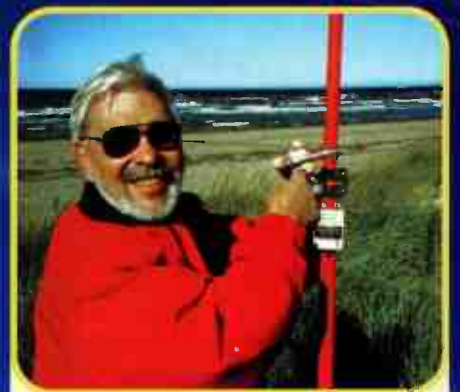


The SHORT WAVE Magazine SWM



Jacques and Pals Go On A DXpedition

DXTV Special

& Scanning Scene

Wavecom's Low-End W40PC - Reviewed

Is This The Best Racal Ever?



JW Reveals All

January 2002 £3.25



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- DXTV
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- Propagation
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- Numbers Stations

the POWER to

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Programmed memory scan
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with
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- Channel Lockout Key

£129.95

Bearcat Scanners

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Data enthusiast Kevin Nice G7TZC says despite the title, don't be fooled into thinking that this Swiss made decoder is anywhere near the bottom of the pile. It just happens to be the cheapest offering from Wavecom.



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Cover Subject: The deserted beach of Miscou Island - home of Canadian DXpedition featured on page 16.

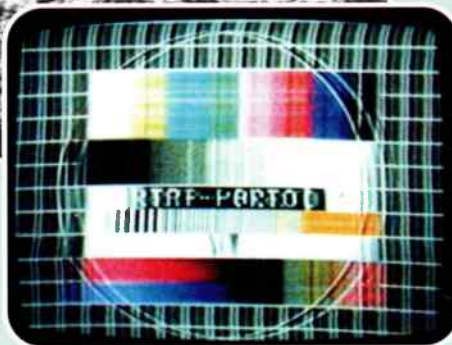
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COMING NEXT MONTH IN *SWM* FEBRUARY 2001

- * Uniden Bearcat UBC-780XLT Trunk Tracker - Reviewed
- * More Miscou Capers with Jacques d'Avignon
- * JW on Racal's commercial v.h.f. receiver from the recent past - the RA1795
- * and much more...

*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 SWMPCB Service, **KANGA PRODUCTS, Sandford Works, Cobden Street, Long Eaton, Nottingham NG10 1BL. Tel: 0115 - 967 0918. Fax: 0870 - 056 8608.**

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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

Changing Times

If you are interested in Datamodes, I guess you will read the review of the W40PC on page 35 of this issue. This decoder represents the leading edge of the short wave listening hobby. Things have indeed come a very long way in the past one hundred years. With the W40PC you can intercept and display traffic that originates from systems that utilise very complex engineering to pass information at an ever increasing rate in a way which is less and less visible to the intended user - all this for less money than that required to purchase a large wide-screen TV set.

The latest types of multi-tone p.s.k. modems seamlessly and transparently link networks around the globe. To their end users, they are just boxes that allows communication. To we hobbyists they represent a challenge and hours of fun filled investigative work.

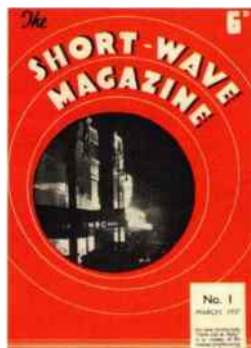
It is a very different world indeed from when radio began. I wonder what Guglielmo Marconi would make of it all. It just happens to be 100 years to the day as I write this, since on 12 December 1901, Marconi in Newfoundland, Canada, heard three short clicks, the Morse letter 'S', which was transmitted from his spark transmitter in Poldhu Cornwall in the UK, making the first ever radio signal to cross the Atlantic.

I for one am humbled by the relevance of this feat.

Another milestone to be celebrated is that you are currently reading the first issue of SWM Volume 60. Volume one was published back in March 1937, and Basil Wardman, Editor at that time, set the scene for *The Short Wave Magazine*, by saying "...Our staff and regular contributors include well-known experts, whose authoritative up-to-the-minute articles assure every amateur experimenter of a means of keeping abreast of developments in radio.

We aim to be unbiased, independent, viewing all proposed features from the standpoint of value and interest to the increasing number of enthusiasts in short wave radio."

The aim remains the same!



SWM's first ever issue.

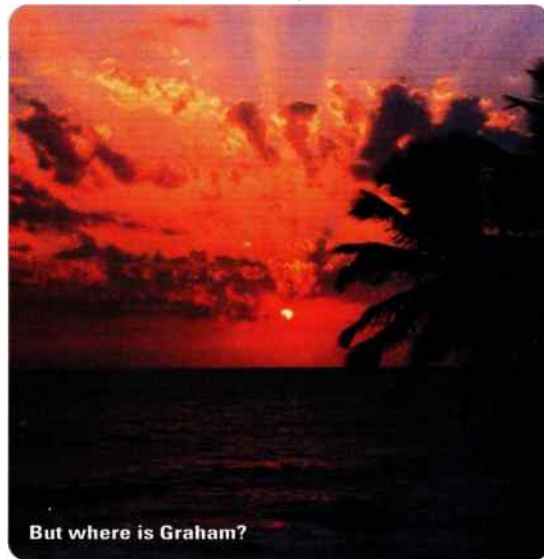


Guglielmo Marconi inside the old Fever Hospital at Signal Hill, Newfoundland, awaiting trans-Atlantic signals.
© Marconi PLC

Other Man's Shack

Despite what I said last month, we have not had space to include 'The Other Man's Shack' in this month's issue. Squeezing material into magazines is a constant juggling act that unfortunately sometimes results in some of the intended items not making it. But, you have my assurance, are you listening Eric? (more fame), 'The Other Man's Shack' will feature in the February issue of SWM.

Post From Afar



We had a postcard the other day from Graham Tanner, who's enjoying a relaxing and tranquil break in Goa. I bet he's enjoying noise free reception there. Maybe he'll tell us of some of the exotic stations he heard on his holidays in his future columns.

Then again, he's hinted that due to the relaxed pace of life he might stay and enjoy the peace and quiet. I certainly hope he doesn't forget to send us his column.

Best wishes to you all from me and everyone associated with SWM.

Have a peaceful New Year.

M 73 Kevin



Dear Sir

Your correspondent P. Brown (October) asked if any reader had ever heard a keyboard picked up by a scanner. Well, I myself haven't, but may I tell readers of a similarly intriguing experience I had?

As a schoolteacher in the 1970s, I used to bring home a Norwegian-made open-reel tape recorder for a mixture of professional and personal purposes. On one occasion when the machine was switched on, but idle, I began to hear a voice as if from a radio - thin, at low volume, but very clear. Tracing it to the tape machine, I naturally listened very hard and even took the risk of switching off and on again to prove I wasn't imagining it. This unexpected reception continued.

I cannot remember what language was in use, but I soon got repeated identification through station announcements and the familiar tuning signal of...Radio Moscow! This surely counts as DX and I have never equalled it since! Perhaps you could keep a letter slot open for odd stories like this?

