HRT

HAM RADIO TODAY

Incorporating SCANNERS

MARCH 1993 £1.70

Home Construction Special

Packet Radio TNC Kit Review

Starting out in project building

CQ WORLDWIDE CONTESTING

9 770269 826031 03

Argus SPECIALIST PUBLICATION BEST VALUE

NOVICE • PACKET • REVIEWS • PROJECTS • SATELLITES

FOR THE PRICE, YOU'D EXPECT THE WORLD.

YOU'LL GET IT.

The TS-950SDX is at the very pinnacle of the Kenwood HF transceiver range. And when you look at its specification, that's not surprising.

It boasts a number of highly advanced features like built-in Digital Signal Processing, 50 Volt MOSFET finals, AIP (advanced intercept point), built-in sub-receiver and built-in automatic antenna tuner. To name but some of its world-leading technical tours-de-force.

Just as important, it's made with Kenwood's traditional attention to detail and reliability, to stand up to a lifetime's use. A fact which your Kenwood dealer will be proud to demonstrate when you visit for a closer look at this world-leading transceiver.

The TS-950SDX is part of a range of Kenwood HF transceivers priced from around £1000 to £3500. And although quality is never cheap, it's still a small price to pay to have the world of amateur radio at your command.

KENWOOD

HOME AUDIO, CAR AUDIO, COMMUNICATIONS EQUIPMENT, TEST AND MEASURING INSTRUMENTS, TELECOMMUNICATIONS

HRT HAM RADIO TODAY

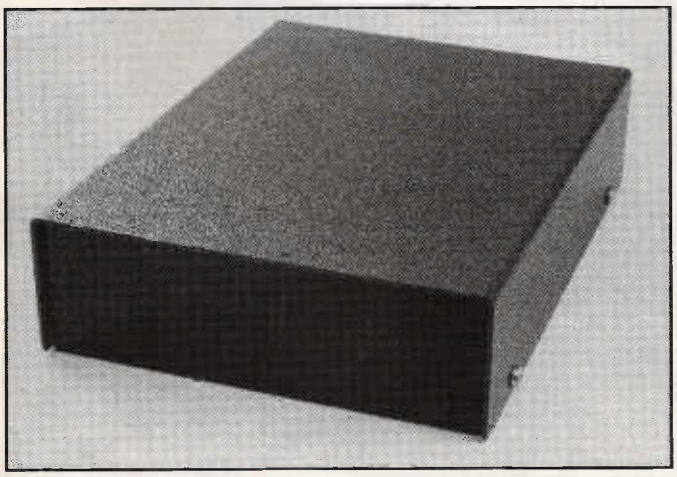
VOLUME II NO.3 MAR 1993

CONTENTS

REGULAR COLUMNS

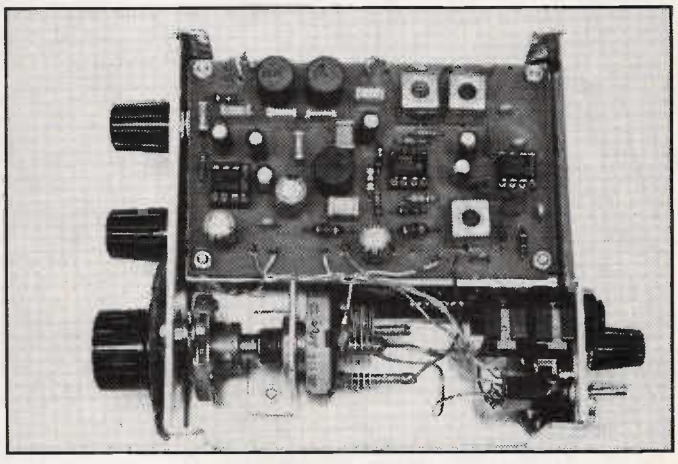
REVIEWS

FEATURES



PROJECT

NEWS AND VIEWS



Home Construction – getting started.

Packet TNC kit reviewed.

KENWOOD APPROVED DEALERS

AXMINSTER
Reg Ward & Co, 1 Western Parade, West Street, Axminster, Devon.
Tel: 0297 34918

BELFAST
GM Electronics, 1-3 Evelyn Avenue, Belfast, Northern Ireland.
Tel: 0232 471295

BIRMINGHAM
South Midlands Communications, 504 Alum Rock Road, Alum Rock, Birmingham. Tel: 021 327 1497

BIRMINGHAM
Ward Electronics, 422 Bromford Lane, Ward End, Birmingham.
Tel: 021 328 6070

BOURNEMOUTH
Lowe Electronics, 27 Gillam Road, Northbourne, Bournemouth.
Tel: 0202 577760

BRISTOL
Lowe Electronics, 79 Gloucester Road, Patchway, Bristol. Tel: 0272 771770

BRISTOL
AMDAT, 4 Northville Road, Northville Bristol. Tel: 0272 699352

CAMBRIDGE
Lowe Electronics, 162 High Street, Chesterton, Cambridge.
Tel: 0223 311230

CARDIFF
PMR Ltd, Industrial Estate, Gwaelod-y-Garth, Cardiff. Tel: 0222 810999

CLACTON ON SEA
Coastal Communications, 19 Cambridge Road, Clacton on Sea, Essex.
Tel: 0255 474292

CORK
Intronic Ltd, Windsor Hall, Glounthaune, Cork, Eire.
Tel: 010 353 2135 4422

COUNTY TYRONE
Tyrone Amateur Electronics, 44 High Street, Omagh, Co Tyrone, Northern Ireland. Tel: 0662 2+2043

CUMBERNAULD
Lowe Electronics, Cumbernauld Airport Cumbernauld. Tel: 0236 721004

DONCASTER
Alan Hooker, 42 Nether Hall Road, Doncaster, South Yorkshire.
Tel: 0302 325690

EALING
Martin Lynch, 286 Northfield Avenue Ealing, London. Tel: 081 566 1120

EASTCOTE
Lowe Electronics, 223 Field End Road, Eastcote, Middx. Tel: 081 429 3256

EDGWARE
Haydon Communications, 132 High Street, Edgware, Middx.
Tel: 081 951 5782

FIFE
Jaycee Electronics, 20 Woodside Way, Glenrothes, Fife. Tel: 0592 756962

HANGER LANE
A R E, 6 Royal Parade, Hanger Lane, London. Tel: 081 997 4476

HAYWARDS HEATH
Bredhurst Electronics, High Street, Handcross, Haywards Heath, West Sussex. Tel: 0444 400786

HOCKLEY
Waters & Stanton Electronics, Spa House, 22 Main Road, Hockley, Essex
Tel: 0702 206835

LEEDS
South Midlands Communications, Nowell Lane Ind Est, Nowell Lane, Leeds. Tel: 0532 350606

LEEDS
Lowe Electronics, 34 New Briggate, Leeds. Tel: 0532 452657

MAIDSTONE
Lowe Electronics, Chatham Road, Sandling, Maidstone. Tel: 0622 692773

MATLOCK
Lowe Electronics, Chesterfield Road, Matlock, Derbyshire. Tel: 0629 580800

NEWCASTLE
Lowe Electronics, Newcastle Airport, Woolsington, Newcastle
Tel: 0661 860418

NEWPORT PAGNELL
Photo Acoustics Ltd, 58 High Street, Newport Pagnell, Bucks.
Tel: 0908 610625

NEWTON LE WILLOWS
Amateur Radio Comms Ltd, 38 Bridge Street, Earlestown, Newton Le Willows Merseyside. Tel: 0925 229881

NORFOLK
Eastern Communications, Cavendish House, Happisburgh, Norfolk.
Tel: 0692 650077

NORTH HUMBERSIDE
Peter Rodmell Communications, Field Head House, Leconfield, North Humberside. Tel: 0964 550921

NOTTINGHAM
R A S Nottingham, 3 Farndon Green, Wollaton Park, Nottingham.
Tel: 0602 280267

PORTSMOUTH
Nevada, 189 London Road, Portsmouth Hants. Tel: 0705 662145

SLOUGH
Lowe Electronics, London Heathrow, 6 Cherwell Close, Langley, Slough, Berks. Tel: 0753 545255

STOURBRIDGE
Dewsbury Electronics, 176 Lower High Street, Stourbridge, West Midlands.
Tel: 0384 390063

KENWOOD

HOME AUDIO, CAR AUDIO, COMMUNICATIONS EQUIPMENT, TEST AND MEASURING INSTRUMENTS, TELECOMMUNICATIONS

CQ de G8IYA

Sometimes, boring paperwork suddenly becomes interesting

Here at the HRT office, being a member of the 'press', I tend to get literally bombarded with paperwork in the post, originated by all sorts of organisations. Some are very relevant, the RSGB for example is seeking opinions on a Morseless HF licence (see this month's 'Radio Today') and the Radiocommunications Agency have just prosecuted two amateurs. However, some I 'searched out' was also rather, let me say, 'interesting', following the many 'scaremonger' type QSOs I've been coming across regarding the 70cm band.

The Low Power Association are the UK group for users of deregulated low power radio. They are sponsored by the RA, and act as a means of liaison between the RA and users and manufacturers of such radio gear. This can range from car alarms, old folks warning devices, down to walkie-talkies and wireless baby alarms. They recently polled their members, which included a British amateur radio equipment manufacturer (yes, there are a few of them left) for their views on spectrum requirements and the agreed European band of 433-434.8MHz for low power radio. Yes, that bit of 70cm we use for repeaters and so on, has been allocated to someone else. Great. The Association says that "This band is currently inside a large allocation provided for radio amateurs. The licensed power levels can be up to 4 kilowatts ERP. Amateur radio repeaters are present in this band, usually situated on high ground giving a huge area of coverage. There is no way that low power devices can co-exist safely with this sort of competition. Therefore for the band to be of any use, it has to be made exclusive." Exclusive to them, that is.

Now as I write this, the RA are putting together their review of the radio spectrum between 28 and 470MHz, and last year they asked for input from radio amateurs on this (see the *CQ de G8IYA* in the Oct 92 issue). As well as, no doubt, many 'individual' inputs, our national society the RSGB submitted a response on behalf of UK amateurs, a copy of which they kindly sent to us (thanks Sylvia). If in such matters we present a unified case to them from a body such as this, maybe in addition to a flood of 'individual' inputs if the RA so desire, as they did, this can only be for the good of amateur radio. I've said it before in these pages, we at HRT don't 'suck up' to the RSGB, but we need a national society (who runs it is up to you) and something like this can only strengthen their need for the support of UK amateurs as members. Think about it.

Oh no, the EMC Directive!

Another one of those bits of 'paperwork' was a document entitled 'EMC Certification of Radio Transmitting Equipment'. The *EMC Directive* is a European Community directive, which will shortly be implemented in the UK. One of its 'better' points is to ensure that electrical and electronic items on sale, should be *immune from interference*, i.e., it should have electromagnetic capability with the environment in which it is intended to operate. Have you been seeing the 'CE' mark on various items on sale nowadays around Europe? I have, and it means that the apparatus complies with the EMC directive, where appropriate.

No More TVI Complaints?

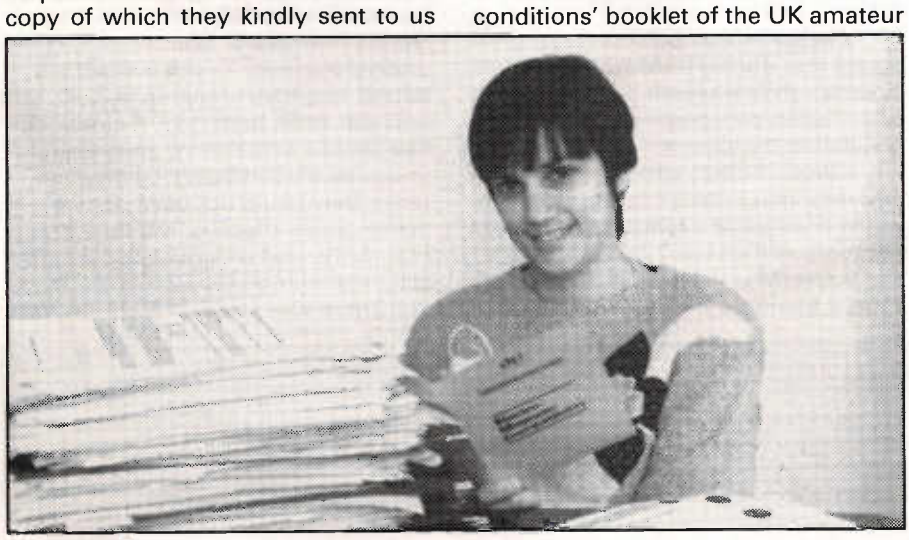
Great, maybe this means that I can run full legal power on 70cm with a high gain stacked beam system (20kW ERP!) pointed straight at my neighbour's TV aerial, and if his TV gets wiped out, is it faulty? No chance! Well, maybe. The immunity requirement is for equipment to operate satisfactorily when situated in strong electromagnetic fields, 2V/m being given as an example. Maybe it's a case of 'get the calculator out and see what power I can run' time! A recent addition to the 'terms and conditions' booklet of the UK amateur licence has been made, indicating that you could need to reduce the field strength generated by your transmitter in such breakthrough cases. Filters added at the affected receiver do tend to help of course, and with this in mind it's good to see the 'Radio Amateurs Guide to EMC' has just been published by the RSGB, a very worthwhile 'buy' in my opinion, and the Tech Ed has already prepared a short review on this for HRT.

But coming back to the EMC directive, this also says that equipment must not *cause interference*. If you want to use a professional transmitter in Europe, e.g. a cellphone or a PMR transceiver, it needs to be 'type approved'. A production sample is tested by an independent laboratory to ensure it meets mandatory requirements, such as spurious emissions and so on, it costs around £2,500 for testing, say, an FM handheld transceiver. This of course will continue in Europe, with the 'CE' mark indicating compliance.

The CE Mark

Now, if you and I are thinking the same way, you'll probably guess what I'm going to say next. Yes, you may soon be seeing the 'CE' mark on amateur radio gear. Fortunately, the Directive has special provisions for amateur radio transmitting apparatus. Where this is available commercially, it'll need to be certified in the same way as non-radio transmitting apparatus. If it's not available commercially, it's deemed to be outside the scope of the directive. In other words, you can build your own linears or whatever without needing them tested or 'approved', which amateurs in some countries must do before they can start building and using their rig. But it raises an interesting point for radio dealers and manufacturers.

Amateur gear will be tested either to *harmonised EMC standards* which are being drawn up, or (probably for receive gear and accessories) it'll instead comply with the EMC *protection requirements* where a 'technical construction file' including a report from a 'competent body' is produced for the piece of equipment. Testing a transmitter will probably need the use of expensive test equipment such as spectrum analyzers, and the hire of such gear for even a day isn't cheap. What happens to radio kit suppliers? The RA tell us that they're still formulating the method for amateur radio equipment testing, and that it'll only come into force in 1996. But it'll come. Here Chris, do you think the EC will consider the HRT review lab?



LETTERS

Letter of the month

Dear HRT,

I am a keen ex-PMR man and through your magazine I would like to ask if any readers are interested in forming an ex-PMR club. I am prepared to do the work of collating all the information, i.e., keeping a register of who has what sort of item, spares, drawings etc., even to keeping photocopies for people's use. If anyone is interested please write to me; Bob Gant G0LXP, 25 Worcester Ave, Garstang, Preston, Lancs PR3 1FJ, please enclose an SAE.

Keep up the good work HRT and thanks again for the best radio magazine available. Your 'helplines' is an excellent idea.

Bob Gant, G0LXP.

Editorial comment;
Well, it would certainly save Chris G4HCL (our Tech Ed and author of the Surplus Two-Way Radio Conversion Handbook) a few hours each week in helping out the large numbers of amateurs who contact him! Seriously though, this is an excellent idea and we welcome Bob's generous approach to aid amateurs, and we'll gladly help in 'sharing the load' by working with each other. If readers are interested, do contact Bob, and maybe we'll all be able to help each other.

Dear HRT,

With reference to the letter in your 'Helplines', January 93 issue, from Mr. D. Barr in Tyne and Wear.

Firstly, where is the sense and the feeling of our hobby that someone who at first glance is someone who may not fit the ideals of many amateurs? Who cares what someone looks like? After all, beauty is in the eye of the beholder is it not?

I read the letter from Derreck and then telephoned him and had a pleasant chat, I live in London so am unable to help him directly, but I have put him in touch with Pete Pennington (via the Dover Club) as Pete got me started in amateur radio with his postal course as featured in an edition of HRT (many thanks Pete). I have also sent Derreck a short book list that I found useful and a copy of the RA booklet 'How To Become A Radio Amateur', latest edition. Is there no 'Elmer' in Derreck's area who doesn't care what someone may look like and give him a start? We all needed a helping hand, so come on do what I did and talk to him!

CQ, CQ, CQ, CQ Tyne and Wear, Pan, Pan, Pan, any Elmer, any Elmer, any Elmer, will you help?

John Maunder, G0PKU.

Editorial comment;
Derreck wrote into our 'helplines' asking for help getting into amateur radio, as he had received the cold shoulder from several local amateurs because of his skinhead appearance. If you would like to help, you can write to; Derreck Barr, 11 Cambo Place, Preston Gardens, North Shield, Tyne and Wear NE30 3RJ, Tel. 091 259 5239.

Dear HRT,

I was concerned to read in the otherwise excellent QRP Corner section of the December issue of HRT that Dick Pascoe G0BPS advocated the unauthorised variation to call signs, in contravention of the rules laid down in the Terms, Provisions and Limitations Booklet BR68 which accompanies a Radio Amateurs Validation Document.

Dick advised operators working with low power to use the suffix /QRP when on QRP frequencies, and also to use /QRP so that operators hearing a weak signal would not mistake it for DX.

Clause 7 (1) in Booklet BR68 states that during transmissions the licensee shall transmit the callsign specified in paragraph (b) of the Validation Document.

Clause 7 (3)(a) informs the operator that he/she shall use the suffix /P when at a temporary location, and clause 7 (4) says that the suffix /M is used when Mobile, or /MM if Maritime Mobile. No other suffixes are authorised.

If it was permissible to add suffixes arbitrarily, then surely I could use the callsign G0OZI/RSGB or G0OZI/ISWL. I suggest that if QRP operators wish to draw attention to the fact that they are using low power, then they should use a phrase such as "G0BPS working QRP". It takes no longer to say than Dick's advocated method.

Newly licensed Novice operators will be using low power, and it is important that they do not commence their amateur radio hobby by falling foul of the licensing agency.

Evelyn May G-17197/G0OZI

Editorial comment;
We forwarded Evelyn's letter to Dick G0BPS, who has replied in his 'QRP Corner' column this month. What do other amateurs think about this?

Dear HRT,

Further to G4OWY and G8VUK/N3KIP's comments regarding implementation of incentive licensing in the UK (Letters column, HRT Nov 92). As something of a 'professional amateur' for a number of years (Assistant Secretary ARRL/IARU, Managing Editor CQ Magazine, Assistant Publisher/Editor 73 Magazine, Managing Editor/Communications Editor Davis Publications Electronics Group) with an 'insider's knowledge' of the process leading to the imposition of so-called incentive licensing in the States and first hand observer of its effects, I could not agree more fully with those gentlemen's assessments.

To call the horrific mess created by incentive licensing in the States a catastrophe would, in my view, be a classic example of British understatement. To put it in simple terms, incentive licensing gutted amateur radio in the US. If someone had set out with malice aforethought to devise a way to destroy amateur radio, they could not have done a better, more effective, job than the FCC, ARRL and other supporters achieved.

There was simply no reason for

£10 for the Letter of the Month

Do you have something constructive to say on the state of amateur radio today? Perhaps you'd like to put your viewpoint to the readers, get some discussion going, or give an answer to one of the issues raised? We'll pay £10 for the best letter we publish each month. So write in with your views, to Letters Column, P.O. Box 73, Eastleigh, Hants SO5 5WG.

incentive licensing in the States. The existing Class A and B licensing structure had worked well and without adverse comment from the amateur radio community for a number of years. Most notably, the Novice and Technician class licences have never, from day one, met their stated goals. Over the years various perks were introduced and still did not produce the results originally stated for those licence classes. The Balkanisation of the US amateur bands is a disgrace and those responsible should be held to account with due penalties imposed upon the guilty.

Incentive licensing in the States is a textbook example of the greedy few seeking to increase their profits at the expense of the majority. Let's hope that British amateurs have the good common sense to defeat any such ill-conceived proposals as would impose incentive licensing upon the Queen's loyal subjects.

Morgan Godwin W4WFL, ex-G5AYL

Editorial comment;
Incentive licensing has it's 'pros' and 'cons', the Radiocommunications Agency tell us that they are very willing to consider the introduction of an 'Advanced' licence call if amateurs want it. If they don't, well, nothing will happen, so nothing's being 'forced down our throats'. However we already have a 'four stage' licence with the introduction of the Class A and B Novice which has, to date at least, shown to be working in introducing 'New Blood' to the hobby. What we need to do, is to keep that 'New Blood' in our hobby!

Dear HRT,

After having got familiar with the June 92 issue of your magazine occasionally received from my British pen pal, there appeared a strong feeling of nostalgia for my former military speciality as I read about more and more things and problems familiar to me. I was a radio operator during my two year military service, working as CW communications operator and receiving high speed air notification information (also in CW mode). However, after being demobilised in 1988 I didn't have any opportunity to become licensed civil amateur, first of all because of having no chance to get proper gear in our country. So I'm still remaining SW DXer, my main interest being broadcast stations, but not giving up hope to start again that fascinating hobby of radio communication.

At present I am in contact with several British amateurs who are interested in broadcast stations DXing as well, and I have known about the problem of DXing stations in the CIS broadcasting in Russian language. Many stations don't send QSLs if the report is written in other language than Russian. So I'd like to offer a kind of solution of this difficulty, if you consider it possible to publish this letter in your magazine.

If any HRT readers would like to send reception report to the station on the territory of the former Soviet Union broadcasting in Russian, but don't know the language, then send your report to me in English. For £1 or 4 IRCs, I'll make a qualified translation and forward it to the station you need in the CIS. For an additional £1, I could receive the correspondence with the station and then send you the reply translated into English. This price just covers leasing computer time to compile the reports, and greatly increased postal tariffs in Russia. My address is; Dmitri A. Souslov, P.O. Box 96, Kazan - 80, 420080 Russia.

Dmitri A. Souslov.

Editorial comment;
So now you know how to get those CIS QSLs!

Dear HRT,

Firstly, I am writing this letter in praise of both Waters and Stanton, and muTek.

I sent off a cheque to Waters and Stanton for a 2m linear, it was posted on a Friday. The postman brought the linear on the following Tuesday, thank you very much for such an efficient service. Next muTek, I had problems installing their front end board into my IC-251E. I sent the rig to muTek on Monday and it was returned to me on Friday complete with board fitted, and more importantly, the only cost was for the carriage. These two companies both deserve praise for their work.

My next question is, has anyone got any programs (comms) for the Amstrad CPC 464+? Only being new into radio, and knowing nothing about computers, leaves me a little bit lost. Obviously any expenses incurred i.e., tapes, postage etc. will be paid. My address is; 15 Aberdare Rd, Church Lane, Eston, Middlesborough, Cleveland TS6 7PB, Tel. 0642 463651

I hope this letter can be published to show off some good service, and it may also get me some programs to run on the computer. Keep producing a very informative magazine, it is a pleasure to read it!

Hugh Purvis, G7NQR.

Editorial comment;
One does hear many 'horror stories' about bad service, it's good to hear amateur radio companies are trying hard to please. In these recessionary times some firms go 'down', others 'stay afloat', we can guess who'll be the type of dealers to keep their head above water.

RADIO TODAY

RSGB Seeks Opinions on HF No-Code Licence

One of the topics currently being discussed by the HF Committee of the Radio Society of Great Britain, is the question of access to the HF bands (below 30MHz) without the necessity of a Morse qualification. Such a licence would be referred to as a 'code free licence'.

The RSGB tell us that amateur radio is controlled internationally by the regulations set by the International telecommunications Union (ITU) which is an agency of the United Nations. They add that current ITU regulations require that radio amateurs operating at frequencies below 30MHz demonstrate their proficiency at sending and receiving Morse code, though the speed and nature of any test is not specified.

The RSGB wishes to consult as widely as possible and seeks input on the question of a code free licence from any UK radio amateur or listener, whether they are for or against the idea of such a licence. Because of the anticipated level of input, letters to them will be acknowledged but cannot be replied to individually. You should send your views, opinions and comments to; The HF Committee, c/o RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Herts. EN6 3JE, to arrive no later than 8 March 1993. Letters should be clearly marked 'Code Free Licence' on the bottom left hand corner of the envelope.

RARE - Radio Amateur Relief Expeditions

Following their previous involvement with relief workers in Romania, and following requests for more help, a group of amateurs have decided to set up a new organisation, Radio Amateur Relief Expeditions, to properly organise and coordinate events. Lead by Dave Davies G0KWY of Swansea and Don Sunderland G6FHM of Shrewsbury, and assisted by a retired Lt. Colonel with a vast experience in many fields, they hope to achieve charity status and to create a database of radio amateurs who wish to help and/or take part in expeditions.

Some of their current projects are; finding specific items requested by Turnu Severin hospital in Romania, requests for radios to be used for hostels for the homeless street children in Bucharest, help in setting up a kindergarten in Bucharest, and relief work in Yugoslavia. They have also planned to have been to Sarajevo and back before Christmas.

They tell us that this is now a very exciting time for them, and hope that the future will hold many and different experiences for their organisation in helping with communications and becoming involved wherever their expertise is needed. They ask for your help in this, to aid the underprivileged and stricken people in these areas. Members who are not able to go on expeditions could play an essential part in procuring equipment and so on, and they need members who have skills and experience as well as being radio amateurs, in medical, engineering, teaching and building areas, plus HGV drivers etc. If you would like more details, contact Don Sunderland G6FUM, 1 Allfield Cottages, Condover, Shrewsbury, SY5 7AP, Tel. 0743 873815/874841, Fax. 0743 874729.

Great Ormond St. Hospital Special Event Station

Between the 24th and 27th February 1993, a special event station is to be held at the Great Ormond Street Hospital in London. Activity is planned from 8.00am to 8.00pm each day, on the HF frequencies of 3.740MHz, 7.070MHz, 14.170MHz and 21.170MHz, with 6m, 2m, and 70cm activity also taking place, Five operators will take part, using three radios in total.

The event has two purposes;

a) To raise as much as possible for the hospital, and

b) To widen the awareness of the Novice Licence. The event will be opened at approx. 10.45am by the Duke of Edinburgh, in an opening contact with King Hussein of Jordan.

The station is hoping to gain a sponsorship from 'individuals' and companies alike, on a 'cost per contact basis'. So if you hear them, give them a call and you'll help them raise some funds, they've set a 'target' of 300 contacts a day. Whilst this isn't high for the number of radios/operators, a 'contest style' operation is not desired, giving plenty of time for children, staff and guests of the hospital to speak with amateurs.

All the radio equipment for the above bands is being supplied by South Midlands Communications Ltd., and Waters and Stanton Electronics are helping out with some of the aerials. A vehicle anti-theft system has been kindly donated by Vecta (Essex) worth over £400, which will be awarded to the person raising the highest amount over £400. You can get further details on the amateur radio station from Justin Johnson on 081 310 3311, or if you would like to help with a donation or would like to have a sponsor pack sent to you, call Pippa Foreman at Great Ormond Street Fund Raising Dept. on 071 916 5678

Valves back in the RAE

Just when you thought that valves were 'old hat', and no longer examined on in the RAE, they're back! It's all part of the aim of a 'common' licence across Europe, with the goal of a HAREC which stands for *Harmonised Amateur Radio Examination Certificate*. Right now, the CEPT T/R 61-01 recommendation allows the issue of temporary reciprocal licences in the countries which have adopted this. A HAREC would take this a stage further and permit the issue of permanent licences in countries which have implemented the CEPT agreement.

Here's where the 'valves' come in. It's necessary to make sure that all amateurs in Europe have passed an examination which covers the same basic areas of study. To ensure that this happens all syllabuses have to be harmonised.

To this end, there has been a change to City and Guilds RAE 7650 syllabus. Section 5 (Transmitters) adds a objective, 'The use of a valve as a power amplifier' with 'Valves, their application as RF power amplifiers, advantages and disadvantages'. It isn't an extra question though, there will still only be eight questions in section 5, but it'll make us 'harmonised'.

Liverpool and DARS 80th Birthday Award

This award is to celebrate the 80th birthday of the society, and is open to any licensed amateur or short wave listener living outside the postcode boundaries of Liverpool. The details are as follows;

Duration; 1st Jan - 31st Aug 1993.

Frequencies; Any for which the amateur is licensed.

Scoring; 1 point will be awarded for each contact with a member of the Liverpool and District Amateur Radio Society on each band or mode. 3 points will be awarded for each contact with a special club station, e.g. G3AHD, G8WCL or any special event stations run by the society. Logs; These must include date, time, band, and mode (for SWLs the callsign of the station worked must also be clearly shown).

Logs must be sent to G0IFK no later than 30th September 1993 and must include an SASE (or two IRCs for DX locations). The first prize is a handsome trophy and runner-up certificates are also available. A full copy of the rules and a list of current members of the society are available from G0IFK and each station will receive a full award list. For more details contact M. Faulkner G0IFK, 17 Lynnbank Road, Liverpool L18 3HE

Callbook - Price Correction

We mentioned the new RSGB Callbook and Information Directory in the Jan 93 issue, and mistakenly printed that the price of £7.00 to members or £9.50 to non-members included p/p - it doesn't! You'll need to add £2.00 for UK p/p, or £3.50 overseas surface. We're sorry about this, and our thanks to HRT readers for telling us. As well as being a 'callbook', it's a useful reference book with over 100 pages of additional information on HF and VHF awards, beacons, contest rules, EMC advice, repeater lists and maps, Morse practice transmissions and test details and so on. Available either direct from the RSGB (see 'Club News' pages for address), or from amateur radio dealers and bookshops (ISBN 1 872309 13 5).

Want a Pitcairn Island Licence?

For those who fancy their hand at a DXpedition to Pitcairn Is., the Radiocommunications Agency have announced that there is now a reciprocal arrangement between the UK and Pitcairn Island. The agreement allows for reciprocation between the UK Class A licence and the Pitcairn Island Full Licence.

New Channel for GB3ER

The 70cm voice repeater GB3ER, located near Chelmsford, Essex, is now back on the air on its new channel of RB3 (433.150MHz/434.750MHz). The repeater group would appreciate any signal reports, comments etc., for this contact G1FOA either on the air or via post; P. J. Franklin, 2 Boyne Drive, Springfield, Chelmsford, Essex, CM1 5QW.

Radio Amateurs Convicted

The Radiocommunications Agency have recently told us of two prosecutions, as an example of successful action taken against people who abuse amateur radio. At Sale magistrates court on 29th May 1992, two radio amateurs were convicted under Section 1 (1) of the Wireless Telegraphy Act 1949, having pleaded guilty to charges of using radio apparatus other than in accordance with a licence. The defendants were conditionally discharged and ordered to pay costs of £112 each. All their equipment was forfeited.

D-Day Coast ARS

This group has just recently formed, their headquarters being in the heart of Normandy. The society is open to all hams and listeners, especially those who have served their army at the time of the landings in June 1944. Their main activities range from QRP to contests, not forgetting wartime radio. They have a quarterly journal called Overload which published in French and English, an annual subscription is £10 ($20 or 100FF) which includes a few club QSL cards, and a subscription to Overload. For an information sheet they ask you to send an SAE and some form of contribution to; The D-Day Coast ARS, P. O. Box 44, 14430 Dozule, Normandy, France.

New DXCC Countries

The ARRL Awards Committee has announced that Croatia, Slovenia and Bosnia-Hercegovina have been added to the DXCC countries list, and they will now accept cards at their DXCC desk for these. Croatia (formerly YU2) which is now 9A, and Slovenia (formerly YU3) and now S5, are added for contacts made after the 25th May 1991. Bosnia-Hercegovina (formerly YU4) which is now 4N4 is added for contacts made after the 14th October 1991.

Low Cost Battery Soldering Iron

The new battery soldering iron from Maplin Electronics is priced at just £3.95 plus p/p (order code YZ42V). Powered by either four alkaline C cells or two ni-cad C cells, and a ni-cad charging socket is fitted for charging from an external 12-16V DC source. We're told the iron should be perfect for work where power points are not close to hand. The combined low voltage element/bit retracts when not in use, which serves both as a safety feature and also protects the element/bit from damage. A 'push to heat' button operates the iron, with working temperature being reached in around ten seconds. The iron comes supplied with one element/bit plus solder, spare tips being available at £1.95 (order code JU28F). Available from Maplin shops, or by mail order with a £1.20 p/p charge, from Maplin Electronics, P. O. Box 3, Rayleigh, Essex SS6 8LR, Tel. 0702 554161.

THE BEST DUAL-BA

Icom IC-W2

A return to **basic design fundamentals** to achieve the right size to features ratio, has produced this truly unique and compact FM transceiver from ICOM.

Perfect, simultaneous dual-band receive is easy even while transmitting on another band.

A **3-way tuning system** allows fast selection of frequency or memory channels by using top-panel control, digit keys or up/down keys.

Selective and group calling is made possible by using individual codes, **60 memory and 2 call channels** make the IC-W2E a most versatile and enjoyable to use transceiver.

Other features include: **built-in page** and **code squelch**, full **5W output** power (12V), **24-hour clock** with ON/OFF timer, **hi-speed scan** and **priority watch**, **auto-dialling**, and monoband working.

Impressed? then visit one of the three Radio Hamstores today, there's so much in store.

Icom IC-W21E

Simple operation, lightweight and dependable. The IC-W21E offers easy operation using only a few switches and independent volume/squelch controls for each band. The ergonomic, splash-resistant and tough design makes the diminutive IC-W21E a snug fit in the palm of your hand.

Cellphone-style 'whisper' function gives full duplex crossband operation via the mic equipped battery pack.

