP2JZB (Pakistan) at 1750, GM0RWU via short skip (Sporadic 'E'), HK5LEX (Colombia) at 2225, KC2JJ/C6A (Bahamas) at 2227, VP2EYE (Anguilla) at 2202, QSL to N3LKB, and lastly, 9Y4NED (Trinidad & Tobago Islands) at 2203UTC.

The 21 & 28MHz Bands

Now I'll take a very brief look at the 21 and 28MHz bands. Firstly Ted G2HKU managed a 21MHz c.w. contact with OY1CT (Faroe Islands) at 1500, while Don G3NOF logged CP6CR (Bolivia) at 2203UTC.



Leighton's busy on HF& VHF nowadays. His main HF station is the KW 2000 B in the photograph.

Finally, on 28MHz, new reporter **Mrs Jo Cruickshank GM0WPQ** uses a converted Amstrad transceiver for operating '10 FM'. She lists contacts with SP4LVG (Poland), DL1KSB (Germany), SM5VOC (Sweden), ON4AST (Belgium), and a host of other European countries via Sporadic 'E' on this band. Thanks for the report and welcome to the column, Jo!

Signing-Off

Well that's about all I can squeeze in for this month folks and it's signing-off time. Again my grateful thanks to all reporters for their dedication. Keep up the good work!

As usual, reports and information by the 15th of each month to: **Leighton Smart GWOLBI**, 33 Nant Gwyn, Trelewis, Mid-Glamorgan CF46 6DB, Wales. Tel: (01443) 411459.

END

BROADCAST

ROUND-UP

This month Peter Shore reports changes to the way BBC World Service operates and has news on how to listen into programmes in Russian from Moscow.

Anyone reading the British newspapers, watching television or listening to the radio cannot have failed to notice the continuing furor over the changes planned by BBC Director General **John Birt** to the way the **World Service** operates. As I reported in last month's column, a campaign to 'save World Service' was launched to try and ensure that the international broadcaster with the most listeners, 140 million at the last count, maintains its status as a separate entity, running its own news operation and making its own programmes.

John Birt was summoned to appear before the Foreign Affairs Select Committee of the House of Commons, and was questioned for almost 90 minutes about the changes and how they would affect World Service. He was also asked when people inside and outside the organisation learnt of the proposals.

It transpired that **Bob Phillips**, John Birt's deputy, was told three days before the public announcement, while the Foreign Office, which pays for World Service, and WS Managing Director, **Sam Younger**, were given 24 hours notice. One member of the Select Committee said that John Birt had "acted like a Tsar", others described his actions as dictatorial and arrogant.

As the war of words continued (with much praise heaped on Bush House by luminaries as varied as the **Dalai Lama**, **Sir Edward Heath** and African playwright **Ben Okri**) the new Chairman of the Corporation, **Sir Christopher Bland**, was summoned to a meeting with the Foreign Secretary, **Malcolm Rifkind**. Following this, a joint Foreign Office/BBC working group was established to look at the plans and how they would affect Bush House. It is expected that the group will report in the autumn.

Change Frequencies

If you expected international broadcasters to change their frequencies at the end of last month you may have been surprised. This

year, a majority of the world's broadcasters will change to their winter season operational schedules on the weekend Britain, and much of the rest of the world, puts clocks back to winter time.

Agreement to alter the usual date was reached by the members of the High Frequency Co-ordination Conference (HFCC) to avoid having two schedule changes in a relatively short period of time.

The HFCC consists of about 30 members, representing the international broadcasters of most European countries, plus Canada and the USA. Each broadcaster prepares the schedule it proposes to operate for each season (you might describe it as a sort of wish list) and takes this to the HFCC meeting.

This summer, the HFCC was hosted by **Czech Radio** in Prague towards the end of August. Each country's schedule is run through a master computer program which identifies where potential interference could occur.

The meeting then hammers out what changes could be made to ensure interference-free operation between members. After a large amount of to-ing and fro-ing, a final schedule is prepared.

The High Frequency Co-ordination Conference has moved on tremendously from the days of the Cold War when just a handful of the major western broadcasters (**BBC World Service**, **Radio Canada International**, **Radio Netherlands**, **Deutsche Welle**, **Voice of America** and **Radios Free Europe** and **Liberty**) met to work out their joint schedules. Today east European broadcasters are an integral part of the HFCC, including those from countries that used to 'jam' western stations.

Programme Confusion

There has been some confusion for listeners trying to hear programmes in Russian from Moscow. There used to be one Russian external service, run by the All-Russia State TV and Radio company.

