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The SHORT WAVE Magazine

SWM

& Scanning Scene

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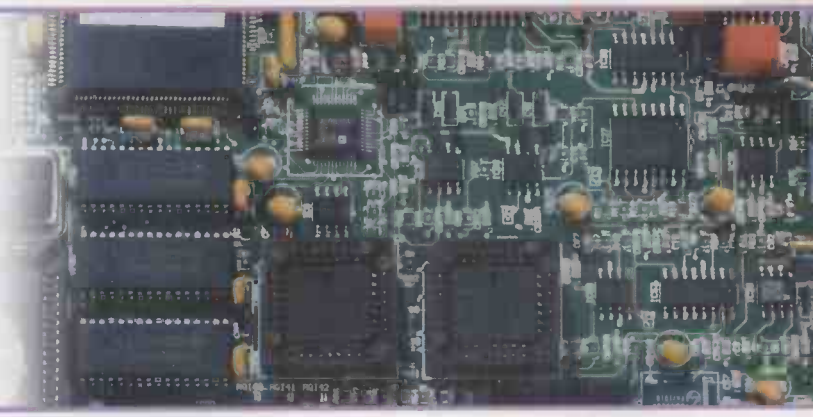

- Another Classic - JW on the RA6790
- Reviewed - Wavecom W41PC
- Multi-band HF Antennas

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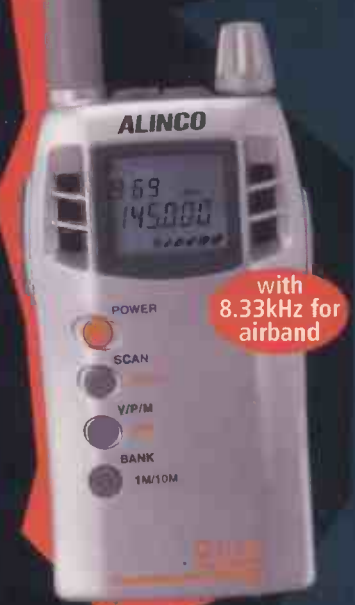

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The SHORT WAVE Magazine contents

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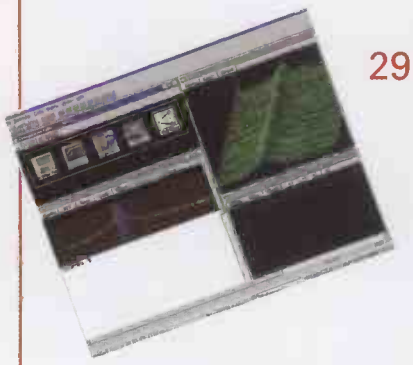

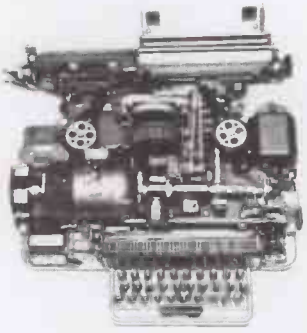

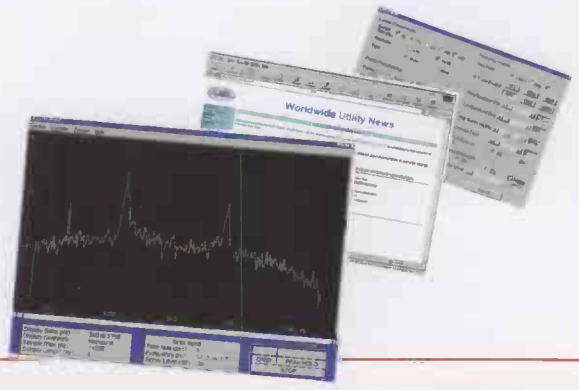

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Make your voice heard with our pull-out questionnaire

cover subject: *Decoding the old and the new. Creed's 7B teletype exhibited at Bletchley Park museum, favoured by yesteryear's decode enthusiasts (pic courtesy of Sam Hallas) and Wavecom's latest solution to data modes - the W41PC.*

Other Features

check out the *SWM* web site www.pwpublishing.ltd.uk/swm

Join in with the on-line action on the *SWM* Readers' E-mail Forum - send an E-mail to **swm_readers-subscribe@yahoogroups.com** to subscribe - don't miss the on-line action!

regular columns

COMING NEXT MONTH IN *SWM* OCTOBER 2001

* **Radio Ukraine**
* **The French Collection**
* **Racal - Hit or Myth?**
* **Videoscanner - Reviewed**

*contents subject to change

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Components For *SWM* Projects
In general all components used in constructing *SWM* projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article. The printed circuit boards for *SWM* projects are available from the *SWM* PCB Service, **KANGA PRODUCTS, Sandford Works, Cobden Street, Long Eaton, Nottingham NG10 1BL. Tel: 0115 - 967 0918. Fax: 0870 - 056 8608.**

Photocopies & Back Issues
We have a selection of back issues, covering the past three years of *SWM*. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for *SWM* are £3.25 each and photocopies are £3.25 per article.
Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate.
A complete review listing for *SWM/PW* is also available from the Editorial Offices for £1 inc P&P.

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Technical Help
We regret that due to Editorial time scales, replies to technical queries cannot be given over the telephone. Any technical queries by E-mail are very unlikely to receive immediate attention either. So, if you require help with problems relating to topics covered by *SWM*, then please write to the Editorial Offices, we will do our best to help and reply by mail.

ed's comments

Book Store Offer

You will not have missed the addition to this month's cover, what is known in the magazine industry as a flag flap. Contained thereon is a plethora of savings opportunities for customers of the *SWM* Book Store. This is one of the ways that we are rewarding our loyal readers. Please take advantage of this great offer and save as much as you can. If your subscription is about to expire, then why not take advantage of the three years for the price of two offer. For that matter, even if yours isn't due to expire, we can add the three years on to the remaining term. Don't forget to order using the special form on the flap or we will not be able to honour the offer.

Survey

I mentioned a couple of months back that we would be publishing a reader survey. You will find it in the centre of this magazine. Contrary to what a seemly small minority seem to imagine, I value all input from readers of this magazine. I listen to all comments, constructive or otherwise. Complimentary and not so complimentary. You have probably noticed that I also publish both types of letter in the adjoining readers letters page. I believe that your opinions and requests for specific contents should indeed shape the magazine. Magazine editors are not prophets, we do not have crystal balls either. Please empower me to craft *SWM* to fit your requirements by letting me know what you want. Complete and post the survey when you've finished reading this, don't put it of 'till later - do it straight away. You may even be the lucky winner of the fabulous Fairhaven receiver or one of the year's *SWM* subscription runner-up prizes.
We really couldn't have made it easier, once you've filled out the survey form, fold it to form a return form and pop it in the post - it's post paid in the UK. Sorry to discriminate against overseas readers, but there is no simple way of offering freepost offshore.
Those with an eye for detail will notice that the closing date for the survey is 2 January 2002, this is to allow for distant readers of *SWM* to have their opinions entered. We will begin analysing returns a soon as they arrive. The draw to establish the winners of the prizes will take place 6 January 2002. With the winners being announced in the February 2002 issue.

Flight Track

An update on what I said last month with further news. Colin Jones dropped me a line and included the reply he received from NATS which reads as follows:
"FlightPathUK Project Delayed - We are sorry to have to announce that the development of FlightPathUK has been put on hold for the foreseeable future.

We are aware that many potential users have been eagerly awaiting the launch of this service for some time. However, recently raised safety and commercial concerns regarding accessing real-time radar data on-line have resulted in further work having to be undertaken before we can be in a position to launch.

Provided that the current problems can be overcome, NATS fully intends to deliver a comprehensive flight tracking service to businesses and enthusiasts in the UK. We will advise you of changes in this situation just as soon as we can.

At this stage, we can only apologise for the frustration caused by the delay which we are endeavouring to keep to a minimum.

You can contact us at:
flightpathuk@nats.co.uk"
The wait, it seems, continues. I'll report any further updates in future issues.

SWM Readers List

This invaluable forum has really been alive this month and the idea of a *SWM* contents 'wish list' has been launched - I'm very much in favour of the fascinating debate that has emerged recently. There are quite a few other constructive ideas lurking in the shadows too.

I really hope that those with strong opinions and those who prefer the silent approach take the initiative to continue the creativeness. The listening community as a whole is bound to benefit. I have already decided to act on some of the better suggestions. See the contents page to discover how to join this list. See you there.

Vy 73 Kevin

Dear Sir

Perhaps the time has come for your 'MilAir' columnist Peter Bond to re-title his offering 'The Mildenhall Column'. This South of England Air Base has become his obsession with the latest, the July edition, a prime example! He complained some time ago that he received very little, or no correspondence from readers North of Watford. Is he aware that we have Leeming in the North of England, Leuchars in Fife, Lossiemouth and Kinloss on the Moray Firth?

A series attempt was made by this reader of long standing to redress the balance and scope of the column, but to no avail, in fact, it was completely ignored! Surely the time has come to take off the blinkers and open up this column to the wider readership, it is certainly long overdue!

J.R. of Fife

I would suggest that Mr. Richardson has probably been tearing his hair out, as there was even more about Mildenhall in the August column - and I make no apology whatsoever. As I have explained before in the former 'MilAir' column, Mildenhall and Lakenheath, being so close together are probably the most popular destinations in the UK for Military Aviation/Airband enthusiasts and consequently make up a big percentage of my correspondence. Having checked all my different forms of correspondence for the first six months of 2001, the total number of reports for Mildenhall and Lakenheath was 43. The total number for military aviation in Scotland was 3. One was about Buchan and the other two about a new Scottish Military frequency, not one related to Scottish airfields. How can I open the column up to a wider audience if the readers don't write to me?

Regarding Mr Richardson's comments. Well, I have checked my letters and E-mails back over the past 18 months and I can find no correspondence from a J.R.Richardson. However, I did have one E-mail in March 2001 from a Hilda Richardson, the text of which was completely garbled and was a mixture of HTML code and raw text and as such was unreadable and could not be acted upon. If it was Mr Richardson's E-mail, I am sorry but there was little I could do. I would also politely suggest that one E-mail garbled or otherwise does not represent a "serious attempt to redress the balance", regular correspondence would though!

If you allow me to reverse the argument and make a point, having checked back even further in my files I can find no airband correspondence whatsoever from Mr Richardson, but he can find the time to write a letter of complaint, therein lies the problem. I am in the fortunate position of having several readers who visit the Mildenhall area quite often and who **send in regular reports**. It would be wonderful if it were the same for many more military airfields, including those in Scotland. The column is only as good as the questions/information I am sent, if you monitor something interesting, send it in, don't automatically think that someone else will have done it. If your airfield is not mentioned then please, please, please, send me a report. Whilst I attempt to include as much information as possible, not every piece of correspondence I receive is put into the column. Such things as lists of aircraft serials, movements which contain no relevant callsign/frequency information are not really suited to *SWM* and so are omitted.

I suppose I should be quite proud that only the second letter of complaint I have received in five years was actually moaning that I put in too much information about one airfield! Lastly, one of my regular Mildenhall correspondents is staying with me for a few days at present and he wishes to point out that he does not consider that he lives in the South of England.

Come on, North or South of Watford, Civil or Military, I challenge you to send in that Airband information and I'll gladly widen the spectrum of the 'Sky High' column! - **PB**

Dear Sir

I am intrigued as to how many of your readers are prepared to admit spending £440 on the new Icom IC-R3, a device which according to the commendably candid review by Alan Gardener in the June *SWM* appears to be almost completely useless, except as a very expensive big boy's toy.

The measured intermodulation dynamic range of just 50dB renders it useless as a normal radio with any form of external antenna or with a powerful transmitter nearby (of which there must be dozens in every conurbation). As a TV, it appears to be marginally worse. Its coverage of f.m. TV is severely limited. Its sensitivity is abysmal, even with a proper outboard antenna. The screen is minute, all of two inches across, and who on earth wants to view TV on the move? Those who do are likely to be in transit by car, train or plane where reception is either minimal or forbidden. The battery consumption appears to be substantial - hence the reference to very expensive lithium batteries.

I accept that Icom have created an incredibly versatile and complex device within a tiny volume, but apart from sad snoopers in anoraks and engineers commissioning a TV installation, I cannot imagine anyone else spending that sort of money on this device. I'd be interested to see what sales are achieved, and in the meantime, I'll stick to my domestic cable TV and enjoy excellent vision and stereo sound.

Michael O'Beirne G8MOB
Surrey

TOP QSL

Dear Sir

My weekend was made by the arrival of the July *SWM* and again I offer my congratulations on another fine issue. I see that the controversy over the front cover design still rages and I refer you to my letter of the 24th February for my own less than complementary comments. (I know I wrote it, but I am unsure whether or not I actually posted it!) - *You did, but like this letter, it was rather long for the available space - **Ed**.*

However, front cover apart, the contents of the magazine are beyond reproach and do not warrant such adverse criticism as has been raised by correspondents Cooper, Holdsworth and others. Neither do I agree totally with Mr Connolly regarding the often changing design of the front cover.

However, I do still strongly disapprove of the 'bitty' layout of the cover that persists and equally strongly regret the recent removal of the vertical title at the LH side. Please desist from proliferating those irritating labels across the cover and try to give the magazine 'touch of class' by employing some design restraint. If you must tabulate the 'contents' on the cover, at least ensure they reflect the actual contents - 'Pirates' and 'Numbers' do not feature in the July issue. I will certainly happily participate in the forthcoming questionnaire/survey, but I already think you are doing a great job.

I must commend you on the brilliant idea of the 'Airband Data Card' enclosed with the July issue. Nevertheless, it is a pity that this great idea has not been thought through adequately, especially from the user's point of view. I noted this is No. 1 of what I can only assume will be a series of Data Cards (?), yet nowhere in the editorial could I see any mention of the overall plan for completing the series - if indeed there is to be a series.

Some questions spring to mind. Although some 57 airports are marked on the map, details of frequencies and runway alignments of only 18 of the busiest are given. Why on earth cause confusion by showing the other 39, seemingly randomly selected airports, on the map if their supporting data is not also listed. Without listing the associated data, these airport locations on their own are as much use to the airband listener as a glass eye. After all, any old map will tell you simply where Dublin or Inverness is located.

If you do not intend to continue the series with further airband details, why identify this card as 'No. 1'?. Why not 'Civil Airports' - to be followed by 'Military Airfields' - if that is the intended sequence - however, I doubt that possibility as I see RAF Lyneham is already shown on the map.

As it was felt necessary, for some obscure reason, to list all the airports, why were the major airports that were detailed on the back of the card not highlighted in some way on the map to differentiate from the rest of them? Basic common sense should dictate that only those airports being detailed should be identified on the map. Subsequent maps detailing lesser airports would be expected to follow on in later issues together with their data. We do not all live within a stone's throw of Heathrow and to the airband listener, his/her local airport, busy or not, is very significant. This is an example of a very good idea being allowed to go off half-cocked.

Although there are several books available of detailed airport frequency listings, I am surprised that a 'quick reference' airfield data book with plasticised pages has not previously been produced. Perhaps that is a gap that *PW/SWM* could fill. Before I retired, I produced my own pocked-sized booklet of UK VHF/UHF repeaters, based on a series of plastic-encapsulated reduced sized road maps which I may still take with me when I am staying away from home with radio in mind.

The correct names of the airports should be used on your map, e.g. 'Newcastle City Airport' instead of 'Woolsington'. That was the old wartime RAF name for the airfield at Newcastle and has not been used for years. Conversely, Blackpool and Liverpool, that are known locally as 'Squires Gate' and 'Speke' respectively, have been correctly named on the map by their city/towns' names.

Having got that off my chest, I would like to comment, finally, on the contents. It is certainly true that you cannot please all of the people all of the time, but with the wide range of related topics now open to people with an interest in radio, I think that, between *SWM* and *PW*, you do an excellent job of satisfying all but the most demanding critic. A quick glance at the list of regular features (at least ten in *SWM*), shows the range covered.

Certainly, some items I skip completely as being of absolutely no interest, others I do read and possibly develop an interest in a new aspect of radio. I always appreciate practical reviews of equipment (new or old) and would welcome an expansion of the 'Communiqué' section to describe more new products or accessories. For instance, has anyone found a source for obtaining a small padded shoulder bag (camera-bag) suitable for toting the combined FT-817 and Z11 tuner? If they are selling as fast as the dealers claim, there must be a great demand for such a holder?

Whatever my interests, I look forward to receiving my two magazines and having dropped the broadest possible hint that a renewal of my subscription for another year would be an ideal birthday present, I look forward to another 12 months' pleasure ahead.

John W. Thexton G3URE
E. Twickenham

The topics listed at the bottom of the front cover are there for the casual, news agent browser, to show the subjects regularly covered in SWM. *The Airband Data Card is certainly intended as the first of many. We differentiated between the airports with data and those without by providing the ICAO codes of the expanded data ones on the map itself. As for Woolsington, John you are not the first to mention this. - My mistake I'm afraid as the map, a standard product with airfields marked, was my idea. I don't think it's fair to accuse it of being half cocked for that though. I hope that your anticipated birthday present becomes a reality. - **Ed**.*

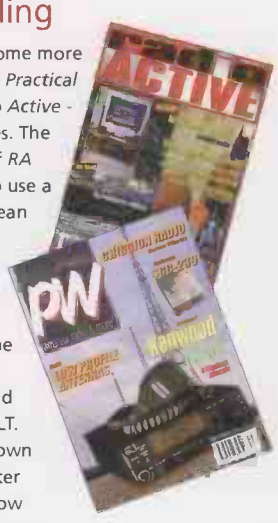
Communiqué

News & Products

Bangor's AGM

Members of the **Bangor and District Amateur Radio Society** meet on the 1st Wednesday of every month in 'The Stables', Groomsport at 2000. On Wednesday 5th September 2001 they are holding their Annual General Meeting. The AGM is always a popular night, where members review the club activities over the last year and elect their committee for the new year. Visitors and new members are (as always) most welcome. More information from **Mike GI4XSF** on **0284-277 2383**, or visit the club website at **http://welcome.to/bdars**

Radio Reading



Why not cram in some more radio reading with *Practical Wireless* and *Radio Active* - *SWM*'s stable mates. The September issue of *RA* covers: Learning to use a multimeter, European repeater details listing and QSLing on the amateur bands as well as a look at the Yaesu FT-1500M 144MHz mobile and the Bearcat 9000XLT.

Get the low down on the 30th Leicester Amateur Radio Show Special in October's *PW*, along with Richard Newton's review of the IC-910, and all your regular favourites too. *Radio Active* and *Practical Wireless* are on sale at all good newsagents, alternatively, subscriptions are available by calling **(01202) 659930**.

Open Day

Special Event Station **GB4BHS** will be activated by members of **Chippenham & Trowbridge Amateur Radio Club** at the Joint Services Open Day to be held at the Basil Hill Site, Corsham, Wiltshire, on **1st September 2001**. The event has a communications theme, but will include many attractions for the family, including displays by RAF Falcons Parachute Team, Royal Marine band and the Royal Signals. Activity is expected to centre on 20/40m with the possibility of 2/6m between 1100 and 1600. For confirmation of details, please contact **Ian G0GRI** on **(01225) 864698** evenings and weekends.

Net Junk

News in from **Chris Richmond G0TOO** who has set up a site - **www.junksale.co.uk** - so that fellow radio enthusiasts can advertise their equipment for sale/exchange and items wanted, etc. There is no cost to advertise as Chris is providing this as a free service and people can add their own adverts themselves by following the instructions. You can E-mail Chris at **g0too@radiosociety.org.uk** for more details.

Sun Boosts Tattoo Attendance

As temperatures soared into the mid 80s on the hottest weekend of the year, **The Royal International Air Tattoo** at RAF Cottesmore, Rutland, attracted an estimated 200,000 visitors. The airshow medical centre treated 220 spectators with sunburn or dehydration.

Over 350 aircraft from 30 nations flew in for Europe's biggest airshow, celebrating its 30th birthday. On both days, in near perfect conditions, a hush fell as a US Air Force B-2 Stealth Bomber swept over the airfield, flanked by F-15 Eagles. Two different aircraft flew the 16,000km round trip from Whiteman Air Force Base in Missouri, just to appear at the Tattoo for a two minute flypast.

In 2002, the Tattoo will return to RAF Fairford, Gloucestershire, after a two-year break while major refurbishment has been carried out there.

Battery Chargers

Nevada are pleased to announce their appointment as UK distributors of Maha Chargers and Powerex batteries from the USA. Maha specialise in a range of 'high tech' battery chargers and high capacity batteries.

First products to be released are:- FNB-72 An ultra high capacity 1700mAh battery pack for the new Yaesu **FT-817**. Included with the battery pack is a special 'rapid charging cable' that will allow you to charge the battery pack in around three hours using the Maha MH-C777 or MH-C888 charger. Price is **£59.95** including the 'rapid charging cable'.

The Maha MH-C777PLUS, a charger that will charge, condition, analyse and digitally display capacity, voltage and time for almost any Lithium Ion, NiMH, and NiCd battery packs. It has comprehensive l.c.d. readouts for capacity, voltage and time. The unit will also work direct from a car cigarette lighter socket and the 'Plus' version is supplied with a universal 80V to 240V a.c. adapter to allow use anywhere in the world. The MH-C777 is priced at £49.95 with the MH-C777Plus priced at £89.95.

Contact Nevada at **Unit 1 Fitzherbert Spur, Farlington, Portsmouth PO6 1TT, Tel: 023 9231 3090, FAX: 023 9231 3091**, E-mail: **info@nevada.co.uk** or visit their web site at **www.nevada.co.uk** for more information.

Solderless Kit

The latest (September 2001) fully illustrated catalogue from **Lake Electronics** includes details of all their 'Novice' kits and, of course, the full range of their kits (with all the bits!), accessories and components for amateurs and s.w.l.s.

The new **short wave** version of the **Solderless Crystal Set** is introduced at the same 'pocket money' price as the rest of the 'Novice' range - just £8 each plus £1 postage. This will make a good 'stocking filler' for many youngsters at Christmas!

A select listing of Vintage Wireless Books is included in the catalogue. The full listing, which is frequently being updated, is available separately on request. For your free copy send a large (A5) s.a.e. to Lake Electronics at **7 Middleton Close, Nuthall, Nottingham NG16 1BX, Tel: 0115-938 2509** or E-mail: **g4dvw@cs.com** or visit **www.lake-electronics.co.uk**

RAE Courses

The **Bishop Auckland Radio Amateurs Club** will be running courses for the RAE and NRAE, starting at the beginning of September 2001. Courses will be held at the club, which meet every Thursday evening at 2000. Those interested should get in contact with **Tim Bevan M0ACV** on **(01388) 832948**.

The **Halton Radio Club** (located in Runcorn, Cheshire), runs a continuing Novice course and a RAE Study Group every Thursday evening between 1900 and 2100 at the Halton Radio Club's HQ, The Play Centre, Norton Hill, Windmill Hill, Runcorn WA7 6QE, Tel: **(01928) 790228**. Further information from **Alan Parker** on the above number (office hours only). Alternatively, visit **http://www.hrc-uk.freeserve.co.uk**

The **North Cheshire Radio Club** will be running both RAE and NRAE weekly courses from Sunday 9th September 2001 starting at 1900. Enrolment can take place on any Sunday from then until the end of November at The Morley Social Club, Morley Green, Wilmslow, Cheshire. This is a registered RSGB examination centre. Contact **Gordon Adams G3LEW** on **(01565) 652652**, FAX: **(01565) 634560** or by E-mail: **g3leq@cwcom.net** for more details.

Videoscanner

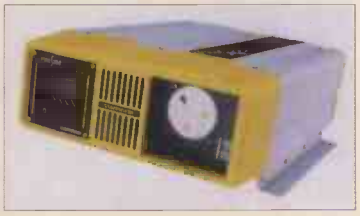
The Videoscanner Microwave Video Scanner Monitor is like the poor man's Icom IC-R3. It can receive all UK 2.4GHz security camera allocations and all UK 2.4GHz Videosender allocations. It has a built-in directional antenna with swivel and tilt mount; an integral 5in monochrome monitor, output sockets for (colour) video and audio (for connection to a VCR or colour monitor), on screen frequency display, scan start/stop control, built-in speaker, brightness, contrast and vertical hold picture controls, demodulates 6.0MHz audio and required 12V d.c. (Look out for an in-depth review next month in *SWM*).

The expected price of the Videoscanner Microwave Video Monitor is around £160. However, for more technical information, see Videoscanner's web site at **www.videoscanner.co.uk** Alternatively, **Videoscanner** can be reached at **PO Box 12, Hedge End SO32 2EG**.

New From Merlin

The new PROsine 1000i d.c. to a.c. power inverter allows you to run almost any mains powered equipment, such as computers, test equipment, pumps or any a.c. powered appliance on board vehicles, boats, planes, specialist machinery and even remote buildings without the need for mains hook up or a generator.

To ensure absolutely clean a.c. power with zero interference, PROsine produces a pure-sine wave. Unlike older 'Modified Sine-Wave' inverters (also known as stepped, quasi-sine or trapezoidal), PROsine is compatible with **all** a.c. appliances to ensure a crystal clear picture on video screens and computers, perfect sound quality of audio equipment and increased efficiency when running items with internal motors like pumps or power tools.



This latest edition to the PROsine range utilises advanced Hybrid IGBT Power Conversion Technology (rather than the older MOSFET systems still used by competitive products) - this makes the unit not only lightweight and compact, but also highly reliable.

Every installation is different. This is why the new PROsine 1000 has been designed to be as 'flexible' as possible, Heavy duty studs on the rear of the unit allow for solid, safe and reliable d.c. connections. These are insulated by two rubber boots supplied as part of the package.

To provide easy control and monitoring of the unit, the PROsine is fitted with a backlit l.c.d. dot matrix display. Information displayed includes battery voltage, current draw and inverter output in watts. For users who want to be able to control their PROsine remotely, the display module can be simply unscrewed and mounted up to 25' away using a simple telephone cable.

The new PROsine 1000 is available in both 12 and 24V d.c. input and is suitable for appliances running at up to 1kW or 1.5kW intermittently. The proven 1800W unit is also available for the frequent use of heavy duty equipment.

Available from Merlin Equipment from £650, PROsine is part of a wide range of power products including inverters, battery chargers, combination charger/inverters battery monitors, cabling products and d.c. distribution components. More information from **Merlin Equipment Limited, Unit 4 Cabot Business Village, Cabot Lane, Poole, Dorset BH17 7BX, Tel: (01202) 697979, FAX: (01202) 691919, E-mail: sales@the-merlin-group.com** or check out their web site at **www.power-store.com** or **www.the-merlin-group.com**

SWM Draws WRTH

A recent visitor to the *SWM* Editorial offices in Broadstone, Dorset, was David Bobbett the Editor of *World Radio TV Handbook*, the annual radio and TV station and schedule guide. David visited us here at *SWM* to allow Editor Kevin Nice to draw the lucky winners for the *WRTH*'s Receiver Of The Year prize giveaway. The lucky winner of the first and runner-up prizes will be announced in the 2002 edition of *WRTH*.

Club Corner

The **Radio Society of Harrow** meet every Friday from 2000 at the Harrow Sports Centre, Uxbridge Road, Hatch End, Middlesex. More information from **Jim Ballard G0AOT** on **(01895) 476933** (home) or daytime on **0207-278 6421** or E-mail: **g0aot@thersgb.net**

Members of the **South Bristol Amateur Radio Club** meet at the Whitchurch Folkhouse, Bridge Farm House, East Dundry Road, Whitchurch. Ring **Len Baker** on **(01275) 834282** (24hr answerphone) for more information.

The **Cockenzie & Port Seton Amateur Radio Club** meet at 1830 to 2130 at the Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton, East Lothian. More information from **Bob Glasgow GM4UYZ** on **(01875) 811723**.

Meetings take place at The Conservative Club, Rye Road, Hoddesdon, Herts on alternate Tuesdays from 2000 for members of the **Hoddesdon Radio Club**. More information from **Don** on **0208-292 3678**.

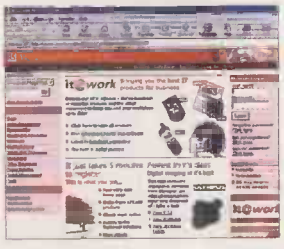
Members of the **Wrexham Amateur Radio Society** meet on the 1st and 3rd Tuesday at Maesgwyn Community Hall, off Lilac Way, in Wrexham, from around 1930 for a 2000 start. Visit **www.qsl.net/wars** or E-mail **Mark Harper 2W1MDH** at **mark_harper@bigfoot.com**

RS Distributes Icom

RS Components have recently signed an agreement with **Icom (UK) Ltd.** to distribute a range of its best selling radio communications products. It is hoped that this new agreement will further increase the profile of the Icom brand name as well as complementing RS Components' extensive catalogue.

RS will carry a wide range of Icom equipment, including the licence free IC-446S transceiver, the IC-R2 pocket receiver and the PC assisted IC-PCR100. RS will also be stocking two of Icom's best selling marine transceivers - the IC-M3 Euro and the IC-M1EuroV as well as a comprehensive selection of accessories.

Founded in 1937, RS Components has developed from humble beginnings to become Europe's leading distributor of electronic, electric and mechanical components. The company also has a comprehensive catalogue featuring over 129,000 products as diverse as power tools, process control equipment, cabling, connectors and much more. For more information about RS Components, please visit **http://rswww.com**



rallies

August 26: The Milton Keynes Amateur Radio Society are holding their 15th Annual Radio Rally at a new venue - this being St Paul's School, Phoenix Drive, Leadenhall, Milton Keynes, Bucks. Talk-in on S22 and SU22. More information from **Dave G3ZPA** on **(01908) 501310.**

August 26: The Torbay Amateur Radio Society's Mobile Rally will take place at Churston Grammar School, Greenway Road, Churston, Torbay, Devon. More information from **John Head G4VUD** on **(01626) 205514** (answerphone during office hours) or E-mail: **rally@tars.org.uk**

August 27: The Huntingdonshire Amateur Radio Bank Holiday Monday Rally takes place today at Ernulf Community School, St. Neots, Cambridgeshire (near to the Tesco Superstore on A428). Doors Open 1000-1400 and admission is £1.50. Hot and cold refreshments available. Features include selling hall and car boot sale. Talk-in on S22. **Peter Herbert M5ABN on (01480) 457347** (between 1800 and 2200).

September 15: The Waterside (New Forest) Amateur Radio Society are holding their Radio & Computer Rally/Boot Sale at the Applemore College, Roman Road, Dibden Purlieu. Doors open 1000. There will be two indoor halls, field traders and exhibits, car boot/flea market, on-demand Morse tests (remember to bring passport sized photos). Talk-in on 2m. Free parking. For more information contact **John Daw G0UUW** on **0238-089 3541** or **Malcolm Troy G0WFQ** on **0238-090 5226**, FAX: 0238-023 6587 or, alternatively, E-mail: **troy-enterprises@faxvia.net**

September 16: The Barry Amateur Radio Society are holding their 2001 Amateur Radio & Computer Show at the Barry Memorial Hall, Gladstone Road, Barry, S. Wales. Why not go along and see the latest amateur equipment, from major manufacturers and suppliers. There will also be fantastic working models of satellites, like *Phase 3D* and others. All this and a Bring & Buy. Contact the Rally Manager, **Brian GW0PUP** on **0292-083 2253**.

September 21-22: The 30th Leicester Amateur Radio Show and Convention is to be held at the Castle Donington International Exhibition Centre, Donington Park, NW Leicestershire, less than five minutes from J23A and J24 M1 motorway. Doors open 0930 till 1730. There will be 150 trade stands of computers, radios and electronics, a flea market, Bring & Buy, local and national clubs and societies. Morse tests on demand, demonstration amateur radio stations, camping and caravanning on-site. Talk-in on 145.550 and 433.550MHz. A one day ticket will cost you £3, concessions (OAPs and under 16s), £2.50. A two day ticket will cost you £5, concessions £4 - under 12s free when accompanied by an adult. More information from **http://www.lars.org.uk** or **Geoff G4AFJ** on **(01455) 823344**, FAX: **(01455) 828273**, E-mail: **g4afj@argonet.co.uk**

October 7: The Great Lumley Amateur Radio & Electronics Society is to be held at the Community Centre, Front Street, Great Lumley, Chester-le-Street, Co Durham. This is classed as the biggest and best rally in the north east. There will be free parking, plus easy access. Good, inexpensive food and drink. There will be a Bring & Buy, radio, hobbies, electronics, computer, satellite and component stalls. Doors open 1000 and admission is £1. More information from **Nancy Bone G7UUR** on **0191-420 2061** (home) or **0191-274 4274** (work) or **lumley.rally@ic24.net**

October 7: The Mansfield ARS, Radio, Computer & Electronics Rally takes place at a new venue. The event takes place at the Intake Leisure Club, Kirkland Avenue, Mansfield. Doors open at 1000. **David G0RDP** on **(01623) 631931** or E-mail: **david.g0rdp@lineone.net**

October 21: The Backwood & District ARS will once again be holding their annual rally at the Newport Centre, Gwent. Features include special Interest groups, parking, licensed bar, catering and trade stands. Doors open 1045 (1030 for disabled). Admission is £1.50 and talk-in will be on S22. More information on **(01495) 228516.**

October 28: The Galashiels and District ARS will be holding their annual rally in the Volunteer Hall, St. Johns Street, Galashiels, Scottish Borders. Doors open 1100 (disabled access from 1045). Admission is £2 and includes a free cash prize draw ticket. There will be all the usual attractions, Bring & Buy, traders and refreshments. **Jim Keddie GM7LUN** on **(01896) 850245** or E-mail: **jlmk@gm7lun.freeserve.co.uk**

■ BRIAN ODDY G3FEX, THREE CORNERS, MERRYFIELD WAY, STORRINGTON, WEST SUSSEX RH20 4NS

LM&S

At this time of year prolonged periods of fine weather are often followed by heavy rain and thunderstorms, which can cause havoc. The lightning discharges that occur during a thunderstorm set up wide band electromagnetic radiations, so although a distant storm may be inaudible, its presence can usually be detected with a suitable radio receiver. The discharges result in damped oscillations called 'atmospherics', which are most obvious at very low frequencies, but they also affect the long and medium wave bands. During a local storm their intensity may well be sufficient to destroy the front-end transistor(s) of a powered radio receiver, so the golden rule is to switch off the set at the first rumble of thunder!

In the tropical regions the atmospherics produced by nearby and distant thunderstorms are almost continuous, consequently they render reception in the long and medium wave bands almost impossible. Their effects become less as the frequency of reception is raised, so the domestic broadcasting services in those areas operate at the lower end of the high frequency bands in specially allocated 'tropical bands' instead of the l.w. and m.w. bands.

The dangers associated with a thunderstorm should never be under-estimated. An unearthed outdoor antenna is likely to be a real hazard during a storm! Each rain drop that falls from an electrically charged cloud will carry a small charge and those which fall on an antenna will deposit that charge upon it. The charge from each droplet will gradually build up and result in the antenna becoming highly charged. A hiss or distinct crackling noise may arise at the point of least resistance where it discharges to earth. So the second golden rule is to earth an outdoor antenna before a storm arrives or whenever it is not in use.

WARNING: Never touch or attempt to earth an antenna which is exhibiting these properties during a storm.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT). Unless otherwise stated, all logs were compiled during June.

Favourable conditions for the reception of Rikisutvarpid (RUV) in Reykjavik via their outlet at Gufuskalar, W.Iceland on **189kHz** were observed by **Thomas Williams** (Truro) on June 2 at the early time of 2206UTC. He rated the 300kW transmission SINPO 22222. After midnight is considered to be the best time to listen for their broadcasts, which are also carried by their outlet in Eidar, E.Iceland on **207kHz**, but when **Ernie Strong** (Ramsey, Cambs) searched the band during the early hours of the 21st he found the propagation conditions rather poor and logged Gufusklar as 22111.

The broadcasts from Kalundborg, Denmark on **243kHz** attracted the attention of **Sheila Hughes** (Morden) on June 28. She listened to them from 0500 until 0700UTC and says "I am hoping to tune in again around this time. Really nice music, news in excellent English and quite good reception". Sheila rated their 300kW transmission 43443 at 0510.

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	H
153	Donebach DLF	Germany	500	A,B*,C,D,E,F,G*
153	Bod	Romania	1200	C*
162	Allouis	France	2000	B*,D,E,F,G*,H
171	Nador Medi-1	Morocco	2000	A*
171	B'shakovo etc	Russia	1200	D*
177	Dranienburg	Germany	500	A*,B,C,D,E,F,H*
183	Saarlouis	Germany	2000	B,C,D,E,F*,G*,H
189	Gufuskalar	W.Iceland	150	C*,F*,G*
198	Droitwich BBC	UK	500	B*,C,D,F,H
207	Munich DLF	Germany	500	A*,B,C*,D,E,F,G*,H*
216	Roumoules RMC	S.France	1400	A,D,E,F,G,H
225	Polskie R-1	Poland	?	A*,B*,C*,H*
234	Beidweiler	Luxembourg	2000	B*,C,D,E,F,G*,H
243	Kalundborg	Denmark	300	A,B,D,E,F,H
252	Atlantic 252	Eire	500	C,D,E,F,G*,H
261	Burg(R.Ropa)	Germany	85	D,F*
270	Topolna	Czech Rep	1500	B*,D,F*
279	Sasnovy	Belarus	500	B*,C,D,F*,H*

Note: Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk

Listeners:-
(A) Simon Hockenhull, E.Bristol.
(B) Sheila Hughes, Morden.
(C) Eddie McKeown, Newry.
(D) George Millmore, Wootton, IoW.
(E) Fred Pallant, Storrington.
(F) Ernie Strong, Ramsey, Cambs.
(G) Thomas Williams, Truro.
(H) Fred Wilmshurst, Northampton.

Medium Wave Reports

Some interesting logs were compiled by the listeners who were prepared to search the band after dark for the sky waves from m.w. stations in the Middle East, N.Africa, Europe and Scandinavia - see chart.

Owing to the long hours of daylight **George Millmore** (Wootton, IoW) decided instead to search during the day for the ground waves from distant stations. Quite a few of the outlets in Holland, Belgium and France rated SIO 555. He also picked up the ground waves from a large number of local radio outlets in the UK - see charts.

During the afternoon of June 28 **Peter Pollard** (Rugby) tried searching the band for the broadcasts from distant local radio stations. Much to his surprise he identified and logged thirty-three of them - see chart.

Short Wave Reports

Radio France International (RFI) is the only broadcaster known to be active in the **25MHz (11m)** band. Their daily transmissions to listeners in E/C.Africa may be heard on **25.820** (Fr 0900-1300). It is not known here just how well they have been received in those areas, but the propagation conditions are likely to have been favourable most days. Reception reports from listeners in Africa would be especially welcome here - please send them to me at the address above.

Some listeners in the UK monitored the RFI broadcasts on a daily basis and they observed variations in reception. The effects of solar activity were very evident during some mornings. The SINPO ratings quoted in the reports were 34222 at 0900 by **Vic Prier** in Colyton; 15322 at 0900 by **Richard Reynolds** in Guildford; 34333 at 0950 in Truro; 44334 at 1020 by **Bernard Curtis** in Stalbridge; 45344 at 1104 by **Eddie McKeown** in Newry; 15522 at 1130 by **Simon Hockenhull** in E.Bristol; 25343 at 1133 by **Fred Wilmshurst** in Northampton.