Mike Troon
Scotland

At the risk of tales of UFO heard on false teeth...slot open... - Ed.

Dear Sir

You may have seen on the E-mail reflector that I am scrounging for a dead Alinco DX-70TH or DX-701. The reason is that I have been given a set for the Air Training Corps, but it is defective, at least the PLL board has suffered damage through moisture ingress.

The cost of a new PLL board alone is £150 plus VAT (and the Squadron have not got the money) and I would also like to use other bits, e.g. the case and some internal chassis pieces to make a decent job of the restoration.

If you can give me some publicity on this project, it would be gratefully received. What I really need is a dead (or surplus) DX-70, any version in which, say, the PA has blown, and the owner has decided not to recover it. Once on-the-air again, it would be in use regularly to train ATC Cadets in Cumbria - North Lancs Wing ATC.

Thanks in anticipation.

Roy Walker
Lancashire

Can anyone help Roy? Replies via SWM Editorial Offices please. - Ed.

Dear Sir

John Wilson is absolutely correct when he says the Racal RA17 was fine in its day, but leaves a lot to be desired in h.f. performance now. Having said that, a skilled c.w. operator and an RA17 is still a winning combination. For general coverage, the later generation solid state Racals take some beating and the RA1770 series is particularly good, having a lower noise cleaner synthesiser and no microprocessor to produce rubbish.

A few weeks ago, I purchased a typical RA1772 at my local Telford emporium, which measured in at 104dB dynamic range and a +31dBm 3rd intercept point (using two - 13dBm tones on 7MHz at 30kHz spacing). Considering in the mid 1970s these were new, around £4000 each, they were built the proper way and I still have the greatest respect for Winn's development team's work that culminated in the RA1771/72/79, etc. series.

The problem now is that one wonders how many more are left for disposal? When they all go, like build quality will not be repeated. After spending the last 15 years repairing and restoring virtually every high-end professional model receiver that is available in the UK market (and a few that are not!), there are not many I would bother to keep - the RA17 and RA1772 I would.

Pat McAlister G3YFK
via E-mail

TOP
QSL

Is there something you want to get off your chest? Do you have a problem fellow readers can solve? If so then drop a line to the Editor at QSL, *Short Wave Magazine*, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.

THE BEST LETTER WILL RECEIVE A £20 VOUCHER TO SPEND ON ANY SWM SERVICE.

Help Corner

Dear Sir

As a relative newcomer to the world of radio, I have been taking *SWM* for only 12 months, but have learned a great deal, not only from your letters page, but from all the other articles, a great magazine! I also take *Radio Active* and I have become a member of the ILA.

My equipment at the moment is an ADR AR2001, Realistic PRO-2042 and this week I acquired a Realistic DX-200, alas without a manual. The outcome is that I am rather lost without one.

My usual dealer, Knights of Kirton Lindsay, Lincs, have more or less told me, a manual is like getting hold of pigeon milk (excuse the pun). So, I am wondering if any of your readers have a manual for this radio, and would be prepared to let me have a photostat copy (expense for photocopying will be met).

With just wandering around the set, I have been able to randomly pick up a few stations, i.e. Radio Africa, Radio Nairobi (weather broadcast), Vohri Tehran, a Polish station, Radio Flanders, Radio Cuba and two or three German stations, to name a few. All this is picked up on a 3m up 3m down in the loft of my bungalow. My two scanners use a discone antenna.

My long term ambitions are to acquire a ham licence and build up a proper radio shack.
K. Goldstraw
Notts

A useful source of Realistic radio data is the Radio Shack web site - www.radioshack.com This is a very useful resource if you happen to have Internet access. Unfortunately, the DX-200 isn't listed. Can anyone help? - Ed.

Dear Sir

Much energy has been expended in voicing the virtues and vices of the RA17 and its comparison with the RA1792. John Wilson's latest article in *SWM* (December 2001) removes much of the woolly thinking and misguided comment, but I suspect that we are all missing several points.

1) These two receivers are poles apart technologically, though in their respective times, they represented the state-of-the-art. Compare a Spitfire with an ME109 or a Phantom F104 by all means, but do not expect it to outperform an F104!

2) These receivers were designed (in the main) for different types of operator and uses. The RA17 was inevitably used by a skilled professional, usually in the Forces, the Security Agencies or communications companies. Few individuals could have afforded one! That said, the RA17 is in fact dead easy to use after some instruction, far easier for me than most of the latest Oriental black boxes, which have so many embedded programs and tiny multifunctional keys. In contrast, the RA1792 was specifically designed:- (a) for remote control. (Typically, the receiver may be at a low r.f. noise location in the country and the operator could be many miles away in a comms centre using a remote controller that resembles the receiver), (b) for use by semi-skilled operators and (c) to be able to cope with any form of pre-mixer selectivity which is a major expense item in any receiver.

3) Each of us has our own ideas on what an h.f. receiver should deliver. The universal truth is that good performance numbers do not always make a good receiver. There are plenty of receivers with an excellent intermodulation, sensitivity and selectivity performance but which, for many reasons, are not particularly pleasant to use. Would that we could 'mix and match', but life is not like that. For example, the old Drake R7 has had synthesiser noise, but is still an excellent runner if you know how to use it. In complete contrast, the old TMC AN/FRR-60V may well be one of the finest receivers ever built for the US Navy, but standing at a height of 1.5m, weighing 318kg and consuming 600W it does not make for an easy operation!

4) I have numerous professional receivers here connected through hybrid combiners to a common antenna so that I can compare and contrast under identical conditions, and no single receiver stands out. There is rarely a signal on the RA1792 that I cannot also hear on the RA17L with the RA98 and RA218 s.s.b. converters. The RA1792, of course, is far easier to use, but sometimes with flaky a.m. signals, the *received audio* via the RA98 sounds better and less distorted. Part of the reason is because I have spent a great deal of time overhauling all my valved Racal gear and have completely rebuilt the audio stages to eliminate almost all the hum and disturbing noises, whereas at I.f., the RA1792 does give an irritating audio whine caused by the microprocessor, particularly noticeable with headphones.

5) My own experience so far is that the receiver with the best overall performance is the Plessey PR2250, but it's big and heavy and it can have problems with its p.s.u.

6) In any event, if we are striving to receive a signal perfectly, why bother with h.f.? I believe h.f. is doing it the hard and expensive way. There are plenty of foreign programmes available via relatively cheap satellite equipment on the Internet. Is it any wonder that the modern youngster seeks to communicate from his keyboard rather than fiddle around with wires all over the garden, TVI, tedious neighbours, licence fees, RAE exams and all the other hassles that an older generation has accepted for many decades. This is not a popular thought in a magazine devoted to radio (and believe me I will support radio to my last gasp), but it is hard to refute the logic of the argument and to reverse the decline in our hobby. I wish it were otherwise.

Michael O'Beirne G8MOB
Surrey

Communiqué

News and Products

Nevada's New Arrival

Nevada are pleased to announce the new Bearcat UBC780XLT base scanner with Trunk Tracking capability. The UBC780XLT has almost continuous coverage from 25-1300MHz, and is Bearcat's most comprehensive 'feature packed' model, including Trunk Tracking, a 2-line alphanumeric display, full backlit controls, PC control and cloning, CTCSS/DCS, SmartScanner and much more. The set will sell for £349.