Since early July, the **Voice of Russia**, a completely separate organisation, recognised as the

country's international broadcaster by Presidential decree last October, has also been transmitting Russian-language programmes. Try tuning in around 1700 on the old favourite **Radio Moscow/Voice of Russia** frequency of 12.035MHz, plus 11.96 and 9.675MHz.

Australia Strike

In Australia, a strike disrupted Australian Broadcasting Corporation (ABC) output in mid-July, including **Radio Australia** which was off the air on 17 July. Staff were protesting against a cut by the Australian government of around A\$65 million to ABC's budget. It is likely that Radio Australia will be affected to some extent.

If you want to listen to Radio Australia in Europe, try: 0700-1100 on 21.725; 1100-1300 on 15.53; 1100-1800 on 9.615; 1430-1800 on 11.66; 1430-1900 on 6.09 and 1800-2100 on 7.33MHz.

Station Verification

Practical Wireless reader **William Rigby** wrote from Morecambe on the Lancashire coast to report reception and subsequent verification of two stations. William picked up **Radio Minsk** at 1930 on 7.105MHz at the end of March and received a QSL from the station in May.

William wrote to Radio Minsk at **vul. Chyrvonaya 4, 220807 Minsk, Republic of Belarus**. The station is now operating its summer schedule at the same time on 11.96, 9.875, 7.21 and 7.18MHz.



William also caught

Radio Moldova

International during March weekdays at 2200 and 2300 on 7.50MHz (now reported to be on 7.52MHz) and wrote to the station at **str Moirita 1, 12028 Chisinau, Moldova**. Apparently he sent a postcard of Morecambe to both stations, together with his reports.

Radio Minsk replied with two QSLs and Belarus stamps. Has anyone else picked up interesting stations and had good QSLs as a result? Let me know at the *PW* office in Broadstone.

Satellite Reception

Finally this month, news for everyone interested in satellite reception who also has access to the World Wide Web. Astra has launched a site on the Web which has details of all current transponder usage, plus details of all the radio sub-carriers. Check out <http://www.astra.lu> when you next surf through cyberspace.

That is all for this time round. Until next month, keep searching the bands for interesting stations and let me know if you find anything unusual. All letters to me c/o the *PW* Offices.

END

Traders' Table

YOUR GUIDE TO SECOND-HAND EQUIPMENT FROM REPUTABLE DEALERS

Due to the fast turn-round of popular secondhand items readers should check on availability of advertised stock. In other words...if you spot something you fancy...don't delay or you could miss it!

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 the no circumstance will the magazine accept liability for non-receipt of goods ordered, late delivery or faults in manufacture.

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01702 206835

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Icom IC-725 HF transceiver £599
Icom IC-728 HF transceiver inc FM £749
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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
MFJ 9040 40M CW 5w portable transceiver £129
MFJ 9030 30M CW 5w portable transceiver £129
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Trio TS-530S HF transceiver £369
Yaesu FT-101E E HF transceiver, analogue, mains £249
Yaesu FT-101Z HF transceiver mains powered £299
Yaesu FT-101ZD HF transceiver £349
Yaesu FT-101ZD MK3 HF transceiver inc. WARC bands £369
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MOBILE / BASE STATION

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Standard C7900 7-cms 10 FM mobile £149
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Kenwood TM-231E 2m 45w FM mobile transceiver £199
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Icom IC-3J 70cms 350mw handheld £99
Kenpro KT-22E 2m handheld (same as IC2E) £99
Kenwood TH-42E 70cms handheld £199
Kenwood TH-22E 2m handheld £169
Kenwood TH-78E 2m/70cms handheld £299
Kenwood TH-215E x2 2m handheld £99
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HAYDON COMMUNICATIONS

0181-951 5781/2

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01480 406770

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Yaesu FT77 with FP700 speaker/PSU and FC700 ATU £499
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Yaesu FRG7700 £285
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Lowe HF150 with keypad £289
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Kenwood R1000 good condition £289

S/W PORTABLES

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Roberts RC818 ex demo SSB £169
Roberts RC827 ex demo SSB £149
Roberts R808 as new £65
Grundig YB 400 SSB £95
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Panasonic RF820 £40

VHF/UHF

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Icom IC32E dual band £265
Icom IC2PE £195
Icom ICW21E dual band £285

SCANNERS

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Uniden 220XLT as new £189
Netset PRO44 £95
AOR 1500EX as new £199
Yupiteru MVT7100 as new £199