Easier repeater operation with repeater memory. Every time you access a repeater all settings are automatically memorized in an independent repeater memory, making recall of the last used repeater information both quick and simple.

Other features include: **battery capacity indicator**, optional remote-control from IC-HM75 speaker/mic, **5 selectable output power settings** including 15mW auto-select (when *dry* cells are failing), **battery state indicator, high capacity battery** (900MAh) fitted as standard, **64 memory channels** plus call and band edge memories and **monitor function** for checking repeater input frequency. **All this in a radio that is so small!**

VISIT ONE OF OUR 3 HAMSTORES TODAY FOR DUAL-BAND AND ALL OTH

We also stock items by AEA, AKD, Alinco, AOR, Barenco, Comet, Cushcraft, Davis, Dee Comm, Diamond, Icom, JRC, Kenwood, Lowe, MFJ, Microset, RSGB Publications, Sony, Toyo, Yaesu, Yupiteru etc. Second-hand and ex-demo equipment is always available.

Payment by Access, Visa and Switch. Part-exchanges welcome, finance arranged (subject to status). Interest free credit on selected new ICOM products. If you cannot visit an ICOM HAMSTORE in person, use our efficient Mail Order Service. Stock items normally dispatched within 24Hrs.

As always we offer full warranty o from the many authorized dealers within UK be replaced if the fault is deemed beyond s ICOM equipment purchased from an unau ICOM warranty.

Gordon G3LEQ & John G8VIQ at Bi Bay and Doug G0LUH & Paul G7MNI in our to seeing you soon.

LONDON
11 Watford Way, Hendon,
London NW4 3JL.
Tel: 081 202 0073
Fax: 081 202 8873

HERNE BAY
Unit 8, Herne Bay West Industrial Estate,
Sea Street, Herne Bay, Kent CT6 8LD.
Tel: 0227 741555
Fax: 0227 741742

BIRMI
Internat
963 Wolverhar
West Mid
Tel: 021 552 007

ALL STORES OPEN TUESDAYS TO FRIDAYS 09:00 - 17:00 & 09:00 - 16:00 SATURDAYS. N.B. Herne Bay cl

AND IN THE LAND

Icom IC-3230H

THE BEST OF BOTH WORLDS IN THIS WORLD

The IC-3230H has many attractive functions for complete dual-band capability, it is also **compact** (140(W) x 40(H) x 165(D) mm.) and fits easily in any vehicle. A **large function display** provides clear, simultaneous readouts of both main and sub operations.

Telephone-style QSO is possible by using both bands. **One-touch buttons** give safe operation, front panel switches and buttons are arranged to give complete operational versatility. A **built-in duplexer** provides single antenna connection.

Extended receiver coverage* includes; 118.000-135.995MHz (AM), 136.000-174.000MHz (FM) and 420.000-480.000 MHz (FM).

20dB receiver attenuation is automatically introduced when lowest power setting is selected. UP button on mic can be programmed to perform any front panel push-button functions.

To whet your appetite other features include; **30 memory channels,** 2 call channels plus 4 scan edge channels. **Full 45W on 144MHz** and 35W on 430MHz, plus low power settings of 10W and 5W. Forced, **air-cooled heatsink** for trouble-free, long duration operation. **3 frequency-search capabilities** include; frequency range, memory channels and priority watch. **DTMF remote control** is available via optional IC-UT55 encoder/decoder, main band can also be controlled by DTMF tones received off air on sub band. Contact us or better still **visit a Hamstore today** for the full picture!

*Performance outside Amateur bands is not guaranteed.

RADIO HAMSTORES

ICOM

MasterCard VISA

R HAM EQUIPMENT

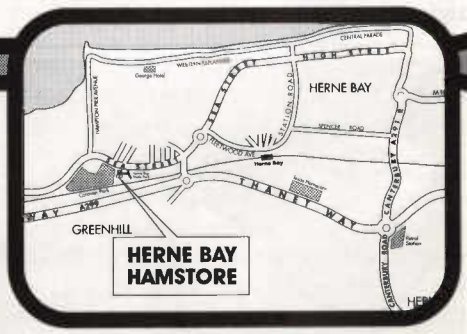
all ICOM equipment purchased
n some cases the equipment will
eedy and satisfactory repair. Any
orized dealer is not covered by

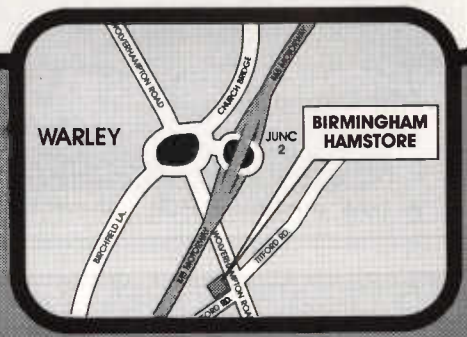
ningham, Chris G8GKC at Herne
w London shop, all look forward

NGHAM

nal House,
pton Rd. Oldbury,
nds B69 4RJ
Fax: 021 552 0051

d for lunch 1300-1400



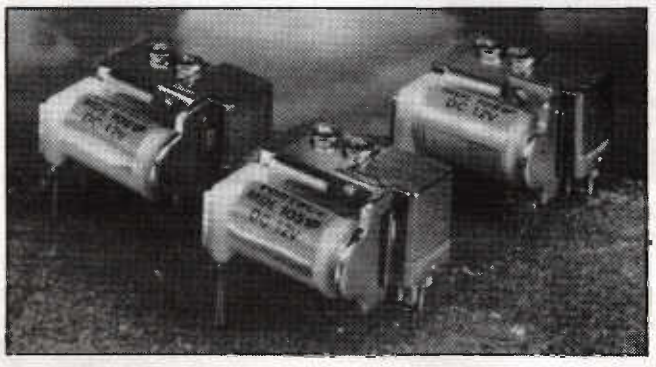


Kenwood Dealers meet in force!

Kenwood amateur radio dealers recently attended the launch of the new nationwide dealership at Kenwood's headquarters in Watford. As of 1st December 1992, Kenwood took over the distribution of its amateur radio products in the UK and Ireland. Mike Atkins, Sales and Marketing Manager of Kenwood's Communications division, said that radio amateurs would benefit from Kenwood's sales and technical support through the new dealers. Can you spot your local dealer here?

Plug-In Data Comms from Melmar

From the firm who provided the terminal for the BBC computer for use with G3WHO software, now consisting of G3LIV on hardware and G4BMK on software, comes Dataterm. This is designed for use on IBM PCs or compatibles, and supports AMTOR (FEC, ARQ and Listen), RTTY, CW, FAX and SSTV. It is a complete unit on one card and plugs into one expansion slot in your PC, straight into the standard 31-way edge connector with all connections on a standard rear entry PC connector. On-screen tune indicators come with the software, and an optional display PC board may also be used which adds a pair of tuning LEDs, a shift switch for 170Hz or 450Hz signals with indicator LEDs, and TX/RX LED indicators. The wired unit, complete to drop into your PC, is priced at £75.00 inc p/p, with the display PCB at £10.50, PCBs only complete with assembly instructions are also available for home constructors. Further details from Melmar Products, 2 Salters Court, Gosforth, Newcastle on Tyne, NE3 5BH, Tel. 091 284 3028. They tell us they are 'amateurs at heart' and invite HRT readers who are new to AMTOR and the other data modes to give them a call to discuss your problems before purchase.

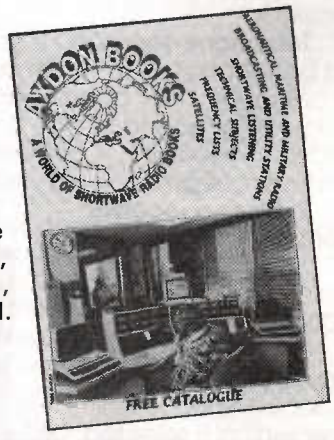


Miniature RF Relay

A new miniature PCB mounting co-axial relay has been added to Cirkit's range of low cost RF switching relays. Those shown here are capable of switching up to 50W CW at 1GHz, and measure only 23mm x 21mm x 17mm, having a maximum insertion loss of 0.3dB at 1.8GHz and a SWR of 1.3:1 at 1.8GHz. The characteristic line impedance is 50 ohms with single pole changeover contacts, and operates from a nominal 12V drawing 30mA. Other types in the range have BNC and N type sockets for remote switching applications and will handle up to 300W PEP. Further information from Paul Bennett at Cirkit Distribution Ltd, Park Lane, Broxbourne, Herts, EN10 7NQ. Tel. 0992 441306

Radio Book Catalogue

Axdon Books have available a free catalogue detailing their wide range of radio books (no less than 99 titles at the last count!). Yours for the asking, from Axdon Books, 32 Atholl Street, Perth, Scotland, PH1 5NP, Tel. 0738 30707



New Address for RF Engineering Ltd.

RF Engineering Ltd, who distribute components and aerial system products from Barker and Williamson Inc. for both amateur and commercial customers, have changed address to; Woeful Lake House, Sherbourne, Glos. GL54 3PR. Tel. 0451 844237, Fax. 0451 844253.

Riverside Computers Shareware Catalogue

PC disks packed full of amateur radio shareware products as well as other subjects such as office, leisure, windows and sound, are featured in the Riverside Computers Shareware Library catalogue. The company, run by a licensed amateur, also has a unique 'customer loyalty system' where you can claim your 5th order for the company's products, to the average value of your previous four orders, totally free of charge. The catalogue is priced at £1.00 and also comes on a PC disk (state disk size/capacity), from Riverside Computers, Riverside House, Manvers Road, West Bridford, Nottingham, NG2 6DJ, Tel/Fax. 0602 452242.

Packet TNC Kit Review

HRT Editor Sheila G8IYA builds her own packet radio Terminal Node Controller

I'm already active on packet, indeed for my sins I'm one of the SysOps of my local DX PacketCluster and node system. However my experiences on packet have normally been a 'plug it in and set the parameters up' affair. I've always enjoyed home construction, whenever I get a chance that is, and following several reader's queries of 'where can I get the information to build my own TNC' I thought I'd better go into the matter a bit further for the benefit of readers (as well as maybe having the fun of building one myself!).

A survey of the 'market' showed there were three or four possibilities, ranging from information only with a PCB from hand-prepared artwork, to full 'commercial quality' kits. The one I chose, featured here, gave several options and has the advantage of 'backing' from one of the largest packet groups in the UK, MAXPAK, the Midlands Packet Radio User Group. The TNC2-DL from the group is a 'TNC-2 clone', meaning it will run all the commonly-available EPROM-based plug-in software that is designed for such TNCs, for example TheNet for network node operation as well as 'end user' software such as that available for many PacComm TNCs.

PCBs, Components, and Kits

The PCB only will cost you £18 from MAXPAK, prepaid and including p/p, together with technical support if needed, a ready-programmed EPROM is also available at £12.50. This option may suit those who wish to source all the components 'from scratch', the accompanying diagram should give you an idea of what's needed. For those who'd like an 'easy' option, including a ready-assembled case, HRT have 'joined up' with J.A.B. Electronic Components who have kindly offered HRT readers a discounted complete kit price of £89.00 (individual prices are; PCB £20.00, EPROM £12.50, parts only kit £52.00, case £12.95, Access/Visa/Cheque). The 'standard price' kit should save you around 35% over buying the parts individually in any case, which may be useful if you don't have a large 'digital electronics junk box' with most of the correct components to hand. This gives you a TNC operating at a 2.5MHz clock speed, if you need higher speeds then a 10MHz option is available at an additional £13.00.

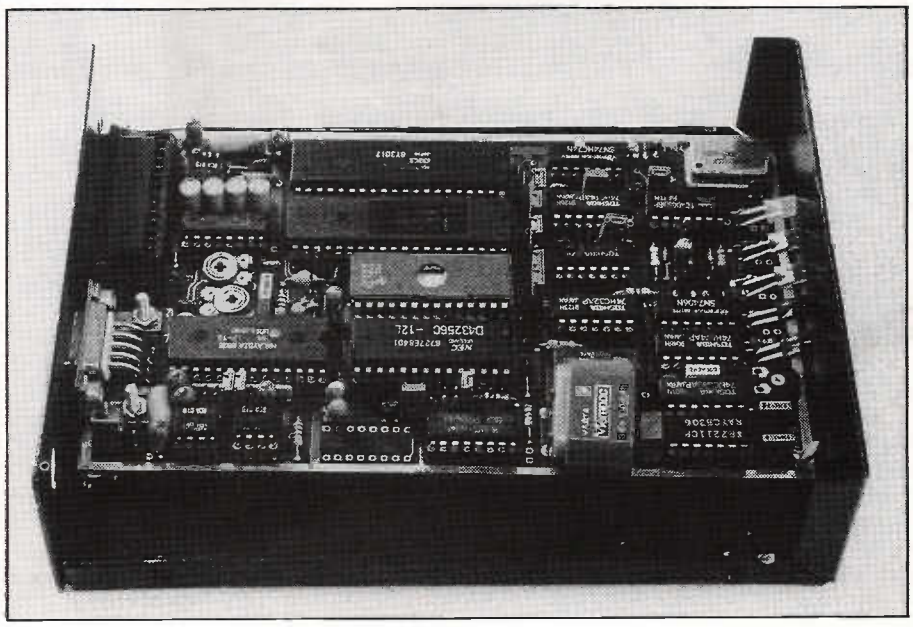
The kit of parts, complete with PCB and manual

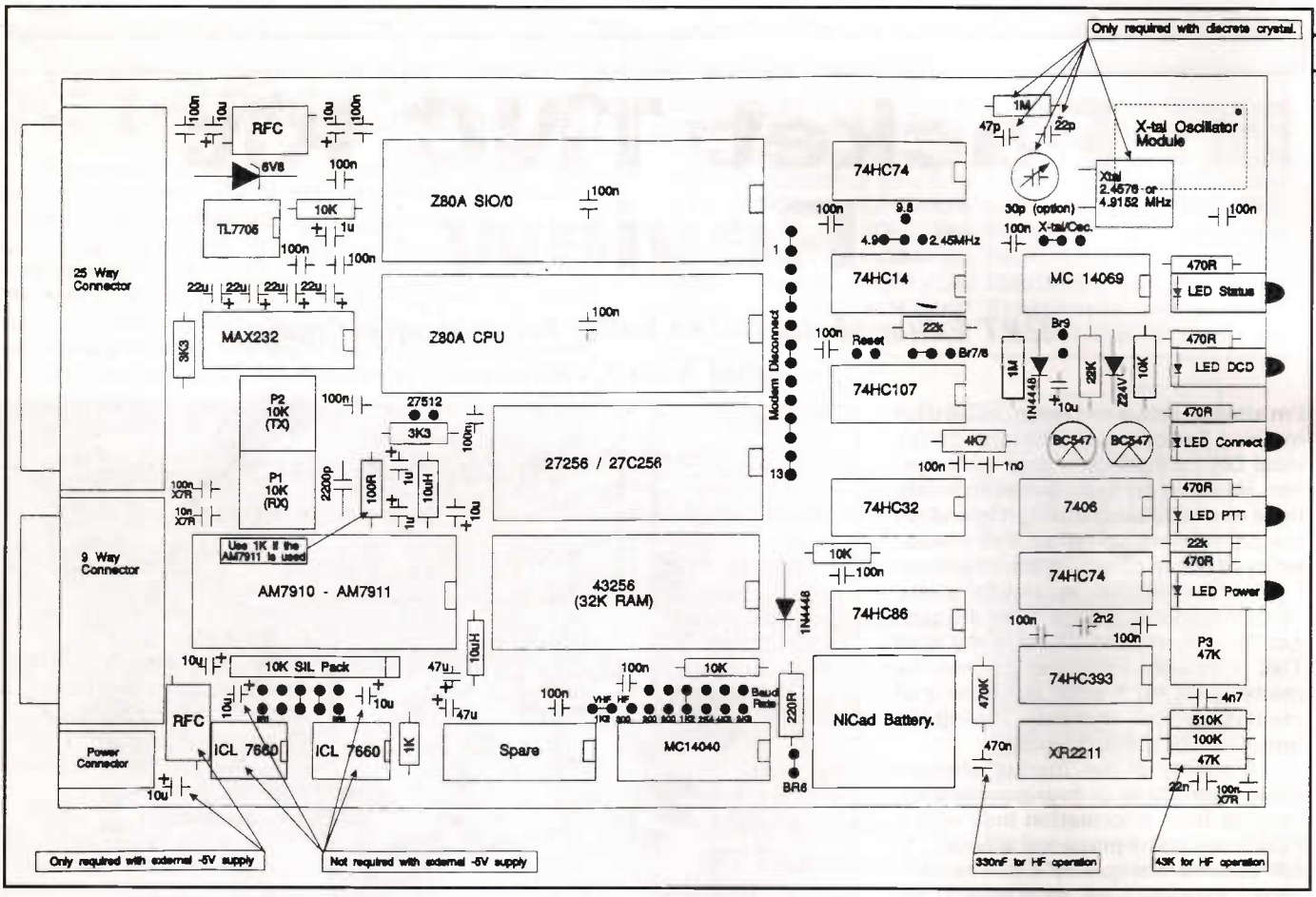
Construction

The PCB comes with a comprehensive 26 page instruction book giving the usual details such as parts lists, circuit diagram etc., and a 'stage by stage' assembly and test procedure.

The dual-sided PCB was a very professionally produced plated-through hole type, i.e., with upper and lower tracks electrically joined where necessary, so I didn't have to solder components 'top and bottom' where needed, this also allowed IC sockets to be used which isn't a bad idea with such a unit!

I had little difficulty in following the details, in all it took me a little over five



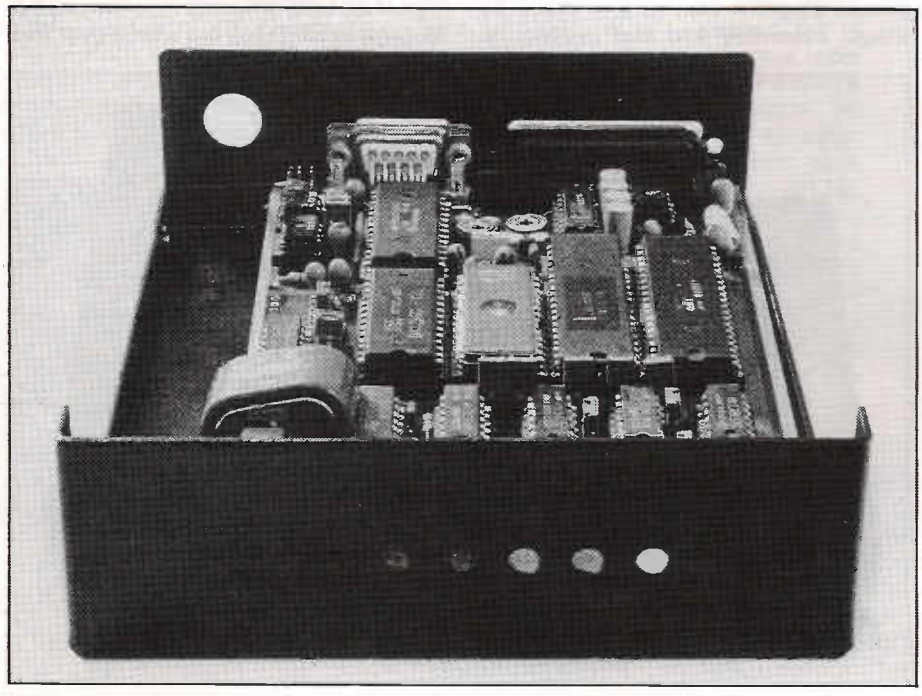


hours to finish building the unit. The MAXPAK-written instruction book does of course assume you've sourced the components yourself and know how to identify them, but a handy list by J.A.B. Components provides a very good 'identification guide' for those supplied in the kit. This for example even gives the resistor colour band markings for each value, thus helping beginners enormously.

The TNC needs a 5V regulated DC

The component arrangement
Will it work now it's finished?

supply for operation, and if you have a -5V supply also available you can dispense with some of the on-board components which are used to generate this. A 'minor' gripe I had was that the DC supply connections weren't as clear as they could be, and I initially connected my +5V DC lead to the -5V connection, until I traced through the circuit to check. I used the 2.4576MHz crystal oscillator module, making sure I'd linked the 'oscillator frequency' jumper BR10 accordingly. The TNC uses a 3.6V nicad as backup, this is designed to fit correctly if IC sockets aren't used. Because of the compact arrangements of components, I had to 'bend' it somewhat to fit next to the adjacent IC standing proud of the board on the socket.



EPROM Software

I already had a number of ready-programmed EPROMs (from my 'Packet SysOp' activities), hence I tested the TNC when complete using these to check compatibility with a number of available software versions. The TNC2-DL has the useful facility of allowing a 27C512 rather than the more usual 27C256 EPROM to be fitted, with an on-board link to switch between 'upper' and 'lower' codes. This could allow enthusiasts to have two software versions on board, e.g. for emergency portable use where either a remote node, or a 'normal' personal mailbox/digipeater, may be needed as and when circumstances dictate.

Did it Work?

Well, yes it did, first time, I'm pleased to say (after I'd corrected the supply wiring). I loaded a 'dumb terminal emulator' into my shack computer

set to the baud rate parameters I'd linked the TNC for, switched my external 5V power supply on, and up came the magic 'power-up' default text on the screen. Setting MYCALL to G8IYA, I connected the TNC to my 70cm handheld and adjusted the modem potentiometer to give a steady illumination of the 'DCD' LED when packets were received, then issued a 'Connect' request to my local node. It instantly came back with a '*** Connected to.....', no problem! 'Fine tuning' of the remaining two potentiometers, these adjusting the RX and TX audio levels to and from my rig, were the only things remaining which I quickly did.

The TNC worked fine with TheNet EPROMS and the PacComm Tiny-2 software I tested it with, and for a while I used it as the TNC for my 70cm network node, without problems.

Conclusions

The TNC provides a good, low cost start in getting going on packet, together with giving the satisfaction of 'having built it yourself'. MAXPAK offer a 'help' service if you do have problems with the TNC which is nicely reassuring, and the availability of a complete parts kit at an economic price is very useful, this can save rally-hunting and multiple orders from different companies each with their postage and handling costs.

A ready-made case is available to complete the project

My thanks go to JAB Electronic Components for the loan of the review kit – if you want a 'HRT Editor ready-built' TNC you know where to go!

Contacts; J. A. B. Electronic Components, The Industrial estate, 1180 Aldridge Road, Great Barr, Birmingham, B44 8PE, Tel. 021 366 6928, and Maxpak, 37 Thicknall drive, Stourbridge, West Midlands. DY9 0YH.

HRT 'Amateur of the Year' Award

Our annual award, this year with a choice of prizes!

The winner will receive their choice of an IC2iE (2m) or IC4iE (70cm) handheld, or an ICR1 wideband receiver as a prize, kindly donated by the London Radio Hamstore

At the 1991 Leicester exhibition, we formally launched the HRT 'Amateur of the Year' Award, the winner last year being Ron Broadbent G3AAJ. Readers of the 'CQ de G8IYA' Editorial in last month's issue will have seen that we're again looking for a suitable 'candidate', and who wins the title is up to you!

The winner will receive an award of an inscribed shield, together with their choice of either an IC2iE 2m handheld transceiver, an IC4iE 70cm handheld transceiver, or an ICR1 handheld wideband receiver. The prize has been kindly donated by the newly opened London Radio Hamstore (who also have Hamstores in Birmingham and Herne Bay), and our thanks go to the *Radio Hamstore* group for their kind provision of the winner's superb prize. We'll also make sure the proposer of the award winner receives a small 'token gift' as a 'thank you'.

Down to the award itself. From original feedback received from our readers, here are the rules for the award which we've kept as simple and open as possible. If you don't wish to deface your magazine by cutting out the nomination header on this page, then just drop an SAE to the address below and we'll be pleased to send you a further header form.

The Award Rules

1) This is an annual award made to the amateur who, from nominations received, has voluntarily helped amateur radio in his/her own way, significantly in the recent past.

2) The award is open to any licensed radio amateur or listener, of any age.

3) Nominations for the award, which must be in writing headed by an official form published in or by the magazine, may be made by any person. In addition, on separate sheet(s) the nomination must give full and complete details on why the nominated amateur should be considered for the award. HRT will at their discretion seek further details from other sources to confirm eligibility.

4) Any commercial or organisational interest in amateur radio does not exclude the nominated amateur, however the award is granted purely on the amateur's voluntary efforts. Regular/non-regular contributors of any publication, including HRT, are eligible in the case of their voluntary work, although direct employees of Argus Specialist Publications are excluded from the award.

5) Nominations for the award should be sent to; HRT Amateur of the Year Award, P. O. Box 73, Eastleigh. Hants. SO5 5WG. These should be sent to arrive prior to 1st March 1993 if possible, although late entries will be accepted until 10th March 1993. The winner will receive an inscribed shield together with the prize of his or her choice of an IC2iE 2m handheld transceiver, an IC4iE 70cm handheld transceiver, or an ICR1 handheld wideband receiver.

HRT Amateur of the Year Award

Official Nomination Header

I wish to nominate; _____
for the HRT 'Amateur of the Year' Award.

My Name; _____

My Address; _____

_____

My Tel. No. _____

SOUTH WALES LEADING AMATEUR RADIO SHOP

EVERYTHING FOR THE ENTHUSIAST

DEALERS FOR:
KENWOOD
YAESU
ICOM
A.O.R.
YUP ITERU

FM DUAL BANDER
TM-702E

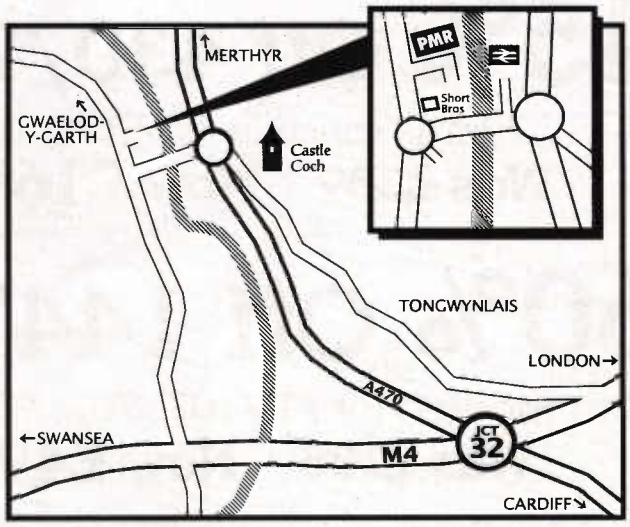
DUAL BAND
TH-28E

FULL SERVICE FACILITIES, WITH MANUFACTURERS SUPPORT AVAILABLE.

MAIL ORDER AVAILABLE ON ALL PRODUCTS
ACCESS, VISA ACCEPTED

PRIVATE MOBILE RADIO LIMITED
INDUSTRIAL ESTATE, GWAELOD - Y- GARTH
CARDIFF CF4 8JN UK

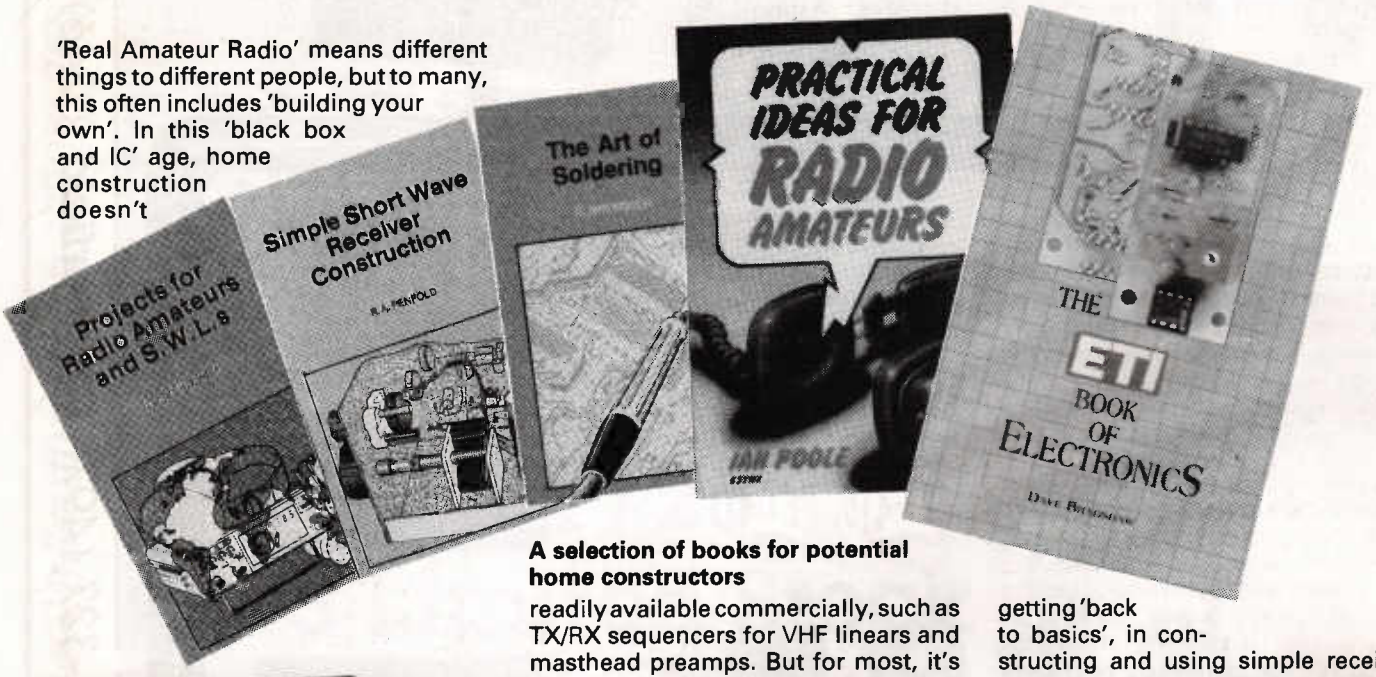
TEL: (0222) 810999 FAX: (0222) 813369



Home Construction – Getting started

Arthur Scott helps you get started in building your own gear and accessories

'Real Amateur Radio' means different things to different people, but to many, this often includes 'building your own'. In this 'black box and IC' age, home construction doesn't



A selection of books for potential home constructors

readily available commercially, such as TX/RX sequencers for VHF linears and masthead preamps. But for most, it's often because of the 'fun' and satisfaction of building something yourself, getting 'back to basics', in constructing and using simple receivers and transmitters on the bands. The G-QRP Club are one such group who promote this as well as many individuals, and you'll have seen several 'simple' construction articles for HF gear in recent years in HRT.

Component catalogues provide a mail-order service for components

mean just valves and HT power supplies any more, neither does it just mean QRP CW equipment.

Why Construct?

More and more amateurs, and SWLs such as myself, choose to build at least one project in their hobby. Even confirmed 'black box' operators sometimes need accessories that aren't readily available commercially, such as TX/RX sequencers for VHF linears and masthead preamps. But for most, it's often because of the 'fun' and satisfaction of building something yourself, and most likely saving yourself some money in the process. Others consider home construction a hobby in itself, with amateur radio as the 'end result' rather as the 'drive' to build it in the first place.

A growing breed of amateurs are having fun in getting 'back to basics', in constructing and using simple receivers and transmitters on the bands. The G-QRP Club are one such group who promote this as well as many individuals, and you'll have seen several 'simple' construction articles for HF gear in recent years in HRT.

Sources of Construction Ideas

Some constructors are fortunate in being able to design their projects themselves. One amateur for example designed and built his own synthesized 2m digital-readout transceiver some time ago. But not all would-be constructors are this way inclined, and for most the source of ideas comes in magazine articles and in books. The recently-published 'ETI Book of Electronics' by Dave Bradshaw (who used to be none other than the HRT Group Editor

and was the holder of the callsign G1HRT – Ed) can help in a useful introduction to modern electronics (published by Argus Books, Tel. 0442 66551, at £10.95 plus p/p). Another good 'ideas' book is 'Practical Ideas for Radio Amateurs' by Ian Poole G3YWX, this is unfortunately now out of print but is available at low cost from firms such as Anchor Surplus in Nottingham.

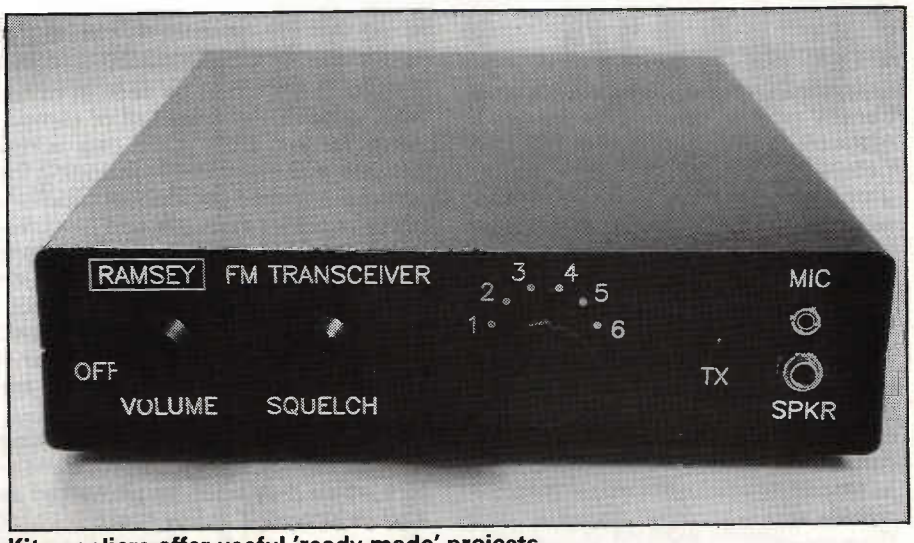
For actual construction projects, a wealth of information abounds. The 'G-QRP Club Circuit Handbook' edited by George Dobbs G3RJV (£11.00 plus £3.00 p/p from the RSGB) gives a tremendous number of 'informal style' construction ideas for QRP projects and accessories.