More information from Nevada direct at **Unit 1 Fitzherbert Spur, Farlington, Portsmouth, Hants PO6 1TT, Tel: 023-9231 3090**, website www.nevada.co.uk or see this new Trunk Tracking base scanner reviewed in next month's *SWM*.



New WACRAL President

Dr. W.G. Peterson, B.Sc(Lon.), FRSC., C Chem. G4EZX has been appointed as President of The World Association of Radio Amateurs & Listeners (WACRAL). Introduced in his early years to a crystal set and the hobby of radio by his grandfather, Geoff progressed to radio and radar instructing in the RAF as a National Serviceman, a career within the chemical industry and later teaching. In the hobby he has enjoyed instructing students for the RAE.

Together with his wife Jenny, for the past ten years he has been responsible for organising WACRAL's Annual Conference whilst enjoying his other hobbies of sailing and ski-ing. A member of the South Street Baptist Church, Meopham, he resides in Gravesend.

Annual Quiz Night

The Bangor & District Amateur Radio Society meet on the first Wednesday of each month in 'The Stables', Groomspout, County Down, at 2000. On Wednesday 2nd January 2002 at 2000, they will be holding their Annual Quiz Night. This is always a great night and visitors and new members are, as usual, most welcome. More information from **Mike G14XSF on 0284-277 2383** or visit the club web site at <http://welcome.to.bdars>

WRN Distributes MTV Music Awards

The 2001 MTV Europe Music Awards were broadcast live from the Festhalle in Frankfurt, Germany, on radio stations across Europe via World Radio Network's digital multiplex on the *HOTBIRD 5* satellite, November 8th.

London-based production company Somethin' Else commissioned **World Radio**



Network (WRN) to provide transmission facilities for this major music event, which was fed from Frankfurt to the WRN Control Room in London on an ISDN line for onward transmission in digital stereo via *HOTBIRD 5* to radio stations that included Radio Clyde and Radio Forfar in Scotland, 105 FM in Milan, KISS FM in Greece, Radio Maximum in Moscow and St. Petersburg, BNR Bulgaria and The Voice in Denmark. Other European stations will broadcast recorded highlights shows over the next few weeks.

Steve Ackerman, Executive Producer at Somethin' Else said, "This was the biggest radio broadcast MTV Europe has undertaken to date and we were very happy with the quality of technical service provided by WRN. The whole project went extremely smoothly".

The line-up of stars in Frankfurt included Best Dance Act nominees Basement Jaxx, German tennis legend Boris Becker and Spanish film director Pedro Almodovar, while the Awards were hosted by Britain's Ali G. The night's big winners included Limp Bizkit who picked up Best Group, Best Album and The Web Award, closely followed by Gorillaz who won Best Dance and Best Song for 'Clint Eastwood'. Robbie Williams and Jennifer Lopez were voted Best Male and Best Female performers respectively.

WRN's digital multiplex provides the facility for audio distributors to transmit ad hoc programming and feeds directly to radio stations throughout Europe. WRN recently distributed a broadcast from the European Cancer Conference (ECCO 11) in Lisbon, Portugal, as well as Sir Paul McCartney's *A Concert for New York* from Madison Square Garden, New York.

2002 Meteor Shower Dates

My thanks are due to Neil Bone, director - Meteor Section - of the British Astronomical Association (BAA) for once again kindly detailing the main showers for 2002 with the periods of greatest activity...

Shower	Overall Period	Peaking Dates
Quadrantids	Jan 1-6	Jan 3-4 (sharp peak)
Lyrids	Apr 19-25	Apr 21-22
Aquarids	Apr 24-May 20	May 4-5
Cetids	May 7-Jun 9	May 14-25 (rather flat)
Delta Aquarids	Jul 15-Aug 20	Jul 28-29 + Aug 6-7
Perseids	Jul 25-Aug 20	Aug 12-13
Orionids	Oct 16-30	Oct 20-22
Taurids	Oct 20-Nov 30	Nov 1-7 (broad, flat, low)
Leonids	Nov 15-20	Nov 17-19 (peaks expected) Nov 18-19 several hours apart
Geminids	Dec 7-16	Dec 12-14 (broad)
Ursids	Dec 17-25	Dec 22-23

Note: The *Perseids* shower may peak late in the evening of August 12-13th and with no moon may provide visual activity across the night sky. The *Leonids* shower is expected to offer enhanced activity with a peak time suggested November 19th at 1000UTC. High shower rates from the *Geminids* can be expected December 14th at 0400UTC. For further details, check out the BAA 2002 Handbook, **Meteor Diary. The British Astronomical Association, Burlington House, Piccadilly, London W1J 0DU, 0207-734 4145.**

New Fluke Accessories

Fluke, the world leader in compact, professional electronic test tools, has introduced a new family of 13 different professional electronic accessories for low energy test and measurement applications. Small and compact, the probes and leads are ideally suited for use with meters by electronic technicians or engineers during installation, testing, troubleshooting and maintaining low voltage and low current electronic equipment.

The new Fluke low energy accessories include:

- TL40** Retractable Tip Test Lead Set with needlepoint tips from 0 to 76mm.
TL910 Electronic Test Probes with replaceable gold-plated and stainless steel tips for hard treach test points.
TP920 Test Probe Adapter Kit comprising push-

Fluke announces new family of accessories.



on adapters with i.c. test clips, probe tip extenders and alligator clips.

- TL970** Hook and Pincer Test Lead Kit offering mini-hook, mini-pincer and micro-hook terminations.
TL93X Multi-stacking banana plug patch cords and BP980 Dual Banana Plug Kit.
H900 Test Lead Holder for storage of all the leads.

All Fluke products are now available from Fluke distributors and representatives world-wide. Visit Fluke's website at www.fluke.co.uk

Silver Service

Philip Hadler, local businessman and Managing Director of Herne Bay based radio communication distributor, **Icom (UK) Ltd.**, has recently celebrated 25 years of service with the company. Philip began his service with Thanet Electronics, later to be known as Icom (UK) Ltd., in 1976. He joined the company because of his interest in the Amateur Radio hobby.

Philip said, "I was always interested in Amateur Radio because my father used to build radios. My interest also happened to coincide with my work. I had been a radio/television service engineer for six years. It wasn't long before I met Dave Stockley (Icom UK's Chairman) and Paul Nicholson, the original founders of the company. They were importing radios, so I started modifying and repairing radios on a part time basis. It got to the stage where I was able to take voluntary redundancy with the company I was with and Dave and Paul offered me a full time job as a service engineer".

Philip worked modifying radio equipment for 18 months. However, it wasn't long before he found out that his selling skills were a lot sharper than his engineering skills. Philip said, "After moving into sales, I was given the task of building up the Icom shop. I was very keen on h.f. radios at the time and I successfully introduced that line into the shop. At the time, I believe we had the best and tiniest Ham shop in the country".

