REVIEWED
THE ALINCO DX-77 'BUDGET PRICED' RIG

WIN!
A COPY OF StripboardMagic
THE LAYOUT DESIGN PROGRAM

BUILD!
THE GDP-430 HAND-HELD
PROJECT - PART 2

REVIEWED
THE HORA C408 'MINIATURE' TRANSCEIVER
Waters & Stanton PLC

22, Main Road, Hockley, Essex. SS5 4QS
Open Mon-Sat 9.00AM - 5.30PM

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Kachina 505DSP HF Transceiver
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SPECIAL OFFER PRICE
Full CTCSS: 20 memories: 1.6MHz repeater shift: Priority channel: Scanning: Dual watch: Dual mode squelch: PTT lock: 1 2.5/2 5kHz steps.
2 30mW output - all from just 2 x AA cells

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£2.95 plus £1 postage

Kanga 505DSP HF Transceiver

Main Features
- 100W HF All bands + Receive 100kHz - 30MHz
- Filters for SSB 3.5, 7.2, 4.2, 1 kHz
- Filters for CW 1kHz, 500Hz, 200Hz, 100Hz
- Band Scope, DSP filter, Memory keyer, log book, VSWR meter, Smith Chart, pre-amp, 20dB attenuator, plus many software controlled functions.

HORA C-150 2m FM Handheld

Can you believe your eyes?
25 / 12.5kHz Steps
130 - 170MHz Rx
1750Hz Tone
20 Memories
Scanning
Battery Save
LCD Readout
Keypad Entry
Includes:
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Antenna Instruction Book
12 Month's Why.

KENWOOD TM-451E 70cms Mobile

NEW
C-408

From HORA
70cms Handheld Full CTCSS

£89.95!
FREE Postage
Full CTCSS: 20 memories, 1.6MHz repeater shift: Priority channel, Scanning: Dual watch: Dual mode squelch: PTT lock: 12.5/25kHz steps, 230mW output - all from just 2 x AA cells
SGC-2020 QRP HF Transceiver

£599
0 - 20 Watts SSB and CW with full break-in. Can run from 12 volts or internal pack. Delivery expected at the end of March

1998 Catalogue

Limited Stocks

WATSON W-MM1 Multimode Modem

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- Powered from RS-232 port

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PW says: "an incredibly well priced radio - amazingly sensitive - audio - worked very well with 12.5kHz channel spacing - An Absolute Cracker"

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1.8MHz to 432MHz

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Credit card size with full CTSS - 300MHz / 20 memories - AM Air Review: February RadCom

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Normally £160.00

Slip it into your pocket for rally use or the local repeater. Earpiece and AC charger included. See page 52 of Feb RadCom

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All future MFJ stock will carry the official UK warranty cards (which have to be returned to us). If your item does not have this card, phone us for guidance. If a product is purchased that does not come through the official channel, you could find yourself at the mercy of a dealer who has no service information, is supplying old versions or non European models, has no access to factory parts or the backing of the UK service team! THE CHOICE IS OBVIOUS!!

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- 8000 character RAM
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- Epson compatible printer port
- Requires 12V at 300mA DC

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- *Suits all data modes
- *Full adjustable pass band & filter

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- 3-way antenna selector
- Built-in dummy load
- Thru position  Size 257 x 85 x 197mm

- £129.95

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55

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Join George Dobbs G3RJV as he 'flies the flag' for open wire feeders.

A CENTURY OF AMATEUR RADIO EQUIPMENT

Phil Cadman G4JCP traces the evolution of Amateur Radio equipment over the last century.

REAL RADIO IN MINIATURE

Dick Pascoe G0BPS discovers that the HORA C408 is in its a 'real radio' in miniature!

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G0NPYLI recalls his Lithuanian trip that turned into a great radio holiday!

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- 50MHz - 54MHz
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- Narrow filters fitted as standard
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- All mode squelch
- Scan facilities
- CTCSS encoder
- Noise blanker
- Quick offset for DX pile ups
- IF shift control
- Separate HF & 6M antenna sockets

100 memories

Detachable faceplate and remote mounting kit available

Speech processor standard

Narrow filters fitted as standard

100W output on HF & 6mtrs

Selectable 4 stage RF gain 20dB to +10dB

Superb TX audio and RX

Excellent RX sensitivity

Full break in on CW

All mode squelch

Scan facilities

CTCSS encoder

Noise blanker

Quick offset for DX pile ups

IF shift control

Separate HF & 6M antenna sockets

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innovation quality style

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**DJ-191E**

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- Battery save facility
- Store function
- Time out timer

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- Scan function
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- CTCSS encoder
- 100 memory channels
- On air cloning

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- Channel Scope
- Full duplex + CTCSS encoder
- AM/SSB channels
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**DR-605E**

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- CTCSS encoder fitted

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Total amount & ___________ CHEQUE/PO (Made to AYP Electronics Ltd.)

SIGNATURE

NAME (MR/MRS/MISS)

ADDRESS

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All prices include VAT at 17.5%. Items subject to availability. Please allow 28 days for delivery.
It's a sad fact of life in my job that I have to regularly mention the passing of yet another Amateur Radio 'personality'. This time I have to pass on the sad news that another wonderful character - Basil O'Brien G2AMV has passed on.

Unfortunately, I did not hear of Basil's death until after his funeral had taken place. On hearing the news about this highly respected former President of the RSGB, I immediately wrote to his widow Eileen G3WIO expressing the sympathy I felt.

Basil was a marvellous character and great fun to be with. I always thoroughly enjoyed the company of the O'Briens at the various RSGB Presidential Installation ceremonies I've attended.

The G2AMV sense of humour will live on however, thanks to Basil's funny pre-Second World War story (involving Fred Camm the founding Editor of *PW* and Austin Forsyth G6FO, founding Editor of *Short Wave Magazine*) I regularly share during *PW* 'Club Talks'. But you'll have to wait to hear that when I visit your club - and as always with Basil's humour - it's worth waiting for! We'll miss you Basil...but you'll not be forgotten!

**Positive Feed Back**

Our readers often let us know - often with positive feedback - when they've enjoyed articles in the magazine. Such was the case with Ray Foutley G3ASG's article on 'Batteryless Calculators' - dealing with slide rules, and published in the February 1998 issue.

While not directly connected with radio as such - slide rules were essential for those of us playing around with 'radio mathematics' before the pocket (battery powered) calculators arrived. The article brought a good response to the Broadstone offices and direct to G3ASG's home in Norfolk.

Because there has been so much interest, Ray has very kindly prepared an information and fact sheet and further instructions on slide rules. If you want a copy they're available free (thank you Ray) if you send an s.a.e. (with 39p stamp) to him at: 7 Kingfisher Road, Downham Market, Norfolk PE38 9RE.

**Radio Basics**

Many of you will realise how much I enjoy my work in leading the Editorial team on *PW*. But I must say that thanks to my 'Radio Basics' column I'm enjoying even more by re-discovering the pleasure of my early days in the hobby.

Building, testing, preparing and writing the 'Radio Basics' column is proving to be very rewarding. Nothing is more discouraging for the newcomer to the hobby to build something - only to find it does not work. So, I do my best to ensure everything is as simple and straightforward as possible, enjoying myself in the process!

In the office we're not 'slaving over hot soldering irons' (just hot word processors!) so it's a wonderful change to get busy in the evening at home testing, assembling and trying ideas for the monthly beginner's series. And although I've been a keen constructor for well over 40 years - things have got rather difficult for me recently.

But believe it or not...my problems aren't caused by my artificial arm. No - in fact the versatile 'split hook' I wear on my artificial arm provides an excellent 'heat shunt'. But I admit it's frustrating when I lose a transistor - only to find I've been clutching it in my hook all the time!

No, my real problems are because I'm now at the 'bi-focal' age! Middle aged eyes - plus diabetic eye problems are my disabilities. But, if I can
Radio Amateur's Examination

Dear Sir

I must add my support to the comments by Ken Davies (Letters 'Shabby Treatment' March 1998) with regards to his letter about the Radio Amateur's Examination (RAE). I also passed part one paper and for the last two exams have tried to pass part two without any success. Surely there is still time for the City & Guilds to reconsider and give us one final chance to pass part two after all the exam is not till May.

The reply given by the City & Guilds is that the paper is not 'invented' by anyone! Their existence was predicted by Maxwell in the 1860s and first demonstrated by Hertz some twenty years later. These two men should therefore take the credit for the discovery of radio waves.

The question of who first applied radio waves for communications purposes is an international controversy which I would rather not enter. Intol

John Leak C98XO
Halifax

Electronic Sentry

Dear Sir

John Brown GAU8BB is on the right track with his electronic sentry to protect the 'shack' (PW page 42 March issue). But may I suggest an alternative version which I have used for some time.

Last year we had the house painted and the painters broke the outdoor Passive Infra Red (PIR) spotlight on the front wall with their ladder. The spotlight casing was smashed so I harvested the undamaged PIR base unit and fitted it in my workshop so it switched a small light on when anyone came in after dark. This saves fumbling for the switch if you are carrying something.

It's photo-electrically controlled and switches the 'pilot' lamp off a few minutes after the main lights come on. The sensor could also sound an alarm in the house if required. As soon as the main lights are switched off, the pilot light comes on again so I can see to lock up and goes off after a few minutes if there is no-one inside. I'm sure readers will think of other variations!

Tony Hopwood
Worcester

Lack Of VHF Projects

Dear Sir

I'm not having a go, but how ironic that you publish a letter complaining about the lack of v.h.f. projects in the edition you promised would conclude the GDP-430 u.h.f. handheld project! Okay, u.h.f. isn't v.h.f., but it is one of the few Class 'B' projects for a while!

Come on Mr Editor...it's not like you to break a promise, at least not without an explanation. Whilst v.h.f. projects are thin on the ground, there are good reasons for this - v.h.f. construction is not as straightforward as h.f.! However, here is an idea using a older PW project in a slightly different way.

The PW Meon was a very popular project when 50MHz was first opened up to UK amateurs and many were built. However - by changing the crystal and a little retuning, a UK CB radio can be used to get onto 50MHz Amateur Radio f.m.

The Meon is a fairly straightforward project which I can personally recommend for the Class 'B' licensee, full or Novice. New crystal frequency = 22.80875MHz gives channel read out which equated to 50MHz frequency e.g. channel 11 will be 51.510, channel 13 will be 51.530. I'm sure Meon reprints are available from the PW Book Store.

The second idea which I have been toying with for a while but not yet tried is to use a simple 3.5MHz d.s.b./c.w. transmitter to drive the Meon. This will require some

Happy PW Memories

Dear Sir

A friend of mine walked in recently and handed me three PWs, circa 1957 and what happy memories flooded back. Those wonderful treks down to Lisle Street in London which was indeed a gold mine for us in those days. I wasn't licensed at the time, but still enjoyed the hobby and PW was a great help.

These PW magazines have given me the courage to have another go at getting back on the air as since I moved into sheltered accommodation, antennas were taboo. I spent a great deal of time getting round the Warden, a pretty lady in her prime and in the end she relented saying she would look the other way on condition no one complained.

I decided on an end-fed wire
reworking of the crystal oscillator to 46.5MHz, but should provide some good DX opportunities.

As you may be aware, I have had a couple of articles published in the G-QRP Club’s newsletter SPRAT. Would you be interested in sponsoring some practical research into making this WAGI work? In return, PW would have an h.f./v.h.f. dual mode project!

Steve GOFUW
Eath

Editor’s reply: My apologies to all concerned Steve, and you’ll see that we are finally able to continue publishing the long-awaited hand-held u.h.f. project. And of course we are very interested in any v.h.f./u.h.f. constructional project and I’ll write to you on the matter.

A Former Prisoner Writes

Dear Sir

With reference to your ‘Keylines’ editorial attempting to assist the prisoners Keith Winward and Don Sobey reminded me of my experiences back in the late 1960s. This was when I got into a spot of teenage stupidity and ended up in Winchester Prison, ‘remanded for medical reports’. I found the experience both enlightening and very frightening. I would also like to thank the Editor for accepting my letter and agreeing to allow me anonymity.

which went up the side of the wall three floors up, hidden behind a non metal pipe with the help of the window cleaner. The rig is a Yaesu FT-747 on loan to me from the RAIBC and at last I can enjoy my FT-747 on loan to me from the RAIBC and at last I can enjoy my h.f./v.h.f. receiver. No v.h.f. receivers were available as they could be modified and used to listen to their security radios or the police. And they considered the books may be of use to anyone to help them carry out the modifications.

Editor’s reply: Good luck on air Mervyn. But readers should be made aware that the Lisle Street area caters for a totally different ‘range of interests’ nowadays!

Chronology of events: Arrest at Bank holiday weekend, police can’t hold me without charge over time of holiday - night in cells, then taken to another police station where there is a magistrate to order my remand. Next stop is Winchester, late in the evening, no food since lunch time, strip search, into cell on main block. The next morning, after breakfast, I am taken to see the ‘Doctor’, I am sat with a few others in the corridor outside (I assume the same has happened to them). We are told to strip off to our underpants while waiting. I suggest (as I am very cold) can I wait to strip off until just before my turn to be examined? I was marched off to a room by two officers on my own, punched several times, told I must “do as I am told or else”, and had my clothes taken and then I got to see the ‘Doctor’. I was examined for needle marks, told to put my clothes on again and sent up to the hospital wing of the prison, most of the people in the place seemed to do as they liked, laying on beds or sitting around reading or playing cards, etc. (they all seemed to be calm and quiet, probably sedated). After three days in here and with no glasses, reading was difficult and I was bored stiff. I was now moved to main cell block and put in with two old chaps who seemed nice enough. While chatting, one told me he had spent most of his adult life in and out of prison, and he knew how the system worked - ask to see the governor and then make a request for my college books and glasses to be sent in.

I got to see someone in an office and asked as I am studying engineering it would be helpful to have my glasses and books in here. “What books”? I was asked. I said radio and electronics and was told they would not allow radio books or any radios except m.w. and l.w. receivers. No v.h.f. receivers were allowed as they could be modified and used to listen to their security radios or the police. And they considered the books may be of use to anyone to help them carry out the modifications.

I said that I as an Amateur Radio operator could easily take a couple of broadcast sets and modify these to make a simple ‘phone transmitter and receiver system to communicate outside without any books. So I saw no rational point in depriving me of educational materials.

At this point, they seemed upset and I was labelled as a ‘trouble maker ’and marched off to the cell

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Club Visit & PW

Dear Sir

We all enjoyed your visit to the Plymouth Club on March 3. Hope you got home okay. Than you also for the splendid ‘new look’ April PW - you have got the colour and everything just right. And I liked the April ‘Keylines’ - especially you happily on the ‘Go Kart’. Will you bring it to Longleat?

Jess Alderman G7PH
Cornwall

Editor’s reply: I arrived home okay Jess, we’re pleased you liked the ‘new look’ and I’ll have the ‘Go Kart’ if John G0SKR will let me borrow it.

block again. A couple of days later I was visited by a Welfare Officer, then the Chaplain. I asked if anyone could get me my glasses and next day I got a visit from the Vicar of my home town. He had brought my glasses he also contacted my parents and a local probation service officer. I had three weeks to wait in prison before being in court and being ‘bound over’ with one year probation. My conclusion is this, the rules are there to make life easier for the officers and are often contradictory. Anyone who questions the authority or logic of the system is in for a rough time. Additionally, anyone of above average intelligence is considered to be a threat who must be subdued or controlled, and no one may question the rationality of the prison regime.

Thank you all for your time, my apologies for my dreadful typing, but I could not use secretarial assistance on this letter. And I would also like to thank the Editor for accepting my letter and agreeing to allow me write anonymously.

Thank you.

Editor’s comment: We have a very strict rules regarding ‘anonymous’ letters in PW. In this case the writer telephoned me, describing the experience asking if he could write in and remain anonymous. Now well established in his career, for obvious reasons I agreed to the request. G3XFD.

Letters Received Via the ‘Internet’

Many letters intended for ‘Receiving You now arrive via the ‘Internet’ Anr forgeting 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 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 correspondence Editor.

Practical Wireless, May 1998
Leicester Amateur Radio Show 1998

Following the closure of the Granby Halls in Leicester, the 27th Leicester Amateur Radio Show (LARS), which will be taking place on Friday 25 and Saturday 26th September, will take place this year at the Donington International Exhibition Centre at Donington Park, Castle Donington, Leicestershire.

The Donington International Exhibition Centre is situated just a few minutes from junction 23A of the M1 motorway and only three minutes from East Midlands International Airport, making it easily accessible as England’s ‘most central venue’. In addition to this, a free shuttle bus service will run from the airport to the exhibition site.

The show will take place in a hall which has been purpose built with a floor space approximately one third bigger than the two Granby Halls combined! This year’s show promises to offer a ‘feast of delights’ for the radio enthusiast and it’s hoped will be even more popular, despite the date and venue changes. Some points to bear in mind are:

- FREE AND UNLIMITED CAR PARKING AT DONINGTON PARK.
- 150 STANDS OFFERING PLENTY OF VARIETY AND NEW PRODUCTS.
- CAMPING & CARAVANNING AVAILABLE ON SITE.
- MEETING ROOM FOR CLUBS AND SOCIETIES.

If you’re interested in booking a stand at the LARS you are invited to contact John G4MTP on Tel/FAX: (01664) 790966 or E-mail: G4MTP@mail.com. All other enquiries regarding the show should be directed to Geoff G4AFJ on (01455) 823344, FAX: (01455) 828273.

Make sure you don’t miss the 27th Leicester Amateur Radio Show, make a date in your diary now!

Planes, Trains & Automobiles!

Think of somewhere interesting, exciting or unusual such as planes, warships, military bases, steam locomotives, etc., and chances are the Scarborough Special Events Group have operated from there! This year the group celebrates it’s 10th Anniversary and to mark the occasion the Group will be on air - over the weekend of 13 & 14th June with the club callsign GX0000.

The main h.f. station using the club call will be activated around 3.725kHz s.s.b. but other stations will be active using c.w. RTTY and 144MHz. Everyone is welcome to call-in, exchange greetings and support the event.

All contacts will be acknowledged with a special QSL card, which features a selection of the group’s most popular QSL cards. Listeners are especially invited to send in reports, either direct or via the Bureau.

Formed in 1988 the Scarborough Special Events Group is made up of Radio Amateurs from all age groups with callsigns ranging from G3s to 2E1s and MO. Other than their common interest of radio (naturally!), the group enjoy getting ‘out and about’ to demonstrate the fun side of our hobby and promote Amateur Radio, especially as we head towards a new Millennium.

Reinstating Repeaters!

Dave Hobro G4IDF has informed the ‘Newsdesk’ that the Malvern Hills Repeater Group are currently trying to reinstate the former 144 and 430MHz voice repeaters GB3MH and GB3MS. These repeaters are situated at Newton, Worcester, and cover the Severn Valley from South Birmingham to Gloucester.

The application for GB3MH has been with the Radio

Hands Free!

If you’re often forced to operate mobile in noisy environments the Shortwave Shop may have just the answer to make audio reception clearer. The Best 75 Throat Activated Microphone, complete with earphone unit, is designed to be used with Icom, Yaesu, Alinco and ADI equipment.

The Best 75 earpiece clips over the earlobe and the microphone sits on either the side or the front of the throat. The best audio is achieved by placing the microphone on the side of the throat and the loudest on the front. There is also an extension remote push-to-talk. The Best 75 is ideal for operating bicycle mobile, go-karting and for use by security guards, etc., and with a retail price of just £39.95 is affordable too!

Also available in the Best 75 range is the 75K for use with Kenwood radios and the 75M for Motorola.
Authority since last November and, based on repeater application clearance times of three to five months, an on-air date of late March, early April is a realistic possibility. This assumes that there are no referrals from either the RA or the National Frequency Allocation Panel (NFAP).

The application for GB3MS was submitted to the RMC during March, and as 430MHz is a shared band this application will also have to be vetted by the MoD, who are the primary users of this band. However, it's hoped that GB3MS will be vetted, approved and on air by the middle to end of the summer.

Anyone who would like further information can contact Dave on (01905) 351568 evenings and weekends or write to 60 Linksview Crescent, Newtown, Worcester WR5 1JJ or alternatively E-mail: DHobro@aol.com or MHRG@aol.com

Portable Electronics Superstore
The latest edition of the Maplin Catalogue has recently been published and for the first time, this 'portable electronics superstore' is also available on CD-ROM. The catalogue features a wide variety of products from the electronics world ranging from hi-fi equipment to computer accessories, through to communications, in-car entertainment and hobbyist bits and pieces.

The CD-ROM version of the catalogue (requiring Windows '95 or Mac OS 7.5 or above) in addition to including the full product range details also includes over 400 semiconductor data sheets, together with full constructional details for over 20 of Maplin's most popular electronic kits. When viewing the CD form catalogue ordering is made easy by the facility to 'transfer' any item you wish to order direct to the order form.

No matter which version of Maplin's catalogue you opt for, you can be assured of receiving same day dispatch, free delivery on all orders over £30 and backup from highly trained staff. The paper version of the portable superstore that takes you into 'electronics and beyond' costs £3.99 and the CD-ROM version just £1.95.

Copies of the catalogue can be obtained from Maplin, WH Smith and John Menzies stores or by calling (0800) 136 156. Alternatively visit the Maplin Website at http://maplin.co.uk

more details contact the Shortwave Shop at 18 Fairmile Road, Christchurch, Dorset BH23 2LJ. Tel: (01202) 490099 or visit their Website at: http://www.shortwave.co.uk

Silent Key:
Frank Hicks-Arnold G6MB
Yet another 'old timer' has passed on with the death of Frank Hicks-Arnold G6MB on February 17 1998 in his 92nd year. Frank was born in Watford, Hertfordshire, on March 29th 1906 and was first licensed in 1920.

Frank gained the callsign G6MB in 1930 and joined the RSGB in the same year. He was the first news reader for the society and also became a Council Member.

During a long association with the electronics industry Frank developed the first printed circuit boards. While working for Qmax Electronics he designed the BA40 transmitter and the famous Qmax chassis punches. The G6MB 'Antennascope' project was published by the RSGB and he presented a series of lectures on the subject, during a country-wide tour sponsored by the society.