MARTIN LYNCH

0181-566 1120

Icom IC202S VHF/SSB/CW transceiver 2m £175
Icom IC24ET 2m/70cm FM handportable incl nicad/charger £199
Icom IC2E 2m thumbwheel handheld transceiver £99
Icom IC2SE 2m FM handheld transceiver £125
Icom IC2SET 2m synthesised handi complete with accessories £159
Icom IC735 HF transceiver with general coverage (x 3) £695
Icom IC737 Latest HF transceiver with auto ATU (x 2) £995
Icom IC775DSP HF 200W DSP transceiver with auto ATU and PSU £2500
Icom ICR71E Communications receiver £495
Icom ICR71E Communications receiver £595
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Yaesu FT209R 2m FM handheld with FNB3 BATT £75
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Yaesu FT290R MkI 2m multimode 2.5W transceiver £269
Yaesu FT290R MkII 2m multimode 2.5W transceiver £349
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FOR YOUR SPECIAL DEALER RATES CALL PAUL ORCHARD ON 01202 659920

FOCAL POINT

Graham Hankins G8EMX says there may be some good news for amateur television on the 430-440MHz band.

The recent major threat to Amateur Television (ATV) has been the possible loss of 4MHz from the 70cm (430MHz) band, proposed in the European Radiocommunications Office *Detailed Spectrum Investigation* (DSI) document. The UK Radiocommunications Agency replied to the DSI, opposing these changes with, it's understood, other European administrations. The 1996 International Amateur Radio Union Region 1 Conference may decide to retain the full 10MHz of the 70cm band, at least for the time being.

The amateur television operator, putting out a wide-bandwidth signal, is particularly aware of the increasing pressure on the tiny gaps in the radio spectrum marked as 'for amateur use'. A portion of the (3cm) 10GHz band will soon be taken by wireless local loop telephony. ATV repeaters in the 1.3GHz band have to avoid aircraft radar, and now there are some car alarms and motorway news transmissions around 433MHz.

Even if the full 430-440MHz amateur allocation is retained for the immediate future, 'use or lose' remains the maxim for 70cm ATV. Remember, it's easy to transmit, and easy to receive on any domestic TV, either with an up-converter or sometimes direct tuning.

Sevenside Group

The **Sevenside ATV Group** runs two repeaters, **GB3ZZ** on 1.3GHz and

GB3XG on 10GHz. Members are applying for permission to enable 'XG' to receive 1.3GHz pictures then re-transmit them on 10GHz, this experiment will enable other users of ATV to be seen in outlying areas to the west of Bristol.

Several engineering projects have improved the repeater's r.f. signals and it has performed extremely well since coming on-air. The Group was featured in an HTV Wales documentary and permission was granted for the broadcast programme to be relayed through **GB3ZZ**.

Paul Stevenson G8YMM is the new temporary editor of the *Sevenside Group's* quarterly newsletter, *P5*. The June issue includes the circuit of a very clever 10GHz frequency counter and an intriguing piece on 13A plugs and mains supply standards throughout Europe.

Kiwi Contact

Michael ZL1ABS is my 'kiwi' contact in New Zealand, sending ATV news via the Satgate packet channels. Michael says: "Hi Graham, the North Shore club had a demo of 24 Line Narrow Band TV, from **Steve ZL2BKA** and **Con ZL2AFP**."

"The technology was worthy of Baird. The camera had a synchronous motor and spinning disc with pinholes illuminating a photo diode.

The receiver had a bicycle dynamotor with a toothed wheel and auxiliary magnets to lock its speed. An audio amplifier fed a bank of high

intensity green i.e.d.s the size and shape of the picture frame".

The club members in New Zealand were able to view the QSL cards and faces through a black spinning disc with spiral pin holes. As the bandwidth was only 2.5kHz the images were transmitted on 40m (7MHz) with an s.s.b. transceiver.

Your Reports

Some fine-weather long-distance ATV is reported by **John Stockley G8MNY**:

"Hello Graham. The recent hot summer has carried some remote 24cm repeater pictures to my home QTH in Croydon. **GB3LO** (Lowestoft) 177km at P2 colour and sound, **GB3PV** (Cambridge) 95km at P2 and **GB3TN** (North Wales) at 171km at P3 again".

John is secretary of the **Home Counties ATV Group**. Their local repeater, **GB3HV** (High Wycombe) was worked by **Francois F1EDM**, **Paul G8IXC** from Chatham and **Garry G4GHD** from Canvey Isle.

Now for a world record ATV contact on 10GHz, reported by **Klaus DL4KCK**: "Hello friends. On May 18 **F1JSR** and **HB9AFO** achieved a 3cm amateur television exchange across the 592km between Corse Island and Spain. This is a new world record on that band and in this mode". (I have asked Klaus for more details of this report).

The packet command 'LC ATV' (List Category) brings up all sorts of enquiries, addressed to anyone who happens to read them. One of these, from **Tony G7OGQ** in Liverpool, was seeking assistance with the construction of the Solent 24cm 1W transmitter kit. As I have built two of these, I responded as best I could.