Solar activity also affected reception in the **21MHz (13m)** band during some days. Quite a few listeners in the UK use Radio Australia's broadcasts in this band as a pointer to propagation conditions. Although they are intended for other areas they usually reach the UK quite well but sometimes they are weak or buried in the noise. During the early morning their transmission from Shepparton on **21.725** (Eng to Pacific areas 0200-0900) may be received here - it was rated 35333 at 0752 by **Tony Hall** in Freshwater Bay, IoW. At 0900 they move to **21.820** (Eng to Asia 0900-1400), rated 34232 at 0902 in Newry.

Also received in the UK during most mornings were HCJB Quito, Ecuador **21.455** (Eng [u.s.b.]), rated 55434 at 0513 in Guildford; R.Finland via Pori **21.670** (Eng to Asia 0630-0700) 45544 at 0650 in Northampton; R.Pakistan **21.465** (News in Eng 0800-0803, Ur to Eur 0803-1100) 42433 at 0800 in Colyton; Swiss R.Int via Sottens **21.770** (Eng, It, Ger, Fr to Near East, Africa 0830-1030) 44444 at 0830 by **Gerald Guest** in Dudley; BSKSA Riyadh, Saudi Arabia **21.705** (Ar to W.Eur 0600-1500) 44444 at 0850 by **Rhoderick Illman** in Oxted; UAER Abu Dhabi **21.735** (Ar to N.Africa 0700-1600) 34333 at 0853 in Oxted - also logged by **John Parry** in Larnaca, Cyprus as 45554 at 1410; Voice of Hope via Julich, Germany **21.590** (Eng to M.East 0700-1200) 22222 at 0930 in Morden; R.Japan via Yamata, Japan **21.755** (Jap, Eng to Oceania 0800-1100) 24222 at 0950 in Truro; VOIRI Tehran **21.470** (Eng to Asia 1100-1230) 33333 at 1120 by **Stan Evans** in Herstmonceux.

After mid-day, HCJB Quito, Ecuador **21.455** (Eng [u.s.b.]) was noted as 34343 at 1320 by **David Hall** in Morpeth; R.Prague, Czech Rep **21.745** (Eng to Asia 1300-1330) 44444 at 1320 by **Vera Brindley** in Woodhall Spa; BBC via Cyprus **21.660** (Eng to Africa 1400-1700) 45434 at 1438 in E.Bristol; BBC via Ascension Is **21.470** (Eng to E/S.Africa 1300-1900) 44444 at 1553 by **Martin Cowin** in Kirkby Stephen; Swiss R.Int via Sottens **21.720** (It, Ar, Eng, Fr to Near East, Africa 1630-1815) 44444 at 1747 by **Martin Venner** in St.Austell; R.Canada Int via Rampisham, UK **21.570** (Eng to Africa 1800-1859) 33233 at 1800 by

Clare Pinder in Appleby; RAI Rome **21.520** (It to N.America 1830-1905) 44444 at 1905 in Rugby; R.Canada Int via Sackville **21.570** (Fr, Eng to Eur 1900-2100) 35553 at 2030 by **David Edwardson** in Wallsend; R.For Peace Int [RFPI], Costa Rica **21.815** (Eng [u.s.b.] to C.America?) 44434 at 2245 in Stalbridge.

The absence of co-channel interference in the **18MHz (15m)** band makes reception more enjoyable - it is a pity there are so few occupants! They include R.Sweden **18.960** (Eng, Sw to N.America, Lat.America 1130-1430), rated 34333 at 1130 in Morden, 55444 at 1248 in E.Bristol & 55555 at 1340 in St.Austell; R.Denmark via R.Norway **18.950** (Da to N.America 1130-1200) 35444 at 1140 in Northampton; R.Norway Int **18.950** (Norw to N.America 1200-1229) 44444 at 1220 in Truro; WYFR Okeechobee, USA **18.980** (Eng to Africa, Eur 1600-2200?) 24212 at 1606 in Newry & 34433 at 1825 in Colyton; Christian Science BC via WSHB Cypress Creek **18.910** (Fr, Eng to E/C.Africa 1600-2200?) 25222 at 1912 in Rugby.

Broadcasts from many areas reach the UK in the **17MHz (16m)** band. The most distant originate from New Zealand and Australia. Except during periods of solar activity Radio Australia's transmission to Asia from Shepparton on **17.750** (Eng 0000-0500, 0600-1100) has been received here quite well. It was rated 32232 at 0204 in St.Austell, 35444 at 0627 in Northampton & 43333 at 0705 in Herstmonceux. Radio New Zealand's broadcast to Pacific areas on **17.675** (Eng 2100?-0500) was rated 35543 at 0415 in Wallsend.

Also mentioned in the reports were the BBC via Thailand **17.790** (Eng to C/S.Asia 0300-0600), rated 35553 at 0520 in Cyprus; R.Bulgaria, Sofia **17.500** (Eng to Eur 1100-1200) 55555 at 1105 in Herstmonceux; Voice of Turkey **17.830** (Eng to Eur 1230-1320) 55544 at 1240 in Northampton; Swiss R.Int via Sottens

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	DXer
3.230	SABC Meyerton	S.Africa	1959	G
3.255	BBC via Meyerton	S.Africa	1950	D,F,G,I,J
3.270	Namibian BC,Windhoek	Namibia	1959	F,G,I
3.300	R.Cultural	Guatemala	0306	F,J
3.320	SABC (RSG) Meyerton	S.Africa	2124	F,G,I,J
3.335	CBS Taipei	Taiwan	2240	I,J
3.365	GBC R-2	Ghana	1951	F,G,J
3.915	BBC via Kranji	Singapore	2100	C,F,I,J,K
3.955	R.Taipei via Skelton	England	1800	B,F,H,I
3.975	R.Budapest	Hungary	2130	B,E,H,K
3.975	R.Korea via Skelton	England	2100	A,B,F,H,K
3.985	Nexus, Milan	Italy	2030	I
3.995	DW via Julich	Germany	2106	F
4.760	AIR Port Blair	India	2331	I
4.760	ELWA Monrovia	Liberia	2039	J
4.765	Brazzaville	Pep.Rep.Congo	2014	E,G,J
4.770	FRCN Kaduna	Nigeria	2016	C,F,G,I,J
4.775	TWR Manzini	Swaziland	0405	D,J
4.783	RTM Bamako	Mali	2006	F,G,J
4.790	Azad Kashmir R.	Pakistan	1908	J
4.800	LNBS Maseru	Lesotho	1958	J
4.815	R.diff TV Burkina	Ouagadougou	2004	G
4.820	R.Botswana, Gaberone	Botswana	2302	F,J
4.830	R.Tachira	Venezuela	0300	F
4.835	RTM Bamako	Mali	2126	E,F,G,I,J
4.845	ORTM Nouakchott	Mauritania	2127	F,G,J
4.860	AIR Delhi	India	1914	J
4.885	R.Clube do Para	Brazil	0407	D,J
4.885	KBC East Sce Nairobi	Kenya	1917	G
4.890	RFI Paris	via Gabon	0402	D,J
4.905	Anhanguera,Araguaina	Brazil	2245	D,J
4.915	Anhanguera,Goionia	Brazil	2250	J
4.915	GBC-1, Accra	Ghana	2000	F,G,H,I,J
4.915	KBC Cent Sce Nairobi	Kenya	1913	G
4.920	R.Quito, Quito	Ecuador	0405	D,J
4.930	R.Internacional	Honduras	0410	D,J
4.935	R.Capixaba, Vitoria	Brazil	0427	J
4.935	KBC Gen Sce Nairobi	Kenya	1915	G
4.945	V do Sao Francisco	Brazil	2259	J
4.950	R.Madre de Dios	Peru	2304	J
4.950	VOA via Sao Tome	Sao Tome	1956	F,G,H,I,J,K
4.960	VOA via Sao Tome	Sao Tome	0429	J
4.965	Christian Voice	Zambia	1946	G,J
4.975	R.Uganda, Kampala	Uganda	1956	G,J
4.980	Ecos del Torbes	Venezuela	0250	D
4.985	R.Brazil Central	Brazil	0303	D,F,J
5.005	R.Nacional, Bata	Eq.Guinea	1949	G,J
5.009	R.TV Malagasy	Madagascar	1920	G
5.020	La V du Sahel,Niamey	Niger	1957	G,J
5.025	R.Parakou	Benin	2030	J
5.025	R.Rebelde, Habana	Cuba	0412	D,F,J
5.025	R.Uganda, Kampala	Uganda	1918	G,J
5.030	AWR Latin America	Costa Rica	0415	D
5.035	R.Aparecida	Brazil	0411	D
5.047	R.Togo, Lome	Togo	2000	C
5.050	R.Tanzania	Tanzania	1958	F,G,I,J
5.100	R.Liberia, Totota	Liberia	1954	G

DXers:-

(A) Bernard Curtis, Stalbridge.
(B) Stan Evans, Herstmonceux.
(C) Bill Griffith, W.London.
(D) David Hall, Morpeth.
(E) Simon Hockenhull, E.Bristol.
(F) Eddie McKeown, Newry.
(G) Fred Pallant, Storrington.
(H) Clare Pinder, while in Appleby.
(I) Vic Prier, Colyton.
(J) Richard Reynolds, Guildford.
(K) Martin Venner, St. Austell.

Local Radio Chart

Freq kHz	Station	ILR BBC	e.m.r.p (kW)	Listener
558	Spectrum, London	I	0.80	B,C,D,E,F
603	C.G,Litt'brne	I	0.10	C,E,F
630	R.Bedfordshire(3CR)	B	0.20	B,C,D,E,F
630	R.Cornwall	B	2.00	C
657	R.Clwyd	B	2.00	C,D,E,F
657	R.Cornwall	B	0.50	C
666	Cl.Gold 666, Exeter	I	0.34	A,C,E,F
666	R.York	B	0.80	E
729	BBC Essex	B	0.20	B,C,D,E,F
738	Hereford/Worcester	B	0.037	A,C,D,E,F
756	The Magic 756,Powys	I	0.63	C,D,E,F
765	BBC Essex	B	0.50	A,B,C,D,E,F
774	R.Kent	B	0.70	C,D,E,F
774	Cl.Gold 774, Glos	I	0.14	D,F
792	Cl.Gold 792,Bedford	I	0.27	C,D,E,F
801	R.Devon	B	2.00	A,C,E
828	Cl.Gold 828, Luton	I	0.20	D,E,F
828	Asian Netwk Sedgley	B	0.20	F
828	2CR Cl G Bournem'th	I	0.27	A,C
837	Asian Netwk Leics	B	0.45	B,C,D,E
855	R.Devon	B	1.00	C
855	R.Lancashire	B	1.50	E
855	R.Norfolk, Postwick	B	1.50	B,E
855	Sunshine 855,Ludlow	I	0.15	A,D,F
873	R.Norfolk, W.Lynn	B	0.30	B,C,D,E,F
936	Brunel CG, W.Wilts	I	0.18	C,E,F
945	Cl.Gold GEM, Derby	I	0.20	D,E,F
945	Capital G, Bexhill	I	0.75	C,E
954	Cl.Gold 954 via ?	I	?	E
954	Cl.Gold 954,Torquay	I	0.32	C
954	Cl.Gold 954, H'ford	I	0.16	A,D,F
963	Liberty R, Hackney	I	1.00	C,D,E,F
972	Liberty R, Southall	I	1.00	C,D,E,F
990	R.Devon, E.Devon	B	1.00	A,C
990	Magic AM,Doncaster	I	0.25	E
990	Cl.G, Wolverhampton	I	0.09	D,E,F
999	C.Gold GEM Nott'ham	I	0.25	D,E,F
999	R.Solent	B	1.00	C
1017	Cl.G,WABC,Shr'shire	I	0.70	E,F
1026	R.Cambridgeshire	B	0.50	B,D,E
1026	R.Jersey	B	1.00	C
1035	RTL C'try(Ritz)1035	I	1.00	C,D,E,F
1035	R.Sheffield	B	1.00	E*
1116	R.Derby	B	1.20	D,E,F
1116	R.Guernsey	B	0.50	C
1116	Valley R, Ebbw Vale	I	0.50	A
1152	Cl.G Amber, Norwich	I	0.83	E
1152	LBC 1152 AM	I	23.50	C,E,F
1152	Cl.G, Birmingham	I	3.00	D,F
1161	R.Bedfordshire(3CR)	B	0.10	B,D,E,F
1161	Southern Counties R	B	1.00	B,C
1170	Capital G,Portsm'th	I	0.50	C
1170	Swansea Snd,Swansea	I	0.58	A
1170	1170AM,High Wycombe	I	0.25	F
1242	Capital G,Maidstone	I	0.32	C
1251	C.G Amber,Bury StEd	I	0.76	D,E
1260	Brunel CG, Bristol	I	1.60	C
1260	SabrasSnd,Leicester	I	0.29	D,E,F
1278	Cl.Gold 1278 W.York	I	0.43	E
1296	Radio XL,Birmingham	I	5.00	C,D,E,F
1305	Premier via ?	I	0.50	C,E,F
1305	Touch AM, Newport	I	0.20	C
1323	Capital G,Southwick	I	0.50	C,E*,F
1323	SomersetSnd,Bristol	B	0.63	E*
1332	Cl.Gold 1332,Pt'bo	I	0.60	D,E,F
1332	Wiltshire Sound	B	0.30	C
1359	Cl.Gold 1359, C'try	I	0.27	D,E,F
1359	R.Solent,Bournem'th	B	0.85	C
1368	R.Lincolnshire	B	2.00	E,F
1368	Southern Counties R	B	0.50	B,C
1368	Wiltshire Sound	B	0.10	C
1413	R.Gloucester via ?	B	?	D,E,F
1413	Premier via ?	I	0.50	C,E
1413	Fresh AM, Skipton	I	0.10	E
1431	Breeze,Southend	I	0.35	A*,E
1431	Cl.Gold, Reading	I	0.14	C,F
1449	Asian Netwk,Peterbr	B	0.15	E,F
1458	R.Devon	B	2.00	C
1458	Sunrise, London	I	50.00	C,E,F
1458	Asian Netwk Langley	B	5.00	D,E,F
1485	Cl.Gold, Newbury	I	1.00	B*,F
1485	R.Humberside (Hull)	B	1.00	E
1485	R.Merseyside	B	1.20	B*,C
1485	Southern Counties R	B	1.00	C
1503	R.Stoke-on-Trent	B	1.00	A*,C*,E,F
1521	Breeze, Reigate	I	0.64	C,E,F
1530	R.Essex, Southend	B	0.15	B,E
1530	Cl.Gold Worcester	I	0.52	A,C,F
1548	R.Bristol	B	5.00	C
1548	Capital G, London	I	97.50	C,E
1557	R.Lancashire	B	0.25	B*
1557	Cl.Gold 1557,N.hant	I	0.76	D,E,F
1557	Capital G, So'ton	I	0.50	C
1566	CountySnd,Guildford	I	0.50	B,C,E
1584	London Turkish R	I	0.20	C,E
1584	R.Nottingham	B	1.00	E,F
1602	R.Kent	B	0.25	C,E,F

Note: Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

Listeners:-

(A) Simon Hockenhull, E.Bristol.
(B) Sheila Hughes, Morden.
(C) George Millmore, Wootton, IoW.
(D) Peter Pollard, Rugby.
(E) Ernie Strong, Ramsey, Cambs.
(F) Fred Wilmshurst, Northampton.

17.680 (Eng, Ger, Fr to Asia 1400-1600) 55545 at 1410 in Stalbridge; Israel R, Jerusalem **17.535** (Heb [Home svce relay] to W.Eur, N.America) 44444 at 1719 in Colyton; WHRI via Maine, USA **17.650** (Eng to Eur, M.East, Africa 1600?-2200?) 54444 at 1753 in Kirkby Stephen; VOA via Morocco **17.895** (Eng to Africa 1600-1900) 44444 at 1845 in Truro; Swiss R.Int via Montsinery, Fr.Guiana **17.735** (It, Ar, Eng, Ger, Fr to Africa 1830-2130) 24222 at 1839 in Newry; Swiss R.Int via Julich, Germany **17.580** (It, Ar, Eng, Ger, Fr to Nr East, Africa 1830-2130) 24232 at 1945 in Rugby; BBC via ? **17.885** (Hausa to W.Africa 1930-2000) 25433 at 1955 by **Fred Pallant** in Storrington; R.Nederlands via Bonaire, Ned.Antilles **17.605** (Eng to C/W.Africa 1830-2025, Dut 2025-2125) 44444 at 2020 in Freshwater Bay, IoW; HCJB Quito, Ecuador **17.660** (Eng to Eur 1900-2200) 44444 at 2022 in Woodhall Spa; BBC via Ascension Is **17.830** (Eng to W.Africa 0800-2100) 45433 at 2033 in E.Bristol.

Radio New Zealand has also been reaching the UK in the **15MHz (19m)** band. Their 100kW transmission from Rangitaiki, N.Island on **15.160** (Eng 1850-2100?) was rated 34333 at 2025 in Woodhall Spa. Radio Australia's broadcasts in this band have been received in the UK on three frequencies from Shepparton: **15.515** (Eng to N.America, Pacific 0100-0700), rated 33333 at 0515 in Morpeth; **15.240** (Eng to Pacific, E.Asia 0000-1000) 43333 at 0700 in Appleby; also **15.415** (Eng to E/SE.Asia 0600-0900) 45334 at 0830 in Freshwater Bay, IoW.

During the morning the BBC via Seychelles **15.420** (Eng to E/S.Africa 0330-0600) was rated 35433 at 0407 in E.Bristol; BBC via Ascension Is **15.400** (Eng to W.Africa 0700-1130, 1500-2300) 23322 at 0730 in Colyton; Voice of Malaysia **15.295** (Eng to Asia) 24532 at 0805 in Wallsend; Voice of Armenia, Yerevan **15.270** (Eng to Eur, M.East 0810-0830 Sun) 34433 at 0820 in Newry; China R.Int via ? **15.210** (Eng to Asia, Australia 0900-1100) 33333 at 0935 in Herstmonceux; WEWN via Vandiver, USA **15.745** (Eng to E.USA, Eur 1100-2100) 33233 at 1102 in St.Austell; R.Bulgaria **15.700** (Eng to W.Eur 1100-1200) 54444 at 1145 in Morden.

After mid-day, Swiss R.Int via Julich, Germany **15.315** (Eng, Ger, Fr, It, Eng to Eur 1000-1230) was 44444 at 1210 in Truro; Africa No.1, Gabon **15.475** (Fr to W.Africa 1600-2100) 34444 at 1614 in Storrington; UAE R.Dubai **15.395** (Eng to Eur 1600-1640) 43333 at 1629 in Kirkby Stephen; BBC via Thailand **15.575** (Eng to M.East 1700-2000) 32333 at 1950 in Rugby; R.Canada Int via Sackville? **15.325** (Eng, Fr to Eur 2000-2200) 44444 at 2000 in Dudley; Voice of Indonesia, Jakarta **15.150** (Eng to Eur, Africa 2000-2100)

Medium Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
531	Ain Beida	Algeria	600/300	F*
531	RNE5 via ?	Spain	?	D,F*
531	Beromunster	Switzerland	500	C*,G*
540	Wavre	Belgium	150/50	C*,D,E,G
540	Sidi Bennour	Morocco	600	C*,F*
549	Les Trembles	Algeria	600	F
549	Nordkirchen (DLF)	Germany	100	F
549	Thurnau (DLF)	Germany	200	D,G
558	Espoo	Finland	50	C*,F
558	Valencia(RNE5)	Spain	20	F*
567	Tullamore(RTE1)	Eire	500	C,D,F*,G
567	Murcia(RNE5)	Spain	50	F*
576	Muhlacker(SDR)	Germany	500	F*,G*
576	Riga	Latvia	500	C*
576	Barcelona(RNE5)	Spain	50	F*
585	Paris(FIP)	France	8	B,D,F
585	Madrid(RNE1)	Spain	200	A*,C*,F*,G*
585	Dumfries(BBCScot)	UK	2	C,E
594	Frankfurt(HR)	Germany	1000/400	C*
594	Oujda-1	Morocco	100	C*,F*
594	Muge	Portugal	100	F*
603	Lyon	France	300	C*,D,F*
603	Sevilla(RNE5)	Spain	50	F*
603	Newcastle(BBC)	UK	2	C*,F
612	Athlone(RTE2)	Eire	100	A,C,D,F*
612	RNE1 via ?	Spain	10	F*
621	Wavre	Belgium	80	C*,D,E,G
621	Batra	Egypt	2000	F*
621	RNE1 via ?	Spain	10	F*
621	Barcelona(DCR)	Spain	50	C*
630	Vigra	Norway	100	C*,F
630	Tunis-Djedeida	Tunisia	600	C*,F*
639	Praha(Liblice)	Czech	1500	C*
639	RNE1 via ?	Spain	?	C*
639	La Coruna(RNE1)	Spain	100	F*
648	Orfordness(BBC)	UK	500	A,C*,D,F*,G
657	Madrid(RNE5)	Spain	20	C*
657	Wrexham(BBCWales)	UK	2	A,B,C,F,G
666	MesskirchRohrd(SWF)	Germany	150	C*,F*,G*
666	Sitkunai(R.Vilnius)	Lithuania	500	F*
666	Lisboa	Portugal	135	C*,F*
675	R10 FM	Holland	120	A,C*,D,F*,G*
684	Sevilla(RNE1)	Spain	500	C*,F*
693	Tortosa(RNE1)	Spain	2	C*
693	Droitwich(BBC)	UK	150	D,F*,G
702	Flensburg(NDR)	Germany	5	C*
702	TWR via Monte Carlo	Monaco	300	C*,F*
711	Rennes 1	France	300	A,C*,D,F*,G
720	Langenberg	Germany	200	F*
720	Lots Rd,Ldn(BBC4)	UK	0.5	D,F*,G
729	Cork(RTE1)	Eire	10	C*,D
729	RNE1 via ?	Spain	?	C*,G*
729	Oviedo(RNE1)	Spain	50	F*
738	Paris	France	4	D
738	Barcelona(RNE1)	Spain	500	C*,F*
747	Flevo(Hilv2)	Holland	400	A,C*,D,F*,G
756	Braunschweig(DLF)	Germany	800/200	C*,F*,G*
756	Bilbao(EI)	Spain	5	F*
756	Redruth(BBC)	UK	2	C*
765	Sottens	Switzerland	500	C*
774	Abis	Egypt	500	F*
774	Enniskillen(BBC)	N.Ireland	1	C
774	RNE1 via ?	Spain	?	C*,F*,G*
783	Leipzig(MDR)	Germany	100	C*,F*
783	Barcelona (COPE)	Spain	50	F*
792	Limoges	France	300	C*
792	Lingen(NDR)	Germany	5	C*
801	Munchen-ismaning	Germany	300	C*
801	RNE1 via ?	Spain	?	C*,F*
810	Madrid(SER)	Spain	20	F*
810	Westerglen(BBCScot)	UK	100	A*,C,F*
819	Batra	Egypt	450	C*
819	S.Sebastian(EI)	Spain	5	F*
828	Rotterdam	Holland	20	C*
837	Nancy	France	200	C*,F*
837	COPE via ?	Spain	?	F*
846	Rome	Italy	1200	A*,C*,F*
855	RNE1 via ?	Spain	?	C*
855	Murcia(RNE1)	Spain	125	F*
864	Paris	France	300	A,C*,F*
864	Socuellamos(RNE1)	Spain	2	F
873	Enniskillen(R.UI)	UK	1	C
882	Barcelona	Spain	20	F*
882	Washford(BBCWales)	UK	100	B,C,D,F*,G
891	Algiers	Algeria	600/300	A*,C*,F*
891	Hulsberg	Netherlands	20	C*
900	Brno(CRo2)	Czech Rep	25	C
900	Milan	Italy	600	A*,C*,F
900	COPE via ?	Spain	?	F*
909	B'mans Pk(BBC5)	UK	140	D,F*,G
918	Domzale	Slovenia	600/100	C*,F*
918	Madrid(R.Int)	Spain	20	F*
927	Wolvertem	Belgium	300	C*,F*
936	Bremen	Germany	100	C*
936	RNE5 via ?	Spain	?	F*
945	Toulouse	France	300	C*,F*
954	Brno (CRo2)	Czech Rep	200	C*
954	Madrid(Cl)	Spain	20	F*
963	Pori	Finland	600	C*,F*
963	Vitoria (EI)	Spain	10	F*
972	Hamburg(NDR)	Germany	300	A*,C*
990	Berlin	Germany	300	C*,F*
990	R.Bilbao(SER)	Spain	10	C*,F*
999	Schwerin (RIAS)	Germany	20	C*
999	Madrid(COPE)	Spain	50	F*
1008	SER via ?	Canaries/Spain	?	F*
1008	Flevo(Hilv-5)	Holland	400	C*,D,F*
1017	Rheinsender(SWF)	Germany	600	A*,C*
1017	RNE5 via ?	Spain	?	F*
1035	Lisbon	Portugal	120	C*
1044	Dresden(MDR)	Germany	20	A*,C*,F*
1044	S.Sebastian(SER)	Spain	10	C*,F*
1053	Talk Sport via ?	UK	?	C,D,F*,G
1062	Kalundborg	Denmark	250	C*
1071	Cairo	Egypt	100	A*
1071	Bilbao(EI)	Spain	5	C*,F*
1071	Talk Sport via ?	UK	?	C*,F,G
1080	SER via ?	Spain	?	C*,F*
1089	Talk Sport via ?	UK	?	C,D,F*,G
1098	Nitra(Jarok)	Slovakia	1500	A*,C*
1098	RNE5 via ?	Spain	?	F*
1107	AFN via ?	Germany	10	A*,C*
1107	Talk Sport via ?	UK	?	C,D,F*,G
1116	Pontevedra(SER)	Spain	5	C*,F*
1125	La Louviere	Belgium	20	C*,D,F
1125	Deanovec	Croatia	100	A*
1125	Llandrindod Wells	UK	1	F
1134	Zadar(Croatian R)	Croatia	600/1200	A*,C*
1134	COPE via ?	Spain	2	F*
1143	AFN via ?	Germany	1	C
1143	Stuttgart(AFN)	Germany	10	A*
1143	COPE via ?	Spain	2	F*
1179	SER via ?	Spain	?	A*,F*
1179	Solvesborg	Sweden	600	A*,C*,F,G
1188	Kuume	Belgium	5	C*
1188	Szolnok	Hungary	135	C*,G*
1197	Munich(VOA)	Germany	300	C
1197	Virgin via ?	UK	?	C,D,F*,G
1206	Bordeaux	France	100	A*,C*,F*
1215	Virgin via ?	UK	?	C,D,F*,G
1224	Lelystad	Holland	50	C*,F
1224	S.Sebastian(COPE)	Spain	5	F
1233	Nitra	Slovakia	40	C*
1233	Virgin via ?	UK	?	C*,F*,G
1242	Marseille	France	150	C*
1242	Virgin via ?	UK	?	C*,F*
1251	Marcali	Hungary	500	C*
1251	Huisberg	Netherlands	10	F*
1260	SER via ?	Spain	?	C*
1269	Neumunster(DLF)	Germany	600	C*,F,G*
1269	COPE via ?	Spain	?	F
1278	Dublin/Cork(RTE2)	Eire	10	A,C,F*,G
1287	RFE via ?	Czech Rep	?	C*,F*
1287	Lerida(SER)	Spain	10	F*
1296	Valencia(COPE)	Spain	10	F*
1296	Orfordness(BBC)	UK	500	C*,F*
1305	RNE5 via ?	Spain	?	C*,F*
1314	Kvitsoy	Norway	1200	A*,C*,D,E,G
1323	W'brunn (V.Russia)	Germany	1000/150	C*,G
1332	Rome	Italy	300	C*
1341	Lisnagarvey(BBC)	N.Ireland	100	A*,B*,F*,G
1341	Tarrasa(SER)	Spain	2	B*
1359	Madrid(RNE-FS)	Spain	600	C*,F*
1368	Foxdale(Manx R)	Is of Man	20	C,E*,F*
1377	Lille	France	300	B,C*,D,F*,G
1386	Bolshakovo	Russia	2500	B,C*,G
1395	TWR via Filake	Albania	500	C*
1395	Lopic	Netherlands	120/40	C*,F
1404	Brest	France	20	A,C*,D,F,G*
1413	RNE5 via ?	Spain	?	C*,F*
1422	Heusweiler(DLF)	Germany	1200/600	C*,F*,G
1440	Marnach(RTL)	Luxembourg	1200	C*,D,F*,G*
1449	Redmoss(BBC)	UK	2	C*
1467	Monte Carlo(TWR)	Monaco	1000/400	C*,F*,G*
1476	Wien-Bisamberg	Austria	600	B*,C*
1485	SER via ?	Spain	?	B*,F*
1494	Clermont-Ferrand	France	20	C*,F*,G
1494	St.Petersburg	Russia	1200	C*
1512	Wolvertem	Belgium	300	B*,C,D,F*,G
1512	Jeddah	Saudi Arabia	1000	C*
1521	Kosice(Cizatice)	Slovakia	600	C*,G*
1521	Castellon (SER)	Spain	2	F*
1530	Vatican R	Italy	150/450	C,F*,G*
1539	Mainflingen(ERF)	Germany	350(700)	C*,F*,G*
1557	Nice	France	300	A*,B*
1575	Genova	Italy	50	C*,F*,G*
1575	SER via ?	Spain	?	F*,G*
1584	SER via ?	Spain	2	F*
1602	SER via ?	Spain	?	F
1602	Vitoria(EI)	Spain	10	C*,F*,G*
1611	Vatican R	Italy	15	C*,G*

Note: Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk.

Listeners:-
(A) Simon Hockenhull, E.Bristol.
(B) Sheila Hughes, Morden.
(C) Eddie McKeown, Newry.
(D) George Millmore, Wootton IoW.
(E) Clare Pinder, while in Appleby.
(F) Ernie Strong, Ramsey, Cambs.
(G) Fred Wilmshurst, Northampton.

54544 at 2015 in Guildford; R.Korea Int. **15.575** (Eng to Eur 2100-2200) 33333 at 2110 in Stalbridge; R.Taipei Int via WYFR **15.600** (Eng to Eur 2200-2300) 45544 at 2215 in Northampton; R.Romania Int **15.105** (Eng to N.America?) SIO 222 at 2313 by **Francis Hearne** in N.Bristol.

Radio Australia's broadcasts in the **13MHz (22m)** band have also been reaching the UK but reception tends to be rather poor. Their transmission on **13.605** (Eng to Pacific areas 0800-1200) was noted as 22222 at 0928 in Truro. Much later, their broadcast to SE.Asia via Darwin on **13.620** (Eng 2200-0000) was rated 22322 at 2245 in St.Austell.

Also mentioned in the reports were Croatian R, Zargreb **13.830** (Cr to Pacific?), rated 44433 at 1015 in Oxted; UAER, Dubai **13.675** (Eng to Eur 1600-1640) 45544 at 1610 in Northampton; DW via ? **13.790** (Fr to W.Africa 1700-1800) 45544 at 1700 in Rugby; AIR via Bangalore **13.620** (Ar to M.East, Africa 1730-1945) 42433 at 1742 in Colyton; Voice of Turkey **13.635** (Eng to Eur, Asia 1830-1930) 44333 at 1835 in Morden; V of Vietnam, Hanoi **13.740** (Eng to Eur 1900-1930) 54444 at 1915 in Herstmonceux; Swiss R.Int via Sottens **13.770** (It, Ar, Eng, Ger, Fr to Near East, Africa 1830-2130) 34333 at 1940 in Newry: Voice of Vietnam, Hanoi **13.740** (Eng, Fr to Eur 2030-2130, Sun) 44434 at 2035 in Stalbridge; WYFR Okeechobee, USA **13.855** (Eng to Eur ?-2200) 35422 at 2039 in E.Bristol; R.Damascus, Syria **13.610** (Eng to Eur 2005-2105; Eng to America, Pacific 2105-2205) 55444 at 2105 in Appleby; R.Havana Cuba **13.750** (Eng to Eur 2030-2130) 34333 at 2105 in Freshwater Bay, IoW; All India R. (AIR) via ? **13.605** (Eng to Far East 2245-0045) 34333 at 2251 in Woodhall Spa.

During the morning the occupants of the **11MHz (25m)** band include HCJB, Quito via ? **11.680** (Eng to Eur? 0600-0800), rated 44444 at 0630 in Dudley & 55544 at 0645 in Herstmonceux; World Harvest R. (WHRI), USA **11.730** (Eng to ?) 35553 at 0820 in Wallsend; R.Australia via Shepparton **11.880** (Eng to Asia 0900-1100) 32222 at 0940 in Truro; R.Finland via Pori **11.755** (Fin to Eur) 44444 at 1046 in Oxted.

After mid-day they include R.Australia via Shepparton **11.660** (Eng to Asia 1430-1700), noted as a potent 44444 at 1420 in Morpeth; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1400-1730?) 44444 at 1509 in Freshwater Bay, IoW; Israel R, Jerusalem **11.605** (Eng to Eur, N.America 1900-1930) 55555 at 1900 in Appleby; V of Mediterranean, Malta via Russia? **12.060** (Eng to Eur, N.Africa 1900-2000) 44333 at 1900 in Morden; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 45544 at 1936 in Northampton; China R.Int via ? **11.790** (Eng to Eur 2000-2200) 35343 at 2041 in Newry; V of Russia **11.675** (Eng [WS]) 54445 at 2050 in Stalbridge; R.Ukraine Int **12.040** (Eng to Eur, N.America 2100-2200) 43534 at 2122 in Colyton; BBC via Ascension Is **12.095** (Eng to S.America 2100-0300) 24232 at 2150 in Rugby; Voice of Turkey **11.845** (Eng to Eur, USA 2200-2250) SIO 333 at 2222 in N.Bristol; R.Taipei Int via WYFR? **11.565** (Eng to Eur 2200-2300) 34333 at 2245 in Woodhall Spa; BBC via Kranji, Singapore **11.955** (Eng to SE.Asia, E.Asia, Australia, New Zealand 2200-0000) 32422 at 2347 in E.Bristol; R.Romania Int **11.940** (Eng to N.America 2300-0000) 44444 at 2347 in St.Austell.

In the **9MHz (31m)** band R.Havana Cuba on **9.820** (Eng to C/N.America 0100-0500) was 43333 at 0415 in St.Austell; TWR Monte Carlo, Monaco **9.870** (Eng to Eur 0655-0800) 55445 at 0710 in Stalbridge; WTJC Newport, USA **9.370** (Eng to USA 24hrs) 54444 at 0540 in Morpeth & 44444 at 0830 in Morden; R.Vilnius, Lithuania **9.710** (Eng to Eur 0930-1000) 44444 at 0945 in Truro; R.Mediterranee Int, Morocco **9.575** (Ar, Fr to N.Africa, S.Eur 0500-0100) 44443 at 1032 in Oxted; R.Nederlands via Wertachtal **9.860** (Eng to Eur 1030-1225) 55545 at 1034 in Kirkby Stephen & 55544 at 1130 in Herstmonceux; R.Australia via Shepparton **9.475** (Eng to Asia 1330-1858) 22322 at 1640 in Colyton; Voice of Turkey via ? **9.785** (Eng to Eur 1830-1920?) 55444 at 1830 in Appleby; R.Australia via Shepparton **9.500** (Eng to Pacific areas 1900-2130) 44444 at 1900 in Dudley; VOIRI Tehran, Iran **9.022** (Ger to C.Eur 1730-1830, Eng to W.Eur 1930-2030) 34433 at 1935 in Newry; Voice of Hope via Julich, Germany **9.495** (Eng to Eur 2000-2100) 33333 at 2020 in Woodhall Spa; Cairo, Egypt **9.990** (Fr, Eng to Eur 2000-2245) 44334 at 2035 in Rugby & SIO 222 at 2216 in N.Bristol; All India R. (AIR) via Bangalore **9.950** (Eng to Eur 2045-2230) 43322 at 2140 in Freshwater Bay, IoW; BBC via Sackville, Canada **9.590** (Eng to N.America 2200-0000) 44433 at 2245 in Northampton; R.Nederlands via Bonaire, Ned.Antilles **9.845** (Eng to N.America 2330-0125) 44333 at 2356 in E.Bristol.

Quite a few of the broadcasts in the **7MHz (41m)** band are beamed to distant places, but sometimes they can be received here quite well. Mentioned in the reports were the BBC via Singapore **7.160** (Eng to SE.Asia 1600-1800), rated 34423 at 1724 in Colyton; R.Nederlands via Madagascar **7.120** (Eng to Africa 1730-2025) 45544 at 1850 in E.Bristol; VOA via Biblis, Germany **7.260** (Special Eng to Eur, M.East, Asia 1900-2000?) 32232 at 1933 in Kirkby Stephen; World Harvest Radio (WHRI) via Maine, USA **7.580** (Eng to N.America) 34333 at 2240 in Northampton; KTBN via Salt Lake City, USA **7.510** (Eng to N.America 0000-1600) 33343 at 0505 in Morpeth; R.Miami Int (WRMI). Miami FL, USA **7.385** (Eng to USA) 55434 at 0547 in Guildford.

Some intended for listeners in Europe originate from R.Japan via Woofferton, UK **7.230** (Eng, Jap 0500-0700), rated 44444 at 0612 in St.Austell & 55544 at 0640 in Herstmonceux; Sudwestfunk via Rohrdorf **7.265** (Ger 24hrs) 34433 at 0814 in Oxted; R.Polonia (Polish R), Warsaw **7.285** (Eng 1700-1800) 43333 at 1730 in Morden; R.Tirana, Albania **7.210** (Eng 1845-1900?) 33333 at 1848 in Newry; R.Minsk, Belarus **7.210** (Eng 1930-2000?) 33333 at 1930 in Truro; China R.Int via Russia **7.170** (Eng 2200-2300) SIO 444 at 2203 in N.Bristol; Family R. (WYFR) via Okeechobee FL, USA **7.355** (Eng 0600-0800, also to Africa) 43334 at 0610 in Stalbridge.