Frank piloted aircraft and even drove racing cars on the famous pre Second World War racing circuit at Brooklands in Surrey! With two daughters, Anne and Jenny and two sons John VK4NPM and Andrew from his first marriage, Frank married secondly Elaine Hartford G0CDZ three years ago, dying on the eve of their third wedding anniversary. The funeral was held at Downton Parish Church in Wiltshire on February 25, where they were married in 1995.

Our sympathies and respects go to Elaine and Frank's family.

Editor.
The 'Spotlight' Is On Again!

It's time to turn the 'Club Spotlight' on again as we invite you to enter your club magazines into the 1998 Practical Wireless & Kenwood Club Spotlight Magazine Competition. Local clubs entering will be competing for the magnificent original trophy - kindly donated by Kenwood - and 'national' clubs will be competing for the 'Bert's Bell' award, which was instituted in 1997 in tribute to the late Bert Newman G2FIX.

It's very simple to enter the Club Spotlight magazine competition and all you need to do is to send us the three most recent copies of your magazine and a covering letter. The covering letter should make it clear what category of club your club is eligible for. For example, the British Amateur Radio Teledata Group - BARTAG - winner of the 1997 national award - can only enter as a 'national' club section, whereas the Cockerie & Port Seton Club - last year's winners, now have to specify that they are a local club.

National Or Local

For either category (national or local) your covering letter should provide the following details:

- How many people are there on the Editorial team and the type of job they do or did (if retired), how long the magazine has been established, how it's produced (on your computer or text supplied to 'outside' printer for professional printing, etc.) and whether or not the publication is 'sponsored', the number of copies printed and membership size of your club. It would also help the judging panel if you could provide some historical details on your club.

The judging panel this year includes Jim Bacon G3YLA, David Barlow G3PLE (who of course first suggested the competition), Zoe Crab, Dave Wilkins G5HY and Rob Mannion G3XFD. Additionally - and for entries in the national category only - the Salisbury Club will be providing one extra judge to decide the winner of the Bert's Bell Trophy (Salisbury was of course Bert's Club).

Entry to the competition is open now and all entries should be at the PW offices in Broadstone no later than Wednesday 1st July 1998. This is because the presentations are to be made at the Leicester Show in September (the new venue of course) and members of the judging panel will be present in places as far apart as Cornwall, East Anglia and Greater London, so it will not be possible to consider late entries!

So, make sure your club's entry reaches us in good time by sending it to Zoe Crab, Club Spotlight Magazine Competition, Practical Wireless, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

The Editor's decision (as head of the adjudication panel) is final and no correspondence will be entered into. Good luck and we look forward to reading YOUR magazine!

Rob Mannion G3XFD

Red Rose QRP Festival

The West Manchester Radio Club will be holding its Second QRP festival at Fornby Hall, Atherton, on Sunday 7th June 1998. There is easy access to the festival from all motorways, as it's near to M6, M1, M25, M60, M62, A580, A6, A577, A579.

There will be large spacious halls at ground level with ample free parking, disabled facilities and low cost refreshments, including a superb selection of delicious hot and cold snacks at low cost, prepared and served by the club's own volunteers throughout the day.

There will also be an excellent large bar area and lounge, a talk-in station on 144MHz, a Bring & Buy stall, this year a low cost Bring & Buy, no sale, no charge, to encourage sale of items both large and small, especially components. Club stalls include FIST and GORP and there will be displays of Morse keys and also of home-brew equipment.

By the way, club meetings are held each Wednesday evening from 8pm at the Miners Welfare Club, Meanley Road, Gin Pit, Astley, Tyldesley, Manchester. Novice and Morse classes are held each week. Further information from Leslie Jackson, 1 Belvedere Avenue, Atherton, Manchester M46 9LQ.

Rob Mannion writes:

Northern VHF Activity Group

Club Spotlight has recently heard from Peter Austin G7BXA, Secretary/Chairman of the G7UEG Northern VHF Activity Group. Here in his own words he tells us that the group have decided to go back to their favourite area, the West Coast of Scotland, during 1998.

"After last year's DXpedition to the West Coast of Ireland, we have decided to go back to our favourite area, the West Coast of Scotland. We had good results from EI on h.f., but v.h.f. was very poor. As we have been to the West of Scotland quite a few times now, we know you can get some very good results from there."

"We will be going to the Isle of Barra, which is the most southerly inhabited island in the Western Isles. It is quite a good location for both Locator and WAB square hunters, as there are two large locator squares, IO66 and IO67, plus NF6O, NF7O, NL69 and NL79."

"We will be basing ourselves on the East Coast of Barra, IO66HX. We also intend to set up a portable station in IO67, which is about three miles away. We will be operating 2m and 6m with the club call G57UEG/P, yes, it's the Ugly Expedition Group, again! We will also be on h.f. with out new club call of MS0BPG/P.

"We hope to be active from Sunday morning, 5th July to Sunday 12th July 1998. As there are four operators going, there should be someone on the air most of the time, but no doubt someone will complain that they listened for about four hours and never heard a thing, well, you have to eat, drink and go to the toilet! So there will always be someone that complains!"

"We will be setting up the main station, consisting of 2 x 13-element & 100W for 2m, 5-element & 100W for 6m and for h.f. a 3-element tri-bander and wires for I.f. and 100W. The portable station will consists of 1 x 13-element for 2m & 180W, 5-element & 100W for 6m, h.f. will be wires and verticals."

"We will be sending out the Western Isles. It is quite a good location for both Locator and WAB square hunters, as there are two large locator squares, IO66 and IO67, plus NF6O, NF7O, NL69 and NL79."

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"We will be sending out
further information on packet and Internet a little nearer the time, but anyone wanting further Information, please contact me, Pete G7BXA, GTHR or Derek G7DKX, who is also the QSL Manager @ GB7GBY or islander@enterprise.net

“Anyone sending QSL cards direct, please don’t forget to Include an s.a.e. or IRCs as we are paying for the DXpedition out of our own pockets. As I said, there will be four operators. These are: G7BXA, G7HSP, G4YQW and G0NES”.

**Rally Success**

The Bangor & District Amateur Radio Society (BDARS), GI’s biggest Amateur Radio club, had such a success with its 30th anniversary rally last year, that it’s holding another one this year. The date is June 14th - and the venue is the same as last year - the Clandeboye Lodge Hotel, on the edge of town. Doors open between 12 noon and 4pm (disabled visitors from 11.30am).

Stewart Mackay G4IOCK, the Society’s Chairman and Rally Organiser says, “Last year’s event was an outstanding success. The most important thing about getting people to a rally is publicity and this year we’re going all out to get news of the event across to as wide a public as possible”.

The Bangor & DARS have also recently ‘twinned’ with Wigtownshire Amateur Radio Club (just across the North Channel in Scotland) and a programme of events is being planned. This will include visits to each other’s clubs, weekly or monthly Nets and a general exchange of ideas. And, like last year, a large contingent of Scottish visitors will be attending the BDARS rally.

For more details about the Rally, contact Roy GIOWVN on (01247) 460716 or Stewart G4IOCK on (01247) 454049.

**Verulam Beware!**

Once again Rob G3XFD is off on his travels, this time to give a PiW talk to the Verulam Amateur Radio Club on Tuesday 28th April 1998 at 8pm at Verulam’s meeting place, the RAFA Club, New Kent Road, St Albans, which is in the town centre. The Verulam Club would also like to invite all radio enthusiasts in Hertfordshire and surrounds to join them. The hall is a non-smoking venue, but with bar facilities. Contact Walter G3PMF on (01923) 262180 for more information.

**Reunion Meeting**

The Siemens Amateur Radio Club in Nottingham is holding a reunion meeting in the Siemens Social Club. All past and present members of the Siemens Radio Club (formerly known as the Plessey or GPT Radio Club) are invited.

The reunion will be held in a private room at the Siemens Social Club, Beeston Rylands on Thursday 7th May starting at 7:30pm. A buffet will be provided at a cost of £2.50 per head.

All those wishing to attend should contact the Club Secretary, Chris Archer G4VFK during the day on 0115-943 3387 or in the evening on 0115-903 8230.

**Wednesdays At Wirral**

The Wirral & District Amateur Radio Club meet on the 2nd and 4th Wednesdays of each month for lectures, etc., at the Cricket Club, Irby, Wirral. While on the other Wednesdays, members gather at a local hostelry for “D & W” (short for drink and waffle).

Several members have set-up the first RMNC/Flexnet packet node in the UK and another group are interested in v.h.f./u.h.f. contesting (with moderate success). A few members are also into AMTOR/RTTY h.f. communications, while another group is using 23cm for ATV transmissions.

Just a few up and coming events are: April 15 - D&W, 22nd - The Great Egg Race VIII (team construction event); 29th - D&W, May 6th - D&W. Visitors and guests are always made welcome. However, if you would like more information, contact Andy on 0151-677 4448 or CLUB@GB7OAR or visit the web pages at: www.merseyworld.com/wadarc

**Take Note!**

‘Club Spotlight’ has recently heard from Mike Street G3JKX, General Secretary of the Royal Air Force Amateur Radio Society (RAFARS), who would like to point out some misunderstandings about becoming a RAFARS member.

Mike says that membership is open to anyone who has served in the RAF at all, including the reserves and anyone associated with the RAF, including civilians employed by the MOD (Air), Cadets and Instructors of the ATC or the RAF section of a CCF are also very welcome. Commonwealth, NATO and Allied Air Force personnel can also become Associate members.

The Society’s ‘in-house’ magazine ORV is published every six months and is a forum for activities and for members to tell of their history and experiences. So, if you fit the membership criteria, contact Peter Lewin G0JKW, Treasurer, at 24 Brookfields Road, Wyke, Bradford BD12 9LU for an application form.
Anyone who has built the original 'crystal' diode receiver described in this column and added the single transistor audio frequency (a.f.) amplifying stage I discussed last month - will realise that there's a limit to what can be done with such a simple receiver. Although with the a.f. amplifier added - stations too faint to be heard in the earphone before will be heard.

But it's still only a crystal set with a.f. amplification. So, to progress further I'm going to describe the addition of a very basic radio frequency (r.f.) amplifier.

**Amplifier & Detector**

Adding an r.f. amplifier to the 'Basics' receiver turns it into a tuned r.f. amplifier and detector receiver. Often referred to as t.r.f. (tuned radio frequency) receivers, the version I'm providing is even more basic than usual, as it uses need to do is to transfer the original tuning coil and variable capacitor to Tr1's circuitry. The 'drawing pin and board' lay-out, Fig. 2, illustrates connecting details for the f.e.t.

Please use a 'heat shunt' when soldering the f.e.t. to the drawing pins! A pair of pliers gripping the f.e.t., while providing an easier one for the d.c. feed for the transistor. This is referred to as a 'high impedances' and the r.f. is then 'shunted' via the 500pF capacitor to the detector. The transistor between the r.f.c. and the 1k resistor removes unwanted r.f. which does get through, and helps 'filters' it to 'earth' to stop it reaching the power supply, (more about this later).

Good quality f.e.t.s are often difficult to get nowadays, but you can make your own very simply (as I did to prove the point!), if you don't have a ready made component. All you need to do is wind a small enamelled wire (28s.w.g.) onto a 100u resistor as it can take, soldering the end to the resistor leads. It's a compromise - but it works well!

**Fig. 1: Circuit of the modified "Basics" receiver showing the original audio amplifier, untuned detector stage and the MPF102 f.e.t. amplifier (see text).**

![Fig. 1: Circuit of the modified "Basics" receiver showing the original audio amplifier, untuned detector stage and the MPF102 f.e.t. amplifier (see text).](image1)

an untuned diode detector.

The circuit is shown in Fig. 1. And if you look at the previous circuit of the receiver (as shown in Fig. 1 and 2 in the March issue) you'll see the difference quite clearly. The a.f. amplifier remains unchanged, but the detector instead of being fed by the tuned circuit (L1 and C1) now takes the amplified r.f. from the MPF102 field effect transistor (f.e.t.) via the 500pF capacitor (a nominal value - and you may have to either decrease or increase the value for best results).

**Adding The Amplifier**

Adding the amplifier circuitry is simplicity itself - and I've simplified it even further by minimising coil winding and coupling circuitry. All you need to do is to transfer the original tuning coil and variable capacitor to Tr1's circuitry. The 'drawing pin and board' lay-out, Fig. 2, illustrates connecting details for the f.e.t.

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**Fig. 2: Illustration of 'drawing pin and board' method of construction. Note orientation of the MPF102 f.e.t., and take care when soldering the leads (see text).**

![Fig. 2: Illustration of 'drawing pin and board' method of construction. Note orientation of the MPF102 f.e.t., and take care when soldering the leads (see text).](image2)

Rob Mannion G3XFD describes how you can add a radio frequency amplifier to your 'crystal' diode receiver...and you'll really notice the difference!
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C.M. HOWES KITS. Available by post and for callers.
John Worthington GW3C0I steps back in time and remembers the old ‘secret agent’ rigs...

Some 50 years ago you could pick up a Second World War ‘secret agent’ rig for quite a modest sum, whereas now they are in very short supply and very expensive. The one that I bought was the Type A MkIII and consisted of a crystal controlled transmitter and a small superhet able to receive c.w. fitted in a little suitcase about the same size as a 1990s portable typewriter.

Together with its mains power supply, Morse key and headphones, the unit cost today’s equivalent of £15 and looked to be ideal for a weekend’s portable operation. It must be noted that I bought the outfit without trial, but trusted its seller and considered that equipment made for use in enemy territory would, of course, be first rate in all respects.

QSO Filled Weekend
With growing anticipation of a QSO filled weekend, I set off for the small hotel in Torquay that was to be our destination and was pleased to see on arrival that our room overlooked a small front garden, which had some tall bushes about 28m from our window. In a short time, I was switching on, armed with a nice end-fed wire and concentrating on tuning the tiny receiver with its ‘edge’ knob operated tuning.

There was a pleasing amount of audio but backlash was severe on the condenser drive and the 7MHz band was crammed into about 6mm of the dial. I tried out the crystal controlled transmitter, there was no a.t.u. as such, matching being carried out by variable tappings down the tank coil.

I had brought a car bulb with me to insert in the antenna lead and this gave me a true idea of...
maximum output. However, there was a snag in that I had to calculate where I was frequency wise! The crystal was marked 7025kcs (note the ‘c’, they were called cycles in those days!) and on the front panel of the receiver there was a neon lamp which lit up when you pressed the key and were tuned somewhere near the frequency. However, it was unusably coarse in operation, which meant that after putting out a CQ call, I had to search as much as possible of the band with the coarse receiver tuning wheel.

Failed To Hear
As a result, I must have failed to hear many replies and in fact I had only one OSO in a period of hours. I remember thinking at the time of the poor folk who had to operate these rigs under the noses (and ears) of the Gestapo. How on earth could they have regular two way QS0s and not be detected with their many calls and fruitless replies from the UK? No wonder their survival rate was so low.

I suppose by the very nature of their fate there is literally no one still living who can say what it was like to have to work with these ill designed boxes. It occurred to me that maybe there had been a skilled amateurs among their ranks who would have suitably modified the equipment by fitting a slow motion trimmer to the tuning and some means of netting the crystal. However, during the Second World War any amateurs that knew their stuff were usually placed where their expertise would be of maximum value (I came across many instances of this in the RAF) and a spy’s job would have been considered less appropriate.

Famous & Scarce
In my own case, before I had a chance to modify the Type A set, I received an offer I couldn’t refuse, the rigs were now becoming famous and scarce! Later on however, I came across a suitable set that looked as if it had been designed by an amateur - it was twice as big as the Type A, but had a powerful Tritet 807 crystal oscillator/power amplifier and a nice little RX that covered 3.5 and 7MHz with slow motion tuning.

In addition to the mains p.s.u., the rig had a vibrator supply for use with car batteries plus headphones and key all complete in the case, which must have looked suspicious I thought, from a Gestapo point of view. However, I expect the true spy used to have a bit of clothing ‘caught’ so that it was visible when they were walking around in the streets with the rig.

The most famous undercover set was the B2 and I believe it was closely ‘related’ to the one I have just described. But it shows that like everything else in Second World War designs, it was greatly improved, much to the relief in this case of the incredibly brave people who had to use them.

\[\text{Gotcha!}\]

Did you spot last month’s April Fool Spoof news story? If not I’ll put you out of your misery.

For all of you who are still wondering, it was of course ‘New Regulations’ relating to the supposed changes to the Morse test and the fact that it must now be passed in the English, French and German. The PW offices have been inundated with worried readers calling and writing in to express their opinions on the matter and to try and find out more.

I would like to say to all of you who were ‘caught out’ by the age old tradition of the April Fool, ‘thank you’ for taking it in the way it was intended and I apologise for worrying those of you who thought it was genuine. For those of you who haven’t worked it out Lirpa Loof, who ‘supplied’ the New Regulations report is in fact April and Fool both spelt backwards!

Thank you for joining in our little piece of fun and if you want someone to blame other than me you could try Lawrence GJ3RAX who sent in the news release! "Gotcha!"

\[\text{Radio Sends You To Sleep!}\]

It’s official radio can send you to sleep! Some of you may have seen Tomorrows World on BBC Television a few weeks ago when a new cure for insomnia was featured in the form a ‘spoon’ that you place in your mouth when trying to go to sleep.

The ‘sleep spoon’ is connected to a cable, which in turn is connected to a radio transmitter. Radio waves are transmitted through the cable into the spoon (which acts as an antenna) and then emits signals to the brain giving a soothing soporific effect thus helping you relax and go to sleep. The use of radio waves in such close proximity to the brain is naturally a concern, however early trials have shown that the levels absorbed using the spoon are 100 to 1000 times lower than when using a cellular phone.

The man behind this invention Professor Boris Pashe says that early trials have shown that using the spoon gives you an extra hours’ sleep and that you ‘drop off’ quicker. He believes that his invention works by restoring a chemical imbalance suffered by insomniacs.

Professor Pashe’s invention is still in its early stages and we wouldn’t advise anyone to suck on their handheld’s antenna to help them go to sleep!

\[\text{PW}\]
On The Block

Rob Mannion G3XFD takes a look at Alinco's 'new rig on the block' - the budget-priced DX-77. And not surprisingly after his experiences with the DX-70...he thinks the new rig has a lot to offer!

I've been the proud owner of an Alinco DX-70 for several years now - and even under the most arduous operating conditions - it has performed extremely well indeed. In fact - despite initial concerns I mentioned during my review - my DX-70 has performed beyond all expectations. In other words...I think it does a superb job.

Bearing in mind what I've just said, I was delighted to get the chance to try out the latest Alinco product - the 'budget priced' DX-77. I don't often like comparing different rigs together because of differing design, etc. - but in this case as they come from the same 'stable' there's no problem and it's very appropriate in my opinion to compare them.

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Base Station

In effect I think the newly introduced DX-77 - it has just received the necessary CE approval by the way - is a 'base station' loosely based on the DX-70 and the channelised h.f. DX-701 which I reviewed in 1997. I might be wrong in this assumption - but the DX-77 certainly seems to be 'related' to both previous Alinco products.

So, what do you get in the DX-77 - package? To answer - and before I get stuck into the actual review let's take a look at the rather neat, 'non fussy' little unit itself.

Unlike the smaller 'mobile' transceiver the DX-20...
77 has a front mounted speaker with a louvered type speaker grille. The main tuning knob is slightly off-set from centre right - and this I found a delight to use. It felt very good, smooth in operation and I'm sure it will appeal to many 'natural' left-handers. (The DX-70 has a main tuning control on the far right - which makes this control one of the only awkward features for operation by G3XFDF).

The Morse key, external speaker and headphone 3.5mm sockets are mounted very conveniently on the front panel below the speaker. And you'll see from the photographs that the other controls - along with the large clear back-lit I.c.d. type display - are very well laid out. The whole transceiver has a very good 'feel' about it and looks very neat into the bargain.

**Design Features**

The Alinco DX-77 design features a published general coverage reception from 500kHz to 30MHz (see note later) and the transceiver is based on a double conversion superhet. Transmission is possible on the 1.8 to 28MHz Amateur Radio bands in a.m., c.w., s.s.b. and f.m. modes. Maximum power output on c.w., f.m. and s.s.b. modes is quoted at 100W (high) and approximately 10W on low power. Power output on a.m. is quoted at 40W (high power) and approximately 4W on the low power setting.

A built-in audio filter is provided for c.w. (narrow c.w. filter is a user installable option). The operator can select c.w. full break-in, semi break-in and auto break-in (delay times are then arrivalistic depending on keying speed). An optional electronic keyer can be fitted.

The DX-77 has 100 'user' memory channels. These can be used to store mode of operation, filter settings, split frequencies, the a.g.c. settings, attenuation levels (or the pre-amplifier setting) and the noise blanker. The transceiver can also be controlled by a personal computer through the serial interfaces connection. With this facility the frequency, mode, power and memory channels can be controlled.

**Controls & Facilities**

The main controls are simple and basic - which means they're a delight to use. The Squelch, RIT, Audio gain, IF 'Shift' and RF attenuation (and r.f. pre-amplifier) are immediately accessible as push-buttons, as are Mode switching operations and the 'HI - LOW' power switching selection.

Everything else on the DX-77 can be selected from the Menu. Here the Function switch is pressed once, and when it's flashing - the menu operation you require is selected. One of the operations selected in this way is the Speech Compression. This is a simple operation and it's either On or Off. Another control option is the variable back-lighting for the I.c.d. It's simple and efficient.

Various options will be available. Unfortunately - none were available with the review transceiver but they include: A c.w. electronic keyer, and narrow filtering (again selected by the Menu system).

I do not intend to provide a list of all the various memory and other facilities. For this I suggest you visit your nearest Alinco dealer and see for yourself. Instead I feel it's my job to tell you just how well (or otherwise) this transceiver performs!

**On The Air**

I was fortunate to be able to operate the DX-77 over a relatively long period for a newly launched transceiver. In fact I had it on loan for over a month!

The transceiver provides a very versatile package and I found myself using the general coverage receiver a great deal. And despite what Alinco stated in the promotional material (they noted 100kHz is the lowest tuning limit) - the general coverage receiver tuned down to 150kHz before switching back to 29.999MHz.

On the lowest tuning range the receiver seemed remarkably sensitive indeed. I was able to 'winkle out' some really weak airport beacons on the m.f. range. I could even pick up Gatwick - which is usually buried in the noise!