By the time Thanet Electronics changed its name to Icom (UK) Ltd., Philip had already worked in every role at Icom, including service engineer, dispatch, ordering, selling, etc. Philip became Managing Director about 10 years ago. He firmly believes that Icom's major achievement has been its great service to its customers.

So, how does Philip sum up his 25 years of service at Icom? Philip said, "Working for Icom has been pretty good. I have been to Japan about 15 times and I still enjoy it, even though it is extremely hard work. Working for Dave has been excellent. He is a really good laugh and we get on together very well. There have been no airs and graces. Quite simply, we are just blokes working together with a common goal".

Dave Stockley, Chairman of Icom (UK) Ltd. and Philip's colleague for the last 25 years said, "During the years that Phil has been with us, the company's fortunes have had inevitable ups and downs. Throughout, Phil has been a steady pillar to lean on. I would prefer to say that he works 'with me, rather than 'for me'. My life has been better for knowing him, a true friend".



Club Corner

The **Sutton & Cheam Radio Society** meet on the 3rd Thursday of each month at 1930 at the Sutton United Football Club, Borough Sports Ground, Gander Green Lane, Sutton, Surrey. A warm welcome is given to all visitors, whether licensed operators or short wave listeners.

On 17th January 2002, **Rob Mannion G3XFD**, Editor of *Practical Wireless*, is giving a talk on *PW - Past, Present & Future*. More information from Club Secretary **John Puttock G0BWV** on 0208-644 9945 or visit their web site at www.scrs.btinternet.co.uk

Members of the **Poole Radio Society** meet in Lady Russell Cotes House, Bournemouth & Poole College of Further Education ("The College"), Constitution Hill Site, Poole, Dorset at 1930 on the 2nd Fridays of the month. Other activities usually take place in the nearby shack on the same site, unless mentioned. Further information about events, etc., from **Phil Mayer G0KKL** on (01202) 700903.

rallies

2002

January 20: The Oldham ARC Rally is to be held at Queen Elizabeth Hall, Civic Centre, West Street, Oldham, Lancs. Doors open at 1000 (1030 for disabled visitors). The event features the usual traders and a Bring & Buy stall. Morse tests will be available on demand (bring two photos). Talk-in on S22 via GB40RC, commencing at 0730. Refreshments and free parking will be available. Details from either **Steve** or **Hazel** on (01706) 848092.

February 10: The 11th Northern Cross Radio Rally is to be held at Thornes Park Athletics Stadium, Wakefield, W. Yorkshire. Easy access from M1 junctions 39 & 40 - well signposted and with talk-in on 2m and 70cm. Doors open 1100 (1030 for disabled visitors and Bring & Buy). Usual attractions, plus Morse tests on demand. Further details from **John G7JTH** on (01924) 251822 or E-mail: g7jth@wdrs.org.uk or visit the club page at <http://www.wdrs.org.uk>

February 10: The Harwell Amateur Radio Society are holding a Radio & Computing Rally at the Didcot Leisure Centre. This venue includes a large spacious hall, disabled facilities (including lift), bar, refreshments and good parking. Located three miles from the A34 between Oxford and Newbury (signposted from A34). Doors open from 1030 until 1530. More details from **Alan G8NVI** on (01235) 816379 or visit <http://www.hamradio.harwell.com>

February 10: The Cambridge & District Amateur Radio & Computer Rally is to be held at Lordsbridge Arena, Wimpole Road, Barton, near Cambridge. Entry is £2, concessions and disabled, £1.50. Doors open at 1000. There will be a car boot sale, Bring & Buy (mostly under cover) and a bar. Free parking. **John G0GKP** on (01954) 200072, E-mail: j.bonner@ntlworld.com or **Bob G0GVZ** on (01223) 413401, E-mail: bob.grimes@btinternet.com

March 9: Crystal Palace and District Radio Club Spring fair takes place at St. John's Hall, Sylvan Road, London SE19, between 1030-1300 hours. There will be amateur radio, electronics, computing, tools, etc. on offer. Admission, including one free drink, is just £1, children free. **Bob G300U** on (01737) 552170.

March 17: The Norbreck Amateur Radio, Electronics and Computing Exhibition, organised by the Northern Amateur Radio Societies Association (NARSA) at the Norbreck Castle Exhibition Centre, Blackpool. Don't miss the largest single day exhibition in the country! Morse tests will be available on demand. **Peter Denton G6CGF** on 0151-630 5790.

April 7: The 45th Northern Mobile Rally & Computer Fair will be held in the Sports Hall of the Harrogate Ladies College, Clarence Drive, Harrogate. **Gerald G0UFI** on (01765) 640695 or www.harrogaterally.co.uk

April 21: The 18th Yeovil QRP Convention takes place today at the Digby Hall, Hound Street, Sherborne, Dorset. Doors open at 1000. Talk-in on S22 GB2LOW. Three lectures by notable speakers, superb in-hall catering, trade stands, Bring & Buy, Construction Challenge and lots more. Details from **Derek M1WOB** on (01935) 414452 or E-mail: m1wob@tiscali.co.uk

April 28: The Aldridge & Barr Beacon Amateur Radio Club will be holding their 3rd Surplus Radio & Electrical Sale at the Aldridge Community Centre, Anchor Meadow, Middlemore Lane, Aldridge, from 1030 till 1430 and admission is just 50p. **Charles** on (01922) 636162.

LM&S



Many of the international short wave broadcasters introduced their 'winter' transmission schedules on October 28. Some of their changes are reflected in the data herein, which is based upon reports of actual reception by listeners in the UK and overseas. Quite a few of the entries in those reports, which were compiled during October, were rendered 'no longer applicable' by the schedule changes, so they have been excluded from the data. Before detailing their reception, may I take this opportunity to wish all listeners and readers a Happy New Year! When making your resolutions for 2002 please include a resolve to send reception reports to me for 'LM&S' so that other listeners will be able to share your findings and add to their enjoyment.

Long Wave Reports

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

Whilst on holiday in Creetown, Galloway during early October **Michael Wasley** (Scunthorpe) searched the band with a new Sony Yacht Boy 400 portable. At 2328UTC on the 8th he heard a broadcast from Rikisutvarpid (RUV) in Reykjavik via Gufuskalar, W.Iceland on **189kHz**. The 300kW transmission rated SINPO 24243. Upon returning home he listened on several occasions for RUV without success, but on the 18th, he found their broadcast audible at 2345UTC and rated it 2132. He then checked **207kHz** for their 100kW transmission from Eidar, E.Iceland, and could just detect it underneath co-channel DLF.

Favourable conditions for the reception of RUV were observed on two nights by **Simon Hockenhill** in E.Bristol. On the 8th he picked up their transmission from Gufuskalar on **189kHz** at 0105 but he was unable to detect it again until the 20th, when it rated 14342 at 2337. Upon tuning to **207kHz** he found reception via Eider, E.Iceland, to be rather better and noted 23432 at 2340 in his log.