Many more for European listeners may be heard in the **6MHz (49m)** band. Those noted in the reports came from the Voice of the Mediterranean, Malta via Russia? **6.110** (Eng 0600-?), rated 45544 at 0615 in Northampton; R.Vlaanderen Int via Julich, Germany **5.985** (Eng 0700-0730) 54444 at 0700 in Appleby; Sudwestrundfunk, Germany **6.030** (Ger) 34333 at 0729 in Oxted; Voice of Hope via Julich, Germany **5.975** (Eng 0700-0800) 55445 at 0745 in Stalbridge; TWR Monte Carlo, Monaco **6.045** (Eng 0655-0800) 55445 at 0750 in Stalbridge; R.Nederlands via Julich, Germany **6.045** (Eng 1030-1225) SIO 333 at 1221 in N.Bristol; R.Nederlands via Flevo **5.955** (Du 0600-1800) 32433 at 1630 in Colyton; R.Polonia [Polish R] Warsaw **5.995** Eng 1700-1800) 43333 at 1730 in Morden; Bayerischer Rundfunk, Germany **6.085** (Ger 24hrs) 45444 at 1737 in Colyton; R.Sweden via Horby **6.065** (Eng 1730-1800, also to M.East, Africa) 44444 at 1741 in Colyton; R.Vlaanderen, Belgium **5.910** (Eng 1730-1756) 44444 at 1747 in Kirkby Stephen; Deutsch Welle (DW) via Julich? **6.140** (Eng Service) 54343 at 1750 in Kirkby Stephen; R.Yugoslavia **6.100** (Eng 1830-1900) 44444 at 1830 in Dudley; R.Budapest, Hungary **6.025** (Eng 1900-1930) 44444 at 1902 in St.Austell; Swiss R.Int via Julich, Germany **6.110** (Ger, Fr, It, Eng 1730-1930) 54544 at 1910 in Herstmonceux; RAI Rome **5.970** (Eng 1935-1955) 35433 at 1937 in Newry; R.Canada Int via Skelton, UK **5.995** (Eng 2000-2100) 44444 at 2010 in Truro; BBC via Rampisham, UK **6.195** (Eng 0400-0700, 1900-2300) 54554 at 2105 in Northampton; R.Sweden **6.065** (Eng 2130-?) SIO 333 at 2131 in N.Bristol; R.Japan via ? **6.055** (Eng 2100-2200) 44444 at 2143 in St.Austell; R.Austria via Moosbrunn? **5.945** (Eng 2130-2200) 44433 at 2145 in Truro; Deutschland R, Berlin **6.005** (Ger 24hrs) 55544 at 2145 in Northampton.

Also mentioned in the reports were a few to other areas: BBC via Antigua, W.Indies **5.975** (Eng to Caribbean, C/S.America 2100-0400) 43443 at 2235 in Northampton; CKZN St.John's, Newfoundland **6.160** (Eng [relays CBN] 0930-0500) 54434 at 2308 in Guildford; R.Corp of Singapore (RCS) **6.150** (Eng 2300-1100), rated 43443 at 2309 in Guildford; BBC via Sackville, Canada **6.175** (Eng to E/C/W.Canada, USA 2200-0400) 43333 at 2336 in E.Bristol; R.Havana, Cuba **6.000** (Eng to N.America 0100-0500) 33433 at 0100 in Newry; WHRI South Bend, USA **5.745** (Eng to N.America 2100?-1000) 54444 at 0250 in Morpeth; American Forces Network (AFN) via Puerto Rico **6.458** (Eng [u.s.b.]) 33333 at 0325 in Morpeth.

The SINPO code is used for broadcast station reports, here is an explanation of the code.

Signal Strength
5 excellent
4 good
3 fair
2 poor
1 barely audible

Interference
5 nil
4 slight
3 moderate
2 severe
1 extreme

Noise
5 nil
4 slight
3 moderate
2 severe
1 extreme

Propagation Disturbance
5 nil
4 slight
3 moderate
2 severe
1 extreme

Overall Merit
5 excellent
4 good
3 fair
2 poor
1 unusable

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Bandscan Australia

This time I have some news on Radio Australia, Australia Television and Radio New Zealand. Again I bring a couple of web addresses and a few other items of news on Australian communications and telecommunications.

Australia Television

Readers will recall the sad blundering that led to the closure of the Australia Television service earlier this year. Last time I said that the government was negotiating with Australian Vision International (AVI) to get the service back on air, but that many commentators were urging that the job be given back to the Australian Broadcasting Corporation (ABC). Well, that is exactly what happened.

Just when AVI thought they had a deal, the ABC and another consortium headed by the Special Broadcasting Service (SBS) were invited to tender for the right to broadcast the service. The ABC was successful and will start the A$15 million (about £5.5 million) per year service towards the end of this year. The prime mover behind the AVI bid, David Hill, is reported as not being too chuffed about this outcome and there have been reports here that he plans to sue the government over the process.

The re-opened service will initially target English speaking Asian audiences and, depending on negotiations for satellite services, beam into the Indian and Pacific Ocean regions later. It will attempt to attract sponsorships and commercial advertisers.

Interestingly, the ABC will be working under contract to Australia's Department of Foreign Affairs. One commentator has noted that while this is not illegal, it is not in the spirit of public interest broadcasting in this country. ABC Chair, Donald McDonald has disputed this claim, pointing out that the BBC World Service is funded by the UK Foreign Office.

Radio Australia

Radio Australia (RA) has increased its output into south east Asia with time being rented on the facilities on the Cox Peninsula once owned by RA. This output complements that through transmission facilities leased in Singapore and Taiwan. The RA network manager has been reported as saying that RA attempts to redirect the signal from the Shepparton, Victoria, site had been of limited success in the period when RA had no access to Cox Peninsula. The perhaps not unsurprising choice of Cox Peninsula facilities followed a competitive tendering process among a reported seven applicants.

New Zealand

Radio New Zealand International has a new web site at **http://www.rnzi.com/** The home page gives access into pages describing the station and its role; the station emblem and mascot; station frequencies, times and programmes; features; sports fixtures; news schedule; merchandise for sale; contact details; streaming audio; and useful links. This site is, to my way of thinking, very clean, usable and useful. Which is more than I can say for the Radio Australia site **http://www.abc.net.au/ra/** which is still difficult to use and aesthetically unappealing.

The technical section in particular will interest *SWM* listeners. It gives a rundown on the station's four antennas and one 100kW transmitter. To whet your appetite, I have included the following based on the technical RNZI web page.

RNZI operates two high frequency and two low band antennas. One of each beams 35° and one of each beams 325°. They can be driven individually, or when fed in parallel the beam widens to 140°. A large reflecting mesh forms a backdrop to each antenna array. The 35° beam covers the south eastern Pacific and North America. The 325° beam covers the south western Pacific, north east Australia, Japan, China and Europe.

The transmitter is located 41km east of Taupo in the centre of the North Island of New Zealand at co-ordinates 176.25°E and 38.50°S. Audio is fed to the transmitter by a digital link from the studios in Wellington, 400km south of Taupo. The transmitter is unmanned and is controlled from the RNZI studio in Wellington.

The current RNZI schedule is as follows: 1650-1850 6.095MHz; 1851-1950 11.725MHz; 1951-2216 15.160MHz; 2217-0458 17.675MHz; 0459-0705 11.725MHz; 0706-1105 9.885MHz and 1106-1305 11.675MHz. Usual closedown is 1305-1650, but 6.095MHz is sometimes used within this period for occasional overnight broadcasts to the Pacific for sports commentaries or cyclone warnings. Note that this schedule will change within the currency of this edition of *SWM*. For the latest schedule refer to **http://www.rnzi.com/**

Web Sites

Imparja Television is a television network owned and controlled by Northern Territory and South Australian Aboriginal shareholders. Its service area covers about 410,000 people across Australia's inland. It can be found at **http://www.imparja.com.au/company.htm** For those interested radio matters from New Zealand have a look at the directory of stations at **http://radio.net.nz/directory.html**

Reports

Martyn Gardiner from Portsmouth has been listening to Radio Australia again. He has managed to bring in a signal on 21.725MHz in the morning at around 0800 with patchy reception but a just readable signal. Also using his Icom, Martyn has pulled in RA's world news at 2100 on 9.5MHz. The program a.m. followed the news until the signal went off air around 2130.

He tells me that he has managed to block out interference from down the band by tuning to the upper side band and tweaking both the i.f. shift and the audio peak filter. As Martyn remarks, "the wonders of modern electronics".

ABC

ABC television ratings have plummeted from 18.4% in February to around 11 or 12% in the 1800 to midnight slot. Figures as low as 8.5% have been recorded on Sunday nights where ABC television once shone. The figures are no doubt of concern to managing director Jonathan Shier who has made ratings the benchmark for his success in the role.

Other News

There has been a frenzy of activity in the government's television black spot program. Funds are being approved and allocated to small communities across the country to bring them new or improved television reception. Some funds are to replace obsolete equipment. The funds come from the partial sale of the national telecommunications carrier Telstra.

The cynic in me says it is no coincidence that the next federal election is due within a few months and that the government fears for its rural and remote seats. Almost as part of the same thought, I wonder what these communities will do when the funds run out; sell some more of Telstra perhaps.

The government has cancelled a planned auction of two national datacasting licences just days before it was scheduled to begin. The auction, for spectrum to bring Internet-like services on digital television, fell in a hole when some of the big players pulled out because of what they saw as onerous restrictions being imposed. The government had been relying on the auction to yield several hundreds millions dollars to the budget.

Untimed local telephone calls have been extended to 40,000 residents in remote Australia in a deal done between the government and Telstra. Unlike UK residents, Australians living in metropolitan areas have always enjoyed untimed local telephone calls. The current Telstra local call rate is around eight UK pence for as long as the call lasts.

I welcome any news and comments. In particular I am interested in any s.w.l. information on Australian stations heard by *SWM* readers so I can chase up more details and interesting snippets from this end. My address is **PO Box 3307, Manuka, ACT 2603, Australia**. For personal replies please send two IRCs. Those with an Internet connection can get me at **greg@pcug.org.au** or **gregmbaker@hotmail.com**

Wavecom W41PC Professional Decoder Review

Although having used Wavecom decoders in the past, Mike Richards was eager to try out the latest version of the W41PC. So, should you be adding this to your shopping list? Read on and see.

Wavecom have earned themselves a formidable reputation in the world of utility decoding and to many enthusiasts they represent a Ferrari like image that listeners aspire to. With this back-drop, you can imagine that I was delighted to get my hands on the latest W41PC version of their decoder. I've used Wavecom's in the past, but they have always been the stand-alone types. The W41PC represents a different approach and comes as a plug-in card to be fitted in a PC. The range of modes and analysis tools supplied in the PC version is formidable and matches that available from the stand-alone types.

Installation

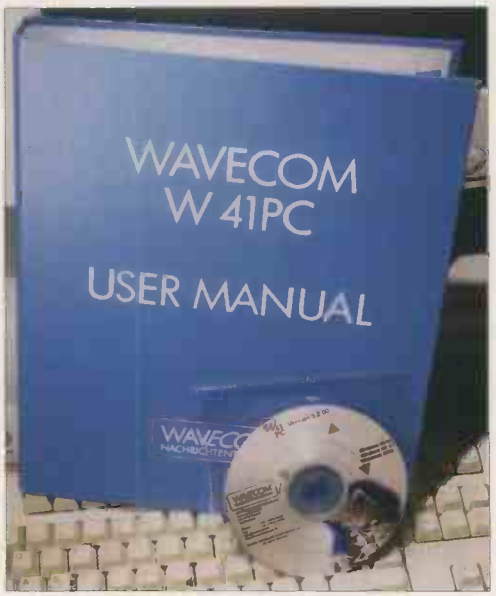
There are two main parts to installing the W41PC with the first step being to fit the card. In order to do this you need to be able to gain access to the PCI/ISA sockets on your PC which normally means removing the case. This is not a difficult operation, but it may be worth seeking assistance if you're unsure about this.

One of the good points about the installation is that the W41PC doesn't need an IRQ allocation or DMA assignments. All it needed was an I/O address and the default setting of 310 worked just fine on my PC. If you need to change this assignment, there's a group of three links on the W41PC that can be used to select one of eight possible address ranges.

The only problem I did encounter was physically getting the card to fit in the socket. This was caused by the spacing between the back plate and the socket being rather large. I'm sure the card was probably within specification, but I had to loosen the screws on the motherboard and ease it backwards before I could fit the W41PC. Once this little snag was cleared and the case back together, the PC fired-up without a hitch.

Loading the supporting software was an altogether easier affair. Just insert the CD-ROM, run Set-up and follow the instructions!

The very final stage is to run the W41PC software, go to the Set-up menu item and set the card address you used. To make running W41PC simple, there's a neat icon placed on your desktop as part of the installation process.



The bespoke d.s.p. electronics featuring THREE processors.

First Shot

With everything up and running, the first job was run a screened lead from the line-out of my receiver to the audio input on the W41PC. The only unusual feature was that the connection on the rear of the W41PC was a BNC rather than the more conventional 3.5mm jack, so you may have to make-up a special lead for this.

As a warm-up, I started by using the W41PC's spectrum analyser to check that signals were actually getting to the W41PC and that the software was working. This was where I first noticed the immense processing power of the W41PC - the spectrum display was really alive. By that I mean that the whole thing was very fast and responsive because there wasn't the lag that you tend to get with PC soundcard based systems.

When you look at what's built-in to the W41PC this is no real surprise. For a start there are two dedicated Digital Signal Processors that are

used to demodulate the incoming signal plus a 16/32 bit processor used for decoding and a digital synthesiser that's used to convert input signals to baseband. That's a lot of processing power by any standards.

Analysis

When you move into the realms of advanced decoding and try tackling what have become affectionately known as the complex modes, you really need some decent signal analysis tools at your disposal. The W41PC is extremely well armed in this area.

Probably the most commonly used tool is the Real-Time FFT which gives the spectrum display I mentioned earlier. As well as a providing a lively display, there are some really powerful measurement features that made basic signal measurement a dream.

Starting with a simple RTTY-like f.s.k. signal, the Real-Time FFT shows the conventional two peaks representing the mark and space tone frequencies. At this point I found that I needed to tame the lively response of the tool by adjusting the averaging function. You could do this either by double clicking the 'Ave' box on the status line or through the Options menu - either way you just type in the averaging you want. I found that somewhere between 10 and 20 was about right for most simple f.s.k. signals. This averaging produced a very clear indication of the mark and space lobes.

Now for the bit I really liked - the measurement cursors. If you click on the display whilst it's running, a grid of measurement cursors appear on the screen and the FFT display freezes. There were two sets of cursors - one used for frequency measurement, whilst the other operated on signal levels. There should be a screen-shot of this display so you can see what I'm talking about.

What was really great about the measurement cursors was that you could drag them around with the mouse to measure different parts of the signal. At the side of each cursor was the measurement result showing the frequency and the spacing between the two outer cursors. This made measuring the shift of a signal just about as simple as you could get.

The level measurement was of less interest for f.s.k. signals, but can come into its own when handling a.m. systems such as satellite FAX signals. This excellent system of measurement cursors was built into all the analysis display modes and really made the W41PC an extremely powerful analytical tool.

For some signals, particularly those using transmission bursts such as SITOR, PACTOR, etc., the Sonogram was very useful as it displayed the spectrum of the signal over a period of time. By using the cursors I could easily measure not only the shift of the signal but also the length of each transmission and the gap between transmissions - all vital clues to the type of signal. If you should need to check spectrum, time and amplitude the waterfall display can handle this. There was even an oscilloscope if you need it.

As most of the signals on h.f. use f.s.k. I found the specially configured f.s.k. analysis tool very handy. When activated this shows four displays on the screen - the top two dealt with baud rate measurement and provided graph and waterfall data, whilst the lower two dealt with the frequency spectrum again in graphical and waterfall versions. Needless to say, when you click on a display you get the excellent measurement cursor to help you.

For those that enjoy taking signals apart, the bit analysis and auto-correlation tools were excellent and really allowed you to dig into those difficult synchronous signals.

Automatic Detection

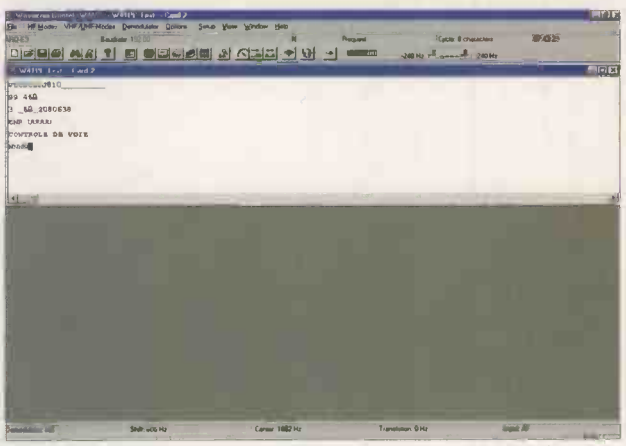
The immense processing power of the W41PC combined with a modern PC delivers some very capable automatic signal detection systems. Having said that, it's important not to expect too much from the automated systems. If you try and decode an unrecognised f.s.k. signal there's a better than evens chance that the auto routines will tell you that it's a Baudot signal, but then fail to synchronise.

To make the most of the automation you need to feed the W41PC with a few clues, i.e. if it sounds like a SITOR signal select that mode first. What I really liked about the W41PC was the way the automation was seamlessly built into all the reception modes. With any mode selection you could enter the shift but not the speed, the W41PC would go away and work it out for itself - likewise with any of the other parameters.

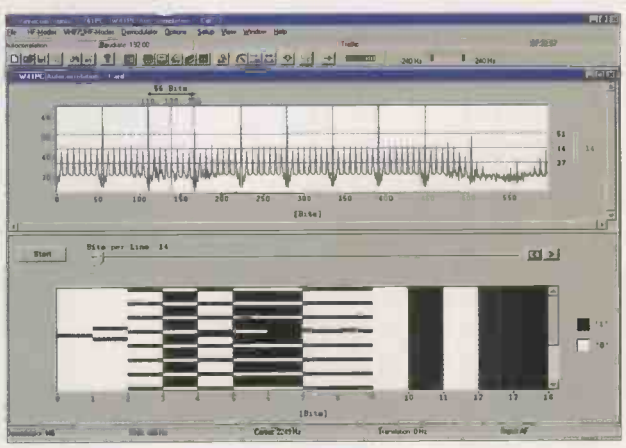
In fact, if you just select a mode and don't enter anything else it will still work it all out for you. This is really helpful stuff and integrates really well with the way real listeners operate.

Most people who splash out on a W41PC will have had some experience of utility decoding so will have that vital 'trained ear'. With this it's dead easy to spot what sounds like an ARQ-E signal. So rather than wait for the W41PC to do a complete analysis of the signal, you just select ARQ-E and the automation does the rest. Whilst tuning around the bands I found this technique to be by far the best way to make use of the W41PC's automation.

If you want to be really lazy, you can use the f.s.k. Code Check option to let the W41PC work out what's going-on. When you choose this the W41PC goes away and calculates the shift and baud rate and then attempts to analyse the resultant data and guess the mode. If it detects several choices - often the case when



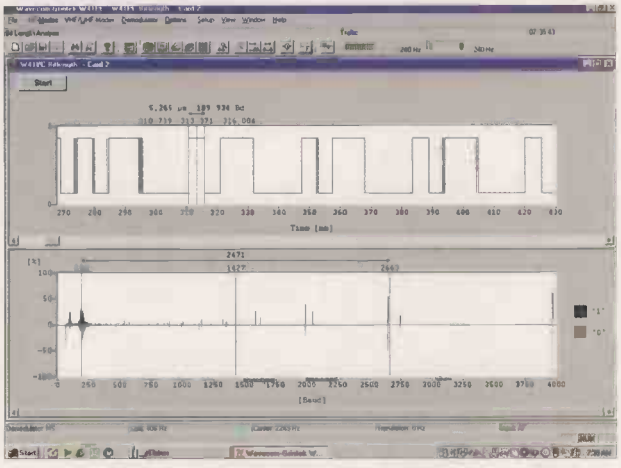
W41PC receiving an ARQE signal.



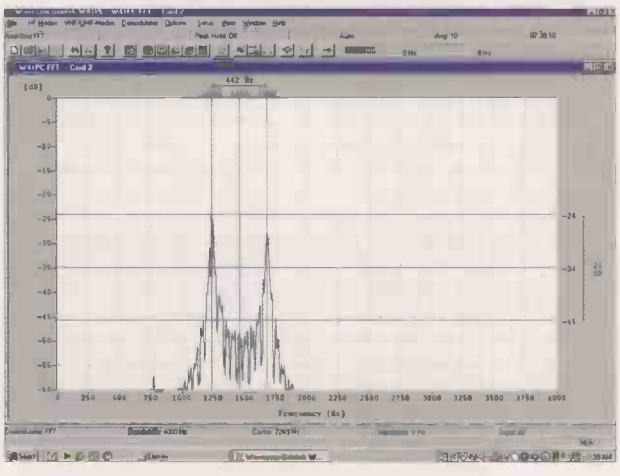
The excellent autocorelation analysis.

complex modes are idling - it presents the choice of modes. You then just double-click on the one you think it's most likely to be. If the W41PC manages to calculate the correct mode it passes the appropriate settings to the decoder and immediately starts displaying the decoded output on the screen.

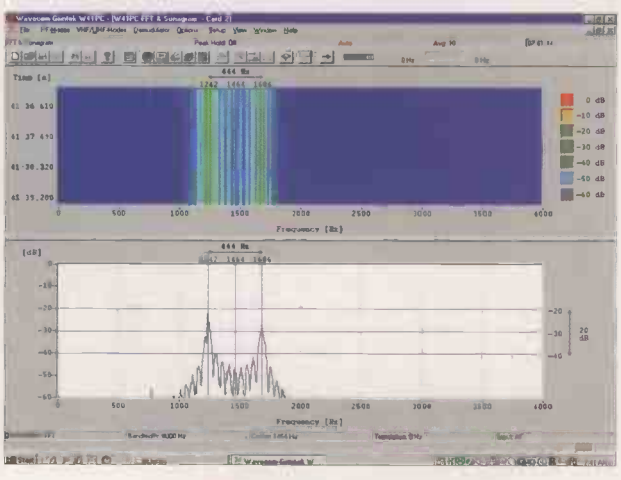
To be honest, I don't think many experienced listeners will make much use of this feature as I found it quicker to make a guess from the sound of the signal and use the automation just to add the detail.



Detailed Bit Length Analysis.



Easy Spectrum analysis with the FFT tool.



Dual display of analysis tools for more detail.

Three Sources

Certainly not in the case of the W41PC. The design team at Wavecom are only too well aware of the importance of the first stages in any decoding system. To support this, the W41PC can accept inputs from three sources: a.f. - conventional 'line-out' audio signal, h.f. - an intermediate frequency signal direct from your receiver in the range 14kHz to 1.5MHz and i.f. - another intermediate frequency signal input, but this time set at approximately 10.7 or 21.4MHz to align with that normally available from the more sophisticated v.h.f./u.h.f. receivers.

You also have the option to choose the type of decoding system you want to use. The recommendation is the you use the Mark-Space decoder for speeds below 300 baud, i.e. on h.f. When this is created, the d.s.p. chips are configured to create a filter Terminal Unit which has traditionally been the most successful for reliably pulling h.f. signals out of the noise. Above 300 baud the d.s.p. decoder is normally selected and gave equally good results.

Everything Under The Sun!

Yes it's true, the W41PC is able to decode a huge range of utility signals - 75 modes when I last counted. There isn't really enough space to list and comment on all of them - take a look at the Wavecom web site at: **http://www.wavecom.ch/** or the list at the end of the review.

Finding the mode you want has been made really easy as the mode menu has been grouped into the various main signal types. These were split between h.f. and v.h.f./u.h.f. systems, then further sub-divided into categories such as Duplex, Simplex, FEC, etc. There were one or two occasions when I wasn't sure where to look, but I just hit the Menu button to get to the large display of all the modes.

Whichever mode I chose, the automation worked a treat to fill-in the missing details. A good example of this was when I tuned in to ARQ-E station FF Marseille on 7.614MHz. The problem with the ARQ-E series signal is that they use a wide range of different baud rates. As it sounded like ARQ-E I just selected this mode and hit the Auto button. The W41PC then worked out the shift/baudrate and synchronises itself with the station ready to receive any messages. I really liked this method of automation as it fitted well with the needs of the more experienced listener.

Great FAX

One of the modes that I thought Wavecom had really well sorted was the reception of h.f. FAX signals. In fact, I would go as far as to say the W41PC delivers the best balance of performance and features that I've seen in any system. As you would expect, the W41PC includes an automated reception feature that can recognise and react to the standard weather FAX start and stop signals.

The only snag I found was that there was no way to automatically capture and save images to disk as individual FAXes. This means if you use the W41PC for totally unattended FAX reception, the result will be one continuous image that you would have to edit to extract an individual FAX.

That aside, the real gems of this mode were the implementation of the phasing and speed adjustments. If you've tried h.f. FAX reception before you will know the frustration of either slanted images or those with the edge in the middle! Wavecom have developed a very simple but effective solution to this. When use choose speed adjustment from the Options menu you are presented with a slider control on the screen and a pattern of dashed lines overlaying the FAX image. As you move the slider the slant of the dashed lines changes. All you have to do is line-up the dashed lines with your FAX image and you're done. It really is that simple.

Not only was it easy to do, but the use of multiple lines make it very easy to align a reference point in the FAX with a nearby dashed line. The phase adjustment was similarly simple, again using a slider, but this time the slider slid the FAX across the screen. All you had to do was slide the FAX until the edge of the FAX was at the edge of the screen. These two controls were just so well thought-out they made FAX reception a real dream.

Their operation was also aided by the W41PCs immense processing power which help make the adjustments both fast and smooth.

HAYDON Communications

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Mail order: 01708 862524

For main product lines see over

THE VERTICAL CYCLOPSE

This new short wave listeners antenna was initially made specifically for one of our commercial customers but we felt the general public would find it of great interest. At only just over 7 feet high this vertical short wave receiving antenna will give amazing results from 0.2-30MHz and thanks to its commercial construction you simply erect it and away you go. Length 7'6". Coax supplied: 20m and PL-259 plugs. SSP ~~£129.00~~.

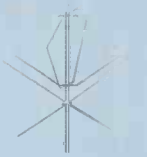
£79.95 P&P £10.00

Q-TEK WIRE CYCLOPSE

A unique ready to go antenna system that works from 0-30MHz. The antenna is centre fed with coax (supplied) and incorporates six tuned coils for optimum reception. The system also incorporates an anti-interference balun and comes ready assembled for immediate use. At only 15.5mtrs (51ft) long it will certainly fit most gardens. (Mounts horizontally down garden). Includes 20m coax lead and PL-259plugs.

£69.95 P&P £8.50

DX-1 PRO (R.F. SYSTEMS)



This is a professional wide band receiving antenna with a very high intercept point that ensures a low noise level allowing even the weakest signals to be heard. Constructed of high-impact plastic and aluminium alloy - the amplifier is protected inside a waterproof stainless steel vessel. The unit is supplied complete with mounting hardware and an indoor controller with PSU (coax not supplied). Freq. 20kHz-54MHz. Gain: +6dB (ref dipole). Intercept points: ≥+75dBm (2nd ord), ≥ + 50dBm (3rd ord). (Static protection included). For the true profile.

£299.00 DEL £10.00

Q-TEK D.C. 2000 DISCONE

SIMPLY THE BEST

A high performance wideband discone offering superb performance from 0.2-2000MHz. Transmit range:- 6m, 2m, 70cm, 32cm & 23cm (power handling 200W). Fitted with low loss 'N' type connector. Supplied with mounting brackets.

OUR PRICE **£54.95** P&P £10.00

Comments from John Griffiths

Putting the DC-2000 up gave me a tremendous boost to all signals with the ancient AR-2000 coming alive! Signals were well received and I found that I wandered out of airband.

ROYAL DISCONE

(Stainless steel)
Frequency range: receives 0.2-2000MHz, transmit 6/2/70 /23cm, connector N type. High sensitivity with an amazing range of transmitting frequencies. Comes complete with mounting hardware & brackets.
SSP ~~£49.99~~.

SPECIAL OFFER **£39.95** P&P £10.00

DX-10 (R.F. SYSTEMS)

A superb quality active antenna with a very high intercept point ideal for weak signal reception without increases in radiated noise. A truly amazing antenna! Freq: 100kHz-30MHz. Bomb-proof over loading figures, 90cm long, mains PSU + controller supplied (coax optional). Atmospheric-noise compensated sensitivity.

£159.95

DEL £10.00

AIR-44

(Airband base)
Prof quality base antenna for AIRBAND. (Civil & military). With SO-239 fitting (1.7m long). Gain 4.5/7dB.

PROFESSIONAL QUALITY

£69.95 P&P £10.00

AIR-33 (As above) 1m long. Gain 3/6dB.
£44.95 P&P £8.50

Q-TEK APOLLO 2000 MkII

A brilliant new compact indoor antenna that covers 0-1650MHz and is just 20" tall (collapsed). Supplied with coax and BNC plug fitted.
Ideal for table top mouning or by the window.

ONLY **£49.95** P&P £5

MLBA (R.F. SYSTEMS)

Ready assembled wire antenna offering low noise reception on long, medium, short wave (100kHz-40MHz) 12.5mts long. Magnetically coupled transfer system ensures reduced static noise levels and allows unwanted build-up to leak harmlessly to earth without damaging the receiver. (Subject to recvr. being earthed).

£59.95 POST £5.00

GLOBAL AT-2000

Deluxe SW ATU
0-30MHz. SO239 fittings.

ONLY **£85.00** P&P £5

(Probably the best ATU around)

PATCH LEADS AVAILABLE IF REQUIRED.

MINI-WINDOM

A low cost, superb passive broadband (500kHz-30MHz) antenna useable down to 150kHz. Ideal for indoor or outdoor use and at only 4mtrs long you most certainly will find the space! Using magnetic transfer technology, interference & noise is minimised. Ready assembled + PL-259/coax.

ONLY **£39.95** P&P £4.00

MLB (R.F. SYSTEMS)

The MLB contains a special impedance matching transformer which converts any piece of wire betwwn 6 and 20 metres long into a wide band receiving antenna. 100kHz-40MHz. Low noise - probably the best there is!

£39.95 POST £3.00

Q-TEK HF MINI TUNE

A superb mini HF ATU for hand-held scanners and desk-top receivers. (BNC fitting:- 0.25-60MHz). Was £49.95.

half price

£25.00 P&P £3.00

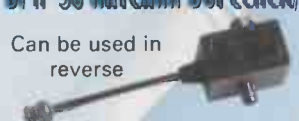
NEW ACT-2010

Mini active antenna. ★ Ideal for all scanners/SW receivers ★ 15-24dB gain ★ 5MHz-1.8GHz ★ 2AA battery or ext DC 3V. Comes complete with flying lead with BNC.

OUR PRICE **£69.95** P&P £4.00

DPX-30 ANTENNA DUPLEXER/COMBINER

Can be used in reverse



Ant A (0-30MHz)
Ant B (30-2000MHz) } To receiver low insertion loss

Allows two antennas to be connected to one receiver without interaction.

£49.95 P&P £3.50

RECHARGEABLE ALKALINE CELLS

Starter kit includes charger & 4 x AA cells. **£13.99** + £2.50 P&P.

Please note that only the special cells can be recharged with this charger.

Extra cells available @ 8 x AA pack £10.99 £1 P&P
4 x AA pack £5.99 £1 P&P 4 x AAA £6.25 £1 P&P. Rechargeable Alkaline. No memory effects. 1.5V cells. 3 x capacity of nicads.

SP-3 (PROFESSIONAL)

Two way combiner. one antenna feeds two scanners (without mismatch). 10-2500MHz. High isolation (BNC sockets).

Can be used in reverse

£49.95 P&P £3.00

SP-1 TWO WAY COMBINER (PROFESSIONAL)

Very high quality combiner allows two short wave receivers to be connected to one antenna without interaction. 50kHz-30MHz (SO-239 fitting).

Can be used in reverse

£49.95 P&P £3.00

HAYDON Communications

For accessories see over

Mail order: 01708 862524

NEXT DAY DELIVERY TO MOST AREAS. £10.00.

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hand-held scanners

ICOM IC-R2

Miniature wideband hand-held scanner covers 0.5-1300MHz (AM, FM/WFM). Search banks memories and many more features.

SPECIAL OFFER **£129.95**

Soft case for IC-R2 ..... £16.99

ICOM IC-R3 SAVE £50.00

'A first!' TV/video picutre & sound! Certainly a gadget for the future – see things you didn't know existed! A wide-band scanner covering 0.5-2.3GHz (AM/FM/WFM) with "TFT" colour display.

SALE PRICE **£399.00**

NEW ACT-2010 superb indoor active antenna. (5MHz-1.8GHz). See your picture & sound improve! **£69.95** P&P £4.00

ALINCO DJ-X3

Micro-handy scanner. 100kHz-1300MHz. 700 memories/stereo FM (earphones)/ attenuator/bug detector/audio descrambler. AM/FM/WFM/ Selectable tuning steps (incl's 8.33kHz).

£129.95
(incl's batteries charger)

MVT-7300EU

- Compact wideband hand-held receiver
- Covers 521kHz-1300MHz (all mode)
- 8.33kHz steps
- De-scrambler

~~£289.00~~

SPECIAL OFFER **£249.00**

Optional nicads/charger £19.95

AR8200 SERIES-2

Never before has one hand portable offered so much. ★ Covers 530kHz-2040MHz (all mode) ★ Computer control caperbility ★ 8-33kHz steps for the new airband spacing ★ Reaction tune caperbility ★ Includes nicads/charger/ antenna and car lead.

SALE PRICE **£389.00**

Soft case for AR8200 ..... £19.95

MVT-7100EU

Wideband hand-held scanner covers 500kHz-1650MHz. (All mode). Includes nicad/car charger/charger/antenna. Extremely user-friendly hand-held reciever with outstanding performance unmatched by its rivals.

SPECIAL OFFER **£199.95**

MVT-9000 MkII £329.95

Soft case for 7100EU/9000 - specify.. £19.99

mobile / base scanners

BEARCAT UBC-9000XLT

25-1300MHz wideband desktop scanner with turbo scan. (Selectable AM/FM/WFM).

Selectable tunning steps + alpha-numeric tagging.

"Our best selling desk-top scanner"

SPECIAL OFFER **£249.00**

FAIRHAVEN RD-500UX+

Superb wideband receiver (all mode) with over 50,000 memories capable of holding text. 20kHz-1750MHz.

UK's No1 PERFORMER.

SSP: ~~£999.00~~ SPECIAL OFFER **£749.00**

NEW AR8600

Extremely versatile all mode receiver (530kHz-2040MHz).

AR5000	£1345
AR5000+3	£1549
SDU5500	£799
AR3000A	£699

RECDUCED PRICE **£649.95**

ICOM IC-8500

Next generation wideband receiver. 0.1-2GHz. (All mode)

2 YR G'EE

Latest UK version

SALE PRICE **£1149.95**

+ FREE RS-8500 (PC software)

AOR AR3000A

Wideband communication receiver (100kHz - 2036MHz). All-mode (includes PSU).

SPECIAL OFFER ONLY **£699.00**

YAESU VR-5000

0.1-2.6GHz all mode receiver with DSP (optional) bandscope/ world clock and too much more to print.

The latest stat-of-the-art wideband communications receiver

A SNIP AT **£649.00**
(incl's PSU)

frequency finders

WATSON HUNTER frequency counter covers 10MHz-3GHz. Incl's nicad/charger/antenna.

ONLY £59.95 P&P £5.

Techtoyz micro counter	£69.95
Opto Cub frequency counter	£99.95
Opto Mini Scout 10MHz- 1.4GHz	£139.00
Opto Scout (400 memories)	£349.95

OPTO CD-100

10MHz-1GHz multicounter. Unit combines an RF frequency counter and an off-the-air decoder in one unit. Decodes: CTCSS, DCS, LTR & DTMR on a 16 character LCD display. Also features "reaction tune" for AOR/Icom scanners.

Was £369.95.

NOW ONLY **£199.95**

shortwave receivers

REALISTIC DX-394

★ Superb performance SW receiver ★ 0.2-30MHz (all mode) ★ Selectable tuning steps (down to 100Hz) ★ 240 or 12V ★ Digital S-meter ★ Attenuator ★ Key pad entry ★ 160 memories ★ Noise blanker. Was ~~£299.00~~.

SPECIAL OFFER **£149.95** P&P £10

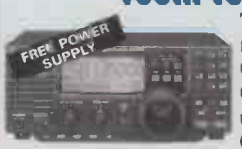
KENWOOD TS-570D6

This brilliant DSP SW receiver replaced the classic R-5000. In our opinion this is the best receiver below £1000.00

ONLY **£849.95**

2 YR G'EE

ICOM IC-R75



The short wave receiver for the true enthusiast.

- 0.03-60MHz (all mode)
- Synchronous AM detection
- PC control capability.

★★★★ *WRTH* gave it 4 star rating.

Optional DSP unit £85.00

SALE PRICE **£575.00**

SECONDHAND SELECTION

HF-150 + keypad	£199.95
HF-225 as new + am/fm	£229.95
FRG-100 excellent condition	£269.00
AR-8000 excellent condition	£199.00
AR-8200 as new	£299.00
ARD-2 ACARS decoder (new!)	£199.95
MVT-7100 as new	£149.95
VT-225 (v.h.f./u.h.f. airband)	£119.95
IC-R2 as new	£99.95
IC-R10 as new	£199.95
UBC-9000XLT desktop scanner (25-1300MHz)	£199.95
MVT-90000 MkII top of range hand-held scanner (0.5-2GHz)	£299.95

garmin gps products

STREET PILOT COLOUR KIT

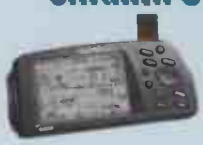
Includes 16 meg cartridge

Package includes UK metro guide mapsource CD, 16 megabyte datacard, PC interface cable, cigarette lighter adaptor, portable antenna + dashboard mount.

SALE £599.00

Garmin Street Pilot colour
£499.00

GARMIN STREET PILOT



UK's most popular GPS system. You may know where your coming from but do you know where your going? Garmin knows both. Superb-ready to use (with maps) car GPS.

SALE £349.00

Garmin Street Pilot UK combo kit complete ready to go
£449.00

GARMIN GPSIII+

Includes FREE map source CD worth £77.00.

Powered by AA cells or 13.8V, this compact navigational system gives detailed maps of the UK & Europe. Supplied with data lead and free on-board maps.

SALE PRICE £349.95

★ ★ SAVE £77.00 ★ ★

GPS-12 NAVIGATOR

(Now with 24 hour battery life) 12 channel receiver. Includes:- UTM, ordanance survey, waterproof to IPX-7 standard).

Normal sale price ~~£129.95~~.

LATEST MODEL

CRAZY PRICE
£99.95

SUBJECT TO AVAILABILITY

NEW GPS MAP 76

New GPS with built-in map database, new improved built-in antenna, 8 meg of spare memory on board (data lead supplied). Auto track log/waterproof and will not sink in water. Accepts mapsource CD data.

INTRO PRICE £329.00

GARMIN ETREX SUMMIT

First combination GPS, altimeter and electronic compass in one small box.

WATER PROOF

SALE PRICE
£189.95

Etrx "VISTRA"	new 24 meg memory	£339.00
Etrx "CAMO"	new model	£129.95
Etrex	Special offer	£109.95
Emap	Special offer	£199.95

portable receivers

WORLDSPACE HITACHI RH-WS1

Over 40 channels of crystal-clear, fade-free programming direct from satellite to your portable digital radio.
Original RRP ~~£249.00~~.

OUR PRICE
£149.00 Incl del

Optional utdoor Yagi antenna kit.....£49.95

HEAR SIGNALS FROM OUTER SPACE

WORLDSPACE ANTENNA

Picture for illustration only

4 element yagi (outdoor). Under 12" long! (You don't need a huge antenna like the one shown!).
Supplied as a complete kit with 25m of coax plus a low noise amplifier. Easy to fit.