Reception of the medium wave band was good and selectivity more than adequate with the filtering provided as standard. Sensitivity was also good and the audio quality was perfectly adequate using the built-in speaker. I didn't bother to use an external speaker - but the convenience of the built-in speaker made me realise it wasn't worth the bother of using the external unit.

Using the DX-77 on the h.f. bands - particularly the short wave broadcast bands - proved it had an excellent receiver. The audio bandwidth was just about wide enough for pleasant listening to my favourite stations (Radio Netherlands from Holland and the BBC World Service).

On the Amateur bands I found that the sensitivity was excellent and the selectivity was good on s.s.b. with the standard crystal filtering. However, for c.w. the narrow (optional) filtering will be a necessity.

I've become rather spoilt by my Alinco DX-70 with its built-in higher specification filtering, and on the busy 3.5, 7 and 14MHz bands in particular I found the 'splatter' from adjacent channels more noticeable on the DX-77 than on the better equipped DX-70 (even though the filters are ceramic types on the DX-70).

However, working on s.s.b. on the 3.5, 7 and 14MHz bands I never lost contact with any station I worked. Even under weekend conditions (where everyone in Europe appear to be trying desperately to work the USA - and using hard-driven linear amplifiers into the bargain).

I had a total of 156 QSOs with the DX-77, and approximately half were on c.w. and the other half on s.s.b. The transceiver coped very well indeed with extended 'on' periods and apart from my firm opinion that the narrow filtering (for c.w.) is a 'must' - I was entirely happy with the excellent performance for what is of course a 'budget' rig.
Audio Reports

I consider audio reports to be very important in reviews. As the PW style of reviews is to avoid the ‘Specification Listing’ approach of some reviewers - so we can convey to you what an experienced and trustworthy author’s opinion on each rig is - I’ve arranged for some simple and straightforward comparisons to be made each time I review a new rig.

Max Bacon G3WMB runs a Kenwood TS-870 (my ‘Top Choice’ transceiver) and consistently puts an excellent signal - with very good audio I might add - into my home in Dorset from his home in Hertfordshire. Max has a special audio cassette of my voice - made on semi-professional audio equipment at my home - and he can compare this with my incoming signal. Additionally, we met recently at the London Amateur Radio Show at Picketts Lock. I was able to confirm that the audio on his transceiver ‘provided a good likeness’ of his voice, and he was able to reciprocate regarding my recordings and previous telephone conversations.

Max’s comments on the received audio from the DX-77 follows, and were decided on during a long QSO on 3.5MHz where Andy GW0UZK from South Wales joined in (sorry to leave you ‘out in the cold’ for long Andy!)

Max writes: “Concerning the testing today your voice on the new Alinco was easily recognisable. The speech quality I preferred was without the processing switched in and with the microphone about 125mm away from your face with you speaking across rather than into it.

“On comparison, the audio from your own Alinco DX-70 was slightly better - but when the microphone from that transceiver was tried on the DX-77 it improved a little. So maybe the microphone has an influence...which it does of course”!

Thank you for your help Max - and I hope we’ll be able to use this ‘on air’ and ‘tape’ comparison more in the future. It’s only a compromise but it is done under real working conditions!

My Opinion

After an extensive period of on-air testing and evaluation it’s my opinion that the Alinco DX-77 provides an excellent ‘introductory’ transceiver or ‘budget’ buy for anyone contemplating getting going on h.f. And in the same package the fortunate owner will also get a very reasonable general coverage receiver and portable transceiver (yes - even though it is approximately 30% larger than the DX-70 it’s still very neat, portable and convenient).

Another reason for seriously considering the DX-77 is that it’s easily expandable. You can install the c.w. filter, electronic keyer and other options very easily indeed.

To be very honest the DX-77 in my opinion does not come up to the same performance mark of the Alinco DX-70 - and I would not expect it to because the DX-70 is so very special. However, I cannot remember anything in the same price range which has so much potential and provides so much ‘as it comes’ as this new product from Alinco has demonstrated.

In my opinion the Alinco DX-77 will prove to a favourite ‘starter rig’ for many years to come. And it’s my hope that many readers will discover the h.f. products of this manufacturer soon - because they just don’t know what they are missing until they do!

My thanks go to Nevada of 189 London Road, North End, Portsmouth, Hampshire PO2 9AE. Tel: (01705) 662145 for the loan of the DX-77, which is available from them for £675 (standard model) or £775 (with options fitted).

Max Bacon G3WMB runs a Kenwood TS-870 (my ‘Top Choice’ transceiver) and consistently puts an excellent signal - with very good audio I might add - into my home in Dorset from his home in Hertfordshire. Max has a special audio cassette of my voice - made on semi-professional audio equipment at my home - and he can compare this with my incoming signal. Additionally, we met recently at the London Amateur Radio Show at Picketts Lock. I was able to confirm that the audio on his transceiver ‘provided a good likeness’ of his voice, and he was able to reciprocate regarding my recordings and previous telephone conversations.

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A Century of Amateur Radio Equipment

Phil Cadman G4JCP takes a break from his ‘Valve & Vintage’ column to briefly chronicle the evolution of Amateur Radio equipment design over the last 100 years.

A typical 'Set' - the epitome of wartime surplus radio equipment.

Condensing a century of progress into a few pages of typescript is difficult. So, my article is very much a personal view of the subject matter! I’ve deliberately concentrated on h.f. equipment. My apologies to those who consider frequencies below 30MHz to be akin to direct current!

The world’s first ‘Amateur’ Radio station is generally accepted to be the one established by Lt M. J. C. Dennis at Woolwich Arsenal in London, in 1898. He used a spark transmitter which was then the only practical way to generate useful amounts of power at radio frequencies.

Spark Transmitter

A spark transmitter is basically a tuned circuit excited by a repetitive spark discharge. Each spark producing damped oscillations in the tuned circuit, as in Fig. 1.

Naturally, the bigger the spark the more r.f. the transmitter produces. Increasing the spark frequency also has the same effect and many ingenious devices were invented to create the sparks as fast as possible.

Most receivers were basically variations of what we now call the crystal set and the number of stations heard was generally dependent on the efficiency of the detector. A great deal of effort was put into finding materials and techniques that produced the most sensitive detectors.

Ironically, the crystal sets were only capable of providing audible reception of spark transmissions because these transmitters produce what’s effectively a modulated signal, a crude form of modulated continuous wave (m.c.w.).

Antennas followed the early maxim: as much wire as possible and as high as possible. While this is still essentially true today the first Radio Amateurs - and professionals, too - had little antenna theory to guide them.

First World War

Development of the spark transmitter and passive receiver continued until the First World War interrupted amateur experimentation. However, throughout the war commercial development of the thermionic valve continued apace both in the UK and abroad and by the time amateur licences were re-issued in 1920 Amateur Radio was well into the thermionic era.

When the Marconi Company’s Writtle station 2MT began broadcasting early in 1922 most people only had a crystal set to listen...
with. The 'crystal' was usually galena (lead sulphide) with a point contact (the 'cat's whisker').

It was with the birth of broadcasting for entertainment purposes that Amateur Radio split from the more general pastime of radio listening. From then on there would always be many more people simply listening to broadcast radio than pursuing the now distinctly separate hobby where equipment increasingly paralleled developments in the commercial radio communications industry.

### The 1920s
Throughout the 1920s the 'straight' or tuned-radio-frequency (t.r.f.) receiver using battery valves reigned supreme. Low-powered transmitters also used batteries, whilst amateurs who could afford them used large transmitting valves fed from mains electricity or from generators and Fig. 2 shows a typical 'self-excited' transmitter of the early 1920s.

The simplest receiver (excluding the crystal set) was a regenerative detector which had to be adjusted into oscillation to receive c.w. transmissions. Quite often the detector was followed by one or more stages of audio amplification to provide loudspeaker listening.

High-performance receivers used several stages of r.f. amplification before the detector and audio stages using separate beat frequency oscillator to detect c.w. signals. As the beat frequency oscillator (b.f.o.) had to be tuneable over the full range of the receiver both amateurs and professionals must have had considerable problems with the frequency stability of these oscillators!

Superhet designs had emerged in the early years of the decade following Armstrong's patenting of his 'supersonic heterodyne' principle in 1918. But these had quickly fallen from favour due, in part, to the only available amplifying device being the triode valve and to the superhet's relative complexity.

### The 1930s
By 1934 however, the superhet receiver had all but dominated the domestic market. Smaller, more efficient valves had become available and production techniques had improved.

The screened-grid valve, which had made stable h.f. amplification possible, was quickly superseded by the pentode. With the introduction of the vari-mu pentode and the multi-grid frequency changer the superhet finally came of age and was to last throughout the whole of the valve radio era.

Until the early 1930s almost all Amateur Radio equipment was home-constructed. But the adoption of the relatively complex superhet created a demand for commercially produced 'amateur' equipment. Manufacturers responded and in 1932 commercial Amateur Radio communications receivers became available in the USA.

### Classic Valves
In the final few years leading up to the Second World War, developments in valve technology produced many of the now 'classic' valves. In the USA, in 1936, RCA introduced the metal 6L6. The glass version, the 6L6G, appeared the following year and the ubiquitous 807 dates from around the same time.

The 6V6 and 6V6G followed in late 1937. The 'GT' version, introduced in 1939, remained in continuous production for over 40 years. In the UK, the Marconiphone Company (GEC) introduced the KT66...a valve much cherished by 'hi-fi' enthusiasts.

In 1939 Mullard introduced the EF50 r.f. pentode, specifically for use in TV. Its all-glass-base construction made it useful well into the v.h.f. spectrum making it particularly popular with amateurs experimenting above 30MHz.

The diagram, Fig. 3, shows the typical arrangement found in communications receivers - both amateur and professional - from the late 1930s through to the 1950s. Some manufacturers used two r.f. stages for improved sensitivity and front-end selectivity while all had between one and three stages of i.f. amplification.

Transmitters had changed little in essence from the early days but they were now far more stable and easier to use. The illustration in Fig. 4, shows the fundamental parts of a 1930s a.m./c.w. transmitter.

### Post-War Decades
The Second World War put a hold on the development of amateur equipment. But development and production of professional communications equipment continued, particularly in America. Later, amateurs were able to take advantage of the war-surplus receivers, transmitters and components.

The rapid increase in the number of Radio Amateurs following the war led to the
problem of heterodynes when working on 'phone' (radio telephony) becoming intolerable in the 1950s.

The solution was suppressed carrier single-sideband working (commonly referred to as s.s.b.). Not only did the annoying heterodynes disappear, but s.s.b. transmissions took up less than half the bandwidth of a.m. transmissions.

Watt-for-watt, s.s.b. possessed a significant advantage over a.m. But the drawback to s.s.b. working was that it required more complex equipment, particularly with regard to the transmitter.

The inevitable change from a.m. to s.s.b. took some time. This was partly due to the additional complexity of s.s.b. equipment discouraging home construction, and to the lack of commercial amateur equipment.

However, even when commercially made equipment did become available it was expensive. The abundance of war-surplus a.m. and c.w. equipment must also have had a restraining effect.

Long after the initial war-surplus stock had been sold off, and even as late as 1970, quantities of ex-Admiralty B40 receivers, amongst others, were still readily available. And, in amateur magazines, constructional articles still favoured a.m. and c.w. over s.s.b.

Eventually however, s.s.b. working and the crowded nature of the amateur bands placed new demands on amateur receivers and transmitters. The single-conversion receiver shown in Fig. 3, gave way to the double conversion receiver as shown in Fig. 5.

**Double Conversion**

Two forms of the double-conversion superhet receiver were developed. One was for general coverage work, and the other for where only certain segments of the r.f. spectrum needed to be covered, as in most commercial and amateur applications.

For general coverage use the frequency of the first local oscillator is varied to produce a constant first intermediate frequency, often around 1.6MHz. The second mixer is fed from a crystal controlled source.

The crystal controlled oscillator results in yet another constant intermediate frequency, usually around 465kHz, although it can be as low as 100kHz. This arrangement gives good second-channel rejection but the stability of the first local oscillator is critical.

More suited to the requirements of single-sideband (c.w.) working is the second arrangement. In this design it’s the first local oscillator which is crystal controlled.

The results is a variable first i.f. whose bandwidth is equal to the width of each of the receiver’s band segments. These are usually 200 to 600kHz wide. The whole of the receiver to the right of the dotted line in Fig. 5, is then designed to receive just this relatively narrow range of frequencies.

Although more complex than the first arrangement the alternative approach gives both good second-channel rejection and good stability. And because the v.f.o. has only a single limited range dial calibration can be accurate to within 1kHz or so.

The real advantage for communications work becomes apparent when the alternative approach is used within a transceiver, and Fig. 6., shows the block diagram of a simple s.s.b. transceiver. Notice how the oscillators and crystal filter are used on both receive and transmit thus giving accurate co-channel operation with single v.f.o. control.

The end of the post-war period of steady Amateur Radio equipment development came to an end in the late 1960s with the introduction of imported s.s.b. gear from Japan.

**Quartz & Mechanical**

For many years quartz crystals had been used in receivers to provide the narrow passbands for c.w. reception but it was the introduction of the crystal (and mechanical) filter that provided the key to the design of the modern s.s.b. transceiver.

On receive, the filter takes the place of several i.f. transformers which, were they present, would be difficult to align. On transmit, the filter simply 'picks-off' the wanted sideband from a double-sideband (d.s.b.) signal. The d.s.b. signal having first been produced by a balanced modulator.

Alignment of early s.s.b. transceivers was by no means a simple task. But it was considerably eased by the inclusion of a crystal filter and by employing common oscillators in both the transmit and receive circuitry.

So successful was the arrangement illustrated in Fig. 6, that it formed the basis of nearly every s.s.b. transceiver from the late 1950s until the advent of the frequency synthesiser in the early 1980s.

**The 1970s**

Much of the development in the 1970s was associated with the change from valves to transistors and the inclusion of various operator conveniences. The change to transistors was quite rapid and soon every stage in the receive/transmit path - with the exception of the transmit driver and power amplifier (p.a.) stages - was solid-state.

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Fig. 3: A typical design arrangement found in communications receivers - both amateur and professional - from the late 1930s through to the 1950s (see text).

Fig. 4: The fundamental block diagram of a typical 1930s a.m./c.w. transmitter (see text).

Fig. 5: A typical design arrangement found in communications receivers - both amateur and professional - from the late 1930s through to the 1950s (see text).

Fig. 6: The fundamental block diagram of a typical 1930s a.m./c.w. transmitter (see text).
simple s.s.b. transceiver

Fig. 6: Block diagram of a designed to receive a relatively narrow range of frequencies (See text).

However, by the start of the 1980s sufficiently rugged (and inexpensive) r.f. power transistors were readily available and the 50 year reign of the thermionic valve in Amateur Radio equipment came to an end. On reflection however, perhaps that last statement is not strictly true as valves are still used in high-power linear amplifiers but even their days must surely be numbered?

Digital Revolution

The adoption of the solid-state, broad-band r.f. p.a. and the introduction of digital electronics now produced the next revolution in Amateur Radio equipment design.

At first, digital electronics were simply used to enhance the operation of equipment, for example by providing a digital frequency readout. However, by the early 1980s the development of the frequency synthesiser resulted in a new approach to transceiver design.

All the oscillators shown in Fig. 6, were replaced by a frequency synthesiser. This generates all the required local oscillator frequencies through a combination of voltage controlled oscillators and digital techniques.

Although there's no fundamental difference between the old and new approaches there are significant differences in implementation. The classic approach relies on conventional tuned circuits ‘peaked’ to follow the transmit and receive frequencies. In contrast, the new approach uses broadband techniques with band-pass filters to provide (very) coarse selectivity and crystal filters to provide fine selectivity.

The first i.f. is made significantly higher than the highest working frequency of the transceiver. Second channel and moderately-close-in selectivity is provided by a ‘roofing’ filter, while the main i.f. filtering is provided by a crystal or mechanical filter at the second (and a possible optional third) intermediate frequency.

The use of microprocessors in Amateur Radio equipment paralleled the adoption of the frequency synthesiser. Indeed, nowadays the two are seemingly inseparable!

Throughout the 1980s manufacturers continued to add ever more facilities. And occasionally, because of this I think they've sometimes compromised the r.f. performance of their products.

Recent Developments

The most recent significant development in transceiver design is the incorporation of digital signal processing (DSP). A digital signal processor is, at least in theory, able to replace the multiple crystal filters that are normally required to provide different i.f. bandwidths.

Naturally, incorporating DSP simplifies the design of equipment. It also obviates the need to purchase expensive add-on filters for serious DX or c.w. working.

The other main preoccupation of Amateur Radio equipment manufacturers seems to be the quart-into-a-pint-pot syndrome. More and more facilities, modes and bands are being packed into physically smaller and smaller boxes. This is true in all amateur equipment design, be it h.f., v.h.f., base station, mobile or hand-held.

Past, Present, Future?

Amateur Radio equipment design began in the radio rooms of the very first radio enthusiasts where every piece of equipment had to be home-constructed. It passed through the inter-war years and on into the latter half of the ‘swinging’ 1960s.

The latter periods were, perhaps, the ‘golden age’ of Amateur Radio. It was when home design, development, modification and construction both paralleled and complemented both new products and ex-government gear.

Since the beginning of the 1970s the demise of a.m. below 30MHz and the availability of Japanese equipment has led to the near extinction of home design and construction of high-performance amateur communications receivers and transmitters. And it’s inevitable that commercial products will continue to use ever-more specialised components and techniques that are simply not suitable for home construction.

Component failures in commercial equipment manufactured 50 years ago are often rectified with ease. But what happens if a custom integrated circuit/surface mount device fails on a modern transceiver? How long will spares be available and at what price?

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With the continuing trend towards miniature rigs we set Dick Pascoe GOBPS on the review trail of the Tiawanese made HORA C408 430MHz transceiver.

First impressions on any new transceiver are very important and in Hora C408's case my 'gut' reaction was "this is well built". It has a solid feel about it, that some of its competitors lack. It fits in the palm of the hand and despite its small size feels like a 'real' radio.

Each control is clearly marked with a row of seven tiny buttons on the left of the front panel. These provide the main functions, which are: Power, Lamp, Set, Moni, Call, SC and V/M. The numbered rotary control on the right of the rig sets the audio out level.

The antenna is just 70mm long and is a solid screw fitting onto the body. This also had a real radio feel about it. Already, after just a few minutes I was getting good 'vibes' from this little set.

The physical size of the C408 also begs the question, 'is there a competition among the black box builders to make the worlds smallest rig'? I remember last year 'playing' with the Alinco DJ-C1E and the DJ-C4. I thought these were small but in comparison the HORA feels like a real radio in miniature. It feels like all the solid hand-holds I have tried in the past, and all this in such a small package!

Many of the 'older style' rigs came with a manual that in some cases was a single sheet of paper in the famous Japanese version of English. In the C408's case there are 41 pages of instructions. The English is very good but with the occasional lapse such as 'it may lead to a trouble' and the 'SET' list of controls need close examination.

Like many of the modern hand-held transceivers of today the HORA C408 does not use an in-built rechargeable cell but relies on standard AA size Zinc Chloride batteries. However, it can use both Alkaline and Manganese standard AA size batteries. The rig will work with a battery level of between 2 - 3.5V and will fail at 1.8V or less. And it's nice to see this voltage level written in the manual.

The push-to-talk (p.t.t.) is set into the left side of the radio and has a comfortable feel to it. As it's so small, there's a danger you might miss the microphone, so the manufacturers have put a mark around the minute hole, which is to be found right in the centre of the front panel. The speaker is mounted just above the microphone and is about 25mm in diameter.

Memories and obviously the best bet is to program each of your favourite frequencies into these. One delight was the ability to select channel numbering, which enabled each repeater or other frequency to be seen as a number rather than a frequency in the display.

Useful Facilities

Another useful facility offered by the C408 is the 'scan' mode and there are two types of
scan available. The first, 'Pause Scan' hesitates at any received signal for five seconds and then returns to scan mode. The second 'Busy Scan' stays on any active frequency, but if that 'busy' signal disappears for two seconds the scan resumes.

The range of frequencies scanned can be selected. You may select a 1MHz range perhaps for the repeater band or a specified frequency range and of course memory scan is also available.

The C408 radio also provides a 'dual-watch' facility where the v.f.o. frequency and one other may be checked at an interval of three seconds. The other can be either the 'Call' channel or one of the memories.

Other facilities include the monitor button (Moni), VFO to memory button (V/M) and the SC button for scan. Some of the commands are quite complex and an hour or three with the manual helps enormously. (I ended up reading it several times to get the best out of this radio).

The usual battery save options are featured in that where the rig only operates for a pre-setable time and then switches to standby. In effect it only listens for up to one second in five. There is also a facility to enable the rig to switch itself off after a pre-set time interval when it is not being used. (Automatic Power Off).

At the required 3V level the rig draws about 230mA on transmit and just a measly 30mA on receive. This is improved dramatically with the power save mode on and drops to 0.5mA and a miserly 80µA with Automatic Power Off (APO) in use.

The dimensions of the C408 are 58 wide by 80 high by 25mm front to back. The height does not include the antenna, which adds a further 70mm. And the internal 8Ω speaker is easily 'man' enough to do the job.

But, what is really impressive is the weight, which is quoted as 100 grams. I was amazed to find that the batteries equated to 50% of the total weight. Yes! The little rig weighs-in at just 50g.

The C408 works from 430 to 439.995MHz with F3 (f.m.) mode transmission. The receiver is quoted as a double superhet with a first IF of 23.05MHz and a second at 450KHz.

Receive sensitivity is stated to be ~12dB (12dB SINAD) with a signal to noise ratio of 30dB or more at 1µV. And I have no reason to doubt these claimed figures.

The transmitter gives about 230mW output and contrary to many people's thoughts this is a high enough power level for chats around the town or the local rally. Being a dedicated QRP man I had no doubts about the effectiveness of low power, after many milliwatt chats into Europe.

Very Impressed

My wife is not licensed but after several years trading at the rallies knows a fair bit about hand-holds. She was very impressed with the Hora C408, she even said "this is maybe the best yet".

Using the C408 I had a chat with Stan G6ZNW across the town of Folkestone with good signals both ways. Good audio reports too!

Ian G3ROO had already bought a C408 for his wife Margaret 2E1DFH who loved it as she said "it fits into the handbag and you hardly know it's there."

Ian told me that the one drawback for the Hora was the lack of a carrying strap. So, Ian in his usual way put one together quickly that worked extremely well.