A number of low cost books from publishers Bernard Babani are also a good guide for home constructers. I would recommend 'Projects for Radio Amateurs and SWLs' by R. A. Penfold as a good 'build your own accessories' guide, at £3.95, available from most specialist book suppliers such as Poole Logic (Tel. 0202 678558, they hold a large range of amateur radio related books). Other titles from the same publishers I'd suggest include 'The Art of Soldering' by R. Brewster and 'Simple Short Wave Receiver Construction' by R. A. Penfold, both also at £3.95. A comprehensive guide to amateur radio which also includes many up-to-date projects ranging from simple to complex is the '1993 ARRL Handbook', available from many radio booksellers and amateur radio dealers.

Tools

Yes, you're going to need some basic tools. The first essential is a soldering iron and the knowledge of how to use it (which is beyond this short guide), plus a pair of wire cutters and if possible a pair of fine nose pliers also. You can get by with most electronic constructional articles with just these, although a simple multimeter is a very handy addition for all-round use, as well as for checking the voltages and so on as your projects nears completion.

If you'd like to 'case your projects up', you will of course need 'mechanical' rather than 'electronic' tools, such as screwdrivers, drills, files and the like. A popular option is that of purchasing ready-fabricated cabinets, either of shaped metal, plastic, or a combination of the two, and then adding your own holes for controls, connectors and the like, and your own labelling as a 'final touch'. These cases are readily available in plenty of shapes and sizes from component dealers such as Cirkit and Maplin, you'll find their catalogues on sale in larger branches of newsagents such as W. H. Smiths in the UK.



Kit suppliers offer useful 'ready made' projects

After the 'basics', you can of course progress by adding to your tool kit depending on your interests, such as IC insertion tools, PCB holders, hole reamers and the like, but these are by no means essential to 'getting started'.

Printed Circuit Boards

Many projects can be constructed on pre-drilled copper- clad stripboard such as Veroboard, using your own layout for non-critical applications such as the higher radio frequencies. Don't try this with a VHF preamp for example, but a Top Band (1.8MHz) QRP transmitter or receiver should work fine.

If you'd like to progress to making your own PCBs 'from scratch', then you'll need other gear such as etching trays and the associated chemicals, plus UV exposure units for photo-etching if you'd like to go the 'professional' route. These may be handy if you envisage doing a large amount of construction, however you'll find that ready-made and ready- drilled PCBs are available for many published projects including those in HRT, from companies such as Badger Boards (Tel. 021 366 6047), this firm will also make your PCB for you from a supplied artwork for your own project.

Dedicated 'construction' magazines such as ETI (HRT's 'sister' magazine, also published by Argus) have even recently supplied PCBs for projects within their pages, taped to the magazine front cover, very handy!

Kits

Possibly the best way of 'getting started' in home construction is to try your hand at building one of the many amateur radio kits available. These normally include a PCB and all the components you need, and sometimes come with a ready- made case or the option of adding one for your project. You'll find kits available from companies such as Badger Boards (021 353 9362), C. M. Howes (0327 60178), J. A. B. Electronics Components (021 353 6928), Jandek (0384 288900), Kanga Products (0303 276171), Lake Electronics (0602 382509), Mainline Electronics (0533 777648), and Spectrum Communications (0305 262250). If you fancy your hand at the more advanced form of construction with surface mount assembly, then Blue Rose Electronics (0925 727848) specialize in this field, supplying amateur radio kits as well as surface mount components and tools. A call to any of the above will bring you details, and either a free (e.g. send an SAE) or otherwise nominally priced catalogue of the kit products they offer.

Components

At one time, virtually every large

Some kits come with a ready-made case to add that professional finish

town had their own 'electronics component' retailer, catering for the needs of the electronics constructor. Unfortunately, although technology and progress is probably the cause of this, such dealers are finding it hard to stock the increasing number of components, particularly ICs and transistors, to meet the needs of today's enthusiasts. More often than not, they can order whatever you need if they don't have it in stock, to often arrive the next day, however a few companies have grown to offer a comprehensive mail order service for constructor's needs. Companies such as Maplin and Cirkit are two that immediately spring to mind, together with Greenweld (0703 236363), Henrys (071 724 0322), Mainline (0533 777648) and Marco (0939 32763), all of these companies have catalogues available at a nominal price.

'Junk Box' Stocking

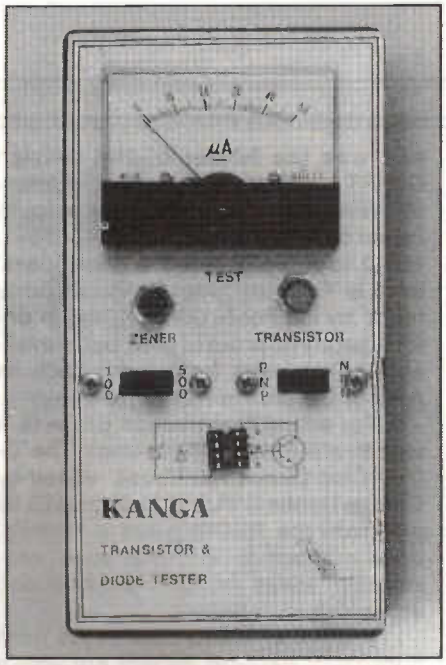
One of the pleasures of home construction is that of being able to use 'junk box' components, i.e., those you already have 'lying around'. But how do you come about such a 'junk box'? It's something you normally build up over a period of time, taking advantage of 'surplus' deals to be found at radio rallies and surplus equipment sales.

Anchor Surplus for example (0602 864902) are often to be seen at rallies with large carrier bags full of components for just £1 or £2 a bag, a real bargain, and many others including the above mentioned component suppliers (Greenweld for example, and Bull Electrical, Tel. 0273 203500) often 'package up' surplus bags of components such as resistors, capacitors, semiconductors and so on for disposal at low prices. Look out for these – you may save yourself a considerable amount in the long run.

A multimeter is useful for checking resistor values, and for surplus transistors which may often be unmarked as well as 'untested', a low cost transistor tester is very useful – Kanga Products can even supply a complete low cost kit for this (featured in the Jan 1992 HRT – Ed). Surplus PCBs packed with components are another option if you don't mind desoldering and testing these, although remember there's often a reason for them being 'surplus' in the first place. Ex-PMR transceivers can however be a useful source of RF, AF, and DC components at low cost, as well as coax connectors and the like, even if you don't eventually use the set to get on the air!

Getting Going

This concludes my brief guide to 'getting started', I can't cover everything in this short article of course, but I hope it's given you a few 'pointers' which you may find useful. As for myself, I've managed to build up a reasonable stock in my 'junk box', which actually extends to a few hundred small plastic drawers (being retired I've managed to spend my time in sorting these out!), however I still enjoy building kits and the like as well as the projects featured in HRT. I hope you find as much pleasure in this as I do.



A transistor tester is a handy item, this one even comes as a low cost kit

WISE BUY BARGAINS!

ALL PRICES INCLUDE P&P + VAT

PYE M294 "A" BAND FOR 2M. 6CH WITH MIC ETC £75
PYE MX294 "A" BAND SYNTHESISED WITH MIC ETC £100
PYE MF5FM "A" BAND FOR 2M. 3CH WITH MIC AND CIRUIT £29
PYE MF5U "U" BAND FOR 70CMS WITH MIC £36
NOLTON NOVA 242 SMALL 10CH MOBILES FOR 4M AM/FM +INFO £26
MICROWAVE MODULES LINEAR AMPS HAVE BEEN PADDED DOWN TOO 106MHZ BUT WE SUPPLY INFO TO MOVE BACK TO 2M 10W. IN 70W OUT £36
PYE M212 "T" BAND FOR 70CMS 1CH. WITH MIC - LAST FEW £31
RACAL MA685 30-76 MHZ WIRE DIPOLE KITS WITH 4 ANTENNA ELEMENTS IN SATCHEL 50W. POWER HANDLING BNC CONNECTOR £12
PYE W15FM "A" BAND WESTMINSTER FOR 2M. WITH MIC £26
COMING SOON... DYMAR SYNTHESISED MOBILES FOR 2M. 99CH. WITH EPROMS AND FULL MOD. INFO. 20W +OP. WATCH THIS SPACE...
FOR CALLERS ONLY OR SENT WITH P/P EXTRA WE HAVE A LARGE QUANTITY OF PMR RADIOS, EG. ITT AM7, STORNO 600, W15AM, M201, MF5AM, F30FM BASE, F401 MIDBAND, F4000 MIDBAND, ALL AT LOW PRICES, PLEASE CALL FOR DETAILS.
MILITARY WRISTWATCHES BY MWC MECHANICAL, UNISSUED + STRAP £42
WE NOW ACCEPT ACCESS/VISA ORDERS ON THE TELEPHONE
SAE. FOR MAIL-LIST OR ENQUIRIES PLEASE
EX. PMR RADIOS ARE SOLD "AS-IS" BUT ARE CHECKED FOR COMPLETENESS BEFORE DESPATCH.

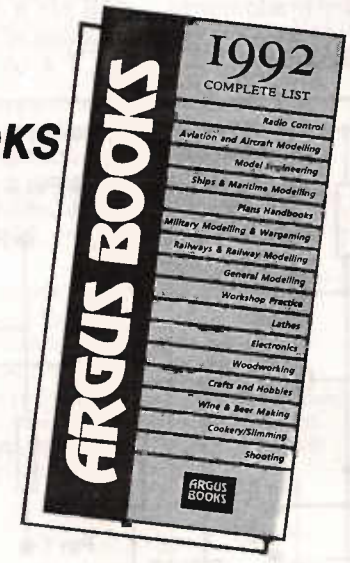
BARGAINS FOR CALLERS. SURPLUS AND SECOND-USER EQUIPMENT ALWAYS WANTED

G.W.M. RADIO LTD

40/42 PORTLAND ROAD, WORTHING, SUSSEX BN11 1QN
TELEPHONE: 0903 234897 Fax: 0903 239050

ARGUS BOOKS PUBLISHING FOR THE SPECIALIST

THE FULL RANGE OF ARGUS BOOKS *are available from all good book and hobby shops or contact Argus Books direct for a 1992 Complete List.*



COMPLETE LIST, Argus Books, Argus House, Boundary Way, Hemel Hempstead, Herts. HP2 7ST

OR PHONE 0442 66551 EXT. 203

OUT NOW!

The Brand New Cirkit Electronic Constructors Catalogue Winter 92/93

- **192 pages**
- **£££'s worth discount vouchers**
- **100s new products.....**

Books - the latest titles.
Capacitors - new range ceramic discs, extended ranges electrolytic and polyester types.
Computers - new CAD PCB layout software.
Connectors - extended ranges of BNC, Jacks, XLR and PCB types.
Filters - new narrow band ceramic and low pass TV filters.
Hardware - additions include new range control knobs, cabinet hardware and heatsinks.
Inductors - more additions to our already extensive range.
Kits - new additions to the Velleman range.
Rigs - handheld 'CB' transceiver, wavemeters and scanning receiver accessories.
Semis - new linear ICs, transistors and a complete new range of LEDs including blue types.
Speakers - new radio mic systems.
Test Equipment - new hand-held frequency meter and satellite TV dish alignment system.
And much more besides.....

- **Available at larger newsagents, from 6th November, or directly from Cirkit.**

£1.70 + 30p p&p

Cirkit

Access VISA

CIRKIT DISTRIBUTION LTD
Park Lane · Broxbourne · Hertfordshire · EN10 7NQ
Telephone (0992) 444111 · Fax (0992) 464457

Plug-In Toneburst For The Pye Olympic

Richard Davis G3TDL adds plug-in repeater accessibility to the Olympic and Europa ex-PMR rigs

About a year ago, I successfully converted a UHF Pye Olympic for operation on 70cm, following the instructions given in Chris Lorek's 'Surplus 2-Way Radio Conversion Handbook'. As I wanted mainly to operate on my two local repeaters, GB3BR and GB3HY, it was necessary to add a toneburst. At the time I had access to a PCB design package running on a microcomputer, and using this I designed a toneburst board which would plug into the facilities socket inside the Olympic, it would also suit the Europa which contains a similar socket. The HRT articles on PMR conversions made me think that other readers might be interested in the design, so here it is!

Circuit

The circuit of the toneburst, shown in Fig.1, is based on a design given in the RSGB Radio Communication Handbook. The crystal oscillator, TR1, runs continuously whilst the power is applied. Its output feeds the input of IC1, a 4020 divider, which divides the frequency by a factor of 2^{12} (i.e., 4096), to produce an output at 1750Hz. The low pass filter formed by R4 and C7 reduces the harmonic content of the waveform, and R5 and RV1 attenuate it to a level suitable to be fed to the Olympic's mic input. R3, C6, and D1 form a timing circuit which determines the length of the burst. When power is first applied, C6 is uncharged and pin 11 of IC1 is low, allowing the divider to operate. C6 gradually charges through R3, and when it reaches about half the supply voltage (which will take about 400ms), the division process is stopped. D1 allows C6 to discharge when the supply is removed.

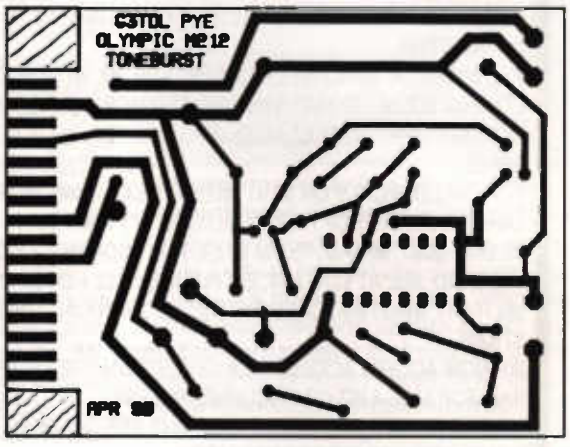


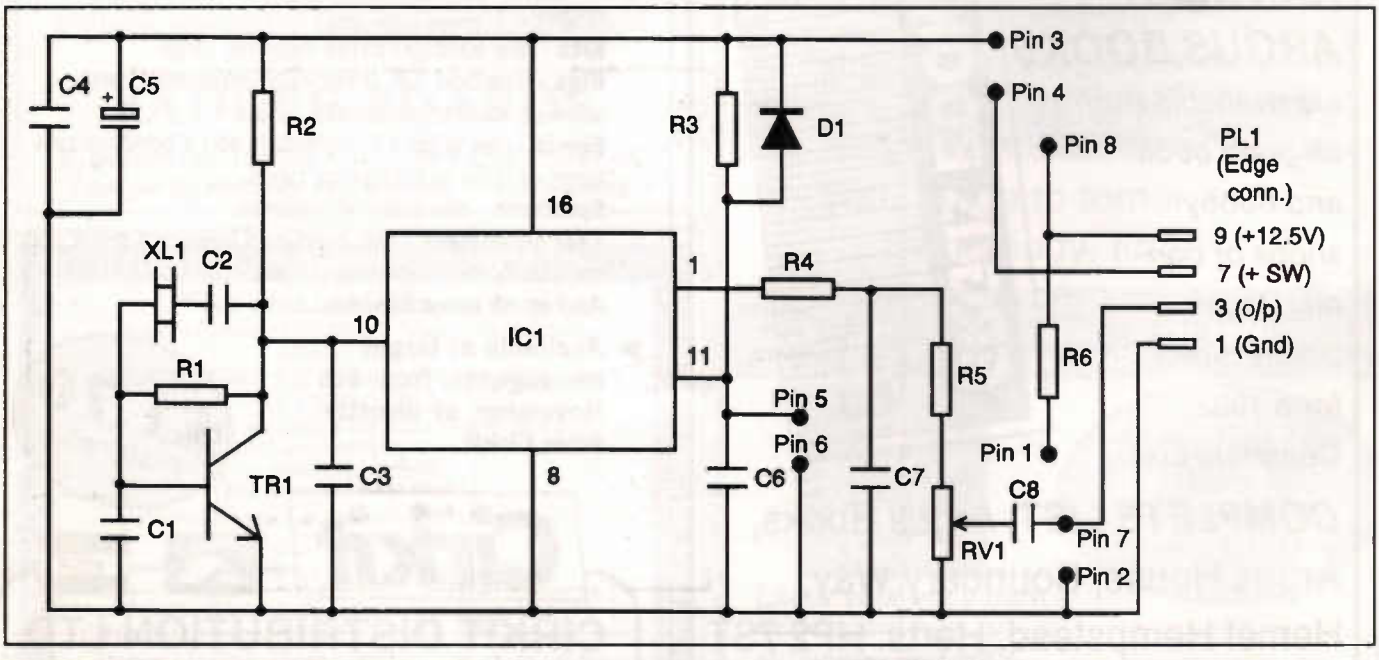
Fig.2 The PCB track pattern

Construction

The toneburst unit is built onto a single sided PC board measuring 75mm x 57mm, one end of which is trimmed to plug into the facilities socket inside the Olympic. The PCB track pattern is shown full size in Fig. 2, and the component layout in Fig. 3. The unit could probably have been made smaller, but this board was a convenient size and space was not a problem! In addition to the edge connector, connections to the board are made via a number of PCB pins, in order to allow for the connection of a toneburst switch and an indicator LED, and to simplify the setting up procedure. The connections to these pins are shown in Fig.4. The 10 volts, which is present on pin 8 of PL1 in the transmit mode only, is taken to PCB pin 4. A switch wired between here and PCB pin 3 allows the toneburst to be disabled when not required.

If a two pole switch is used, as

Fig.1 The toneburst circuit



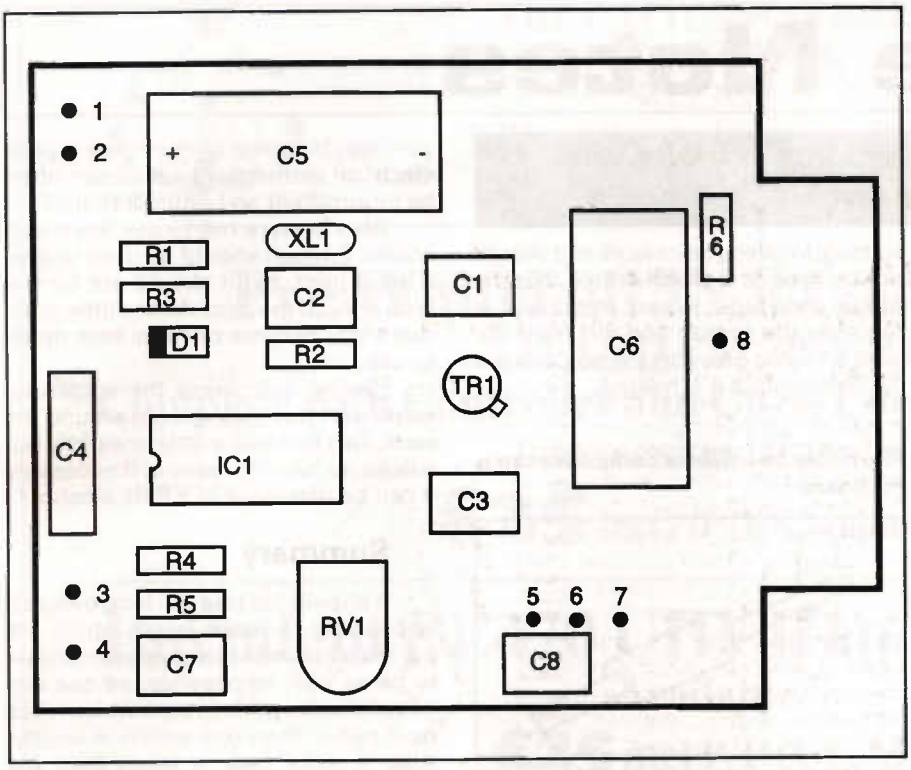


Fig.3 Component layout

shown, the second pole can be used to operate an LED wired between PCB pins 1 and 2 to indicate that the toneburst is switched on. The supply for this LED is obtained from PL1 pin 10, which carries the unswitched 12 volt supply, R6 being the current necessary current limiting resistor. The switch and the LED can conveniently be mounted on the blank panel at the front of the facilities compartment.

Linking PCB pins 5 and 6 ties pin 11 of IC1 directly to the negative supply. In this condition, the timing circuit is disabled and the toneburst operates continuously whilst the supply voltage is present. This facility was provided in order to simplify level setting, but could be used to convert the unit to a 'non automatic' toneburst (as favoured by G4HCL!), in which case R3, C6, and D1 would not be required.

The crystal is a miniature wire-ended HC18u type, obtainable from the various crystal suppliers who advertise in HRT. Apart from this, the only other component deserving of a mention is C6, which should be a non-electrolytic type, since electrolytics can suffer from low leakage resistance and rather wide value tolerances.

Setting up

Since the toneburst frequency is determined by the crystal, the only adjustment required is the toneburst level. Plug the board into the facilities socket, make the connections shown in Fig. 4, and temporarily connect together PCB pins 5 and 6. When the PTT is pressed, the unit will now produce a continuous output. If you have access to a deviation meter, you can now adjust RV1 to give a deviation of about 2.5kHz peak to peak. However if, like me, your test equipment budget doesn't run to such exotic items, you can make use of a second rig tuned to the Olympic's transmit frequency. Look at the audio output from this rig using a oscilloscope, and, with the Olympic on transmit and the toneburst switched off, whistle into the microphone and observe the amplitude of the signal on the oscilloscope screen. Now switch the toneburst on and adjust RV1 to give a display of about half the amplitude observed on the whistle! Needless to say, these tests should be carried out with the Olympic on dummy load to avoid upsetting other band users!

If all else fails, get a friendly local amateur to listen to your transmission and tell you when the tone level sounds about right. The level is not all that critical, but if it is set too high or too low you will find that you cannot access any repeaters. Finally, if you want the unit to operate as an 'automatic' toneburst, remove the link between PCB pins 5 and 6.

Parts list

C1	220pF	ceramic	R1	220k
C2	22pF	ceramic	R2	1k
C3	100pF	ceramic	R3	270k
C4	1nF	polyester	R4	10k
C5	22µF10V	electrolytic	R5	33k
C6	2.2µF	polyester	R6	4k7
C7	47nF	polyester	RV1	47k skeleton preset
C8	220nF	polyester	XL1	7.168MHz, HC18U
D1	1N4148 or similar small signal silicon diode			
IC1	CD4020			

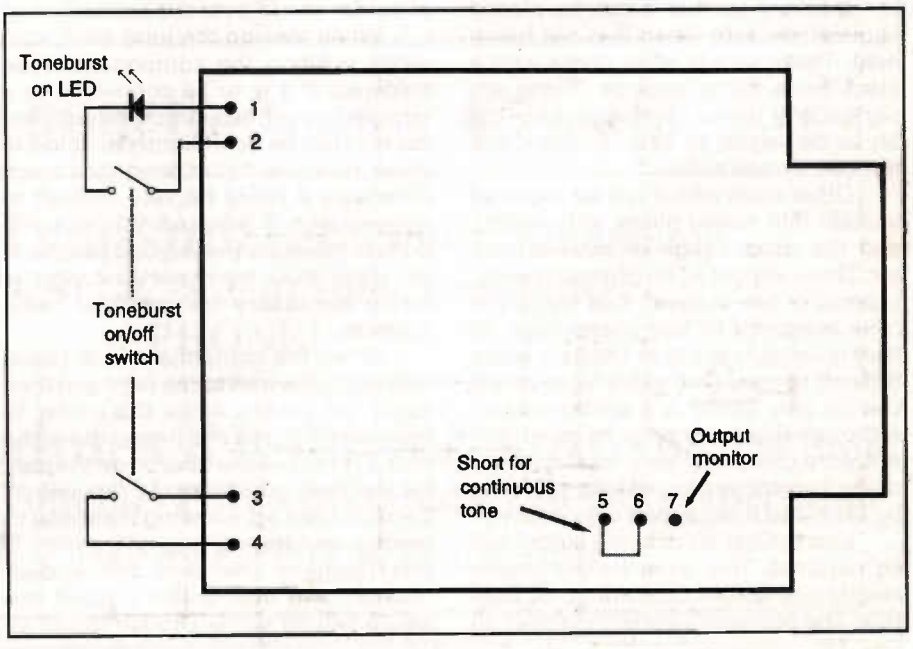


Fig.4 Connections to PCB pins

Novice Notes

Ian Poole describes the right way to solder your components

Good soldering is at the heart of any radio construction project. If it is well done then it will look neat and tidy. If a poor job is made then it will not only look bad but it can be a source of trouble because the electrical characteristics of the joint will be poor

To be able to solder well requires a degree of skill. Fortunately this can be gained quite easily after a little practice.

Tools

Before starting any soldering it is necessary to have the right tools. The most important is obviously the iron itself. For most amateur work a small 15W or 25W iron is quite suitable. The more expensive thermostatically controlled irons are much nicer to use but they are much more expensive, and are not really necessary unless a very large amount of construction is envisaged.

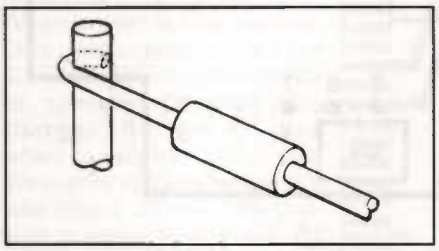
The type of bit for the iron is also important. It is very easy to think that a very small bit is the best if printed circuit board work is to be undertaken. This is not always so. For most work a bit around 3mm to 5mm in size is better because it allows the heat to flow out more evenly over the joint. Very small bits should only be used for very fine work – e.g., when using surface mount components.

It is also important to have a proper stand for the iron. Often irons can be bought complete with a stand, and one is necessary so that it can be placed somewhere safe when it is not being held. These stands often come with a place for a damp sponge. These are particularly useful as they enable the bit to be wiped to keep it clean and remove excess solder.

Other tools which will be required include thin nosed pliers, side cutters and the usual range of screwdrivers etc. These should all be of good quality, especially the cutters. It is usually a false economy to buy cheap tools as they invariably break or they are more difficult to use. One more item which can be very useful is a solder sucker. Although they may seem to be a bit of a luxury, they are very useful when doing repairs as they enable solder to be removed from a joint very easily.

Last but not least, some solder will be required. This must be the proper electronics solder containing its own flux. The plumber's variety is not at all suitable for electronics work and should not be used. It is worth noting that the flux in the solder is very important. It removes the grease and dirt from the joint and also prevents the solder from oxidising when it is heated.

Fig.1 how to solder a component to a PC board



Making Some Joints

Before starting the first project it is it is wise to make a few practice joints. When making a joint, first ensure that both surfaces are clean and free from grease or oxidation. This will allow the solder to flow over the surface of the metal and adhere or 'take' to it (note that ordinary solder will not take to aluminium, a special solder has to be used for this). If the solder does not adhere properly then a permanent joint will not be made. To enable this to happen it is sometimes worth 'tinning' the surface first by allowing a thin film of solder to run over the surface.

When making the joint itself, correctly position the component to be soldered. If it is to be connected to a terminal or printed circuit board then the lead can be bent slightly to hold it in place. However do not bend it too much otherwise it could be very difficult to remove later if required. Whilst some purists maintain that a good mechanical joint must be made first, this is rarely necessary for amateur radio projects.

When the component is in place, first apply the iron to the joint and then apply the solder. Allow the solder to flow over the joint and then remove the iron. Try not to keep the iron on the joint for too long otherwise the flux will all become used up, allowing the solder to oxidise and thus giving a dry joint. If this happens the joint will appear 'frosted' and dull, unlike a good one which will be shiny. Dry joints can be very troublesome as they give a poor electrical connection, which can often be intermittent and difficult to find.

Also beware not to use too much solder. Enough should be used to give a good joint, but it should not form a blob around the joint. After a little practice it will become obvious how much to use.

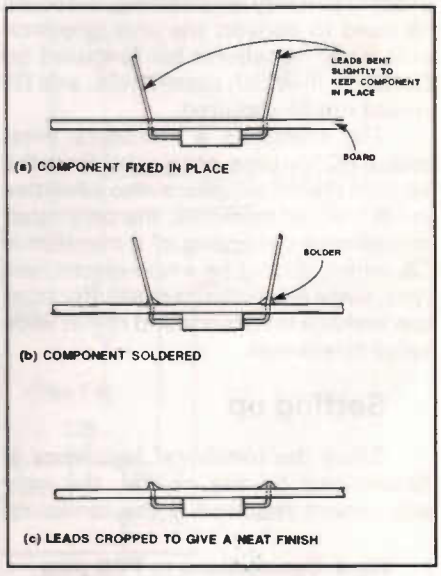
Having completed the soldering, some dark flux may remain around the joint. This can look a little unsightly but it does no harm to leave it. If necessary it can be dissolved in a little alcohol.

Summary

It should not take too long before it is possible to make joints which are quite acceptable. However, remember to be as neat as possible, as one can have far more pride in a job which looks neat rather than one which is untidy. Also if more care is taken then the circuit is more likely to work.

Never forget some safety aspects. Soldering irons are hot and can give some very unpleasant burns. Keep them away from clothes and always place them in their stands when they are not being held. It is also worth warning any visitors to the shack when the iron is on, and do not have the power lead for the iron anywhere where someone may catch it. Finally keep the room well ventilated and try not to breathe the fumes.

Fig.2 soldering a component to a terminal (note – the lead is bent round the terminal to hold it in place during soldering, but it is possible to lift the lead up when desoldering).



AOR Radio Communication Products

When you own the miniature AR210 Packet TNC, you have to open the case just to marvel at the beauty!

- **Extremely compact**
- **High reliability multi-layer PCB**
- **SMD built using SMT 'no wires'**
- **Optional internal NiCad!**
- **RS232C support from 300 - 19200 baud plus ABAUD**
- **Lithium backed BBS with mail indicator**
- **CWID & 3rd party commands**
- **Standard DE9 connector**
- **Two sets of transceiver connection**
- **Ideal for portable operation**

Photo not to scale

Front - actual width

The *New* AR210 Packet TNC has an extremely small case size of only 100 x 60 x 22mm approx. and ultra light weight of 90g (without NiCad battery fitted). However, nothing is compromised, the AR210 features five status LED indicators (CON STA PTT DCD PWR), a standard DE9 RS232C connector, power socket, power switch, plus two sets of radio connectors and externally accessible hard reset switch.
TAPR TNC-2 Upper compatible using a Z80A software compatible ASIC TMPZ84C015BF-6 CPU running at 4.9152 MHz allowing RS232C baud rate up to 19200. High performance LSI/TCM3105NL modem chip. 1200 baud AFSK AX.25Level2 Version 1.14TE with extended command set. Lithium backed BBS with 3rd party & mail indicator, real time clock, CWID, KISS etc. plus Diagnostic, Calibration, Special monitor command and more...
Operation from an external power source 10 - 13.8V DC @ 200mA or from an optional internal NiCad pack (120mAH) 4.8V DC @ 55mA.

Depth - actual size

Actual size!

Height - actual size

AR210 ~ Packet TNC

Size and cost to suit your pocket **RRP £149.00 including VAT.**
UK Carriage free

Receivers: 'All Mode' ~ 'All the time'

With the **AR3000A** your listening horizons are truly extended providing receive coverage from 100 kHz all the way up to 2036 MHz without any gaps in the range. The AR3000A offers the widest coverage on the market today with a high level of performance and versatility from long wave through shortwave, VHF and onward to the upper limits of UHF and SHF.

Not only will the AR3000A cover this extremely wide range it will allow listening on any mode: NFM, WFM, AM, USB, LSB AND CW. The high level of performance is achieved by using 15 band pass filters before the GaAsFET RF amplifiers unlike other receivers which may rely largely on broad band amplifiers. This ensures high sensitivity through the entire coverage with outstanding dynamic range and freedom form intermodulation effects.

The receiver features comprehensive search & scan facilities providing speeds of up to 50 increments per second. An RS232 port is provided enabling full remote control via most computers. A rear panel switch changes control between the keypad and RS232 port.

The AR3000A is powered from 13.8V DC, a suitable mains power supply is provided with the receiver. Other accessories include a telescopic whip, DC lead and comprehensive operating manual. **RRP £875.00 including VAT.**

Enhanced model - **AR1500E** - the World's first true compact hand-held wide range receiver offering SSB as standard has been made even better. Coverage is from 500 kHz all the way to 1300 MHz without any gaps in the range. Channel steps are programmable in multiples of 5 kHz and 12.5 kHz up to 995 kHz, the BFO will allow tuning between these steps for SSB operation. All popular modes are provided NFM, WFM, AM and SSB (USB, LSB and CW) with the BFO switched on.

The receiver is supplied with a comprehensive selection of accessories: DA900 wide band flexible aerial, NiCad pack, Dry battery case (for use with 4 x AAA alkaline cells), Charger, DC lead fitted with cigar lighter plug, Earphone, Soft case, SW aerial wire terminated in a BNC connector for shortwave reception and Operating manual.

Versatility is excellent. The AR1500E may be powered from it's internal NiCad pack, spare dry batteries may be carried for extended operation and used with the dry battery case, the set may also be plugged directly into the cigar lighter socket of a motor vehicle (external input range 11 - 18V DC). **RRP £299.00 including VAT.**

If you are unable to obtain supplies of AOR products from your local dealer, you may order directly - we have a fast mail order service. We usually have 'nearly new' stock available at attractive prices too! Please send a large S.A.E. (34p) for full details.

AOR AOR (UK) Ltd.
Room 2, Adam Bede High Tech Centre,
Derby Road, Wirksworth, Derbys. DE4 4BG.
Tel: 0629 - 825926 Fax: 0629 - 825927
A subsidiary of AOR Ltd Japan E&OE

SCANNERS INTERNATIONAL

From the Editor's Desk

The changing European scanner scene

From my knowledge, the German government have been very 'touchy' on scanners. Indeed one day last year, while I was sampling a traditional Bavarian pastime of sitting under the chestnut tree in a Munich beer garden, complete with stein of beer and a barbecued chicken, my radio which I had in 'scan mode' opened up and a C-Netz call (UHF cellular telephony) came through. My German host, a professional radio engineer who was sat beside me, almost threw a fit! The general idea I gained was that I should turn it off immediately for fear of being taken away by the 'Polizei'!