£49.95 P&P £7.00

SONY SW-100E

★ Miniature portable all mode SW receiver ★ Station presets for 50 frequencies ★ Single side band system ★ Synchronous detector ★ Tuning in 100Hz + 1kHz steps ★ Includes compact antenna/stereo earphones/ carrying case RRP ~~£229.95~~.

SPECIAL OFFER £139.95 P&P £10

ACE-30	PSU for above	£24.95
AN-100	Active antenna	£64.95

SONY SW-30

The ideal holiday partner!
★ Fully digital world receiver ★ FM/MW/SW ★ Covers all short wave broadcast/MW plus FM stereo (on h/phones) ★ Programmable memories ★ Sleep timer + alarm function ★ 1kHz tuning for short wave.

RRP £79.95.

HALF PRICE £39.95 P&P £7.50

SANGEAN ATS-909

A superb performance portable/base synthesized world receiver with true SSB and 40Hz tunning for ultra clean reception. The same radio is sold under the Roberts name at nearly twice the price. Other features include RDS facility, 306 memories and FM stereo through headphones. The ATS-909 represents superb value for money.

SPECIAL OFFER £139.00 P&P £10

Optional PSU £16.95

SANGEAN ATS-818 ACS

★ Portable SW receiver with built-in cassette deck
★ 54 memory presets
★ Continous coverage 150kHz-30MHz (all mode)
★ SW tuning in 1kHz steps
★ FM coverage 87.5-108MHz.

SSP £199.95

SPECIAL OFFER £119.95 P&P £10

Optional PSU £16.95

special interest

REGULAR-GAINER RH-770

BNC 21cm flexible whip that is ideal as replacement

OUR PRICE £14.95 P&P £1.50

SUPER-GAINER RH-9000

BNC 40cm flexible model for the ultimate in gain.

OUR PRICE £19.95 P&P £1.50

JM-838

JUMBO WALL/DESK CLOCK.
● Wide screen/2" digit time display ● Barometer
● Calender ● Temp
● Auto RF synch clock from Rugby.

PRICE £59.99 P&P £5.00

RM-913

RADIO CONTROLLED CLOCK.
● 12/24hr alarm function
● Auto clock from "Rugby" RF signal
● Alarm function
● Backlight & more
● Incl's batteries

SPECIAL OFFER £11.99 P&P £2.00

The W41PC is available from the UK agents **Sight Systems Ltd., Woods Way, Worthing, West Sussex BN12 4QY, Tel: (01903) 242001, FAX: (01903) 504494,** **www.sightsystems.co.uk**

My thanks to Sight Systems for the loan of the review sample. The current price of the W41PC is £3,400.

It's often handy to be able to check the quality of the FAX image you're receiving and the W41PC provided this through the zoom that was conveniently assigned to the right mouse button. The zoom range was 10% through to 400%, but I found that 100 or 200% was just right for checking image quality.

Save The Day

When you've managed to find something useful you have the option to save the information in a number of formats. The most obvious is to save the result as a W41PC file which is the best option if you want to be able to view the information later using the W41PC. You also have the option to save the result of your efforts either as a bit-map - ideal for FAX or as text - ideal for messages. You can also make a selection and save just part of the screen if you wish.

VHF/UHF

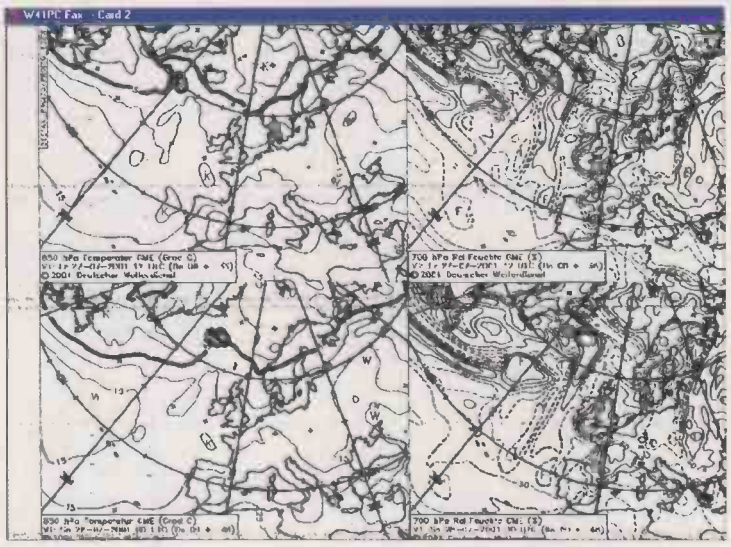
Although I have concentrated on h.f. based utilities in the review, the W41PC contains an impressive range of modes and analysis tools to support the higher frequency modes. Included in this is decoders for all the Selcall and pager systems plus the MPT1327 trunked radio system. The analytical tools are supplemented by some specialist phase-shift analysis displays to help make sense of the wide range of signals available.

Manual

The review wouldn't be complete without a mention of the excellent owners' manual which is supplied in a hard A4 folder printed on high quality paper. Not only did the manual cover all the operation points with plenty of diagrams, but it also provided some valuable insights to the workings of the different modes.

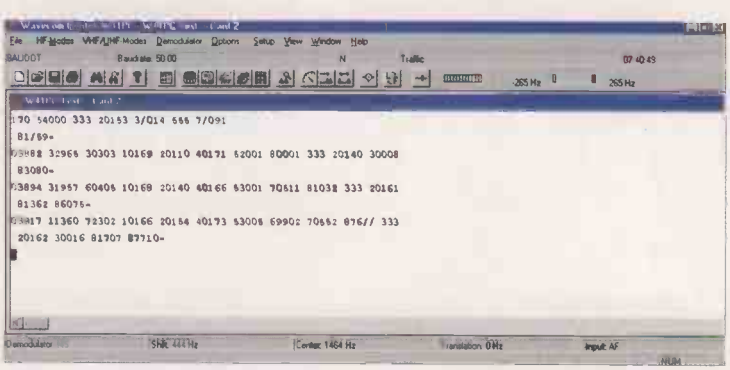
Summary

There is no getting away from the fact that the W41PC is a very sophisticated decoding and analysis system. You can sense the processing power as soon as you start to use it because all the signal displays are so much more lively than many Soundcard based systems. I've only scratched the surface of what it can do in this review. However, the power and sophistication of the W41PC also means that it is not really suitable for beginners - though I suspect the price will be the main deterrent for new listeners. If you really want to start taking h.f. and v.h.f. signals apart the W41PC needs to be somewhere on your shopping list. ***SWM***



Typical FAX image received during the review.

The huge range of W41PC modes.



W41PC receiving a RTTY signal from Hamburg Met.

Which came first
The Chicken or the Egg?

Another month, another classic that would grace the station of any short wave listener. This time, John Wilson looks at the Racal RA6790 receiver.

I refer in fact to the Racal RA6790/GM and RA1792 receivers, but thanks to some research, I think I have the answer. The Racal 6790/GM is another of those moderately rare receivers which enthusiasts talk about with some respect. I had never actually handled a sample, but thanks to some loose talk on the Internet about the RA6790 being 'deaf', a brave reader of *Short Wave Magazine* offered me a 6790 for review. How could I refuse? I will remove the /GM from further references in this article.

Common Background

The RA6790 was the result of an American government contract for the R-2174 URR, and I am told that designers from Racal UK went to the US to finalise design and make the first production units. The design was subsequently further developed back in the UK and became the RA1792, which was sold on a world-wide basis.

The prefix '67' denotes a US market product, whilst '17' denotes a UK product - seemingly simple, but I didn't know this until recently. We all learn something every day. The fact that it's an almost unknown receiver in the UK is due to this American contract, which means that our cousins over the pond know a lot about the '6790, but are quite unfamiliar with the RA1792.

When you look at the RA6790, the relationship with the RA1792 is fairly clear, but take a look inside both receivers and it is not only clear, but blindingly obvious that the two receivers have a common background. Take a look at the service manuals and spend some time comparing circuit details and you find that many of the sub units are virtually identical. This being so, it was a little surprising to compare side by side performance measurements of the two receivers and find significant differences.

I wish I'd been in manufacturing in those heady days when government contracts were being dished out with such gay abandon, and companies like Racal and Collins and GEC and Uncle Tom Cobley Ltd. were all snouts in the trough on open ended cost plus contracts. But I wasn't, and we enthusiasts now have to say thank you to this period for providing us with a plethora of fine receivers which we could not possibly have afforded when they were current production. Such as the RA6790!

It's A Receiver!

Out of the box comes a solid feeling receiver weighing 13.5kg (30 pounds) and occupying a standard 19in wide panel of 3U height (5.25in) remembering that rack panels are all specified in Imperial measure (pause for a brief burst of Elgar and remember Waterloo, Trafalgar, Crecy, Agincourt, Harfleur and a few more). Once more unto the breach, dear friends, once more.

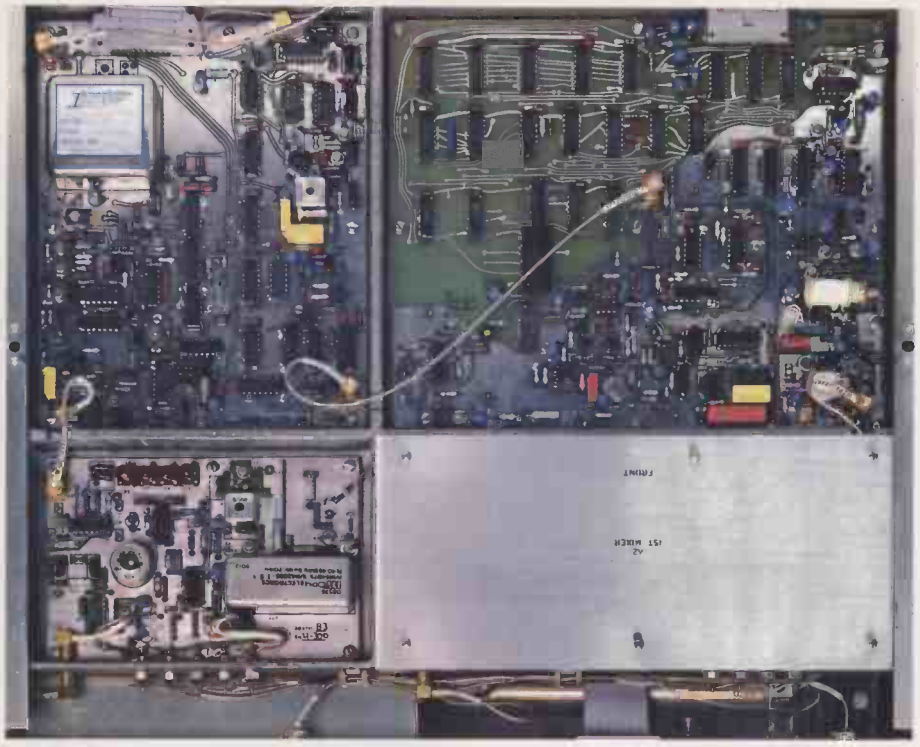
The RA6790 is, astonishingly, a receiver. That is to say it has a frequency display, a tuning knob, buttons for each function and the necessary controls to allow an operator to actually drive it. There are no multi-function controls, no d.s.p., no memories, no scanning - it's a receiver, plain and simple! Well, perhaps not so simple because there obviously has to be some processing power inside it to control all the functions along a data bus, but from the operator's point of view, it's all straightforward.

The front panel is classically elegant, with the familiar large Racal tuning knob, nicely

weighted for the right 'feel' and placed at just the right height above the bench top for comfortable operation. Above the tuning knob is a long l.c.d. which shows the operating frequency down to 1Hz, with a sub display showing b.f.o. offset to ±8kHz in steps of 10Hz. The b.f.o. display is only shown when in c.w. mode.

To the right of the main tuning knob is a membrane keypad for direct frequency entry and as in other receivers of this type from Racal you have to remember to enter leading zeros if you want to operate below 10MHz. In other words, 9MHz has to be entered as '09', but since this is now commonplace among data entry systems, it doesn't present a problem. (But it's still easy to get confused when entering frequencies below 100kHz 'cos you forget how many zeros to put in).

On the same keypad are the buttons for changing the tuning rate, electronically locking the panel controls, tuning and zeroing the b.f.o. in c.w. mode and the local/remote control changeover. The 'enter' button is the one you have to remember to press before entering a frequency from the keypad.



Three Rates

Tuning rates are selected by repeated pressing of the 'rate' button and the three rates are well chosen to cover most users' needs. There are 100 tuning steps per revolution of the tuning knob, with 'fast' tuning in 1kHz increments giving 100kHz per revolution, 'slow' tuning in 30Hz increments giving 3kHz per revolution, and a very fine tuning rate of 1Hz per increment giving a silky smooth 100Hz per knob revolution.

The very fine rate is not announced on the display, and an anomaly here is that if you are using the tuning knob in the very fine tuning rate, you cannot access the keypad for direct frequency entry, but this is a comment not a complaint. It's simple enough to poke the 'rate' button to show 'slow' whereupon the keypad is accessible.

At the far left is another membrane keypad carrying mode selection, filter bandwidth selection and a.g.c. delay times. Other buttons select sidebands in i.s.b. mode and change the metering from r.f. level to audio lone level.

Monitoring of the receiver settings is done by a second l.c.d. panel, and this displays the current settings for bandwidth, tuning rate, a.g.c. delay, manual gain control, mode in use and the signal meter. The information on this particular panel is easy to read and unambiguous except for the signal meter bar graph which is really hopeless except as a very rough indication that something is happening.

As a calibrated measuring tool it is quite useless, and taking a look at what JRC have achieved in their quasi-analogue displays on the more recent NRD series of receivers shows us just how far display technology has advanced since these early days. Early days? The handbook which came with the receiver is dated 1982 which astonishingly I remember as the year of the Falklands campaign, and until typing this still thought of as fairly recent! Where did those 19 years g

What About Reception?

Reception modes provided are u.s.b., l.s.b., c.w., a.m. and f.m., i.s.b. is available as an additional option. Once again we have the oddity in that all fitted i.f. filter bandwidths can be selected in a.m., f.m. and c.w. modes, but u.s.b. and l.s.b. are restricted to the single bandwidth determined by the matched pair of s.s.b. filters. The f.m. bandwidth is ultimately limited to the 20kHz bandwidth of the roofing filter, so the mode is strictly for narrow band communications signals, not for wide band broadcast f.m.

The handbook for the RA6790 lists a bewildering array of i.f. filters including no less than 10 mechanical filters from 300Hz to 6kHz, with two different bandwidths for s.s.b./i.s.b. use. In addition to these mechanical types, there is a list of 23 different crystal filters including a surprising 75Hz bandwidth, so when you pick up one of these receivers from the second user market, you have to be fairly careful in determining what is fitted in the filter slots. The other thing to watch out for is that the receiver offered either soldered-in or plug-in facilities, but not both, so you may end up with a receiver with the filters soldered-in and therefore not exchangeable.

The review receiver seems to be fitted with what the handbook calls the 'standard' complement of mechanical filters comprising a matched pair of s.s.b. filters which are asymmetric, with four symmetrical mechanical filters having bandwidths of 300Hz, 1kHz, 3.2kHz and 6kHz. A fifth bandwidth is provided by a straight through link which means that i.f. selectivity is then determined by the 20kHz roofing filter at 40.455MHz in the first i.f. conversion.

The significance of having a pair of asymmetric filters for u.s.b./l.s.b. selection is that in professional receivers it is normal to have the filter slope nearest the carrier frequency (corresponding to low audio frequencies in the demodulated signal) much steeper than the slope on the other side of the filter (corresponding to high audio frequencies in the demodulated signal).

In the case of the RA6790 s.s.b. filters, the carrier side slope is 3/60dB in 150Hz, whilst the high side slope is 3/60dB in 1300Hz - quite a difference. Note also the standard Collins/American method of quoting noise bandwidth at the -3dB points rather than the customary -6dB.

The filters can be installed in any order on the plug-in board, because the built in test (BITE) system automatically measures the filter bandwidths on start-up and arranges them in ascending order of bandwidth selected by buttons BW1 to BW5 on the front panel keypad. The u.s.b. and l.s.b. filters are also measured and allocated to the correct mode select buttons. Clever facility which the AOR AR7030 carried a stage further by having a function which automatically measures the fitted filters and then displays the actual bandwidth on the main receiver display - but not many people know that!

Self-Check

The RA6790 can be re-initialised using the BITE system by using the 'lock' and 'AM' buttons in a two step sequence and this will start the receiver on a full self-check. Should something be amiss during any of the tests, the display will show a two digit error code, the meaning of which can be determined from a table in the manual. Mind you, what you choose to do after an error message is displayed is something else, and I will repeat my cautionary message to you regarding the need for skilled attention should anything require adjustment or repair.

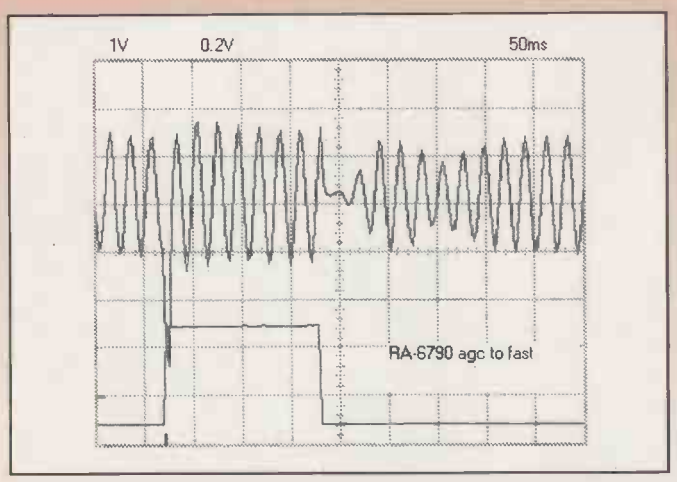


Fig. 1: The RA6790's audio response to a step r.f. input for 'fast' a.g.c. setting.

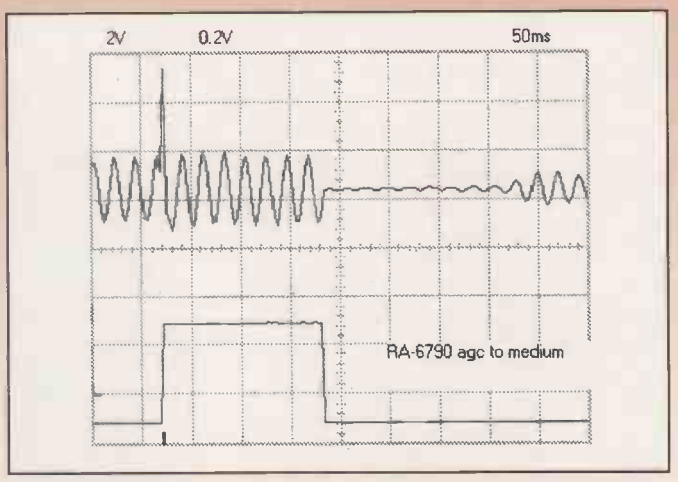


Fig. 2: The RA6790's audio response to a step r.f. input for 'medium' a.g.c. settings.

The a.g.c. system provides ideal facilities because you can select full a.g.c. control, full manual gain control or manual gain control as a 'pedestal' with the a.g.c. sitting on top of the fixed gain pedestal. Three a.g.c. delay times are provided, 'fast' with a 30ms delay, 'medium' with a delay of 200ms, and 'long' with a delay of 3.75 seconds. I call these delay times rather than decay times because Racal chose to use a hang type a.g.c. system in which the receiver gain is held down for the delay period, followed by a controlled return to full gain at the end of the delay.

The effect can be seen in **Fig. 1** and **Fig. 2** which show the audio response to a step r.f. input for 'medium' and 'fast' a.g.c. settings. Also shown is the now expected 'pop' at the start of the r.f. burst, caused by a slower than ideal attack time in the a.g.c. system. The handbook gives the attack time as 20ms for all a.g.c. settings, which is probably too slow for s.s.b. communications channels.

During my a.g.c. tests I also discovered a strange situation, shown in **Fig. 3**, where the audio recovers at the correct point, 200ms after the end of the input signal, but then takes a second 'bounce' for a further 100ms before finally recovering. Very odd, but it causes no audible effects in normal listening since it seems to occur only at specific level changes in the input signal.

Fed Directly

Circuit architecture is typical of the professional receivers of the era, with antenna signals being fed directly to a double balanced mixer along with a high level (about +20dBm) local oscillator from a frequency synthesiser covering 40.955 to 70.455MHz, the first i.f. being 40.455MHz. It is said there is a version of the RA6790 which allows the synthesiser to tune down to 40.455MHz (i.e. an antenna input range down to zero frequency), and in fact when I looked inside the review receiver I found that the PROMs on the controller board were labelled 'VLF'.

Discussions among RA6790 enthusiasts in America are continuing on the topic of whether or not this is a 'genuine' Racal modification, but I get the feeling from looking at the performance of the RA6790 that it is just a software change to remove a block on the synthesiser, and offers no guarantee of performance below 500kHz. An a.g.c. controlled three stage first i.f. amplifier and the 20kHz wide roofing filter follow the first mixer, and than the signal passes into another balanced mixer using the well known MC1496P device, much loved by the Japanese amateur radio manufacturers and regularly appearing in their designs. In fact, this device is still chosen and used by manufacturers, so it's had a long life for a semiconductor linear i.c.

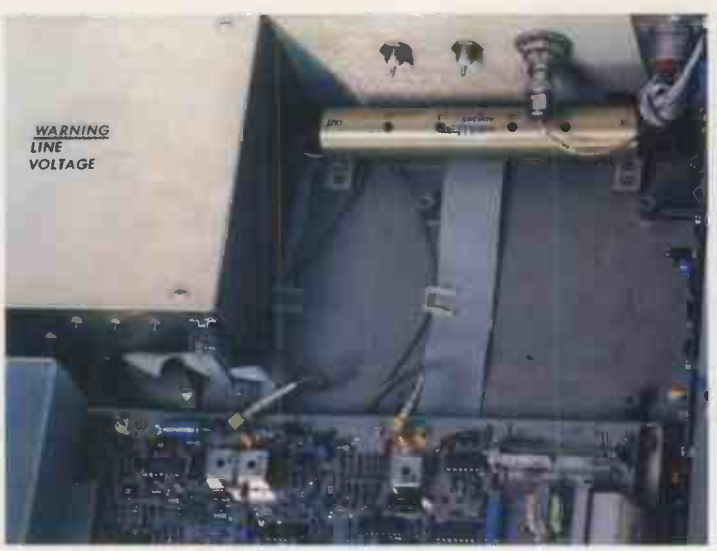


Image Rejection

A low pass filter follows the second mixer to help image rejection, and the 455kHz signal is amplified in a single high gain stage before being passed to the main i.f. filter bank. It's unusual to find that the inputs of all seven filters are fed in parallel with no switching, the filter selection being carried out only on the output end of the filters by the commonly employed diode type of switch. This means that there is a lot of stray 455kHz flying around the input end of the filters and this shows up as a compromised filter ultimate rejection performance.

The same knowledgeable enthusiasts have devised modifications to switch and ground both ends of these filters, and their results would indicate that such changes are well worth incorporating. The stop band leakage can clearly be heard when tuning within a few kHz of a strong signal, and my 900/909/918kHz check when carried out after dark when signals are high, clearly demonstrated the leakage. It's not dramatic, but it's there.

After the 455kHz filtering, there is further gain in an a.g.c. controlled i.f. amplifier and then we reach the demodulators for the various modes. Both s.s.b. and c.w. are demodulated in another MC1496, and f.m. is passed to another familiar linear block using an MC1357 which demodulates the f.m. signal to audio. However, the MC1357 contains a high gain limiting amplifier, and as we have seen in other designs (the idea must have come from a semiconductor manufacturer's application note) the heavy limiting can strip off most of the modulation from an a.m. signal leaving a square wave version of the a.m. carrier.

In the RA6790 this amplitude limited carrier

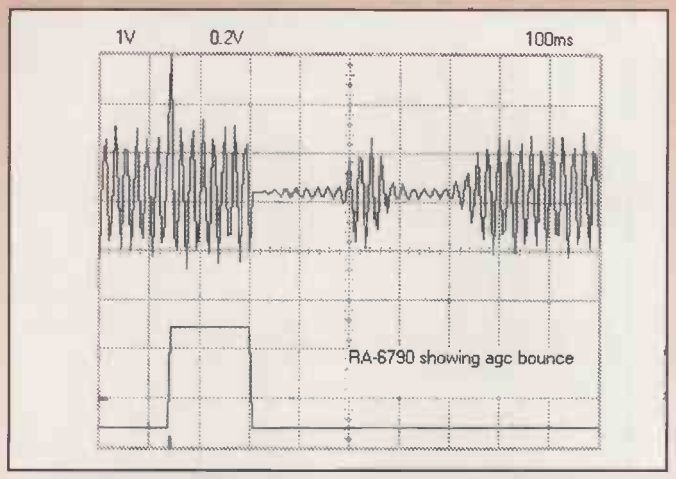


Fig. 3: Strange a.g.c. situation.

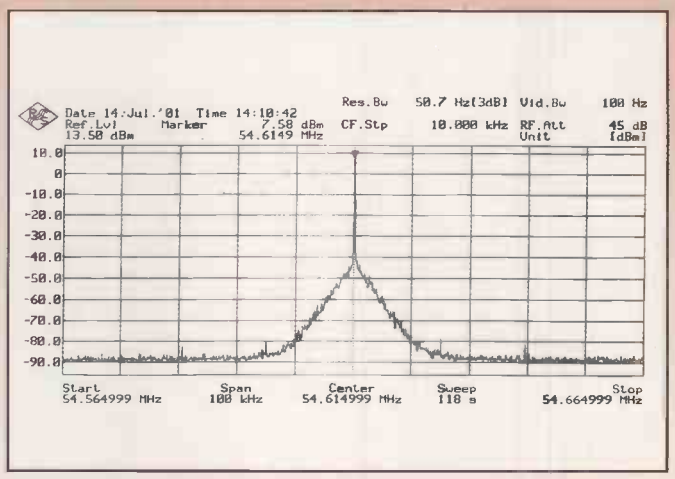


Fig. 4.The RA6790's first conversion oscillator plot, not as good as a RA1792!

is then fed to the s.s.b./c.w. product detector where it is used as the demodulating carrier for the incoming a.m. signal from the i.f. amplifier chain. Because the amplitude limited carrier is of a constant high level, it effectively 'over-writes' the real carrier coming in with the a.m. sidebands and the combination of the MC1357 and MC1496 become a 'Homodyne' detector which has the great attribute of minimising selective fading effects due to the carrier and sidebands changing in relative amplitude during (usually night time) propagation conditions. It's in effect a type of synchronous a.m., but a 'cheap' version and nowhere near as good as a properly designed synchronous detector with a phase locked local carrier generator.

Why is not so good? Because however severe the amplitude limiting inside the MC1357, and the almost universal use of 'Optimod' types of compression system which can deliver 100% modulation on negative going audio peaks, and up to 110% modulation on positive audio peaks, the limited carrier will still contain modulation components, and under heavy modulation you get serious distortion of the a.m. carrier into the s.s.b. detector and corresponding distortion in the audio coming out of it - and it is clearly audible as a 'grittiness' in the audio on modulation peaks. That being so, this type of homodyne detector was used by JRC in the NRD line until recently being supplanted by d.s.p., so the technique has been around for some time.

Clean & Crisp

Audio recovery on all modes is good, with s.s.b. signals sounding clean and crisp, and the gain distribution inside the receiver seems well constructed with none of the ear-aching noise roar at the end of transmissions - also thanks to the good a.g.c. characteristics despite the 'pop' effects. So far, all is subjective, but I did carry out my usual tests on the RA6790 and here are the results:

Sensitivity

Frequency (MHz)	Mode	Filter (Hz)	12dBm SINAD (dBM)
14.20	u.s.b.	2.4	-116
14.20	c.w.	0.5	-123
14.20	a.m.	6	-107
14.20	f.m.	8	-112*
9.50	u.s.b.	2.4	-116
6.50	u.s.b.	2.4	-115
2.20	u.s.b.	2.4	-116
0.90	a.m.	6	-108
0.20	a.m.	6	-102
0.06	a.m.	6	-91

*(3kHz dev.)

Note the obvious falling-off of performance at lower frequencies outside the receiver design range.

Third order intercept point using two signals 20kHz apart came out at +25dBm with a dynamic range of 103dB which is better than specification, whilst second order intercept was at +53dBm with a dynamic range of 91dB. This rather ordinary second order performance show the lack of preselection in the receiver.

Reciprocal mixing performance which highlights purity or otherwise of the first conversion oscillator (mainly) was poor at close-in spacings, getting better beyond 50kHz.

Spacing (kHz)	dBc/Hz
5	-99
10	-105
20	-115
50	-139
100	-146

The change between 50 and 100kHz away from the carrier was interesting, so I did my usual plot of the first conversion oscillator signal which you can see in **Fig. 4**. The noise pattern around the signal is quite surprising, and compared to the cleanliness of a crystal oscillator absolutely awful.

It is quite obvious why the phase noise is poor close-in, and you should also note the presence of little spurious carriers at ±15kHz and ±30kHz which got in the way when I was doing the intercept point checks. Mighty strange. I may pursue this subject in a separate article in the not too distant future, because my records for the RA1792 don't show the first oscillator to be this noisy. Perhaps Racal did some design changes between models, but I'll have to compare the circuits directly in order to see if that is the case.

Just to put things into context, I did the same measurements on a Kenwood TS-900 transceiver made a bit before the '6790 and here are the phase noise results:

Spacing (kHz)	dBc/Hz
5	-128
10	-145
20	-149
50	-150
100	-152

Now that's what we call a clean oscillator!

Summary

The RA6790 is another classic and would grace the station of any short wave listener. As I said earlier, we enthusiasts owe a great deal of gratitude to the manufacturers who made these receivers for military and government contracts, and as in the days after WW2 when the AR88, HRO, BC-348 and all those expensive receivers appeared on the surplus market, the appearance of the Racals and Collins and Cubics now which are a result of downscaling after the end of the Cold War, is a stroke of good fortune for all of us. Paying up to £1000 for some of these receivers is actually a bargain when you compare the price of anything new, and you should just note how few manufacturers are actually making new receivers. My message to you is, if you want a good receiver for general use, buy it soon before they all disappear.

In a way, the RA6790 is a much more sophisticated version of the WW2 classics, and

The Chicken or the Egg?

the performance overall is excellent. Everything works correctly, operation is easy to understand (a button for each function), and the fact that this was a Racal design when the company was at the height of its powers is a bonus. Audio and a.g.c. work well in all modes (apart from the itty bitty gritty a.m.) and although the phase noise lets it down a little, it's still a great receiver. I would rather have an RA6790 than any of the new receivers of the last five years, and that says a lot.

Eternal Thanks

My eternal thanks to the brave chap who loaned me his receiver, and thank you to all those who have expressed a liking for my articles. I'll repeat again that all I do is sit in your seat and try out receivers on your behalf. I try to be totally objective and write the story as it is. If I find a serious problem with equipment, you can be sure I'll let you know, so further thanks are due to the Editor of *Short Wave Magazine* for being courageous enough to tell the unvarnished truth on its pages.

Happy listening. ***SWM***

Typical Racal.

Decoding, Past, Present & Future

As a special treat this month Mike Richards takes a look at decoding from its beginnings right through to where he thinks it could end-up in the future!

In The Beginning

It is impossible to say when it all started, but back in distant time the only way to signal across long distances was to use drums, guns, bugles, bells, fire or smoke! A classic example of this was the elaborate chain of beacons that was put in place to give Queen Elizabeth warning of the arrival of the Spanish Armada. This was very sophisticated because the beacons were also used to summon the muster parties to fight the Spanish as well as provide a warning to the Queen. They even had a standby system for bad or foggy weather. This used a relay system of horsemen to carry the messages.

The first significant development of a more versatile system that could handle a range of messages was the introduction of flags and semaphore. What's amazing, is that it was such a good system that it's still in use today. That makes semaphore the most successful and long lived remote message system ever. If you fancy taking a look at the semaphore code, the following Web site might prove interesting; **http://www.anbg.gov.au/flags/semaphore.html**

The five-key keyboard used in Baudot's telegraph.

Telegraph

You may be forgiven for thinking that Morse code was developed before the first telegraph you'd be wrong! The very first telegraph was developed by German inventor Samuel Soemmering in 1809. This used a separate wire for each character of the alphabet - about 35 in total. At the distant end, about 600m away, the wires were placed in a tank of acid. As an electric current was applied to a wire, a stream of bubbles would rise from the appropriate wire at the distant end, not the most commercially viable system, but it was a start!

The real beginning of a workable system came when Samuel Morse and Alfred Vail were issued a patent for a telegraph system based on the use of electromagnets. This started the electronic communication revolution because the Morse telegraph could send signals over huge distances, providing there were relay based repeaters every 16km or so. With the development of the standardised International Morse Code, this system really took off and has only very recently slipped out of main-stream commercial use. The great attraction of Morse Code based systems is their pure simplicity, there aren't many communication systems that you could tap-out on a radiator! The simplicity of the Morse system also found favour in the early days of radio communication. The main Morse code users these days are radio amateurs and the attraction for many, including me, is the fact that sending and receiving Morse is more of an art form than it is a technology.

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Continued on page 33

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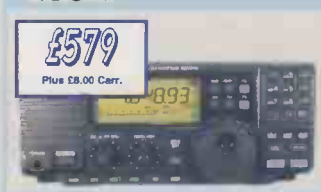

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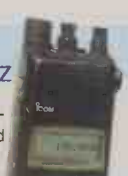

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This palm size handy offers great performance. Offers FM, WFM and AM * Auto squelch * 400 Memories * 11 Tuning steps * CTCSS decode * Duplex monitoring feature * PC Programmable * Built-in attenuator * Priority watch * Needs 2 x AA cells (extra). Antenna included.

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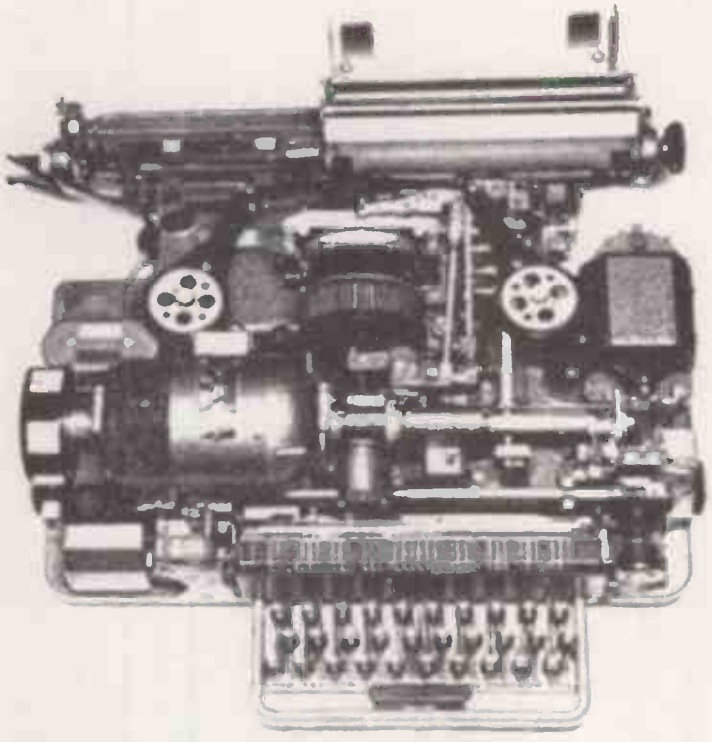

inside creed: A look inside the Creed 7B.

Need For Speed

Whilst the Morse code based telegraph system took the world by storm, they were expensive to run because skilled operators were required and comparatively slow, 25 to 30 words per minute was just about the upper limit. The commercial development therefore focused on ways to automate the sending and more importantly the reception of telegraph messages. These started with machines that could record the telegraph signal as printed dots and dashes on paper tape, but this still needed a trained operator to convert the result into a usable message. The next important breakthrough came in 1880 when Frenchman Emile Baudot developed his new printing machine, which used his 5-unit code to represent letters of the alphabet.

The breakaway from Morse's code needed a new transmitting key and Baudot used a neat 5-key piano keyboard. To operate this required use of two fingers on the left hand and three on the right. The beauty of the system was that each character could be sent very quickly and provided an excellent platform for future automation. On the down side, manual operation required a very skilled operator as the letters had to be sent at a steady, unvarying, rate. The technological transformation came thanks to the efforts of a certain young Fredrick Creed.

Creed decided there had to be a better way to generate and print messages than Baudot's system, so he left his job as an operator with the South American Telegraph and Cable Company in Chile and sailed to Glasgow to start putting his ideas into practice. Using a second-hand typewriter as the basis of his experiments he produced a compressed air powered transmitter which was taken-up by the British Post Office in 1902. Spurred-on by his success, Creed set about automating the reception of messages. This started with development of the re-perforator, which took the received telegraph signal and produced a punched tape that was an exact replica of the original message. Creed then went on to produce a machine that read the paper tape and converted the code into plain text. This was the real birth of the printing telegraph and Creed's machine could do this reliably at an astounding 200 words per minute. One other notable development that helped Creed was New Zealander, Donald Murray's work to adapt Baudot's code to make it more suitable for use with an electromechanical printing system. The Creed teleprinter system was a tremendous commercial success and most of the systems that are used today have their origins set firmly in the pioneering work done by Morse, Creed, Baudot and Murray. For a detailed paper on the early telegraph codes take a look at this link:
http://www.rtty.com/England/fiveunits.htm

Electromechanical RTTY

Once the use of the new printing telegraph spread to the radio spectrum it was not long before keen listeners and amateur operators starting findings ways to use the technology. The transmission method for the RTTY signal was much the same as it is today and used what's called frequency shift keying. This is where the carrier frequency of the transmitter is altered in synchronisation with the RTTY signal. In a typical system the difference between the two possible frequencies, known as the shift, would be around 400 to 850Hz with 850Hz being more common in the early systems. To receive a RTTY signal you first needed a suitable printing teleprinter, but also an electrical converter known as a terminal unit to convert the audio signal from the receiver into a suitable current source to drive the electromagnets in the teleprinter.

One of the earliest units available to enthusiasts was the Alltronics Teletypewriter Model A Receiving Converter. This appeared in 1955 and used all-valve technology and a neat magic eye tuning indicator. As you would expect at this time of great progress, there were lots of ingenious designs published in various magazines to support this growing interest area.

The next significant step came with the development of the transistor, although the relatively high voltages and nasty spikes from the electromagnets represented a significant design problem. One of the most successful Terminal Units to come from this era was the ST-5 designed by **Irvin M. Hoff W6FFC** and published in the *RTTY Journal* in May 1970. One of the secrets to its success was its use of 88mH toroidal inductors that had become readily available on the surplus market. The use of these inductors and some well-designed electronics produced a terminal unit with top-

Compukit UK101 pioneering home computer.

The man himself, Emile Baudot.

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PK-232

flight performance that was still used by contest operators up until very recently. I wouldn't be surprised to find the ST5 still in use. When the ST5 was first introduced the only practical option for displaying/printing the RTTY text was to use a standard teleprinter. As a result, listeners of the day needed to have good mechanical engineering skills as well as their radio knowledge. Probably the most popular and affordable teleprinter for amateurs was the Creed 7 series, though they were definitely not for use in the lounge! They were heavy and noisy and required a separate room away from everyone else! The other teleprinter that gained favour was the Creed 444. This was much bigger than the 7 series but much of this bulk was taken-up by large outer case and soundproofing that was necessary to make the 444 usable in an office environment.