Alan G4YFP was amazed at the compactness of the rig. "How much further can they go in miniaturisation" he asked? "It's a real radio that's been shrunk."

Bottom Line

So, the bottom line is that I have used several of the small rigs offered from various sources over the past few years. Each time using my own Icom IC-2SE as the standard to compare the rigs against.

I have owned my little Icom for about five years and during that time have found little to beat it. A couple have got close but none have tempted me enough to change until now.

My nearest 430MHz repeater is 34km away, but my local 144MHz repeater is just 5km away. If this had been a 144MHz model I would have kept it!

I loved this little rig, it has all that I would expect of a compact transceiver. I not only liked it, I liked it a lot and would like to thank Lowe Electronics Ltd. for supplying the review model.

Practical Wireless, May 1998
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Hallicrafters Lives

The well-respected name of Hallicrafters lives on in the guise of antennas for the 144MHz band. Their unusual collinear 5/8 over 5/8 base station antenna was on show at the London (Pickets Lock) show. The antenna is unusual in that the elements are in a helically wound form, with an adjustable top section (costing £24.99). Also using an unusual Gamma matching system the antenna gives a good gain and flat s.w.r. over the whole band and is said to be able to withstand 500W f.m. or 1kW s.s.b. and may be directly mounted onto any pole of 25 to 40mm diameter.

Also on display, alongside the 144MHz antennas at the show, was a base station collinear antenna for the 430MHz band (priced at £10.99), several mobile antennas for 144 and 430MHz (costing £10.99) and a collinear base station antenna for 50MHz, costing £34.99, all very reasonable prices. More information on the Hallicrafters series of antennas is available from B. Havenhand G30OP at 11 The Coppice, Booker, High Wycombe HP12 4SA.

Saintly Six

An antenna that is rarely seen, but may be about to make a comeback is the halo type of antenna. Moonraker have recently introduced a halo antenna suitable for the 50MHz band with a maximum dimension of one metre or less. The halo is one of a series of antennas for the 50MHz band that Moonraker can supply, but it's the only one you could put in the car without taking it apart or skewering a passenger! Just the sort of thing for those days out.

For more information about their range of 50MHz antennas, or their wide range of antennas for other bands, contact Moonraker at Unit 12, Cranfield Road Units, Cranfield Road, Woburn Sands, Buckinghamshire MK17 8UP, or Tel: (01908) 281705, FAX: (01908) 281716.

Alford Viewing

Unable to find a suitable antenna for his Amateur TV setup, Clive King G6MYT, decided to make his own version of the Alford slot antenna for the ATV portion of the 1.2GHz band. Accurately machined out of high quality alloy, the antenna needs only your own feeding line and connector to complete. The antenna was on display at the recent Shortwave Shop Open Day. It costs £88 plus P&P direct from Clive King at 112 Rolls Drive, Bournemouth, Dorset BH6 4NA. Tel: (01202) 481681.

Qtek Verticals

Now available from Vine Antenna Products is a new tri-band beam antenna, the C3-SS covering the 14, 21 and 28MHz bands. The antenna is in reality a set of three 2-element monoband antennas sharing the same 1.5m boom, with a turning circle of 8.25m. The longest element has a length of a little under 7.5m, there are no traps or coils to absorb c.f. energy, and it's claimed to offer excellent performance.

For more information about the C3-SS antenna or other products contact Vine at The Vine, Llandrindod.

Welcome to AiA!

Welcome to 'Antennas in Action', I mentioned in the last Antennas-in-Action that I would be bringing you the results of the questionnaire that we ran some time ago. After a little bit of fun arranging the data into a tabular form, I found that my first impressions were broadly correct.

You seem to think that we are doing it about right - and your other comments and ideas will be incorporated as appropriate.

There are however, at least two readers out there who think I should throw 'Tex Topics' away and let other authors have the space. Perhaps if we had more readers who wrote in with their ideas then maybe I could. Remember any readers ideas can win a copy of More Out Of Thin Air or the equivalent to spend in our Bookstore (whatever your views on 'Tex Topics' are).

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8 pages of antennas

PW - Antennas in Action, May 1998 33
When I was first licensed in 1946, my shack was up in the attic of a boarding house on the sea front at Hastings. There was no way that I could put antenna wires more than a couple of metres above the roof but, using no more than 10W of transmitter power, one antenna gave me my first taste of DX working. Using c.w. I’d contacted stations in all continents after a few weeks. The one antenna that helped me achieve all this was the W3EDP antenna design developed in the mid-1930s by the holder of that call Mr H.J. Siegel.

Unusual History
The W3EDP antenna has an unusual history. For some reason, Siegel never wrote anything about his ‘own’ antenna design which, when being developed, was in a world where Radio Amateurs had no rotary beams, no coaxial cables and no a.t.u.s. Long wires and resonant ‘Zep’ antennas were in universal use.

The first descriptive article on the W3EDP antenna was published in the RSGB’s Bulletin (it’s now called RadCom) in February 1936. It was written by Siegel’s friend Yardley Beers W3AWH. Beers produced a similar article that appeared the following month in the American QST magazine.

Yardley Beers told how his friend W3EDP, started his painstaking experiments by using 30.5m (100ft) of end-fed wire. He gradually reduced this inch by inch until the very best results were obtained. It is said that he used up more than a thousand feet of wire at that time.

Not liking simple end-fed wire antennas, Siegel then began ‘cut and try’ techniques to determine his ideal length for a counterpoise. A lot of judicious wire pruning revealed that a counterpoise length of 5.18m (17ft) gave the best results. This wire ran out at right angles to the main wire, which was only 6m (20ft) high.

Solder the inner to the braid at this point.

Loop made from a length of coaxial cable.

Fig. 1: The simple coupling circuit suggested by G2WD in 1936 for coupling the valved transmitters of the day to a W3EDP antenna. Although capable of extremely good matching it would be considered very complex and difficult to use, by today’s amateur, needing adjustment of three interactive controls to achieve best results.

Fig. 2: An inductive, or faraday coupling loop may be made up from a length of coaxial cable. The most effective diameter of the loop depends on the band in use, but some 150-250mm diameter is a good start point. Two loops coupled side-by-side would give almost complete ‘Earth’ isolation whilst allowing the r.f. energy to pass from transmitter to antenna, or vice-versa.

Table 1 gives details of counterpoise lengths for the nine h.f. bands

Nineteen Bands
Although the W3EDP antenna may be used on the nine major h.f. bands, when he developed his antenna, Siegel only envisaged its use on four bands: 3.5, 7, 14 and 28MHz. Fortunately for us, his design has since proved to be very versatile and can be effective on all our h.f. bands from 1.8 to 28MHz. No doubt it could be made to work on 50MHz too!

For use on the bands it was originally designed for Siegel’s wire lengths hold good. But today for our ‘new’ bands gained since 1952 onwards, there must be a few changes to the counterpoise arrangements. The W3EDP antenna has a medium impedance feedpoint impedance. Having neither a very low nor a very high impedance at its feedpoint end, that is usually inside the house or shack.

Feed-points of medium impedances are always much easier to match than high or low impedance points, and they also limit any r.f. feedback problems. On some bands the antenna is best when used as a simple long wire, but on others a counterpoise will be needed. The counterpoise behaves as one leg of a very widely spaced open wire feed line making the antenna like an end-fed ‘Zep’. This puts its high impedance points well away from the operating position. As our bands are now no longer all harmonically related, a single counterpoise length will not suffice.

On ‘Top-band’ (1.8MHz) the antenna element is only about one sixth of a wavelength long.
and must be tuned against a conventional quarter wave counterpoise of about 38.65m (126ft). Although this counterpoise is short for this band, one of my local amateurs GOAKY has used a W3EDP antenna with success from several caravan sites in the West Country. He can put an S9 s.s.b. signal all over the UK using it. This is good, particularly as the antenna is no more than 6m (20ft) up (usually into a convenient tree). The counterpoise wire he just lays into a tree induces losses that are a 'must'. Just throwing the counterpoise wire in a convenient tree (not earthed) will always be at high r.f. fall below this height. Its far end (20ft) but ideally it should not be arranged to give best efficiency when its value of 150 or 200pF would be borrowed from the shack with an S.W.R. meter. By sliding the current balun over 'L' the best S.W.R. reading can be found. Plug-in coils for each band or a single tapped coil can be used.

Practical Considerations

Let's have a look at some practical considerations of using the W3EDP antenna, the versatility of which is remarkable. The 25.6m (84ft) wire does not have to be run out away from the shack horizontally or sloping upwards. Whatever happens to the launch-weight never found out! The antenna will still perform reasonably well when running at right angles to the direction of the main wire. The antenna will still perform reasonably well when it isn't running in the ‘correct’ directions or even when the counterpoise run is bent. Remember that Siegel used an indoor counterpoise, as I did some 50 years ago. For a time I lived in a small cottage in the heart of an urban area and had no garden or even a back yard. I devised an ‘invisible’ W3EDP by using thin enamelled wire from an old transformer winding.

For the ‘invisible’ W3EDP I tied the end of the wire to a piece of modelling clay, and flung it over a neighbouring roof top. It could not be seen and it coped well with 75W of power until the wind induced metal fatigue and breakage. Whatever happened to the launch-weight? I've received letters from amateurs having trouble with the W3EDP on one or more bands. Mostly they write that they have experienced r.f. in the shack with attendant feedback problems. In most cases I've suggested that they set up the matching arrangement shown in Fig. 2. The antenna has no earth connection and the earth wire must be removed from the a.t.u. I've received letters from amateurs having trouble with the W3EDP on one or more bands. Mostly they write that they have experienced r.f. in the shack with attendant feedback problems. In most cases I've suggested that they set up the matching arrangement shown in Fig. 2. The antenna has no earth connection and the earth wire must be removed from the a.t.u. The antenna is connected to the ‘earth’ terminal on the a.t.u. in the place of the station earth. When the a.t.u. itself is earthed, the W3EDP antenna is detuned, corrupting the essential working of the antenna. The braid of the connecting coaxial will of coarse earth the a.t.u. and to prevent r.f. running along the outer surface of this braid a current balun is needed. The layout using this option is shown in Fig. 3.

A suitable current balun can be made by winding the coaxial cable along a thick (12mm) ferrite rod (try about 15 turns). Another for could be tried by stacking three large ferrite toroids (the type used to counteract TVI on TV cables) and then winding the coaxial cable with as many turns as possible on the toroids. A further possibility is to slip a large number of ferrite tubing rings over the coaxial cable close to the a.t.u.

If you are using ferrite tubing ‘beads’, then I think using about 15 beads should be enough for the higher h.f. bands, although, for 1.8MHz working I'd use at least twenty beads. If you are using the balun method, the earth wire must of course remain connected to both the transceiver and the power supply.

Like all antennas, the higher the antenna is placed, the more effective it will be for the DX work. And in every case, where possible; it's best kept away from the screening effects of buildings or large trees.

A W3EDP does not show any marked pattern in its radiation and on the lower frequency bands is an ‘All Round’ radiator. Many QRP stations in the UK and overseas use W3EDP antennas and despite the low power levels used, achieve remarkable results. Don't you think it's time you tried one?

Table 1: With our 'modern' bands some changes are needed on the length of the counterpoise needed to give best efficiency on the bands. The dimensions are given in metres (and feet for the non-metricated).

<table>
<thead>
<tr>
<th>Band (MHz)</th>
<th>Counterpoise (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8</td>
<td>6.65 (22ft)</td>
</tr>
<tr>
<td>3.5</td>
<td>5.18 (17ft)</td>
</tr>
<tr>
<td>7.0</td>
<td>5.18 (17ft)</td>
</tr>
<tr>
<td>10</td>
<td>7.00 (23ft)</td>
</tr>
<tr>
<td>14</td>
<td>1.96 (6.5ft)</td>
</tr>
<tr>
<td>18</td>
<td>1.96 (6.5ft)</td>
</tr>
<tr>
<td>21</td>
<td>5.18 (17ft)</td>
</tr>
<tr>
<td>24</td>
<td>None</td>
</tr>
<tr>
<td>28</td>
<td>None</td>
</tr>
</tbody>
</table>

The counterpoise is connected to the ‘earth’ terminal on the a.t.u. in the place of the station earth. When the a.t.u. itself is earthed, the W3EDP antenna is detuned, corrupting the essential working of the antenna. The braid of the connecting coaxial will of coarse earth the a.t.u. and to prevent r.f. running along the outer surface of this braid a current balun is needed. The layout using this option is shown in Fig. 3.
Ashamed of using ‘only’ 100W and a dipole antenna? Dick Bird G4ZU/F6IDC says there’s really no need, your set-up could be better than you think!

Newcomers to the h.f. DX bands are often heard, sometimes almost apologetically, to remark ‘I’ve only got 100 watts and a dipole’. But I say there’s really no need to be ashamed of such a set-up, it may be better than you think it is!

Nearly all propagation forecasts are based upon the assumption that the set-up is a 100W transmitter and a dipole antenna at each end of the QSO. So, the monthly charts give quite a good idea of what is possible with simple, low-power installations. You must however, when making use of the charts, take care to pick the right frequency band, and to respect the recommended times-predicted for best communication.

Professional antenna consultants, when asked to evaluate the relative gain (or loss!), of some new-fangled, and maybe rather expensive antenna innovation generally use the half-wave dipole as their main standard reference antenna! Following their advice can often save you wasting a lot of hard-earned cash!

Editorial Note: When the gain (or loss) figures are given for an antenna when referred to a dipole, in this case ‘dBd’ (literally dB-dipole) should appear after the quoted figures. So, you would see ‘5.6dBi’ or similar in the gain parameters. Giving gain figures as ‘dB’ has no real meaning as the reference used is not given. If the reference is the theoretical isotropic antenna, then the figures should be labelled ‘dBi’ (literally dB-isotropic) and the gain figures are about two and a half dB higher (so appearing apparently better) than when a dipole is the reference. Tex.

However, it seems that one or two self-appointed ‘experts’ have recently been decrying the common dipole, and have suggested that vertical antennas are a much better choice, because of certain very special ‘low angle’ advantages. As a result of an expert’s suggestions, you might even have been contemplating the purchase of, let us say, 10m of 50mm (2in) dural tube. You may have also contemplated digging up your nice green lawn to lay down a large number of wire radials, with a view to installing a self-supporting quarter-wave vertical for 7MHz.

But before going to a large amount of trouble and expense, it would be wiser to investigate just how much you are likely to gain (or lose), in return for all the hard work. Rather surprisingly, computer analysis shows that an ordinary wire dipole, half a wavelength above ground, will have about 7dB more gain than a quarter-wave vertical, and that the vertical does not, in fact, have any significant low angle advantages (see Fig. 1).

So, with your nice new vertical, you would most likely finish up with a 7dBd loss (Note the ‘d’ reference). This is quite a substantial loss, less than 25W from your precious 100W output is actually radiated! Not only that, but the loss would be even greater if you chose a trap-loaded vertical, to provide multi-band coverage.

Let me assume that your main interests on 7MHz happened to be short to medium range contacts in daylight, if so a dipole at quite a low height above ground might be all that is required (see Fig. 2). The ground below acts as a reflector, giving useful additional gain
for medium distance propagation. For increased gain at somewhat greater distances, you could try putting a wire reflector, almost lying in the grass, below and to the rear of your existing half-wave dipole. I have conducted a number of interesting experiments, with the help of HB6WV, and various VK and ZL stations, using this laid out reflector technique, so I know that it is quite effective.

**Intelligent Use**

If you make intelligent use of vertical polarization, then you needn’t completely write-off vertical antennas. I feel that, in all fairness, there are one or two rather special cases where a vertical does make sense. Take 1.44MHz (or 430MHz) f.m. for example, the fixed relay stations, and nearly all the mobiles, use vertical polarization, so you would certainly be the odd man out, if you didn’t follow their example. All the same, the more experienced ‘two metre’ operators generally switch over to a horizontally polarized beam antenna when it is a question of DX contacts using s.s.b. or c.w.

For mobile work on the h.f. bands, (Radio Amateur or C0), a shortened vertical whip is also just about the only practical solution, although, particularly on the lower frequency bands such as 1.8, 3.5, or 7MHz, you may have to accept losses of some 10-20dB, along with very narrow bandwidth and matching problems free balance permitting of course. But for the moment, I want to examine simple and less expensive solutions. For a start, if you are prepared to concentrate your efforts on some particular area of choice, you can more or less forget the lattice towers and rotating mechanisms.

I make extensive use of fixed wire antennas for the 14MHz band, because of the low visual impact, and anyone with limited space (and finances) might possibly be interested in some of the things I have used with reasonable success. It may sound rather paradoxical, but the first design, a sloping antenna, I’m going to offer, combines the gain of a dipole in the favoured direction, with the ability to ‘lose’ signals from unwanted directions! The intention, in my particular case, was to reduce European QRM when contacting VKZL on the long-path, or keeping ‘skeds’ with friends just across the Atlantic Ocean.

In the simplest form of sloper antenna, you just attach one end of your 14MHz dipole to a convenient chimney, and slope it down towards the ground at an angle of between 45 and 60° (see Fig. 5). If you have no young children running around, the lower extremity can come down to within a metre or so of the ground, or be tied, with a nylon or similar cord to the garden fence.

A sloper antenna system can be fitted into a back-yard which is less than six metres long, and when you get bored

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**Fig. 3 and Fig. 4.** The radiation resistance will generally be little more than 5-10Q, and it’s obvious that the only earth return is through the capacity of the vehicle down to ground!

For fixed station work on 1.8MHz, most of us are more or less forced, by lack of space, to use some sort of top-loaded vertical antenna. The radiation efficiency will, admittedly, be very low, and the only consolation is that most other band users are working with a similar disadvantage.

Maritime mobile operation is probably the one exceptional case where a vertical does render very good service. A large expanse of salt-water ‘earth’ most certainly gives the vertical a ‘shot in-the-arm’. And as a vertical is non-directional in the horizontal plane, any sudden change of course when backing-up into the wind, is less likely to cause communication problems.

From what I’ve said, I hope you will now be convinced that, for most purposes, we should not underrate the classic half-wave dipole. All the same, it would be nice to have greater directivity, so as to reduce noise and QRM coming in from unwanted directions.

**Improved Directivity**

Sometimes we need either improved directivity, or gain, or both. And for this a two or three element Yagi on a 30 or 35m tower is not to be despised, OXYL neighbours, planning officer and bank

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**Fig. 5: A sloper antenna for 14MHz could be set up in even a small garden.**

**Fig. 6: Changing the slope from 40 to 60° makes only a minimal change to the radiation pattern. (0dB = 0dBd)**

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PW - Antennas in Action, May 1998
with one particular heading, you can relocate the lower end to favour some new direction. The directivity plots, Fig. 6, show the sort of gain and directivity which can be obtained with such a simple set-up, with the lower end only 300mm off the ground, and with full allowance for wire resistance and ground losses. It is interesting to compare these two plots with the earlier ones. The gain of the sloper antenna is about half a dB down on a horizontal dipole suspended at much greater height, which is, for most purposes, immeasurable. The gain is still well up on any sort of vertical system, and you have quite good suppression of high angle QRM from the rear half of the system. Which just goes to show how small changes can have quite dramatic effects, if you know exactly where you are heading.

The 'half-sloper' variation, as shown in Fig. 7, is quite popular in North America (where real estate can be much larger). The normal practice is to run some 50Ω cable up a lattice tower and bind the outer screen to the tower metalwork. Then extend the inner with a quarter-wave sloping wire which is pulled out at around 40° with the aid of a nylon cord. The screening of the coaxial cable that is bonded to the top of the tower, provides a return path down to ground. It seems to me that this technique could possibly be adapted for use by Radio Amateurs who happen to live in a multi-story tower block. There is almost certainly an old-water pipe in the bathroom and in most cases the bath-room is on an outer wall. A coaxial-fed quarter-wave could therefore be slung out of the window with the earth return being made to the old-water pipe. As there will be little opportunity for 'fine tuning', it would be best to make the wire just a little more than a quarter-wave long and bring it to exact resonance by means of a series capacitor. Try to avoid letting the wire dangle in front of the window of a lower floor apartment. With a little ingenuity it could probably be pulled out at an angle with nylon fishing line to a convenient stack-pipe.

There are so many unknown factors that it is quite impossible to make a computer evaluation with pretty polar diagrams but the r.f. will obviously have to go somewhere and I see no reason why it shouldn't work. If you are in a really lofty tower-block the height above ground might work wonders. Well worth a try.

Space permitting, you could further improve upon this rather primitive example by installing a sloping wire reflector, pulled out to the rear. I hope I've given you hope for your station with a simple antenna system, and I hope to publish full details of additions and other unusual solutions in another article.

73 Dick Bird.
In Ray Fautley G3ASG's 'Antenna Workshop' in the March issue of A-i-A, there was a slight problem with the illustration of the calculator keys to press. On page 53 there were two references to a key symbol with 'Esc' on it. This should have been the keystroke (X raised to the power of y). My apologies for letting it appear. Tex.

**Tex topics**

**Back in the January 1998 issue of Tex Topics' (TT), Duncan Head GP7PNE warned readers of a problem he had found with N-type plugs ('N-Type Warning' page 45 January 1998 PW). Since then I've made a few enquiries about finding a supplier of plugs that have a retaining ridge on the centre pin, and at the Pickvetts Lock show I found one.

The supplier I found who can supply N-type plugs with retaining ridges on the centre pins is Westlake Electronics. I found the plugs amongst the many plugs, sockets and other items on offer at the show costing £3 each (inclusive of VAT). If you cannot find Westlake at a show post and packaging is another 75 pence. A small price to pay for peace of mind.

**A Better Bobtail**

Back in the January 1998 issue of TT there was a design from Brian Williams GW4RGB for a Bobtail antenna suitable for the 144MHz band. From Frank Cox G1OPW comes the design for a Bobtail antenna suitable for the 430MHz band shown in Fig. 1. Frank wrote "many years ago I made a Bobtail antenna from the materials and to the dimensions suggested by the late Fred Judd G2BCX, published in PW dated March 1986". Frank went on to say that it proved to be a very good antenna, but due to its size he could only use it mobile.

The results of Frank's experiments resulted in the design of Fig. 1. The elements of the feed-point line and top line are made from 12mm square aluminium tubing. The two radiators were made from 4mm diameter studding with a length of 165mm from the bottom of the top element. These elements are mounted through holes drilled 15mm in from each end of the 700mm long top element and held in place with suitable nuts.