A few days later, Tony replied: "Graham, thanks for taking the time to reply to my initial bulletin. I have just ordered one of the 1W ATV kits from the **Worthing Repeater Group**."

Tony continues: "I'm really looking forward to having a try at 24cm (1270MHz) ATV, and have found that I have a good site for v.h.f./u.h.f., but I have very little experience of construction and to be honest I am dreading having to build the thing. I

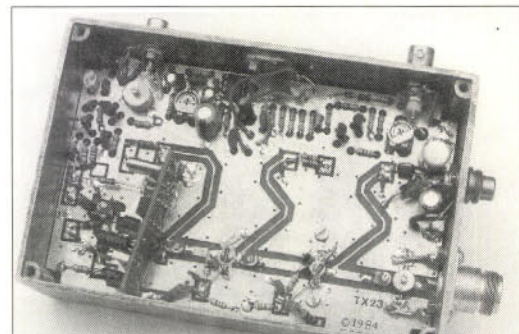


Fig. 1: A built ATV 24cm 1W kit. Anticlockwise starting at BNC socket - video modulator, 6MHz sound sub-carrier, 1.3GHz oscillator, crystal phase lock board (optional), two 1.3GHz pre-amps, 1W final amp to N socket.

know of quite a few 23cm (1296MHz) users who fancy a try at ATV, but the thought of building the kits, etc. puts them off".

Well, Tony, I would really like to help. Perhaps the photo (Fig. 1) on this page will give you a guide. The paperwork that comes with the kit shows much of the microwave construction, but I recommend using a small soldering iron and keeping all the oscillator and r.f. amplifier component leads really short.

A good idea may be to build a simpler kit (try a 70cm up-converter) to bolster your confidence. There are plans to make *Focal Point* more practical, so it is useful to understand the problems that inexperienced constructors may have.

Amateur Television A to Z

Connectors: Keep to BNC or N type for all r.f. connections. Other types eg. PL-259 or Belling-Lee are too lossy at the frequencies we use, or do not have a constant impedance. This is particularly important on 24cm.

Coaxial Cables: Throw away that domestic TV downlead! Best affordable performance for 24cm is Westflex 103 airspaced. Please use the special N type plug designed for the thicker central conductor. More expensive, yes, but much easier to fit and to remove and refit!

Chroma (or Chrominance): The low-bandwidth (approx. 1MHz) colour content of the transmitted picture.

Composite Video: Signal containing encoded high-definition light/dark picture detail with interleaved chroma.

Well, I am really crawling through this. But it's on to D, E and F next time.

Please keep those packet messages coming into GB7SOL.#29.GBR.EU or letters together with photographs of you and your station to me, Graham Hankins G8EMX, 11 Cottesbrook Road, Acocks Green, Birmingham B27 6LE.

END

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BARGAIN

b a s e m e n t

Compiled by Zoë Crabb



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Altron 70 foot tilt over wind-up tower, £400. TH7DX 7-element 3-band beam, £300. HAM V rotator with 100 feet control cable, £200. Tel: Notts (01636) 892059.

Amber 4400A multi purpose audio test set, £20. Transformer 600-0-600V 630mA, 240V input, £12. Powerful airblower for pair 4CX350's, 240V, £15. Pair of chimneys for 4CX350S, £3. Dave G3UVB, Oxon. Tel: (01865) 372466.

Amiga 1200 computer and PK232MBX data comms., controller package 80MB hard drive, external floppy drive, 1084 colour monitor, HIQ tower power supply with quad CD ROM drive, squirrel SCSI interface, £700. G3SSQ, QTHR. Tel: (01727) 851518.

Analysar Ando AC8211, 0.1-1750MHz, 10.7MHz i.f. output, Icom R7000, 25-2000MHz with remote, C-IV interface, Scanstar professional software (both new), all cables and disc tone antenna, £2,100 o.n.o. Will split. Tim, Bucks. Tel: (01494) 677773 days or (01494) 672281 evenings before 9pm.

AOR8000 and Optoscout reaction tune, three months old, excellent condition, genuine reason for sale, bargain at, £585 + postage o.n.o. Only sold together, includes manuals, cables, boxes, etc., both still brand new. Tel: N. Yorkshire (01723) 507273 10am to 7pm, no time wasters please, thanks.

AR77 comms receiver, £65. RME69 rare RX, £85. Yaesu FT-203R hand-held 2m (144MHz) transceiver, £90. Drake TR4-C h.f. transceiver, a.m./s.b., £150. Tel: Bromley 0181-325 8014 evenings or weekends.