For many listeners, the problems associated with running a teleprinter based system were a major deterrent and this aspect of the hobby was reserved very much for enthusiasts. For a more detailed look at the early days of the teleprinter try this web site: **http://www.samhallas.cwc.net/telhist1/**

Enter The Microprossessor

The development of the microprocessor has had a major impact on just about all our lives and it was certainly responsible for bringing about a transformation in the world of data and telegraph decoding. The very early days of home computing were dominated by machines such as the Compukit UK101 and the Tandy TRS-80. For most enthusiasts the limiting factor was price, that's where the TRS80 and UK101 really scored as they were just about affordable. I must say that I have very fond memories of building my first UK101 back in the autumn of 1979. Software for these early computers was largely home-made and developing RTTY programs inevitably meant learning 6502 or Z80 assembly language and going through a fairly laborious process to build a working program. Nonetheless, this provided an excellent learning ground for keen young enthusiasts and many new careers were born in this era.

During the early 80s home computing really took off with famous models such as the BBC B, VIC 20, Commodore C64, Dragon 32, ZX Spectrum to name but a few. All these new computers were supported with an ever-growing range of specialist software that was primarily designed to support amateur radio operators. When it came to producing software for these new machines, one or two manufacturers stood out with successful packages. Grosvenor Software's BMK Multi combination was very popular with radio amateurs and listeners alike as was Technical Software's excellent support for a wide range of computers. The main modes to be found on the h.f. bands at this time were c.w., RTTY, SITOR and FAX. Many of these computers and software combinations were extremely good and did all you would ever need to do when operating RTTY, AMTOR or c.w. They featured stored memories for common messages and included the facility to operate at different speeds and record the recovered text to a disk file.

At this point in the development cycle, all these programs relied on the use of some form of terminal unit between the receiver and the computer. Most of these were updated versions of the ST5, though there was one breakthrough with the introduction of a range of Phase-locked loop integrated circuits. These were typified by the NE556, which many manufacturers quickly adopted as the foundation of a much simpler and cheaper form of Terminal Unit. Unfortunately, many early versions were plagued with design problems and those wanting the best results stuck firmly with the filter based terminal units.

Stand-Alone Decoders

To many listeners the thought of getting involved in complicated and expensive computers was not at all attractive. The market responded to this with a rapid rise in the development of stand-alone decoders. These decoders accepted an audio signal from your receiver and displayed the decoded output on a basic monochrome monitor. In those days high-resolution 17 monitors were a figment of the imagination and most listeners had to put up with second-hand 9in green screen

Sample code conversion charts for early telegraphs.

monitors! Controlling the decoders mode and other settings was done using an array of buttons on the front panel.

Although these stand-alone units were very convenient, the most sophisticated versions were very expensive. At the top of the range were units like the Wavecom 4000 series and the Universal M-8000. For the general user the ERA Microreader was very popular and the Easy Reader DM-1000 worked well.

Amstrad Hits The Spot

The 1980s were probably the most exciting times in terms of computing developments with a huge range of computers being launched every year. The one problem was that all the computers were different and needed specialist software, there was no standardisation at all. IBM were eating away at the main business market with their Personal Computer, but it was too expensive to attract much interest from the amateur or domestic market.

Entrepreneur Alan Sugar was quick to spot this market opportunity with his Amstrad company launching the PC1512 PC clone in 1986. The impact was staggering and this model quickly captured 25% of the European computing market! As well as making Alan Sugar a rich man, the launch of this PC helped pull the computing world towards the IBM PC as the standard. Whilst some other makes battled on, the competition to get into the PC compatible business was great news for radio enthusiasts as the prices really started to plummet whilst the computing power grew rapidly.

Standardisation was really good for software development and a number of new programs and modes started to appear. The most significant was the development of Packet Radio for use by radio amateurs. This development was important because Packet Radio required the use of a separate interface called a Terminal Node Controller. This was similar in some respects to a Terminal Unit except it included some sophisticated processing power to control the communications link. Whilst the early units only handled Packet Radio, is wasn't long before manufacturers realised that, with a few software modifications, their TNCs could be configured to both transmit and receive a wide range of data modes. Prime examples of this technology were the infamous AEA PK-232 and the rival Kantronics KAM. These were developed to be able to decode Morse, RTTY, AMTOR, SITOR and FAX as well as Packet Radio.

The widespread use of PCs by the listening community took some time to get going and didn't really take-off until the early 1990s. At that time most of the software was of commercial origin and included *PC-HF-FAX* and the Hoka Code 3. The latter product was a real breakthrough at the time as it provided very sophisticated analysis tools as well as the facility to decode modes that could only normally be tackled by the top-flight stand-alone units. Sadly the Code 3 was very poorly supported in the early days and the combination of limited support and inexperienced users led to a lot of complaints.

As the development of PC based software progressed, two programs soon emerged that were to dominate the amateur world for many years - *JVFAX* and *Hamcomm*. These programs, along with a few others, introduced a new and even cheaper method of handling the interface between the radio and the computer. Gone was the need for a complex ST5 clone or Phase locked loop system, the comparator interface had arrived.

The comparator was a very simple device with just a handful of components that were used to limit the amplitude variations of the signal and change the voltage to a level that could be applied to the computer's serial port. The design was so neat that even the power could be fed from the serial port. The only snag was an incompatibility between *JVFAX* and *Hamcomm* over the polarity of the power supplies. This was quickly resolved and meant that a single, cheap, interface could be used for just about all your decoding needs. Many companies started to produce kits and ready-made interfaces, but one company, Pervisell, stood out from the rest. They produced (and still do) very high quality interfaces that were backed-up excellent customer service.

One of the significant points about both *JVFAX* and *Hamcomm* was their distribution as shareware. This meant you could get hold of working copies for free and then just make a financial contribution to their respective authors if you liked the program. Whilst this was great for the listener, the program quality combined with ease of access just about killed the commercial software market. All the companies that had enjoyed the success of the early years of radio and computing gradually packed their bags and moved into other fields. The most sophisticated program of this era was *RadioRaft*, which revolutionised cheap, automatic, mode detection.

The infamous ZX Spectrum.

Up-to-Date

The late 1990s through to today have seen a gradual move back to more commercially developed decoding software. This change is driven by two key factors. 1) Software programming, especially for digital signal processing, is a very specialised field and few amateurs have the necessary skills and 2) most of the shareware software now has a more commercial pricing structure - if you want to get your hands on the full version.

Probably the most significant development has been the improvements in computer soundcard technology. Nowadays even the most basic soundcards feature a very sophisticated Digital Signal Processing chip that is well up to the level required to handle utility signals. As a result, most of the radio software appearing on the market today uses the soundcard to carry out the initial processing of the audio signal. Not only does this make decoding that bit cheaper, but when you use shareware software

Continued on page 38

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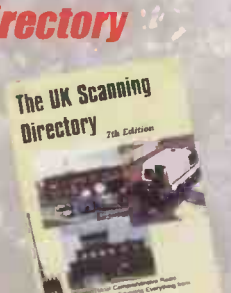

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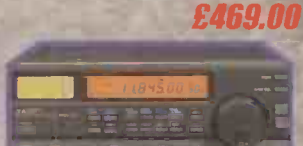

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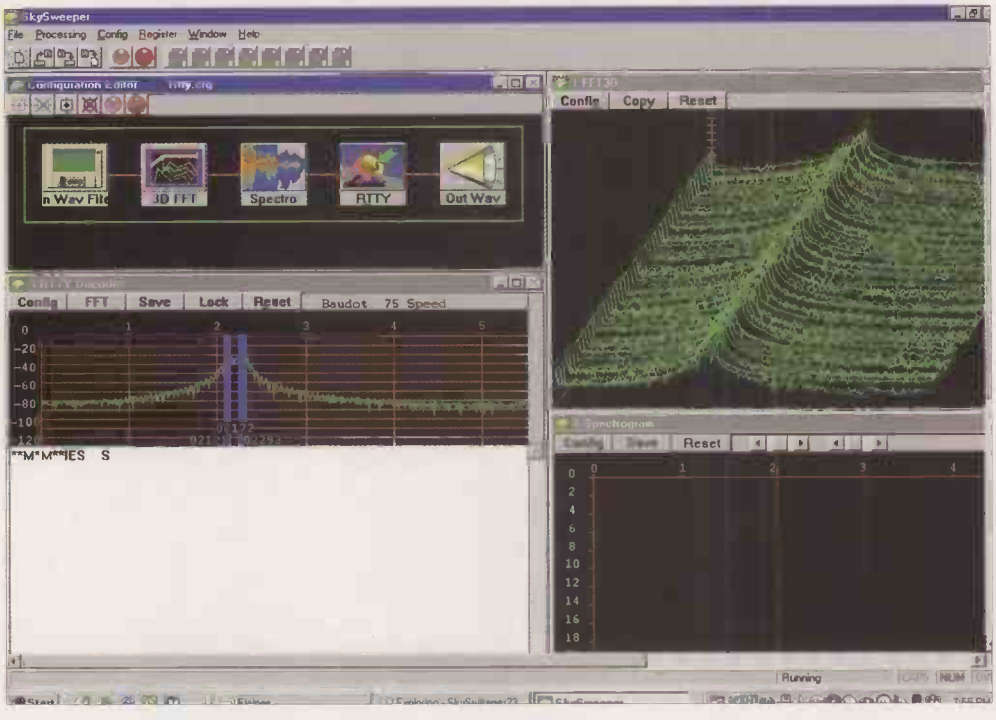
Decoding, Past, Present & Future

Continued from page 35

you find that you can try decoding with no initial outlay at all - great news for new listeners.

Another benefit from the use of soundcard technology is the huge range of signal analysis tools that are available to the listener. Many of these tools have been designed for use by audio engineers or musicians, but can be very powerful aids when trying to analyse a new or unknown data signal. A good example of this is *Spectrogram*. This excellent, freeware, audio analyser lets you really get inside a data signal so that you can take detailed measurements to calculate the shift, speed and other essential clues. To see a selection of some of the best packages for the PC take a look at the Software Gems on my Web site: **http://www.mikespage.btinternet.co.uk/**



State-of-the-art software decoding.

What Does The Future Hold?

If I really knew the answer to this I'd be a very rich man! However, I can hazard a few guesses based on the knowledge of what's gone before and the sort of new technology that's appearing. Before I look at what's likely to happen on the decoding front, we ought first to think about what's likely to happen with the radio spectrum. Is h.f. dead? Will satellites carry all the traffic? I think the answer to both of these is no.

Whilst I'm sure satellite utilisation will continue to expand rapidly, the technology required to launch and support satellite communications is very expensive. There is also the vulnerability of satellites to consider the *Galaxy-4* failure in 1998 blacked-out paging services, financial networks and petrol pumps across the US as the on-board computers failed. The failure was almost certainly due to a radiation storm emanating from the Sun and effected in the region of 45 million customers. These failures are more common than you might expect and represent a major concern to satellite operators. There is also the risk of satellites being hit by meteors and other space debris. In contrast, h.f. radio is really a very cheap communications system and whilst it may be occasionally disrupted by magnetic activity, it is relatively cheap to recover. Services utilising h.f. radio will never compete in terms of bandwidth and speed of communication, but it will continue to provide excellent back-up links and reliable low-speed communications. The usefulness of h.f. communications is being greatly enhanced by modern technology and I'm sure systems such as ALE (Automatic Link Establishment) will develop rapidly and provide the automation and reliability that is required to create viable commercial applications.

So what will our decoder look like for the new modes? I think it's pretty safe to say that the PC will, for the moment, remain the focal point of our decoding technology. However, there will be an increasing need for the decoder to have control of the receiver. Technologies that use frequency hopping to make best use of the propagation conditions or to enhance security can only be resolved if the decoder can make the appropriate changes to the receivers tuning. The temptation is to predict that the receiver will become fully integrated with the PC. This may well happen, but there is a huge amount of work to be done to overcome the interference problems that exist when you try and receive microvolts of weak r.f. signal right next to a digital processor with 800MHz plus of high energy square-waves. For the near future at least, you can expect to see some physical separation between the r.f. section of the receiver and the PC. The vast majority of data modes will be decodeable using the technology built into the standard sound card so the decoders will become little more than software applications. I suspect they will contain a good range of analysis tools and may well follow the type of user-friendly interface that was pioneered in *SkySweeper*. If the commercial systems start to use complex phase modulation techniques then there may well be a need to move to an external interface with a dedicated Digital Signal Processor to handle the demodulation.

Summary

The last hundred years has seen a tremendous leap forward in our ability to communicate messages over long distances, but the most radical change has occurred in the past 15 years thanks to the advent of the microprocessor. With technology moving at such a pace I can't wait to see what the next 15 years will bring!

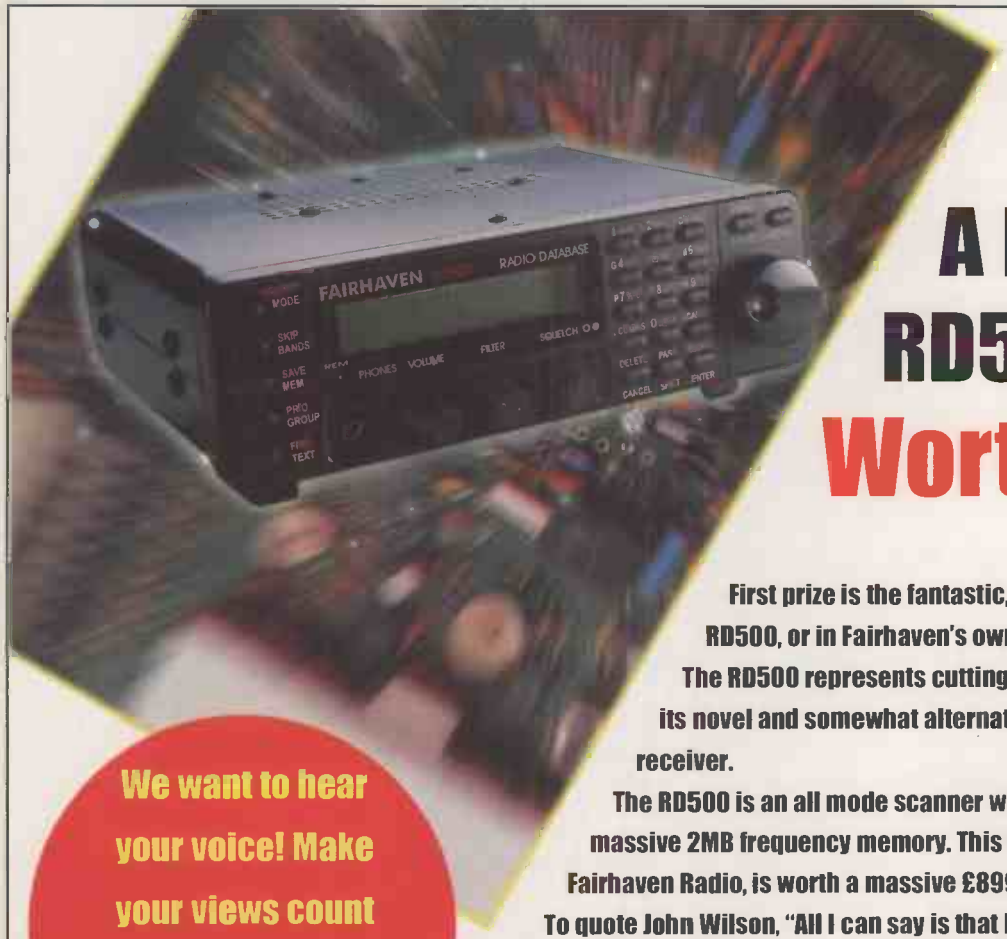
SWM

SWM Survey 2001

Win one of our great prizes by helping us give you the magazine you want!

Win a superb Fairhaven RD500 radio database. If you take the short time required to complete this *Short Wave Magazine* reader survey, not only can you make your views known and help us craft *SWM* to suit your preferences but also you will be automatically entered into the *SWM* prize draw. In addition to our fantastic first prize courtesy of Fairhaven Radio, we have **ten runner up prizes of a one year subscription to *Short Wave Magazine***. Please take the time and let us know how we can make *SWM* even more interesting to you.

Kevin Nice
Editor
Short Wave Magazine



Win... A Fairhaven RD500 Worth £899!

First prize is the fantastic, wide-band receiver - the RD500, or in Fairhaven's own terminology, Radio Database. The RD500 represents cutting edge British technology, with its novel and somewhat alternative concept to a scanning receiver.

The RD500 is an all mode scanner with computer control and massive 2MB frequency memory. This terrific prize, kindly donated by Fairhaven Radio, is worth a massive £899.

To quote John Wilson, "All I can say is that I was impressed with the RD500 at our first meeting, and I'm really impressed now. This is really innovative design and deserves success. I know of no other receive which combines all the features found in the RD500...".

We want to hear your voice! Make your views count and enter the draw for these brilliant prizes

RD500 is a HF Receiver.
RD500 is a VHF/UHF Scanner.
RD500 can store 54,700 alpha tagged frequency entries.
RD500 can record audio.
RD500 has TV sound and video outputs
RD500 has a 45-key TV style remote.

SWM Survey 2001

How many issues of SWM do you usually buy in a year?
1 ❑ 2 ❑ 3 ❑ 6 ❑ 9 ❑ 12 ❑ Subscribe ❑

If you are not a subscriber, have you ever thought of subscribing? Yes ❑ No ❑

What kind of offer would persuade you to subscribe?

.....

.....

When did you first buy SWM?
Within the last 12 months ❑ 3 years ago ❑
2 years ago ❑ More than 3 years ago ❑

How many other people usually read your copy of SWM?
None ❑ 1 ❑ 2 ❑ 3 ❑ 4 ❑ 5 ❑ 6 or more ❑

How did you discover SWM?
Club ❑ Advert in other Publication ❑ Newsagent ❑
Friend ❑ Internet ❑

How do you obtain your copy of SWM?
From a Newsagent
- On firm order ❑ - From an Amateur Radio Dealer ❑
- Home delivery ❑ - By subscription ❑
- Casual purchase ❑ - From a friend ❑

If you purchase from newsagent, please tick which one:
Dillons ❑ WH Smiths ❑
Fourbouys ❑ Tescos ❑
Martins ❑ Other ❑

Do you have difficulty finding a copy of SWM? Yes ❑ No ❑

Do you think that at £3.25 the price for SWM is:
too low ❑ about right ❑ too high ❑

If the following delivery methods were available for SWM, which would you use?
(Please tick all that apply and also tick to show the one that you would prefer.)
Paper Magazine ❑ ❑ Preferred
CD ❑ ❑ Preferred
Website ❑ ❑ Preferred

If you chose the paper magazine, would you be interested in buying CD back issues/Volumes? Yes ❑ No ❑

If you obtained a copy of the SWM/PROMA CD, was it:
Cover mounted ❑ Bought from SWM Direct ❑

How do you rate the overall design and layout of SWM compared with when you started reading the magazine?
Worse ❑ Same ❑ Better ❑

What do you think of the design of SWM's covers?
Very Good ❑ Good ❑ Average ❑ Poor ❑ Very Poor ❑

Do you buy SWM because of what you see on the cover?
Yes ❑ No ❑ Sometimes ❑

How many of these magazines do you read or buy per year?

	None	1-3	3-6	6-9	9-12
Radio Communications	❑	❑	❑	❑	❑
Practical Wireless	❑	❑	❑	❑	❑
Electronics & Wireless World	❑	❑	❑	❑	❑
Radio Active	❑	❑	❑	❑	❑
Monitoring Times	❑	❑	❑	❑	❑
Popular Communications	❑	❑	❑	❑	❑
Others	❑	❑	❑	❑	❑

(please specify).....

Which advertisers have you purchased from (Please tick all boxes that apply)?

Aerial Techniques	❑	Lowe Electronics	❑
Air Supply	❑	Martin Lynch & Sons	❑
AKD	❑	Moonraker (UK) Ltd	❑
AOR	❑	Nevada	❑
ASK	❑	Northern Short Wave Centre	❑
Broadercasting Systems	❑	Optoelectronics	❑
Celebrity Communications	❑	Pervisell Ltd	❑
Chevet Supplies	❑	Photavia Press	❑
Computer Aided Technology	❑	QSL Communications	❑
Fairhaven	❑	Radioworld	❑
G3TUX	❑	Roberts Radio	❑
Haydon Communications	❑	SRP Trading	❑
Icom (UK) Ltd	❑	Telford Electronics	❑
Interproducts	❑	The Shortwave Shop	❑
Javiation	❑	Timestep Weather Systems	❑
Jaycee Electronics	❑	Waters & Stanton PLC	❑
Klingenfuss Publications	❑	Wellbrook Communications	❑
Lake Electronics	❑		

Others (please specify) .....

.....

.....

Do you usually buy from:
Your local dealer ❑ Rally/exhibition ❑
Mail order ❑ Other ❑

Do you usually buy New ❑ or Second-hand ❑ **equipment?**

Do you read nearly all ❑ some ❑ a couple ❑ none ❑ **of the advertisements in SWM?**

How many rallies/Amateur Radio shows do you visit each year?
None ❑ 1-2 ❑ 3-4 ❑ 5 or more ❑

How much do you spend on the radio hobby in an average year? (Including QSL expenses, books, equipment, rally visits, etc.)
Under £50 ❑ £50 - £100 ❑ £101-£250 ❑
£251-£500 ❑ £501-£1000 ❑ Over £1000 ❑

How many books have you bought from the SWM Book Store in the last year?
0 ❑ 1 ❑ 2 ❑ 3 ❑ 4 ❑ 5 ❑ 6 ❑ 7 ❑ 8 or more ❑

How would you rate the SWM Book Store Service?
Excellent ❑ Good ❑ Average ❑ Poor ❑ Very Poor ❑

Do you hold an Amateur Radio transmitting licence?
Yes (Class A) ❑ Yes (Novice A) ❑
Yes (Class B) ❑ Yes (Novice B) ❑ No ❑

If you have any other major hobbies or interests, what are they?

.....

.....

How do you rate your expertise in radio and electronics?
Beginner ❑ Average ❑ Experienced ❑

On a scale of 1 - 10 how happy are you with the current content of SWM?
Not at all happy « [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] » Very happy

How important to you are the following regular features in SWM?

	(Not at all Important) « 1	2	3	4	5	6	7	8	9	» (Very Important) 10
Advertisements	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Airband Civil/Military	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Amateur Bands	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Bandscan - America	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Bandscan - Australia	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Bandscan - Europe	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Beginner's series	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Book Store	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Club News	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Competitions	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Computing related	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Construction-minor	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Constructional-major	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Industry News	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Decode	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
DXTV	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Editorials	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Historical features	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Info in Orbit	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
LM&S	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Maritime Beacons	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Modifications	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
News (General)	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Numbers Stations	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Off the Record (Pirates)	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Propagation	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Rallies	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Readers' Letters	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Reviews - HF Receiver	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Reviews - Scanners	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Reviews - Software	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Reviews - Accessories	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Reviews - Older Equipment	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Satellite TV News	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Scanning	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
ShackWare	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Special Offers	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
SSB Utilities	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑
Valved equipment	❑	❑	❑	❑	❑	❑	❑	❑	❑	❑

Which subject covered in SWM interests you the most?

.....

On a scale of 1-10, please tick to indicate how you rate the technical content of SWM?
Not technical enough « »Too technical
[1] [2] [3] [4] [5] [6] [7] [8] [9] [10]

Would you like to see any of the following in future issues of SWM? (Please tick all that apply)
Professional Radio ❑ Video Surveillance Monitoring ❑
Regular Buying Guides ❑ Military/Diplomatic Communication Networks ❑
Beginners Information ❑ Emerging radio based techniques/products ❑
Citizens Band ❑ Speed cameras/Traffic monitoring technologies ❑
Historical Features ❑ Public Events Communications ❑
Emergency Communications ❑ Radio based/related services/products ❑
Dealer Profiles ❑

What other radio related subjects not currently covered by SWM would you like us to include?

.....
.....
.....

We occasionally publish themed issues that concentrate on a particular aspect of the hobby. Should we:
❑ Carry on devoting a large part of occasional issues to a single theme
❑ Spread the content evenly throughout the year and not have themed issues

What radio related societies, clubs or specialised groups do you belong to?

AMSAT	❑	RIG	❑
BARTG	❑	ILA	❑
BATC	❑	WACRAL	❑
G-QRP	❑	Radio Station DX Club	❑
EDXC	❑	Local Club	❑
ISWL	❑	None	❑
RAYNET	❑		
RSGB	❑		

Other (please specify) .....

Which of these do you listen to regularly?

Broadcast Stations	❑	Beacons	❑
Utilities	❑	Data	❑
PMR	❑	FAX	❑
Emergency Services	❑	SSTV	❑
Telephones	❑	Amateurs	❑
Airband	❑	CW	❑
Weather Satellites			

Other (please specify) .....

Do you own a home computer?
No ❑ Windows ❑ Linux ❑ Mac ❑ Other ❑

Do you have Internet access? Yes ❑ No ❑

If yes, what is your e-mail address?

.....

How long have you been on the 'net?
less than 1 year ❑ less than 2 years ❑ less than 3 years ❑
3 years or more ❑

Is your access pay per use ❑ **or do you have** unmetered access ❑?

Modem/connection speed?
56K or less ❑ 64K ❑ Broadband/cable ❑ Other ❑

Did you answer the SWM August 1998 survey? Yes ❑ No ❑

SWM Survey 2001

PERSONAL DATA

Personal details are required for statistical purposes only and will be treated in the strictest confidence. Your answers will be stored in a database but your name and address will not be associated with them in any way. **If you are not happy with answering any of the following questions, please ignore them but you must supply your name and address if you want to be included in the prize draw.**

How old are you?

Under 15 ❑ 26 - 35 ❑ 46 - 55 ❑ Over 65 ❑
16 - 25 ❑ 36 - 45 ❑ 56 - 65 ❑

Are/were you employed in an electronics related field?

Yes ❑ No ❑

What is your annual income?

Under £8,000	❑	£15,001-£20,000	❑	£30,001-£35,000	❑
£8,001-£10,000	❑	£20,001-£25,000	❑	£35,001-£40,000	❑
£10,001-£15,000	❑	£25,001-£30,000	❑	Over £40,000	❑

Please tick this box if you do not wish to receive further information from PW Publishing Ltd and/or associated companies. ❑

Thank you for taking the time to complete this questionnaire. Please write your name and address in the space below and post the form to us, you will be entered in our prize draw. There's no need to use a stamp, we will be happy to pay the postage.*

Name.....

Address.....

.....

.....

Postcode.....

*Please note: The FREEPOST facility is only available to readers in the United Kingdom, Northern Ireland, the Channel Islands and the Isle of Man. Overseas readers will have to pay for the postage but they will still be entered in the prize draw. We have set the closing date of 2nd January 2002 to allow time for entries to arrive from overseas.

Please Affix Tape Here

SWM Survey,
PW Publishing Ltd.,
FREEPOST,
Arrowsmith Court,
Station Approach,
Broadstone,
Dorset BH18 8ZZ.

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NEVADA®

LARGE STOCKS
FAST DELIVERY
EXPERT ADVICE

www.nevada.co.uk

Bearcat UBC 3000XLT

- 25 - 550, 760 - 1300 MHz
- AM/FM/WFM
- 400 memory ch
- TURBO SCAN 100 Ch/Second
- TURBO SEARCH 300 St/Second
- Automatic Freq Storage
- Selectable Attenuator
- Automatic Freq Sorting
- Data Skip
- Delay Key
- Channel Count Key
- Supplied complete with earphone, case, belt clip, charger and rubber duck antenna

NEVADA PRICE- £199.95

UBC 220XLT

CHEQUE SPREAD

- 66 - 956 MHz (with gaps)
- AM/FM
- 200 memories
- TURBO SCAN 100 Ch/Second
- TURBO SEARCH 300 St/Second
- Data Skip facility
- 10 Priority Channels
- Memory Backup
- Supplied c/w earphone, belt clip, charger and rubber duck antenna

NEVADA PRICE- £149.95

UBC 120XLT

CHEQUE SPREAD

- 66 - 512 MHz (with gaps)
- AM/FM/WFM
- 100 memory channels
- TURBO SCAN 100 Channel/Second
- TURBO SEARCH 300 St/Second
- Data Skip facility
- 10 Priority Channels
- Programmable Search
- Channel Lockout Key

NEVADA PRICE- £129.95

UBC 60XLT

A brand new low cost scanner that covers MARINE, LAND MOBILE and more!

- 66 - 512 MHz (with gaps)
- 30 memories
- Channel or Freq display
- Priority Channel
- Channel Lockout
- Scan Delay

NEVADA PRICE- £79.95

YAESU VR120

PROFESSIONAL GRADE WIDEBAND POCKET SCANNING RECEIVER

- 100kHz - 1299.995MHz
- AM/FM/WIDE-FM
- 640 Memory channels
- Preset 'Quick Tune' mode
- Selection of scanning modes
- 'Channel Counter' feature measures frequency of local signal
- Clone capability

NEVADA PRICE- £159

YAESU VR500

SPECIAL!

ULTRA COMPACT RADIO

- 100kHz - 1300MHz
- FM, Wide FM, USB, LSB, CW, AM
- 1091 Memory channels
- Weight 220g
- Comes complete with Antenna, carrystrap, Belt clip
- Optional Charger: NC60

Optional Accessories

- FNB-59 NiCad battery pk
- NC-60 AC adaptor
- CSC-72 Soft case
- EDC-5B DC cable with cigar lighter plug
- EDC-6 DC cable
- CT-35 Cloning cable

NEVADA PRICE- ~~£244~~ £199

Bearcat UBC 860XLT

AIRBAND Base Scanner

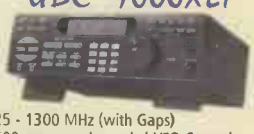
CHEQUE SPREAD

A stylish low profile base scanner with TWIN TURBO scan and search facility. Covers civil airband, marine, police, cellular plus more!

- 66-88, 108-174, 406-512, 806-956MHz
- 100 mems • Turbo Scan - 300 steps/sec

NEVADA PRICE- £139

UBC 9000XLT



- 25 - 1300 MHz (with Gaps)
- 500 memory channels I VFO Control
- Selectable Attenuator I Selectable Delay
- Selectable Mode AM/WFM/NFM
- TURBO SCAN 100 Ch/Sec
- TURBO SEARCH 300 St/Second
- Alpha Numeric Display
- Automatic Store I Frequency Transfer
- Auto Tape Record I Data Skip facility
- Programmable Search

NEVADA PRICE- £269

ICOM R3

NEW!

REVOLUTIONARY NEW HANDHELD!

- 495kHz - 2451MHz
- 450 memories
- Modes: FM, AM, WFM, AM-TV, FM-TV
- Alpha tagging
- CTCSS with tone scan
- 2" colour TFT display
- Video audio output

SUPPLIED C/W

- *telescopic antenna*
- *belt clip*
- *charger*
- *LI/ION battery pack*

NEVADA PRICE- £449

ICOM IC-R2

SPECIAL!

PRICE MATCH

One of the smallest radios we have ever seen, Palm size wide band size is not everything. Packed in this receiver's small package are some pretty big features.

- 500kHz -1310MHz
- AM/FM/WFM
- 400 memories plus 25 band edge memories for easy scanning between specified frequency

NEVADA PRICE- ~~£154~~ £139

MAYCOM AR108

Palm sized Airband & VHF Scanner

- Airband: 108 - 136.975MHz
- VHF: 136 - 180MHz
- Selective Channel Steps: 5, 10, 12.5, 15, 25, 1MHz
- Modes: AM or FM
- Memories: 99
- Dual Watch Function
- Key Lock
- Battery Save Function
- Battery Voltage Indicator
- Supplied C/W Belt Clip, Carrying Strap

Mains Charger £8.95 £2.75 p&p

NEVADA PRICE- £69.95

AR 8200 MkII

SPECIAL!

LATEST model!

- 530kHz-204MHz
- All Mode inc. 8.33kHz AM
- 1000 Memories
- Plus LOTS MORE!

WE CARRY THE FULL RANGE OF ACCESSORIES here's just a few!

CT8200 ...CTCSS	£69.90
EM8200 ..External memory	£59.90
RU8200...Record/Play Back	£59.90
TE8200 ...Tone eliminator	£39.90
VI8200....Voice inverter	£59.90
SC8200P..Padded soft case	£19.95

NEVADA PRICE- ~~£434~~ £399.95

YUPITERU MVT 3300

- 66 - 88MHz, 108 -170MHz 300 - 470MHz, 806 - 1000MHz
- MODES: AM/NFM
- STEPS: 5, 6.25, 10, 12.5, 25kHz
- MEMORIES: 200
- BAND MEMORIES: 10 (user re-programmable)
- PRIORITY CHANNELS: 10
- SCAN/SEARCH SPEED: 30/ second
- Requires 4 x AA batteries
- SUPPLIED WITH: Antenna, Earpiece, Carrying Strap and built-in Desk Stand

NEVADA PRICE- ~~£154~~ £149

YUPITERU MVT 7100

Probably the most popular high end Scanner. It's easy to use and can receive just about anything!

- 530kHz-1650MHz
- AM/FM/WFM/SSB/CW
- 1000 memories
- Steps 50Hz, 100Hz for tuning LSB & USB
- 155H x 64.4W x 32Dmm
- Weight - 320g
- Supplied with NiCads, mains charger, 12VDC cigar lead, belt clip, carry strap

NEVADA PRICE- ~~£244~~ 229

YUPITERU MVT 7300

- 520kHz -1.32GHz
- 1000 Memories
- 8.83kHz Airband
- Duplex reception
- Descramble function
- Clock timer
- Signal strength meter
- Auto memory write
- Supplied c/w Mains adaptor, NiCads, Belt clip

NEVADA PRICE- ~~£284~~ £259

YUPITERU MVT9000EU

FLAGSHIP MODEL, with a range exceeding 2000MHz, a real time bandscope.

OP90 Soft Case £26.95 £2.75 p&p

- 531kHz - 2039MHz
- 1000 memory channels
- W-FM, FM, N-AM, AM, LSB, USB, CW
- Scanning steps 50Hz-125kHz
- Duplex receive capability
- Fast tune facility
- Built-in ferrite rod antenna for AM broadcast reception

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NEVADA PRICE- ~~£549~~ £549

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NEW!

Receive over 40 channels of FADE FREE DIGITAL PROGRAMS direct from satellite to this radio - *from almost anywhere in the world!*

IN STOCK

Hitachi radio features:-
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PRICE - £149.95

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Compact high performance radio capable of receiving multimode signals in the 100kHz-30 MHz spectrum. Excellent strong signal handling, high sensitivity & dynamic range to eliminate annoying intermodulation interference.

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- Analog S-Meter
- Line Audio output
- 100 memory channels
- +15dBm 3rd order intercept
- Miniature size. 8"W x 2.5"H x 9"D

NEVADA PRICE £399.95

YAESU VR 5000

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- 100kHz - 2,599MHz
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AOR AR-8600

NEW!

Now in stock!

All mode wideband base RX
- 530kHz-2040MHz
- 8.33kHz airband steps
- Optional slot cards

OPTIONAL PSU AVAILABLE

NEVADA PRICE £699

ICOM PCR 1000

COMPUTER RADIO SYSTEM

- 100kHz - 1300MHz
- ALL MODE RECEPTION
- Plus Lots More!

PRICE MATCH

NEVADA PRICE £319

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YAESU FRG-100

PRICE MATCH

This receiver provides solid coverage from 50kHz to 30MHz with all mode reception of AM, SSB and CW. Supplied c/w AC mains supply

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AOR AR 5000

PRICE MATCH

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- 10kH - 2.6GHz

All mode top class receiver & scanner packed with features

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DIGITAL WORLD BAND RADIO WITH R·D·S

- Covers MW/LW/FM/SW
- Receives SSB short wave
- 307 presets
- Clock/alarm facilities

Supplied with dual voltage AC supply, sw antenna, earphone, carrying case

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ROBERTS R9914

DIGITAL WORLD RADIO

- Covers MW/LW/SW/FM
- SSB & CW reception
- Ideal for BBC World Service
- Clock/alarm facilities

Supplied c/w AC adaptor, earphone, carrying case

NEVADA PRICE £99.95

GRUNDIG YB400

PORTABLE SW RADIO

PRICE MATCH

- General coverage RX (144kHz - 30MHz)
- SW: 1.711-26.1MHz
- FM Stereo• MW/LW
- SSB reception
- 40 station preset
- Narrow/Wide bandwidth
- Mains or Battery powered (with optional mains adaptor)
- Supplied c/w SW Handbook, Carrying case, External Wire Antenna, Carry Strap

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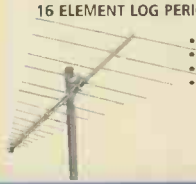
SCANMASTER LP1300

WIDEBAND BEAM ANTENNA
16 ELEMENT LOG PERIODIC DESIGN



- 105 -1300MHz
- Gain 11-13dBi
- 'N' type connector
- 500W

NEVADA PRICE £129

SCANMASTER DESKTOP

A complete desktop antenna covering 25 -1300 Mhz, just 36" high with 4 metres of cable, fitted BNC plug with a magnetic base.

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SCANMASTER DD 1300

DOUBLE DISCONE

A high performance wideband antenna

- 25-1300MHz
- Ultra wideband TX capability

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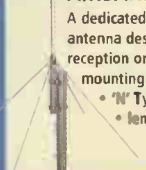
SCANMASTER B128

AIRBAND BASE SCANNER

A dedicated CIVIL AIRBAND base antenna designed to give long distance reception on 117-140MHz. Supplied c/w mounting tube & mast clamps.



- 'N' Type connector
- length: 1mtr

NEVADA PRICE £39.95

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■ E-MAIL: decode@pwpublishing.ltd.uk ■ Web: http://www.mikespage.btinternet.co.uk

Decode

Elsewhere in this issue I've covered decoding past, present and future, but there is no doubt in my mind that by far the most important decoding tool is your listening ability. Whilst the only system you can actually resolve completely using your ear is Morse code, a trained ear can recognise most of the data modes far quicker that the most sophisticated decoders I've ever tried.

A typical example would be spotting the difference between a SITOR and a PACTOR signal. Even the best systems will take some time to do this, whilst a trained listener can spot the difference instantly. With a bit of training, you can also tell the difference between SITOR FEC mode and ARQ-E systems - in fact, you'd be amazed at just how much you can recognise.

Why is this important? By far the most valuable benefit is the time you can save. If you're looking around for stations to monitor you can use your listening skills to find the mode you want, rather than having to stop on every data signal to try and work out what it is. A skilled listener can very quickly tune across a band and home-in on the right signal.