The spacing between the legs of the matching feedline should be kept 10mm apart with a suitable insulating spacer. The feed-point should be made with coaxial cable to two points some 62mm up from the 'closed' end of the matching line. The outer of the coaxial cable should be connected to the open leg. The area around the feed-point should be weatherproofed, and if possible should be within a weatherproof plastic box.

For fixed station use, the coaxial cable should be of best quality and as short as possible. For portable use a short (electrical V/2) length of cable with a good quality N-type (or silver plated BNC) plug should be used, making handling easier.

**Ten Metre Bobtail**

Brian Williams then sent in another design, his Ten Metre Bobtail, though this time for the 28MHz band, Fig. 2. Brian says this design is centred around 28.5MHz, but the s.w.r. should be

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**Fig. 1: A Bobtail antenna for the 430MHz band and ideal for Novice operators as it has some gain broadside to the antenna, improving the signals in those directions.**

**Fig. 2: A Bobtail antenna for the 28MHz band - could be a useful antenna with the conditions improving over the next couple of years. (Note - not to scale).**
acceptably low over the whole of the 28MHz band. For the ‘purist’ he suggests that to optimise it for the f.m. portion at 29MHz then the dimensions should be reduced by some 25mm overall.

Brian says the antenna should fit in all but the smallest back yard and should, ideally, be supported on a polypropylene catenary rope above some 5m high, and mentions that the matching feeder could be made up from open wire feeder but he hasn’t had time to do those experiments yet.

The design Brian sent in shows that the matching feedline is made up from 300Q slotted twin and has an overall length of 2.26m. For a 300Q feed-point impedance he suggests that the coaxial cable is connected at 152mm up from the closed end with the inner of the coaxial cable going to the side not connected to the centre vertical of the antenna. The diagram of Fig. 2, is not drawn to scale.

**T2FD Antenna**

Another antenna that seemed to raise quite a bit of correspondence when it was mentioned in the column was the T2FD originally offered by Glenn Ross G3MWR in the March 1997 issue. The arguments as to how efficient the antenna was went back and forward for several issues. Now you have an opportunity to see if the T2FD antenna works for you!

At the Picketts Lock show John Badger of Badger Boards presented me with his new T2FD centre piece with load resistor fitted. The centre, made from a section of heavy duty g.r.p. tube, a little under one metre long, needs only 15.25m of copper wire each side to complete your own T2FD antenna. The Badger Boards T2FD centre should cost in the region of £8 + P&P from Badger Boards, Tel: 0121-681 4168 for more details.

**Good Library**

I keep saying that I think a good library is an absolute necessity for anyone with a hobby. And Amateur Radio is no exception so, I asked Michael in our Book Store to come up an month’s offer on some suitable books. Readers ordering any two of the following books can save the post and packing charge of £2.

The partnership of William Orr W6SAI and Stuart Cowan W2LV has produced several antenna books, and the one I think is an ideal reference for Yagi antenna design is the Beam Antenna Handbook. In this A5 sized book are packed 12 chapters dealing with all aspects of directional beam antennas. It’s not just antennas though as, the first chapter deals with radiation and propagation and how this affects your signal.

Next there follows four chapters on Yagi antennas from h.f. to v.h.f. These chapters deal with the effects of element diameter and taper effecting dimensions, before discussing several designs. There’s a chapter discussing the problems associated with ‘tri-band’ Yagi arrays and methods of getting multi-band antennas to work properly.

The second half of the book deals with the principles of matching antennas to the feedline, how to build, install and evaluate antennas and, what test equipment makes installation and evaluation easier. The final chapter is a round-up of other directional antennas designs for a variety of bands. Well illustrated throughout, this is a good book to have in your library.

Written by John Devoldere ON4UN Antennas and Techniques For Low-Band DXing covers more than just basic antenna structures. This book is specifically aimed at those who like ‘winking out’ the DX on the three lower h.f. bands of 1.8, 3.5 and 7MHz.

There are 14 chapters in this (almost) A4-sized book covering all aspects needed to chase the DX on these bands, propagation, techniques, equipment and the use of a computer to aid to improving your station. On the antenna side, dipoles, vertical, Yagi, and quad and large loop antennas along with arrays of all types are discussed, each with their own section within the book. This book is useful to more than people than the name alone would suggest - well worth the space on the shelf.

For those with less real estate or simpler antenna requirements, two books from the pen of PW columnist John Heys G3BDQ cover using ‘simple’ wire antennas with your station. The seven chapters in Practical Wire Antennas cover the many aspects of using ‘long-wire’ antennas high in the air to antennas strung underground.

If you thought that a wire antenna was just a wire antenna - then you have not had the opportunity to read John’s book. The list includes: dipole, monopoles, Zepp, G5RV, W3EDP, Half-wave, Windom, Marconi, quad and Steeples antennas and so on. The steeple antenna was the subject of a search by Brian Lowe VE3TJE back in the November 1997 issue of A-i-A.

Holders of a Novice Amateur Radio licence have a restriction placed on the amount of r.f. power they may generate and use. This means that any antenna system in use must be efficient for an effective station. Practical Antennas For Novices is the second book from John G3BDQ dealing with (mainly) wire antennas for the various bands that a Novice may use.

There are suggested antennas for the 1.9, 3.5, 10, 21, 28, 50 and 434MHz Novice allocations, but the designs will work for any radio amateur whatever licence is held. Although these books seem slim compared to the “thumb-busters” we’ve become used to, they shouldn’t be dismissed - they are good value as practical designs. Should be on everyone’s shelf.

Sadly I’ve run out of space again for this month - so I’ll see you again in the July issue for the next Antennas-in-Action. But don’t forget my ‘Electronics-in-Action’ column in next month’s magazine.

That’s all I have time for this session. See you all in the next issue of A-i-A.
Please mention Practical Wireless when replying to advertisements

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**ICOM**

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<td>Microwave mods 50W VHF</td>
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Practical Wireless, May 1998
**yaesu FT-847GX**

70MHz NOW AVAILABLE ON THIS MODEL FROM ML&S

Due to the enormous interest world-wide for this product, deliveries have unfortunately been delayed. We now expect our first volume shipment to take place during early May, hopefully soon.

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Martin Lynch in the early hours arranging the FT-847GX and IC-746 "Shoot Out" at the recent London Amateur Radio Show.

With the manufacture of IC-756 finished, take a closer look at the new IC-746. It leaves the discontinued model for dead! A serious HF, 6M, 2M, all at 100W Base Transceiver including an excellent DSP system is that's easy to use.

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LY96BDX
A Great Radio Holiday!

John Podvoiskis G0NPI/LY1GI is involved in the Baltic DX Group Meetings and during 1996 the group visited Lithuania. In his article John recalls the 'highs and lows' of a trip that turned out to be a 'great radio holiday'.

The Baltic DX meeting (BDX) has become something of an annual tradition and the July 1996 one was the fourth in the series. Even though we did not spend every waking hour at a transmitter and made only 3208 QSOs, we did quite a lot in those 10 days. It was definitely a 'great radio holiday'.

The main organisers of the BDX are Willy Vaseikis LY2PX, Linas Balsys LY2BHP and Tadas Vysniauskas LY2BAW. I help co-ordinate in the United Kingdom. The BDX theme has always been to 'Enjoy radio and to see Lithuania'.

The 1996 group comprised of Boris Rodin RW3AY and his wife Irena Dave Reid PA/G0BZF, myself John Podvoiskis G0NPI, Robin Hewes G3TDR and Steve Wilkins G0NIF. The attendees are not always the same although some people have returned more than once. Previous groups have also included Americans, Germans and Scots to name a few.

What the 1996 summer's group lost in size it certainly gained in mobility. This helped when crossing the country, working from two of the 'mountains'; enjoying ORO from the super LY2ZZ station, working from the centre of Europe and joining the LY Hamfest. We also found time for visits to the two main BBSs in Lithuania, to meet local amateurs in their QTHs and to sample the very good local beers!

Tadas LY2BAW provided the 4-by-4 vehicle and the very effective mobile and static station equipment while Linas helped with the extra car and second mobile 144MHz rig. We used the special call LY96BDX, when operating together, and, under the newly implemented CEPT regulations, LY/own call for local working.

"The LY amateurs thought we were crazy for drooling over it"!

Practical Wireless, May 1998
Week's Highlight
The highlight of the week was definitely the all-night stand at LY2ZZ in Siauliai. This club station has more awards than walls to hang them on! Each room in the detached house is packed with radio. The 3.5 and 21MHz desks are in one room. The 1.8MHz desk is in the back room together with a small workshop. The 7MHz desk is on the landing and the 28MHz station is in the kitchen - but at the time of our visit was QRT.

Each operating position has its own linear and its own antenna. These are as follows: two 5-element Yagis for 21MHz, a 6-element Yagi for 14MHz, a 3-element Yagi for 7MHz and a vertical delta loop for 1.8MHz. They are held up by a tower farm, almost 50m high. This is some shack by any measure!

Robin observed the closed band situation as he took on 21MHz. But it wasn't quiet for long, day or night. Steve had never worked a 'pile-up' before but after 13 hours on 7MHz had to be peeled from the rig! "I feel really - what's the name" (he said) he was elated.

John battled on 1.8MHz against heavy QRN in west Europe and finished up in Canada by dawn. We left the 'super' pile-up on 14MHz to Dave for which he was richly thanked on air.

If you've never done this kind of operating before, I suggest you should try it at least once in your life. The LY2ZZ station offers good training for beginners and good practice for experienced operators too.

The station is looked after by Jonas Paskauskas LY2PAJ. Most of the equipment is (was) soviet military. Although it's not pretty, its performance leaves many 'oriental' rigs standing. What a delight to try something like this. The LY amateurs thought we were crazy for drooling over it!

Mobile From Mountains
During our stay in Lithuania we operated from two 'mountains', Medvegalis and Satrijos. Operation was on the 144 and 430MHz bands but with no tropo, results were poor. On 430MHz we only made one f.m. contact because the band is still 'empty' in Lithuania. These rounded hills are all less than 300m a.s.l. and smaller than the Vilnius TV tower. The country is not as flat as Holland but once you get above the trees, the signal should go for miles.

Operation was from the 'centre of continental Europe' was good fun. The actual spot where we operated from is on a hill, off the main road. The inscription stone has been stolen but the signposts are still there. We worked on the h.f. bands up to 28MHz using the call LY96BDX/E and, in the short time we stayed there, made over 40 contacts. Not bad with 100W into a 2.5m vertical on the roof!

Incidentally, the 'centre' is one of a number of centres of Europe, apparently, and was determined by the French Academy of Science. We learnt about some of the others from contacts.

City Tours
Because our base was outside Vilnius, at the Villon Hotel, we booked a guided walk-about tour around Old Town. Some of the excavations behind the cathedral have suprised even the local historians.

The city has a mixture of styles and looks, well, European. As you move away from the centre you see groups of concrete high-rise housing blocks. These are convenient supports for any antenna an

amateur needs.

The Technical School station in Vilnius is LY1BZB. Their antenna is a self-built cubical quad rotated by a re-cycled grinding wheel motor. The view from the roof of the 9th floor is completely unobstructed.

The LY1BZB BBS is the only packet link between LY and the world. Its port is on 14MHz.

The current sysop at the time was Romas Rancys LY2BKF and he switched it off for a while so we could work on single-sideband. We managed the Falkland Isles and Alaska amongst many South Americans. One operator from Argentina said 'good luck in the basketball' as Lithuania were playing them in the Olympics that night!

You can't visit Vilnius and not go up the TV tower, it's the 4th highest in the world. The tower houses an exhibit downstairs in memory of those who died during the coup in 1991.

"... meet local amateurs in their QTHs and to sample the very good local beers"!

Dave GOBZF working the 14MHz band during the 'super pile-up'.

You can find out more about BDX by contacting:
UK: John G0NPI, Tel: 0161-793 5922
DL: Mike DF1ZE, Fax: 06028 996711
LY: Willy LY2FX, Fax: +370 2 221256

The BDX Web site can be found at: http://ourworld.compuserve.com/homepages/drcp/homepage.htm
Lithuania is located around K015 square and is one of the Baltic States. It has about 1400 radio amateurs in a population of some 3.8 million.

Most of the amateur activity is on h.f. with c.w. being the most popular mode. However, 144MHz f.m. operation is spreading quickly with a number of repeaters. Packet radio has limited coverage and the v.h.f. and u.h.f. bands have their dedicated enthusiasts.

The Technial School station, LY1BZB, is situated in Vilnius. Robin G3TDR is pictured here busily making contacts.

Another city we visited was Kaunas. Leonas Klimukas LY2AE led us along Laisves Aleja, the pedestrian walkway through to Old Town. Dalija, our tour guide, explained about Kaunas’s medieval importance as a market town on the confluence of two rivers. Later we met some of the local amateurs including Vytas Mickevicius LY2PU who was sysop of the next biggest BBS in LY. Its only port is on 144MHz.

Vytas told us the Packeteers in the south of Lithuania were attempting to get a 430MHz link to the Polish BBS SP4KTO in Suwalki. The Packet network in LY is growing slowly and is still inadequate for many of the smaller centres of population. In fact, Internet is now being used by some as a way out.

Apart from radio and the city tours, we visited the seaside at Palanga, a flying club near Prienai and the wireless Museum in Siauliai. We did so much during our 1996 visit and had such a good time we arrived home tired, but very satisfied.

No visit to Vilnius is complete without a trip up the TV tower.

The culmination of BDX96 was near Moletai, in the east of the country (K026), where most of Lithuania’s radio amateurs were attending their radio society’s annual Hamfest. We set-up station in a detached house on the site, which is in a clearing in the forest near a lake. This is actually a holiday camp belonging to the national fertiliser company Azotas.

Antennas and supports were everywhere, some for the 144MHz contest, some for meteor scatter and some for listening. The blast from the 1kW camp station on 14MHz, LY96RMD, forced us work the other h.f. bands instead. However, the chat, the beer and the barbecue reduced our operation even more. Anyway, we did rather nicely on 50MHz, working around Europe and quite a few G’s too. We were joined here by Mike Staff DF1ZE and Hei-Jo DJ1OJ with their mobile ‘shack’. They were just beginning their tour of the Baltic States (LY YL ES) opening QRA squares.

Apart from radio and the city tours, we visited the seaside at Palanga, a flying club near Prienai and the wireless Museum in Siauliai. We did so much during our 1996 visit and had such a good time we arrived home tired, but very satisfied.

Many Thanks

The BDX96 group thank the organisers for their energy, those who looked after us for their patience and the people we met at different stages in our tour of Lithuania for their friendliness. Thanks also to all the local amateurs with our apologies for any QRL and QRM from us on the 144MHz calling channel and the repeaters.

Thank you for such a good time. Best 73 to you all.

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This month Geoff Pike G1OGDP describes the first constructional stages on the prototype of his low power hand-held U.H.F. transceiver project.

This time I'm describing the first part of the construction stages of the U.H.F. project, right up to receiver alignment. Part 3 will deal with the final construction and transmitter alignment.

From the photographs you'll realise that for my prototype all the circuit boards were housed in a hand-held case. The case for a hand-held will need to be made-up and will probably involve quite a bit of work....if it's the first time that you have made a case for yourself.

However, it may well suit the individual constructor to build the project into a larger 'desktop' type of case. These are often available from components catalogues. Or you can make one for yourself!

All the p.c.b.s I used in the prototype are made from glass fibre backed material. The transmitter and receiver are both made from double-sided p.c.b. material as a ground plane is mandatory for reliable and repeatable U.H.F. operation.

Home construction of the p.c.b.s is possible and quite straightforward using only a 'Dalo' etch-resist pen and some I.C. pad transfers. Holes can be either 0.8mm or 1mm and the isolated areas on the ground planes can be made with a 3mm drill.

The p.c.b.s for this project will not be available from the PW PCB Service. However, further information on the p.c.b.s and the project will be available from me at the address shown at the end of the article.

To help you build your version of the transceiver, all the sub-units and assemblies have been photographed. This approach provides enough information to be used in conjunction with the circuit diagrams already published (*see note below) to build your transceiver.

The photograph, Fig. 1, shows the prototype transceiver out of its casing and partially dismantled to show the sub-units.

*Note: An 'errors & up-dates' on the transceiver circuitry will be published with the final part of this project. Editor.

Case Details

The actual casing you decide on is your choice of course, but I'll describe my own version to provide some guidance so you can make your own. In practice mine was made up from a single piece of 22g aluminium sheet measuring 300 x 200mm.

The sheet was then cut into two pieces and then folded between two wooden blocks. I then made the tops and bottoms from 18g aluminium sheet and some lengths of 6 x 6mm aluminium angle.

Receiver & Decoder Boards

In the prototype, both the receiver and N.B.F.M. decoder boards bolt through onto the back case using counter-sunk screws. It should be possible to achieve a flush back when finished.

In my version the tone burst/audio amplifier board, Fig. 2 (above board), Fig. 3 (track side) needed a brass strip soldered to the LM380 end to act as both a heatsink and a mounting point (this is not shown in the photograph but the point where it is soldered to, is indicated). This also doubles as the top of the battery compartment. (The track side was suitably insulated from the batteries with a strip of p.t.f.e. or polythene).

The remaining boards are fitted on the case sides. This does however, cause a few problems in mounting them, but I'll described how to overcome the difficulties in Part 3.

Board Interconnections

Now let's look at the required board interconnections to help you decide on your own transceiver. And before you start I suggest you look at the relevant diagrams and photographs and decide the positions.
and runs of coaxial cable, which will of course depend on your choice of case and lay-out.

For the a.f. connections I recommend you use audio coaxial cable with on-board connections. This is to avoid earth loop problems.

The power supply connections focus on the change-over relay with the 'common' being fed with battery and +ve from the On/Off switch. The Normally Closed (NC) connection feeds the receiver side and the Normally Open (NO) side feeds the transmitter. (This may be a convenient point to mount the supply line decoupler between battery +ve and ground (1000uF @ 16V).

The Alignment

Time to look at the alignment now, and I think it's probably best to do the receiver first. I'm sure this will be the first part you tackle and I recommend this approach because at the end of the process you should be able to hear something!

Initially, you should check for a 12V supply and a regulated 8V to the oscillator. Initial current consumption will be in the order of 20mA, rising to about 45mA when a suitable crystal is fitted into the socket.

Preset inductor L104 so that the slug is about 3mm into the former. The oscillator should start. However, if it doesn't start you should then add about 2.7pF across C140 until reliable starting is achieved. (The upper limit to this slugging capacitor is about 4.7pF, any bigger and the amount of feedback will become excessive and the crystal stability will be compromised).

Next, you should adjust L104 for the appropriate frequency and if possible measure the output at the end of the 3dB pad. It should be in excess of 10dBm (but do not peak L104 to achieve this level).

You should now optimise L104 for frequency and not drive level. This is because there is plenty of drive to excite Tr105.

Now set L105's core flush with former and C148 almost fully unmeshed. With a good frequency meter you can read the final frequency. However, don't be surprised if only a 'times four' crystal frequency is read instead of a 'times six'.

Final adjustment can be done when receiving a signal. At this stage the receiver board will draw about 45-60mA from a 12V NiCad supply.

With the local oscillator working satisfactorily, you should then preset C101 to about 35% meshed and both the helical and i.f. 'cans' may left as they are. With a voltmeter, check for a 5V drop across R102, 105 (i.e. about 5mA collector current). Incidentally: the quadrature coil (T101) will probably be close to the desired setting.

Next, using an analogue voltmeter on pin 10 of IC101 you should check for about 3.5 to 4V. Adjust T101 as necessary.

Final adjustment for best sound quality can be done when you're receiving a signal. Then you should verify the frequency using a digital frequency meter that XL1 is 10.245 or 11.155MHz as required.

Finally, set the squelch control so that it is close to opening...
Race, local oscillator and first mixer board.

Fig. 5: The copper track side of receiver local oscillator and first mixer board.

Fig. 6: Receiver second i.f. board from component side.

Fig. 7: The underside (copper track) of the receiver second i.f. board shown.

(about 0.66V on the wiper of R115). If another transmitter is available, then set it to the appropriate frequency and connect a scope to pin 18 of IC101 and peak C101, helical, and T102 for maximum signal. Arrange to keep the signal at this point below about 50mV to avoid overloading and to make it easier to see a peak. This completes the alignment and it should now be producing a good signal.

Next Time

Next time, in Part 3 I'll be describing the final construction stages and transmitter alignment. But in the meantime if you need advice and further information on the project - you're welcome to contact me.

The GDP-430 is a versatile little project and I have no doubt that other versions produced will take into account what you need out of the rig. So, it will be interesting indeed to see what 'variations on a theme' occur!

You can write to me at the address shown here, and I'll be delighted to help you. However, I'm not available on the telephone and would appreciate if you could supply a large s.a.e. (with 50p stamp) so I can enclose extra information and updates on the project.

Write to: Geoff Pike GIOGDP, 2 Windslow Drive, Carrickfergus, County Antrim, Northern Ireland BT38 9BB.

I look forward to helping you on the air with your very own GDP-430 transceiver!

PW

Please accept my apologies for the delay in presenting the final parts of this project. The delays have been unavoidable but with the assistance of the author we're now able to publish the final instalments of the project. My thanks go Geoff Pike GIOGDP for his help and his kind offer to assist readers wishing to build this interesting transceiver. Rob Mannion G3XFD, Editor.

Practical Wireless, May 1998
Please mention Practical Wireless when replying to advertisements.

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Open Mon-Fri 9.30-5.30pm, Sat 9.30-2pm

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Tel: 01384 481681
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### FT-847

- **Price:** £1399.95
- **Status:** NOW IN STOCK

### FT-1000MP (AC)
- **Type:** HF transceiver
- **Price:** £1799.95

### FT-1000MP (DC)
- **Type:** HF transceiver
- **Price:** £1699.95

### FT-920
- **Type:** With free FM unit & AM filter
- **Price:** £1199.95

### FT-840
- **Type:** HF transceiver
- **Price:** £599.00

### SP 8
- **Type:** Base speaker
- **Price:** £139.00

### MD-100A8X
- **Type:** Base microphone
- **Price:** £109.00

### FT-290R
- **Type:** 2m all mode mobile
- **Price:** £399.95

### FT-50R
- **Type:** 2m + 70cm handheld
- **Price:** £215.00

### VX-1R
- **Type:** Miniature 2m + 70cm handheld
- **Price:** £215.00

### YAESU FT-920
- **Type:** HF transceiver, FREE FM unit & AM filter
- **Sale Price:** £1199.95

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### ICOM IC-746
- **Price:** £1395.00
- **Note:** Due to a massive bulk purchase, we can sell a limited number of IC-746's at wholesale price.