AVO meter MDL8 MkIII, Advance a.f. signal generator. Teletip equipment dual-beam oscilloscope. Farnell stabilised p.s.u., all mint condition. Offers. Tel: New Milton (01425) 619376.

Datong automatic r.f. speech processor, model ASP, £60 o.n.o. Hi Mound MK701 Morse key, £35 o.n.o. MFJ c.w. filter, £10. 100kHz crystal calibrator, £5. 4m (70MHz) hand-held, £20. ERA BP34 audio filter, £20. Doug, Norwich. Tel: (01379) 677774.

Dynatron radiogram, circular 1948-52, full working order, never needed any repairs, model RG15, serial no. 1117. Best offer on 28th day after publication. Lewis,

Leamington Spa. Tel: (01926) 334974.

Eddystone 750 Receiver: Good condition, double conversion superhet general coverage receiver 500kHz to 32MHz, 115V a.c. version (complete with transformer) £75. Also various language courses (cassette and records). Call Rob G3XFD at PW Office.

Eddystone 1837/2 h.f. receiver, 0.1-31MHz, a.m., c.w., u.s.b., l.s.b., digital, £325. Hallicrafters SX100 h.f. receiver, 0.5-31MHz double conversion, i.f. notch filter, £120. Hammarlund SP600 classic, £175. Eddystone 770S 0.5-1GHz, as new, £150, manuals. Tel: Sunningdale (01344) 27869.

Eddystone receivers, 770R 19-165MHz, £135. 870A 150kHz-24MHz, £80. AR88 'S' meter, cased (v. minor fault), £145. WSC 12 tank transceiver, 1.6-10MHz, £95. WS No 19 p.s.u., variometer, mic., headphones and original operators manual, £165. Tel: Yorkshire (01482) 869682.

EGA monitor and drive card games port, £100 o.n.o. Chris G7GJZ, Somerset. Tel: (01278) 786621 after 5pm.

EN1350L wide-band linear amplifier, 0.25-105MHz, 50dB gain, £350. HP4815 vector impedance meter, 0.5-108MHz, £300. Marconi TF2002B signal generator with TF2170B digital synchroniser 0.01-88MHz, £100. Solatrol dual 0-30V p.s.u., £40. John G3WZT, W. Sussex. Tel: (01403) 864222.

Fairmate HP200 hand-held radio scanner, 500kHz to 1.3GHz, including charger, antennas, soft case, original packaging, hardly used, mint condition, £190. No offers. John, Coventry. Tel: (01203) 465328 6-7pm.

FRG-7700 receiver, plus FRA-7700 active antenna, both boxed with manuals and presented in excellent condition, £250. Tel: Slough (01753) 546012.

FT-480R, excellent condition, 1W low, 10W high, multi-mode, manual, first mic., £200 o.n.o. Gary G7TES, Cumbria. Tel: (01768) 881866 (evenings) or (01768) 868144 (daytime).

FT-7000 original spec., no mods, immaculate with handbook, £150 o.n.o. Offers for Skiptech power supply 14A, new, unused, Hodech p.s.u., 3A, Bremi p.s.u., 3A, buyer collects or pays carriage. G0HAE, Southampton. Tel: (01703) 455777 anytime.

FT-902DM with Denset base mic., spare p.a. valves, manual, £400. FTV901R with 2m (144MHz) and 6m (50MHz) fitted, manual, £200. HF-225, little used, £350. Mizubo a.t.u. RX a.t.u., £20. KW107 a.t.u., £90. Richard G0XAY, South Glos (01454) 218362.

Grundig stereo system Top-Boy 600L with auto 60 record player, dark wood, immaculate condition, 46" x 15" x 30".

£100 o.n.o. Complete with instructions and wiring diagrams. Robin Wright, Peterborough. Tel: (01733) 66394 evenings.

Hammarlund SP600 RX (heavy!), Tono 550 decoder, manuals, speaker, W. Fehlhaber, Tel: 0131-336 1086.

Heil desk mic. with HC5 element, £55. Alnico DJ-180 hand-held plus extras, £125. Tonna 17-element 2m (144MHz) beam, £45. MuTek 6m (50MHz) transverter 2m (144MHz) i.f. TVVF 50C MkII, £190. Must sell. QSY to USA. Paul G7GUC, Lincoln. Tel: (01522) 731294.

HF cubical quad 1/2 glass spreaders metal spider, £80. Yaesu FT-208R hand-held with NC-8 charger, 12V adapt, case, spkr/mic. and batteries, £80. Apricot CP/M computer s/ware and manuals, very good packet, £20. All v.g.c./o.n.o. Ian G0KRL, Suffolk. Tel: (01359) 270527 after 6pm.