Conversely, you can use your ears to specifically find a mode that you don't recognise. You can then turn to the analysis tools in your decoder to try and work-out what the signal is and see if you can decode it.

$$F(u,v) = \frac{1}{MN} \sum_{x=0}^{M} \sum_{y=0}^{N} f(x,y)\, e^{-j2\pi(ux/M+vy/N)}$$

$$f(x,y) = \sum_{u=0}^{M} \sum_{v=0}^{N} F(u,v)\, e^{j2\pi(ux/M+vy/N)}$$

ST9864

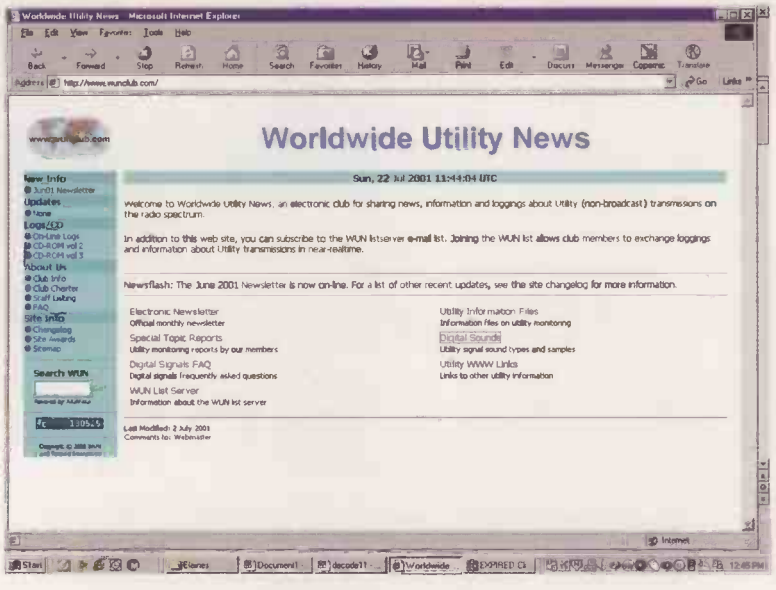
Brain the size of a planet? Try a Fourier Transform!

Whilst many decoders include mode detection, I have yet to see one that can beat a trained ear for pure speed, at least on the more common modes. If you're new to decoding and want to try some ear training, an excellent place to start is the World Utility News Club (WUN) site **http://www.wunclub.com/digfaq/signals.html** There you will find their excellent Digital Signals FAQ (which covers just about every mode ever seen on the h.f. and v.h.f. bands). More importantly, the site contains an excellent collection of recorded data signals that can be found at **http://www.wunclub.com/sounds/index.html**

Rather than use locally generated signals, most of the samples are real off-air signals so provide a very useful reference. I suggest you download the samples to your hard disk as playback over the Internet is a bit slow. The files are all ordinary .WAV files so all the standard media players will be able to handle playback.

Once loaded on your computer, you can start practising. I suggest you just tune around one of the busy utility bands (8MHz is a good place) and every time you find a signal you don't recognise, take a look through the samples to see if you can find a match. This might sound a bit laborious, but its worth the effort as you will pick-up the different sounds very quickly.

As well as using the samples to train your ear, the files provide a useful source of test signals to let you get familiar with using your decoder. Most software decoders can be set to process a .WAV file so you can call them up from you hard disk and see how your decoder copes.



Visit the WUN site for Utility Signal Recordings.

Digital Signal Processing - Part 2

This month's tutorial takes a look at the heart of digital signal processing Fast Fourier Transforms. Before I start, lets quickly recap on last month. The first part of any digital signal processing operation is to convert the signal into a digital format. This is done using a device fairly logically called an Analogue to Digital converter or A-D converter.

In essence, this takes voltage readings of the analogue signal at a rate that's twice the highest frequency in the signal. As an example, a utility signal with a top frequency of 4kHz would have to be

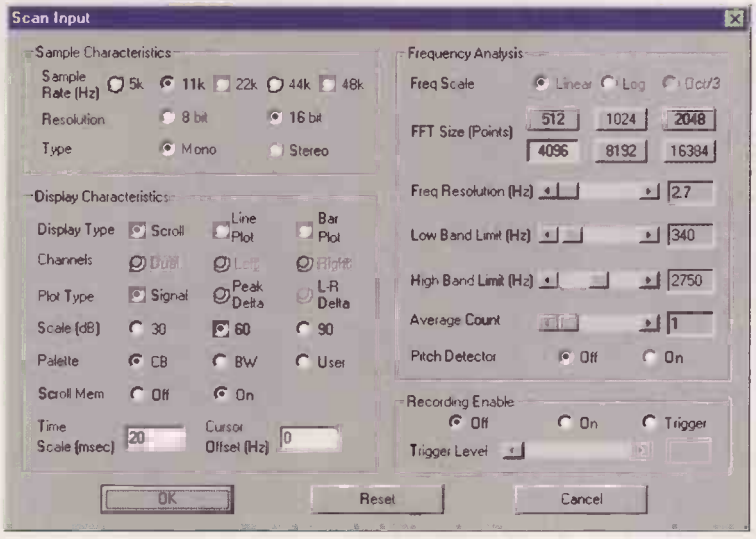


Illustration of the FFT settings in *Spectrogram*.

sampled at 8kHz in order to capture a usable digital likeness. Now you have probably realised that this process produces a huge amount of data in a short space of time - like 480,000 samples every minute!

Assuming each sample or measurement is an 8 bit number, that means we will need a fair amount of storage space if we're going to keep some of the data. In this example we would need 480kb for every minute we wanted to record. The other point to note is that if we are going to perform some calculations or alter this data in some way, we will need a processing system that runs quite quickly.

With the demands for speed and storage space you can probably appreciate why affordable d.s.p. is a comparatively recent development. Fortunately, the modern PC with its processor running in hundreds of MHz and Gb disk drives being the norm brings d.s.p. capabilities to everyone.

The real secret of digital signal processing rests in the methods that are used to calculate frequency information from what is just a series of voltage measurements taken at regular intervals. This conversion process requires the use of some very complex maths, so I don't intend to try and explain it in detail here. Instead I'll try and provide an outline that will help explain the background to some of the user options that you will often find in d.s.p. applications.

The first point to note is that a computer can't really handle continuous signals very well, hence the need to use the sampling technique I described last month. This limitation also determines the way in which the computer handles processing the signal to extract the frequency information. In order to do this, the d.s.p. application will break the signal samples into manageable chunks and then perform a calculation on each of the chunks.

The mathematical trick used to convert a set of samples into a frequency analysis is the Fast Fourier Transform and this is a neat adaptation of the Discrete Fourier Transform. The FFT was first proposed in a practical format back in 1965 by Americans James W. Cooley and John W. Tukey. The development of the Fast Fourier Transform or FFT has probably been the most significant breakthrough in making d.s.p. available to all.

To give you an idea of why it is so important, processing a signal containing just eight samples using a Discrete Fourier Transform would need 49 complex multiplications and 56 complex additions. If you then expand this to a more usable size of 1024 sample points, the DFT would need over 20,000,000 complex multiplications and additions.

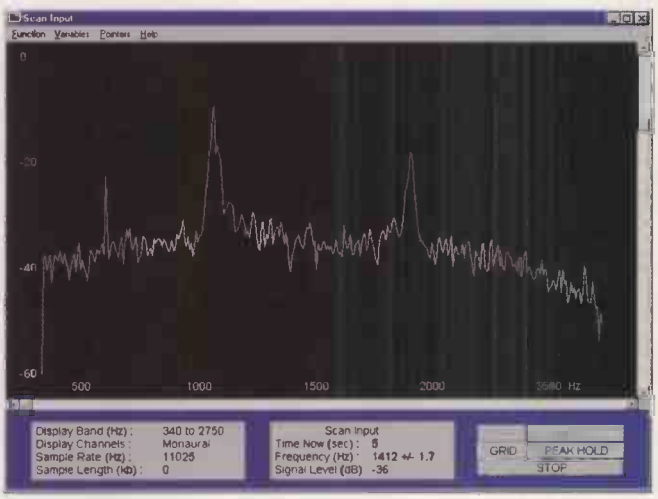
Applying this to our original sample rate of 8kHz you can see that we have samples arriving at a rate of 8000 per second. If we then break that into 1024 sample chunks we would need a computer that could handle over 156 million complex calculations every second just to extract the frequency information!

The trick with FFT Is to divide each large sample into a series of simple 2-point samples. These small samples then only require 1 multiplication and 2 additions to calculate the DFT and recombining the result is very simple. Using this technique we only need to perform around 1500 calculations and some recombination work to analyse a signal 1024 sample points.

You can see from this that the FFT is a far more efficient way to handle extracting frequency information from a set of samples. One of the settings you will often find on d.s.p. applications is the option to set the number FFT points, this is the number of samples that the FFT will analyse.

Choosing a larger FFT size increases the frequency resolution of the process, but takes more time. To give you an idea of how you should choose the FFT size you will find that the maximum frequency resolution of the output is the sample rate divided by the FFT size. If we take our example using an 8kHz sample rate and a 1024 point FFT we can expect a frequency resolution of 8000/1024 = 7.8Hz.

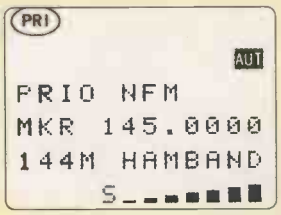
Next time I'll take a look at Windowing techniques and show you how choosing the correct window can improve the results you get. If you want to know some more of the detail around DSP take a look at the DSP Guide that can be found at:
http://www.dspguide.com/

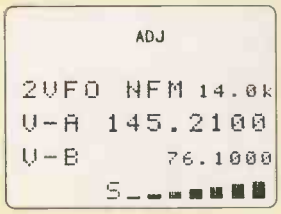


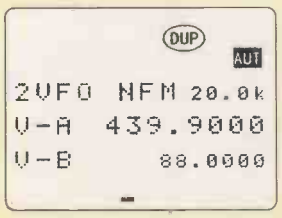
***Spectrogram 6* - Line display Option.**

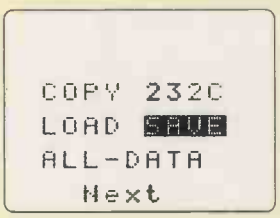
New *Spectrogram*

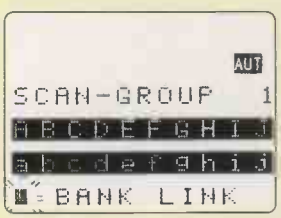
As a neat link with my piece on d.s.p., I've just noticed that a new version of *Spectrogram* has just been released. This is my favourite spectrum analysis tool and its just been made significantly better. I'll cover the changes in more detail next time, but if you want to give it a try, visit my web site or go straight to:
http://www.monumental.com/rshorne/gramdl.html

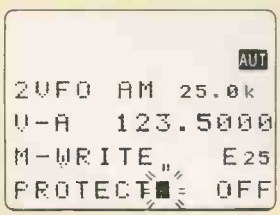


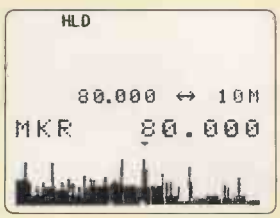


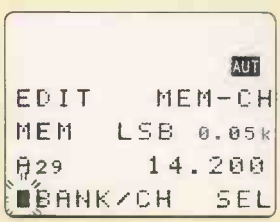












AR8600

MOBILE - BASE - TRANS-PORTABLE

*High sensitivity design

The AR8600 is an extremely versatile **all mode** receiver (**530kHz - 2040MHz**) which can be used virtually anywhere, mobile, base or trans-portable... powered from an external 12V d.c. power supply, optional d.c. lead from a 12V vehicle or from an optional internally fitted NiCad battery pack. A strong twin metal case with die cast front panel characterises the multi-purpose role. All mode receive capability is provided including Single Side Band with programmable tuning steps down to a resolution of 50Hz with the frequency established by a highly accurate Temperature Compensated Crystal Oscillator (TCXO). An RS232 port further extends the capabilities with free supporting control software available from the AOR web sites.

Although many microprocessor features have been adopted from the trendsetting AR8200 Series-2 hand portable receiver, **the AR8600 RF front-end is an all new (*high sensitivity) design with a first rate switched attenuator and preselection around VHF to ensure the highest levels of adjacent channel rejection with software spurii cancellation.** In addition to a hinged telescopic whip aerial, the AR8600 is supplied with a **detachable plug in medium wave bar aerial** which locates on the rear chassis of the receiver for localised medium wave monitoring. An additional BNC socket is mounted on the rear chassis so that **10.7MHz i.f. output** may be extracted for use with external spectrum display and vector analyser units such as the AOR SDU5500. The TCXO ensures **high stability** with **minimal internal spurii** and is usually only seen in top of the range (more expensive) models such as the AR5000 and AR7030.

The chassis is manufactured from two metal compartments, effectively a **metal chassis inside a metal cabinet...** this provides excellent screening characteristics and great robustness highlighting its multi application role. The **front panel** is also manufactured from **die-cast aluminium**. Size is 155(W) x 57(H) x 195(D) excl. projections, weight less than 2kg.

The all important **8.33 kHz airband channel step is *correctly implemented*. Computer control** is available via a standard 9-pin RS232 D-type connector on the rear chassis, just a standard RS232 cable is required for connection to a PC, the extensive RS232 command list is printed in the operating manual. In addition, **'optional internal SLOT CARDS'** (which fit into the rear chassis of the AR8600) extend the capabilities even further, five cards may be fitted with two operational simultaneously. **Supplied with:** Swivel base telescopic whip aerial, MW bar, comprehensive illustrated operating manual with RS232 listing, d.c. lead.

** AR8600 'Goldene Mikrofon' best receiver*

AR8200 SERIES-2

NEVER BEFORE HAS ONE HAND PORTABLE OFFERED SO MUCH

The AR8200 represented a beacon when first released, technology marches forward with the NEW AR8200 SERIES-2 keeping the innovative concept and forward thinking alive and bright. It has not been easy improving on what many thought to be the ultimate, however the NEW AR8200 SERIES-2 does provide even more with nothing taken away.

A Temperature Compensated Crystal Oscillator **(TCXO)** now forms the heart of the AR8200 SERIES-2, this ensures **high stability** with **minimal internal spurii.** Performance too has seen the AOR R&D team fine tuning the design for **best sensitivity and strong signal handling** over the extremely wide coverage of 530kHz to 2040MHz (all mode receive without gaps). The aerial has also been replaced by a **telescopic whip** on a swivel base, this ensures the best results, a medium wave bar aerial is also provided as standard. The design team have certainly been taking account of customers wishes, the keyboard ZERO key has been swapped in position with the DECIMAL to match the telephone layout, LCD illumination has been increased (for improved visibility) and following requests for longer operation between charges, the **4 x AA size NiCads have been increased in capacity,** again reflecting improvements in modern technology. The obvious change has been left for last... the **cabinet colour** has been changed from green to **black!**

The list of features is vast, tuning step sizes are programmable in all modes down to 50Hz with comprehensive step adjust and correctly implemented **8.33kHz** for the new VHF airband spacing. Connection to a computer is possible with the optional CC8200 lead/interface with free PC software available from the AOR web site. Unique optional slot cards further enhance features (CTCSS, tone eliminator, record / playback, external memories, voice inversion).

* AR8600 'Goldene Mikrofon' best receiver, German *funk* magazine 2001

Each year, the German magazine *funk* awards prizes to manufacturers release innovative products into in the radio market in the proceeding twelve months, importantly the voting for the 'best' is made by the readership of the magazine so truly reflects customer satisfaction. The awards are generally presented at the Friedrichshafen HamFest at a prestigious after-hours buffet, this year was no exception. For the category of **'best receiver'**, this years award was presented to the **AOR AR8600**... the receiver providing excellent value for money with notably better image response and strong signal handling than other receivers in its class (middle price range).

The AR8600 award was in 'good company', other categories being won by Kenwood for the TH-D7E(V2.0), TM-700E, TS-2000 and by Yaesu for the FT-817.

In previous years, several other AOR receivers have won 'Goldene Mikrofon' awards including the AR7030 short wave receiver and the AR5000 high performance base receiver.

'REAL' SHORT WAVE LISTENING

No sooner than we had completed a large number of commercial overseas orders for the AR7030, more orders arrived. Despite being over five years old, the AR7030 is tremendously popular **still beating off the competition.** AR7030, **the professional choice**. *Sorry if you encounter short delays in the supply of the AR7030, it will be well worth the short wait.*

Excellent strong signal handling, low noise local oscillator (producing extremely low reciprocal mixing figures) and excellent audio fidelity demonstrates the attention to detail carried through design and into manufacture... the analogue circuits of the AR7030 exhibit none of the strange AGC and poor audio characteristics found in other 'higher priced' DSP competitors. Many feel that the AR7030 is the best short wave analogue receiver ever. Receiver of the Year 1996/97 WRTH, 5-star award and editors choice Passport to World Band Radio for several successive years. Designed and built in the UK as a collaborative project between internationally acclaimed designer John Thorpe and AOR.

★★★★☆ AR5000+3 awarded four stars by both the authoritative Passport To World Band Radio and World Radio & TV Handbook

AR5000
True base receivers are few and far between, some have simply evolved from the hand held equivalents with little tangible improvement in performance or facilities over their smaller counterparts - *the AR5000 is not like this!* High performance, top quality build and true wide coverage all mode receive. The "+3" version offers even more with synchronous AM, AFC and Noise Blanker. Popular with government agencies throughout the world. **AR5000c** Frequency coherent version for commercial applications, special order.

Commercial & government operators have selected the AR5000, AR5000+3 and AR5000c in great numbers over recent years resulting in the model being recognised within their organisations in the same manner as many household brand names & products. For counterintelligence surveillance, the AR5000 (often partnered with the SDU5500) forms the cornerstone of modern day monitoring. System training often revolves around the AR5000 which leads to even wider implementation across departments. Transform ***your*** hobby to a commercial grade listening post with the AR5000, **the professional choice.**

AR5000+3 - Sync AM, AFC, NB
The "+3" version offers even more with synchronous AM (upper side band, lower side band and double side band with excellent lock range), AFC (Automatic Frequency Control for accurately tracking moving transmissions or unusual band plans) and Noise Blanker.

SDU5500 The SDU5500 is a Spectrum Display Unit providing practical and cost effective spectral monitoring for band occupancy and identification of new transmissions.

Many other products available including the ARD-2 ACARS / NAVTEX decoder, AR3000A receiver, aerials, software etc. Please phone or write requesting details or visit the extensive AOR UK web site at ***www.aoruk.com***

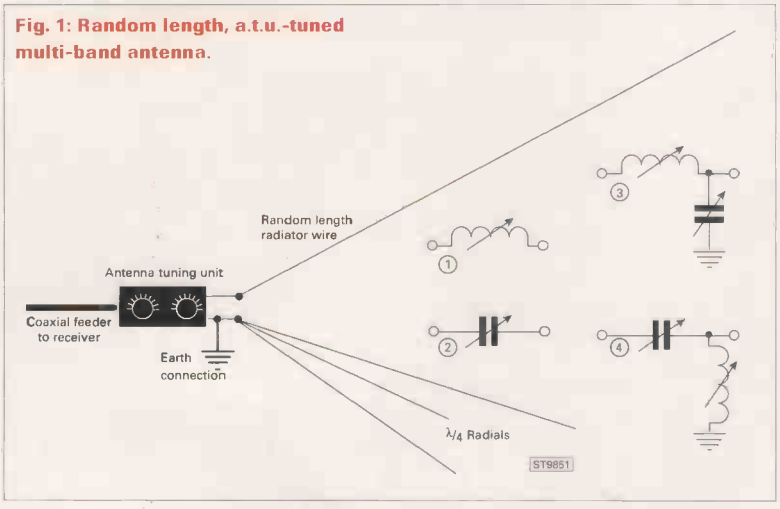
Multi-Band Short Wave Antennas

Another gem of antenna wisdom from the late Joe Carr K4IPV. Come on, the weather's warm and the evenings long, it's time for experimentation.

The first short wave receiver that many people buy will have either a telescopic whip antenna mounted on the radio, or will use a single wire antenna unceremoniously connected to the 'Ant' socket on the rear/side of the case. This type of antenna works well when you are first starting out, and indeed, depending on your own needs, may work well into the future. But once you get a 'Real Serious Shortwave Receiver' - which means generally 'serious money' - or gain the tuning skill required to separate out more than BBC, Voice of America and Radio Moscow, a 'Real Serious Antenna' can improve the performance of your receiving system.

The key word here is 'system'. The receiver is only one component of an overall system that has the purpose of receiving short wave signals. Although there are other elements that may or may not be needed (depending on modes, your goals, the nature of the receiver itself), the antenna is a constant over all short wave radio receiving systems. Enhance the antenna, and you enhance the whole thing. Indeed, if I had limited money (which I do), then I would put most of it - or all of it - into the antenna rather than such accessories as preamplifiers and pre-selectors (the latter may be needed for excluding unwanted signals, but otherwise does not usually add much to overall reception). The payback for an antenna is simply greater than for other accessories, especially for the short wave bands.

Fig. 1: Random length, a.t.u.-tuned multi-band antenna.



Antenna Attributes

The receiver antenna can provide several different attributes. Because these attributes vary quite a bit from one antenna design to another, it may also be necessary for you to have more than one antenna. In other cases, you will need to select a single antenna that meets your needs the most, even though not totally suited to your needs. For the present, let's focus on the issue of how to get a multi-band antenna in a limited space, or on a limited budget.

That first 10m slug of wire that you tossed out the window and over a tree limb when you bought your first receiver is an example of a non-resonant antenna. A statement that is generally (but not totally) true is that resonant antennas tend to pick up more signal and deliver it to the receiver than do non-resonant antennas. Unfortunately, most resonant antennas tend to be single-banded, and that means a short wave listener will need several antennas to do the job. Or do they? In this article we will take a look at several options for making a multi-band antenna.

Random Length Wire Antenna

We started out with the premise that a first-time short wave listener has a chunk of wire, 10 to 30m long, slung out the window to some convenient support, such as a tree limb. A variant of that type of antenna that is tuned, more or less, and is multi-band is detailed in **Fig. 1**. The radiator element is at least equal to quarter wavelength on the lowest frequency of operation. For example, for coverage of the h.f. band, you might want to make the wire radiator element at least 25 metres long (30 metres is nice). The basis for this length is:

Length (m) = $73/F_{MHz}$

where F_{MHz} is the 3MHz lower end of the h.f. spectrum.

The key to this form of antenna is the use of an antenna tuning unit (a.t.u.) that can convert a high impedance down to 50 or 75Ω. Several suitable models can be found in advertisements in this magazine or the catalogues of the major short wave vendors.

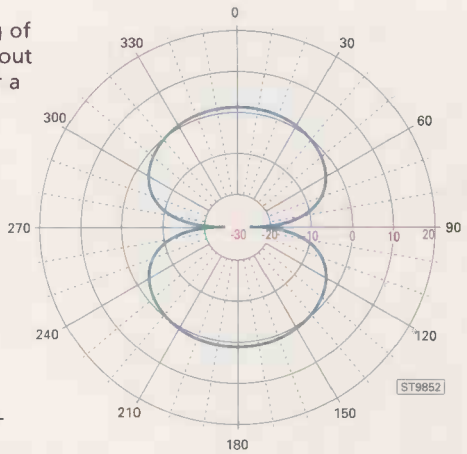


Fig. 2: Figure-8 dipole horizontal pattern.

It is absolutely essential that this form of antenna have a 'good earth'. What does that mean? It means a low resistance connection to a good earth system (e.g. 2.5m copper clad steel earth rod) through a very short earth wire made of braid or flashing copper. Unfortunately, that requirement is not always easily met...especially for second-floor installations.

A counterpoise earth is an artificial earth, also called an earth plane, made of quarter wavelength radials (like those used on verticals). The radials are cut to the centre of the desired band (Length = $75/F_{MHz}$ meters). Although the rule is to have as many radials as possible for

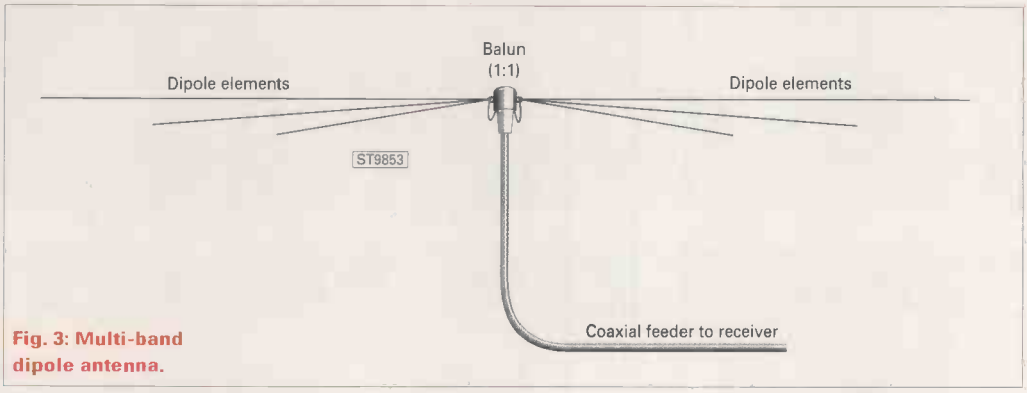


Fig. 3: Multi-band dipole antenna.

each band, there are practical limits. Above fifteen radials per band (!), the effectiveness, or rather the marginal return, for each additional radial decreases markedly. The optimum number seems to be two to four radials per band, although even just one radial per band will work wonders over a poor earth ground.

will also work on a frequency three times the resonant frequency. For example, as a Novice class ham operator (late 1950s), I used a 40m dipole on both 40 and 15m. The pattern at this 3l/4 frequency will be a four-lobes 'clover leaf' rather than a figure-of-eight.

The dipole has a nominal feed point impedance close to separate supports (as shown in **Fig. 3**). Another option, however, is to use a multi-conductor cable such as antenna rotator cable (four or five conductors depending on the type bought), with each separate conductor cut to a different band. Although I've not tried it, the use of 14 or 16 conductor computer 'ribbon cable' seems to bear

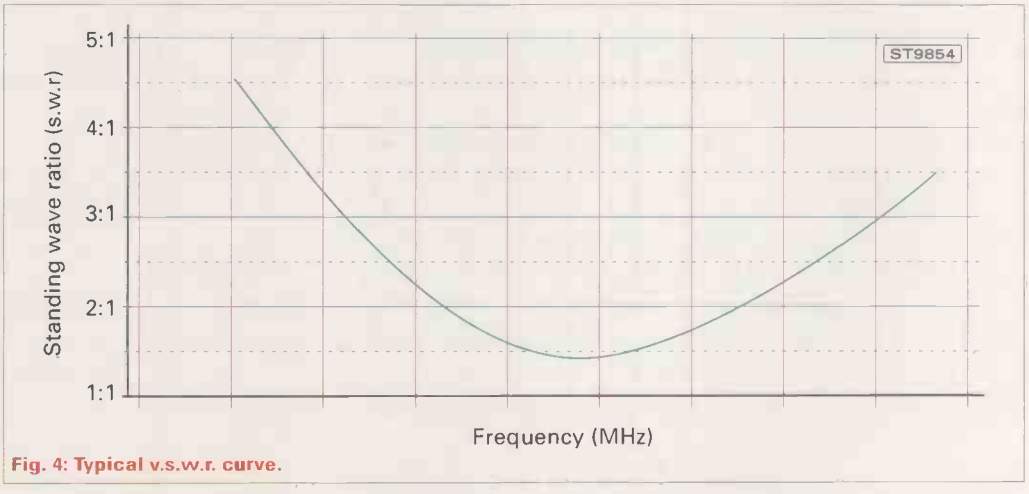


Fig. 4: Typical v.s.w.r. curve.

Multi-Band Multi-Dipole

The dipole is a half wavelength wire antenna that is fed in the centre with 75Ω coaxial cable. It is bi-directional, having a 'figure-of-eight' reception pattern (**Fig. 2**), with maximum pick-up broadside to the antenna and the nulls off the ends of the wire. This type of pattern is useful both for increasing the signal level in the direction of reception, but also (more importantly) for nulling interfering signals by positioning the nulls in their direction.

The dipole is inherently multi-band, but only at the harmonics of the fundamental resonant frequency. The length (in metres) at the fundamental is $144/F_{MHz}$. But that antenna enough to 75Ω to make a good match to that type of coaxial cable. As the frequency departs from the resonant point, however, the impedance climbs dramatically. As a result, we can connect multiple half wavelength dipoles to the same feedline (**Fig. 3**). The impedances of all the dipoles is in parallel, so tends to reduce the overall impedance seen by the feedline, hence the receiver. However, off-resonance the impedances are so high that it decreases the overall impedance a negligible amount.

Constructing the multi-band dipole can be done in several different ways. The most common method, perhaps, is to simply connect multiple dipoles to the same feedpoint and route them at small angles from each other

investigation in this respect.

One problem with the use of rotator or ribbon cable, however, is that it tends to be small diameter and not terribly strong. Do bear in mind the strength of the antenna, especially if it is installed out of doors. Be careful.

Tuning A Dipole

One of the disadvantages of publishing an equation for antenna length is that readers will actually take it seriously. For example, the dipole's overall length (in metres), is $144/F_{MHz}$, and that looks so very precise. It is true that all formulas are approximations only. Differences in location, differences in wire size, and differences in end insulator characteristics, conspire to change the real length required. This effect is greater on the higher bands than on the lower bands. At the higher frequencies, 20 or 30mm is a greater percentage of the total.

The best way to tune a dipole is to erect it a bit longer than necessary, and then run a v.s.w.r. curve (**Fig. 4**). The minimum point is at the resonant frequency. If the resonant point is too low, then shorten the antenna, but if it is too high you must lengthen the antenna. Because it is easier to shorten than lengthen (cut wires being what they are), I recommend cutting the antenna initially a bit low, and then trimming up-band from there. I use an MFJ Enterprises MFJ-259 VSWR analyser for my antenna work.

Conclusion

The case of the multi-band antenna need not be difficult, as might be presumed. Multi-band antennas can be built using simple wire construction.

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Fig. 5: An invaluable tool for antenna work MFJ-259.

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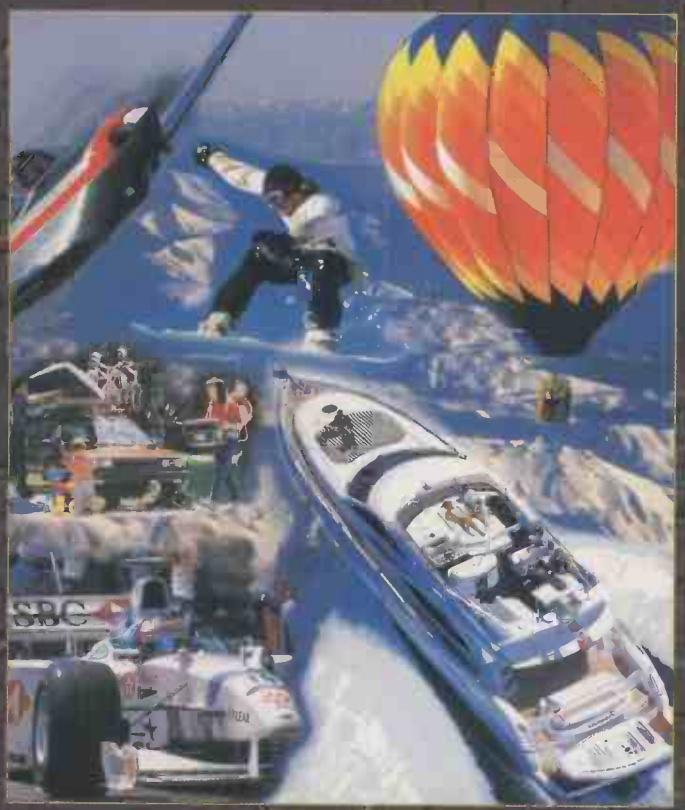

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Sky High

Welcome to 'Sky High' - the civil and military airband column. I have to report that there seems to be some strange forces at work! Readers of last month's column will be aware that my Yupiteru MVT-7100 died on me shortly after my arrival at Mildenhall show. Endless button pressing, battery changing and several resets failed to bring it to life. On returning home, further attempts at resuscitation were also to no avail.

Consequently, a parcel and letter were prepared ready for it to be sent off to the workshop, but just before I sealed it up, I thought I would have one more try. Installing the same batteries, I turned it on and it burst into life and has worked perfectly for four weeks! One of the resets had obviously worked as all the memories had been erased, the only problem I have now is that I have become paranoid as I am convinced that if I spend ages re-entering the 750 or so stored memories, it will immediately blank out on me again. Isn't modern technology wonderful!

Airline Callsigns

Steve L. E-mailed me to ask if I can identify two callsigns heard recently from his home in Weston-Super-Mare. The first is '**DIRECT**'. This is Direct flight who operate four Cessna Caravans on behalf of the Ministry of Agriculture, Food and Fish, (or whatever they're called this week), and also Scottish Fisheries.

The second is the callsign '**COMPASS**', well my records show that this a UK company called Compass Aviation who are allocated the 3 letter code '**CPS**'. On checking further, I can find no reference to them actually owning any aircraft, so I would assume that they are a corporate company who charter aircraft and use their registered callsign for these flights.

One other UK callsign change noted recently. UK airline Sabre Airways, (ICAO 'SBE'), became Excel Airways at the beginning of May, their new callsign is '**EXPO**' and three letter ICAO code '**XLA**'.

Frequency News

David W. has kindly confirmed my comments regarding the Scottish Military frequency 124.05. This is definitely a standby/discrete frequency which he has heard in use during exercises such as Clean Hunter and JMC. He also reports that 124.95 has been noted in use for air/air interceptions and suggests that it may be a Scottish Military Special Tasks Cell. I have no record of this in use with Scottish, so any further confirmation from our readers would be welcome.

The Aberdeen frequency 121.25 which was used for North Sea Radar has been withdrawn. The ATIS at Edinburgh has been changed to 131.35. East Midlands have been using a new frequency of 134.175 as an Approach frequency instead of 119.65, (with 119.65 now being used as Radar). My correspondent suggests that this may only be a temporary measure.

Internet Info

My recent comments regarding e-groups on the Internet relating to airband subjects brought two differing responses. One anonymous letter, (from disgruntled of Portsmouth - noted from the postmark), strongly indicated that some radio

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Sky High

enthusiasts, (perhaps understandably), really do not want to be dragged kicking and screaming into the technology of the 21st Century. Whilst in my opinion the 'Hard Copy' which are books and magazines, still have a long term future, there is little doubt that in the modern world the need for instant information in certain hobby areas is insatiable. Like it or not the Internet, (with its many advantages and pitfalls), is here to stay.

On the positive side of my mail, having read my comments about the Military Airband groups, **Jim** from Reading asks if I know of an Internet group that deals specifically with the Civil Airbands. Well, having looked around e-groups there are one or two related groups, but they seem to receive only a small number of postings. Does anyone know of a group worth joining for civil airband information?

On a similar vein, **Martin S.** E-mailed me to let me know about a group he has joined which is based around air traffic across the Atlantic Ocean. The Atlantic group covers all aspects of h.f. traffic in this region and has extensive reports on frequencies, callsigns and Selcalls, etc. He reports that to join the group you send a message to them at **majordomo@qth.net** with the message content, 'subscribe atlantic'. Alternatively, you can E-mail the group at **atlantic@qth.net**

HF News

The HF Long Distance Operational Control station QUANTAS SYDNEY, (callsign QUANTAS CONTROL), has closed. The area in the Pacific that this station controlled has been taken over by the joint Australian/New Zealand Air Force Network who operate from five stations at Auckland, Darwin, Perth, Sydney and Townsville. The station callsigns are AIRFORCE AUCKLAND, AIRFORCE PERTH, etc., with collective callsigns also being used, e.g. AIRFORCE ANZAC, AIRFORCE AUSTRALIA and AIRFORCE NEW ZEALAND. The frequencies in use are 8.974, 11.235 and 13.206, (daytime 2100-0900) and 3.032, 5.687, and 8.974, (nightime 0900-2100).

Incidentally, for those of you who may be new to airband listening, the times above are ZULU TIME. This is the time taken at the Greenwich Meridian in London and is what for many years has been referred to as Greenwich Mean Time or GMT. (Sorry, I am of the old school - I refuse to call it UTC or Co-ordinated Universal Time!). This time reference is used world-wide by all Civil and Military aircraft, so if an aircraft takes off in the UK at 1430, (1530BST), aircraft taking off simultaneously in Auckland, New York or Singapore would also depart at 1430. *(All times quoted in* SWM *are UTC unless stated - **Ed.**).*

Jim T. from Glasgow has written to me asking if I could clarify the changes to the USAF Global HF System which have taken place over the past year. I know Graham has mentioned this in the 'SSB Utilities' column, but for those of you who may not read it, (shame on you!), this is the situation as I understand it.

The frequencies 8.968 and 17.976 have been withdrawn. The stations at Albrook, MacDill and the short lived Bayonne have all closed. The station at Andersen now uses the callsign 'Guam', McClellan uses 'West Coast' and I have heard aircraft calling Hickam, using the callsign 'Hawaii'.

Perhaps the most significant change for UK h.f. listeners is the, (alleged), closure after almost 50 years of Croughton, Oxfordshire, as a radio station. The transmitters, antennas and a maintenance staff still remain, but the station is now operated remotely from Andrews. As I write this in early July, the callsign 'Croughton' is still being used. Some sources have suggested that although the Global HF Network transmissions are being controlled remotely from Andrews, it may be the case that some radio operators are still present at Croughton and there may still be a facility for discrete transmissions. Any thoughts anyone?

Recent Change

Lastly, news of the most recent change to the GHFS was sent to me recently by a colleague in the USA. This is the closure of the station at Incirlik in Turkey on the 1st May 2001, (last noted by me on the 26th April). It has been replaced by a new station at Sigonella in Italy and so far has been noted using the frequencies 4.709, 6.724, 9.007, 11.271 and 15.038, (the first report that I noted of 9.007 in use was on the 23rd March). It seems odd that the frequencies do not tie in with the Primary GHFS frequencies, but from the traffic heard, such as EAMs, (Emergency Action Messages), it is definitely a GHFS station. Official Documents, dated late June 2001, as yet do not carry this latest change to the Global HF System.

New Manchester Runway

I am grateful to **Rob** and **John** who have sent me a letter and a map regarding the new Southern Runway at Manchester. They tell me that the area alongside the perimeter fence adjacent to the parallel Runway 06R/24L is an excellent place for both the airband listener and the photographer. Safe off-road parking is possible at both ends of the Runway and also at a number of places along the country lanes that route along the south-side of the airfield. There are a number of public footpaths that cross this open area and the ground undulates significantly so that in the raised areas you can get a clear view of the Runway, unobstructed by the fence. In particular, one large area West of the Runway 24L threshold is meant to be very good and can be reached from the Altrincham Road.

Rob reports that during the recent fine weather armed with camera and radio he spent several of his days off part way down the Runway and got some excellent lift-off and touchdown shots. When the airfield is landing on Easterly's, (from the West), the preferential Runway for landing is 06R and some excellent landing photographs are also possible. The reader should note that at present this Runway is not in use between 1200 and 1500.

They have also included a listing of the current Manchester frequencies which are as follows: Tower 118.625/119.525, Approach 119.4/118.575/121.35, Ground 121.85, Clearance delivery 121.7/Arrival ATIS 128.175/Departure ATIS 121.975. Thanks lads.