### ICOM IC-775
- **Type:** Flagship HF transceiver
- **Price:** £895.00

### IC-746
- **Type:** HF + 6 + 2m transceiver
- **Price:** £1395.00

### IC-706 MKII
- **Type:** HF + 6 + 2m transceiver with free DSP unit
- **Price:** £895.00

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- **Type:** HF transceiver
- **Price:** £1799.95

### FT-1000MP (DC)
- **Type:** HF transceiver
- **Price:** £1699.95

### FT-290R
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- **Price:** £399.95

### FT-50R
- **Type:** 2m + 70cm handheld
- **Price:** £219.95

### VX-1R
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- **Price:** £215.00

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- **Price:** £599.00

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- **Price:** £399.95

### FT-50R
- **Type:** 2m + 70cm handheld
- **Price:** £235.00

### VX-1R
- **Type:** Miniature 2m + 70cm handheld
- **Price:** £215.00

### TM-G707
- **Type:** New dualband mobile with detachable head. Fitted with CTCSS
- **Price:** £299.95

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- **Price:** £299.95

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### DX-70TH
- **Type:** 100W HF + 6m transceiver (all mode)
- **Price:** £659.00

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### DR-605
- **Type:** Dualband mobile
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### DR-430
- **Type:** 70cm mobile
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### DR-140
- **Type:** 2m mobile (50W)
- **Price:** £215.00

### DJ-65
- **Type:** 2m handheld
- **Price:** £129.95

### DJ-190
- **Type:** 2m handheld
- **Price:** £129.95

### DJ-541
- **Type:** 70cm handheld
- **Price:** £95.00

### DJ-511
- **Type:** 2m handheld
- **Price:** £85.00

### DJ-C1
- **Type:** 70cm handheld
- **Price:** £129.95

### DJ-C4
- **Type:** 70cm handheld
- **Price:** £129.95

### ALINCO DJ-G5
- **Type:** Dualband handheld. The only true dualbander available at this price.
- **Price:** £229.00

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### DX-70TH
- **Type:** 100W HF + 6m transceiver (all mode)
- **Price:** £659.00

### FT-920
- **Type:** HF + 6m transceiver
- **Price:** £659.00

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### GM-30A
- **Type:** Low pass filter
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### HMC-3
- **Type:** Box headset
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### EM-1
- **Type:** Clip mic-earphone
- **Price:** £24.95

### WR-2
- **Type:** Waterproof bag
- **Price:** £13.95

### ALINCO DJ-G5
- **Type:** Dualband handheld. The only true dualbander available at this price.
- **Price:** £229.00

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### YAESU FT-920
- **Type:** HF + 6m transceiver.
- **FREE FM unit & AM filter.
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- **Type:** The ultimate HF + 6m transceiver on the market.
- **Price:** £1495.00

### ICOM IC-T8
- **Type:** Triple-band handheld.
  - 6, 2, 70cm.
  - **Price:** £299.95

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BASE COLINEARS
P&P £8.50
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TSR-3302 GF 144/70.4/57 (1.7m) £54.95
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TSA-6001 Duplexer (+Cover) 2/70 (9/359) £24.95
TSA-6003 Duplexer (Cover) 2/70 (Plt.259) £19.95
CFX-314 Triplexer (6/7/10) (Cover) £56.95

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2m 1ele (boom 65'/118d) £69.95
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2m 1ele (boom 65'/118d) £69.95
2m 1ele (boom 65'/118d) £69.95
2m 1ele (boom 65'/118d) £69.95
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70cm HBKYV (boom 12') £16.95
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Easy to mount HF mobile whips ready to go with PL-259 fitting.
PL-80 ......... 80m whip (approx. 1.5m long) £21.95
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4m Length 92' (S0239) £39.95
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A high quality headset that will fit hand portable + most HF & VHF/URF trvrs via optional interface. £24.95 P&P £3.50

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1kW
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IP-20 20m version (10.1m) £49.95 P&P £6
IP-17 17m version (7.6m) £49.95 P&P £6
IP-15 15m version (6.7m) £49.95 P&P £6
IP-12 12m version (5.9m) £49.95 P&P £6
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K-7000 46-105m vertical £319.95
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5 section telescopic mast. Starting at 2.5" in diameter and finishing with a top section of 1" diameter we offer a 6 metre and a 12 metre version. Each mast is supplied with guy rings and stainless steel pins for locking the sections when erected. The closed height of the 8 metre mast is just 5 feet and the 12 metre version at 10 feet. All sections are extruded aluminium tube with a 16 gauge wall thickness.
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Standard kits (complete with wire) £22.95
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MAST HEAD PULLER EASY TO FIT PULLER WITH MOST CLAMPS (UP TO 2") £7.50 P&P £5.50

SECTIONAL MASTS Carriage £8.50
4 x 5 foot aluminium sections each swaged at one end.
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1½ dia £29.95
1½ dia £36.95
2 dia £45.95

WALL BRACKETS + MAST BASE PLATES
2" Mast base plate £12.00 P&P £5.50
Stand off £8.95 P&P £5.50
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12" T&K Brackets £12.00 P&P £8
18" T&K Brackets £18.00 P&P £8
24" T&K Brackets £20.00 P&P £8

NEW Q-TEK WINCHES
A range of fully galvanized all steel construction winches with safety catch. (SEND SAE FOR SPEC SHEET)

STANDARD WINCHES (DIRECT PULL) P&P £8
QW-400 400lb £21
QW-800 800lb £27
QW-1000 1000lb £31
QW-1200 1200lb £36
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BRAKE WINCHES AVAILABLE

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AS A PREMIER INDEPENDENT UK AMATEUR RADIO DEALER, the secret of our success lies in our massive buying power which has given us the best possible deals from the manufacturers. These we then pass on to you, the customer. Even though we have two shops we have always kept our overheads to the minimum enabling us to give our customers the lowest UK price. We pride ourselves on our first class advice, sales and service. If you are one of the hundreds of existing customers that already deal with us then you'll already know this.

If you are not, then why not give us a call and find out for yourself.

**NISSEI METERS**

- RS-102 1.8-150MHz (200W) £39.95 p&p £5
- RS-402 125-525MHz (200W) £39.95 p&p £5
- RS-101 1.8-60MHz (3W) £79.95 p&p £5
- RS-502 1.8-525MHz (200W) £99.95 p&p £5
- RS-40 144/430Pocket PAL/SWR £34.95 p&p £1
- RS-40N As above with N-type £39.95 p&p £1

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**S.W. PORTABLES**

- SONY SW-100E Award winning miniature portable SW receiver. Its performance is brilliant for its size. The best shortwave receiver for under £250.
  - RRP £49.95 SALE PRICE £149.95

**SONY SW-55E**

- Superb quality portable SW receiver with 125 presets. 100Hz step tuning for shortwave. Includes compact antenna, stereo headphones and carry case. RRP £299.95
  - SALE PRICE £235.00

**GARMIN GPS-III**

- Latest UK version complete with moving map of UK & Europe. £499.

**ULTRA**

- PB-2512 ‘M’ 25-30 amp power supply with variable volts (2-15). Dual meters (Volts + amps). The UKs best selling power supply. Most of our competitors are selling the 20A versions for the same price. RRP £34.95. OUR PRICE £89.95

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- VECTRONICS VC-300DLP UK's most popular 300W ATU with built-in dummy load. £129.95

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- MFJ-949 Special offer £139.95
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**NOW IN STOCK**

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  - SALE £289.00

- DB-770H High gain 2m + 70cm telescopic antenna with wideband receive (14” long BNC). OUR PRICE £24.95

- DB-2602 2m/70cm/23cm (2/2.5/5dB) flexible antenna with wideband receive (14” long BNC). OUR PRICE £22.95

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- Matches all hand helds. Can be worn on the belt or attached to the quick release body holster. £19.95

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- Opto-electronics are ready to pioneer the market by proudly introducing the latest in technology for frequency counter, the OptoScout 3.1-Mk2. Latest mini frequency finder from Optoelectronics. It will capture and memorise up to 400 frequencies that can be recalled directly into the G8-8000. Supplied with ant, transcriber, and RDS RRP £114.95
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**SPECIAL OFFER**

- GARMIN Gps-III GPS-III £339.00

**OPTOELECTRONICS**

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**COAX SWITCHES (P&P £5)**

- CX-201 'N' 2-way (SO 239) £18.95
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Next working day delivery £10

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Alinco (New low prices)
From 1.8-50MHz

Alinco DX-70T (with CTCSS), 100W HF, 10W 6m, all mode.
£695.00

Alinco DX-70TH, 100W HF, 100W 6m, all mode.
£775.00

SPECIAL OFFER: We will give you FREE a 25 amp PSU with every Alinco DX-70T and DX-70TH sold.
Carriage £15.00.

IC-706 MkII
100W HF + 6m, 20W 2m
PA price £1095.00 (PRICE MATCH)

SPECIAL OFFER: We will give you FREE a 25 amp PSU when you purchase a NEW IC-706MkII.
Carriage £15.00.

SG-230 Smartuner®
Antenna Coupler SSB, AM, CW & DATA (SG-230 special offer £299.00)
Carrie £10.00

You can't buy a smarter tuner than this. An automatic antenna coupler so intelligent it precisely tunes any length antenna – 8 to 80ft – in the HF band. The Smartuner® automatically evaluates and switches 64 input and 32 output capacitance combinations, plus 256 inductance combinations in a “pi” network. The amazing result is over a half-million different ways to ensure a perfect match for your transceiver. And the most intelligent feature of all is that the Smartuner® remembers the chosen frequency and tuning values, and will automatically reselect those values – in less than 10ms, each time you transmit on that frequency. The SG-230 Smartuner®. Buy Smart.

ICOM’s Latest Mid-Price Transceiver
The IC-746 is Icom’s latest HF/VHF transceiver, providing wideband coverage; HF to 50MHz through to 144MHz. Superior design. VHF base station capabilities. DSP and 100 watt RF output will make this THE transceiver to own in ‘98.

£1695.00 (PRICE MATCH)

SPECIAL OFFER: We will give you FREE a 25 amp PSU when you purchase a NEW IC-746. Carriage £15.00.

SG-230 Smartuner® Antenna Coupler SSB, AM, CW & DATA (SG-230 special offer £299.00)
Carrie £10.00

You can't buy a smarter tuner than this. An automatic antenna coupler so intelligent it precisely tunes any length antenna – 8 to 80ft – in the HF band. The Smartuner® automatically evaluates and switches 64 input and 32 output capacitance combinations, plus 256 inductance combinations in a “pi” network. The amazing result is over a half-million different ways to ensure a perfect match for your transceiver. And the most intelligent feature of all is that the Smartuner® remembers the chosen frequency and tuning values, and will automatically reselect those values – in less than 10ms, each time you transmit on that frequency. The SG-230 Smartuner®. Buy Smart.

ICOM IC-T8E
Tri-band handheld 2/6/70. NEW.
Triple band 2/6/70
Wide band Rx
WBFM for FM broadcast RX up to 5W output!
Splash resistant
CTCSS as standard
Switchable TX narrow FM
(12.5kHz for 2m band
123 memories
Very compact – smaller than most single banders
RPP £349.00 (PRICE MATCH)

SPECIAL OFFER: We will give you FREE a 2m/70cm Micro Mag Antenna when you purchase a NEW Icom IC-T8E. Carriage £10.00.

YAESU VX1-R
Tri-band handheld 2/6/70.
500mW output on 2/70
Li-Ion 1000mAh battery
5-1300MHz receive
8 character alpha-numeric display
Built-in CTCSS function
Dual watch feature
5M airband RX
Weight: 120g with antenna & battery
RPP £269.00

SPECIAL OFFER: We will give you FREE a 2m/70cm Micro Mag Antenna when you purchase a NEW Yaesu VX1-R. Carriage £10.00.

YAESU FT-847
FEATURES:
100W on HF and six meters
50W on 2m and 70cm
SSB/CW/AM and AM
Built-in DSP
Full duplex crossband operation
Voice announcement
Built-in keyer
CTCSS built-in

£1695.00

SPECIAL OFFER: We will give you FREE a 25 amp PSU when you purchase a NEW Yaesu FT-847. Carriage £15.00.

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Goods normally despatched within 24 hours. Please allow 7 banking days for cheque clearance. Prices correct at time of going to press - E&OE
This month the Rev. George Dobbs G3RJV takes a look at one of his ‘pet’ subjects - matching transmitter outputs into the antenna, building a 2 match, ‘flying the flag’ for open wire feeder and of course launches off with his usual appropriate quote!

...nor seeks nor finds he mortal blisses, but feeds on the antenna kisses

Shelley: Prometheus Unbound

Many years ago when I first attempted to release an Amateur Radio signal on the unsuspecting world, my transmitter used valves. (How things have changed!).

My valved power amplifier (p.a.) was connected to the outside world from a link on the anode-loading coil. The end-fed antenna was moved up and down this variable tapping to light a small bulb in series with the wire. It seemed to work and I had many happy contacts on the lower short-wave bands.

As time moved on I was introduced to transistor p.a. stages with their low impedance output and to the use of 50Ω coaxial feeder. But by the time I was actively building QRP transmitters ‘the tail was wagging the dog’ and 50Ω was king!

The power amplifier outputs were not at 50Ω and most antennas did not have a 50Ω impedance. But 50Ω was the approved impedance for the transfer of radio frequency (r.f.) power.

If it wouldn’t go through a length of coaxial cable, an r.f. signal was of no use to the average radio amateur.

The usual approach was to adjust the output of the power amplifier to represent 50Ω impedance, then to configure the antenna to accept a feeder impedance of 50Ω. This is fine in the case of a half-wave dipole for a specific frequency but most other antennas require a matching network.

The diagram Fig. 1 shows the ‘T’ Match Antenna Tuning Unit commonly used for matching a transmitter to an antenna. The values shown here will work for any amateur bands in the range 1.8 to 30MHz feeding into a whole variety of antennas. The 22μH inductor can be a variable coil of the ‘roller coaster’ type or a coil with taps along its length to select sections of the winding.

Balanced Feeders

Balanced feeder line is two parallel wires spaced somewhere between 25 and 50mm apart. (It can be bought but it is more commonly home-made).

I normally use pvc covered multistrand wire: two lengths held apart by insulated spacers. My spacers have been all kinds of things and plastic plant labels work very well! And for the last 20 years the only consistent antenna at G3RJV has been a doublet made from two 20m lengths of wire fed with a parallel feeder line.

So, what about those transmitters which have been adjusted to supply 50Ω coaxial cable? To find out the answer...read on!

The T Match Tuner, in Fig. 1, is still usable but it requires a balanced output. This may be achieved by adding a balun transformer. An interesting little word, it means BALanced to UNbalanced transformer. For this application a 4:1 ratio balun is required. This is shown in Fig. 2.

The transformer is bi-filar wound. Bi-filar winding is simple; it just means two windings side-by-side on one core (a ferrite rod). The technique is to lightly twist two wires together (about eight twists per 25mm) and wind them on the core as one winding.

To make the balun take some pvc covered ‘bell wire’ and twist two lengths together until they form a ‘single’ wire. Then wind eight turns on the ferrite rod. Bind the wires to the rod with pvc or amalgamating tape. (The rod can be reduced in size to fit the winding - a saw cut, followed by a sharp tap will break the rod).

The windings must be connected as shown. The dot on the drawing represents the beginning of each winding. It’s easy to use an ohmmeter to check the beginning and end of each wire or you may like different coloured wires.

In effect the balanced feeder is connected between the beginning of one winding and the ending of the other. The windings are in series and the 50Ω input is connected to the junction of the two windings. Just connect the 50Ω end of the balun to the antenna output of the tuner and the ‘balanced 3 end’ to the balanced feeder line.

Balanced Tuner

The diagram in Fig. 3, shows an Antenna Tuner designed for balanced feeder lines. The transmitter is link coupled into the centre of a coil, which is tuned against ground. The feeder lines are tapped along the coil until a good match is obtained.

In practice L1, L2 and L3 is really one coil with a centre portion used for the coupling with a link over this section to join L1 and L3. But be...
warned - it is not an easy project to build. I have tried several using the Barker & Williamson (B&W) airwound coil stock sold in the USA. They all worked well but were a nightmare to tune for the first time.

The matches have been achieved for each band they can be marked on the coil and the tuning knobs. These tuners certainly 'suck' c.f. power out of transmitters but they are not for the faint hearted!

The Z Match

The 'Z' Match is the commonest form of balanced antenna tuner. It's a classic of amateur radio literature and it works very well indeed. Circuitry of the Z Match is shown in Fig. 4, and in effect it's a tuned balun. Two similar windings are coupled on a common former. One of the similar windings is connected to the open wire feeders. The other winding is balance tuned against ground. The transmitter is capacitively coupled to the tuned end of the balun.

Because most amateurs will want to use the same antenna across the entire Amateur Radio h.f. spectrum, one set of inductors will not be sufficient to do the whole job. Some of my Z Match tuners have used three or four sets of coils to cover the whole spectrum. But it is possible with two sets of coils as shown in Fig. 4. by adding a parallel winding - L3 in this case.

The version shown in Fig. 4. comes from an 'unknown' radio classic, Amateur Radio Circuits published by the RSGB in 1964. Even the RSGB deny having produced this book! It is full of useful ideas.

The real problem with the Z Match as described is getting the sets of coils right. Ideally they should be open wound and air spaced.

Some time ago I discovered a company in Norfolk called Isoplethics who are producing a very interesting range of radio products. Many being designed for the vintage radio market. When I discovered that they were making some airspaced coils, I enquired if they might produce coils suitable for a Z Match Tuner. Within a couple of weeks Isoplethics sent me a prototype set of coils which I 'lashed up' on the bench with suitable capacitors to produce a Z Match. It worked well and the company improved the design and the second sets of coils were built into the successful tuner shown in the photograph, Fig. 5.

The tuner is easy to build. Two variable capacitors are required of the sort that was once common in valve broadcast radios. Fortunately Isoplethics can supply such capacitors if you do not have an ageing junk box.

However, please remember that BOTH OF THE CAPACITORS ARE LIVE WITH RF VOLTAGES and must not be connected to ground. I used an insulated base and front panel for my prototype. The twin gang capacitor must have its 'frame' (Chassis') connected to ground and the insulated connections joined to the ends of L1. (My Z Match is suitable for c.f. powers of up to 10W.)

Words Of Explanation

If you have never used a Z Match Tuner before, it does require a few words of explanation. The simplest way is to tune up the antenna with a standing wave ratio (s.w.r.) meter for the minimum return loss.

My method is to roughly tune by using the receiver on a weak signal and adjusting the tune and load controls for maximum signal strength. I then use a low level of signal from the transmitter in conjunction with the s.w.r. meter to obtain the best match.

In simple terms what I do is: Set the s.w.r. meter in 'Reflected' (Reverse) and 'walk the meter reading down'. This is done by slowly adjusting the two tuning knobs in conjunction with each other - small adjustment of one, then small adjustment of the other.

It should be possible to get a low reading on each band with the appropriate coils. Don't forget to mark the settings for future use!

Try open feeder - it is an easy way to run several bands from one antenna. And please do try a Z Match, they really do work well.

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This month's choice of books from the PW Editorial team start with a selection of Rob Mannion G3XFD's 'personal favourites'. Rob's favourites are in regular use in his own reference library and all those chosen for this month's 'Profiles' come with his personal recommendation.

**Introducing QRP**
Dick Pascoe G0BPS

If you're not 'into QRP' or home-brewing (the two actually go very well together!) Dick Pascoe's delightful little booklet will prove both interesting, informative and entertaining. Dick (rightly) says that "Remember - power is no substitute for skill"! and this comment is carried on the title page of the book, which provides an introduction to the history and skills of low power operating in the United Kingdom. Dick looks at techniques, circuits, operating practices, getting going with QRP and lists personalities, clubs and useful addresses. If your Amateur Radio interest is flagging - why not give yourself a 'boost' (by reducing power!) and rediscover 'real radio'.

Dick's book and QRP are both a revelation, very enjoyable and highly recommended. If you enjoy a challenge and would like to say "I did it - using a tiny transmitter-receiver I built myself - this book is for you!

**Personally recommended by Rob Mannion G3XFD.**

**G-QRP Club Circuit Handbook**
Compiled By Rev. George Dobbs G3RJV

No higher recommendation can come for this book than the fact that it's compiled from the G-QRP Club's 'archives' by G3RJV himself. Packed throughout with tips, hints, full scale projects for transmitters, receivers, transceivers, station accessories and antennas - it's just like having a book full of G3RJV's 'Carrying On The Practical Way' articles.

Printed in a variety of artwork and typographical styles which reflect the different authors and origins, this book concentrates on circuits and notes (rather than fully detailed PW style constructional articles). Full of 'weekend' projects - it's a classic and very readable - containing enough ideas (including some valved circuits) to keep you going for years! Highly recommended by Rob Mannion G3XFD.

**W1FB's QRP Notebook**
Published by The ARRL

The late Doug Demaw W1FB's work did much to keep 'home-brew' radio alive and well in the USA, Europe and throughout the world. His approach - simple and very straightforward - encourages the reader 'to have a go' themselves. In fact, one of my favourite simple receivers (a little f.e.t. regenerative detector job using a single MPF102 and single i.c. audio amplifier) is featured in this book.

Packed with circuits (receivers, transmitters, antennas, accessories and a host of design tips and ideas) this 'notebook' style book provides superb reading, an introduction to 'home-brewing' and operating QRP equipment. Highly recommended, and I wouldn't be without my copy! Rob Mannion G3XFD.
Listening Guides

Listening is very much a part of our hobby, so to offer you some guidance on what you can find on the broadcast bands here are three titles you might like to consider for your bookshelf.

Edited By Clive Woodyear

This substantial booklet provides quite a surprise for the first time reader - because until they see them listed few will have realised there are so many radio broadcasting stations in the United Kingdom. Filled with station details, location, powers and with detailed maps and references - it's an ideal companion for the radio listener and is also a very convenient size.