Icom IC2GE v.h.f. f.m. 2m (144MHz) transverter with manuals, charger and large capacity batteries CM-73, only £100 each, o.n.o. Andy, Suffolk. Tel: (01449) 775395.

Icom 251E 144MHz transceiver, f.m., s.b., c.w. with Icom SM-5 desk mic., boxed with manuals, ex. condition. Gary, Coventry. Tel: (01203) 559702.

Icom IC-706, as new condition, £925. Tel: Middlesex 0181-426 1710.

Icom IC-706, mint with separator kit, £900. FT-790, mint, £225. Both boxed with all doc, etc. Wanted TS-850, TS-870, plex, cash either way, w.h.y.? Dual bander TS-940. Tel: Lancs (01257) 230168.

Icom IC-901E (boxed), dual-band 2m/70cm (144/430MHz) mobile transceiver with optional 2m (144MHz) s.b. and wide-band receiver units, £675 o.n.o. Will exchange for Icom IC-275H with cash adjustment either way. Barry Williams G7OFR, Yorkshire. Tel: (01274) 880895.

Icom R71E, good condition, Yaesu FRG-8800, small fault, both together, £700 o.n.o. Tel: Beverley (01482) 864412.

Jay Beam VR3 vertical tribander, 10, 15, 20m, manual, boxed, in very good condition, £40. L. Symons, 14 Maidenwell Road, Plympton, Plymouth PL7 3RB.

Jaybeam 44-ele 70cm (430MHz) antenna, £25. Buyer collects. Star SG-10C printer suitable for Commodore C64 or C128, £35. Robert GMOCSN, South Lanarkshire. Tel: (01698) 286078 after 6pm.

KDK2033 2m (144MHz) mobile 5/25W, used only base, Vega receiver Selina, eight band, both working condition, £120. Carriage extra. Andy G1CQB, Hants. Tel: (01289) 584532.

Kenwood 79E, fast charger, 1hr full charge, £50. 79E batt pack, £20. Alnico dual-band

hand-held, v.g.c., £210 o.n.o. 2m vertical, £15. Tel: N. Wales (01745) 730148.

Kenwood R-2000 communications receiver with f.m. fitted by Lowes, two years old, excellent condition, boxed and manual, just passed RAE so my good friend must make way for new 2m (144MHz) rig, £350 o.n.o. Ken Capewell, Warwick. Tel: (01926) 842881.

Kenwood R-5000 h.f. receiver plus v.h.f. conv., v.g.c., £650. Rascal RA1772 15kHz to 30MHz professional receiver, c/w handbook, good condition, £650. Also some Rascal spares. Tel: (01424) 753949.

Kenwood TH-42, 70cm (430MHz) hand-held, just like new, they don't come much smaller than this, go on - treat yourself, £180. Tel: Kevin (01202) 659910 office hours. E-mail kevin@brs95787.demon.co.uk

Kenwood TH-42E 70cm (430MHz) handie, immaculate condition, manual, charger, current model RRP, £289, best offer. Tel: Ridgway (01473) 644944 or home (01394) 383165.

Kenwood TS-140S, ex. condition, £450. Daiwa automatic antenna tuner, model CNA1001, £150. Icom 736 h.f. transceiver plus Icom SM-8 mic. Icom SP21 speaker, still 21 months warranty, £1300, all boxed. Gary, Coventry. Tel: (01203) 559702.

Kenwood TS-940, mint condition, boxed with manual, c/w filter, £800. Also Kenwood AT230 a.t.u., £100 o.n.o. Bob GWOHOL, Cardiff. Tel: (01222) 843099.

KW Viceroy MkIII TX, 1960, non WARC, built-in p.s.u., lovingly restored, c/w crystal, mic., manuals, spare valves, perfect, £120. Buyer collects. Ken G4ZLX, Dorset. Tel: (01258) 455507.

KW2000A h.f. s.b. transceiver, complete with p.s.u., mic. and manual with circuit detail, suit beginner, £120. Bruce, Plymouth. Tel: (01752) 220040.

Lowe HF-225 with f.m. board and W225 whip antenna, boxed and genuine, as new, £350. Alan, Kent. Tel: (01892) 535974 after 6pm (home) or (0973) 807455 (work) 9-5pm.

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MFJ-9420 20m (14MHz) 10W s.b. TX, new and boxed, £130 o.n.o. RN Electronics 6m (50MHz) linear amp 2.5W in, 25W out, £25. Terry, Wakefield. Tel: (01924) 823108.