■ ROGER BUNNEY, 35 GRAYLING MEAD, FISHLAKE, ROMSEY, HANTS SO51 7RU

Satellite TV News

Unfortunately, bad news on the digital receiver scene. The RSD ODM 300 series that featured full auto search on all digital parameters, ie FEC, SR and PIDS, is no more. This popular receiver was one of the very few that you just entered the frequency, it did the rest and told you its findings!

RSD have ceased all UK manufacture of DTH (domestic) receivers, they're too busy with the professional digital market. RSD receiver designs are now being made by Eisen in Korea, as yet there's no UK distributor and having found the Eisen web site, it was entirely written in an unknown [Korean?] script! The Stirling factory has no 'end of line' receivers being sold off - I did check!

I've been scanning over *Eutelsat 2F3* @ 21.5°E lately, a 'difficult' satellite since much of the traffic is of short duration - news feed inserts, OBs, etc. and usually signal levels are much lower than their entertainment channel counterparts. The first weekend in July produced a race-riot situation across Bradford, the worst reportedly seen this year.

Monday 9th and justice for the guilty - the uplink truck 'SIS-13 UKI 147' was in the town centre late afternoon reporting the court cases inside the nearby civic hall. A signal not reaching 20% on my scale, but it locked with just a few dropouts - 11.692GHz-H, SR 5632 + FEC 3/4. And it was another pavement job for 'UKI-511 SKY NEWS-A' back on June 26th with (a familiar ex TVS) SKY reporter updating with a live report on the 'Lord Archer Diaries', London trial - 11.693GHz-H, 5632+3/4.

More entertaining however - once more on *2F3* - on June 25th was evening horse racing from the Kilbeggan race course in Ireland. The earlier events went into hard encryption, but eventually all coverage was in the clear, the 'Eircel Handicap Steeplechase' was one race that showed the truly rural location and surrounding countryside. Thanks (!) to 'SISLINK-20 UKI-190' for this transmission @ 11.668GHz-H, 5632+3/4. Racing continued from prior to 1730 through until after 2100, the service ident was the simple 'P11668H01'. In recent times most of the popular UK race courses have been connected to fibre resulting in fewer horse race meetings carried via satellite.

The Reuters Moscow TV Bureau previously fed output of the main 'PTP' TV channel at various times of the day back to the 'West' on 11.556GHz-H via *MSS-K*, 21.5°W. More recently the 'Moscow Bureau 4' has been seen using 11.520-H and 11.556GHz-H, 5632+3/4, often seen after 0930 and early UK evening around 1730 onwards, occasionally using NTSC 525-lines rather than PAL 625-lines, this to take the 1300 and 2100 (Moscow time) main news bulletins plus adjacent programming - though the July 8th a.m. transmission carried a government or high level conference session which dominated much of the morning's programme time.

Onto more local developments, evening of July 10 and the Anglia-TV OB unit were out on the sands uplinking via the usual 'BT-TES42' truck with pictures of a rubber inflatable lifeboat - but things are a-changing as the reporter then suggested, walking away from the inflatable to the new lifeboat which is a hover lifeboat capable of 30 knots over sea and about 11 knots over land or mud flats. The hovercraft is a new on-trials prototype for the RNLI which in demonstration zoomed across the beach and onto the sea - all exciting stuff via *Intelsat 801*, 10.983GHz-V, 5632+3/4.

Had a call July 10th from **Edmund Spicer** (Littlehampton) - whilst he was adjusting his hand operated dish missed *Eurobird* 28.5°E and ended up 'somewhere between 28° and 35°E' - lucky as within this patch the new *Astra-2C* that launched mid-June ex Baikonur has been testing, Edmund found very strong carriers between 10.714 and 11.850GHz. (Stefan Hagendorn reports *2c* @ 32°E July 2nd).

Interesting that SES Astra will initially move the new *Astra-2c* to the 19.2°E *Astra-1* slot rather than the digital 28.2°E slot, this is to provide transmission backup for the ageing 13 year old *Astra-1a* until *Astra-1K* flies. Edmund keeps a close watch on the Eutelsat's *Hot Bird* 13°E slot and noticed that the French equivalent of *Big Brother* that goes out as 'live' as part of the TPS PAY-TV digital bouquet was actually several minutes behind the same live selection of 'La Grand Frere' that was going out on the M6 channel over *Telecom 2B/D* 5°W @ 12.522GHz - in real live analogue SECAM.

Another reader advises that the Globecast 'SERTE PARIS' feed over 11.402GHz-V on *Hot Bird* analogue has closed down - and yet a further analogue closure is the *Eutelsat W2*, 16°E RTK Kosovo PAL transmission that's gone black on 11.421GHz-V. And can any reader advise the whereabouts - if indeed he is still active - of Dutch TV amateur PI6ALK that previously downlinked @ 12.729GHz-H on *Eutelsat W2*, 16°E - he's disappeared!

As readers may know, in a previous life I worked in broadcasting for nearly 30 years and seeing a problem unfold on-air really brought back the live TV situation of decision time. *NSS-K* evening of June 26 was relaying a live report from the front lawn of the White House, Washington, into the SABC news Johannesburg. The hardened reporter obviously needs a reverse programme sound (from the SABC news) in his earpiece so that he can 'take his cue at the right time - the reverse sound is called 'IFB' (stands for interrupted foldback). With but a few minutes to the live insert there's no IFB in his ear and there's some kind of trouble in the nearby satellite truck. Now Rodney is the sound engineer and can't figure out where the sound has gone, our reporter keeps his cool and tells Rodney to dial up SABC on a mobile 'phone and to get the Johannesburg studio control room to patch the comms into the 'phone and then "you cue me Rodney". Reporter is cool, Rodney is agitated, but at the right moment, he waves his hand and South Africa receives the live report, apparently the event is President Umbecki's official visit to meet with George W. Bush. The 'drama' unfolded on the Globecast 11.590GHz-V, SR 20145+3/4 21.5°W bird - live telly news, it's instant decision time and most of the time you win!

One of the breaking news items in late June into July was the arrival of Slobo Milosevic at the UN War Crimes Tribunal, the Hague, Holland, for trial on his numerous misdeeds. June 28th finds numerous SNG crews hanging around at the nearby airport and at the Hague for the first sightings of the villain.

Roy Carman (Dorking) logged six different sat uplinkers that evening including INTRAX, ENEX, SBS, Sky News (using UKI 257 SIS 26) and others unidentified using *Eutelsat W2*, 16°E at or below 11.050GHz and in the 12.507-12.570GHz Telecom band. Mention of Telecom and the BBC live news injects which have been rather evasive, one sat to check is the *Telecom 2B/D* slot at 5°W. Roy found three downlinks for the Beeb during the election period at 11.578-V; 11.614-V and 11.690GHz-H, all using 5632+3/4.

Satellite uplink engineers are creatures of habit and speed, if something works then leave it (witness the regularity of the Meridian/Anglia OB feeds, always the same freqs!) so the top end of the *Telecom* 5°W bird is the first place to check out!

Finally the bizarre oddity of this month's column relates to a *Eurobird* 28.5°E sighting June 12th, 12.634GHz-V, 5632+3/4 on the Satcom DSNG uplink truck for 'SCOPUS'. Fashion statement watch company 'Swatch' sponsored a sales event with white clothed participants standing in a guarded mountainside wind tunnel. At the critical moment the 'wind' is switched to fast blow - but not hurricane force. An interview with a departing participant reveals that the wind tunnel is a top secret military installation and this is the first time 'Joe Public' have gained access. Question - what's the connection between a 'Swatch' watch and a mountainside wind tunnel?

Kilbeggan races in Ireland from 'SISLink 20, UKI-190', note the digital service across the service ident (via Eutelsat 2F3).

Weatherman Carl prepares for his weather forecast live into *Meridian Tonight* during the June heat wave (*Intelsat 801*).

A serious reporter awaits his cue for a live report into the news - somewhere...(via *NSS-K*).

This an NTSC feed into the 'States ex Moscow to include the main network news (via *NSS-K*).

Live motor rally action from Cyprus (via *Eutelsat W2*).

A live 'GV' (GV = general view) from Camp David, Maryland, which catches a C-Band SNG truck driving off home! (*NSS-K*).

Test pattern ex Bradford after the riots (*Eutelsat 2F3*).

Reporter keeps his cool and checks out with the SABC on a mobile when the return IFB feed is dead (*NSS-K*).

■ **DAVE ROBERTS c/o *SWM* EDITORIAL OFFICES, BROADSTONE**
■ **E-MAIL:** scanning@pwpublishing.ltd.uk

Scanning Scene

I've been looking at Pager traffic again. I can't help it. I guess I'm just a saddo. It can be a most useful information source, however, with traffic alerts for delays on London Underground and other transport events being notified to employees via POCSAG pager. Other than that, there is some interesting traffic and increasingly these days some folks are actually monitoring DX pager transmissions.

There's a bloke in Europe who has an interest in monitoring POCSAG from the Llama Paging Company in Costa Rica! I read some of their messages last week and I've just regained consciousness. There's a really excellent pager decode program available these days. Called *PDW* it decodes POCSAG, FLEX, MOBITEX (Mobile Data Terminals) and ERMES pagers. If you are an airband enthusiast, it will also happily display ACARS data.

There are an excellent range of set up options and it runs through the soundcard of your computer with no interface or if you have no soundcard or want to decode FLEX, ERMES and MOBITEX, you will probably need to build or acquire the interface which is described in detail in the *PDW* program's documentation.

The computer requirements are that you have a Pentium or equivalent processor with 8MB of RAM, running *Windows 95* or later, 900K of hard disk space is needed (a very small amount) and a VGA screen. A soundcard is necessary, unless you want to use the interface option.

Assuming that you go the soundcard route, you'll need a screened lead with a plug suitable for your scanner's audio output (earphone or external speaker) on one end and a stereo plug on the other that fits into the line input of the card. Wire the left and right poles of the plug together so that the audio enters both channels of the card.

Setting up *PDW* is dead easy and within a short time messages will display on the screen. Filters can be set to search for specific pagers and for text so that the recovered messages can be easily sorted. For FLEX paging you'll need to derive the signal from the discriminator of the receiver, but for general POCSAG use the soundcard works just fine. The *PDW* program can be downloaded from **http://www.pcapaging.ic24.net/**

Frequency information is included in the documentation. There is a freeware version which I did not have much luck with, but the shareware version works well with all the features of the registered version with the exception that it times out after 20 minutes. This gives you adequate time to see if this program is for you and if it is, then the details of where you should send your £10 registration fee are in the register file.

Entirely Free

Now some good news and some bad news. First the good news. PROMA data is now entirely free, yes, available at no cost at all. The bad news is that it's now only available via the Internet from **http://groups.yahoo.com/group/scanpromauk** This can't be helped as Paul can't find the time or cash to disseminate information by hard copy and post.

I hate to bang on about computers and the Internet, but the amount of information that can be accessed over the Internet is truly numbing. Internet access is really becoming necessary for anyone technically aware. If you want to see how you like the Internet before buying, try and find an Internet cafe and pay a few pounds and just try it out.

Military Matters

Monitoring military matters can be a bit fraught and I don't want to mention specifics on paper, but those of you that may overhear such stuff on frequencies between 410 and 425MHz will find that they are gradually disappearing. These frequencies have been flogged by the government for use with the civil Dolphin TETRA system and official users have moved elsewhere within the same band.

Military folks, of course, have a plethora of most expensive and sophisticated radio gear to use. You can imagine the trouble that they get in if they lose a bit of a radio. Apart from the cost, there are security implications in losing kit. Likewise, if equipment gets damaged, replacement is expensive and repair costly in time. That is why in some cases you may hear military voice procedure on your PMR446 radio.

The guys have been using some PMR446 sets for routine natter over short distances. They are characterised by the voice procedure which is a dead giveaway. Just a tip for the military guys here...when you are on PMR446, try and sound like a shoe shop or whatever.

Speaking of military voice procedure in these increasingly lawless times there are many job opportunities for ex military personnel within the security field. These folks have experience of radio work, are used to responsibility and in many cases have surveillance and intelligence training.

Their radio comms are distinctive in that they will often sound similar to, "Hello one this is zero, radio check over". "Zero this is one you are OK over". That kind of stuff, nothing too slick here, but quite recognisable.

Many of security companies that work on projects in different parts of the UK, and indeed the world, have a somewhat cavalier attitude to radio frequencies. They may use frequencies practically anywhere in the spectrum. It just depends what equipment they have available and to which channels they choose to tune it. Many of them pay no attention to radio licensing even if they have ever heard of it.

Quite honestly, I am aware of security operations taking place in many parts of the r.f. frequency spectrum totally without authorisation. It may take the authorities many weeks to track them down even if they are aware of their presence in the first place, by which time the job is completed and the boys are gone.

In addition to this, encrypted and modern ex military frequency hopping gear is becoming much more available to buy. A company in Herefordshire deals in much of this equipment, so don't be surprised to hear anything almost anywhere these days.

UK Mapped

Have you ever seen those Land Rover Discovery vans with a dish antenna mounted flat on a short pole at the back of the truck? It looks like a mini AWACS unit. Also there will be a whip antenna and mobile 'phone antenna too. The vehicle will be parked up and possibly unattended.

Look a few yards away and you may see a chap hiking a piece of ground in a precise way. He'll be carrying a backpack with antenna that appears identical to those on the car. The backpack makes the man look like an astronaut in training. He'll probably be holding a small computer type unit in his hand or it may be mounted as an extension to the pack, angled to one side of the guy. I'm afraid it's not NASA on a field training exercise. It's actually an employee of the Ordnance Survey. Despite it's name, the OS has been a totally civilian business since 1983 and they have now mapped the whole of the UK very precisely.

The 'astronaut' is one of their surveyors who, with the aid if his personal GPS (that's the dish antenna accounted for), literally manually enters all features onto the portable computer which then uploads the data to the vehicle for storage and download at the end of the working day via telephone. I'm sure that the vehicles are not left unattended in many parts of Britain where anything left unguarded gets stolen, but I have seen some vehicles parked about isolated parts of the countryside when I have been out and about on my travels.

Two Requests

A couple of requests now. Firstly, has anyone read the book *Transmitter Hunting* by Joseph D. Moell and Thomas N. Curlee? Did you find it of interest or really useful? It certainly sounds fascinating anyhow and I wondered whether anyone had actually read it. Secondly, has anyone tried out any of the non powered antenna combiners or diplexers that are now being offered for sale? What are your thoughts on their effectiveness?

Be Aware

Finally, and I rarely mention this, but be aware that it's illegal to listen to anything other than legal broadcast stations, amateur and CB traffic and other radio transmissions for which you hold a licence. If you do happen to want to listen to anything else, please be discreet.

SWM

Scanning Scene

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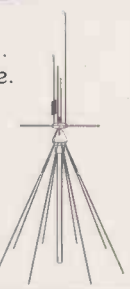

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DX Television

Although June was a reasonable month for Sporadic-E reception it lacked the all-day openings normally associated with this time of year.

Exotics

The 13th was relatively quiet until 1630UTC when Ukrainian YT-1 pictures emerged on Channel R2. Weak noise-level signals were present on E2, but by 1710 reception improved to reveal the Iranian IRIB-2 logo in the top-right of the picture. The signals, accompanied by sound, faded but later Arabic pictures were seen with only a line of text in the lower-left corner. Reception continued until 1740. The following morning at 0830 an Arab presenter was clearly visible on E2.

On the 17th at 1728 **Barry Bowman** (Manchester) discovered a music programme, possibly of Middle Eastern origin, with a logo resembling a minaret in the top-right.

Between 0807 and 0821 on the 21st **Peter Barber** (Coventry) saw a presenter on E3 wearing a shallow fez and long shirt. There was Arabic script at the bottom of the screen scrolling from right to left with possibly a logo in the bottom-right of the picture. Shortly after at 0940 on E2 **Simon Hockenhull** (Bristol) discovered a news bulletin with Arabic titles. Unfortunately, no station logo was visible and the signal soon vanished.

Other Reports

George Garden (Edinburgh) had his first real taste of Sporadic-E on June 7th with Spanish signals on E4. Despite using a four-element f.m. array feeding a JVC CX-610 small-screen colour receiver, George adds that the TVE-1 logo was clearly defined. The signal re-emerged on the 8th at 0400UTC, but on E2 and E3 a different programme, without a logo, was seen consisting of previews or pop music clips within rectangles.

Iain Menzies (Aberdeen) has successfully logged several countries in colour using a Thomson multi-system portable. The best reception was Canal Plus (France and Corsica) in SECAM colour during a rare period of unencrypted transmission.

The unidentified cookery programme on E2 and E3, which several enthusiasts have failed to identify so far, may be Sweden. Simon Hockenhull noticed a cookery programme at 1835 on the 18th.

No Warning

Simon Hockehull comments that with the imminent demise of TVE-1 on E2 and E3 there was no warning caption advising viewers to retune. In fact, as this column is being written during the first week of July, the Madrid E2 transmitter is still on-air!

Italian Mystery

Towards the end of June a logo resembling the old 'Video' identification (the Italian private transmitter below E2 before its name change) has been seen on Channel A on more than one occasion and with private station TVA present.

Slovenia Identified

Vincent Richardson (Dolgarrog) has just replaced his mid-Eighties D-100 DXTV converter with the latest scanning version. This is fed from an amplified four-element rotatable Band I array mounted atop a hinged pole mast. At 1429 on the 23rd a stylish analogue clock appeared with Slovenia in large letters followed by a subtitled programme. This enabled a mystery '1' logo in the top-right of the screen to be identified at long last.

Icelandic Reception

Stephen Michie (Bristol) advises that Icelandic TV has introduced restyled graphics resembling Estonia's recent throw outs! Stephen noticed these on the 11th at 1109 on E4. Icelandic signals were also around on the 12th. At 1512 Peter Barber (Coventry) saw schedules and text advertisements with repeated graphics. A rotating question mark featured in the top-right. Although programmes are rarely shown through the day, Icelandic television has progressed somewhat. Thirty years ago programmes were suspended for up to eight weeks during the summer, with only the test card to watch. Those were the good old days!

FM Reports

George Garden reports the closure of a 'local' religious station on 107.0MHz, probably because it was an RSL or, more likely, an illegal activity. On June 11th George heard Energy 106 on 106.6MHz, possibly Northern Ireland, as Lisburn and Belfast were mentioned during adverts. Simon Hockenull heard several Spanish stations via Sporadic-E on the 5th between 1950 and 2020. Meanwhile, a mystery has been solved - Iain Menzies (Aberdeen) has identified the Spanish station on 87.6MHz as CATINFO. On the 17th at 1723 Simon identified YLE NYKSI (Finland) on 87.9MHz playing classical music.

Service Information

Stephen Michie advises of the following changes:-

Norway: NRK-1 now shows a news bulletin called 'Nyther' at midday. Also, the programme schedules clock has been restyled.

Lithuania: A new type of clock is in use. The G-204 test card is used with either 'LRTC 2' or 'VILNIUS' identification. Colour bars are also used with a logo top-left. At times a white raster or a vertical bars pattern is also broadcast.

Estonia: A new opening sequence consists of live red pandas and other animals climbing branches. The EESTI TV logo is shown in the lower-left of the screen and 'ETV' top-right. The old logo is still shown on the digital clock.

Italy: The new RAI UNO 'butterfly wings' logo can be displayed in any of the four corners. Beware - it looks like Arabic when the signal is weak!

Austria: The E4 outlet at Patscherkofel has moved to E29.

Keep On Writing!

Please send your DXTV, slow-scan TV and f.m. reception reports, news, off-screen photographs and information to arrive by the first of the month to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS**. We can also use off-air pictures stored as JPG files on PC disks and good-quality video recordings. The new E-mail address is **GarrySmith@dx-tv.fsnet.co.uk** and our website is **www.test-cards.fsnet.co.uk**

Fig. 1: Moldova (tvm) captured on R2 by Stephen Michie.

Fig. 2: Lithuanian (LRT) clock on R2 received by Stephen Michie.

Fig. 3: Slow-scan TV received on 14.230MHz by Peter Easton GM1 RPC.

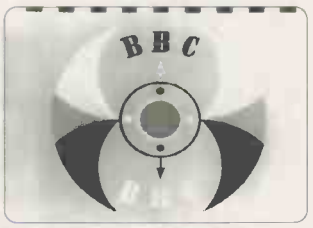

Fig. 4: This month's ramble 'Down Memory Lane': the BBC 'Bat's Wings' Tuning Signal which was introduced on June 16th,

■ LAWRENCE HARRIS, 55 RICHVILLE ROAD, SHIRLEY, SOUTHAMPTON SO16 4GH
■ E-MAIL: info.orbit@pwpublishing.ltd.uk ■ WEB SITE: http://www.itchycoo-park.freeserve.co.uk

Info in Orbit

This month's deadline is just three days after we (finally) move to Southampton. The last piece of my weather satellite (WXSAT) equipment to be taken down was the crossed-dipole on the roof, though a minor problem resulted in the entire cable run of some 20m being left in position. Meanwhile, my log-periodic yagi was detached from another mast for removals.

The large satellite television dish and analogue system has gone to a friend's house and, three days before the big move, I have dismantled the METEOSAT Primary Data (PDUS) dish that has served me well for several years. On arrival, I have to decide whether to set up the small METEOSAT dish, or go for a low-level test mounting of the crossed-dipole antenna. New surroundings are almost certainly going to have a significant effect on reception characteristics - maybe better, maybe worse. At least METEOSAT reception is likely to be identical virtually everywhere in Britain.

Current WXSATs

NOAA-12 and *NOAA-14* have continued their 'me first - you first' orbital dance. *NOAA-12* makes 14.24 orbits per 24 hours and *NOAA-14* makes about 14.13 orbits per day - slightly less than *NOAA-12*. Consequently, *NOAA-12*'s orbital period is slightly faster, so it regularly catches up and overtakes *NOAA-14*.

George Newport's colourfully enhanced image from *NOAA-12* shows the approaching poor weather that signalled the end of a spell of sunny skies from June into early July. As at the time of equipment dismantling, *METEOR 3-5* continued operations as did *RESURS 01-N4*.

Solstice Solar Eclipse

By coincidence, the first total eclipse of the sun in the new millennium happened at about the same time as the summer solstice - on 21 June 2001. Eclipse chasers, including **Kevin** and **Monika Smith**, travelled to various locations along the zone of totality. They took a series of superb images and very kindly provided me with samples, including **Fig. 2**, taken from a dried river bed in north-east Zimbabwe, close to the Mozambique border. Kevin also sent me a superb animation of the whole event.

The European geostationary WXSAT *METEOSAT-7* was ideally placed to image the earth and capture the cone of darkness as it crossed the continent during the eclipse. It has a full schedule of essential transmissions, so *METEOSAT-6*, positioned at 9°W, was brought out of 'stand-by' status for this special operation. A special scanning mode was used: instead of covering the full Earth disc in half-hourly intervals in the normal manner, a large part of the southern hemisphere was scanned at ten-minute intervals. This allowed for a more rapid observation sequence of the movement of the Moon's shadow across the Earth.

Images were subsequently made available via the Eumetsat web site - see **Fig. 3**. The 1200UTC image shows the darkened shadow causing the otherwise bright clouds to become barely visible. Interestingly, Eumetsat rectified the *METEOSAT-6* images to a nominal sub-satellite point of 0° longitude.

An eclipse image was also produced during routine scanning by *METEOSAT-7*. America's NOAA scientists processed and enhanced this to produce **Fig. 4**, a synthetic colour image comprising data from the visible and infra-red channels.

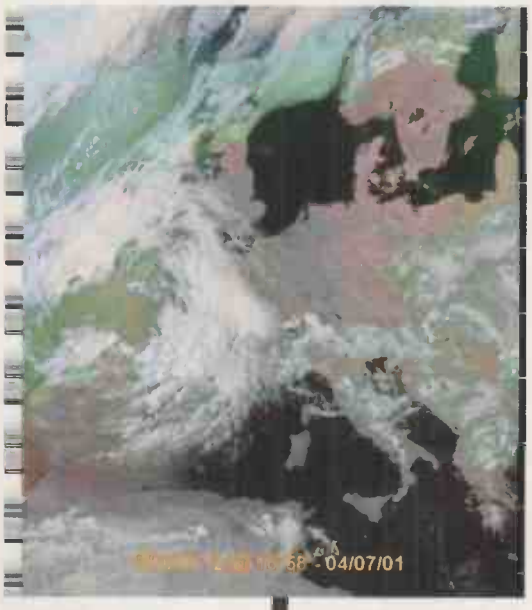

Fig. 1: *NOAA-12* 1558UTC on 4 July from George Newport.

Easterly Views

Alan Jarvis and I first met at the RIG Conference at Newport a few years ago, after a long spell of correspondence about WXSATs. Alan has been monitoring the polar orbiters and *METEOSAT-7* regularly, and *GOES-E* (the American equivalent of METEOSAT) occasionally. He lives in Cardiff, from where he can drive to locations that provide a clear view to the western horizon; here he can receive transmissions directly from *GOES-8* - just a couple of degrees or so above the horizon. On this occasion, Alan's attention was caught by an unusually clear easterly pass from *NOAA-15* in the early morning.

The picture **Fig. 5** shows a part of the visible image section of the complete pass from the southbound orbit at 0607UTC on 24 June. Alan commented "This is the furthest south-east I have ever received, and you can see the Nile Delta, the Dead Sea, Lake Tiberias (Sea of Galilee), Israel, Lebanon, etc. By my reckoning, the elevation of the satellite at Cardiff was only about one degree". Alan uses a home-built quadrifilar helix antenna in the roof space at about 10m above sea level, a Timestep Proscan receiver and the program WXSAT.

I agree with Alan's comments about "furthest south-east". Certainly from my (now former) Plymouth address I had difficulty with easterly passes because of the location of the house - on the west side of a steep hill. I occasionally received a *METEOR 3-5* pass that showed this region of the eastern Mediterranean, but only because that satellite is in a higher orbit that allows satellite reception further east.

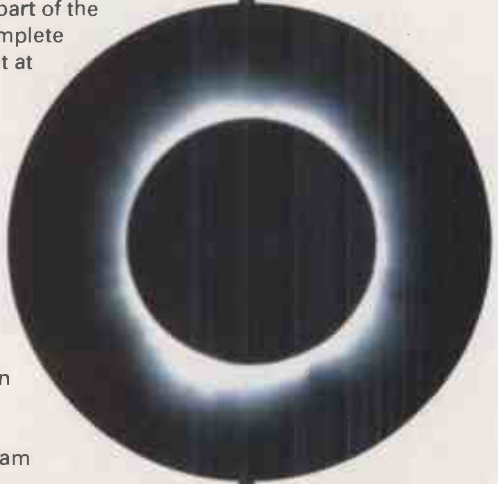

Fig. 2: Totality - solar eclipse image from Kevin and Monika Smith.

Fig. 3: *METEOSAT-6* image of solar eclipse (copyright © 2001 EUMETSAT).

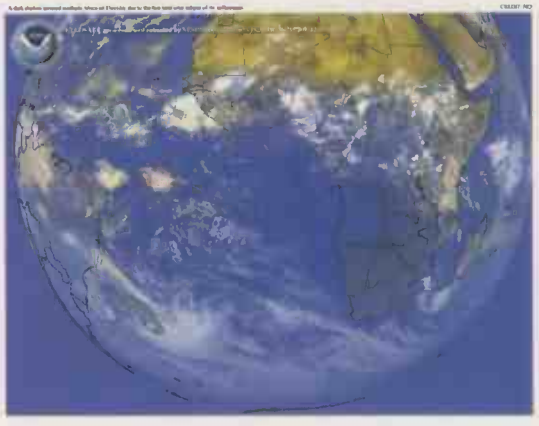

Fig. 4: *METEOSAT-7* image of solar eclipse courtesy NOAA and

Fig. 5: *NOAA-15* 0607UTC 24 June from Alan Jarvis.

Fig. 6: h.r.p.t. tower.

The Ultimate Dish Mounting?

Joseph Gresham lives in Florida, USA and has corresponded with me about his increasingly sophisticated WXSAT receiving station. Back in May I received an E-mail telling me that he planned to enhance coverage from his h.r.p.t. reception system by erecting a tower on which to mount his dish. For the reception of high resolution picture telemetry - which is in the 1700MHz band - the dish has to be controlled for satellite tracking. A few weeks later and it was all done! "I put up the 6.5m tower and used a Hazer on the top so I can lower the dish for maintenance. This has made a big improvement to my local area coverage. My next project is to use a 1.52m dish for *FENG YUN-1C* to improve signal gain," commented Joseph.

I suspect that planning restrictions in Britain would probably prevent such a tower from being erected at a residential property, but if anyone has special knowledge of such matters, please let me so and I will pass this on.

The first hurricane of the season - *Adolph* (see **Fig. 7**) - was imaged by *GOES-8* at 1745UTC on 29 May off the west coast of America.

Fig. 7: Hurricane *Adolph* from Joseph Gresham.

Contrails In Satellite Images

Contrails - trails of condensation - form in fairly predictable situations. Clouds form when the amount of water vapour in the atmosphere is greater than the atmosphere can sustain. The higher the temperature of the atmosphere, the larger the amount of water vapour that it hold - and conversely, the smaller the amount at lower temperatures. At high altitudes, the temperature of the atmosphere is low. Contrails therefore form when the water vapour in a jet engine's exhaust freezes instantaneously as it comes into contact with outside air, where ambient temperatures may be -30°C or colder.

Even if the upper atmosphere is very dry, condensation trails still form at very cold temperatures, though the ice crystals may sublimate very rapidly, and therefore the contrail may not persist. If the relative humidity is fairly high, contrails can form at higher temperatures, and persist, possibly broadening in the upper winds. They can then become visible in meteorological satellite images. Contrails can often be identified because they are usually very straight, and occasionally criss-cross, as seen in several of the images in this feature. Naturally forming cirrus cloud bands are usually broader, thicker, and more-or-less parallel.

I occasionally notice contrails in my own images, so I invited members of the WXSAT mailing lists on the Internet to send sample images. The results were very impressive so here is a selection of the many received.

Mike Jupp G1HWY sent a couple of very good recent images taken from his *NOAA-16* h.r.p.t. system. I selected **Fig. 8** showing channel 4 infra-red in which Mike has slightly enhanced the contrast to make the trails standout.

Figure 8 shows a clear "circular contrail pattern over the Norwegian/Swedish border. This pattern was seen in an earlier *NOAA-15* pass and persisted into the later *NOAA-16* pass in the afternoon". **David Taylor** sent me an image from the same pass, but recorded at the Russian SMIS station. He comments: "13 June 2001, saw a most peculiar contrail just north of Oslo, Norway. The clearest image was from the thermal channel (4) - where white represents cooler. You can see the lakes in southern Sweden which are lighter (cooler) than the surrounding land in this image which was taken by *NOAA-16* at 1118 UTC".

Most aircraft trails show as straight lines, but there seems to have been an aircraft circling north of Oslo, with the trails from each circle blowing to the east, making a coiled-spring like pattern! These circles were first visible on the 0836UTC *NOAA-15* image, suggesting that the aircraft was circling for at least two and a half hours!

Ohio, USA is indicated on the upper right of **Fig. 9**; the central region is Indiana, and Illinois is on the left side. Newly formed contrails, such as those seen in **Fig. 9** showing southern Indiana, are narrow and well defined. Older contrails seen in Illinois are broader and more diffuse. Well-defined shadows cast onto the surface below from the contrails are just visible in southern Indiana. The large distance between the clouds and their shadows in this mid-morning image indicates that the contrails are at very high altitudes. The infrared image (not shown) may not always be useful in determining the altitudes of contrails because the clouds are somewhat thin, resulting in warm radiation coming up from the ground.

Fig. 8: *NOAA-16* h.r.p.t. 1121UTC on 13 June from Mike Jupp.

Contrails over southern Indiana - 7 March 97 / GOES-8 Visible

Fig. 9: *GOES-8* full resolution (1km) visible image showing contrails in the Ohio Valley on 7 March 1997.

Fig. 10: Ship and jet contrails from Dale Ireland.

Another factor with visibility is that the resolution of GOES infrared is 4km, compared to 1km in this visible image. There are no contrails evident to the north or south of a narrow zone, probably because there was insufficient moisture at high altitudes. Water vapour imagery is useful for estimating high level moisture, and the water vapour image at this time indicated that there was more moisture in the narrow zone where the contrails formed. My thanks to NOAA/NESDIS for the use of their image and information.

NOAA has a web site that carries **Fig. 9**, together with other images: **http://orbit-net.nesdis.noaa.gov/arad/fpdt/contrail.gif**

Dale Ireland has produced a web page **http://www.drdale.com/cam/wxsat/contrails/index.htm** with good examples of both ships' trails and jet contrails, based on his own satellite images, featuring the American west coast.

Basil Haigh captured an h.r.p.t. image from *NOAA-16* on 21 May showing a large number of contrails to the east of Britain.

Arne van Belle is the Co-ordinator of the Radio Observers of the Dutch Remote Imaging Group Werkgroep Kunstmanen, and sent three h.r.p.t images showing classic cases of contrails. A unique image from *NOAA-16* on 22 December 2000 shows one contrail from a jetliner that approached (presumably) Aberdeen airport. It was put in a holding pattern that shows as a perfect oval trail. The following descending approach is also clearly seen.

Thomas Renkevens of NOAA advised me of the location of some false coloured contrail imagery from 2 November 1999, provided by the OSEI (Operational Significant Event Imagery) site at **http://www.osei.noaa.gov**

John Huecksteadt also provides a site: **http://www.mindspring.com/~jwhac4ca/pages/contrails.htm**

Dr Thomas Koenig advised me of the following sites providing images over western Europe: **http://www.dfd.dlr.de/app/iom/1999_03/index.html** and **http://www.dfd.dlr.de/app/iom/1999_03/highres.html**

My thanks to others who supplied suitable images for inclusion.

After The Move!

The saying - that moving house is one of the three most stressful events in one's life - was perfectly true. On Sunday morning (two days after the move) we still have no telephone because BT failed to keep their promise to ensure a connection from mid-day on Friday. My consequent lack of access to the Internet means that I will have a large number of E-mails waiting! The removals firm failed to wait for my arrival in Southampton and simply broke into the house, transferred the furniture, my computer and WXSAT hardware to seemingly random locations! I now wait for a telephone line to send off this article to the editor! Meanwhile, my thanks to several readers for their kind wishes for our house move.

Fig. 11: Contrails over western Europe from Basil Haigh. Stephen Padar operates his h.r.p.t. system in America from where he recently recorded Fig. 12.

Fig. 13: *NOAA-16* h.r.p.t. 1250UTC 22 December 2000.

Fig. 12: *NOAA-12* captures contrails over central Florida - from Stephen Padar.

Frequencies

NOAA-12 and *NOAA-15* transmit a.p.t. on 137.50MHz.
NOAA-14 transmits a.p.t. on 137.62MHz.
NOAA-16 has unresolved faults with a.p.t. transmission.
NOAAs transmit beacon data on 137.77 or 136.77MHz.
METEOR 3-5 transmits a.p.t. on 137.30MHz in sunlight only.
RESURS 01#4 transmits a.p.t. on 137.85MHz.
OKEAN-O, OKEAN-4 and *SICH-1* use 137.40MHz for brief transmissions.
METEOSAT-7 (geostationary) uses 1691 and 1694.5MHz for WEFAX.
GOES-8 (western horizon from western Britain) uses 1691MHz for WEFAX.

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■ E-MAIL: shackware@pwpublishing.ltd.uk

Shackware

First off the welcome mat this time around is **Des Taylor** or Leicester. Des writes "My Fujitsu PC seems to be getting a bit long in the tooth. I bought it in 1996 when a 100MHz processor was a respectable turn of speed, a 1.2Gb hard disk seemed really big and an 8x CD-ROM was as fast as you could get, but I notice that it sometimes loses sync when I'm decoding and takes ages to build up the screen if I'm trying to clean up a captured SSTV image. After calling around my local computer shops, it seems that the only advice anyone can give me is to put my system in the bin and start again with a new one - remarkable! Can what still seems to me like a perfectly good computer, albeit a little slow, really only be fit for the bin? I'd like to increase the disk space, perhaps upgrade from *Windows95* and make it all go a little bit faster and I'm amazed that none of this is possible. What do you think, Jerry?".

What I think Des, is that once again salesmen in computer warehouses prove that they very definitely do not have their customers' best interests at heart. All they want to do is to sell you another computer. In fact, it's not only perfectly possible to upgrade your system, it's good for your bank balance, good for the environment and good news all round (except for computer box-shifters!).

Upgrading the hard drive is easy. Buy a computer mag from your newsagents and have a rummage for a cheap deal on a smallish (!) IDE hard drive with a capacity of say, 8Gb. Though this will be a massive step up from your 1.2Gb, it's considered small in these days of 30Gb hard drives as standard. A device like this should be available at under £50. A processor upgrade such as the Spectra 333 available from Evergreen Technologies will treble your machine's power and provide the 'all-important' MMX code-handling capabilities too (see **www.evertech.com** for details and you'll find prices in the aforementioned computer mag). These processors cost (discounted) around £80. A replacement 24x CD-ROM can be had for a little over £20 if you shop around and an OS upgrade to say *Win98* is cheap if you check out your local free ads paper and buy up someone's old version following an upgrade to a newer version of Windows. Upgrades such as these will cost you less than £150, are easy to fit yourself and will transform your machine and give it a new lease of life. Happy upgrading!

Next up is **Garry Potts** of Swanage who came by an Atari ST and some interesting software in not altogether happy circumstances. We'll let Garry explain...

"Recently my neighbour died. He was an old chap, but had always been interested in home computers, almost since the beginning in the 1980s. I think because he started out with a Sinclair ZX81. He used to pop into my shack occasionally and watch me decoding ACARS and other utility transmissions and I used to go around to his house and look over his computers. Though he never really took up short wave listening, he used to use a lot of flight simulator software which I've always found fascinating.

When he died, his widow asked me what I thought she should do with his computer collection. I suggested the local primary school, but they didn't want it. Anyway, it was broken up and his relatives took most of it. Jean, his wife, asked what I'd like and I chose his Atari ST which she duly gave me along with what can only be described as a sack of software!

I've spent the last month or two getting to grips with this stuff, but there's one item I'm really confused by and after asking around, no-one else seems to know either. It's a blue cartridge with the word 'Aladin' (sic) written across it. It was in a shoe box with a lot of disks of software, some of which have 'boot disk' and 'System 4.2' written on them. The disks are rejected by the ST if I try to read them in the machine. There's no manual and no other details - can you help?".

My pleasure Garry. The Aladin cart is a device which enables the ST to emulate an Apple Mac - when it's installed the ST 'becomes' a Mac and can make use of Mac software. Emulators of one kind and another have always been popular, but Mac emulators for the ST were particularly successful for a time (the machine itself was dubbed the 'Jackintosh' at its launch, a reference to its progenitor Jack Tramiel and the machine's Macintosh-beating capabilities).

The device was manufactured by German company Proficomp in 1987. It was described as 'The new operating system for the Atari ST' and the name is spelled Aladin because apparently that's how 'Aladdin' is spelled in Germany. The emulator was shipped complete with the necessary 64K Mac ROMs (and therefore it's emulating Macs prior to the 128K-ROM Mac Plus).