Information provided also includes programming details (for example - that Asian or Chinese language station you've heard may not be abroad - but could be here in Britain, aimed at serving 'ethnic minority' communities living here) for all the stations listed. A really important aspect of the book is the comprehensive 'Buyer's Guide' to help you select the right broadcast radio for your purposes. Highly recommended - a really useful little booklet.

Passport To World Band Radio 1998
Editor In Chief Lawrence Magne

This heavy-weight soft-backed book provides an annual guide to short wave broadcasts, and broadcasters throughout the world. It’s useful ‘hour-by-hour’ guide is particularly helpful as it assists the listener on where to find stations from particular countries at certain times.

Backed up by comprehensive technical guides, 'best buys' in receivers and complete with background technical information (how to choose your receiver, etc.), this book is for the beginner and experienced alike. The more experience you gain - the more you get from the book. An excellent choice for the bookshelf next to your radio.

World Radio TV Handbook
Editor In Chief Andrew Sennit

The WRTH has rightly become a 'classic' in radio listening guides. Within its 600 plus pages this conveniently-sized soft-backed book contains 300 pages of 'domestic' radio listings, 50 pages of international listings, web sites and addresses of broadcasters and 100 plus pages of listings by frequency.

Of particular interest to the English speaker is the special guide to broadcasts in English. Also included is the well-known WRTH 1998 survey of short wave receivers and accessories and world-wide TV station addresses and contacts. Highly recommended for your bookshelf.

Telephone

(01202) 659930
April 18: The SAMS'98 Computer & Electronics Show is to be held in the Bingley Hall, Staffordshire Showground, Warwick Road, Stafford (A518 Stafford-Uttoxeter Road), signposted from junction 14 on M6, turn shuttle from Stafford Railway Station. Doors open 1000 to 1900. Admission for adults is £2, children under 14, 50p. Concessions, OAPs, RSGB Members, Student Card, U16, £2. (Advance Tickets C2 plus s.a.e.) This is the 10th consecutive year and the 10th AMS (All Micro Show) at Bingley Hall. Last year an attendance of approximately 3000 and over 100 trade stands covering the computing spectrum, along with accessories, software, books, components, radio, satellite and much more. There will be masses of free parking (a licensed bar from 11am and refreshments, meals and a café). A great day out! Sharon Aitwood, Sherward Promotions, Knightsdale Business Centre, 30 Knightsdale Road, Ipswich, Suffolk IP4 4JL. Tel: (01473) 741313. Fax: (01473) 741361 or e-mail: services@harwood.co.uk.

April 19: The Ycevi ARU 16th GRP Convention is to be held at Digby Hall, Mound Street, Sherborne, Dorset. Doors open 0900-1700. There will be high quality lectures with the Reverend George Dobbs G3RJV as VIP, plus trade stands. Sherborne, Dorset. Doors open 0900-1700. There will be masses of free parking (a licensed bar from 11am and refreshments, meals and a café). A great day out! Sharon Aitwood, Sherward Promotions, Knightsdale Business Centre, 30 Knightsdale Road, Ipswich, Suffolk IP4 4JL. Tel: (01473) 741313. Fax: (01473) 741361 or e-mail: services@harwood.co.uk.

April 19: The Swansea ARS Amateur Radio & Computer Show will be held in the Swansea Leisure Centre on the A4067 Swansea-Mumbles coast road. Doors open 10.30am to 5pm. Attractions include trade stands, Bring & Buy, h.f./v.h.f. stations, special interest groups, a licensed bar and full catering, S22 talk-in. Roger Williams QW4WHH on (01792) 404422.

May 4: The Dartmoor Radio Rally is to be held at the Welverton memorial Village Hall, Meavy Lane, Yelverton, Devon. There will be parking for 00 cars and access for disabled visitors. There will be trade stands, a Bring & Buy, refreshments, etc. Doors open at 1030, talk-in on S22. There are beautiful views over Dartmoor, so it's ideal for a picnick, so why not bring the whole family? Ron G7LLG on (01822) 892586.

May 10: The Cayston Manor Radio & Computer Rally will be held at Cayston Manor Park, Fairley, Tarnworth, Staffordshire on the A449. Main traders are in four marquees, there will also be a large outside traders flea market, a Bring & Buy stall, local clubs and special interest stands.

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 directly. Editor.

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Practical Wireless, May 1998
Valve & Vintage

The sound of marching feet and the uniformed figure of Ben Nock G4BXD clearly indicates that there's a 'military flavour' to the vintage column this month. So, pay attention because Ben's looking towards Scandinavia and Europe on this 'parade'!

I'm starting off this month with two rather attractive sets from the Scandinavian countries. The RA-190 is a very nice 'special force's type set, separate receiver and transmitter, very much like the WS No. 128 found in the UK.

The receiver, or 'Mottagare', uses eight one and a half volt heater valves. These, an 1L4, 1R5, 3V4, etc., are in a standard single conversion role employing r.f. amplifier, mixer, separate oscillator, and two i.f. stages, audio detector/a.f. amplifier, audio output and b.f.o. stages.

The transmitters, or 'Glad', are wired in series-parallel and fed from a 3V supply. The h.t. voltage of 67.5V is also obtained from batteries, two of these being used.

Fig. 1 (Right): The RA-190 'Special Forces' set with transmitter on top and receiver below. The lead on the transmitter unit (top) plugs into the now vacant transmitter socket (see text).

The Transmitter

The transmitter, or 'Sandare', uses two valves, a 3A4 type as crystal oscillator and another 3A4 valve as the p.a. stage. A switch on the transmitter selects either full power transmit using the two 67.5V batteries in series to give 135V, receive, low power transmit with the batteries in parallel, or 'off'.

A grounded parallel tuned circuit is used in the p.a. with taps for the antenna connection. Here a portion of the r.f. is rectified and used to give an indication on a small meter that can also be used to check on the state of the batteries.

The RA-190 receiver covers 1.1 to 1.7MHz, and then 2.5 to 16MHz in another four bands. The transmitter covers 1.6 to 16MHz in four bands (c.w.) only with an output of 800mW up to 8W, and 400mW up to 16MHz.

The complete station comes with a 'wrap around' bag which holds a selection of crystals, the headphones, key, antenna and ground wires (and a little 'dangly thing' to throw a wire over trees!) and a few bits of connecting wire.

The batteries to power the set are held in small pouches attached to a belt arrangement which can be worn by the operator. The whole kit is finished in a nice shade of green.

Despite the low power (though of course there's nothing wrong with QRP!), I made several contacts on 3.5MHz, using my long wire antenna. The transmitter has a very nice note and the receiver and b.f.o. are stable enough for a long QSO without re-tuning.

The 'big brother' to the RA-190, is the RA-200. This is a back-pack set, covering 2 to 8MHz and providing c.w. or a.m. modes. Power output is 500mW from batteries and up to 8W with an external h.t. supply from a hand-cranked generator.

I have limited information on the RA-200 at the moment. However, I have tried the RA-200 out on the air, using it on 3.5MHz running just the 500mW with the battery supply. I managed several nice contacts on c.w. including Peter G3ZRP in Swindon at 569, Ralph G6JZY in Portishead at 579, Sam G3HVI in Stoke at 519 and even a QRP-to-QRP with Chas G3AJW (he was using 3W) giving me a 569. All QSOs were carried out using my 41 metre long wire.

Made In Brussels

Next in line is the RST 101, an interesting set made by the MBLE company in Bruxelles (Brussels). The package consists of the set, a transmitter-receiver, a hand-cranked generator, antenna wire, poles and guys, leads, headphones and canvas bags in which to carry everything. A manual I received from Peter ON6PW (see later) is dated 1955.

Six crystal controlled channels are available on the transmitter, which can operate between 3 and 12MHz. The crystals are housed inside the set so changing them requires the case to be opened up (very inconvenient!).

The receiver is a fully tuneable set covering the same frequencies as the transmitter in three switched bands. A small push button (which can be used as the Morse key) is fitted to the set but an external key, which is much easier to use, can be connected via a standard jack socket, as can a set of headphones.

Two valves are used in the receiver and both are 6AG5 types. The first valve is used as a regenerative detector and the second valve as a straight audio amplifier.

In the transmitter, three valves are used one, a 6AG5, as a crystal oscillator then a further two 6AG5s in parallel as the p.a. stage. Two small lamps, covered with long rubber sleeves, enable the oscillator and p.a. stage trimmers to be adjusted (they are tuned for maximum brightness on the bulbs).

As well as the hand cranked generator, batteries can be used to power the RST 101 (on receive only). To

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transmit, the generator supplies 6.3V for the valve heaters and 350V h.t. supply. This is regulated inside the set using an OA2 valve to supply the receiver with a 150V stabilised supply.

Again, I got on to 3.5MHz and tried this set out...with good results, working amongst others, Ray G3JFF near Portsmouth, on the Military Wireless Amateur Radio Society (MWARS) c.w. net. I found that the receiver is a little wide and the tuning control a little slack, but good reports were received from the transmitter making it a very pleasant little set indeed.

Requests For Help

Quite a few requests for help this month. Firstly there's a note from Robin G3UWP, asking if I or any of you readers out there could identify a mystery set which he was lucky enough to find at an ordinary car boot sale!

The mystery set uses a plug in coil pack (the only one Robin has covers 5 to 9.5MHz) but the set has a second calibration chart in the lid for the range 9.5 to 10MHz. A tag on the rear has the words Mk 26 RBH, but other than a serial number, no markings are evident.

Next comes a note from Tony G3YNT, with a picture of a strange American low band v.h.f. set. It's an unusual shape, being very thin with the valves mounted on their sides. The set covers 23 to 60MHz and has space at the rear for batteries. Perhaps you can identify this one?

Now it's on to a very interesting set indeed. An initial note came from Guido ON6RL, on behalf of his friend Peter ON6PW (good callsign!), asking for information on what at first sight appeared to be an 18 set. Indeed, the suitcase type mounted transmitter-receiver does have an 18 Set receiver unit but the transmitter, though looking like an '18' has subtle alterations.

The transmitter is crystal controlled, with two crystal sockets being provided. It has a panel mounted send/receive switch, a mounted key and front panel mounted antenna socket. The case also contains an a.c./d.c. mains power supply.

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Win A Copy Of StripboardMagic

In ‘Electronics-in-Action’ (April 1998) Tex G1TEX had the opportunity to review a new computer program called StripboardMagic that makes creating a circuit onto Veroboard so very easy. Now two readers have the chance to win copies of this program.

How can you win your copy of StripboardMagic? - It's easy, just answer these questions. You will need the April 1998 issue of Electronics-in-Action to do this.

1) What is the cost of StripboardMagic?
   a) £400
   b) £39.95
   c) Free to two winners

2) What is the name of the suppliers of StripboardMagic?
   a) Amber
   b) Ambyr
   c) Ambile

3) What did Tex consider the 'magic' action of StripboardMagic to be?
   a) Autoplace
   b) Autohome
   c) Autounion

4) What operating system does StripboardMagic need to run under?
   a) Windows95
   b) Windows
   c) Windsor Castle

As a tie-breaker how many words of more than four letters can you make from the letters contained within the title StripboardMagic?

Send your answers on a postcard, by May 29, giving the four answers and the number of words you have managed to make from StripboardMagic. And don't forget to include your name and address, to:

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VHF REPORT

REPORTS & INFORMATION BY THE LAST SATURDAY OF EACH MONTH.

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Packet radio: G8BMD
UK DX Cluster: G8BMD
This MONTH David Butler G4ASR HAS REPORTS OF TROPOSPHERIC OPENINGS ON THE VHF BANDS AND DETAILS OF A BROWIDE ROUND TABLE MEETING.

There was little in the way of any notable propagation reported on the V.H.F. and u.h.f. bands during the month of February. Having said that there were periods of enhanced tropo conditions between February 13-18 and February 25-26 which enabled contacts to be made into central Europe and Scandinavia. There was also a reasonable auroral backscatter opening on February 17-18 allowing contacts to be made on the 144MHz band with stations far away as Estonia (ES) and Lithuania (LY).

Conditions on the 50MHz band however have been noticeably poor. In the UK during this winter season although, as previously reported, there has been an upsurge of activity in other parts of the world. Solar activity is inextricably linked with world-wide F2 propagation on the 50MHz band (and h.f. bands of course).

Many propagation researchers are predicting a surge in solar activity over the next few months. They expect to see a vigorous and energetic upsurge in solar indices corresponding to the beginning of accelerated summer solstices. Indeed spotless days are now becoming quite rare as we continue the climb to solar maximum of Solar Cycle 23.

TROPOSPHERIC OPENINGS

Reports of tropospheric openings were first reported during the evening of February 13 by stations in central and northern England who were hearing Belgian, Dutch and German stations at good strengths on the 144MHz band. Fortunately, the good conditions continued through the period being a bringing increased activity to the v.h.f. and u.h.f. microwave bands.

On the 430MHz band the station of John Quarmby G3XJDY (J002) reported hearing EA1BP (IN73) at 59 and the u.h.f. beacons BR1VC (J054), FAXU-H (J066) and H8FB (IN68). On the south coast G1HWW (J090) made a number of contacts on the 430MHz band including DJ3YEL (IN041), DL4H (J031), F1MJC (IN068) and F6APE (IN97).

Conditions on the 1.3GHz band were equally good with John G3XJDY working many stations in DL, F, ON and PA. Among the stations contacted on s.s.b. were W0AS (IN063) running 700mW, DL3YEY and DJ0IOU (both in J042), DG2BCP (IN034), F1DUZ and F6APE (in IN97), F6HYR and F6GCI (in JN18) and F6LTA (IN068). Later that evening John found the band open across the North Sea to Denmark and made an s.s.b. contact with the station of OZLZ2 (J054).

The enhanced tropo conditions extended right up into the microwave region with the station of PA0WJW (J022) hearing the beacon at the QTH of Simon Freeman G3LQR (J002) peaking 599 on the 10GHz band PA0WJW made some excellent c.w. and s.s.b. contacts with G3AP (IN080) at 476km, G3YVX (IN091) at 488km, G5ZTF (J091) at 344km and G4BRR (J091) at 426km. All contacts, incidentally, were made on 10368.100MHz, the centre of narrow band (c.w. and s.s.b.) activity. Even higher in the microwave spectrum Simon G3LQR heard the PI7KHC beacon peaking 599 on a frequency of 24192.100MHz (the 24GHz band).

The 'lilt' conditions declined somewhat in the following days but picked up again on February 18. Jamie GW7SMV reported hearing a number of DL and F stations on the 144MHz band from midday. Later in the afternoon, around 1620UTC, he heard the Swiss station HB9RDE (JN37).

Interestingly there was a fair bit of activity from Luxembourg with the stations of LX1A, LX20X and LVR3N (10HRP) being worked on the 144MHz band by stations in central and north-eastern England. Propagation on the 430MHz and 1.3GHz bands was predominantly to central France with stations in south-east England hearing the FX4UH8 (432.868MHz) and FX4UHY (129.683MHz) beacons located in JN06. The best tropo of the month occurred during the period February 25-26. Although some stations (approximately 15 hours from 1700UTC through to 0800UTC) there was some good DX to be found, especially on the 144MHz band. From your reports it seems that the band was open to DL, LA, OZ, S4 and S5. At the QTH of David Dibley G4HKG (J091) contacts were made, mostly on s.s.b., with DJ2ER (J035), DJ4IT (J033), DL5WJ, D7FDG (J052), DL7ANK (J062) and DL9OAI (J064).

The ducting also extended into central Europe, contacts being made with SP1EO (J073) and SP4MPB (K033), the best DX of the evening at 1452kHz. Scandinavian contacts were also made with 2LP2HA (J038), OZ5AGI (J056), OZ9X (J065), SM7BOU (J066) and SM7WT. David mentioned that the propagation, although quite patchy on the 144MHz band and that nothing was heard at his QTH on the 430MHz, 1.3 and 2.3GHz bands.

Up in the north-east of England Dave Storr G1GCP (J039) heard DL3BSK (J072), DL2SWG (J052), DL7ULM (J062), OZ1SY (J045) and SM6TZX (J067) on the 144MHz band. Four contacts were made into Poland with S1P1EO at 1060km, S1P3QW (J049) at 1058km and SP4CHY and SP4MPB (both in K033) at 1450km.

Also in locator J093 the station of John Clerk G4NLO (J038) had s.s.b. contacts with OZ1JAU and OZ2BZ (both in J055), SM6TZX (J067), SM7FXM (J065) and SP4MPB. As mentioned by G4RXG there didn't appear to be any activity on higher frequencies although G3XJDY did hear the SKL1UHF (J067), OZ1LHU (J057) and OZ2QIV (J055) beacons on the 430MHz and 1.3GHz bands.

AURORAL OPENING

On February 14 there was a coronal mass ejection (c.m.e.) from the Sun. This caused disturbed conditions in a few days later, resulting in planetary geomagnetic indices of Kp=4 on February 17 and 26 on February 18. As a result of this geomagnetic activity, there were a number of auroral events but on this occasion the geomagnetic A indices of 14 on February 17 and 26 on February 18. Some operators were alerted to the impending opening by auroral observations at the Manchester observatory in the 49MHz region. Other people simply noticed the 'spots' on the DX

Cluster (from 1720UTC) relating to auroral activity on the 50 and 144MHz bands. Among the first such spots was one from Nick Peckett G4LUX (J094) at 1722UTC who heard the SK4MPI beacon at 0010 on 144.412MHz peaking 55A.

In a Packet radio message Eljie PACEE (J033) also mentions hearing the SK4MPI beacon at 57A but found activity surprisingly low. He caught the first phase, making c.w. contacts with LA5TIF (J058), OZ9X (J056), SM2ZVR (J099) between 1800-1900UTC. By the way, Eljie runs 400W into the twin 1½ element 9FTY Yagis at 22m above ground. Others spots on the DX Cluster included those from Clive Davies G4FVP (J094) who reported GMA0BD (J087), GMA4SM (J085) and M4M4AMY (J074) on the 144MHz band around 1800-1900UTC.

The main event, though, took place during midnight and was quite intense. Normally there is relatively little activity on the 50MHz band during such late night events but on this occasion the word must have got around. Indeed it was so good that there were even a report on G4PAW (J073) being worked within a 100km circle. The 70MHz band.

In north Wales the station of GW0CWE (J073) worked 3GAI1J (J036), MM4AMW (J075) and MM4BLQO (J077) with signals ranging between 55A to 59A. At the QTH of G4TVF the Finnish beacon OH9SIA (KP36) was heard at 2300UTC with a mixture of aurora (55A) and auroral-E (559).

Clive then made contacts on the 50MHz band with LA2WPA (J039), FW1IY (J014), WP12Q (J011) and 04YTN (IP62) on the Fareo Islands. The beacon stations OH9SIA (KP36) and OHZ6VF (J010) were also heard. However, the Norwegian beacon SK3IS (JF11), usually an excellent indicator of auroral openings, was not heard. Subsequently, Staffan SM13UC and Tony SM3HUV went to the top of the mountain where the beacon is located and discovered that the antenna was completely broken by the wind and snow.

Up on the 144MHz band Eric Gedevias GW3XVY (J033) made s.s.b. contacts with GM31II (J068), G47UCV (J075) and GM8LFB (J088). He also contacted the Swedish station JI24RA (J079) who was 59A over the 1290km path.

Showing the value of using Morse code during auroral events Andy Cook G4PIQ (J001) made a number of c.w. contacts which included the stations of ESJA1 and ESJ210 both in K029 over 1709km away, LY28W (K025) at 1625km, L38IO and L5ASO (both in J059) and GM4AFF (J086). Andy also made a number of s.s.b. contacts with SM4VQP.

In Finland, the land of
perpetual auroras. Jari OH1XT (K0P1) reported making 44 c.w. contacts on the 144MHz band between 1600-0115UTC. He uses a Yaesu FT-736R transceiver with a 150W amplifier and two 15-element Cuckoo Yaquis. His best DX was with the station of GM4DGT (IO85) at 1536km and QV9J (JP62) at 1500km.

Contacts were also made with stations located in DL, LA, LY, OZ, PA, SM, SP, UA1 and YL. He also made one c.w. contact on the 430MHz band working LY2E (K0C3) over a path of 640km. Of course the correct distance is far greater than this. The path lengths quoted are point-to-point distances and ignore the fact that the signals actually go via the northern auroral curtain.

What was probably the last UK observation of this auroral opening was made by the station of IL2TPY on 0116UTC at 1330UTC lasting for 30 minutes. Around the same time the station of TR8CA was heard very weakly in Jersey. Another t.e.p. opening was reported by 3C5I on February 21 from 1230UTC. The event lasted for an hour with Alan making contacts into France, Italy and Malta. QSL cards for 3C5I Incidentally should go via PO Box 650232, Dallas, Texas, 75265, USA.

On February 21 Cedric CT3FT (located on the Madeira islands) reported that he was now getting daily evening openings via t.e.p. to PY2 and PY5 areas. He also mentioned hearing the Ascension Island beacon ZD8VFH (IJ22) on most evenings around 2000UTC and that he heard 3C5I on February 20 and 21 in beacon mode.

SOUTH AFRICAN STATIONS

On February 22 stations in ZS6 (South Africa) had their first major opening into Europe and Asia. The 50MHz band opened up at around 1245UTC and remained in good shape for nearly three hours.

At least six ZS6 operators are known to have caught the opening working stations in F, I, IS9, OD, YU, 4X4, 5B4, 9A and 9H. Ian ZS6BE reports that propagation into southern Europe was excellent with Italian stations coming in at 9A208F (don't they always?)

Earlier in the morning Ian heard the ZS1I beacon (28.202MHz) via F2 backscatter. Reception of the European Channel E2 video (48.25MHz) followed an hour or two later complete with Italian 'pirate' radio stations on nearby frequencies.

There were also weak video signals on Channel R1 (49.75MHz), the old OIRT block countries and Russia. Indicating that the F2 mode path was limited to Southern Europe. Ian noticed that the maximum usable frequency (m.u.f.) peaked at over 54MHz with strong signals being heard on Channel E2 Audio (51.25MHz) from Spain. He also heard the low power beacons SV150, YU658, 5B4CY and 9H156.

Although none of these openings reached as far north as mainland UK. Ken Osborne G4IGO (K0PB) did report positive identification of F-layer television signals on February 21. This occurred between 1005-1035UTC on 49.740 and 49.760MHz and was also observed at the QTH of G4HBA. The incidence of these openings are typical of what has happened in previous Solar Cycles.