I was told it was only radio amateurs who may own scanners, and that's to check that their transmitters aren't radiating any frequencies they shouldn't. Otherwise, they are strictly 'Verboten'. Now maybe my German isn't up to scratch as well as I thought it was, but a 68 page A4 sized book entitled 'Scanner Praxis' dropped into the Editorial in-tray a few days ago (published by Verlag für Technik & Handwerk GmbH, Fremersbergstraße 1, 7570 Baden-Baden, at 9.80DM plus p/p). Within its pages are scanners galore, including articles on 'Polizeifunk', or police radio communication to you and I, including photos of an officer using his handheld and a police dispatcher at his radio console. They even publish the frequency bands of services such as C-Netz (451.3-455.74 and 461.3-465.74MHz) that I wasn't supposed to listen to! The times, they are a changing.

ScanNews

Bill Robertson's roundup of the latest scanner news

Scotland Yard goes Trunked

Scotland Yard have recently been looking for a trunked radio system, and by the time you read this they should have agreed on one. They need efficient communication of course, their coverage being almost the entire region within the M25 including all security at Heathrow airport, all governmental protective responsibilities, and security for the Royal Family. In line with most police forces, they're going towards encryption to keep things secure, using digital rather than analogue encryption. With 20,000 radios and 1,000 dispatch consoles to take care of, they need to make the best use possible of their frequencies. They started transferring their personal handheld radios from VHF to UHF in mid 1990, but the police in the UK still about the only ones who still use 25kHz channel spacing on UHF, whereas the PMR users employ 12.5kHz to double the number of available channels. Maybe they'll go 12.5kHz spacing as well!

Modified DJ-X1Ds now available

Waters and Stanton Electronics tell me their DJ-X1Ds have been selling so fast that they've not been able to keeps stocks of 'crystal filter modified' types (see the review in Scanners Dec 92). They have now increased their technical resources, and are now modifying them in 'batches' to keep in stock. Having managed to compare the 'before and after' sets, I can say there's an enormous difference between the two, the modification being in my mind *very* worthwhile. Further details from Waters and Stanton, 22 Main Road, Hockley, Essex, SS5 4QS, Tel. 0708 444765.

Iridium orbiting cellular phone system

In talking about this system (see last month's *ScanNews*) I've been inundated with request for more information! Well Motorola and Scientific Atlanta have already planned to have pre-production Iridium phones working in early 1993, with full scale production in mid 1994, so it looks like it's 'on'. It isn't regarded as a substitute or replacement for existing cellular systems, but rather to cover areas where cellular doesn't. The system uses a number of satellites (originally 77 but now a lesser number) in low-earth orbit, 413 nautical miles to be precise, with the 'cells' effectively moving along at 7.4km/s with mobile users being 'handed' from cell to cell as they pass by them. A seven-cell frequency re-use pattern will be used, see the 'Trunking' feature in the Jan 93 issue of *Scanners*.

Within each 'cell', the downlink frequencies will have a channel spacing of 350kHz with 280kHz bandwidth, and digital speech compression will be used so that 25 'channels' can in fact handle 55 conversations. Each satellite is planned to produce a number of fixed high-gain spot beams (like direct broadcast TV satellites but more concentrated at just 372 miles in diameter) to make up the cells, and each of the satellites are 'networked' together to form a switched communication system.

So when your AR-3000 or whatever starts hearing strange things on Wide FM around 1616-1626.5MHz, you'll be able to tell your friends all the technical details about what you're hearing!

Inmarsat to launch Global handheld phone service

Hot on the heels of Iridium, comes the Inmarsat-P phone system. Inmarsat, the International Maritime satellite Organisation, have been providing a satellite phone service for some time. This normally needs 1m dishes though, the type you see on ships and alongside news reporters in disaster areas. A photo of one of their proposed handheld phones shows a compact unit about the size of a cellular portable, with a rather 'thick' aerial, altogether quite pocket-sized. Inmarsat hope to decide on the system details in July this year and plan to launch it later this decade, it will obviously be a hot competitor to the Iridium system. No news on the frequencies as yet, although they well be in the same range at the Iridium system as this is the 'agreed band', but watch this space!

Buyers Guide

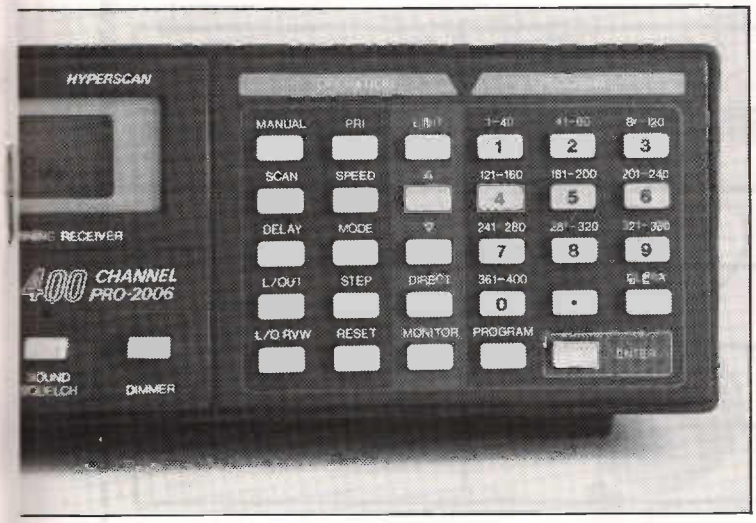
Here's our latest list of the scanners available in the European market today. These are listed with their frequency coverage, modes of operation, number of memory channels available, typical selling price in the UK (including nicads and charger for handheld scanners), and which issue the set was reviewed in (SI indicates Scanners International, HRT indicates Ham Radio Today, back numbers and photocopies available from the address given in the main magazine). All frequencies are given in MHz, with 'H' signifying a Handheld scanner, 'B' signifying a Base/Mobile scanner.

Mode of operation indicates those which may be selected on any entered frequency. Note that some scanners have AM limited to Airband coverage only, where this is the case this is clearly shown. All scanners have a 'Search' facility apart from those where this is also clearly shown.

Scanner distributors and dealers are shown in the magazine's advertising pages, and these dealers will be pleased to offer full details including the latest prices of the scanners they stock.

Make	Type	Freq Coverage	Modes	Mem	Typ Ch.	Review Price
Alinco DJ-X1D	H	500kHz-1.3GHz	AM/FM/WFM	100	£269 (no batts/charger)	SI Dec 92
AR 800E	H	75-105 118-174 406-495 830-950	AM/FM	20	£169	HRT /Sep 88
AR 900	H	108-174 220-280 300-380 406-470 830-950	AM/FM	100	£199	HRT Aug 89
AR-950	B	60-88 108-136 137-174 220-290 291-380 406-470 830-950	AM/FM	100	£254	
AR 1000 MkII	H	0.5-600 805-1300	AM/FM/WFM	1000	£249	SI No.3
AR 1500	H	0.5-1300	AM/FM/SSB	1000	£299	SI Aug 92
AR 2000	H	0.5-1300	AM/FM/WFM	1000	£279	
AR-2002	B	25-550 800-1300	AM/FM/WFM	20	£399	HRT Oct 86
AR-2500	B	0.5-1500	AM/FM/WFM/SSB	1984	£399	
AR-2800	B	0.5-600 800-1300	AM/FM/WFM/SSB	1000	£425	SI Jan 92
AR-3000A	B	0.1-2036	AM/FM/WFM/CW/SSB	400	£875	SI May 92
Bearcat BC50XLT	H	66-88 136-174 406-512	FM	10 No search	£100	HRT Apr 88
Bearcat BC55XLT	H	29-54 136-174 406-512	FM	10 No search	£99	
Bearcat BC70XLT	H	66-88 118-174 406-512	FM AM Air	20	£199	HRT Jul 88
Bearcat BC100XLT	H	66-88 118-174 406-512	FM AM Air	100	£184	HRT Apr 87
Bearcat BC142XLT	H	68-88 136-174 406-512	FM	16 No search	£110	
Bearcat BC175XL	B	66-88 118-174 406-512	FM AM Air	16	£169	
Bearcat BC200XLT	H	66-88 118-174 406-512 806-956	FM AM Air	200	£220	SI No. 1
Bearcat BC760XLT	B	66-88 108-174 350-512 806-956	FM AM Air	100	£194	
Bearcat BC800XLT	B	29-54 118-174 406-512 840-912	FM AM Air	40	£149	
Bearcat BC855XLT	B	68-88 118-174 406-512 806-956	FM AM Air	50	£185	
Bearcat UBC950XLT	B	29-54 118-174 406-512 806-956	FM AM Air	100	£235	SI No. 1
Black Jaguar MkIII	H	28-30 50-88 115-178 200-280 360-520	AM/FM	16	£179	HRT Jun 88
Fairmate HP-100	H	15-550 805-1300	AM/FM/WFM	1000	£249	HRT Apr 90
Fairmate HP-200	H	0.5-600 805-1300	AM/FM/WFM	1000	£269	

Make	Type	Freq Coverage	Modes	Mem	Typ Ch.	Review Price
Fairmate HP-2000	H	0.1-1300	AM/FM/ WFM	1000	£269	
Icom IC-R1	H	0.1-1300	AM/FM/ WFM	100	£329	SI No. 2
Icom IC-R100	B	0.1-1800	AM/FM/ WFM (SSB opt.)	100	£475	SI No. 2 (No.3)
Icom IC-R7000	B	25-1300	AM/FM/ WFM/SSB	99	£925	HRT Feb 89
Icom IC-R9000	B	0.1-2000	AM/FM/ WFM/SSB/ CW/FSK	1000	£4080	
JIL SX-200N	B	28-88 108-180 380-514	AM/FM	16	£325	
JIL SX-400N	B	26-520	AM/FM/ WFM	20	£649	
Jupiter MVT6000	B	25-550 800-1300	AM/FM/ WFM	1000	£369	
Kenwood RZ-1	B	0.5-905	AM/FM/ WFM	100	£465	HRT May 88
Nevada MS1000	B	0.5-600 805-1300	AM/FM/ WFM	1000	£279	
Realistic PRO-34	H	68-88 108-136 136-174 380-512 806-960	FM/ AM Air	200	£249	
Realistic PRO-35	H	68-88 108-174 406-512	FM AM Air	100	£180	SI Feb 82
Realistic PRO-37	H	68-88 107-174 380-512 860-960	FM AM Air	200	£200	
Realistic PRO-38	H	68-88 136-174 406-512	FM	10 No search	£79	
Realistic PRO-43	H	68-88 118-174 220-512 806-1000	AM/FM	200	£230	SI Feb 93
Realistic PRO-2005	B	25-520 760-1300	AM/FM	400	£329	SI No. 1
Realistic PRO-2006	B	25-520 760-1300	AM/FM	400	£330	SI Jun 91
Realistic PRO-2022	B	68-88 108-136 136-174 380-512 806-960	FM AM Air	200	£200	
Realistic PRO-2024	B	68-88 108-136 136-174 380-512	FM AM Air	60	£100	
Realistic PRO-2025	B	68-88 136-174 406-512	FM	16 No search	£99	SI Oct 81
Realistic PRO-9200	B	68-88 108-137 137-174 406-512	FM AM Air	16	£130	SI Apr 92
Regency HX850E	H	60-89 118-136 140-174 406-495	AM/FM	20	£179	
Regency HX-2000	H	60-89 118-174 406-512	AM/FM	20	£99	HRT Jan 87
Revco RS-3000	B	26-32 60-90 118-180 380-512	AM/FM	50	£225	
Shinwa SR001	B	25-1000	AM/FM/ WFM	200	£299	SI May 91
Signal R535	B	108-143 220-380	AM	60	£199	
Signal R550	B	118-137	AM	40	£129	
Sony AIR7	H	0.1-2.2 76-136	AM/FM/ WFM	30	£229	HRT Sep 87
Sony ICF PRO80	H	0.15-108 115-223	AM/FM/ SSB	40	£299	HRT Dec 87
Sony ICF 2001D	B	0.15-30 76-108 116-136	AM/FM/ SSB	32	£279	SI No. 1
Standard AX700	B	50-905	AM/FM/ WFM	100	£545	
WIN108	H	108-143	AM	20	£113	
Yaesu FRG9600	B	60-950	AM/FM/ WFM/SSB	100	£520	HRT Jul 87
Yupiteru VT125	H	108-142	AM	30	£169	SI Aug 91
Yupiteru VT150	H	142-170	FM	30	£169	
Yupiteru VT225	H	108-142.1 149.5-160 222-391	AM/FM	100	£249	SI Jul 92
Yupiteru MVT5000	H	26-550 800-1300	AM/FM	100	£239	HRT Nov 89
Yupiteru MVT6000	B	25-550 800-1300	AM/FM	100	£199	
Yupiteru MVT7000	H	1-1300	AM/FM WFM	200	£319	SI Sep 91
Yupiteru MVT8000	B	8-1300	AM/FM/ WFM	200	£349	



ScanAds

Want a scanner or receiver, or have you got one to sell? Do you need some accessories, or simply want to advertise your local scanner/airband club? Then advertise free in our 'ScanAds' page! This is a free service for reader's privately-owned scanner- related products and for non-profit enthusiast groups (for other equipment please use the 'main' magazine ads – thanks). Commercial or private ads may also be placed in the pre-paid classified ads section – call 0442 66551 for details. Send your free reader's ad to; ScanAds, Scanners International, P. O. Box 73, Eastleigh. SO5 5WG, or you can fax your coupon to us directly on 0703 263429. There's no limit as to the length, just continue on a separate sheet if required, but please note that the coupon below, or a photo/fax copy of this, must accompany each submitted advertisement as proof of readership. Your name/address as requested on the coupon will not normally be published, this is just for us to get in touch with you if we there are any problems, so please include the contact details you require, together with your area or town, within the advert text itself. Your ad will appear in the first available issue.

FOR SALE

Bearcat 175XL desktop scanner, manual, boxed, £80. (Coventry). Tel. 0203 334361 after 6.00pm

Lowe SRX-30 communications receiver, 500kHz-30MHz, AM/SSB, 240V/12V, good condition, £110. Yupiteru MVT-5000 scanner, AM/FM, 25-550MHz, 800-1300MHz, little used, £150. Tony G6SHU (Newport, Shropshire), Tel, 0952 825679

Fairmate HP-2000 1000 memory scanner, continuous coverage 550kHz-1300MHz, manual, nicads, aerials, various books, boxed, as new, £210. Paul (Southampton), Tel. 0703 660469/320387

Yupiteru MVT-7000 scanner, boxed, 9 months guarantee, complete with all accessories, listening guide, spare nicads and charger, £240. Barry (Dewsbury, W. Yorks), Tel. 0924 466838

Icom IC-R1 scanner, complete with all accessories, boxed, as new, £250. (Southport). Tel. 0704 26657 evenings

JIL SX400 scanner with matching PSU, £175. John T. Allsopp G4YDM, (Washington, Tyne and Wear), Tel. 091 416 2606

AOR-3000 Scanner mint condition, £450. Peter Jerram (Carterton, Oxon), Tel. 0993 842243

Saiko 16ch FM mobile 12V scanner, 78-88, 155-168, 456-476MHz, telescopic aerial, brand new, boxed, unwanted gift, £50. Eric Page GU3HKV, Seacroft, Clos du Murier, St. Sampson, Guernsey, Tel. 0481 47278

Yupiteru MVT-7000 handheld with nicads, cigar plug, carrying strap and original box and packaging, only six months old, excellent condition, selling for only £200. Also discone aerial, free with radio. (Birmingham). Tel. 021 770 8593

AOR-2800 Scanner 500-1300 SSB, still under guarantee, mobile/base with discone, £300 ono. Dave (Northampton), Tel. 0604 844138 after 6.00pm.

Nevada MS-1000 scanner receiver, home base 25-1300MHz, £220. Peter Hollis, 68 Kingstone Ave, Deneside, Seaham, Co. Durham. Tel. 091 581 2095

PRO-204 Scanner, Icom IC-R72 HF receiver, mint, both for £550 cash. William J. Bannister, 7 Lairds Place, Liverpool 3 6JJ, Tel. 051 207 2602

Uniden Bearcat 200XLT handheld scanner, with charger and case, boxed as new, £155. (Nuneaton). Tel. 0203 397209

WANTED

Urgent Help wanted. Two novices with PRO-37 SC, can anyone help us get going? Use - frequencies, aerials, info in general. Postage paid. Thanks. Mr. D. Howarth, 11 Willowgrove Park, Sandy Lane, Preesall, FY6 0EJ

Modification Details for Realistic PRO-32 manual AM/FM selection. Please contact Martin Miller, 122 Moor Lane, Upminster, essex RM14 1ET

EXCHANGE

Olympus OM4 SLR camera, mint condition, for AOR-1500 scanner or MVT-7000 or Grundig Satellit 700. (Finchley). Tel. 081 346 3297 anytime.

SCANNERS Free Readers Advertisements

Name .....

.....

Address .....

.....

.....

.....

Signature .....

Date .....

Enter your ad in the boxes below and send to ScanAds, PO Box 73, Eastleigh, Hants SO5 5WG

S.R.P. TRADING

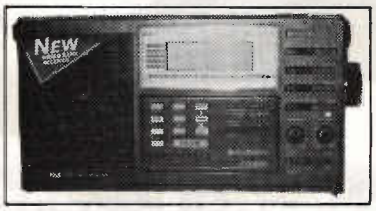
SANGEAN ATS 803A

(Direct key-in world receiver with quartz alarm clock timer)

Tunable BFO SSB/CW!

Specifications and features

★ 150-29.999 continuous tuning with no gaps. Phase locked loop-double conversion Superheterodyne ★ Full shortwave/AM/SSB 150-29999kHz no gaps! + FM87.5-108 mono/stereo ★ Five tuning functions: Direct press button frequency input auto scanning, manual scanning memory recall and manual tuning knob



★ Built-in clock and alarm. Radio turns on automatically at preset time and frequency. ★ Large digital frequency display. ★ Fourteen memories – nine memory channels for your favourite station frequencies. Last setting of mode and waveband stored in five memories. ★ Direct press-button access to all 12 shortwave broadcast bands. ★ Two power sources – battery or AC mains adaptor. ★ General coverage of all AM bands in LW/MW/SW (dedicated broadcast band coverage on all versions), plus of course the FM band for quality sound broadcasts in headphone stereo. ★ SLEEP function turns the radio on or off after an adjustable time of 10-90 minutes. ★ Separate BASS and TREBLE controls for maximum listening pleasure. ★ External antenna jack for better reception. ★ Adjustable RF GAIN control to prevent overloading when listening close to other strong stations or if there is interference. ★ New improved wide/narrow filter (6/2.7kHz) ★ BFO control (Beat Frequency Oscillator) enables reception of SSB/USB/LSWB (single side band) and CW (Morse Code) transmissions. ★ Illuminated display to facilitate night-time use. ★ Designed for both portable and desk top use. ★ Five dot LED signal strength indicator.

DIMENSIONS: 29.2cm×16.0cm (11.5in×6.3in×2.36in).
OUTPUT: 1200mW (10%THD) WEIGHT: 1.7kg (3.75lbs) without batteries. Wide/narrow filter switch.

£109.95 + £5 check, test and p&p.

SKY SCAN

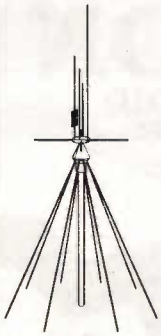
Desk Top Antenna Model Desk 1300

Built and designed for use with scanners. Coverge: 25 to 1300MHz. Total height – 36ins – 9ins at widest point. Comes complete with 4 metres of RG58 coax cable and BNC connector fitted.. Ideal indoor – high performance antenna and can also be used as a car antenna when your car is static. REMEMBER YOUR SCANNER IS ONLY AS GOOD AS YOUR ANTENNA SYSTEM!

£49.00 + £3.00 p&p

SKY SCAN

V1300 Antenna



Most discones only nave horizontal elements and this is the reason that they are not ideal for use with a scanner. Most of the transmissions that you are likely to receive on your scanner are transmitted from vertically mounted antennas. The Sky Scan V1300 discone has both vertical and horizontal elements for maximum reception. The V1300 is constructed from best quality stainless steel and aluminium and comes complete with mounting pole. Designed and built for use with scanners.

£49.95 + £3.00 p&p

SKY SCAN

Magmount MKII

For improved performance, wide band reception, 25 to 1300MHz. Comes complete with protective rubber base, 4m RG.58 coax cable and BNC connector. Built and designed for use with scanners.

£24.95 + £3.00 p&p

SANGEAN
Portable SW Antenna

ANT 60

FREE WITH EVRY ATS 803A

- Greatly improve reception power of portable shortwave receiver
- Easy hookup to snap onto telescoping rod antenna or plug into radio's external AM antenna jack extends to 7 metres (23 feet).
- Portable for indoors and outdoors.
- Suitable for all kinds of shortwave radios.

£14.99 FREE POST & PACKING WITH THIS ISSUE ONLY

YUPITERU

MVT 7000 HANDHELD

PROBABLY THE UK'S MOST POPULAR HANDHELD SCANNER!

★ Receives 8 to 1300 MHz 100kHz-1300MHz (ot reduced sensitivity)
★ 200 Memory chonnels
★ Rotory or keypad freq. control
★ AM/FM/NFM
★ Lorge disploy with signol strength ..mete

EACH SET IS SUPPLIED COMPLETE WITH:- Full set of high power NiCods, AC chorger, DC power leod ond corry strop

January Special Offer - £PHONE

MVT 8000 MOBILE/BASE

This new model is the mobile version of the popular MVT 7000 Hondheld obove.

★ Receives 8 to 1300MHz, 100kHz to 1300MHz (ot reduced sensitivity)

THIS RADIO IS ESPECIALLY SENSITIVE AT UHF FREQS. Set is supplied with moins power unit

January Special Offer - £PHONE

MVT 6000 MOBILE/BASE

An economy version of the new MVT 8000 obove -housed in the some cose.

★ Receives 25-550MHz, 800-1300MHz
★ 100 Memory chonnels

January Special Offer - £PHONE

AIRBAND RADIOS

This month we ore pleosed to introduce **THE WORLDS FIRST DEDICATED CIVIL/MILITARY AIRBAND RECEIVER, THE VT225.**

A powerful pocket sconner thot leoves the competition stonding. - A super sensitive set designed for optimum performonce on the Civil/MilitoryAirbands.

★ Receives 108-142 MHz Civil Airband 222-391MHz Military Airbond 149.5-160MHz Morine Bond
★ 100 Memory chonnels
★ AM/FM on VHF
★ Priority chonnel function

EACH SET IS SUPPLIED COMPLETE WITH:- NiCods, earphone, corrying strop ond moins chorger

January Special Offer - £PHONE

VT-125 UK CIVIL AIRBAND RECEIVER

Using the some technology os the VT-225, this set covers the full Civil Airband - hearing distont signols thot ore inoudible on some other sconners.

★ Covers 108-142MHz
★ 30 Direct entry memories
★ Seorch steps 25, 50, 100kHz SUPPLIED COMPLETE WITH NiCADS AND UK CHARGER.

January Special Offer - £PHONE

FAIRMATE

HP2000

STILL ONE OF THE MOST POPULAR HANDHELD SCANNERS ON THE MARKET.

Over the lost yeor the HP2000 hos outsold olmost all other models.

★ Continuous coveroge from 500kHz to 1300MHz
★ 1000 chonnels of memory
★ Keypad or rotory control
★ AM, FM ond WIDE FM modes
★ Seorch steps from 5 to 995kHz

EVERY SET COMES COMPLETE WITH:-

Full set of high power NiCods, 2 ontennos, corrying cose, eorphone, DC coble, belt clip ond strop, UK chorger

January Special Offer - £PHONE

MS1000 BASE/MOBILE SCANNER

MOBILE VERSION OF THE HP2000 HANDHELD BUT WITH SEVERAL ADDITIONS:-

★ Switchoble oudio squelch
★ Tope recorder output socket
★ Automotic - signal operoted tope recorder switching
★ All metol cose for improved EMC compatibility
★ Receives:- 500kHz - 600MHz, 805 - 1300MHz. Supplied with moins power supply

January Special Offer - £PHONE

AOR SCANNERS

AR1500 HANDHELD

Covers 500kHz to 1300MHz receiving NFM, WFM, AM, ond SSB. Supplied with o lorge selection of occessories including:-

★ Chorger
★ Dry cell bottery cose
★ 5 mtr LW ontenno
★ Eor piece
★ Soft cose

NOW IN STOCK
January Special Offer - £PHONE

AR2002 BASE/MOBILE

Receives 25 - 550MHz, 800 - 1300MHz, AM, FM, WFM Super-sensitive receiver

January Special Offer - £PHONE

AR2500 BASE/MOBILE

Receives 5-550MHz, 800-1300MHz AM, NBFM, WFM. 1984 Memory Chonnels, Fost 36 CH/SEC Scon. Resolves SSB with BFO control

January Special Offer - £PHONE

AR2800

★ Receives 500kHz - 600MHz, 800 - 1300MHz AM, FM, WFM. SSB copobility with BFO.
★ 1000 Memory

January Special Offer - £PHONE

SCANNERS

ALINCO DJ-X1 HANDHELD SCANNER

★ Covers 500kHz to 130MHz
★ AM/FM/WFM
★ 100 Memories
★ 3 Sconning speeds

January Special Offer - £PHONE

SRP Trading, Unit 20, Nash Works, Forge Lane, Belbroughton, Nr. Stourbridge, Worcs.
Tel: (0562) 730672. Fax: (0562) 731002

Saturday

MARCH 13th FROM
10.00am - 6.00pm

LONDON AMATEUR RADIO & COMPUTER SHOW 19

NDON
R RADIO &
PUTER
HOW
93

Sunday

MARCH 13th FROM
10.00am - 6.00pm

COME & VISIT THE HRT

HAM RADIO TODAY

(BLUE HALL, STAND 'I')

G4ZPY
PADDLE KEYS INTERNATIONAL

Largest selection of Hand Crafted Key in the world.
See our new miniature 3 in 1 Twin Paddle Key at London.

For details send S.A.S.E. or 2 IRCs
41 Mill Dam Lane
Burscough, Ormskirk
L40 7TG England

Come and see us in the Red Hall

SPECIALIST ANTENNA SYSTEMS LTD

Present the finest range of DX antennas and accessories

cushcraft

40-2CD	40m 2 element Beam
20-4CD	20m 4 element Beam
20-3CD	20m 3 element Beam
15-3CD	15m 3 element Beam
10-4CD	10m 4 element Beam
TEN-3	10m 3 element Beam
A4S	20-15-10m 4 element Beam
A3S	20-15-10m 3 element Beam
A3WS	17-12m 3 element Beam
D40	40m Rotary Dipole
D4	40-20-15-10m Dipole
D3	20-15-10m Dipole
D3W	30-17-12m Dipole
R7	40-10m H/W Vertical
R5	20-10m H/W Vertical
AP8	80-10m Vertical
AV5	8 Band HF Vertical
AV3	20-15-10m Vertical
A50-6S	6m 6 element Beam
A50-5S	6m 5 element Beam
A50-3S	6m 3 element Beam
AR-6	6m Ringo Vertical
17B2	2m 17 element Beam
13B2	2m 13 element Beam
124WB	2m 4 element Beam
A144-7	2m 7 element Beam
A144-11	2m 11 element Beam
A144-20T	2m 10 element X Oscar
AR-2	2m Ringo Vertical
ARX-2B	2m Ringo Ranger II
AR-270	2m/70cm Vertical
424-B	70cm 24 element Beam
A430-11	70cm 11 element Beam
416TB	70cm 8 element X Oscar
ARX450B	70cm Ringo Ranger II

MIRAGE/KLM

COMMUNICATIONS EQUIPMENT

40M-2	40m 2 element Beam
20M-4	20m 4 element Beam
15M-4	15m 4 element Beam
10M-4	10m 4 element Beam
KT34-A	20-15-10m 4 element Beam
KT34-XA	20-15-10m 6 element Beam
6M-7LD	6m 7 element Beam
6M-5	6m 5 element Beam
2M-20LBX	2m 20 element Beam
2M-16LBX	2m 16 element Beam
2M-13LBA	2m 13 element Beam
2M-22C	2m 11 element X Oscar
2M-14C	2m 7 element X Oscar
432-30LBX	70cm 30 element Beam
432-20LBX	70cm 20 element Beam
435-40CX	70cm 20 element X Oscar
435-18C	70cm 9 element X Oscar

LINEAR AMPLIFIERS

A1015G	6m 10-150w g/f rx
B3030G	2m 30-300w g/f rx
B3016G	2m 30-160w g/f rx
B1016G	2m 10-160w g/f rx
B108G	2m 10-80w g/f rx
B215G	2m 2-150w g/f rx
D3030N	70cm 30w-100w
D1010N	70cm 10w-100w
D15N	70cm 2w-20w

GASFET PRE-AMPLIFIERS

KP-1/2M	2m Indoor unit
KP-1/70	70cm Indoor unit
KP-2/2M	2m Masthead unit
KP-2/70	70cm Masthead unit

TELEX hy-gain

7-2	40m 2 element Beam
7-1	40m Rotatable Dipole
205CA	20m 5 element Beam
204BAS	20m 4 element Beam
203BAS	20m 3 element Beam
155CA	15m 5 element Beam
153BAS	15m 3 element Beam
105BAS	10m 5 element Beam
103BAS	10m 3 element Beam
TH7DXS	20-15-10m 7 element Beam
TH5MK2S	20-15-10m 5 element Beam
EXP14	20-15-10m 4 element Beam
TH3JRS	20-15-10m 3 element Beam
TH2MK3S	20-15-10m 2 element Beam
DX88	8 Band HF Vertical
12AVQS	20-15-10m Vertical
14AVQ	40-10m Vertical
18VS	80-10m Vertical
66DX	6m 6 element Beam
64DX	6m 4 element Beam
215DX	2m 15 element Beam
216SAT	2m 8 element X Oscar
7031DX	70cm 31 element Beam
7030SAT	70cm 15 element X Oscar

ROTATORS

T2X	Windload 1.9m²
HAM IV	Windload 1.4m²
CD45 II	Windload 0.79m²
AR40	Windload 0.28m²

WE NOW HAVE
GEM QUAD PRODUCTS
PLEASE ASK FOR DETAILS

LIGHTNING ARRESTERS AND FULL RANGE OF COMMERCIAL ANTENNAS ALSO AVAILABLE. PLEASE ASK FOR FULL DETAILS

Trefonen. Oswestry. Shropshire SY10 9DJ
Phone 0691 670440 Fax 0691 670282
CALLERS WELCOME — PLEASE NOTE OUR NEW ADDRESS

OPENING HOURS
Mon-Fri = 8.30-5.30
Saturday = 9.00-1.00

Software Review – EI5DI Super-Duper

Don Field G3XTT tests the latest logging software

EI5DI's Super-Duper (abbreviated to SD for the remainder of this review) is a contest logging program which, in its HF version, covers the various RSGB HF contests, together with the ARRL DX and 10m contests, the CQWW and CQ WPX contests, and the IARU HF Championship. A VHF version of the program is also available, but not reviewed here.

To my mind, the important aspects of a contest logging program are; ease of data entry, good ergonomics to minimise errors and maximise ease of use in the heat of the contest, 'knowledge' of the contest – i.e., what constitutes a multiplier, etc. – in order to allow accurate scoring; real-time feedback to the user of score, QSO rates, multipliers still needed, dupes, etc, to maximise QSO and scoring rates, and; good after-contest editing, printing of log and dupe sheets, etc.

How does SD rate?

Getting started with SD is simplicity itself. Set up a suitable directory on your hard disk (though you can log to a floppy disk if necessary), and copy all the files. No need to print out the user instructions, the latest version of SD comes with a very presentable printed manual. When you boot up the program you are led very clearly through a series of initial screens in which you enter your callsign, the contest type and mode, and various other essential data. You are then taken into the QSO entry screen which looks very familiar to anyone who has used K1EA's CT or K8CC's NA contest programs. My one complaint here is that there is no means of going back if you make a mistake. You either have to press on to the logging screen, or re-boot your computer.

Logging QSOs is very straightforward. Like CT and NA, SD assumes that your 'Sent' signal report is 59(9). This seems to be the way of life these days, though I notice that more realistic signal reports are still the norm in many RSGB contests, so this may cause you problems. One neat facility, though, is the way you can associate a memo to yourself with any QSO. So you could, if necessary, make a note that the 'sent' report was different, and then edit the log after the event. My major complaint in this area is that the program will not allow you to log a QSO until you have received a full exchange of information. This is unrealistic. In RSGB contests, for example, the organisers accept that you may QSO non-contest stations and therefore not receive a serial number. However, the contacts are still valid for points, but SD will not allow them to be logged! Editing QSOs, even after they have been logged, is very easy indeed. You can scroll up, or enter the QSO number and be taken straight there. And because the log file is an ASCII file, it can be edited after the contest with any text editor.