Aladin supports a screen resolution of 640x400 (i.e. bigger than the compact Mac screens of the day), runs at the ST's 8MHz, addresses up to 4Mb of RAM and works with the ST's parallel and serial ports. It supports a variety of printers including Atari's own laser printer. The emulator could not make direct use of the Mac's GCR encoded floppies, so there was an intermediate, Aladin format, somewhere between the two.

Also, it was possible to create 'Janus' disks - single-sided Aladin on one side and GEM on the other! The disks of software you have will work fine once the emulator cart is in place and Aladin is up and running (switch off the ST, plug the cart into the port at the left-hand side of the machine, switch on and put the Aladin boot disk in the drive).

Aladin came with various utilities including file transfer software for getting Mac stuff into the ST, a RAM disk (the 'SuperDisk') which could be used as the boot drive once the emulator was up and running, and an 'adapt' program which was used to patch Mac software which misbehaved and crashed the emulator.

In use, Aladin worked very well. It was stable, fast and useful (within the limits of the ST itself and the 64K ROMs) and enabled access to Mac software which at that time (late-1980s) was among the best available to microcomputers. There's not much you can do with that cart, Garry, other than explore it and marvel at the way the computer market operated 15 or so years ago, but you'll have fun doing it - good luck!

Tom Neal of Bristol writes "I've acquired a copy of the *Visicalc* spreadsheet program for my Commodore Amiga from an on-line source of public domain software. It dispenses with the computer's workbench operating system and uses simple key commands instead. I've been told that *Visicalc* is very powerful, but I'm yet to find any real use for it. Any ideas?".

Visicalc was so revered when it made its first appearance at the end of the 1970s, that it's said people were spending thousands of dollars buying Apple computers just to run it! Even now, web-based bookseller Amazon (**www.amazon.co.uk**) lists around 15 books devoted to the program and, while *Visicalc* is very definitely past its prime, it is certainly still possible to do useful calculations with the program. Over the years, I've picked up several books devoted to *Visicalc* (I run the program on my beloved Atari 8-bit system) one of which, *Visicalc for Science and Engineering* by Stanley Trost and Charles Pomernacki, published by Sybex (ISBN 0-89588-096-2), offers lots of excellent ready-to-use 'matrices' (*Visicalc* code analogous to a computer programming language). Included within are matrices to calculate everything from the capacitance, inductance and impedance of coaxial cable to antenna gain, satellite orbits and filter and amplifier characteristics - a thoroughly useful tome.

While actually providing the matrices here is beyond the scope of 'ShackWare' (it would bust my allotted space by pages!) I'm more than willing to pass on the matrices to anyone who writes with an all-important s.a.e.

Online Sources

The move from paper flyers and catalogues to exclusively web-based examples is one which frankly, I lament, but every now and then one or two sites take my eye. One such is the Morgan Computer Company's. This outfit began life selling second-hand photographic equipment in the Tottenham Court Road, but made the move to computer surplus sometime in the mid-1980s (I bought a plotter for an Oric from the shop for £20 in 1985).

Nowadays, Morgan sells mainly factory-refurbished and end-of-line stock and every so often there's a real gem of a bargain among the mountains of PC equipment. Morgan offers an excellent, attractive and usable web site and you can register for the monthly Morgan Flyer - the best of both worlds in fact!

Greenweld is another (regularly readers will know that I've bought much useful electronics surplus from Greenweld). The company ceased trading in 1999, was bought and relaunched by new owners and now features a comprehensive web presence at **www.greenweld.co.uk** There's much to interest the tinkering public here and those with an Internet account should point their browsers at the Greenweld site soon. *(Of course those of you who read sister magazine* PW *will have received copy of Greenweld catalogue free with the July 2001 issue - **Ed.**).*

And Finally

That's it for this time. Keep your letters and E-mails coming - I enjoy every one. Good listening.

■ JACQUES D'AVIGNON VE3VIA ■ E-MAIL: jacques@pwpublishing.ltd.uk

Propagation Forecasts

How to use the Propagation Charts

The charts contain three plots. The lower dashed line represents the lowest usable frequency (LUF), or ALF (Absorption Limiting Frequency). The chances of success below this frequency are very slim.

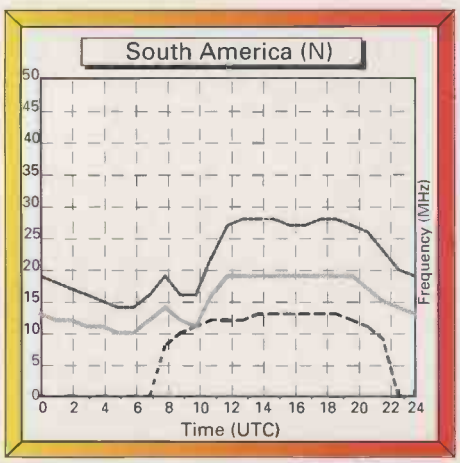
The middle line indicates the optimum working frequency (OWF) with a 90% probability of success for the particular path and time.

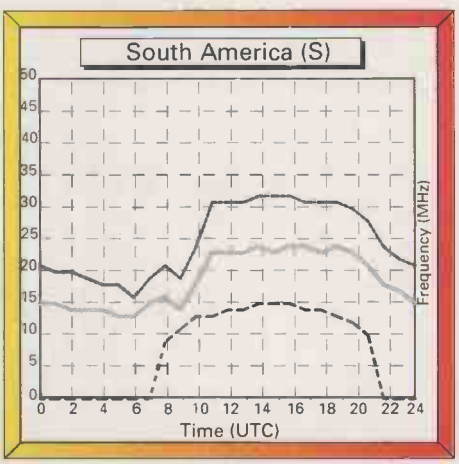
Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50% probability of success for the path and time.

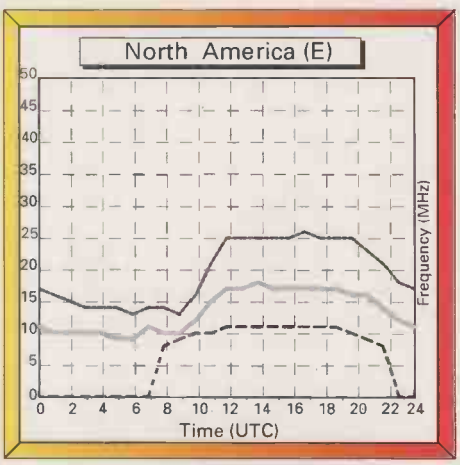
To make use of the charts you must select the chart most closely located to the region containing the station that you wish to hear. By selecting the time chosen for listening on the horizontal axis, the best frequencies for listening can be determined by the values of the intersections of the plots against frequency.

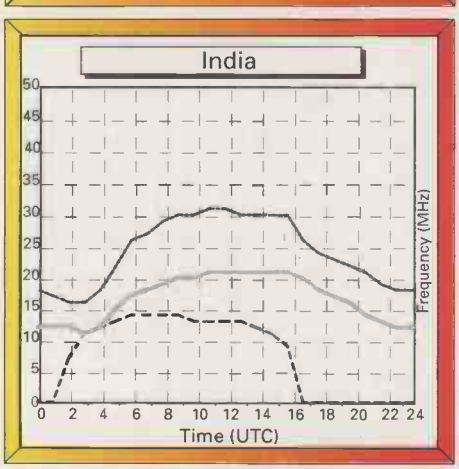
Good luck and happy listening.

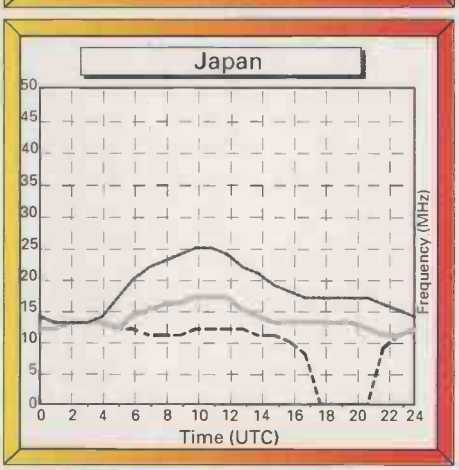
September 2001
Circuits to London

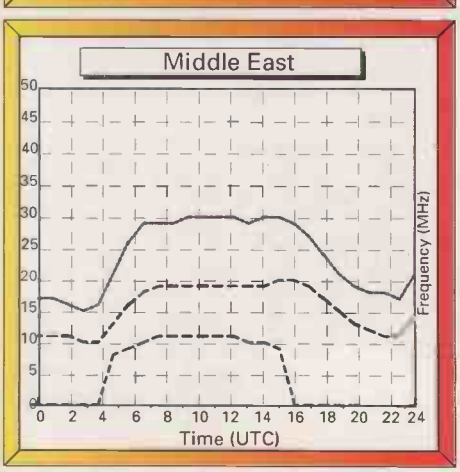


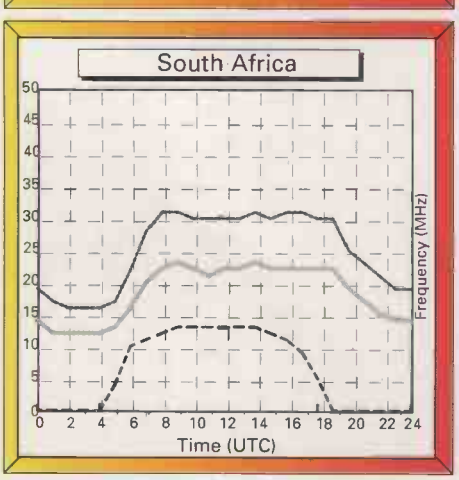


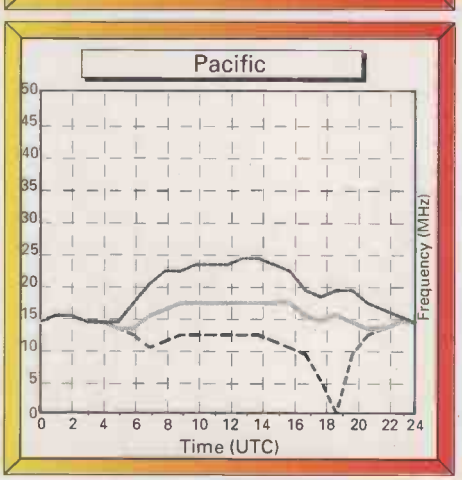


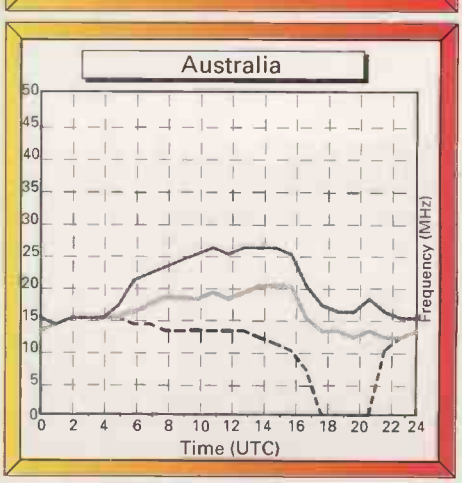












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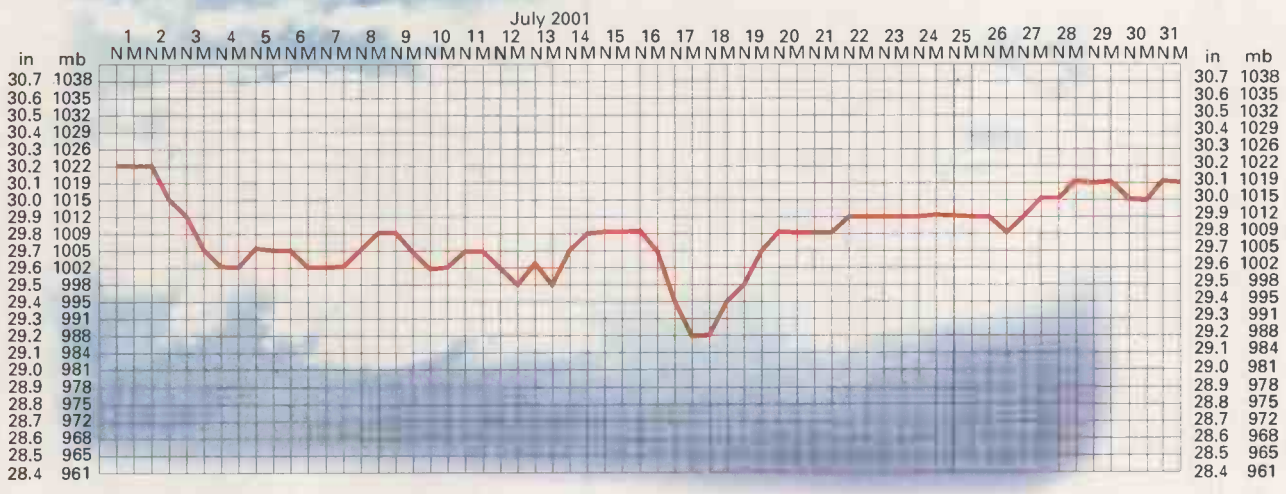
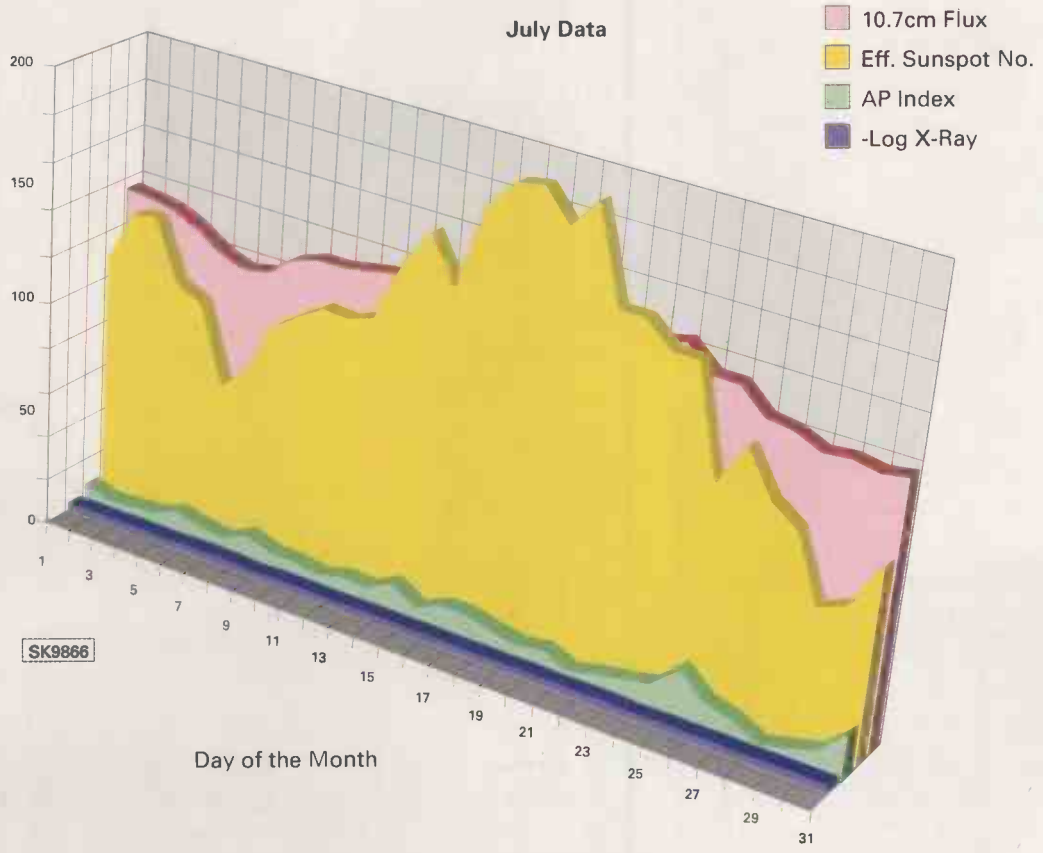
Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, July 2001.





guide to the chart

The 10.7cm solar radio flux is used as an indicator of the general level of solar activity.

The K and AP indices are measures of geomagnetic activity.

The K index ranges from zero (very quiet) to nine (severely disturbed).

K values of five or greater correspond to geomagnetic storm conditions that can relate to poor propagation conditions.

The AP index ranges from 0 to 400. An AP of 30 is the threshold for geomagnetic storm conditions.

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SSB Utilities

This month we start with a letter from **Ian Sharman** in Northampton who asks about the radio establishments at opposite ends of the country. He says that in the past I have mentioned the 'radio site' at RAF Chelveston, which is not that far from Northampton - this is one of the 'transmit' sites for the RAF 'Architect' service. Ian would like to know about the 'antenna sites' at Culmhead in Somerset and Milltown in Morayshire.

The site at Milltown in Morayshire is quite well documented. It is about 7km northeast of Elgin and is a few km east of RAF Lossiemouth. It is marked on Ordnance Survey Landranger *Sheet 28* as simply 'Milltown Airfield' and does not give the usual map symbols of radio masts. I have a handwritten note in my copy of *Eavesdropping on the British Military* which says that RAF Milltown is the other transmit site used by the RAF 'Architect' service, but I do not remember where I got that snippet of information from.

In the past I have also mentioned the various reports that the Milltown site is now used by the Rescue Communications Centre at RAF Kinloss as the transmit site for its 5.680MHz frequency. The RAF are very cautious about revealing exactly what signals come from each of their antenna sites, and whether the site is used for transmitting or receiving. Therefore I cannot confirm that Milltown is used by the RCC, or not!

I have not been to that part of Scotland, but I have been to the site at RAF Chelveston. A few years ago I was visiting the area and sat for a few hours just a few hundred metres from the site. I had a small portable h.f. receiver with me and was tuned to the appropriate RAF 'Architect' frequencies. I really would have expected a huge signal if I was so close to the transmitting antennas, but I heard nothing. I tried several experiments while I was in the area - primarily different lengths of antenna, and heard no signals at all.

The 'radio station' at Culmhead in Somerset is a former BBC World Service transmitting station. The site is due south of Taunton, on the edge of the Blackdown Hills; my road atlas still has the site listed as 'W.T. Station'. The only suitable reference that I could find on the Internet for Culmhead was a series of driving instruction showing how to get to a gliding site, and it mentioned passing the "...former BBC radio station at Culmhead, now with its antenna removed". The Ed tells me that until recently Culmhead was the home to a GCHQ outpost. This answers Ian's orginal question whether the site was still used.

More Selcalls

At the end of June I attended the air show at RAF Waddington near Lincoln, and spent most of the day talking with various crew-members from the visiting aircraft. One of the most surprising snippets of information that I discovered was that the RAF's fleet of E-3D Sentry airborne early-warning aircraft are now equipped with commercial selcall equipment. One of the aircraft was open for public inspection, and a quick glance inside the cockpit revealed the all-important selcall-code. One of the crew-members confirmed that all the aircraft were similarly equipped, so there are now seven 'new' selcalls to be discovered. I also managed to speak with the crews of several other aircraft at the airshow and confirmed their selcall codes. The new C-17A aircraft have selcall codes, and by the time this column appears in print the third aircraft should have been delivered and the fourth and final one is expected any day.

Concorde

As predicted a few months ago, a British Airways Concorde has flown again following its grounding as a result of the crash in Paris in July 2000. On Tuesday 17 July Concorde G-BOAF departed from London Heathrow soon after 1300UTC using the callsign 'Speedbird 9180'. The flight was designed to follow the usual route out to the Atlantic as if it were going to New York, but then to turn north and head towards Iceland. Somewhere up in the North Atlantic the flight turned round and returned to the UK to land at RAF Brize Norton.

There was a lot of interest in this flight and several messages were seen on the 'SWM Readers' list on the Internet asking about the callsigns and frequencies. There were all sorts of messages claiming that the flight would use the last two letters of its aircraft registration (Alpha-Foxtrot in this case), and suggestions that listeners should monitor 5.616MHz for the flight. Regular listeners knew that they should be listening to 5.649MHz, and that is where the flight was heard.

BAW9180 made its initial call to Shanwick on 5.649MHz at 1406UTC and was welcomed back by the radio operator. The flight requested a Selcall check (AG-EJ). At 1427UTC a position report was passed to Shanwick: BAW9180 57.04°N 20°W 1427 F500 climbing ETA 60°N 23°W 1438 60°N 19°W next. BAW9180 gave another position report at 1440UTC, and others followed regularly for the next 45 minutes.

For the record, the flight flew the following route whilst in the oceanic airspace (all times are UTC): SM 15°W at 1404, 57°N 20°W at 1427, 60N 23W at 1437, 60N/19W at 1446, 55°N/ 19.34°W at 1502, 50°N 20°W at 1517, and finally back to SN 15°W. The 'SM' and 'SN' positions at the start and end of the flight are 'Supersonic track Mike' and 'November'. Those of you with *Airnav* or other tracking software may care to plot the above positions to provide a picture of the route flown.

JMC

In my column in *SWM* July, I mentioned the JMC exercise held in the coastal waters around Scotland and mentioned that the second JMC exercise would be held in either late June or early July. I even suggested that listeners could be alerted to the exercise taking place by the inclusion of 'additional information' broadcasts at the end of the regular 'Architect' broadcasts.

At the beginning of June I discovered that exercise 'JMC 012' would be taking place between 18 and 29 June, so it was slightly earlier than expected. This was after I had submitted my column to the Editorial Offices so I was unable to change the dates in the July column. Those of you who normally listen to the 'Architect' broadcasts to find out where JMC h.f. traffic can be found may have noticed that during this exercise there were no 'additional information' broadcasts from Architect. This change in procedure not only confused listeners, as participating aircraft and ships also had problems with the lack of information. One morning there was a succession of ships and aircraft calling 'Architect' to find out which frequencies they should be using to contact the other players in the exercise.

The third JMC exercise should take place in the Autumn. One source of information says that it will take place between 30 October and 8 November. Listeners should make a note in their diaries now, but I cannot guarantee that these are the correct dates. The JMC should take place around about this time, but the exact dates may not be made more public until perhaps as little as one month before the start.

BRIAN ODDY G3FEX, THREE CORNERS, MERRYFIELD WAY, STORRINGTON, WEST SUSSEX RH20 4NS

Maritime Beacons

The increasing hours of daylight during April, May and June deterred some listeners from searching the band after dark. However, those who did so picked up the sky waves from quite a few distant beacons.

A total of twenty-six beacons were logged mainly at night by **Brian Keyte** (Gt.Bookham) during April and the last two weeks of May - see chart. Whilst on holiday for a week in Ballater, Aberdeenshire, Brian ran a thin wire through trees behind the holiday cottage to a wire fence to form an antenna 167m long, running NNW/SSE. He searched the band mainly during the late evenings of May 6 to 8 and logged a total of nineteen beacons.

On the 6th, at approx 2245UTC, he heard two beacons in Baltic Russia on **312.5kHz** - Balitysk (BK) and Mys Taran (BT); also Kyz-Aul (KA) in the Ukraine. On the 7th, Mahon, Minorca (MH) on **292.0** and several beacons along the coast of Spain were logged between 2100 & 2200 - see chart. Ristna, Estonia (RS) on **307.5** was also heard. The beacon at Prins Christian Sund, S.Greenland (OZN on **372.0** was clearly audible at 0130. On the 8th, at approx 2130, four beacons in the Ukraine were heard on **309.5**, including Yevpatoniyskiy (EA), with an accented A (in Morse dit, dit-dah-dit-dah).

The band was searched at night by **Fred Wilmshurst** (Northampton) and the most distant beacon he heard was Prins Christian Sund, S.Greenland (OZN) on **372.0**. Beacons on the Faeroe Is at Myggenaes (MY) on **337.0**, Akraberg (AB) **381.0** and Nolso (NL) **404.0** were also received. From the opposite direction he picked up the sky waves from the beacon at Carla Figuera, Majorca (FI) on **286.5** and three along the south coast of Spain at Cabo Sebastian (SN) **291.0**, Punta de Llobregat (OR) **303.5** and Cabo de Palos (PA) **313.0**. Several others along the N/NW coast of Spain were also heard - see chart.

Almost all of the entries in the report compiled by **Robert Connolly** (Kilkeel) were logged at night. The beacon at Ponta Moriea, Cape Verde (MO) on **308.0kHz** was the most distant entry. From the same direction La Isleta, Canaries (LT) on **291.9** was noted but there was no mention of Punta Lantailla (NA), which shares that frequency on the Canaries. He says "I spent several nights recently successfully targeting Mediterranean areas while following the movement of high pressure systems in that area". The beacons at Vorontsovskiy. Ukraine (WR) on **309.5kHz** and Capo Sandalo, Italy (IP) on **310.0** were heard for the first time and several others in those areas were logged - see chart.

The beacon at Cabo Estay Lt (VS) was reported as being on **317.0** in the June article, but Robert has pointed out that an aero beacon with the same callsign (VS) operates on that frequency from Valenciennes, France. He says "Cabo Estay, listed as **312.5**, has not been heard for quite a while and is presumed closed". Robert also mentioned that since his last report some changes have taken place, or are about to take place. The beacon at Genova, Italy (GV) on **310.5** has now been converted to radiate data in the form of differential corrections (DGPS) for use with the Global Positioning System (GPS). Information he has received from Lithuania suggests that Klaipede (KA) on **305.0** is scheduled to be converted to radiate DGPS data and Nida (ND) on **315.5** has now been closed.

Down in West Sussex **Fred Pallant** (Storrington) tried searching the band during the evening between 1900 & 2000UTC. He logged five beacons, but four of them proved to be aero radiobeacons, which are outside the scope of this column. The one that was valid was at Cabo Machicharo, NE.Spain (MA) on **284.5**.

Owing to a receiver fault **Peter Pollard** (Rugby) was unable to compile a report this time, but he has now succeeded in locating and rectifying the problem. He tried searching the band at approx 2130 on July 12 but was unable to detect any maritime radiobeacons, although many aero beacons were clearly audible.

List Of Equipment Used:-

Robert Connolly, Kilkeel: JRC NRD-525 + Timewave DSP9+ filter + Datong AD370 active antenna.
Brian Keyte, Gt.Bookham: AOR AR7030 + random wire antenna.
Brian Keyte, while in Ballatar, Aberdeenshire: AOR AR7030 + random wire attached to top strand of a wire fence - see text.
Fred Pallant, Storrington: Trio R-2000 + Howes CTU-9 a.t.u. + random wire antenna.
Peter Pollard, Rugby: Sony ICF-2001D + random wire antenna.
Fred Wilmshurst, Northampton: Icom IC-R70 + Global AT-1000 a.t.u + random wire antenna in loft.

Long Wave Maritime Radiobeacon Chart

Freq (kHz)	C/S	Station Name	Location	DXer
284.5	MA	Cabo Machicharo	NE.Spain	A,B,C*,D,E*
285.0	NO	Cabo de la Nao Lt	S.Spain	A*,B*
286.5	FI	Cala Figuera	Majorca	A*,B*,E*
288.5	FI	Cabo Finisterre Lt	N.W.Spain	A,B,C*,E*
288.5	UD	Cabo Salou	S.Spain	B*
289.5	NP	Punta Carena	Italy	B*
290.5	VI	Cabo Villano Lt	N.Spain	B,E*
291.0	SN	Cabo San Sebastian	S.Spain	A*,B*,C*,E*
291.9	LT	La Isleta	Canaries	A*
292.0	MH	Mahon, Minorca	Balearic Is	A*,B*,C*
293.5	RO	Cabo Silleiro Lt	N.Spain	A*
296.0	KN	Skrova Lt	Norway	A*
297.0	B	Cabo Trafalgar	SW.Spain	A*
301.5	L	Torre de Hercules	N.Spain	A*,B,C*,E*
303.0	D	Rota	SW.Spain	A*
303.5	OR	Punta de Llobregat	S.Spain	A*,B*,E*
304.5	MY	Cabo Mayor Lt	N.Spain	A,B,C*,E*
305.0	KA	Klaipeda Rear Lt	Lithuania	A*
305.7	DA	Dalatangi Lt	Iceland	B*
306.5	H	Hel Lt	Poland	B*
307.5	RS	Ristna	Estonia	A*,B,C*,E*
308.0	MO	Ponta Moriea	Cape Verde	A*
309.0	CI	San Benedetto Lt	Italy	A*
309.5	BA	Punta Estaca Bares	N.Spain	A,B,C*,E*
309.5	EA	Yevpatoriyskiy Lt	Ukraine	C*
309.5	OD	Odesskiy	Ukraine	C*
309.5	SW	M.Khersonesskiy	Ukraine	A*,C*
309.5	TR	M.Tarkhankutskiy	Ukraine	A*,C*
309.5	WR	Vorontsovskiy	Ukraine	A*
310.0	IP	Capo Sandalo Lt	Sardinia	A*,B*
310.5	AS	Castellon	Spain	A*
311.5	SA	Senigallia	Italy	A*
312.5	AT	Mys Aytodorskiy	Ukraine	A*,B*
312.5	BK	Baltijsk	Russia	A*,B*,C*
312.5	BT	Mys Taran Lt	Russia	A*,B*,C*
312.5	DB	Doobskiy	Ukraine	A*,B*
312.5	KA	Mys Kyz-Aul	Ukraine	A*,B*,C*
313.0	PA	Cabo de Palos Lt	S.Spain	A*,E*
314.5	TL	Punta D.Penna	Italy	A*
337.0	MY	Myggenaes	Faeroe Is	A*,B*,C,E*
372.0	OZN	Prins Chris's Sund	Greenland	A*,B*,C*,E*
381.0	AB	Akraberg	Faeroe Is	A*,B*,C,E*
404.0	NL	Nolso	Faeroe Is	A*,B*,C,E*

Note:
Entries marked * were logged during darkness.
All other entries were logged during daylight or at dawn/dusk.

DXers:-
(A) Robert Connolly, Kilkeel.
(B) Brian Keyte, Gt.Bookham.
(C) Brian Keyte, while at Ballater, Aberdeenshire
(D) Fred Pallant, Storrington.
(E) Fred Wilmshurst, Northampton.

PAUL ESSERY GW3KFE, PO BOX 4, NEWTOWN, POWYS SY16 1ZZ

Amateur Bands

Every month we try to add a comment to help newcomers - this time it concerns log-keeping. Most of us start listening on a very casual basis and only begin keeping a formal record after a few cases of 'I'm sure I heard him last year - I wish I'd made a note at the time!'.

Experience adds a rider, namely that you never know what will be wanted, so you start to note more and more. Which is another way of saying that we should think what is to go into the log before we open this new one.

You can buy 'proper' log books, but I prefer to use an exercise book because they don't seem to get so dog-eared so quickly. Also, any notes about changes to the station, antennas and so forth can go in a similar notebook so they all stack tidily.

Still with logs, a certain amount of thought is justified as to what should be entered - if entries are consistent that's one thing, but also we don't want too much detail. A log entry to one line is a good rule, it is easier on the eyes too!

Antenna Properties

In answer to **John**, the gain of an antenna is quoted in decibels relative to either a dipole (dBd) or an isotropic radiator (dBi). The latter radiates equally in all directions, so it's very theoretical. However, when you realise that the difference between a dipole and the isotropic radiator is less than 3dB, then the reality of losses in antennas begins to hit home.

As for polar diagrams, if we take a piece of circular graph paper and plot on it the measured strength of the signal from a generator at the centre, the result will show us what is going where. Obviously it'd be nice if the antenna does exactly what we want, but in practice nothing is perfect, so our polar diagram shows us the problem patches.

For example, a big side-lobe might be due to a reflection from something conducting - I recall once spending time staring at a mirror - not realising the silvering was my culprit! 'Reflection' in our context can be anything beyond a perfect absorber - and the only one of those I've ever seen wasn't perfect! Don't forget either that a decibel is a ratio.

Letters

Ron Pearce in Bungay noted John Wilson's review of the one-valver kit - Ron being addicted to these. For myself, given only that we substitute 'FET' for 'valve' I'd go along with I that. Why make that change? Simply to get rid of some heat and noise and improve stability.

The **International Listeners Association** has a HQ station MW0CRL based at **1 Jersey Street, Hafod, Swansea SA1 2HF**. I was pleased this time to see they have a beginner's column of several pages in their *Just Listening* - something I always look forward to reading and doubly so when I read GW4OXB on good s.w.l. reports. A good report rates a QSL for its rarity value alone, compared against the usual 'you were 59 (on some unspecified date and time) please QSL'. On the other hand, a card from an obvious new chum gets a card plus a letter explaining what constititutes a useful listener report.

Peter Goodhall in Holywell, Oxford, is still improving. The latest progress report says he's been flying his kite again for the first time in three years - and seeing it up at 150 feet. A good point this - it means Peter can and is measuring his own progress.

Peter's Dad, **Paul**, has taken the 300Ω ribbon off his G5RV antenna in favour of open-wire feeder and a 'tail' of coaxial cable, as G5RV orginally designed it - the ribbon feeder arrangement works passably, but its losses vary with the weather, not to mention the tendency of the thing to break in the first gale. It doesn't take long to make up a decent bit of open-wire feeder and arrange it to behave in a breeze or a gale.

All you need then are the two 15.45m halves of the antenna proper and the length of 72Ω coaxial cable to reach the receiver. Note that the twin-feeder length should be 10.3m of open-wire or 8.94m of ribbon - quite a sizable difference in impedance and losses! Still with the Goodhalls, one wonders if they would do better by sharing one antenna.

The thought was caused by **Phil Townsend** and his noise problems. Firstly, considering the short length of coaxial cable, it is acting as a capacitor of about 100pF shunting away both signal and noise equally. Secondly, the antenna couplers so far tried do not match the antenna to the receiver - while the preselector seems to be acting more as an a.t.u. anyway. As for the cable, it sounds like 'semi-air-spaced' low-loss stuff. Certainly if the receiver **needs** a preselector, something is wrong. Perhaps a pair of signal diodes back-to-back at the receiver antenna terminals would improve matters since the Piccadilly Line won't go away!

Ted Trowell on the Isle of Sheppey now, trying hard to keep the garden under control and yet get some air-time in. On 10MHz Ted noted TR8XX, JW0PK, OH0JWH and on 14MHz 9M2TO, 9Q5BQ, HK5YC, PY2CJ, J49HW/P, JT1BH, E20HSK and VP5/W6XK. 18MHz gave JT1 BH, JA9IPF, PY7ZY, TR8XX, PZ1AP, 9Q5BQ, CO8LY, OX3NUK, JA7BXS, CX3EU and HK6KKK. At 21MHz we see JY9NX, JG3KIV, VP5/N3MT, P49V, D90CCD, JA5PL, YC0LND, BX4AB, CX3EU, CX3AL, PR7NJ, YC8UFF, JD1BFA, ZF2MU, FG7XC, LUJIC, ZP6CW, and on 24MHz ZS5LB, VP2VE, YB8DPO. So 28MHz was left for LU1DZ and ZF2MU.

Activities

October and November sees 8Q7QQ, mainly 6m, but keep an ear open on 28.885MHz and the WARC bands. Also, we hear that there is to be a '12m single-band DXCC Award'. Certificates will be dated but not numbered and applications will be accepted from July 2nd. 12m credits count from October 1 for the De Soto Cup, but they will be included in the DXCC challenge totals. Confused? Me too!

Cancellations

The Chesterfield FK/C operation is off, for want of enough operators and WD4NGB reports his group will not go to Somalia. On the other hand, the Pitcairn Island group led by **Tom Christian VP6TC** are going to Ducie Is on November 16. Also, Pitcairn Is ARA have applied for IARU Membership .

Finale

That's it again for another month. For next time deadline is as usual the first of the month, and the address Box 4, Newtown SY16 1ZZ.

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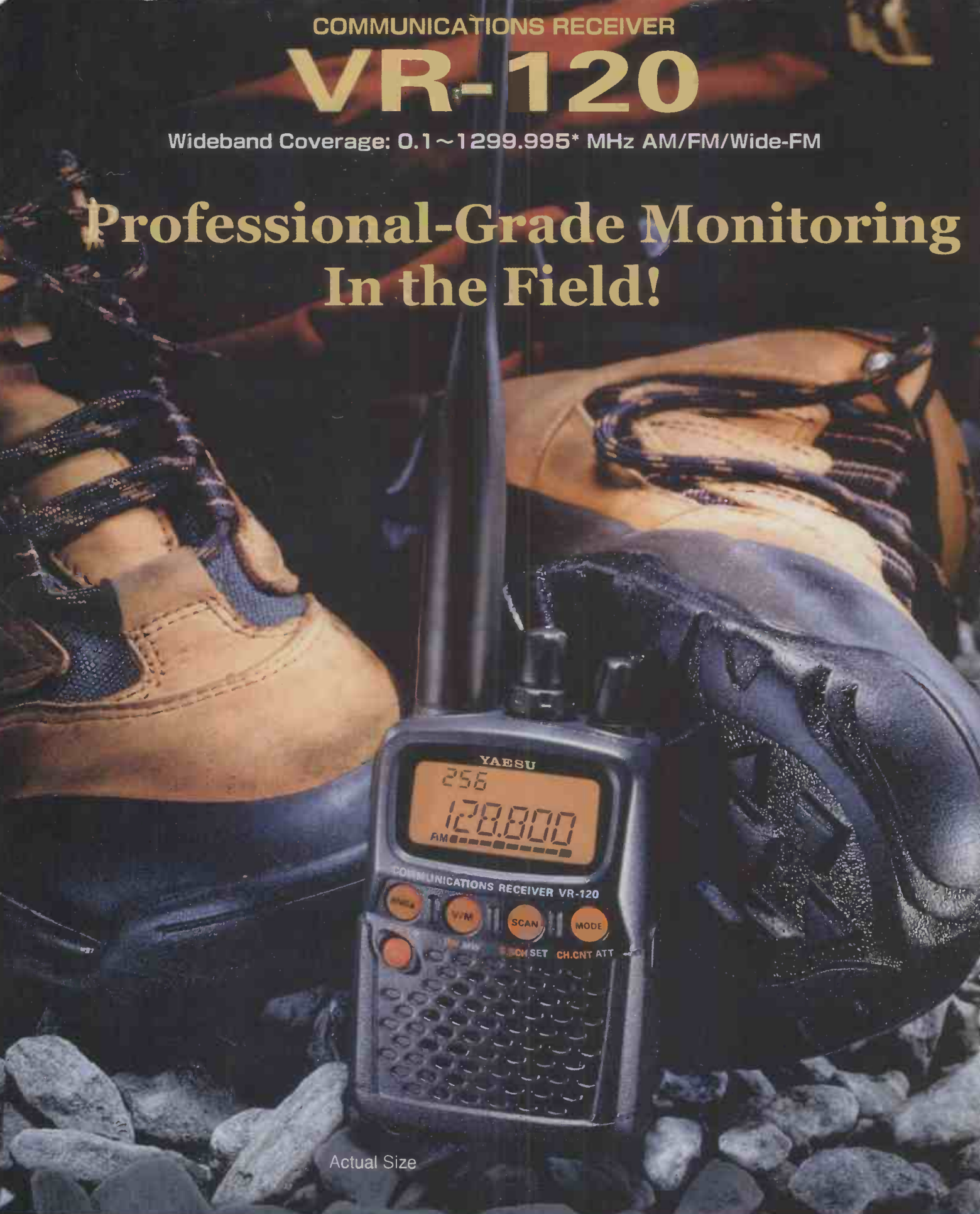

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