A broadcast from RUV via Gufuskalar on **189** was also picked up on the night of the 20th by **Ernie Strong** in Ramsey, Cambs. He logged the transmission as 23343. Earlier in the month he was surprised to hear during the afternoon of the 10th, Topolna, Czech Republic on **270kHz**, with a rating of 23333 at 1520UTC.

At 1735 on the 25th **Brian Keyte** (Bookham, Sy) noticed that the 500kW Droitwich transmitter on **198kHz**, which carries BBC R-4, was off-air, leaving a weak signal from Westerglen & Burghhead which share the frequency. During the next 20 minutes he used his AOR AR7030 receiver plus four large single turn outdoor loops to see what could be uncovered on the adjacent frequencies. There wasn't time to obtain idents before the Droitwich transmission resumed on **198kHz** so he had to deduce the likely stations from the Italian, Russian and German languages being spoken. He noted them as RAI via Caltanissetta, Italy on **189kHz** (SINPO 23343); RSM via ?, Russia on **198** (23443); DLF via Munich, Germany on **207** (22432); Kiev, Ukraine on **207** (23543).

After dark on the 31st, **Fred Pallant** (Storrington) observed co-channel interference on some frequencies from stations in N.Africa, which suggested enhanced conditions. At 2124 he picked up a football commentary in Italian broadcast by Radiotelevisione Italiana (RAI) via their 10kW outlet at Caltanissetta, Italy on **189kHz**.

Medium Wave Reports

The longer hours of darkness encouraged more listeners to search this band for the sky waves from m.w. stations in the Middle East, N.Africa, Europe and Scandinavia.

The onset of darkness at a reasonable time prompted dedicated DXer **George Millmore** (Wootton, IoW) to take a serious look at the band and he compiled an interesting and extensive log - see chart.

Writing from Rugby, **Peter Pollard** says "Following my earlier look at the medium wave band, I decided this month to have a proper go at both the local radio and continental stations. By sheer luck I chose to begin on October 14, listening for local stations in the afternoon and for continentals after dark. Reception was so good that I continued for the next three days! During this time conditions varied in the direction from which I heard stations. One afternoon it was mainly stations to the East of Rugby; another those to the West. At night it was similar - Spain one evening; another E.Europe".

The ground waves from some local radio stations reached quite distant places during daylight - see chart. Those detected for the first time by **Ernie Strong** came from ILR Valleys Radio on **1116kHz** (SINPO 22332 at 1210UTC on the 10th) & Magic **1161**, Goxhill, N.Lincs on **1161** (22121 at 1240 on the 10th). He says "I am still awaiting my first Scots transmitter. Under the right conditions I should think that the likes of Forth AM on **1548** would be audible as it runs 2.2kW".

Although the effective radiated power of a transmitter must be adequate to ensure good reception in the intended service area at all times, a number of other factors determine how well the transmission can be received in distant places. Perhaps the most important are the frequency of the transmission and the nature of the terrain between the transmitter site and the point of reception.

As the ground waves travel over the earth's surface they lose energy, or become 'attenuated'. The amount of energy loss incurred is dependent upon the type of rock or soil over which they pass. Granite or old sandstone, found on Dartmoor, Snowdonia and the Northern Highlands, result in very high attenuation. Old limestone, found in most of the Wash and the Southern Uplands results in high attenuation. New limestone and chalk, found in the Cotswolds, Chilterns and the North and South Downs result in moderate attenuation. Clay soil, as in the Midlands, causes little attenuation. Recent deposits and freshwater, as in the Fen district and the Vale of York, have very little effect. Least attenuation occurs over sea water paths.

The attenuation increases as the transmission frequency is raised, so the high frequency end of the m.w. band may not be the best place to search for the more distant local radio stations during daylight!

Short Wave Reports

Many listeners have been wondering if the international broadcasters would make better use of the **25MHz (11m)** band in the months ahead. The good news is that Deutsche Welle (DW) returned to this band on October 28, when the winter schedules were implemented. Radio France International (RFI) is continuing to broadcast daily in French to listeners in E/C.Africa and they have now included a section in English from 1200 until 1230UTC. At the time of writing (early November) it is not known if any other broadcasters are taking advantage of the propagation conditions in this band.

Whilst visiting Sydney, Australia **Bill Griffith** (W.London) seized the opportunity to search the short wave bands with his Sony ICF-SW55 portable plus wire antenna 10m long. On November 1 he had no difficulty in receiving either DW on **25.740** (Ger to Asia? 08307-1400) or RFI on **25.820** (Fr, Eng to E/C.Africa 0830-1300) - in fact both transmissions rated SINPO 44444 at 1120UTC! He was very disappointed by the absence of the BBC in this band. Bill is now travelling to New Zealand and hopes to send a report from there for the February edition of 'LM&S', so watch this space!

In the UK, the reception of both transmissions is unreliable because they arrive via back scatter and other modes. The SINPO ratings quoted for DW on **25.740** were 45444 at 0830 by **Bernard Curtis** in Stalbridge; 35522 at 0940 in E.Bristol; 35243 at 0953 by **Eddie McKeown** in Newry; 24323 at 1057 in Storrington. A 'good signal' was noted by **Thomas Williams** in Truro.

Those for RFI on **25.820** were 45434 at 0830 in Stalbridge; 55534 at 0900 by **Richard Reynolds** in Guildford; 34322 at

Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	F*,G*
153	Donebach DLF	Germany	500	A*,B*,D,E*,F*,G*,J
153	Bod	Romania	1200	B*,D*,G*
162	Allouis	France	2000	D,E,F*,G*,J
171	Nador Megli-1	Morocco	2000	A*,F*,G*
171	B'shakovo etc	Russia	1200	B*,D*,E*,G*,J*
177	Oranienburg	Germany	500	A*,D,E,F*,G*,J*
183	Saarlouis	Germany	2000	D,E,F*,G*,J*
189	Gufuskalar	W.Iceland	150	A*,D*,H*,I*,J*,G*
189	Caltanissetta	Italy	10	C*,F*,G*
198	Droitwich BBC	UK	500	B,D,E,G*,I*,J
198	WesterglenBBC	UK	50	C
198	R.Mayak via?	Russia	150	C
207	Munich DLF	Germany	500	A*,C,D,E*,F*,G*,I*,J*
207	Eidar	E.Iceland	100	A*,D*
207	Azilal	Morocco	800	F*,G*
207	Kiev	Ukraine	500	C
216	Roumoules RMC	S.France	1400	A*,D,E,F*,J
216	Krasnoyarsk	Siberia	1200	G*
225	Polskie R-1	Poland	?	A*,B,D,E*,F*,G*,J*
234	Beidweiler	Luxembourg	2000	D,E,F*,G*,I*,J
243	Kalundborg	Denmark	300	A,B,D,E*,F*,G*,J
252	Atlantic 252	Ire	500	D,E,F*,G*,J
261	Burg(R.Ropal)	Germany	85	E*,G*,J*
261	Jaldom Moscow	Russia	2500	A*,B*,G*
270	Topolna	Czech Rep	1500	A*,D,E*,G*,I*,J
279	Sasnovy	Belarus	500	A*,B*,D*,G*,J

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

Listeners:-

- (A) Simon Hockenhill, E.Bristol.
- (B) Sheila Hughes, Morden.
- (C) Brian Keyte, Bookham, Surrey.
- (D) Eddie McKeown, Newry.
- (E) George Millmore, Wootton, IoW.
- (F) Fred Pallant, Storrington.
- (G) Ernie Strong, Ramsey, Cambs.
- (H) Michael Wasley, Scunthorpe.
- (I) Michael Wasley, while in Creetown, Galloway.
- (J) Fred Wilmshurst, Northampton.