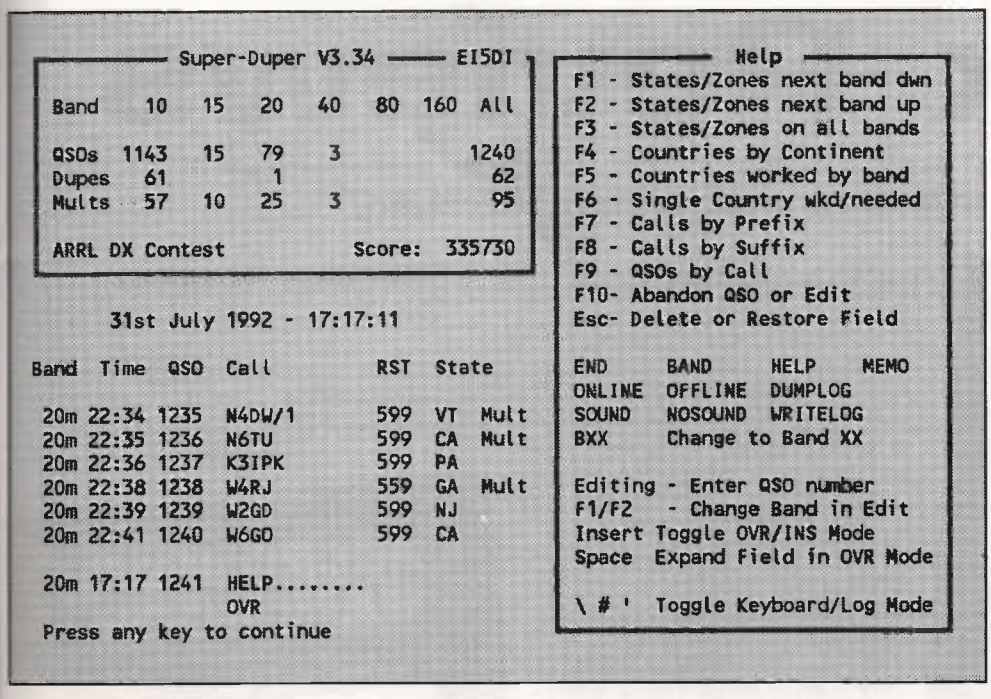
SD uses the first 640k of your computer's memory and is therefore limited to logging about 3,000 QSOs (or more if you are using DOS5 loaded in high memory). You can always open a second log file if you run out of space, but you cannot then score or 'dupe' against QSOs made earlier. EI5DI promises that a later release will be able to use your computer's extended memory to get round this limitation (which, in fairness, applies mainly to the very serious contesters or multi-operator groups).

Country recognition, an area in which many programs fall down, is very good indeed. The program recognises portable designators, either before or after the callsign so that, for example, it would recognise both *TA/G3XTT* and *G3XTT/TA* as being Turkey. The *COUNTRY.DAT* data file can also be edited with any text editor so that you can put in callsigns of stations which would otherwise be ambiguous. For example ZK1XX could be in either the North or South Cook Islands. As long as you can find out which, even after the contest, you can edit the data file, reboot the program, and the ZK1XX contact will be correctly assigned. My only gripe is that /MM and /AM suffixes are ignored and the contact counted for the home country, which for most contests is incorrect.

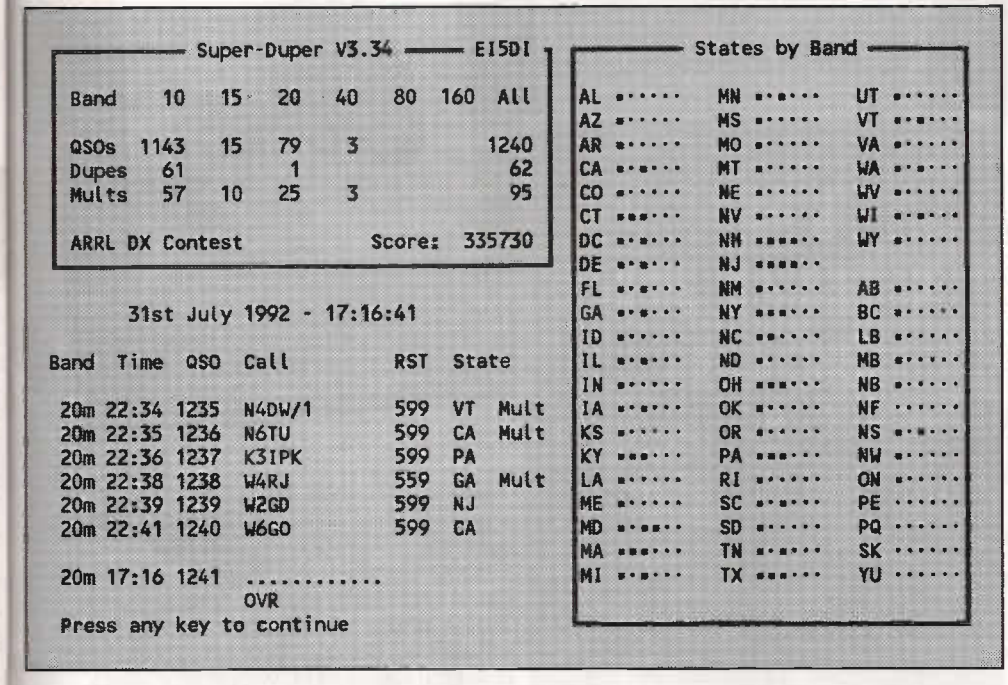
SD has been written to minimise the number of keystrokes and to avoid complex key combinations. You use the function keys for most of the frequent activities ('Check Partial' for example, where you can see whether the fragment of a callsign you have heard matches any of the stations you have already worked). Some functions are even easier. To change bands, for example from 20m to 80m, just type 'B80' in the callsign field. Typing HELP in the callsign field brings up a help window, though I think it would be useful if EI5DI provided a handy reference card with the main commands, to keep by the computer during the contest.

One of the key features of SD is consistency. As EI5DI puts it, he has introduced bookkeeping principles to contest logging. As an example, if you edit a state, zone or country for a particular callsign, then the information is changed for every other contact you made with that station.

My major complaint with SD is in its 'knowledge' of the major contests. Let me give some examples. In the CQWW contests, so-called WAE countries (Shetlands, Vienna International Centre, Karelo-Finnish Republic, Sicily) count as multipliers, but are unknown to SD which works only against the ARRL countries list. SD doesn't know that Turkish stations may be in either Europe or Asia (which makes a difference to the scoring) and asks you to correct the zones for Asiatic Russian stations even though, for example, it is obvious to anyone in the know that UA0Y is zone 23 and UA0Q is zone 18 (K1EA's CT logs all these correctly). SD does not allow you to log the operator against every QSO, as required in RSGB rules for multi-operator contests, although you could use the memo facility, mentioned earlier, to log a change of operator. In fairness, SD was written first for the ARRL contests, and support for other contests has been added later, so presumably the algorithms will be improved as EI5DI gets feedback from users. Indeed, Paul has been very co-operative during this review and promised an updated version in time for the RSGB HF Convention, taking my comments into account. As far as the ARRL contest is concerned, you can log any callsign you like as long as you enter a valid state or province. This may or may not be a good thing – I leave it to the reader to judge.



Pop-up 'help screen' showing available options



Typical 'F3' key screen during ARRL DX CW contest

SD provides some very useful on-screen information during the contest. One window displays your QSO rate, while another allows you to monitor score to-date. Another tracks your multipliers so that you can see immediately which states/provinces you still need (ARRL Contest). In the CQWW contests, where both zone and country are multipliers SD displays a window showing the zones you still need on the band on which you are operating, but when you log a QSO the window changes briefly to show the bands on which you still need the country you just logged before returning to the zone display – a nice touch. Various summary windows can also be called up easily using the function keys.

Using SD after the contest is very simple. If you actually logged on paper, you can enter QSOs into SD and the only difference from using it in real-time is that you need to enter the time of each QSO. The command 'WRITE' will create your log entry which you can then use any text editor to edit if need be, and can then print. However, there is no facility for printing a dupe sheet, multiplier list, or contest cover sheet, as required by most of the contests which SD supports. As the log file is ASCII, there should be no problem importing the data into a station logging program at a later date.

In terms of facilities, I haven't yet mentioned the fact that SD can key your radio (you need to build a simple one-transistor interface) which may not suit the CW purists but, in my experience, is an ideal way of handling CW contests. SD doesn't, though, have the bells and whistles which are becoming increasingly common in state-of-the-art logging programs, such as packet interface, radio interfaces, support for multi-single and multi- multi contesting, voice keyer support, etc. Of course, whether you really want any of those facilities is another matter altogether and depends on what sort of a contester you are.

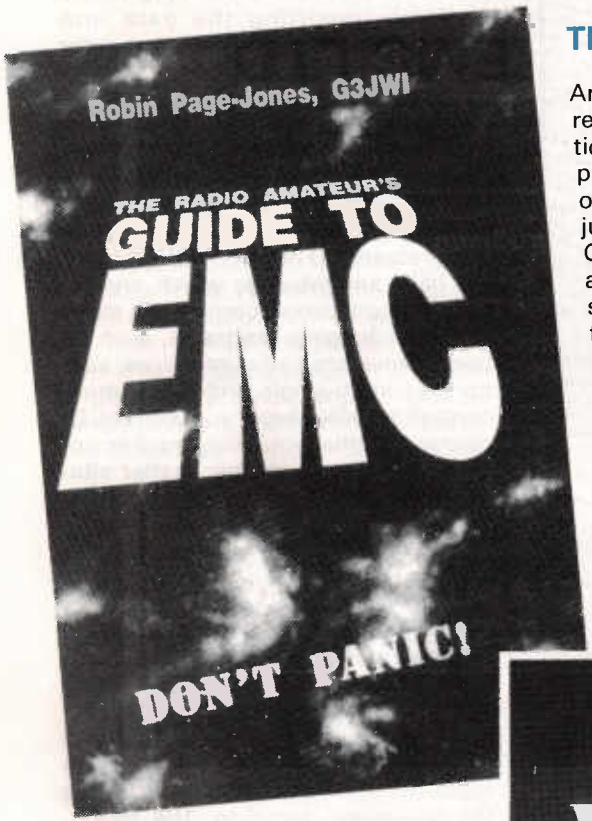
Verdict

SD is a competent contest logging program which has room for improvement. EI5DI has already indicated that some of the shortcomings will be attended to in future releases, so you certainly won't be left high and dry. In some areas of its operation it leaves the opposition standing. The benchmarks are *CT* and *NA* as far as the major international contests are concerned, and G3WGV's *LOG* (distributed by the Chiltern DX Club, and shortly due for a major upgrade) for the RSGB HF and VHF contests. Against either of these SD still has some way to go in features but not in usability. Also, although CT is extremely comprehensive and benefits from user feedback from literally thousands of users in the US and elsewhere, new releases have been notoriously 'buggy' whereas SD seems to be a solid program not prone to crashes. And getting user support from the US is less easy than picking up the phone to Ireland. G3WGV's LOG is excellent for the RSGB contests but, as yet, has very little to offer for the big international contests. It is also more complex than SD to set up. If you want one program that makes a reasonable stab at both UK and international contests and which shows excellent promise for the future then SD may well be for you.

SD is available direct from Paul EI5DI for £20 or $35. This includes telephone support and access to upgrades for 12 months.

Book Reviews

The latest collection to arrive on the HRT bookshelf

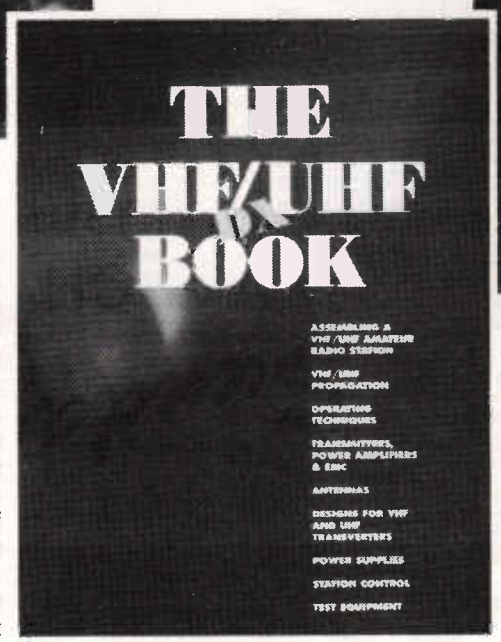


The Radio Amateur's Guide to EMC

No, it's not the 'Hitchhiker's Guide to the Galaxy', even if it may look like it! But the sub-title of 'Don't Panic' does sum the book up very well. Within its pages, Robin Page-Jones G3KWI packs in a wealth of information, helping amateurs to avoid EMC problems by practising 'good housekeeping' as well as helping in the diagnosis and cure of problems if or when they do occur. Prevention is better than cure of course, and it's good to see a chapter devoted to this. A very comprehensive account of filters and their construction is given, together with a summary of the filter performance of many home-made and commercially available filters. The 'human' factor' in dealing with neighbours is also well covered, as this can often 'make or break' an otherwise successful technical cure. 117 pages, 244 by 173mm, ISBN 1 872309 16 X, published and available from the RSGB at £6.50 (£5.65 to RSGB members) plus p/p (£2 in the UK). Address in 'Club News'.

The VHF/UHF DX Book

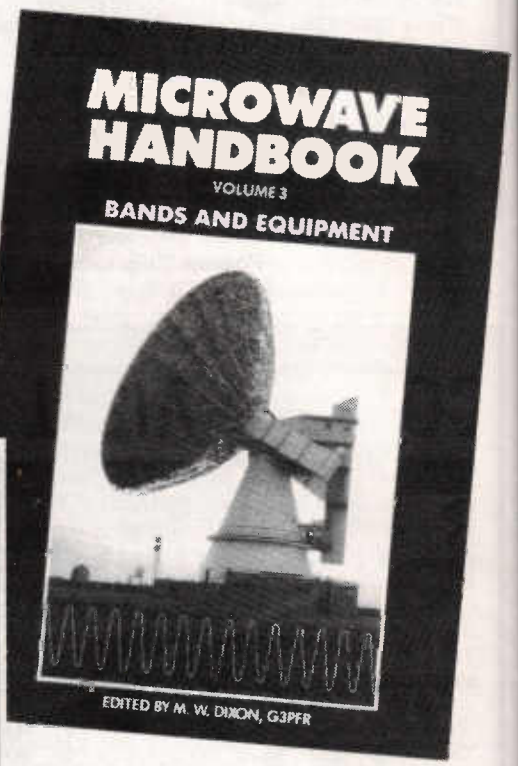
An up-to-date book reflecting current 'state of the art' VHF/UHF practices, has been long overdue. DIR publishing, under the watchful eye of Trevor Preece G3TRP, have done just this with Editor Ian White G3SEK putting together a vast amount of information from himself and other well-known amateurs such as G3NAQ, G4ASR, GW4FRX, DL6WU, G4DDK, G4HUP, G4FRE/WG3I and G4HGT. The callsigns probably say it all to those 'in the know', however for others this book represents an invaluable amount of knowledge by recognized experts in the amateur VHF/UHF field, covering equipment (transmitters, receivers and test



gear), aerials, operating, and propagation. A blend of advanced technology and personal skill is put across, together providing a superb introduction to VHF/UHF DX as well as giving many useful ideas and techniques for 'seasoned' operators and constructors. 452 pages, 246 by 189mm, ISBN 0 9520468 0 6, priced at £18.00 in the UK and published by DIR Publishing, P. O. Box 771, Buckingham, MK18 4HH, Tel. 0280 812197.

Microwave Handbook Vol. 3

Another recent book from the RSGB Publications stable. This, as its name suggests, is the third in the series, and



'rounds off' with band-by-band accounts of the characteristics and potential of the 1.3GHz (23cm), 2.3GHz (13cm), 3.4GHz (9cm), 5.7GHz (6cm), 10GHz (3cm) and 24GHz (12mm) bands, plus a 'finalé' of the bands above these. Constructional descriptions are given for practical equipment, with many 'ideas' which the reader can develop upon. Very much an enthusiast's book, one which could find good use not only for its 'own sake' but also for use with other amateur interests such as satellite, packet, and ATV communication. With this in mind, the 10GHz chapter alone stretches to 133 pages, thus providing plenty of information in line with the rapid uptake of the band for these modes. 277 pages, 244 by 183mm, ISBN 1 872309 12 7. Published and available from the RSGB at £14.47 (£12.32 to RSGB members) plus p/p (£3 in the UK).

SPRING INTO ACTION ... Take out a subscription *now!*

SUBSCRIPTION HOTLINE

0737 768611

Subscription Rates

One Year

U.K £20.40 (post free)

Europe £26.80

Sterling Overseas £28.90

U.S Dollars Overseas $58

Two Years

U.K. £40.80 (post free)

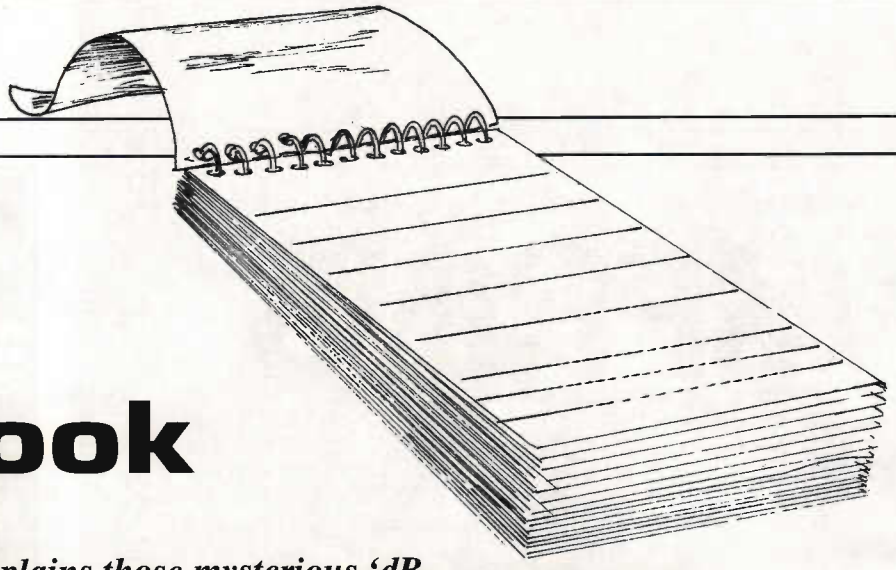
Europe £53.60

Sterling Overseas £57.80

U.S. Dollars Overseas $116

Yes, I want to subscribe to *H.R.T.* for:
❑ one year ❑ two years.
Please commence my subscription with
.....issue.
I enclose my cheque/M.O for £ ..... payable to ASP or please debit my Access/Visa
Card no: .....
Expiry no: .....
NAME.....
SIGNATURE .....
ADDRESS .....
.....
.....
.....POST CODE.....

Please return coupon to H.R.T.
Argus Subscription Services,
Queensway House, 2 Queensway,
Redhill, Surrey RH1 1QS.
Please note you may receive futher information about offers and services which maybe of particular interest to you.



From My Notebook

Geoff Arnold G3GSR explains those mysterious 'dB referenced' figures

This month, I shall be continuing the brief look at the subject of decibels which I began in the last issue. I hope that you remember the explanation of the two formulas for calculating 'power' decibels and 'voltage' decibels, and why they are tied together according to a square-law relationship.

Measurements

Virtually all meters used to indicate power or decibel ratios in radio, electronic or sound engineering are actually measuring voltage across some known load impedance. The scale of the meter is usually calibrated in milliwatts or watts, or in some form of dB, to give a direct readout of power or power ratios. There is no reason why an ordinary voltmeter shouldn't be used for the same purposes, except that you will have to do a calculation after every reading, using the formula $W = V^2/R$, or more correctly $W = V^2/Z$ since we are talking about AC signals rather than DC.

In these explanations, I am going to assume for simplicity that all the impedances concerned are non-reactive – in other words they are pure resistances. I'm also going to assume that the signals that we are going to apply to the amplifiers are of a constant amplitude; an unmodulated carrier in the case of RF, or a constant audio tone in the case of AF. If you have an amplifier where the input and output impedances are the same, typically 50 ohms in and out in RF circuits, the voltage gain and power gain are exactly the same in decibel terms. Taking as an example the small RF linear amplifier I mentioned last month, that 50 watts out for 10 watts in is a power gain of 5 times, equivalent to roughly 7dB. The voltage equivalent of 50 watts across 50 ohms at the output is 50 volts (multiply the power and the impedance together; the square root of the result is the voltage). The voltage equivalent of 10 watts across 50 ohms at the input is 22.4 volts. The voltage gain from input to output is 50 divided by 22.4, or around 2.23, and in decibels that corresponds to roughly 7dB. 'QED', as my maths teacher used to say!

Things are totally different for an amplifier whose input and output impedances are different. Let's take as an example an audio power amplifier which has a 600 ohm input impedance (a standard for audio lines), and is designed to push out 20 watts into a 15 ohm loudspeaker system. The technical specification for the amplifier is quite likely to quote an input signal level on that 600 ohm line of 0dBm (spoken as zero- or nought-dee-bee-em). Your response to that piece of information is likely to be 'What on earth is that?', or words to that effect!

dBm

In the same way that 'dBW' means 'decibels relative to one watt', 'dBm' is an abbreviation meaning 'decibels relative to one milliwatt'. That figure of '0dBm' denotes 'zero decibels relative to one milliwatt', in other words, a milliwatt. So, our amplifier gives 20 watts out for 1 milliwatt in, which means that it has a power gain from input to output of 20/0.001, or 20,000 to 1. In decibel terms, that's just a little bit more than 43dB.

Now let's look at the circuit in terms of signal voltage levels. To dissipate a power of one milliwatt in 600 ohms you would need to apply 775 millivolts, or 0.775V. At the output of the amplifier, 20 watts into a load of 15 ohms is equivalent to 17.3 volts. So, the voltage gain from input to output is 17.3/0.775, around 22.3, which would equate to 27dB.

That's obviously nothing like the 43dB we got for the power gain calculation, and the reason is that we made no allowance for the difference between the impedances of the input and output circuits. As I pointed at the end of last month's 'Notebook', you must never forget that 'R' features in the equation $P = V^2/R$. It would be totally misleading to say that the amplifier has a voltage gain of 27dB, without at the same time specifying the different input and output impedances.

On the other hand, if you were to tweak a preset gain control in the audio amplifier and see that the output level (as indicated on an AC voltmeter connected across the load) has doubled, it would be quite correct to say that the gain from input to output has **increased** by 6dB, because the 'before' and 'after' measurements are both being made in the one place, at the output, and across the same circuit impedance.

Power References

I've already talked about two of the 'special' decibels. The first, dBW – meaning decibels relative to a reference power level of one watt – has for some time now been used instead of watts to specify the maximum transmitted power that a UK amateur station can use on each mode and band. Tables and graphs for converting watts to dBW have appeared in most of the amateur magazines, but Table 1 gives a few useful reference points for conversions in both directions. The equivalent figures have been rounded in each case. It is easy to see a pattern in the figures which will help in calculating other powers not directly quoted.

The second 'special' decibel, dBm – meaning decibels relative to a reference power level of one milliwatt – is widely used in audio distribution engineering, in applications such as public address and stage sound systems, and in telephone systems.

It is also used in specifying levels in some RF circuits, particularly in filters and mixers. It can be highly confusing to the uninitiated that drive levels to a double-balanced mixer (DBM) are

quoted in dBm! In 50 ohm systems, the voltage equivalent of 0dBm is 224mV (0.224V).

Just as there is a relationship between milliwatts and watts, there is of course a correlation between dBm and dBW. A thousand milliwatts equals one watt, and 30dBm is the same level as 0dBW (30 being the log of 1000). To convert any dBm figure to dBW, subtract 30; to convert dBW to dBm, add 30.

Voltage References

In talking about signal levels presented to a receiver input by an aerial, the units dBV and dBμV are often used. These stand respectively for decibels relative to one volt and decibels relative to one microvolt. Again, one is related to the other; 120dBμV is the same as 0dBV, and -120dBV is the same as 0dBμV. Add or subtract 120 as appropriate to convert between the two. Note that the circuit impedance is not specified; 0dBV is 1 volt regardless of whether it's a 50 ohm, 75 ohm or 600 ohm (or whatever) system.

Although impedance doesn't make any difference to voltage-related decibel measurements, it is important to know whether the value quoted is the open-circuit voltage from the source (EMF), or the loaded or closed-circuit voltage (PD) – in other words what you would actually measure if you connected a voltmeter across the circuit. Regular followers of my column may recall that I spoke about this some time ago. If the impedance of the load is precisely matched to (meaning it has the same value as) that of the source, the PD will be exactly half the EMF. In receiver sensitivity measurements, it is the convention to assume that this is so, even though the input impedance of a receiver is in real life anything but constant as it is tuned across its coverage.

The corresponding power levels are quite small: 0dBV (1 volt) is equivalent to 20mW in 50 ohms, just over 13mW in 75 ohms, or around 1.7mW in 600 ohms. 0dBμV (1 microvolt) is very small indeed in power terms, just 20 femtowatts (that's 20 x 10^{-15} or 20 one-thousand-million-millionths of a watt) in a 50 ohm circuit.

I've already referred to decibels of voltage gain, and these are sometimes abbreviated to dBVG or dBVg – more or less self-explanatory, once you know.

In transmitter specifications and reviews, you will often see the unit dBc used to refer to the levels of harmonic or intermodulation distortion. This means their level relative to that of the carrier-frequency component. If a harmonic is specified as -60dBc (meaning 60dB below the carrier) when the carrier level is 100W, the harmonic has a power of 100 microwatts.

Aerials

In aerial literature, you will come across two 'special' decibels. The first of these, dBd, stands for decibels with respect to a dipole. What it means is the gain of a particular aerial, measured in the direction of its maximum radiation, compared with that of a reference half-wave dipole in the direction of its maximum radiation, which is of course at right-angles to the wires or rods which make it up.

It is calculated by measuring the received field strength at some distant point whilst feeding a test signal to the reference dipole, then transferring the test signal to the aerial under test and measuring the new received field strength.

The second, dBi, stands for decibels with respect to the mythical isotropic radiator, one which radiates equally in every direction in three dimensions. Because the isotropic radiator is a theoretical concept, rather than a real aerial, it is not possible to measure its radiation, only to calculate it.

A thin half-wave dipole has a theoretical gain of 2.14dB over an isotropic, because it concentrates its radiation into the familiar 'figure-of-eight' profile at right-angles to the dipole, rather than spraying it equally in every direction.

Looked at another way, this means that any aerial will appear 'better' by 2.14dB if its gain is quoted relative to an isotropic radiator rather than a dipole. If an aerial manufacturer gives the gain of his products as so many dB, without owning up to whether they're dBd or dBi, it pays to be cynical and assume it to be dBi.

Sound

Although not strictly radio, sound is closely related. We speak into a microphone, which converts the sound to electrical impulses. After amplification and modulation, the signal is radiated to a distant receiver, where is it selected, demodulated and amplified before being applied to a loudspeaker or headphones, where it is converted back to sound.

The conversion of sound energy to electrical energy and vice versa is not at all an efficient process. For example, no more than a few per cent of the electrical power applied to most loudspeakers is radiated as sound. So those tens or hundreds of watts of AF power pushed out by a hi-fi or PA amplifier are mostly wasted as heat in the loudspeaker voice-coils!

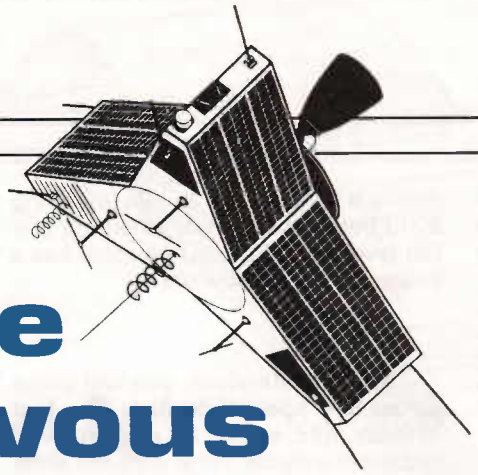
The human ear does not respond equally to equal sound pressure levels at different audio frequencies. When measurements of sound intensity are made, compensating or 'weighting' corrections are applied to the results to relate them to how loud they will sound to a listener. There are a number of different weighting curves, but the most commonly used is known as Curve A, giving rise to weighted values specified in dBA – yet another 'special' decibel.

Table 1 – Relating dBW to Watts

Watts	dBW	dBW	Watts
0.2	-7	-6	0.25
0.5	-3	0	1.0
1.0	0	4	2.5
2.0	3	6	4.0
5.0	7	12	16
10	10	15	30
20	13	16	40
50	17	20	100
100	20	22	160
200	23	26	400

Table 2 – Decibel-based measurement systems

dBA	sound level measurements, relative to that at a reference frequency of 1kHz, weighted according to Curve A to compensate for human hearing characteristics
dBc	noise and distortion levels in a transmitter output, relative to the carrier level
dBd	gain of an aerial, relative to a dipole
dBi	gain of an aerial, relative to an isotropic radiator
dBμ	signal level, relative to one microvolt
dBm	signal level, relative to one milliwatt
dBmO	a chosen arbitrary signal level at some point in a system, against which all other gains and losses in the system are measured
dBO	similar to dBmO
dBV	signal level, relative to one volt
dBVG	decibels of voltage gain from input to output of an amplifier
dBW	signal level, relative to one watt



Satellite Rendezvous

AMSAT-UK News collated by Richard Limebear G3RWL

If you're an SSTV fan, you'll be pleased to hear that SSTV sessions will be held on Oscar 13 on Saturdays and Sundays, using Mode J on a downlink of 435.980MHz, and Mode B immediately after Mode J on 145.960MHz. The 'Ops Nets' will take priority, so look for SSTV activity immediately after they conclude.

Russian Satellites

AO-21 is still operating with 9 minutes of FM repeater and one minute of 400 baud PSK telemetry. This 10 minute cycle repeats continuously. Uplink frequency is 435.016MHz and downlink frequency is 145.987MHz, both FM.

It is not yet quite clear why RS-14/AO-21 sensitivity keeps changing without commanding from the ground. One of the reasons may be self-switching of the 12dB input attenuator on the transponder. To investigate this phenomena the command station planned an experiment switching the attenuator OFF and ON. Commands were It off and on making sensitivity high on 6 and 7 of Nov and low on 8 and 9 of Nov. I haven't heard of the results of this test yet.

RS's: The ground command station reports that RS-10 will always stay in Mode A and RS-13 will always be in Mode K. They further stated that there are no plans to change transponders in the near future.

RS-15: This is planned, possibly for April. It will be in a 2,300km circular orbit with an inclination of 63 degrees. This satellite is basically a clone of RS-10/11 and weighs about 70kg. It was built by the same successful team which has built all previous RS birds. RS-15 will be a Mode A satellite and will have two telemetry beacons. Also, it will have an on-board bulletin board system (BBS) with 2 Mbytes of memory.

As one can see, the passband is 40kHz wide and this is a non-inverting transponder. The beacons will send down 64 channels of telemetry. The transponder's RF downlink power will be around 5 watts and the beacon's output power will be 0.4 watts, but with a command from the ground, the beacon's output power can be increased to 1.2 watts. The aerials will be quarter-wave monopoles for both uplink and downlink.

KitSat

KITSAT-1 (KO-23) is currently experiencing deep eclipse periods of about 30 %. Currently, from the command station, they are doing nothing on the payload tests but are monitoring power and battery conditions.

Because Tx0 is not guaranteed to work and only Tx1 is working in low power mode, the power condition is considered to be a serious problem on KO-23. They expected that Nov. 15 was the highest eclipse point, but the battery depth of discharge got deeper and deeper so they have only recently uploaded the new software, it took 2 days for just loading 5 programs. This reload is for testing Tx0, which they were not able to use since it went wrong after launch. This loading includes CCD Camera test, DSPE Voice telemetry broadcast (mainly in Korean), and CPE, TDE.

Because of the eclipses they can only do one experiment at a time during this period. And it ends at the end of January.

MicroSats

AO-16 and LO-19 continue to be nominal and with the winter upon us, imaging on WO-18 is looking farther south of the magnetic equator. Expect to see images of Northern Australia, the coast of Peru and Chile, the southern tip of India and Lake Victoria being generated. Additionally, a group of students at Weber State University have chosen to develop an extensive telemetry analysis program. There are many gigabytes of telemetry downloaded from WO-18 on file at WSU because students have virtually never missed capturing data on at least one pass per day since launch. The program, incorporating a complete statistics package, and which is also capable of extracting and analysing individual telemetry parameters from the mass of data on file is expected to provide valuable insights into satellite work.

Fuji Oscar 20

They seem to be keeping to the JA mode on every Wednesday UTC. At all other times the Mode JD BBS is in operation. Mode JA Uplink passband is 145.900-146.000MHz and the downlink passband is 435.900-435.800MHz; Mode JA is an inverting transponder. The Mode JA beacon can be heard on 435.795MHz.

Doug Loughmiller KO5I joins UoSAT

KO5I has accepted an appointment at the University of Surrey. Since November 1, Doug has taken up his duties as the Manager of the Ground Control Station and of Satellite Mission Operations for both UoS and Surrey Satellite Technology Limited (SSTL). In his new job, Doug will be responsible for the 'day-in-day-out' issues concerning the UoSATs and the ground station at the UoS. Some of these tasks include the planning, organizing, and scheduling of operations on the UoSATs for both the radio amateur community and professional organizations. Doug will also act as a liaison between the amateur radio community and the professional organizations who use the UoSAT satellites.

Doug Says he will try to answer each and every enquiry in a timely manner as it comes in but please don't expect instant responses while he learns the job. He is particularly interested at this time to hear from people making use of UO-11 and what types of activity they find useful.

Next 'Oscar-0' Operation by VE3ONT

Over the weekend of the 14th Nov the operators at VE3ONT planned to be active during the ARRL's Annual Earth-Moon-Earth (EME) Competition. They had planned to use the 46m diameter dish at a Space Institute QTH on 432MHz to provide AO-13 users the opportunity to make their first OSCAR-0 contact. Regrettably, because of a power outage and some bad weather they were unable to be operational. However, the same group of operators for this EME Competition are planning to return in the

Spring of '93 for another effort. And later, in the autumn, they are planning a 3-band EME effort on 144MHz, 432MHz and 1296MHz.

New AMSAT-NA Directors

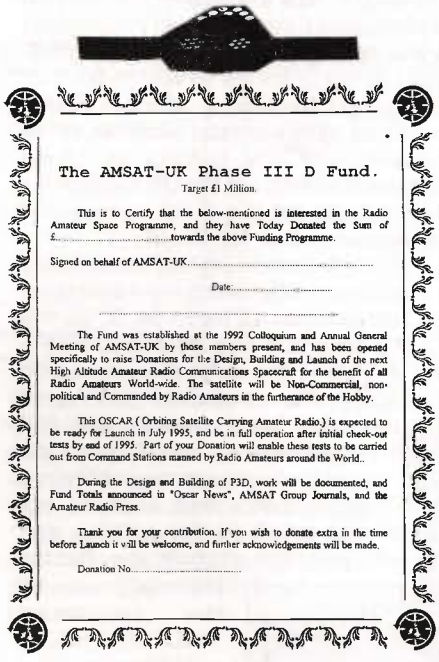
The following individuals were elected to the AMSAT-NA Board-Of-Directors; Joe Kasser W3/G3ZCZ, Dick Daniels W4PUJ, and Tom Clark W3IWI. Bob McGwier N4HY has resigned from the Board and according to the AMSAT-NA Bylaws, the First Alternate will take his place; this is Dick Daniels (W4PUJ).