NRDS15 + NVA speaker. + NDH memo unit and handbook, box, cables, photo sent on request (s.a.e.), £465 v.n.o. Carriage extra. Wanted PWs, odds, Jan, Feb, June, Nov, Dec 1950, Oct 1951, June/July '53, Apr, May, Sept, Oct, Dec 1955, Dec '56, Nov '57, June, July, Aug, Sept '58, Jan, Aug '59, March, Oct, Dec 1963, June 1967, any condition. Tel: Essex 0181-505 6303.

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R-1000 RX, g.c., c/w handbook, 30 bands, £199 to include P&P. Dentron a.t.u., 1kW, £99 to include P&P. Peter, Cleveland. Tel: (01287) 634397 9-5 (work QTH).

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RCA AR77 communications receiver, £60. Philips 462-A15 table radio, Bakelite case, l.w., m.w. and s.w., (c 1950?), £50. Murphy A26G console radio, wood cabinet, l.w. and m.w., (late 1930s?), £50. None working, buyer collects. Tel: Southampton (01703) 449503.

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For enrolment details, please contact the Faculty office on **01823 366371** or the course tutor on **01823 366366 ext.211**.

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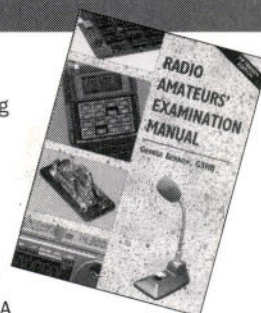
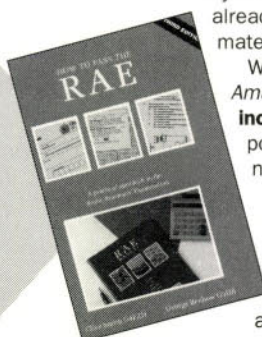
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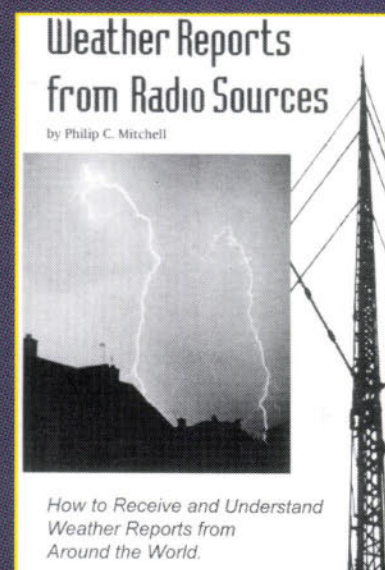
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The author Philip Mitchell is a regular contributor to our sister publication *Short Wave Magazine*. He's written several articles on meteorology in a bid to combine his interests of radio monitoring and weather.

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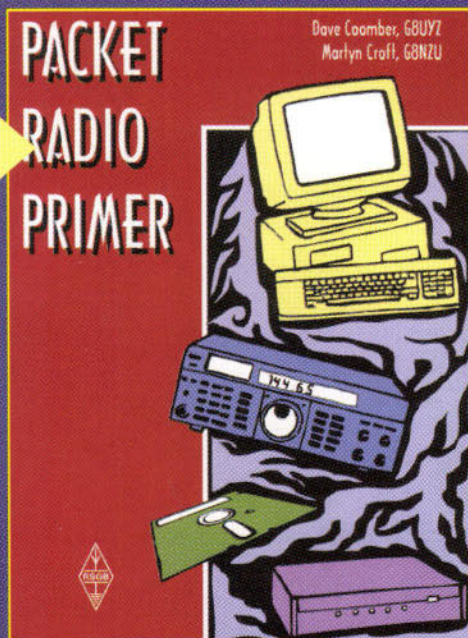
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The *RSGB Prefix Guide* which was originated by **Geoff Watts BRS3129** is now in its second edition, re-launched and is described as being the 'Complete Guide to Country Prefixes'.

This second edition has been brought right up-to-date as it now includes a DXCC code list which can now identify the countries which have changed their names and are therefore difficult to identify.

If you are a keen DXer then at £5 the *RSGB Prefix Guide* is one of the best value books available.

3



Packet Radio Primer (RSGB)

Dave Coomber G8UYZ & Martyn Croft G8NZU

This book, now in its second edition, has been completely revised and expanded to include new packet developments. It's described as a light hearted introduction to the world of Packet Radio aimed at helping the beginner to get involved with the minimum of fuss.

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Whether you're a beginner in the world of Packet radio or a seasoned enthusiast the *Packet Radio Primer* would be a worthy addition to your book shelf and at only £8.95 is great value!

4

Satellite Hackers Handbook

Colin A. Grellis



Receiving Station on a Budget.
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The Satellite Hackers Handbook

Colin A. Grellis

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The author explains what equipment is needed and how to get all you require as cheaply as possible. If your interests lie in non-broadcasting stations such as weather or amateur radio satellites the *Satellite Hackers Handbook* shows you how easy it can be to receive weather pictures, as well as explaining how amateur satellites are used for transmitting over long distances on v.h.f.