Tropical Bands Chart

Freq (MHz)	Station	Country	UTC	Dxer	Freq (MHz)	Station	Country	UTC	Dxer
2.310	ABC Alice Springs	Australia	2030	G	4.850	R.Yaounde	Cameroon	2124	F
2.325	ABC Tennant Creek	Australia	2031	G	4.850	CNR 1	China	2148	K
3.200	TWR Manzini	Swaziland	1957	K	4.860	AIR Delhi	India	1826	F,G,H,J,K
3.210	REE via Costa Rica	Costa Rica	0216	C,K	4.885	R.Clube do Para	Brazil	2300	J
3.230	SABC Meyerton	S.Africa	1959	K	4.890	RPI Paris	via Gabon	0359	F,K
3.255	BBC via Meyerton	S.Africa	1825	G,J,K	4.890	R.Port Moresby	Pap.N. Guinea	1200	B
3.270	Namibian BC, Windhoek	Namibia	1824	G	4.895	R.IPB AM C po Grande	Brazil	0615	K
3.300	R.Cultural	Guatemala	0519	K	4.895	AIR Kurseong	India	1645	H
3.315	AIR Bhopal	India	1656	G	4.895	Pakistan BC	Pakistan	1653	G
3.316	SLBS Goderich	Sierra Leone	1936	G,K	4.905	R.Nat.N'djamena	Chad	2012	K
3.320	SABC (RSG) Meyerton	S.Africa	1820	G,K	4.915	R.Anhanguera	Brazil	0619	K
3.335	CBS Taipei	Taiwan	1701	G,K	4.915	R.Difusora, Macapa	Brazil	0250	C
3.365	GBC R-2	Ghana	2027	G,J,K	4.915	GBC-1, Accra	Ghana	2020	F,G,J,K
3.915	BBC via Kranji	Singapore	2115	F,K	4.920	R.Quito, Quito	Ecuador	0526	K
3.945	AIR Gorakhpur	India	1714	K	4.920	AIR Chennai	India	1653	G
3.955	R.Korea via Skelton	England	2200	E,F	4.927	RRI Jambi	Indonesia	2227	K
3.955	R.Taipei via Skelton	England	1854	A,F,J,J	4.930	AIR Shimla	India	1655	G
3.965	RPI Paris	France	2134	E,F	4.940	AIR Guwahati	India	1655	G
3.975	R.Budapest	Hungary	2135	A,F,L	4.950	VDA via Sao Tome	Sao Tome	1950	F,G,K
3.975	R.Korea via Skelton	England	2100	A,I	4.960	VDA via Sao Tome	Sao Tome	2012	G,K
3.985	Nexus, Milan	Italy	2136	E,F,J,L	4.965	Christian Voice	Zambia	1758	K
3.995	DW via Julich	Germany	2235	E,F,L	4.975	R.Uganda, Kampala	Uganda	1833	C,G,J,K,L
4.005	Vatican R	Italy	2114	E,J	4.980	Ecos del Torbes	Venezuela	2229	K
4.770	FRCN Kaduna	Nigeria	2010	C,F,G,J,K	4.985	R.Brazil Central	Brazil	2330	J,K
4.783	RTM Bamako	Mali	2006	J,K	4.990	Hunan 1, Changsha	China	2232	K
4.790	Azad Kashmir R.	Pakistan	1658	G,K	5.005	R.Nacional, Bata	Eq Guinea	1954	C,G
4.800	LNBS Maseru	Lesotho	1751	K	5.009	R.TV Malagasy	Madagascar	1650	F,G
4.820	R.Botswana, Gaborone	Botswana	2121	F,J,K	5.010	R.Garoua	Cameroon	1800	K
4.820	La Voz Evangelica	Honduras	0527	K	5.010	Guangxi 2, Nanning	China	2234	K
4.820	AIR Calcutta	India	1658	G,K	5.020	La V du Sahel, Niamey	Niger	2130	F,K
4.825	R.Cancao Nova	Brazil	0524	K	5.020	Solomon Is BC Honiara	Solomon Is	1104	B
4.830	R.Tachira	Venezuela	0245	C	5.025	R.Parakou	Benin	1916	E,G,K
4.835	RTM Bamako	Mali	2122	F,J,K	5.025	R.Rebelde, Habana	Cuba	0621-	K
4.840	AIR Bombay	India	1659	G,K	5.025	R.Uganda, Kampala	Uganda	1700	G,J
4.845	DRTM Nouakchott	Mauritania	2133	D,F,K	5.030	AWR Latin America	Costa Rica	0529	K
					5.050	R.Tanzania	Tanzania	1910	G,J,K
					5.100	R.Liberia, Totota	Liberia	2345	J

0900 in Scunthorpe; 35232 at 0923 in Newry; 35522 at 0935 in E.Bristol; 32423 at 1030 by **Vict Prier** in Colyton; 24323 at 1053 in Storrington; 44444 at 1200 by **Bill Griffith** in W.London; 35343 at 1205 by **Fred Wilmshurst** in Northampton. In Larnaca, Cyprus **John Parry** logged their transmission as 35535 at 1225.

In the 21MHz (13m) band reception over long distances was usually quite good during October, but sometimes the effects of solar activity disturbed the propagation conditions. Quite often R.Australia's early morning broadcast to Pacific areas via Shepparton on 21.725 (Eng 0200-0900) reached our shores. It was rated 34433 at 0713 by **Rhoderick Illman** in Oxted. At 0900 they change frequency and beam towards Asia from Shepparton on 21.820 (Eng 0900-1400), rated 33343 at 1110 by **David Hall** in Morpeth & 44444 at 1240 by **Stan Evans** in Herstmonceux.

Other broadcasters taking advantage of the propagation conditions in this band include Swiss R.Int via Sottens 21.770 (Eng, It, Ger, Fr to M.East, Africa 0830-1030), rated 23222 at 0835 in Scunthorpe; R.Prague, Czech Rep 21.745 (Eng to E.Africa, S.Asia 1000-1030) 54444 at 1005 by **Sheila Hughes** in Morden; HCJB Quito, Ecuador 21.455 (Eng [u.s.b.]) 44444 at 1319 by **Vera Brindley** in Woodhall Spa; Channel Africa, Johannesburg 21.725 (Eng to Africa, Eur? 1300-1455) 34232 at 1342 in Newry; BBC via Cyprus 21.660 (Eng to S.Africa 1400-1700) 42333 at 1630 in Colyton; BBC via Ascension Is 21.470 (Eng to S.Africa 1300-1900) 34554 at 1757 in Larnaca, Cyprus; Voz Cristiana, Chile 21.500 (Sp to S.America 1100-2100) 44444 at 1805 in W.London; WYFR Family R. via Okeechobee, USA 21.525 (Fr, Eng to Eur, Africa 1800-2200) 54334 at 1820 in Staibridge; R.Nederlands via Bonaire, Ned.Antilles 21.590 (Dut to C/W.Africa 2030-

DXers:-

- (A) Stan Evans, Herstmonceux.
(B) Bill Griffith, while in Sydney, Australia.
(C) David Hall, Morpeth.
(D) Simon Hockenhill, E.Bristol.
(E) Rhoderick Illman, Dxted.
(F) Eddie McKeown, Newry.
(G) Fred Pallant, Storrington.
(H) John Parry, Larnaca, Cyprus.
(I) Clare Pinder, while in Seaton, Cornwall.
(J) Vic Prier, Colyton.
(K) Richard Reynolds, Guildford.
(L) Michael Wasley, Scunthorpe.