Major Changes in Phase-3D Interface

From Amsat-UK's Oscar News comes the following; At the end of October 1992, the European Space Agency (ESA) informed Amsat-DL that the 1920mm diameter launch vehicle separation interface will not be available. The present design of the Phase-3D, as reported last month, uses the 1920mm diameter interface on the large end of the conical adaptor, located in the middle of the spacecraft. When ESA personnel visited with the Phase-3D design team in Marberg on the 18th November, it became clear that the Phase-3D satellite in its present design configuration had no chance of being launched.

The new spacecraft configuration, to be provided by the ESA, will probably be based upon a cylindrical adaptor structure with a 2624mm diameter basic size, a new development for Amsat. The 2624mm interface is the 'native' bolt circle on top of the upper stage of the Ariane 5 launch vehicle. Although the ESA has announced a delay of the Ariane-502 launch by six months, the new Phase-3D spacecraft basic design has to be completed by early 1993. One of the most difficult problem areas will be the machining of the 2624mm diameter machined parts.

Dick Jansson WD4FAB (who recently provided the engineering drawings for Phase-3D) points out that the change in the separation interface on Phase-3D is not a 'doom and gloom' statement, it just means there will need to be some serious revision to the spacecraft design. Dick is currently examining several new spacecraft concepts, adding that we have all the basic elements in place to create a new spacecraft configuration, it's just a matter of doing the design effort.



The AMSAT-UK Phase III D Fund.

Target £1 Million.

This is to Certify that the below-mentioned is interested in the Radio Amateur Space Programme, and they have Today Donated the Sum of £.....towards the above Funding Programme.

Signed on behalf of AMSAT-UK.....

Date:.....

.....

The Fund was established at the 1992 Colloquium and Annual General Meeting of AMSAT-UK by those members present, and has been opened specifically to raise Donations for the Design, Building and Launch of the next High Altitude Amateur Radio Communications Spacecraft for the benefit of all Radio Amateurs World-wide. The satellite will be Non-Commercial, non-political and Commanded by Radio Amateurs in the furtherance of the Hobby.

This OSCAR (Orbiting Satellite Carrying Amateur Radio) is expected to be ready for Launch in July 1995, and be in full operation after initial check-out tests by end of 1995. Part of your Donation will enable these tests to be carried out from Command Stations manned by Radio Amateurs around the World..

During the Design and Building of P3D, work will be documented, and Fund Totals announced in "Oscar News", AMSAT Group Journals, and the Amateur Radio Press.

Thank you for your contribution. If you wish to donate extra in the time before Launch it will be welcome, and further acknowledgements will be made.

Donation No.....

The Amsat-UK Phase 3D Fund

Also from Oscar News comes details of how you can help Phase-3D get into orbit, as the Design, Building, and Launch Fund, for this the biggest project that international Amsat groups have yet planned, is now under way. Amateur satellite enthusiasts will already know about the systems and modes of operation available to every radio amateur when this satellite is launched in 1995. If you'd like to contribute to the funding of this, please send your donation to; 'The Amsat-UK Phase-3D fund' at the address below. This expense is not funded by part of licence fees or from subscriptions from your national society. Your contribution, large or small, will be acknowledged with one of the certificates pictured here, which are printed in colour on parchment paper. Non-members of Amsat-UK will also receive the current issue of OSCAR News.

AMSAT-UK News

We've now run out of the Guide to Oscar Operating, however there's a new edition coming soon, once I've written it! Since the beginning of October as I write this Amsat-UK have had over 125 new members – keep up the promotional work please lads.

The Packet Satellite Guide by KI6QE is selling well, and if anyone was thinking about getting a copy they'd better hurry up before they all go. It's priced at just over £10 to members, including software.

For further information about Amsat-UK contact: AMSAT-UK, c/o Ron Broadbent, G3AAJ, 94 Herongate Rd, London, E12 5EQ. Big SAE gets membership info, SWLs are welcome.

KEPLERS

SAT:	OSCAR 10	UoSat 2	AO-13	PACSAT	DO-17	WO-18	LO-19
EPOC:	92327.72779571	92329.5986901	92320.86799879	92322.66524954	92330.09177997	92330.05883495	92330.07327120
INCL:	26.9979	97.8328	57.4092	98.6354	98.6371	98.6359	98.6390
RAAN:	53.0244	358.8537	349.7992	43.8508	51.3700	51.3750	51.5309
ECCN:	0.6020435	0.0011401	0.7280931	0.0012672	0.0012871	0.0012274	0.0013698
ARGP:	35.2832	296.2313	301.2935	84.0012	60.4718	70.2279	61.7481
MA:	352.5150	63.7724	7.3704	276.2613	299.7746	290.0227	298.5078
MM:	2.05879559	14.6874720	2.09715109	14.29759362	14.29893742	14.29877747	14.29966338
DECY:	-6.1E-07	7.09E-06	1.36E-06	1.98E-06	2.83E-06	5.6E-07	2.23E-06
REVN:	4304	46668	238	14721	14828	14828	14829

SAT:	FO-20	AO-21	UO-22	KO-23	RS-10/11	RS-12/13	Mir
EPOC:	92313.67971649	92328.98725050	92313.62564058	92329.24468158	92329.56845914	92329.78696295	92329.98822007
INCL:	99.0611	82.9456	98.4904	66.0790	82.9292	82.9230	51.6222
RAAN:	205.2944	204.6667	27.0436	33.2721	29.8563	73.7025	164.1375
ECCN:	0.0539771	0.0034141	0.0011306	0.0013996	0.0011987	0.0028478	0.0002091
ARGP:	225.9231	232.7100	234.0234	235.2475	158.9637	256.5024	104.8549
MA:	129.6204	127.0924	125.9933	124.7226	201.2003	103.2960	255.2614
MM:	12.83214360	13.74500640	14.36724050	12.86273546	13.72300325	13.74006557	15.56237064
DECY:	-2E-08	1.01E-06	2.02E-06	1E-08	9.7E-07	5.9E-07	1.5947E-04
REVN:	12903	9125	6899	1348	27178	9045	38729

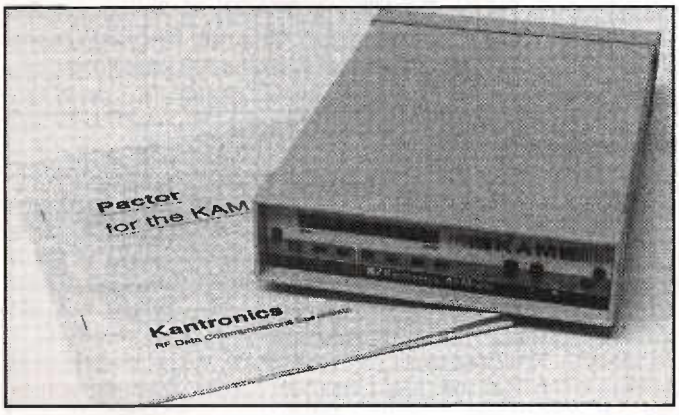
Packet Radio Roundup

HRT's packet SysOp Chris Lorek G4HCL tests the new KAM upgrade for Pactor

I've had my KAM (Kantronics All Mode communicator) virtually since they first became available in the UK, and great fun I've had with it. The 'beauty' about many such amateur data terminal units is that you can upgrade them fairly simply, often by a plug-in EPROM, to give new modes and facilities as these become available.

Pactor for the KAM

The latest amateur data mode, which has literally taken the HF data side 'by storm', is *Pactor* (see last month's HRT). And the piece of hardware that is the most 'talked about' on Pactor BBSs is that of the Pactor upgrade for the KAM. I was privileged to take a 'sneak preview' of this, my thanks to Kantronics Inc. in the USA for the provision of the EPROM and software for this.



Pactor with the KAM, now available as a plug-in upgrade

The upgrade involves simply replacing a plug-in EPROM inside the KAM followed by a 'hard reset'. This adds 13 additional commands, such as MYPTcall (your callsign for use on Pactor), PTSum (maximum number of received frames to assemble to obtain a valid frame) and so on.

On the Air

I initially had a few problems in using my (rather old) KAM with Pactor, however it was found that the internal crystal clock timing was very critical (as is the case generally with this mode), this having to be set to within 50Hz of the correct frequency. Modern KAMs are fitted with a crystal trimmer, mine wasn't, and my thanks to Lowe Electronics (who are the UK Kantronics distributors) for the quick turnaround service work that followed!

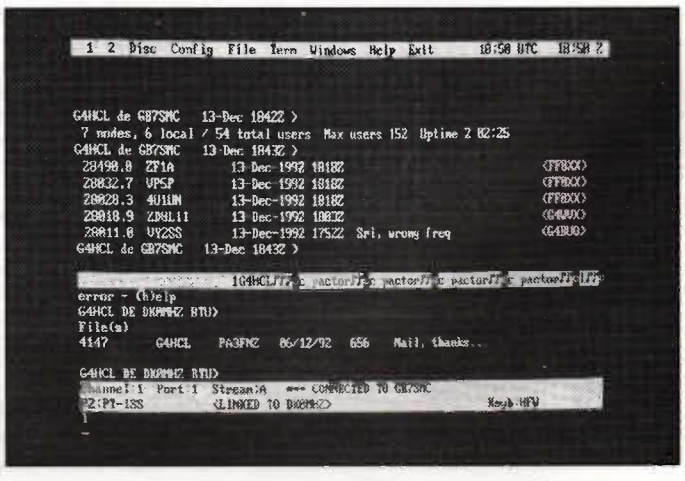
Tuning Pactor signals was simply a case of carefully tuning my transceiver for the extreme LEDs to be lit on the KAM's bargraph display. I used an FT-990 in 'Packet' mode for this, even with the 500Hz filter switched in I found the passband was correctly set and I didn't need to start messing around with passband offsets or whatever. A 'PTListen' command allowed me to monitor on-air Pactor activity, and to call another station on Pactor I simply issued the command 'PACTOR VE3CIZ' or whatever call I wished, 'long path' connects were catered for by modifying this to 'PACTOR !VE3CIZ'. The 'HF VAL' LED on the front panel lit when the speed in use was 200 baud, this normally being under automatic control, although you can 'force' either speed if you wish.

I found the KAM would receive Pactor data quite well, even down in the noise, how its 'Digital Memory ARQ' compares to the '8 bit A/D memory ARQ' found in other Pactor controllers I would need to reserve judgement on until I'd managed to give the two a lot more tests. One thing I did find, was that I somehow had to use more TX power with the KAM to 'get through', maybe a little more 'crystal tweaking' was needed? I sometimes found that my transmitted RF would 'get back' into the RS-232 line which I hadn't found before on HF modes, so again I would need to reserve judgement on this until I'd done a lot more on-air work.

Built-In Pactor Mailbox

The KAM allows access to its personal bulletin board in Pactor mode also, this using the 'normal' *Send, Read, List*, etc. commands familiar to packet operators. I've made good use of this plenty of times on VHF/UHF packet, and I'm looking forward to it being quite handy for HF as well. It's just a pity that UK licence regulations don't allow unattended HF data operation without a special NoV (Notice of Variation).

Hostmaster II+ in use, HF Pactor at the top, VHF Packet at the bottom, simultaneously



After a brief period of operation with a 'dumb terminal emulator' to control the unit, I tried Kantronics' latest Hostmaster II+ upgrade which included Pactor control. This was absolutely superb! It allowed me to have multiple-stream VHF/UHF packet connects (upper section of screen), as well as monitoring unconnected packets (top section of screen), be in HF Pactor mode (lower section of screen), see my HF TX 'echo' (centre line on screen) and my entered 'type ahead' text (bottom of screen) as well as providing upper and lower 'status' reports of what everything was doing! I'd already been a 'converted' Hostmaster user, I'm now even more fanatic about it! I wonder what new mode they'll come up with next?

Potential Packet SysOp Guidelines

If you're thinking of setting up a BBS or a node with a GB7 callsign, then 'A Guide To Data Licensing In the UK' is essential reading. This is a comprehensive document published by the RSGB's Data Communications Committee, and is available in return for a large SAE (stamped at 34p in the UK) to Chairman of the DCC Ian Suart GM4AUP, 37 Meldrum Mains, Glenmavis, Airdrie, Strathclyde, ML6 0QG. It also gives useful information on the frequencies available for Nodes *without* a GB7, and information on the way to go about setting up a BBS such as liaising with the local packet group and other BBS SysOps for forwarding.

Funding the Network?

Many amateurs think about running a BBS or network node, however most don't realize the time involved, nor the real expense, an hour each day for 'BBS maintenance' isn't unrealistic! There's been some talk of 'funding the network', although fortunately it is available for all amateurs to freely use. Let's hope it stays that way, but the real way to improve it is to get together with your local group, and get new links and facilities in place. Often the establishment of a new dedicated node system for inter-area linking would be more beneficial than 'yet another' single frequency node on 2m or 70cm, as many individuals would possibly set up. This all takes money, so again the answer is to get in touch with your local group, if you haven't got one, why not think about forming one! A number of amateurs working together can often work wonders.

The new DRSI DPK-2

CTRL-Z, End of Message

As I write this I've just received a review sample of the new DRSI DPK-2 TNC, space permitting you'll see this featured in next month's HRT. I've finished my tests on the superb G7JJF TNC driver software also, you'll see this soon too. Until then, 73 from Chris G4HCL @ GB7XJZ.

VHF/UHF Message

Geoff Brown GJ4ICD gives a hint on finding a cheap VHF/UHF monitorscope to help find that DX

On the 1st November Malta (9H) had its first opening to Australia on 50MHz this season, so at least *somebody* is getting the DX!

The big anticyclone around the 5th produced nice propagation to the east (OK) and south of France and Spain on the higher bands, solar flux levels dived down to just above the 100 mark, with more sporadic E during the month. Also in late November the USA were having a few openings into central and southern America on 50MHz, and now that so many countries in Europe are active on 6m, more of the short type openings via sporadic E are being logged.

A note from Ray Cracknell, G2AHU; Ray says in his notes to me "use it or lose it". At present the frequency spectrum 28-470MHz is under review by the Radiocommunications Agency, and there could well be a 'chop' of allocations for amateurs. So please use the VHF/UHF bands as much as possible, even if propagation is poor vast distances can be worked via CW to keep things alive.

Just who is QRV on six

During a recent phone call with a reader, the question was asked 'just who *is* QRV on six in Europe?'. Well, the answer is nearly every country! Here is the check list; TF, OY, LA, SM, OH, OZ, GM, G, GI, EI, GW, GU, GJ, GD, CT, EA, F, LX, ON, PA, DL, SP, OK, HB, YU, OE, I, IS0, IT9, TK, SV, YO, LZ, HB0, ZB, EA6, 9H, TA, ZA, OH0, OJ0, 4J, UA1, ES, LY, YL, UA2, HV, 1A0, T77, and CU. Yes, 51 to my knowledge are QRV or have been activated on 6m. I should also point out that all the forementioned are legal countries, there are a few not in the list like C31, 3A2, SV9, SV5 and HA, but it is hoped that some DX-peditions will take place this coming summer.

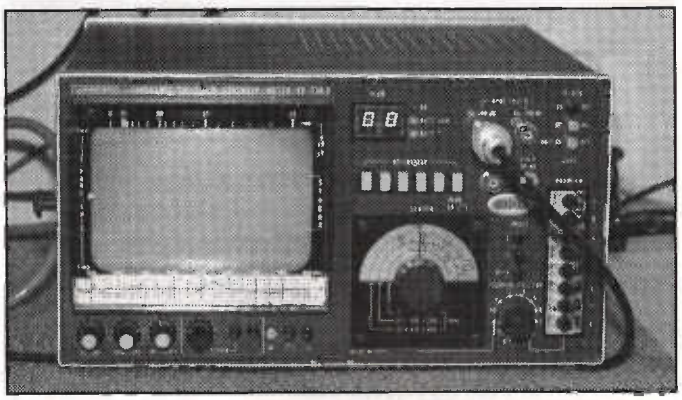
Looking at those 50-plus countries, all are workable with low power via summertime sporadic E, and that is over half your DXCC award!

Latest QSL info.

Another bumper list is enclosed this month by courtesy of the UK Six Metre Group, they include many of the newly licensed Spanish stations.

On Six

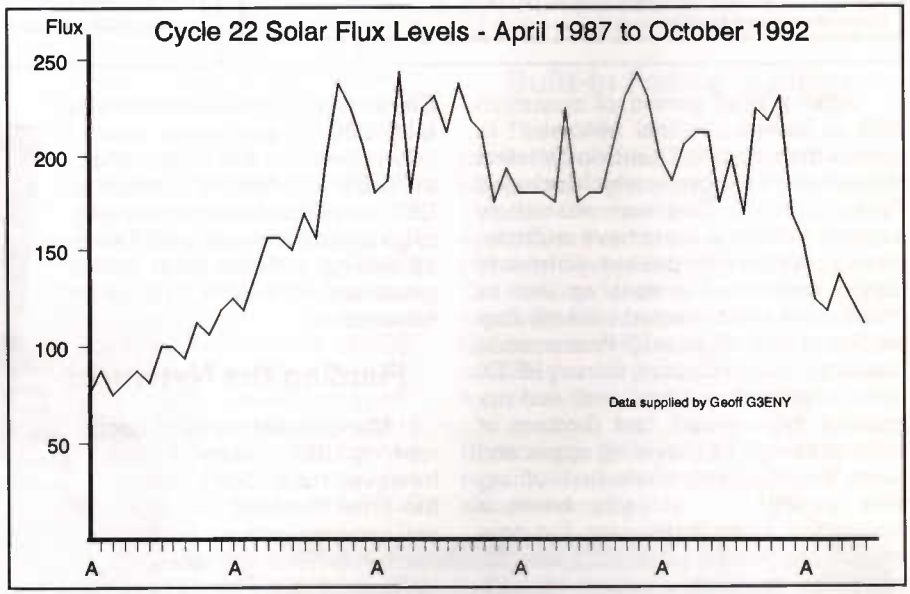
Well, things have been really poor compared to previous years, but it was expected and we just lived in hope of great DX again. Avid DXers advise me that due to a decline in solar flux levels, the liaison frequency on 28.885MHz will become unusable (outside Europe) and so a new frequency has been established on 21.325MHz. This frequency at present opens up to stateside at around 1230z, certainly a good way of keeping in touch, but we will have to resort to 14MHz later in the cycle?



A cheap surplus TV meter makes a good VHF/UHF monitorscope

On 144MHz

Dave G0DJA (West Yorks) writes; "There seems to be a lack of DX activity up here", yes Dave I do agree, many people seem to have tied their radio up to the packet system and activity seems to be falling. Dave's other comments are that he fears activity is dangerously low on all VHF/UHF/SHF bands, which is not good at the present time.



During previous autumn openings on 50MHz, various carriers and stations were noted between 32-45MHz. Most of the frequencies I noted from 1989 to 1991 have appeared very quiet this year, showing a decline in the MUF as can be seen by the latest graph of solar flux levels. 'ES' openings were noted on several occasions during the month, early evenings were favourite for a few Spanish openings but they failed to link up with the common Spain to Brazil late TEP openings. Ela G6HKM worked EH7UH (IM67) which was her only 50MHz QSO of the month!

Ela G6HKM keeps the activity going from Essex and reports she has just received a certificate from the JARL (Japan). It is called VU-2000, and is granted for 2000 SSB contacts confirmed with QSLs! Ela writes; "With the prospect of conditions being poor on 50MHz, it looks as though I will have to explore other awards, but only those that are a bit of a challenge appeal to me".

Other news from Ela is that

November 5th/6th were pretty good days on 'two', she worked OK1VMS/P in JO60, OK1UBR (JN69), HB9RCJ (JN37), others include JO30, 31, JN19, 27, 38, 48, 49, 58, and 59, and on the 6th the band opened to OE5VHL (JN68).

Snippets

GM0ICF was reported on the VHF net (14.345MHz) stating that he hopes to be QRV on 23cm EME very soon, he is currently building a large 23cm amplifier. Dave G0DJA is at present building a transverter (wow, another constructor!) and hopes to be QRV on 70cm and 23cm very soon.

DXCC countries latest news is that the ARRL DX advisory committee has voted to recommend the following; Croatia 9A from 26/6/91, Slovenia S5 from 26/6/91, Bosnia YU4/4N4 from 15/10/91, and Macedonia YU5/4N5 from 8/9/91, more details later.

Jean-Marie F6BSJ and George F8OP have written to me, they are trying to find a 8930 tube, can anyone help? George also comments on the lack of F2 and TEP on 50MHz from the south of France.

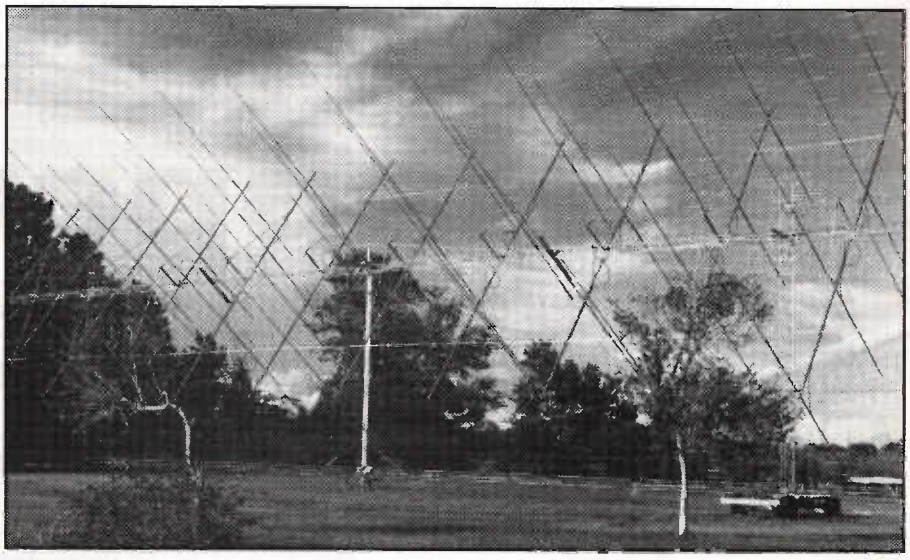
Chris GM3WOJ becomes the first Scottish amateur to attain his 100 countries on 50MHz, now that's some going from his latitude.

Samir OD5SK confirms that he has just received the 50MHz beacon that was built for him by myself and others in Jersey. Samir says; "All is going well and there is no TVI", so keep an eye out on 50.078MHz in the next few months.

A good Sporadic E monitor!

With the invasion of European satellites, aerial contractors have been replacing their field strength meters with field strength meters incorporating spectrum analyzers and satellite receivers. This has led to units like the Uniohm EP738b Panoramic TV field strength meter being available on the surplus market. This Italian masterpiece covers 48 to 110MHz, and 450 to 880MHz (bands 1/3/4/5) making it ideal as a 'visual display' for six and two metres. The power source is also interesting as it can run on 240 volt AC, 12 volt DC, and internal nicads, making the unit fully portable.

A 10dB stepped attenuator up to 90dB and a digital display is also standard, which can be very useful for measuring your harmonics! The visual display can be selected between a) Picture (Pal), b) Signal strength (measured in dB), and c) as a spectrum scope, displaying for example 48 to 110MHz up the left hand side of the screen, which when an aerial is connected will provide the viewer with, for instance, large spikes across the screen of VHF FM radio signals, or in my case, a large spike from the neighbour's baby intercom on 49MHz, this all being in black and white of course and not colour.



144MHz EMEer W5UN's 48 x 17 elements array

If used in the spectrum state you can manually tune carriers and then display in the picture mode, so in reality you have a fabulous ES monitor. Provision is also made for eight pre-selected memories which can be manually tuned, these can be used to store your favourite European video channels or local UHF TV channels, and so to act as a normal B/W TV receiver.

The cost?, well, I have now come across three of these units so far and they varied in price from £75 to £125 depending on what the condition was and also whether they had a rechargeable battery inside them. They provide a good cheap way to look at naughty harmonics, and my thanks go to Wally Le Couteur in Jersey for the loan of his unit for setting up 50MHz beacons. I think they are a bargain if you should come across one at the forthcoming rallies.

Well that's another month gone, many thanks to the UK Six Metre Group for their information, and anyone interested in joining is asked to contact Chris G3WOS, Old White Lodge, 183 Sycamore Road, Farnborough, Hants GU14 6RF. Until next month, 73 and keep those reports coming in to; Geoff Brown, TV Shop, Belmont Road, St. Helier, Jersey, CI, JE2 4SA, Tel/Fax 0534 77067

QSL Information

EH1YV – Agustin Quintas, Box 148, 36200 Vigo, Pontevedra, Spain
EH1DVY – Carlos Gracia, Real 24, 42366 Tajueco, Soria, Spain
EH2AGZ – Nicolas Vera, Doxz 1214, 50500 Tarazona, Zaragoza, Spain
EH2BLR – J. Barinaga, Esperanza 3 A-1, 01002 Vitoria, Alava, Spain
EH2JG – Arseli Bardeci, Las Vegas 69, 01479 Luyando, Alava, Spain
EH3ADW – Juan Farres, La Miranda Villa 45, La Ametlla Del Valles, Barcelona, Spain
EH3AQJ – Ramond Albert, Torns 25 1, 08014 Barcelona, Spain
EH3DZG – Gustavo Ortega, Almirant Marquet 3, 08800 Vilanova I La Getru, Barcelona, Spain **EH3KU** – F. Lizama, Libertat 27, 43860 Ametlla De Mar, Tarragona, Spain
EH6ET – Jose Pujol, Paseo Mallorca 15, 07011 Palma, Mallorca, Spain
EH6FB – Jose Sala, Box 8, Suliva, 07830 San Jose, Ibiza, Balearic Is.
EH6VQ – Gabriel Duran, Box 1534, 07080 Palma, Mallorca, Balearic Is.
EH8ACW – Apartado De Correos 2537, 35080 Las Palmas, Gran Canaria
EH9MH – Manuel Perez, Plaza Tarrogona 9, Melilla EH9IB – Pedro Ruiz, BDA LA Constitucion 4 2, 29800, Melilla
HF7PAR – Via SP7HT. Ul Leszczynska 64 M 10, 25-326 Kielce, Poland
LA5TFA – Aasmund Jakobsen, Graatindvn 1, N-9100 Kvaloysletta, Norway
LA9HW – Jan Almedal, Plogsvingen 5 A, N-1410 Kolbtn, Norway
LY2WR – TV Transmitters RC, Box 927, 2044 Vilnius, Lithuania
LZ1ZX – Dimiter Rahnev, Yavorov 37, 8680 Straldja, Bulgaria
LZ1MC – Slavi Lyutskanov, Box 74, 6000 Stara Zagora, Bulgaria
OY6A – Via G6JQV (anyone with address please?)
SM6SYN – Arne Johansson, Osterradagatan 3, S-46400 Mellerund, Sweden
SN5PAR – Via SP5CCC, T. Ciepielowski, PO Box 19, 03-996, Warszawa, Poland
SR5PAR – Via SP5TAW (via bureau only)
TSS1I – Via IN3WWW
UA2F/DK2ZF – R. Niefind, Rademacher Kamp 2, W-2117 Kakenstorf, Germany
UA3PW – Box 444, 300021 Tula, Russia
UD6DX – Alex Polyakov, PO Box 222, Baku 370000, Azerbaijan, Russia
UX1A – Via OH2BC (see ZA1A)
YL/ES9C – Via ES5RY, Tom Soomets, Box 177, EE2400, Tartu, Estonia
YU1EU – A1 Ekmedzic, Cara Dusana 35, 11080 Zemun, Yugoslavia
ZA1A – K. Leino OH2BC, Pitkankalliontie 6-8B4, Espoo, SF- 02170, Finland
3Z5PAR – Leszek Dunowski, U1 Bacha 30 m 908, 02-743, Warszawa, Poland
4U1ITU – (July/Sept 92 only) Alberto Guerra I0XGR, Via S. Lorenzo 30, 00040 Lanuvio (RM), Italy
9A2SB – Zlatko Miocevic, Punitovacka 38, 544000 Djakovo, Croatia

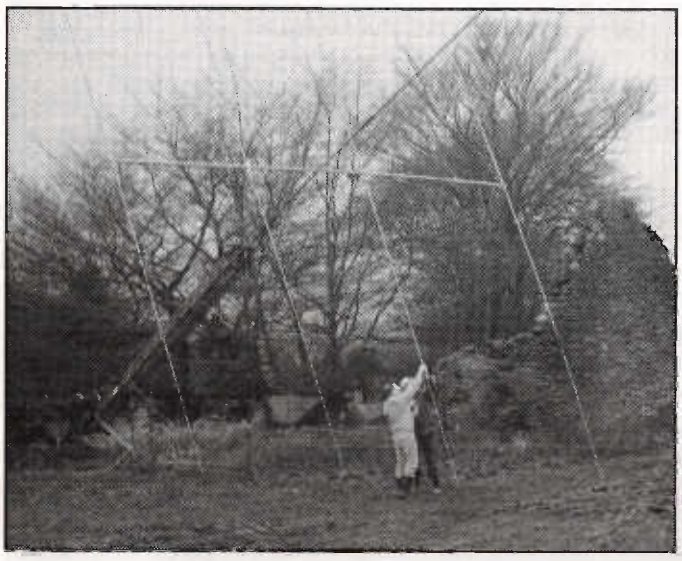
HF Happenings

Don Field G3XTT looks at the 'Most Wanted' DX countries

Publishing deadlines being what they are, I am putting pen to paper (well, more accurately, fingers to keyboard) in the aftermath of the CQWW CW Contest. My plans to operate from the Channel Islands had to be abandoned so, instead, I found myself joining the multi-multi team at GW8GT in South Wales. GW8GT is the callsign of the Red Dragon contest group, which was founded ten years ago, and has been gradually building up a very competitive contest station. They have four permanent towers, with beams for 10m, 15m and 20m, and a full-sized cubical quad for 40m, which has to be seen to be believed! It works as well as it looks, and brought us 127 countries, 38 zones and about 2700 contacts on 40m over the 48 hour contest period.

If you have only a modest home station, joining a multi-operator group is a great way to have access to better facilities, and operating alongside more experienced operators is also an ideal learning opportunity. I was delighted, therefore, to see a number of British groups putting on such efforts in the CQWW CW Contest. Mind you, during contests even amateurs with modest stations can work some useful DX, because the 'big guns' can usually hear very well in addition to putting out potent signals. As an example, I was speaking shortly after the contest to Jim Davidson, GI3FJX, who runs just 50W to a Butternut vertical. He told me that his contest contacts had included 8P9Z (Barbados) and VS6WO (Hong Kong), both worked on the 80m band. Jim was first licensed in 1949, so maybe

Working on the 20m 4 ele at GW8GT



Neil G3OAY at the 20m operating position at GW8GT, shown on front cover inset photo.

experience is the secret of his success.

Contests are, of course, an ideal way to learn about propagation, because stations will be active from all parts of the world right round the clock, so what you can hear at any one time is a good indication of which propagation paths are open. As expected, for example, Japanese stations were audible almost round the clock on 40 metres, coming in via the long- path (over South America) from our dawn until about mid-day, and then direct via the short-path until about midnight our time. We worked KH0AM in the Mariana Islands on 10 through 80m, and one UK station even reported hearing them on Top Band (160m).

'Most Wanted Countries' Survey

VP2ML's DX Magazine carries out an annual survey of the countries most needed by DXers around the world. The results are significant for two reasons. Firstly, of course, they tell us how 'rare' the various countries of the world are in DXCC terms, showing the movements from year to year as major expeditions are mounted or amateur radio is reintroduced into the country (as happened most significantly in Albania). Secondly, many would-be DXpeditioners use the survey as a basis for their planning, so it gives an indication of where we might expect DXpeditioners to be heading out to over the coming year. The table shows the top twenty 'Most Wanted Countries', both worldwide and as indicated by European respondents to the survey. *Peter 1st Island* heads both lists now that Burma and Albania have been well and truly aired. Further down the list there are significant differences between which countries are rarest on a world basis (and the survey will have been predominantly based on responses from the USA) and those which are most sought after by European DXers. European operators tend to be most in need of countries in the Pacific, always a difficult path from Europe, whereas amateurs on the West Coast of the US, for example, regard Pacific stations almost as 'locals'.

Anyway, to show that DXpeditioners really do take notice, there's already news of forthcoming DXpeditions to KH1 (Baker and Howland Islands) and to KH5 (Palmyra Island and Kingman Reef). Nine operators, three of them from Europe (including British DXer and DXpeditioner Ian Shepherd G4LJF) plan to be active from the Baker and Howland Island group in late- January/early-February for a total of about 7 days. They plan on taking lots of aerials and linear amplifiers in order to be able to put an effective signal into Europe and satisfy as much of the demand as possible. The plans for KH5 also call for particular attention to Europe, and the operators will include Vincent G0LMX, a veteran of last year's Clipperton Island operation. They will reach the islands around the end of February and plan to set up stations on both Kingman Reef and Palmyra Island and to be active for about ten days in all.

As well as the above, the group which went to the South Sandwich Islands early last year are already talking about the possibility of a trip to Peter 1st Island. They must be gluttons for punishment! Peter 1st is perhaps even less accessible than the South Sandwich Islands, and is likely to present similar challenges once there, in terms of getting ashore and then surviving for the duration of the operation. There has been only one previous DXpedition, by LA1EE and LA2GV, in 1987. Einar and Kaare used a helicopter to ferry them ashore and, both experienced in Arctic living, did a fine job of handing out contacts. However, in the intervening years many new DXers have come onto the bands and other countries high on the 'Wanted' list have now found their way into our logs (Albania, Burma, Yemen, Laos, etc). So expect Peter 1st to act as a magnet to DXpeditioners, perhaps next winter (i.e., the Antarctic summer). In some ways I'm surprised that Heard Island (VK0) isn't higher on the 'Wanted' list than

Peter 1st Island, as the only major DXpedition to Heard Island was ten years ago, in 1983.