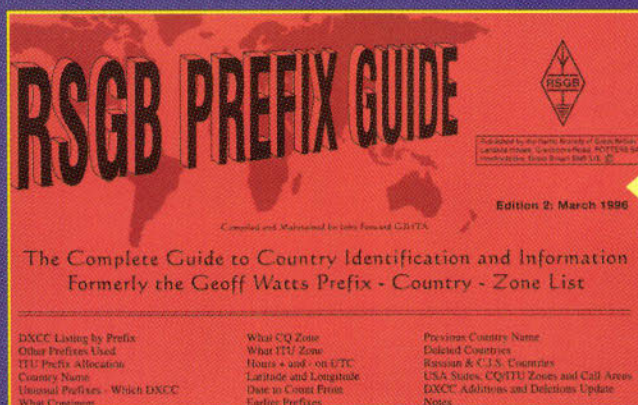
As well as all this information, also contained within its 120 pages is a list of equipment suppliers, a comprehensive glossary and a short list of useful addresses. And that's not all, *The Satellite Hackers Handbook* is supplied with a free PC disk which contains programmes for receiving and decoding satellite transmissions.

The *Satellite Hackers Handbook* costs £18.75.

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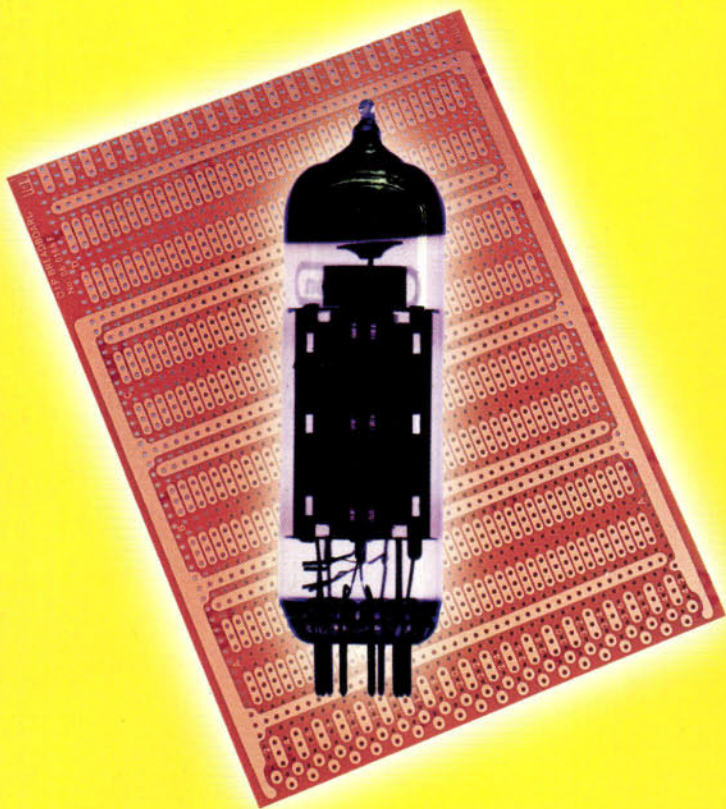
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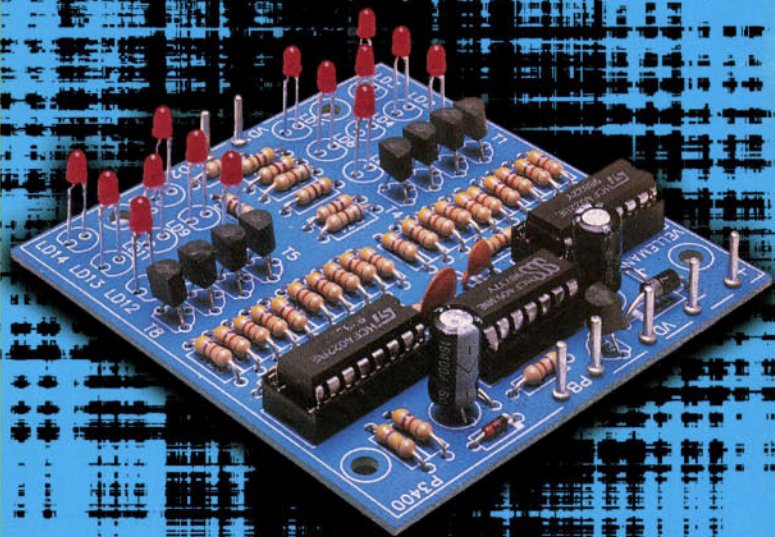


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