Listeners:-

- (A) Simon Hockenhill, E.Bristol.
(B) Sheila Hughes, Morden.
(C) Brian Keyte, Bookham.
(D) George Millmore, Wootton, IoW.
(E) Clare Pinder, while in Seaton, Cornwall.
(F) Peter Pollard, Rugby.
(G) Harry Richards, Barton-upon-Humber.
(H) Ernie Strong, Ramsey, Cambs.
(I) Michael Wasley, Scunthorpe.
(J) Michael Wasley, while in Creetown, Galloway.
(K) Fred Wilmshurst, Northampton.

Local Radio Chart

Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener	Freq (kHz)	Station	ILR BBC	e.m.r.p (kW)	Listener
990	Magic AM, Doncaster	+	0.25	G,H,I	1359	R.Solent, Bournemouth	B	0.85	D,F,H*
990	CI.G, Wolverhampton	+	0.09	C,F,H,K	1368	R.Lincolnshire	B	2.00	G,H,I,K
999	C.Gold GEM Nott'ham	+	0.25	C,F,G,H,I,K	1368	Southern Counties R	B	0.50	B,C,D
999	Magic 9-99 P'stn	+	0.80	J	1368	Wiltshire Sound	B	0.10	F
999	R.Solent	B	1.00	C,D	1377	Asian Sd, Rochdale	+	0.10	G
999	Valley R, Aberdare	+	0.300	A	1413	R.Gloucestervia ?	B	?	F,H,K
1017	CI.G, WABC, Shr'shire	+	0.70	C,F,G,H,I,K	1413	R.Gloucestervia, Bolton	B	0.50	G*
1026	R.Cambridgeshire	B	0.50	C,F,G,H,I,K	1413	Premier via ?	+	0.50	C,D,H
1026	Downtown R, Belfast	+	1.70	J	1413	Premier, Dartford	+	0.50	G*
1026	R.Jersey	B	1.00	A,C,D,E*	1413	Fresh AM, Skipton	+	0.10	G
1035	RTI, C'try(Riz)1035	+	1.00	C,D,F,H,K	1431	Breeze, Southend	+	0.35	A*,C,B*,H
1035	R.Sheffield	B	1.00	G,H,I	1431	CI.Gold, Reading	+	0.14	B,C,D,K
1035	N.Sound 2, Aberdeen	+	0.78	G	1449	Asian Network, Peterbro.	B	0.15	C,F,G,H,K
1116	R.Derby	B	1.20	C,F,G,H,I,K	1458	R.Cumbria	B	0.50	J
1116	R.Guernsey	B	0.50	C,D,E*	1458	R.Devon	B	2.00	D
1116	Valley R, Ebbw Vale	+	0.50	A,H	1458	R.Newcastle	B	2.00	G
1152	CI.G Amber, Norwich	+	0.83	G,H	1458	Sunrise, London	+	50.00	C,D,H,K
1152	LBC 1152 AM	+	23.50	C,D,H,K	1458	Asian Netwk Langley	B	5.00	F,G,I,K
1152	CI.G, Birmingham	+	3.00	FK	1485	CI.Gold, Newbury	+	1.00	C,H,K
1161	R.Bedfordshire(3CR)	B	0.10	C,F,H,K	1485	R.Humberside (Hull)	B	1.00	G,H,I
1161	Brunel CI.G, Swindon	+	0.16	C	1485	R.Merseyside	B	1.20	D,H*,J
1161	Magic 1161, Goxhill	+	0.35	G,H,I	1485	Southern Counties R	B	1.00	B,C,D
1161	Southern Counties R	B	1.00	B,C,D	1503	R.Stoke-on-Trent	B	1.00	C*,F,G,H,I,K
1170	CI.G Amber, Ipswich	+	0.28	F,H	1521	Breeze, Reigate	+	0.64	B*,C,D,H,K
1170	Magic 1170, Stockton	+	0.32	G,H	1530	R.Essex, Southend	B	0.15	C,H
1170	Cap Gold, Portsm'th	+	0.50	C,D	1530	CI.Gold via ?	+	?	H
1170	Signal 2, Stoke-on-T	+	0.20	F	1530	Big AM, W.Yorks	+	0.74	G,I
1170	1170AM, High Wycombe	+	0.25	C,K	1530	CI.Gold Worcester	+	0.52	A,C,F,K
1242	Cap.Gold, Maidstone	+	0.32	B,C,D	1548	R.Bristol	B	5.00	D
1251	C.G Amber, Bury StEd	+	0.76	C,F,G,H	1548	Cap.Gold, London	+	97.50	C,D,G,H
1260	Brunel CG, Bristol	+	1.60	D	1548	Magic A8, Liverpool	+	4.40	I,J
1260	SabrasSnd, Leicester	+	0.29	F,G,H,K	1548	Magic AM, Sheffield	+	0.74	G
1260	R.York	B	0.50	G	1557	R.Lancashire	B	0.25	G
1278	CI.Gold 1278 W.York	+	0.43	G,H,I	1557	CI.Gold 1557, N.hant	+	0.76	C,F,H,K
1296	Radio XL, Birmingham	+	5.00	C,D,F,G,H,I,K	1557	Cap.Gold, So'ton	+	0.50	C,D
1305	Magic AM Barnsley	+	0.15	G,I	1566	CountySnd, Guildford	+	0.50	C,D,F
1305	Premier via ?	+	0.50	C,D,H,K	1584	London Turkish R	+	0.20	C,F
1305	Touch AM, Newport	+	0.20	D	1584	R.Nottingham	B	1.00	C,G,I,K
1323	Cap.Gold, Southwick	+	0.50	C,D,K	1584	R.Shropshire	B	0.50	C
1332	Premier, Battersea	+	1.00	C	1602	R.Kent	B	0.25	C,D,K
1332	CI.Gold 1332, Pribo	+	0.60	F,G,H,I,K					
1332	Wiltshire Sound	B	0.30	C,D					
1359	Breeze, Chelmsford	+	0.28	C,H					
1359	CI.Gold 1359, C'try	+	0.27	C,F,H,K					

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

R.Australia's broadcasts have been received in the UK on the following frequencies: **15.240** (Eng to Pacific, E.Asia 0000-1000), rated 32433 at 0730 in Colyton; **15.415** (Eng to E/SE.Asia 0600-0900) 44333 at 0818 in Oxted; **15.515** (Eng to N.America, Pacific 0100-0700) 44433 at 0655 in Herstmonceux.