Other DX

Rather further down the 'Wanted' list, but still a nice one; W5IJU has been planning a trip to Navassa Island (KP1) for 26th March to 3rd April. As I write this he was still looking for others to join him but, all being well, everything will be set for the DXpedition by the time you read this. Being in the Caribbean there is usually good propagation to Navassa, so you should be able to work them easily on several bands.

HK0/AA5AU and HK0/KB5GL will be active between 27th February and 7th March from San Andres Island, a Colombian Island in the Caribbean. They will operate on 10, 15, 20 and 40m, on CW, SSB and RTTY.

Nearer to home, a Finnish group will operate from Market Reef (OJ0) from the 25th to 28th February, all bands and modes. Market Reef is a rather curious 'country'. It is a small island between Finland and Norway, and the national border runs through it! On the Finnish side is an unmanned lighthouse and it is from here that most amateur radio operations take place. It has DXCC status because it is separated from Finland by another DXCC country - the Aland Islands (OH0). The Swedish end of Market Reef, from which there have been occasional operations as SI8MI, etc, counts simply as Sweden for DXCC purposes. Confusing, isn't it!

While on the subject of DXCC, the ARRL has finally announced a decision regarding the former Yugoslav republics. QSLs from Croatia (9A) and Slovenia (S5) for contacts made after 26th May 1991, and from Bosnia-Herzegovina (4N4 and YU4) for contacts made from 15th October 1992, are now valid for DXCC and may be submitted for credit. A decision on the DXCC status of Macedonia is still pending. This outcome is rather curious given that, as I write this, Macedonia has stabilised and has its own government, whereas fighting in Bosnia seems to get worse by the day and various groups control different parts of the country. This must surely raise questions about stations operating, for example, from Banja Luka, a Serbian- controlled enclave within Bosnia.

IRCs, Airmail and old Surface Mail


UNION POSTALE UNIVERSELLE **COUPON-RÉPONSE INTERNATIONAL** C 22

Ce coupon est échangeable dans tous les pays de l'Union postale universelle contre un ou plusieurs timbres-poste représentant l'affranchissement minimal d'une lettre ordinaire, expédiée à l'étranger par voie de surface.

Prix de vente (indication facultative): 95 cents

Timbre du bureau qui effectue l'échange

SAN LEANDRO CA FEB 25 1992 USPO


UNION POSTALE UNIVERSELLE **COUPON-RÉPONSE INTERNATIONAL** C 22

Ce coupon est échangeable dans tous les pays de l'Union postale universelle contre un ou plusieurs timbres-poste représentant l'affranchissement minimal d'un envoi prioritaire ou d'une lettre ordinaire expédiée à l'étranger par voie aérienne.

Prix de vente (indication facultative): 150 円

Timbre du bureau qui effectue l'échange

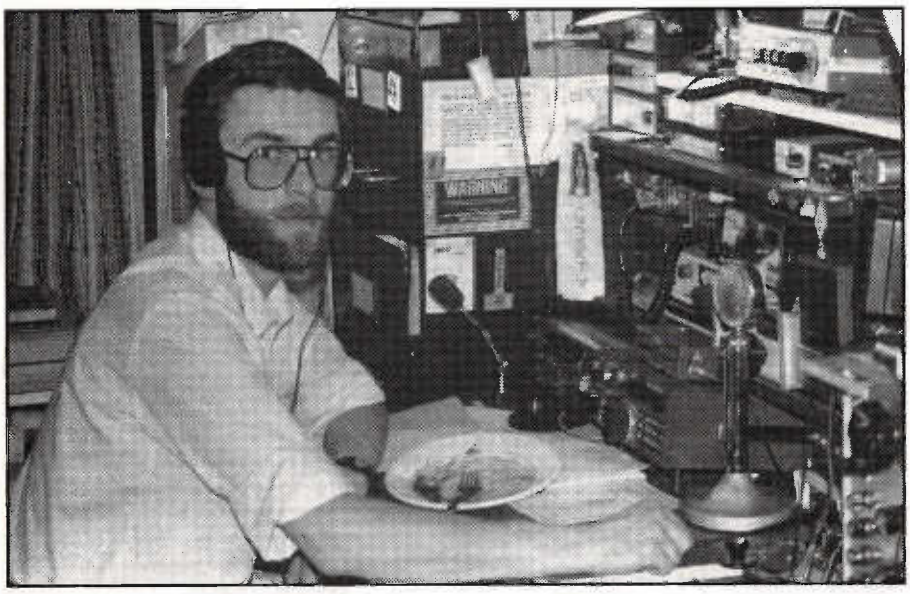
MIYAZAKI -9.VI.92.8-12 JAPAN

IRCs

As well as its 'Countries Wanted' survey, I was also interested to read an article in a recent copy of the DX Magazine about the status of International Reply Coupons (IRCs). IRCs have long been used by DXers as a secure and convenient way of sending return postage when applying for direct QSL cards (as against being prepared to wait for them to filter back via the QSL bureau system). There has always been a question of how many IRCs to send, given that the wording on an IRC stated that it could be redeemed for postage stamps sufficient to ensure a return by surface mail. However, given that by far the majority of international mail is now carried by air, there is now a new variety of IRC which specifically states that it is good for being exchanged for stamps to whatever value is necessary to cover airmail postage back to the originating country. As you will see here, the only difference between the two varieties of IRC is that one refers to *voie de surface* (i.e., surface mail) and the other to *voie aerienne* (air mail). However, if you find yourself with one of the old variety, don't panic. The Universal Postal Union has decreed that all IRCs will be honoured now as if they were the airmail variety, which means, in the UK, that you can exchange them for 39p in stamps. It also means, of course, that if a DX station demands more than one IRC for return postage, then he is asking for a contribution over and above his postage costs. Whether you regard this as reasonable is for you to decide.

Most Wanted Countries (from DX Magazine)

Position	Worldwide	Europe
1	Peter 1 Island (3Y)	Peter 1 Island (3Y)
2	Bhutan (A5)	Baker, Howland (KH1)
3	Libya (5A)	Kermadec Is (ZL8)
4	Andaman Is (VU4)	Kingman Reef (KH5K)
5	Laccadive Is (VU7)	Heard Is (VK0)
6	Heard Is (VK0)	Bhutan (5A)
7	Tunisia (3V)	Macquarie Is (VK0)
8	Uganda (5X)	Mellish Reef (VK9)
9	Spratly Is (1S)	Andaman Is (VU4)
10	Madagascar (5R)	Auckland Is (ZL9)
11	Yemen (7O)	Banaba Is (T33)
12	Ghana (9G)	Ghana (9G)
13	Tromelin Is (FR/T)	Amsterdam Is (FT/Z)
14	Bangladesh (S2)	Cocos Is (TI9)
15	Iran (EP)	Willis Is (VK9W)
16	Glorioso Is (FR/G)	Palmyra Is (KH5)
17	Kingman Reef (KH5K)	Nauru (C2)
18	Baker, Howland (KH1)	Central Kiribati (T31)
19	Congo (TN)	Tromelin (FR/T)
20	Mt. Athos (SY)	Laccadive Is (VU7)



Petr OK1CZ, manning G3RJV's station at Rochdale

QRP CORNER

Dick Pascoe G0BPS discusses the advantages of Morse for QRP operators

There have been hundreds of letters to various Editors of amateur radio magazines about what appears to be the greatest divergence of opinion in the amateur fraternity since the first spark transmitter. *To key or not to key* is the question. Without getting into the arguments about whether Morse should be the gateway to the HF bands, there is a case for the use of Morse code in the hobby.

For the 'ham' who regularly runs the full legal power permitted, with a solid 59 report at both ends, then SSB is perfectly adequate. The QSO could possibly continue on AM even, but this would almost certainly be considered antisocial. I have used AM on 80m before now and been sworn at. My licence says that I can use it, I could even use FM if I wanted, but these modes on crowded bands are very antisocial and therefore should not be used.

It has been accepted that on the 10MHz band, SSB should not be used as it is a very narrow band. CW only should be used to 'cram' more stations in. This then gives us a further reason to promote the use of the code. Many low power operators are delighted with their logbooks showing huge amounts of DX worked with SSB at very low powers. One such operator is Dave G4XNP who sent me copies of his log showing a list of DX stations worked that makes the mouth water. With just half a Watt he managed QSOs with VP5, W6, HA2, 4N3, OE, VO1, ED3, YZ, IT9, 4U1, and VP9.

Dave is rather the exception to the rule, most low power operators prefer to use Morse code. There is a very good reason for this. As most amateurs are aware, the voice is made up of a variety of frequencies, and to understand it almost all of these frequencies must be heard by the recipient. If only a small number of these are heard, the signal will be unintelligible. With Morse code, the signal is either there or it is not. This makes it easy to copy in difficult conditions such as when engaged in a QRP contact.

If a stronger station drifts onto your frequency when engaged in an SSB contact, the stronger station often obliterates the weaker, making this weaker station unintelligible. When using Morse code this is not always the case. I have often sat working the 'third order' station. You must have heard it, the one you want is always underneath two others (yes, I know a good filter can help here).

I have deliberately avoided the controversy over the Morse test for entry to the HF bands. The Morse code will continue to be used whatever happens because someone will always want to keep it going, no matter how proficient the digital communications become. Very often we forget the reason we took up amateur radio. It is a hobby, and as such should be enjoyed in any way that we want. I love to use Morse code, I am not very good at it, 15 WPM maximum, but I enjoy it like several thousand others. Surely that is reason enough to keep it in use within the hobby.

A letter from Evelyn G0OZI raised a few points about operating with low power. In my column of the December issue I mentioned adding 'QRP' to the callsign. Evelyn correctly reminded me that it was not permissible to add a suffix to the callsign other than that required by the issuing authority.

Whilst we all use the suffix /M or /P when operating in mobile or portable situations, the 'normal' operator uses the actual words "G0BPS mobile" without mentioning the 'stroke' '/'. My suggestion, which I stick by, is that an operator may say that he is a low power station by the addition of QRP to his CQ call. I often use "CQ de G0BPS QRP station" with no mention of the '/'. In CW I (with many others) also use the addition of QRP to a CW call. This is in no way intended, or usually seen as, a suffix to the callsign.

QRP Clubs

We tend to forget that we are not alone within the QRP fraternity, there are QRP clubs in many countries. In those countries where there are none, amateurs tend to join larger clubs such as our own G-QRP club and the ARCI (American Radio Club International). Readers my want to join these other clubs, so here is some information.

The Czechoslovak QRP Club is one of the newer clubs, being in existence for just a couple of years. I had the pleasure of meeting Petr OK1CZ at the gathering at Rochdale last October, needless to say I soon became a member of this club. The certificate is quite nice too. Information from; Petr Doudera OK1CZ, U1. Baterie 1, 16200 Praha 6. Czechoslovakia. The club magazine is a good read, with text in both Czech and English.

With over 7000 members, the ARCI is one of the largest clubs. Although the name suggests it is an international club, most of its members are American. The club magazine *The Quarterly* is also very good, and, as the name suggests it appears every three months. The contact for membership information is myself at the address below.

The German QRP Club is also an active group with many low power operators. More information from Rudi Dell DK4UH, Weiniestr 10, W 6737 Bohl-Iggelheim, Germany.

The beauty of joining in with these groups is the friendship found on the bands. It somehow makes it all worthwhile. That's it for this month, please send your news, views, and comments to me; Dick Pascoe G0BPS, Seaview House, Crete Road East, Folkestone, Kent CT18 7EG (please note change of address), or via GB7SEK on packet. 72.....

Club News

Aberdeen ARS meet every Friday, 7.30pm, at 35 Thistle Lane, Aberdeen (just off Rose St.). Visitors and anyone interested in radio or electronics will be made most welcome. Planned club events/talks;
Feb 12th 'The Great Morse Debate'.
Feb 19th Electrotherapy, by Bill GM3FRI.
Feb 26th 'How I got started in Amateur Radio', by various speakers.
Mar 5th Junk sale.
Mar 12th PC Public Domain Software Giveaway, by GM8FFX.
Mar 19th Concrete in amateur radio, by GM0CQV.
Mar 26th Beetle Drive and family evening.
Further details can be obtained from John GM1TDU, Tel. 0224 706619

Acton, Brentford & Chiswick RC meet at 7.30pm on the third Tuesday of each month, at the Chiswick Town Hall, Turnham Green, Chiswick, London W4. New members welcome. Club event;
Feb 16th WAB, talk by G0HHP.
Further details from Colm Mulvany G0JRY, Tel. 081 749 9972.

Aylesbury Vale RS meet on Wednesday evenings in the Village Hall in Hardwick, located off the A413 between Aylesbury and Buckingham. Club events;
Feb 17th Visit to Bletchley Park Museum.
Mar 3rd RSGB video evening.
Mar 17th AGM.
For more details and meeting times, contact Martin G4XZJ, Tel. 0296 81097

Bangor and District ARS meet on the first Friday of each month, 8.00pm, in the Winston Hotel, Queens Parade, Bangor, Co. Down. Planned club talk;
Mar 5th Medical electronics, by GI4BXB.
Further details from R. Buckley, GI3HCP, Tel. 0247 460251

Basingstoke ARC meet on the first Monday of each month, 7.30pm, at the Forest Ring Community Centre, Sycamore Way, Winklebury, Basingstoke, Hants. Planned club diary;
Feb 28th 2m direction finding competition.
Mar 28th 2m direction finding competition.
For further details Tel. 0256 25517

Barnsley and District ARC was formed in 1913, and meets every Monday night in the radio shack at the rear of the Darton Hotel, Station Road, Darton, Barnsley. Anyone interested in radio or the Novice licence is most welcome to attend. Forthcoming club events/talks;
Mar 15th Junk sale.
Mar 22nd AGM.
For further details contact Ernie G4LUE, Tel. 0226 716339 between 6.00pm and 8.00pm.

Braintree and District ARS meet on the first and third Monday of the month (except bank holidays), 8.00pm, at the Community Centre, Victoria St., Braintree. There is a club net on 2m on the second and fourth Mondays at 20.00 GMT on 145.375MHz. Planned club events/talks;
Feb 15th PMR Conversion practical.
Mar 15th Members memories.
For further details please contact Derek Mayes G3MMA, Tel. 0787 474312

Bridlington and District ARS meet every other Thursday, 7.30pm, in the Combined Cadet Building, Bridlington Upper School, Yorkshire, all visitors welcome. Planned club events/talks;
Feb 4th CW and Raynet, Brian G4XBU.
Feb 19th Computer programming, Keith Goodyear.
Further details can be obtained from Norman G4NJP, 44 Hilderthorpe Rd, Bridlington, Yorks YO15 3BG.

Bristol (South) ARC meet every Wednesday at the Whitchurch Folkhouse Association, Bridge Farm House, East Dundry Road, Whitchurch, Bristol. Club diary of events/talks;
Feb 10th Magazine exchange evening.
Feb 17th 70cm ATV challenge.
Feb 24th Soldering iron competition.
For more information and meeting times, telephone Whitchurch 832222 on a Wednesday evening.

Bromley and District ARC meet on the 3rd Tuesday of each month, 7.30pm for 8.00pm at the Victory Social Club, Kechill Gardens, Hayes, Kent. Club events/talks;
Feb 16th Introduction to Fibre Optics, Alan Ogden.
Further details from Mr. Geoffrey Milne G3UMI, 142 Hayes Lane, Hayes, Kent, BR2 9EL, Tel. 081 462 2689.

Bromsgrove and District ARC meet every Friday night for on- air, construction, and natter nights. On the second Friday of each month at 8.00pm they have a talk/ lecture at Waselly Country Park. Planned club talks/events;
Feb 12th Photography.
Mar 12th AGM.
For further details contact Joe Poolle G3MRC, Waselley Country Park, Gannow Green Lane, Rubery B45 9AT, Tel. 0562 710010

Buxton ARC meet at the Lee Wood Hotel, Buxton, at 8.00pm on the 2nd and 4th Tuesdays each month. Club diary of events/talks;
Feb 9th Basic PC construction.
Feb 23rd Video night.
Mar 9th Foxhunts explained.
For further information contact Derek Carson G4IHO, Tel. 0298 25506

Mid Cheshire ARS meet each Wednesday, 8.00pm, at the Cotebrook Village Hall, Cotebrook, Cheshire. Planned club events/talks;
Feb 10th Testing portable equipment, by G8XMZ.
Feb 17th Construction night.
Further details from M. Baguley G7LQD, 21 Sovereign Close, Northwich CW9 7XN

Dacorum AR and TS meet on the first (informal) and third (formal) Tuesdays, 8.00pm, at the Heath Park, Cotterells, Hemel Hempstead. Club talk/event;
Feb 16th Aerial design (part 2), Mike G0NJI.
Mar 16th Junk sale and blue smoke evening.
For further details contact Dennis Boast G1AKX, Tel. 0442 259620

The D-Day Coast ARS have just recently formed, their headquarters are in the heart of Normandy. The society is open to all hams and listeners, especially those who have served their army at the time of the landings in June 1944. Their main activities range from QRP to contests, not forgetting wartime radio, and they have a quarterly journal called 'Overload' published in French and English. An annual subscription is £10 ($20 or 100FF) which includes a few club QSL cards, and a subscription to Overload. For an information sheet they ask you to send an SAE and some sort of contribution to; The D-Day Coast ARS, P. O. Box 44, 14430 Dozule, Normandy, France.

Dereham ARC meet at the St. Johns Ambulance Hall, Yaxham Road, Dereham, at 8.00pm. Planned club talks;
Feb 11th SSTV, by Robert G4TUK.
Mar 11th 'Strange noises on the HF bands', Mark G0LGJ.
For further details contact Mark Taylor G0LGJ, Tel. 0362 691099 or G0LGJ @ GB7TLH packet.

Dragon ARC meet on the first and third Mondays of each month at the Fourcrosses Hotel, Menai Bridge. Club diary of events/talks;
Feb 15th A Rough Guide to QRP, GW0ETF.
Mar 1st St. David's Day 'radio' Eisteddford.
Mar 15th Evening of amateur radio videos.
Further details from the Secretary Tony Rees GW0FMQ, Tel. 0248 600963

Echelford ARS meet on the second and fourth Thursday each month, 7.30pm, at the Community Hall, St. Martin's Court, Kingston Crescent, Ashford, Middx. Planned club talks/events;
Feb 11th Intruder watch, G3JVC.
Feb 25th Construction contest evening.
Mar 11th Radio with computers, G3XTC/G4XLM.
Mar 25th Transmitting aerial basics, G3MCK.
Further details from P. Townshend, Tel. 0344 843472

Edgware and District RS meet, at 8.00pm, at the Watling Community Centre, 145 Orange Hill Road, Burnt Oak. They have Morse practice sessions, and run club nets on Mondays and the last Sunday of each month. Visitors always welcome. Planned club talks/events;
Feb 11th Model rockets, by G4CQF.
Feb 25th Morse training evening.
Mar 11th Bring and show evening.
Mar 13/14th Commonwealth contest.
Mar 25th Morse training evening.
Further details can be obtained from Howard Drury G4HMD, Tel. 0923 822776, or

Steve Slater G0PQB, Tel. 081 953 2164

Grantham Radio Club meet on the first and third Tuesdays of each month at the Kontak sports and social club, Barrowby Road, Grantham, starting at 8.00pm. Everyone welcome. Planned club talks/events;
Feb 16th ATUs, by G3VSX.
Mar 2nd Fire prevention in the shack.
Further details from John Kirton G8WWJ, Tel. 0476 65743

Halifax and District ARS meet at 7.30pm on the first and third Tuesdays each month, at the Running Man Public House, Pellon Lane, Halifax. The first Tuesdays are informal 'Noggin and Natter' nights, other planned club events/talks;
Feb 16th Junk sale, Queens Rd. Neighbourhood Centre.
Further details can be obtained from Mr. D. Moss G0DLM, Beechwood Lodge, Lightcliffe, Halifax HX3 8NU, Tel. 0422 202306

Hastings Electronics and RC meet every Friday, 7.30pm at Ashdown Farm C.C., Downey Close, Hastings, for a social evening, and every third Wednesday of each month for their main meeting, at West Hill Community Centre. They run RAE and Novice courses. Planned club talk;
Feb 17th Weather recording, by G4ITM.
Mar 17th AGM.
For further details contact Reg Kemp G3YYF, Tel Crowhurst 83454

Hesketh ARC is a small but active club based in Southport, Lancashire. They tell us they ran a successful Novice course with nine students last year who all passed, and are currently running another course for Hesketh Bank ATC. They meet every other Tuesday in Birkdale, Southport. Planned club talks/events;
Feb 16th QRP on the air.
Mar 2nd Bring and buy.
Mar 16th Set up a weather station at your QTH.
For further details contact Bernie G7DEM, Tel. 0704 63344 or via packet @ GB7NWI.

Hoddesdon Radio Club meet alternate Thursdays at the Conservative Club, Rye Road, Hoddesdon from 8.00pm. Club diary of talks/events;
Feb 18th Visit by RSGB General Manager, Peter Kirby.
For more information contact Roy G4UNL, Tel. 081 804 5643.

Horndean and District ARC meet on the first Thursday of each month at Horndean Community School, Barton Cross (off Catherington Lane), Horndean, Hants. Club diary;
Feb 4th Junk sale.
Mar 4th Control and communications/first action first aid.
Further details can be obtained from Stuart Swain, Tel. 0705 472846

Keighley ARS meet at the Cricket Club, Ingrow, near Keighley every Thursday at 8.00pm. Most club meetings are 'Natter nights', other events/talks include;
Feb 11th Night on the air.
Feb 25th Visit to West Yorks Fire Service HQ.
Mar 11th The sky, the beauty, the wonder.
Mar 25th Transatlantic on 2m.
Further details from Kathy Conlon G1IGH on 0274 496222

South East Kent (YMCA) ARC meet at the Dover YMCA in Leyburne Road, Dover, every Wednesday at 7.30pm. The club is actively involved with manning the permanent special event station at the South Foreland Lighthouse, and also runs Morse and Novice classes. Planned club talks/events;
Feb 10th The role and workings of Raynet, by G0FAK.
Feb 24th Introduction to Packet, by G7IXL.
Mar 3rd Evening for Novices.
Mar 10th South Foreland Lighthouse operators' meeting.
Mar 24th Video 'TV from the Goodwin Sands'.
For further details about the club and courses contact Eileen G7HXJ, Tel. 0304 372656.

Kettering ARS meet every Tuesday at 7.30pm at The Electricity Sports and Social Club, Eksdale St, Kettering. Club diary of events/talks;
Feb 23rd Gas distribution and radio links.
Mar 23rd Kettering in World War II.
Further details from Len G0RDV (was G7EHM), Tel. 0536 514544

Liverpool and District ARS meet at 8.00pm every Tuesday evening at The Churchill Club, Church Rd, Wavertree, Liverpool. Planned club events/talks;
Feb 9th Activity night.
Feb 16th Weather satellites, G3PDC.
Feb 23rd Surplus sale.
For further details contact Ian Mant G4WWX, Tel. 051 722 1178.

Maidenhead and District ARC meet, 7.30pm, at The Red Cross Hall, The Crescent, Maidenhead. Planned club events/talks;
Feb 4th The history of GB2SM (Science Museum).
For further details contact Neil G8XYN, Tel. 0628 25952

Mansfield ARC meet on the first Thursday every month, 7.30pm, at The Polish Catholic Club, Off Windmill Lane, Woodhouse Road, Mansfield. Planned club diary of events/talks;
Feb 4th RSGB video evening, and DXpedition to VU.
Mar 4th The Nottinghamshire ambulance service radio network.
For further details contact Mary G0NZA, Tel. 0623 755288

Norfolk ARC meet every Wednesday at 'The Norfolk Dumpling', The Livestock Market, Harford, Norwich, 7.30 for 8.00pm start. Club diary of events/talks;
Feb 17th Science for all, Arnold G3PTB.
Feb 24th Informal and night on the air.
Further details can be obtained from Sheila Snelling G0KPW, Tel. 0603 618810.

Northern Heights ARS meet on the first and third Wednesdays every month, 8.00pm, at the Broadshaw Tavern, near Queensbury, between Bradford and Halifax. Forthcoming club events/talks;
Feb 17th Mr. Dougherty's lecture.
Mar 3rd ATV, by Geoff Barber and Jon Grantham.
Mar 17th HF night on the air.
Further details can be obtained from Stan Catton G1HYR/G0IYR, Tel. 0274 673116.

Nottingham ARC meet every Thursday, 7.30pm. in the Sherwood Community Centre, Mansfield Road, Nottingham. Visitors interested in amateur radio, whether as a transmitting amateur or SWL, are most welcome. Forthcoming events/talks include;
Feb 11th Generating your own power.
Feb 18th Construction/activity/prep. for TDOA.
Feb 25th The Lundy Is. DXpedition, G5LP.
Mar 4th Forum/foxhunt forum.
Mar 11th Batteries.
Mar 18th Construction exhibition/competition.
Mar 25th Top band/MW propagation, G3VGW.
Further details from Ian Miller G4JAE, Tel. 0602 232604

South Notts ARC meet every Friday, 7.00pm, at Highbank Community Centre, Farnborough Road, Clifton Estate, Nottingham, and have regular construction nights at Fairham Community College, other planned club events/talks;
Feb 19th The Secret War, Henry G4MHB.
Feb 26th On air.
Mar 5th Open forum.
Mar 12th Construction.
Mar 19th VHF linear and PSU design, G6ABU.
For further details contact Julian G0LXX, Tel. 0602 211069, or Ray G7ENK, Tel. 0602 841940.

Southgate ARC meet on the second and last Thursdays of each month at the Winchmore Hill Cricket Club Pavilion, Firs Lane, Winchmore Hill, London N21. Forthcoming club events/talks;
Feb 11th Multimode action on the air.
Feb 25th Inter-club darts match.
Mar 11th Rig check evening.
Mar 25th Cartography, Lecture at Kings College London.
For further details contact Brian Shelton G0MEE, Tel. 081 360 2453.

Stevenage and District ARS meet every Tuesday, 7.30pm, at Cottswood House, Ridgemond Park, Telford Ave, Stevenage, Herts. Morse practice available on club nights. Planned club events/talks;
Feb 9th Talk and demo on woodturning, by G4ISO.
Feb 16th On air practice and procedures.
Feb 23rd The American Experience, Take 2, by G0OVO.
Further details from Peter Good G7HCL, Tel. 0438 724509

Stockport ARS meet on the second and fourth Wednesdays each month, for details of their meeting place contact Club Secretary Jim G3KAF, Tel. 061 439 4952. Planned club events/talks;
Feb 10th Computers, by G0HJQ.
Mar 10th Amateur TV, by G0ITP.
Mar 24th Surplus equipment sale.

Stratford upon Avon & District RS meet at the Home Guard Club, Main Road, Tiddington, Stratford upon Avon, at 7.30pm. Club events/talks include;
Feb 8th Trials and tribulations of an OWL, Stan G4AXW.
Feb 22nd Test equipment evening, Terry G3MXH.
Mar 8th RF problems with motor vehicles.
Mar 22nd Surplus sale.
Details from A. Beasley G0CXJ, Tel. 060 882 495.

Sudbury and District RA (SAnDRA) meet on the first Tuesday of each month, 8.00pm, at The Five Bells Inn, Great Cornard, Sudbury, Suffolk. Forthcoming talks/events;
Feb 14th Cambridge rally.
Feb 21st East coast rally.
Mar 2nd Natter night with raffle.
Mar 13th London ARC show.
Further details can be obtained from Colin Muddimer G0PAO, Tel. 0787 77004.

Surrey Radio Contact Club meet on the first Monday of each month at TS 'Terra Nova', The Waldrons, Waddon, Croydon, Surrey. Planned club talks;
Mar 1st Surplus sale.
For further details contact Bernard Wynn G8TB, Tel. 081 660 7517

Sutton and Cheam RS meet on the 3rd Thursdays each month, 7.30pm for 8.00pm at Sutton United Football Club, The Borough Sports Ground, Gander Green Lane, Sutton, Surrey. Natter nights are on the first Thursday of each month, and they have a club net on Monday at 20.30 on 70.3875MHz, and Tuesday at 10.30 on 3.760MHz. Club talks;
Feb 18th Constructional contest.
Mar 6th Annual dinner.
Mar 18th Cable television, by Ralph McDermott.
For further details, Tel. 081 644 9945

Torbay ARS meet every Friday at the ECC Social Club, Highweek, Newton Abbot at 7.30pm. They have informal meetings most Fridays with a talk/event once a month, details as follows;
Feb 19th AGM.
Mar 19th Talk and film by RNLI.
Further details can be obtained from Walt G3HTX, Tel. 0803 526762 or Andy G4VPM, Tel. 0803 329055

Trowbridge and District ARC meet at Southwick Village Hall, Southwick, Trowbridge, Wiltshire for a main meeting every 1st Wednesday of the month, and a natter night every 3rd Wednesday. Planned club events/talks;
Mar 3rd Direct Conversion RX, by G0BBL.
For further information please contact Ian G0GRI, Tel. 0225 864698 evenings.

Wimbledon and District ARS meet on the second and last Friday of each month in St. Andrews Church Hall, Herbert Road, Wimbledon SW19. Planned club events/talks;
Feb 12th Vertical aerial adjustments.
Feb 26th The History of Cameras, by G0KEB.
Mar 12th SWR measurements.
Mar 26th Secret Listeners, by G8DIU.
Further details available from Chris Frost G0KEB, Tel. 081 397 0427.

Wrexham ARS meet at Maesgwyn Road Community Centre, Wrexham (behind the Wrexham Maelor Hospital Maternity Unit). Forthcoming events/talks;
Feb 16th Video night – amateur television
Mar 16th AGM.
For further details and meeting times contact D. Ian Wright GW1MVL, Tel. 0978 845858

Yeovil ARC meet every Thursday, at the Red Cross Centre, Grove Avenue, Yeovil, Somerset. Club events/talks;
Feb 11th Vintage radio, by G7LNJ.
Feb 18th Club project 20/80m transceiver theory, by G3PCJ.
Feb 25th Don't be afraid of CW, by G3GC.
Mar 4th Club project final testing.
Mar 18th Club project, any problems and future plans, G4GVM.
Mar 25th Operating and natter night.
Further details can be obtained from Cedric White, Tel. 0258 73845

National and International
British Amateur Radio Teledata Group (BARTG) have a quarterly magazine, hold two contests and a rally each year. The membership officer is Peter Adams, G6LZB, Tel. 0923 220774 for details of joining the BARTG, for other information the group's Secretary and Publications Manager is Ian Brothwell G4EAN, 56 Arnot Hill Road, Arnold, Nottingham NG5 6LQ, Tel. 0602 262360, or via packet G4EAN @ GB7BAD.
G-QRP Club publish a quarterly magazine devoted to low power communication, and hold regular get-togethers. Their secretary is Rev. G. Dobbs, St. Aiden's Vicarage, 498 Manchester Road, Rochdale. Lancs. OL11 3HE. Tel. 0706 31812.
International Short Wave League who as well as running an International QSL bureau for amateurs and SWLs, have a monthly newsletter and regular get-togethers at their rally stands. See their feature in the June 92 issue of HRT. For more details send an A4 sized SAE to; ISWL HQ, 10 Clyde Crescent, Wharton, Winsford, Cheshire. CW7 3LA
The Irish Radio Transmitters Society send out regular newsletters giving details of local activities. The societies annual dinner and AGM will be held at The Royal Hotel, Bray, on 24/25th April. The contact man for this is Dave Moore EI4BZ, 12 Castle Ave, Carrigtwohill, Co Cork. Tel. (Eire) 021 883555
Radio Society of Great Britain are based at Lambda House, Cranbourne Road, Potters Bar, Herts. EN6 3JE, Tel. 0707 59015. They have a unique blend of full-time staff at Potters Bar coupled with many volunteer officials around the country. See their 'open day' feature in the July 92 issue of HRT.
Royal Naval Amateur Radio Society have a large number of on- air nets, and meet together at rallies and events throughout the UK. They publish a regular newsletter, and offer a wide variety of member's supplies. Information from their Secretary Mick Puttick G3LIK, 21 Sandfield Cres, Cowplain, Waterlooville PO8 8SQ, Tel. 0705 255880.

To include your club, or rally, in this feature, make sure you send us your events details early. We only list active clubs, i.e., those who send us their diary of planned talks/events, so if they're not listed here they're obviously not very dynamic! Is your club listed – if not then either give your Secretary a boot or get some activities going! Dates to be included in the issue published on the first Friday in April must reach us by the 15th February, addressed to 'HRT Club News', P. O. Box 73, Eastleigh, Hants SO5 5WG.

Rallies

February 7th
South Essex ARS Radio Rally, will be held at The Paddocks, Long Road (A130), Canvey Island, Essex. Doors open at 10.00am, with trade stands, bring and buy, home made refreshments, free parking plus parking outside the main door for disabled visitors. 2m talk-in on S22 (G4RSE). Further details contact Ken Hendry G0BBN, Tel. 0268 755350.

February 14th
2nd Northern Cross Rally, will be held at Rodillian School, near the junction of M1/M62,. For further details contact Dave Gray, Tel. 0532 827883.

February 21st
Barry ARS will be holding their annual rally at the Barry Leisure Centre, Barry, S. Glam. Doors will open a 10.00am (9.30am for disabled visitors), and there will be talk-in on S22 VHF. Further details from Colin Lake GW0LBJ, Tel. 0222 530070

East Coast Amateur Radio and Computer Rally will be at Clacton Leisure Centre. For further details Tel. 0255 474292

February 27th
Tyneside ARS 5th Annual Rally will take place at the Temple Park Leisure Centre, South Shields. Doors open at 11.00am (10.30am for disabled visitors). We are told all their usual visiting trade stands will be in attendance, and those visitors not wishing to partake in the rally have all the amenities of the leisure centre available. For further details contact Jack Pickersgill G0DZG, Tel. 091 265 1718

March 13/14th
London Amateur Radio and Computer Show, will be held at Picketts Lock Centre, Picketts Lock Lane, Edmonton, London. We're told there will be a large trade presence, free parking, lectures, disabled facilities, bring and buy, and a special interest group section. Talk-in will be on 2m and 70cm. For further details, telephone 0923 678770

March 14th
Wythall Radio Club are holding their annual rally at Wythall Park, Silver Street, Wythall (near Birmingham on the A435, two miles from junction 3 on the M42). They've told us there will be the usual traders in three halls, a bring and buy stall, and a bar and refreshment facilities available. Talk-in will be on S22 and admission 50p, doors open at 11am. Further details can be obtained from Chris G0EYO, Tel. 021 430 7267

Free Readers Ads!