The propagation openings appear in a cyclic fashion. First you start with a dead band with no apparent openings. Then there is an outburst from the sun giving rise to auroral backscatter openings for a few days.

Then follows a period of good F2 or t.e.p. openings. This eventually dies out, leaving a dead band before the next (28-day) rotation of the sun when the whole process start again. This is an extremely crude model of how the Sun affects propagation on the 50MHz band but as a generalisation it's reasonably good. What it means in practice is that there are auroras, followed by F-layer propagation, followed by a few days peace and quiet!

MICROWAVE BANDS

If the thought of chasing DX on the 50MHz band doesn't quite turn you on then perhaps you could be operating at the other end of the spectrum, up in the microwave region. Although it may sound complicated, the reach of beginners (or even established radio amateurs) is this far from the truth.

Indeed building an f.m. transceiver for use on the 10GHz band can be relatively simple. Although it can’t compare to the performance of a modern narrow band (s.b./c.w.) transverter built on microstrip with chip components a wide band (f.m.) Gunn oscillator and voice receiver can easily be built in few evenings.

The Gunn oscillator and receive mixer can be based on surplus 10GHz doppler intruder alarms. This sort of approach is very inexpensive and far from specialised. The units can be used for fixed line-of-sight audio or video links or, if you wish to extend the range, out portable from local hill tops. The photographs Fig. 1 shows the station of Dave Hall G8VZT operating portable on the 10GHz band.

Some years ago the RSGB Microwave Committee started a series of Microwave Round Table events with the aim of getting inexperienced microwave builders and operators together to exchange knowledge. Round Tables are held at various venues, normally at the Rutherford Appleton Laboratory near Didcot, Oxfordshire, the Crawley Radio Club, West Sussex, the Flight Refuelling Radio Club, Wimborne, Dorset and the BT Laboratory at Martlesham Heath, Suffolk.

The events typically include measurement facilities for checking or aligning equipment, a microwave bring and buy table and a few afternoon lectures. Most importantly it is a meeting place for fellow enthusiasts to get together to discuss latest microwave developments.

The next Microwave Round Table is being held at the Rutherford Appleton Laboratory (RAL) on Sunday April 26 between 10.00 to 17.00 hours. The usual programme will take place, an exchange of microwave and related radio equipment, a comprehensive range of supervised test gear operated by experienced, informative and informal talks and a microwave forum for you to give your opinions to the Microwave Committee. Please note that this function is organised on behalf of the RSGB Microwave Committee for microwave operators to exchange items and information pertaining to microwaves. It is not a rally, nor is it...
The month of February must surely have been one of the warmest since records began. Certainly quite a few amateurs have mentioned to me over the air that they’ve suffered no antenna damage this winter, due to the fact that the freezing temperatures didn’t materialise this year. That’s good news for most operators, no doubt, but it also seems that conditions on the bands are steadily improving as we work our way slowly towards the next sunspot peak.

Our reporters this month all indicate that propagation conditions have been reasonably stable, allowing most parts of the world to be heard and worked almost daily. There have been ‘patchy’ days of course, but it looks as if there is a definite improvement to most of the bands.

**DX NEWS**

Over to DX news and the RSGB’s DX Newsheet, which is edited by Chris Page G4AUE. There’s news that Anders SWDORY is operating from Vietnam as XV7SV until June. He’ll be operating on 3.526, 7.026, 10.135, 14.212, and 21.235MHz only, and QSLs should go to his home call address.

From Sri Lanka, Mario HB9BRM will be active as 4S7BG until the 3rd of June, QSL to home call. And from the Malagasy Republic I read that SR8FK is still active, often on 10MHz around 0000UTC. Meanwhile, JA0HFA will be operating out of Zambia under the call sign 9Z1AM until the 31st of December 1998. He’s mostly using s.s.b. with a cubical quad antenna on 14MHz, but he will also be building antennas for the low frequency bands.

Down in the Antarctic, Dave N2<i>WBN</i> is the new operator of K4AAF at the American Antarctic Base Palmer on Antarctica (QSLs should go to K41MZU). While still in the South Atlantic, C9AAP is active again from the Chilean Antarctic Base Capitan Aruto Pat on Greenwich Island, and QSLs go to CE2L0L.

**WHERE’S SEBORGA?**

I’ve received a letter from Brian Leach G3DXY of Gloucester, asking for the whereabouts of Seborga. He’s worked and received QSLs from home call address.

...  

**PROGRESS REPORT**

Someone who has been operating on the lower bands for a change is Don McLean G3NFO in the town of Yeovil in Somerset. He’s worked FG6FC (Guadeloupe) QSL via F6QZU and M3DSN (Martinique) both on s.s.b. after 2300UTC. By the way, contrary to information in the February issue, Ted is an all QRP man, through and through!

Next comes a report from Derek Blunden IRS 171057 in Westlea, Swindon, who reckons that the DX is pouring in! Derek’s log shows s.s.b. reception on 3.5MHz of CPSN0 (Bolivia) at 0740, V32PKV3 (Canada) at 0841, ZL1BOQ (New Zealand) at 0821, FM3DN (Martinique Island) at 0856, VP9CXV (Falkland Islands) at 0744, VK1EL (Australia) at 0925, and W2YE (USA) at 2259UTC.

**THE 7MHZ BAND**

I’ll start the 7MHz band slot with the log from Sean Gilbert GA4GC in Milton Keynes, as he’s been having so much enjoyment out of this band recently. Sean’s log shows c.w. contacts with LU1ZC (South Shetland Islands), a QRP contact with 9K2ZZ (Kuwait), P5AAA (Netherlands Antilles), W4ADN/V5PS (Turks & Caicos Islands), CO8ZZ (I’m still none the wiser). No doubt our intrepid readers will be able to enlighten you. If you can help Brian, he can be contacted on Gloucester (01452) 520779.

There have been so many ‘new’ states formed in and around Europe over the past few years that very often it’s been nigh on impossible to keep track with them! I’ve heard of Seborga being worked by various amateurs, but having made a few enquiries amongst the local operators, CO8ZZ is still none the wiser.

Next comes a log from Pat G3OUC. He’s the chap who uses kite antennas on the 1.8 and 3.5MHz bands, as is well known for his expertise in this field.

Using his series of home-made ‘Skyliner’ rigs running power levels of 300mW and 5W s.s.b., Pat says he’s been working all over the British Islands on 3.5MHz of late. But on 1.8MHz and using ‘roach pole’ (fishing rod) verticals running an output of 500mW on s.s.b., he’s racked up contacts with Finland and Germany.

More from Pat in the 28MHz slot, but if any readers are interested in kite antennas, then Pat is your man! He can be contacted at 15 Turnpike Road, Newbury, Berkshire AG14 2ND.

**PORTUGUESSE PUW READER**

I also received a letter from Augusto Ceolda CT1ABE in Ostrélas, Portugal, who says he’s an avid PUW and ‘HF Far & Wide’ reader, and he also enclosed a photo of him in his shack. (see Fig. 1). Augusto managed to visit the Picketts Lock (London Amateur Radio) Show last year and enjoyed meeting the PUW team on the stand.

It’s nice to know that we’re attracting attention from all places, with other expectations so please keep track with them! I’ve heard of 73 Alaf Ofge in Namibia, and ‘HF Far & Wide’ reader, and he also enclosed a photo of him in his shack. (see Fig. 1). Augusto managed to visit the Picketts Lock (London Amateur Radio) Show last year and enjoyed meeting the PUW team on the stand.

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around 1800 on most days”. Thanks for the report Don!

**THE 14MHz BAND**

On the 14MHz band, Carl G/0WSW, again using QRP c.w. at 5W output, hooked up with K1GOD (USA) at 1339, 38BCF (Mauritius) at 1635, EAS/GJ2XQK/CP (Canary Islands) at 1701, and 4X5ORE (Israel) at 0811, while a brief excursion on s.s.b. netted a contact with 9E3/DH (Canada) at 1533UTC.

Meanwhile, Don G3NOF worked a nice one in the shape of PA3HEN/MM off the coast of Angola. Next came YB1WYN (Indonesia), Z7D7QO (St. Helena Island) QSL via KB2NS, 5313HG (Tanzania), and 9X0A (Rwanda) QSL via DL5WM, all using s.s.b.

Back to Ted G2HKU now again on the key who lists his 14MHz contacts with 9K2ZZ (Kuwait) at 1500. Operating later, at 1700 brought in K6QAW (west coast USA), 9K0A (Rwanda), EA8CN (Canary Islands), V7ENH (western Canada), and Z60Q South Africa.

The 14MHz band is where it often ‘dead’ band, eh? Keep up the good work, Pat!

**THE 18 & 21MHz BANDS**

The 18 and 21MHz bands have been the main ‘hang out’ for Charlie Blake M4AJJ, even though he’s been busy with non-radio activities lately! Charlie (See Fig. 2) works all s.s.b. on these bands, and has hooked up with A41LZ (Oman) at 1200 (QSL via OH2NU, 6W1QV (Senegal), and 8Q7AA (Maldives Islands) - QSL via N7TX.

**THE 28MHz BAND**

Last but certainly not least comes the 28MHz band. Here, Pat G3OUC in Newbury, has built a 10W s.s.b. rig for 28MHz, has been having some fun with it on the band. Based on a design from the Solid State Design for the Radio Amateur book, in conjunction with a dipole up at 10 metres.

Pat notes contacts with 7A3Q (Turkey), Z59PT (South Africa), EK4CK (Armenia), SB4J (Cyprus), UA4ZR (European Russia), V51DKL (Greece), VE3RE (Canada), and VD4NGB (USA). All were worked in less than five months, with a QRP 28MHz rig - not bad for QRP sideband on an often ‘dead’ band, eh? Keep up the good work, Pat!

**SIGNING-OFF**

Well that just about wraps it up for this month, and it’s signing-off time folks. My usual thanks to all reporters and correspondents for your information and other publication material, that’s what makes the column what it is. New reporters are more than welcome, so keep up the good work, and good DXing to all of you!

**Editorial note:** It’s essential - if you wish to have your reports included in this column - to ensure that you provide full information on transmission/reception mode, power levels, frequencies, times of operation and antennas used. The column is aimed at helping everyone to get the best out of h.f. operation and not to provide ‘personal score’ listings! Help Leighaxon to help you! Rob Mannion G3XFD.

**THAT’S ALL FOR THIS TIME. SO UNTIL NEXT TIME CHEERIO.**

73 Leighton GWOBI

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**PW LISTENING & OPERATING WATCH LIST**

At all times in UTC

- **Charlie Blake M4AJJ** listens & operates: 0500 - 0700 on 7.061MHz s.s.b. with an RND 525 receiver and sloping wire antenna.

- **Steve Locke GWO5GL** operates: 1100 - 1500 most days around 14.180MHz s.s.b. using a Kenwood TS-940 beam antenna temporarily out of commission due to damage.

- **George Woods G3LPT** listens & operates: an open net on 29.570MHz f.m. every weekday morning (except Mondays) at 0930.

- **Don McLean G3NOF** listens & operates: 1030 Saturdays on 3.685MHz on the ISWL Net or 1030 Sundays on the Yeovil ARC Net 3.665MHz s.s.b. using a Kenwood TS-950 & trapped dipole antenna.

- **John Wheeler G0ULX** listens & operates: on 3.530MHz QRP c.w. using an Alinco DX-70 receiver and long wire antenna. Also at 2300 on either 3.530, 7.025MHz (c.w.) or 3.7MHz s.s.b. Occasionally on 14.035MHz c.w. between 0100 - 0200. (All operation dependent on PW work load).

- **Sean Gilbert G4UJC** listens & operates: around 0700 to 1100 and 2100 to 0000 seven days a week on 14MHz and 7MHz c.w. using an FT-370 and Alinco DX20 transceivers at 5/25W output and a G3VR dipole antenna in the loft space.

- **T. Ibison GW6T** listens & operates: each evening between 1900 - 2000 or on around 7.020MHz c.w. or 14.035MHz c.w. using a Ten Tec Scout at 50W.
is a true standard with full interworking between systems.

This is great news for you and I, and means that it is now safe to go out and buy that new 56k modem as I am told of course that it has been upgraded to the new V.90 standard. Most manufacturers are well advanced with the release of the new modems so they should be in the shops by the time you read this.

If you've already bought your modem, don't worry, as most modern 33.6k modems are flash upgradeable. This is where you can effectively load a new set of software yourself.

The best way to see if your modem is suitable is to look-up your modem manufacturer on the Internet. You should find that just about all the manufacturers have some form of on-line help for software downloads. If it's not obvious from the front page, try going to their support page.

If you want to keep bang up-to-date with what's happening with V.90 take a look at the Internet 56k site which can be found at http://www.56k.com if you've any hints or tips to offer please drop me a line.

FILE TRANSFERS

Whilst most newcomers to the Internet spend most of their time using just their Web browser to get around, there are other systems that can, at least in some cases, prove much quicker. One that I find particularly useful is File Transfer Protocol. Although it sounds complicated, it really is very simple to use and can be a very quick way to find and download software from the Internet.

One of the reasons for wanting to use more than one system to work with the Internet is linked to the way in which your computer handles data travelling to and from the Internet. I mentioned WINDOWS SOCKets or WINSOCK last month and it's this part of the system that effectively gives you a number of connections to the Internet using the same dial-up connection. I know it sounds complicated, but it's best visualised rather like a mains extension block that lets you connect several appliances to the same power outlet.

In the WINSOCK system you can run several different programs that each use the Internet at the same time. The benefit of this system is that you can be looking around the target site using your Web Browser while leaving the File Transfer Protocol (FTP) program to download the latest software.

Let's take a slightly closer look at what this FTP is all about. In order to make use of FTP you first need to get your hands on some client software. This is not too difficult as most Internet Service Providers included an FTP program in their main software package. If yours doesn't then there's plenty of shareware and freeware systems available on the Internet.

A good place to look for applications is Strood's business of moving files, let's take a look at just how you get connected to another computer on the Internet. Once you've got your client software you next need to find a site to connect to.

Now most software clients come ready set up with most of the larger FTP sites already loaded. If yours doesn't, then try using the following site: ftp.funet.fi This popular Finnish archive happens to be particularly good for radio related software.

Once you've typed in the address you can then ask for the program to connect you. Not surprisingly, when you log on to another computer on the Internet there has to be some restrictions as automatically default to anonymous login.

Once you've logged-on, moving around is really very simple indeed. You can use the small folder icon to move about the computers disk space and to change directories.

When you find a file you want just double click on it to start the retrieval process. Incidentally, this download is supplemented by a progress bar that usually shows both the transfer rate in bits/second and the progress.

If you're using more sophisticated FTP programs such as CuteFTP you even have the option to make particularly good use of the index file. This index file is simply a text file that contains a one line description of each of the programs in that directory.

With simple systems you have to download and view the index file to find out more about the programs. In CuteFTP you can set the program to automatically download this file and display the one line descriptions right next to the program listing in the main window. Really useful browsing around FTP archives.

If you've got Windows '95 loaded on your PC then one item of radio software that you really ought to get yourself is the excellent Spectrogram v1.2. This incredible freeware program gives you real-time spectrum analysis at your finger tips. The latest version of the Spectrogram program is particularly useful because of its real-time analysis modes. For the radio amateur the Scan Input mode is probably the most useful because you don't have to make a recording of the audio signal you want to analyse. In this mode the program will analyse and display the signal in real-time without consuming vast quantities of valuable hard disk space.

The most obvious use for the program is as a very sophisticated tuning aid for anyone with an interest in the data modes. However, you can also use it very successfully to look at all types of audio signal. If you haven't got a copy of Spectrogram you should find it at: ftp.funet.fi/pub/ham/misc/gram412.zip If it's disappeared from that site, just search around the popular archives for the filename.

If you'd like to order a real copy of Hamcom/VIVAX, etc. I've arranged a very special offer with the Public Domain and Shareware Library (PDSL). They have put together a library set of all five disks for just £12 all inclusive.

Using PDSL also makes ordering much easier as you can accept all the usual credit cards so you can order by phone - you don't even have to write a letter! Please direct all orders and enquiries about this disk set to PDSL Winson House, Beacon Road, Crowborough.
THAT'S ALL FOR THIS TIME. SO UNTIL NEXT TIME 'HAPPY SURFING'. SEND NEWS OF YOUR INTERESTING FINDS TOGETHER WITH ANY QUESTIONS TO ME AT THE ADDRESS AT THE HEAD OF THE COLUMN.

THANKS TO A NEW HIGH-Powered MEDIUM WAVE TRANSMITTER RFI COULD BE BEAMING PROGRAMMES TO THE MIDDLE EAST BY EARLY NEXT YEAR (SEE TEXT).

BROADCAST
REPORTS & INFORMATION TO ME PLEASE

PETE R SHORE,
C/O PW EDITORIAL OFFICES,
ARROWSMITH COURT,
BROADSTONE,
DORSET BH18 8PW

E-MAIL:
petershore@pwpub.demon.co.uk

THIS MONTH PETER SHORE HAS NEWS OF A DUTCH STATION'S RECEIVER SHOPPING LIST ALONG WITH LOTS OF NEW FREQUENCIES AND PROGRAMME SCHEDULES.

It is a time gone out of the high-frequency bands, both for Radio Amateurs and short wave listeners? This is certainly an impression which I have come to accept in recent months, and it seems to be one shared by a number of receiver manufacturers and retailers who I have talked to. The number of people buying traditional transmitting and receiving equipment is falling as a growing percentage of the population - including a good proportion of people who have been long term amateurs and listeners - hook themselves to the Internet to talk to people around the world and to listen to broadcasters.

And as the market shrinks, so does the number of equipment manufacturers. Try and find an ordinary portable short wave receiver, and you are limited in the UK to just a couple of brands. Grundig has all but pulled out of the short wave market across Europe, and its North American distributor is sourcing models specifically for that region direct from the Far East. Gone are the days when high quality equipment was designed and built by engineers in Germany who understood short wave from beginning to end and produced receivers which were really well suited to the task in hand.

But perhaps short wave is about to have something of a renaissance. At least that's the plan of the world's leading international broadcasters and the associated transmission companies. At a meeting in China during early March, a new organisation was launched which intends to revolutionise broadcasting below 30 MHz. Digital Radio Mondiale is promoting the digitalisation of the a.m. band in order to deliver i.m. quality sound over even the most difficult short wave paths.

At a stroke all the interference and fading which short wave suffers will disappear, to be replaced by almost perfect reception. And all that listeners will need will be a new receiver which, Digital Radio Mondiale claims, will cost little more than £20, far more before existing short wave sets. Big names are involved with Sony and Sangean (who make the Roberts Radio short wave receivers) committed to producing the new digital receivers and getting them in the shops by 2003.

Digital a.m. will work alongside conventional analogue transmission, so that people worldwide will have a choice of listening. That's vital as the take up of new radio sets is going to be slow at first. But with enough momentum, and sufficient content available on the new digital services, the speed of implementation will pick up. I'll bring you more information about how digital a.m. is going to affect you and me as listeners in the coming months here in PW. In the meantime, don't let the impending digital revolution stop you from looking for absolutely impartial and highly accurate information about the entire range of short wave sets that are on the market produced by Radio Netherlands.

LATEST EDITION
The latest edition of the Dutch station's Receiver Shopping List is now out, and is available either on the Internet at www.rnwsnl or by post from PO Box 222, 1200 JG Hilversum, The Netherlands. The book is a vital resource for anyone who is even remotely interested in choosing a new set, or simply comparing what's on the market with the equipment you have at home.

FREQUENCIES & PROGRAMMES
The new season for frequencies and programmes began at the end of March when most of the world changed its clocks. During the summer time in the northern hemisphere, higher frequencies tend to be used during the daytime for long distance transmission, so if the station you want appears to have vanished, look up in the higher megahertz bands.

Israel's summer schedule for English is now: 0400-0415 on 17.295, 11.605 and 9.435 MHz; 0430-0435 on 15.650 and 16.504 MHz; 1400-1430 on 17.535 and 15.650 MHz; 1545-1557 on 17.295, 15.650 and 11.605 MHz and 1900-1925 on 15.650, 15.64, 11.605 and 9.435 MHz.

STATION NEWS
Radio Finland has changed the time of its half-hour English programme for North American listeners. The new time is 0200 UTC and the frequencies are 9.78 and 11.90 MHz. The morning transmission stays put at 1230 UTC on 15.40 and 11.90 MHz on Sundays only.

Radio Afghanistan is a station which beams anti-Taliban propaganda to Afghanistan. It broadcasts in Dari, the national language of Afghanistan, at around 0230 UTC on 7.084 MHz for an hour, with a further 60-minute programme on the same frequency at 1430 UTC.

A new high powered medium wave transmitter could be beaming programmes from Radio Monte Carlo and Radio France International to the Middle East by early next year. A 1200kW transmitter may be built on Cyprus to increase coverage of the strategically important region for the two French and Arabic language broadcasters. The frequency will be 1233 kHz, which currently has a 600kW transmitter installed.

The Voice of Malaysia has English programmes on short wave at 0435-0435 on 6.175, 9.75 and 15.295 MHz. The first two hours consist of the Voice of Islam.

UNUSUAL CATCH
An unusual catch reported by German Dieter Harald Kuhl is of the Voice of Justice from the Republic of Mountainous Nagorny Karabakh. This station operates on Wednesdays at around 1500 UTC and Fridays at 0600 UTC, both on 9.677 MHz. The station's address is Tigran Meds Street 13A, Stepanakert, Republic of Mountainous Karabakh.

GOOD NEWS
Good news from Canada, with the government giving C$15 million over the coming three years for capital expenditure at Radio Canada International (RCI), including new transmitters which will be digital-capable. Thank goodness that there has been a change of heart after years of squeezing RCI until it was nearly strangled!

THAT'S ALL FOR THIS TIME SO, UNTIL NEXT MONTH, GOOD LISTENING!

Peter
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Howes Kits contain good quality printed circuit boards with screen printed parts locations, full, clear instructions and all board mounted components. Sales, constructional and technical advice are available by phone during office hours. Please send an SAE for our free catalogue and specific product data sheets, or you can browse this information on our Internet Website (URL at top). UK delivery is normally within seven days.

73 from Dave G4QKH, Technical Manager.
Please mention Practical Wireless when replying to advertisements

INNOVATION FOR THE NEXT MILLENNIUM

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