HELPLINES

RTTY decoder and serial interface HRT June 1986, further info on construction and listing for Commodore 64. I would appreciate contact with anyone who has built and uses this system. Dave Forsyth, 20 Chapel View, Rowlands Gill, Tyne and Wear NE39 2PN, Tel. 0207 543776

Free to good home, i.e., UB40, disabled, or budding Novice or instructor; 1992 ARRL Handbook, packed full of amateur radio information, projects etc. It's big! First to phone receives as a gift, but must either collect or pay postage. Chris G4HCL, (Eastleigh, Hants), Tel. 0703 262105, preferably 6.30-8.30pm.

Help, any info on Totsuko (Shimutzu) TR2100M 2m SSB. Circuits, manual, or addresses of manufacturer's agent etc., all expenses paid. Tom Burke, 25 West St., Cleethorpes DN35 8QA, Tel. 0472 602335

Wanted; Comm 64 software, amateur only, log, locator, CW tutor, CW, RTTY, etc., would be grateful for anything, disk, tape, post paid. K. Brown (Aldershot), Tel. 0252 331069

User manual wanted for Centronics serial printer model 15.4, purchase or loan, all expenses gladly refunded. V. Roberts G3EGY, 118 Pinewood Cresent, Mier, S-O-T, Staffs ST3 6HZ, Tel. 0782 324407

Manual and circuit diagram please for Eddystone made Marconi International Marine badged model 3873a, all expenses refunded. Peter Lepino (Surrey), Tel. 037 245 4381 anytime, thank you.

Belcom LS102L operators manual required, original or photocopy, all expenses refunded. R. Rogers, 11 Broomfield, Octavia Way, Staines, Middx TW18 2QD, Tel. 0784 454400

Operations Manual required for Tandy TRS-80 colour computer, photocopy or original loan, all expenses will be reimbursed. Computer to be used for packet radio. Mr. P. Davies G1XCB, 91 Station Road, Hadfield, Hyde, Cheshire SK14 7AR, Telephone 0457 853397

Could Someone out there put some information on a computer 'bulletin board' for me? Worldwide if possible (not into this type of thing myself), can send information sheet via post. Write to; M. B. Evans, 120 Loughton Way, Buckhurst Hill, essex IG9 6AR

Does Anyone know which magazine or magazines list all the radio ham rallies that are and will be taking place in the future, please give me a call. Paul, 113 Wattville Rd, Handsworth, Birmingham, Tel. 021 327 3176

WANTED

Yaesu FT-707 MkII in good condition, or Yaesu FT-101ZD with FM board. Also Kenwood low pass filter. D. Martin, 13 Maple Drive, Johnstone Castle, Renfrewshire, Scotland PA5 9ST. Sorry, don't have a phone.

HRO Bandspread coils and coil box. Eddystone 358X coils and PSU S.390/B, any condition considered. Technical manual on Eddystone type ECR RX (1938), and Hallicrafters Sky Champion model S20. Copy of original data on Eddystone 'The All World Two' RX, C1936, WHY? Andrew Humphries (Warwick), Tel. 0926 400876

YC-7B digital frequency display, and FP-12 AC PSU for Yaesu FT-7B. Also any where I can get the service manual, schematic diagram, and any information on how to put FM on the FT-7B. Michael Hardy, 45 Barber St., Hoyland, Nr. Barnsley, N. Yorks, S74 9RD

ATU for TS-430S HF transceiver. W. Ford (Warwick), Tel. 0203 381382

Zenith Transoceanic radio wanted. I have Panasonic RF8000, Grundig 3400 plus 300, and Grundig 2001, all in mint condition, offers please or WHY? T. Hare (Hitchin, Herts), Tel. 0462 441867, thanks.

Six metre module, Yaesu MD1 B8 base mic, and SP102 speaker for Yaesu FT-726R base station tribander. John Brown 2E1BCF, 17 Fell View, High Spen, Rowlands Gill, Tyne & Wear NE39 2BW, Tel. 0207 542194

Address for Digiprom or Digicom modem packet, suitable for the CC64, I think they were called JSM. Also crystal calculations for converting Motorola CD100 UHF to 70cm, already converted but need help with more chanels. Wanted - FT-23 or similar for a Panasonic SSB RFB65. M. Colley, 118 Devon Cres, Birtley, Co. Durham.

NRD-525 VHF/UHF converter CLF233 narrow filters plus any other NRD-525 boards or acessories, speakers, phones etc. Mr. E. S. Taylor, 27 Eden Road, Abbotts farm, Rugby, Warwickshire, CV21 4HS

Pye PF85 VHF or UHF, for spares. Mr. Arthur Bolton, 135 Witton Lodge Road, Perry Common, Birmingham B23 5AR, Tel. 021 350 0824

Icom IC-R7000 must be in mint condition, the CT-17 (RS-232) option would be most welcome. Also, AR-3000 or AR-3000A, for cash. (Finchley, London). Tel. 081 346 3297 anytime.

Eddystone Model EC-958 880 or 730/4 in good condition. Ted (London), Tel. 081 366 6079

Standard C520/528 2m/70cm twin bander. Tomasz B., 127/3 Lauriston Place, Edinburgh EH3 9JN.

Icom IC-240, Tony Cox (Camberley), Tel. 0276 451209

Speech processor, urgent, price and details please. J. Frazer (Derby), Tel. 0283 221870

FC-700 ATU or FC-707, FP-700 or FP-757HD. Also wanted a cheap 2m rig, maybe a ready converted ex-PMR rig, cash waiting. Andy, (Nottingham). Tel. 0602 328362

Wanted Urgently, HF band module for Yaesu FT-726R, also sat unit, pound notes waiting for the above. Don (Cardigan), Tel. 0239 811157

EXCHANGE

For shortwave equipment to same value, I will exchange my Yamaha FE70 electronic organ, approx. value £850/£950. L. Toy (Truro), Tel. 0872 42246

Belcom LS10ZL 26 to 30MHz multimode transceiver, for Clansman type BCC351/355 manpack, must be mint and complete. Also exchange mint TS-430S multimode HF transceiver, for FT-650, or IC-575H, or FT-736R, must be mint. Also I have a TS-751E, want mint TM732E/TM731E, Alinco DR-599E, or FT-5200, again only mint condition. D. Craker (Stubbington, Hants), Tel. 0329 663834 after 7.00pm.

Realistic PRO-2006 scanner 25-520, 760-1300MHz, AM, WFM, NFM, for Kenwood R-2000 or Trio R-1000 R-2000. Scanner less than 1 month old. Cash adjustment possible. (London). Tel. 081 310 8517 evenings.

My **Heathkit** HW8 transceiver in mint condition plus PSU manual and HW8 handbook, for SW receiver. Geoff (Huddersfield), Tel. 0484 645923

Microwave Modules 100LS 144MHz linear preamp, 1/3W input, 100W output, mint, boxed, exchange for 100W+ 50MHz linear or V/UHF scanner RX, must be in GWO, can post. John (Edinburgh area), Tel. 031 331 3360

Dressler ARA-30, superb active aerial, 200kHz-30MHz (up to 100MHz reduced performance), exchange for Icom IC-240. Tony Cox (Camberley), Tel. 0276 451209

Pentax K1000 SLR, 50mm 1.4f, 70-210mm zoom, case, flash, excellent condition, exchange for Mizuho 20m QRP SSB/CW transceiver. Lee G0RSZ, 15 Heathville, Dallington, Northampton. Tel. 0604 582551

FOR SALE

RX8 multimode receive interface for BBC B computer, will receive Fax, SSTV, CW, RTTY, PKT, AMTOR, NAVTEX, ARQ, FEC, cost £259, accept £150. Also Trio 9R159 receiver, tatty, hence £30. Mrs. Goddard (York), Tel. 0904 782554

Yaesu FT-690 6m multimode, £250. 6m transverter from 2m, £40. Wanted - Weltz 300 Meter. Dave Biddle (Norwich), Tel. 0603 745512

Trio TR-9130 25W 2m multimode, plus fist mike, base mike (MC6OA), two power leads, two mobile brackets, Datong ASP processor, MM preamp, workshop and operators manuals, boxed, £450 ovno, no split. Also Uniden 2830 25W 10m multimode, plus mike, Adonis AM303G base mike, slide mount, two power leads, workshop and operators manuals, bo xed, £375 ovno, no split. J. Bolton G4XPP (County Durham), Tel. 0388 745787

Yaesu FT-290R 2m multimode transceiver, with carrying case, strap, nicads, charger, excellent condition, boxed, £325. Also matching linear FL-2025 with mobile mounting bracket MMB31, £85. C. Knowlson (Cheshire), Tel. 0625 531154

Analogue Technology replay model 3 digital voice message system, sends CQs etc. for you. Three seperate messages up to 32 or 64 seconds, size 6in x 4in x 5in deep, with power supply, cost £180, now £40. A. F. Sephton, 16 Bloemfontein Ave,

Shepherds Bush, London W12 7BL, Tel. 081 749 1454

Philips M294 VHF (PMR) mobile, 3 channel, suit 2m, as new, £80. Fairmate HF2000 scanner, 100kHz to 1300MHz no gaps, with nicads, aerial BTC, VGC, only 6 months old, £200 ono. Also two Philips PF85 UHF (PMR) hand helds, single channel, rapid charger, 4 batteries, as new, £150. Steepletone MBR 7 shortwave receiver, £35. Jim Cowburn (Sutton Coldfield), Tel. 021 351 6204

Diamond D-130 super discone aerial, can be transmitted on 2m, 6m, 70cm, and 23cm amateur frequency bands, stainless steel, £65. Discone receiving aerial, £20. Receiving preamp for HF, VHF, and UHF, £20. 2m/70cm mobile aerial, £20. All post paid. M. Marsden (Ormskirk, Lancs), Tel. 0704 892088

Valves, octal, 6V D. D. signal. Bridge rects 10A 400V. Mercury switches 10A. Toggle panels switches. Caps 40V 15,000. All £1 each. Mr. Williams, 20 Woodplace Lane, Coulsdon, Surrey, Tel. 07375 55256

FT-290R Mkl 2m multimode, two mobile mounting brackets (one new and still in box), charger, case, rubber aerial, and extention speaker, £260 ono. Ian Bevan (Diss, Norfolk), Tel. 0379 740742 evenings.

Icom IC-7100 receiver, 25-2000MHz, SSB, window scan, 1000 memories, mint condition, two months old, £765 ono. Also Diamond D-707 active base aerial with gain control, new, unused, £69. (Nothe London). Tel. 071 485 4351.

VHF and UHF MkIV SRG aerial matching units, both measure 6in x 3in x 2in VHF BW 120 to 160MHz, UHF BW 410 to 460MHz, £25 each. Used them for quick Raynet aerials on sites. P. Turner (Suffolk), Tel. 0473 785203 anytime.

PRO-204 scanner, Icom IC-R72 HF receiver, mint condition, both for £550 cash. William Bannister (Liverpool), Tel. 051 207 2602

Alinco DJ-120E 2m handheld with extended transceive, complete with charger, boxed as new, £130. Also Uniden Bearcat 200XLT handheld scanner, with charger and case, boxed as new, £155. A. Hawkins (Nuneaton), Tel. 0203 397209

Silent key sale; Heathkit SB400 TX, SB300 RX, £200. Heathkit SB303 RX transistor, Heathkit SB401 TX 80 to 10m, £250. Avo 8, leather case, as new, £65. Heathkit valve millivoltmeter, £20. 500 volt Megger, offers. Advance signal gen. E model, £30. Telequipment storage scope DM55A, £100. FT-101E, as new, phones, mic, £300. R. Richardson (Glemsford, Suffolk), Tel. 0787 280259

Kenwood TS-440S HF transceiver, 10 to 160m, automatic ATU, YK885 SSB filter, and YK88LW LW filter fitted, boxed and in mint condition, £750. CPL Ian Ward, 51 SQN, RAF Catterick, Richmond, N. Yorks DL10 7NP

Yaesu FT-757GX with FP700 matching power supply, £575. Diamond SX-200 SWR, 1.8 to 200MHz, reads average power, hardly used, £50. MM RX converters, 2m to 28 IF, £18. 70cm to 28 IF, £15. 2m RX amplifier, £8. Liner 2 2m SSB, £35. All ono. William Waugh (Edinburgh), Tel. 031 667 9849

Easy-PC package, £60. Analyser III package, £80. Two complete sets of valves for Yaesu FTDX401 plus others. B. Spencer G4YNM (Swindon, Wilts), Tel. 0793 642856

Radio and TV related books/mags, send SAE or 2 IRCs for list. Also 'living room loop' send SAE or 2 IRCs for more details. 18ft White Knight aerial, buy to collect, what offers? Write to; Mr. M. Evans, 120 Loughton Way, Buckhurst Hill, Essex IG9 6AR England.

MuTek TVVF144a, manual, excellent condition, boxed, £180 ono. Kenwood TS-440S, CW and SSB filters, boxed in original packing, excellent condition, £800 ono. Cushcraft 2m 15 element beam, good condition, £70. Dave Kay (Bolton, Lancs), Tel. 0204 852410

70cm 17ele crossed yagi, brand new, never used, £25. Mark Asquith (Barnsley, S. Yorks), Tel. 0226 758491 anytime.

Nevada MS1000 scanner receiver, homebase, 25 to 1300MHz, £220 ono. Peter Hollis (Co. Durham), Tel. 091 581 2095

Yaesu FT-757 and Kenwood TS-430S, £575 each ovno. Bearcat scanner 100XL, 16 channel, £120. Hi-Mound twin paddle key, £25. Nevada tuner, £100. Adonis desk mike, £30. ERA CW/RTTY Microreader decoder, £130. Four band vertical Cushcraft aerial, offers. All prices ovno. John Moran G0MYI (London), Tel. 081 698 7684

AOR-2800 scanner, 500 to 1300MHz SSB, still under guarantee, mobile/base with Discone, £300 ono. Dave Benfield (Northampton), Tel. 0604 844138 after 6.00pm.

Yaesu FT-200 transceiver, plus PSU and manual, one owner, mint condition and boxed, bargain £250 ovno. Also Realistic DX300 receiver, 0 to 30MHz digital readout, home base, 13.8V, excellent condition with manual, £180. Mr. Watts (Minehead, Sommerset), Tel. 0643 704927

Yupiteru MVT7000 handheld with nicads, cigar plug, carrying strap, original box and packing, only 6 months old, excellent condition, £200. Also Discone aerial free with radio. J. Carver (Birmingham), Tel. 021 770 8593

Trio TS-530SP 160 to 10m transceiver, perfect condition with MC35S mic, £440. Yaesu FRG-7700 communications receiver, 100kHz to 30MHz, good condition, £235. 13.8V, 25A PSU, £28. Gary Tuppery (Birmingham), Tel. 021 711 1553

Lowe SX30 communications receiver, 500kHz to 30MHz, AM/SSB, 240V/12V, good working order and condition, £110. Yupiteru MVT-5000 scanner, little used, AM/FM, 25 to 550MHz, 800 to 1300MHz, £150. Storno 600, synthesised on 2m (24 channels), ideal for voice or packet, 10W, £55. Tony G6SHU (Telford), Tel. 0952 825679

Kenwood TS-140S HF transceiver, mint, £550. Kenwood TM-241E 2m transceiver, mint, £225. EP925 3 to 15V, 25A PSU, £75. JIL SX400 scanner, £175. HS5 headphones, £25. MC43S mic, £15. AKD HF wavemeter, £35. John Allsopp (Tyne Wear), Tel. 091 416 2606

Shure mic model 450, offers. Also old AVO heavy, £15. Buyer collects. J. Frazer (Derby), Tel. 0283 221870

Saiko mobile scanner, 16ch, FM, 12V. 78/88, 155/168, 456/476MHz, telescopic aerial, brand new, boxed, unwanted gift, £50. Eric Page, Seacroft, Clos du Murier, St. Sampson, Guernsey. Tel. 0481 47278

Yaesu FT-726R, 2m and 70cm, with satellite and HF modules fitted, from 21.000 to 29.999MHz, SSB, CW, FM, mint condition, nice home base, boxed with manual, £625. Ken Church (Kings Lynn, Norfolk), Tel. 0553 766166 daytime, or Tel. 0553 768274 after 6pm.

AOR-3000 scanner, mint condition, £450. Peter Jerram (Oxon), Tel. 0993 842243

Subscriptions and back issues:
Argus Subscription Services,
Ham Radio Today, Queensway House,
2 Queensway, Redhill, Surrey
Tel: (0737) 768611

Subscription rates:
UK £20.40, Europe £26.80, Sterling
Overseas £28.90, US Dollars
Overseas $58. Airmail rates available on request. Cheques payable to ASP.

USA Subscription Agent:
Wise Owl Worldwide Publications,
4314 West 238th Street,
Torrance CA90505
Tel: (310) 375 6258

USA Visa/Mastercard orders:
Phone: (213) 375-6258 Pacific
Time: 6pm-9pm weekdays,
10am-6pm weekends.

Editor
Sheila Lorek, G8IYA

Consultant Technical Editor
Chris Lorek BSc (Hons) AMIEE, G4HCL

Technical Illustrator
Tony Burlinson

Creative
Design Manager; Peter Kirby
Photographer; Manny Cefai

Advertising
Advertisement Sales; Amanda Spray
Classified Sales; Helen Taylor
Advertisement Copy Control;
Marie Quilter

Management
Managing Director; Terry Pattisson
Circulation Manager; Debra Stupple
Production Manager; Tony Dowdeswell
Group Editor; Stuart Cooke
Group Advertising Manager;
Claire Jenkinson

HRT Address;
Ham Radio Today, ASP, Argus House, Boundary Way, Hemel Hempstead, Herts HP2 7ST
Tel: 0442 66551
Fax: 0442 66998

Editorial Queries:
Tel: 0703 262105
Fax: 0703 263429 (24 hrs)

Printed in Great Britain by
Wiltshire Ltd, Bristol

Member of the Audit Bureau of Circulation

FOR SALE

Yaesu FT-708R 432MHz hand held, with speaker mic, £100. FT-230 144MHz mobile, £50. 386SX PC, 2 Meg RAM, 40 Meg HD, SVGA graphics, mouse, Windows, Lotus Works, £600. Green screen monitor, suitable for BBC, £40. T. Hawkins (New Milton), Tel. 0425 611835

Alinco DJ-580 with car power lead, as new, 6 months old, dual band extended receive and transmit, battery and charger, CTCSS board fitted, £275 ovno. Jason Fox (London), Tel. 081 529 3677, or 0831 587318 anytime.

Pye A200 and MF4AM Reporter, ideal for 4m, £35. Apricot PC/xi and some software, £70. Racal/Milgo modem (MPS1222), £50. Gang of Eight plus Eprom programmer, £200. Eprom eraser, £45. Both for £230. I. Graham (Beds), Tel. 0933 412362 evenings only.

Yagi Hy-Gain aerial TH3JR-S Thunderbird Junior, 10, 15, 20m, only 6 months use, partly assembled and packed in two tubes, £225. L. Evans G0SJQ (Weobley, Hereford), Tel. 0544 318875

Spectrum hardware technical software RX4, with TIF1 interface and software, £19. J & P Electronics fax for Spectrum with time clock interface, software, £16. Three 3in discs, used, £1 each. Paul Bowen, 37B High St., Wem, Shropshire SY4 5DG

FT-290R, case, nicads, charger, manual, VGC, £200. IC-2E handheld, battery pack, charger, manual, VGC, £100. C. France (Melton Mowbray), Tel. 0664 64287

Icom 726 HF, with 6 metres, and matching PS55 power supply, £750. 5 element Tonna aerial, £20. MFJ948 ATU, £70. Yaesu G-400 rotator, £80. Dave Gale G1GVM (Eastleigh, Hants), Tel. 0703 611905

Collins KWM2A HF transceiver, good condition, £230. Kenwood TH-75E hand held, 2m/70cm dual bander, mint condition, with soft case, and charger, £275. Katsumi electronic keyer model EK-108A, excellent condition, £50. KW Electronics SWR meter, good condition, £20. Tony Neal (Leeds), Tel. 0423 734062

Standard C528 dual band, 2m/70cm hand held transceiver, extended coverage to 980MHz, 5W output, dual receive, comes with CTCSS tone board, speaker mic, base charger, mobile and base power leads, 3 battery packs and charger, base plate, all boxed and excellent condition. Cost over £620 new, will accept £375 ono. Steve Powell (Bracknell), Tel. 0344 486281

Tono 9100E multimode communications terminal, AMTOR, RTTY, ASCII, CW, stand alone unit. Full autotrack on CW RX, just hook up to audio, TTL, or RS232. Comes with screened monitor, all leads, and comprehensive instruction and service manuals. Cost £1000+ will accept £375 ono. Steve Powell (Bracknell), Tel. 0344 486281

RA17W Racal receiver, fully working, good condition, with manual, £180 ono. Full set of new valves for above, £25 ono. Happy to demo to serious cash buyers. Mike Gibson (High Wycombe, Bucks), Tel. 0494 816342 after 8.00pm, or Fax. 0494 816935

Tokyo HyPower HL120V 2m linear/preamp, 3/10W in, 170W out, £180. Also HL160V 70cm, 100W+ out, £295, both mint. BNOS 25A PSU, £120. Kantronics Data Engine, £290. Kantronics DVR 210 high speed packet transceiver, £160. Kenwood MC43S mic, new, £18. Paul Chamberlain (Crawley), Tel. 0293 515201

AMT-1 AMTOR/CW/RTTY with EPROM cartridge for CDR64. STC5 TU RTTY G4BMK Progs disk/tape RTTY/CW for CDR64. Commodore C64 computer with case, PSU, data casette/1541 disk drive plus amateur progs. £220 or split. G3LNW (Bath), Tel. 0761 432248

National HRO p/supply, 7 coils, handbook, rough but works hence £40, buyer collects. Trio R-600 AM/SSB/CW 150kHz-30MHz, handbook, £190. Ten-Tec Corsair, all filters plus 363 VFO, handbooks, £640. Argosy CW filter £20. MFJ422B-X Curtis keyer £40. Coax switch 3 way, £10. All plus carriage. Ted Trowell (Sheerness), Tel. 0795 873100

Essential Reading for aspiring radio hams. Five books including multiple choice 'Question and Answers' and 'How to Pass the RAE', £6.00 the lot including postage. Geoff (Huddersfield), Tel. 0484 645923

Belcom LS102L 10m transceiver with continuous tuning, complete with Belcom mic, good condition and excellent working order having recently been checked and realigned to peak performance, £280. Reg Rogers (Staines, Middx), Tel. 0784 454400

Eddystone EC-10 £70, Eddystone 680X, £100, Eddystone 730/4, £120, Mizuho 144MHz SSB/CW, £70. Mr. Arthur Bolton, 135 Witton Lodge Road, Perry Common, Birmingham B23 5AR, Tel. 021 350 0824

Free Readers Ads!

Name ..... Signature .....

Address ..... Date .....

..... **Send this form to:**
Free Readers Ads, Ham Radio Today, A.S.P., Argus House, Boundary Way, Hemel Hempstead HP2 7ST.
..... You can also fax this advert on (0703) 263429

ENTER YOUR ADVERTISEMENT HERE: FOR SALE/WANTED/EXCHANGE/HELPLINES* *Delete as appropriate

RETAIL NETWORK

AVON

Open Mon-Sat 9.30AM - 5.00PM
Bristol & Avon Independent Retailer
ICOM - YAESU - ALINCO - AOR
Packet Radio Equipment Satellite Tracking Equipment
Sole Agents for DRSI Packet PC cards/L.L. Grace DSP-12
Junghans MSF Controlled Clocks
Accessories - Books - Magazines

AMDAT 4 Northville Road. Northville, Bristol BS7 0RG
Tel: (0272) 699352 Fax: (0272) 236088

BIRMINGHAM

HEWARD'S HOME STORES LTD.
(Est. 1963)
822/4 Kingstanding Rd., Birmingham B44 9RT
Tel: 021-354 2083
G4RJM with over 41 years in The Radio Trade
Ham Equipment urgently wanted!
Open: Mon-Sat 9-6

CORNWALL

SKYWAVE CORNWALL 24hrs, 7 Days a Week
RADIO AMATEUR & MARINE COMMUNICATIONS SERVICES
ICOM, YAESU, NAVICO JAYBEAM, Etc
SLADES ROAD, ST. AUSTELL,
CORNWALL PL25 4HG
Tel: 0726 70220
Voice Bank 0426 961909

KENT

Icom (UK) Ltd. Dept. HRT
Unit 8, Sea Street, Herne Bay, Kent CT6 8LD. Tel: 0227 741741. 24 Hour Fax: 0227 360155.
ICOM TUES-SAT 0900-1700

LANCASHIRE

AMATEUR ELECTRONICS/HOLDINGS G3LLL.
YAESU, JAYBEAM, DRAE, DATONG, BLACK STAR COUNTERS, ETC, FT 101 EXPERTS

G3LLL
6JS6C 6146B 12BY7A Original type approved valves & our own Double Balanced Mixer and new band WARC Kits for original FT101 MK1-E. S.A.E. List. Full Yaesu range. 15 mins Junction 31 M6. Free parking. Call and consult G3LLL without obligation. Holidays? Phone, check we are open before calling. Lunch 12-1.30pm.
45 JOHNSON STREET, BLACKBURN BB2 1EF. (0254) 59595. CLOSED THURSDAY.

HAMPSHIRE

SMC The Communicators

South Midlands Communications Ltd
S. M. HOUSE, SCHOOL CLOSE, CHANDLERS FORD, INDUSTRIAL ESTATE.
EASTLEIGH, HAMPSHIRE SO5 3BY. TELEPHONE: [+44] ([0]703) 255111
FAX: [+44] ([0]703) 263507 SMC FX TELEX: 477351 SMCOMM G

THE OFFICIAL UK YAESU IMPORTER
OFFICIAL DISTRIBUTORS FOR: COMET • DAIWA • TERELEADER • TOKYO • HY POWER • HOKUSHIN

LONDON

ARE COMMUNICATIONS
TEL 081 997 4476
★ Well stocked with YAESU, ICOM, KENWOOD, STANDARD, AOR ETC.
★ We buy and sell secondhand equipment
★ Equipment servicing available
★ Friendly and helpful staff!
6 Royal Parade, Hangar Lane, Ealing, London W5A 1ET
Mon-Fri: 9am-6pm Sat: 9am-3pm

NORTHANTS

Northampton Communications
C.B. RADIO SERVICE CENTRE
1 VICTORIA RD
NORTHAMPTON
MAIL ORDER AVAILABLE
FOR DETAILS RING **0604 26283**
ACCREDITED WITH B.S.I 5750 FOR P.M.R.
AT OUR MAIN SERVICE CENTRE
BRIXWORTH
Putting Communications into Perspective

OXFORDSHIRE

SERVICE MANUALS
Available for Most Equipment
TV, Video, PMR, Military, Amateur, Test etc. Any Age, Make or Model.
Write or Phone for Quotation.
MAURITRON (HRT)
8 Cherry Tree Road, Chinnor, Oxon, OX9 4QY
Tel:- (0844) 51694. Fax:- (0844) 52554.

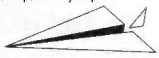
WEST SUSSEX

BREDHURST ELECTRONICS LTD.
HIGH ST., HANDCROSS, WEST SUSSEX.
TEL: (0444) 400786
FAX: (0444) 400604
Situated at the Southern end of M23. Easy access to M25 and South London. Open Mon.-Fri. 9am-5.30pm, Sat. 9.30am-4pm.
ICOM KENWOOD YAESU
MAIL ORDER RETAIL

TYNE & WEAR

SUPERTECH
Communication Specialists
YUPITERU AOR PAMA SONY
★ Official Nevada and Kernow Stockists
★ Full range of CB's, Scanners and Accessories in stock.
★ Branches throughout the North East
★ Mail order available
32 Russell Way, Gateshead Metro Centre, Tyne & Wear, NE11 9YZ
Open: Mon-Fri 10am-8pm Sat 9am-7pm
Thurs late night 10am-9pm
TEL: (091) 4932316
Near the UCI Cinema)
MAIL ORDER AVAILABLE

YORKSHIRE

AVIATION ENTHUSIASTS AVIATORS — LISTENERS
AIR TRAFFIC CONTROLLERS — on hand to help 'Guide' you towards an interesting & rewarding pastime.
AIR BAND RADIOS — SCANNERS etc. Over 20 to choose from: AERIALS & ACCESSORIES: MAPS — BOOKS: CHARTS: CAA PUBLICATIONS: POSTCARDS: MODELS: TIE PINS & BADGES: AIRBAND TRANSCEIVERS: PHOTOS: PILOTS' PRODUCTS
Information pack only 50p.

AIR SUPPLY
83b High Street, Yeadon, Leeds LS19 7TA. Tel: 0532 509581
Opening times: 10.00am - 1.00pm and 2.00pm - 5.30pm
Shop just two minutes from Leeds Bradford Airport. (Closed Wednesday & Sunday)

SCOTLAND

JAYCEE ELECTRONICS LTD
20 Woodside Way Glenrothes Fife KY7 5DF
Tel: 0592 756962 (Day or Night)
Open:Tuesday-Friday 9-5; Saturday 9-4
Good range **Kenwood, Yaesu & icom** etc, plus quality secondhand equipment

SOUTH WALES

ELECTRO MART
Receivers, Scanners, Howes, ERA, CB, Marine radio etc. part exchange welcome
FULL SERVICE AND REPAIR FACILITIES
96 High St, Clydach, Swansea
Tel: 0792 842135

NORTH WALES

T.M.P COMMUNICATIONS
UNIT 27, PINFOLD INDUSTRIAL ESTATE PINFOLD LANE, BUCKLEY, CLWYD NORTH WALES 0244 549563
ICOM YAESU
KENWOOD, ALINCO, STANDARD, DIAMOND, REVEX, JAYBEAM, AOR, LOWE, etc
AMATEUR · MARINE · AIR · PMR · SWL SCANNERS etc
Large stock of secondhand equipment in stock (changing daily) equipment also wanted
OPEN THROUGH THE WEEK 11am-7pm except Tuesdays and Sundays

ARE COMMUNICATIONS '92

6 Royal Palace
Hanger Lane
Ealing, London
W5A 1ET
081 997 4476
Fax 081 991 2565

NEW YEAR SPECIALS

FT-290R2
FT-690R2
FT-790R2

SPECIAL PACKAGE INCLUDING NICADS, CHARGER, CASE.

FT-736R

THIS CAN INCLUDE EVERYTHING, IT'S JUST A QUESTION OF HOW MUCH.

FT-26/ FT-415

Including S-microphone and soft case
70cm version also available

FRG-100

The latest HF receiver from Yaesu which is tipped to outsell all other shortwave receivers

FT-990/FT-990DC

You have the choice with or without P.S.U. never let it be said Yaesu cannot cater for your needs

FT-530

The dual bandy handy of the 90s there's not much more that this can include it's all in there!

Curiosity Corner

MVT-7000
IC-R1
DJ-X1D
AOR-1500

The four most popular scanners, now supplied with a very special frequency guide – **FREE**

TS-850S, TS-450S, FT-890, FT-890UT, IC-728, FT-747GX

All the above HF transceivers supplied with 12 volt, 25 amp power supply – FREE (offer valid until 28/2/93)

After hours line

0836 550899

ARE COMMUNICATIONS '92
6 Royal Parade, Hanger Lane, Ealing, London W5A 1ET
Easy parking at the rear of the shop. Part exchange and equipment purchases welcomed! Credit facilities available subject to status APR from 37.8%. Located next to Hanger Lane tube station (Central Line) and on the junction of the A406 and A40.
Open Monday – Friday 9:30 – 5:30 Saturday 9:30 – 3:00
Don't delay phone or fax today!
Tel: 081 997 4476
Fax: 081 991 2565

Yaesu's Pair of Aces

The FT-26/76 hand-helds make your life simple with all the features you will ever need. They're easy to use and designed to fit comfortably in your hand, and weighing in at just one pound each, the FT-26/76 lets you travel light.
For complete details on these handhelds call your nearest Yaesu dealer now!

FT-26/FT-76

Hand-helds that make your life simple

- **FT-26: 144-146MHz. FT-76: 430-440MHz.**
- **Supplied as standard with FNB25 and NC28C.**
- **53 Memory Channels.**
- **5 Watt Output, 12V DC NiCad Batteries Available.**
- **Four User-Programmable Power Levels (with FNB-27).**
- **Built-In Vox.**
- **Built-In DTMF calling For Selective Or Group Calling.**
- **Backlit Display and Front Buttons.**
- **Direct 12-Volt Operation With E-DC-5 Adaptor.**
- **Key, PTT and Dial Locking.**
- **Automatic Repeater Shift (ARS) Built-In For 2 Meters.**
- **Automatic Power Off.**
- **Selectable Channel Steps.**
- **Automatic Battery Saver.**
- **User Selectable Channel-Only Display, Simple Operation For New Hams.**
- **Accessories Options:**

A selection of batteries and leather cases. Desktop quick charger (NC-42 1 hour). CTCSS encode/decode unit (FTS-17A). DC adaptor with noise filter (E-DC-5). Mobile mounting bracket (MMB-49).

Performance without compromise

YAESU

UK Sole Distributor
South Midlands Communications Ltd, S.M. House,
School Close, Chandlers Ford Industrial Estate,
Eastleigh, Hants S05 3BY.
Tel: (0703) 255111.