Also noted in the reports were the BBC via Skelton, UK **15.485** (Eng to W/SW.Europe 0700-1600), rated 45544 at 0920 in Northampton; VOA via Kavala, Greece **15.205** (Eng to M.East, S.Asia 1400-1600?) 33323 at 1545 in Scunthorpe; Africa No.1, Gabon **15.475** (Fr to W.Africa 1600-2100) 33443 at 1640 in Storrington; AWR via Meyerton, S.Africa **15.295** (Eng to Africa? 2000-2030) 44344 at 2000 in Newry; R.Korea Int, Seoul **15.575** (Eng to Eur 2100-2200) 32333 at 2150 in Stalbridge.

Noted in the **13MHz (22m)** band were R.Australia via Shepparton **13.605** (Eng to Pacific areas 0800-1200), rated 34433 at 0823 in Oxted, 34333 at 0841 in Woodhall Spa & 33343 at 0925 in Morpeth; R.Austria Int via Moosbrunn **13.730** (Eng to Eur. M.East 1230-1300) 55555 at 1233 in Newry; AIR via Bangalore **13.620** (Ar to M.East, Africa 1730-1945) 32433 at 1810 in Colyton; R.Netherlands via Flevo **13.700** (Eng to Africa 1830-2025) 44434 at 2020 in Stalbridge; R.Netherlands via Flevo? **13.700** (Dut to ? 2130-?) 34333 at 2130 in Storrington; R.Australia via Darwin on **13.620** (Eng to SE.Asia 2200-0000) 34323 at 2208 in Scunthorpe.

Broadcasts from New Zealand and Australia have been received in the UK in the **11MHz (25m)** band. R.New Zealand's broadcast to Pacific areas on **11.675** (Eng 0706-1005) was rated 43433 at 0825 in Herstmonceux. Their transmission was also picked up by **Bill Griffith** while in Sydney, Australia and rated 54445 at 0840UTC. R.Australia via Shepparton on **11.660** (Eng to Asia 1430-1700) was logged as 44444 at 1425 in Morpeth & 33333 at 1523 in Woodhall Spa.

Also mentioned in the reports were the BBC via Cyprus on **12.095** (Eng to W/SW.Eur 0500-1200), noted as 55545 at 1102 in E.Bristol; Polish R [R.Polonia], Warsaw **11.820** (Eng to Eur 1300-1400) 44444 at 1340 in Newry; R.Netherlands via Tashkent **12.070** (Eng to Asia, Far East, Pacific 1430-1600) 43333 at 1543 in Oxted; R.Pakistan, Islamabad **11.570** (Ur to Eur 1700-1900) 42433 at 1700 in Colyton; Israel R, Jerusalem **11.585** (Heb [Home svce relay] to W.Eur, N.America) 44434 at 1820 in Colyton; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800-2100) 54444 at 1900 in Morden; R.Netherlands via Madagascar **11.655** (Eng to Africa 1730-2025) 43554 at 1919 by **Francis Hearne** in N.Bristol; Israel R, Jerusalem **11.605** (Heb, Eng to Eur, N.America 1900-2030?) 44544 at 1915 in Northampton & 55444 at 2000 in Seaton, Cornwall; R.Netherlands via Madagascar **11.655** (Dut to Africa 2030-?) 34333 at 2111 in Storrington; HCJB Quito, Ecuador **11.890** (Eng to Eur 2100-2200) 32223 at 2120 in Stalbridge; BBC via Ascension Is **12.095** (Eng to S.America 2100-0300) 54445 at 0232 by **Bill Griffith**, while in Santa Barbara, California USA.

R.Australia's broadcasts in the **9MHz (31m)** band on **9.580** and **9.710** were clearly heard by **Bill Griffith** while staying in Sydney but there was no mention of **9.580** (Eng to Pacific areas & N.America 0800-2130?) in the reports from UK listeners. However, **9.710** (Eng to Pacific areas 0800-0900) has reached the UK and was rated 23332 at 0822 in Oxted. Later, their broadcast to the Far East, SE.Asia & Pacific areas on **9.500** (Eng 1900-2130) was logged as 34333 at 1955 in

E.Bristol & 34443 at 2011 in Storrington.

Also mentioned in the reports were HCJB Quito, Ecuador **9.780** (Eng to Eur 0700-0900), rated 54445 at 0855 in Stalbridge; R.Vilnius, Lithuania **9.710** (Eng to Eur 0930-1000) 55544 at 0935 in Herstmonceux; R.Polonia (Polish R, Warsaw) **9.525** (Eng to Eur 1300-1359) 44333 at 1300 in Morden; BBC via Kranji, Singapore **9.740** (Eng to E.Asia 1000-1600) 33323 at 1452 in Scunthorpe; China R.Int via ? **9.785** (Eng to Asia 1500-1600) 33323 at 1500 by Gerald Guest in Dudley; Voice of Greece, Athens **9.420** (Gr to Eur, Balk 1800-2050) 34424 at 1825 in Colyton; R.Netherlands via Wertachtal **9.895** (Eng to Africa 1830-2025) 44333 at 1904 in Newry; BBC via Cyprus **9.410** (Eng to W/SW.Eur, N.Africa 1600-2200) 45544 at 2005 in Northampton; VOA via Woofferton, UK **9.760** (Eng to N.Africa, M.East 2100-2200) 44444 in Woodhall Spa & SIO 444 at 2144 in N.Bristol; CBC North Quebec via Sackville, Canada **9.625** (Eng, Fr, Inuk, Cree 1155-0610) 44534 at 2104 in Guildford.

Some of the broadcasts in the **7MHz (41m)** band are intended for listeners in Europe. Those noted came from R.Japan via Woofferton, UK **7.230** (Eng, Jap 0500-0700), rated 44333 at 0500 in Seaton, Cornwall & 55555 at 0645 in Herstmonceux; WYFR Family R. via Okeechobee FL, USA **7.355** (Ger, Eng 0600-0800, also to Africa) 55444 at 0720 in Stalbridge; Sudwestfunk via Rohrdorf **7.265** (Ger 24hrs) 35444 at 0847 in Northampton; R.Budapest, Hungary **7.130** (Hung?) SIO 333 at 1927 in N.Bristol; R.Polonia (Polish R), Warsaw **7.270** (Eng 1300-1355) 33332 [best on u.s.b.] in Oxted; Voice of Russia **7.440** (Eng) 34535 at 1930 in Larnaca, Cyprus; AIR via Bangalore **7.410** (Hi, Eng 1745-2230?) 44434 at 1745 in Colyton; Voice of the Mediterranean, Malta via Russia **7.440** (Eng 2000-2100) 44444 at 2000 in Newry; R.Polonia (Polish R), Warsaw **7.165** (Eng 2030-2130) 43333 at 2105 in Morden.

Whilst beaming to W.Africa the Voice of Nigeria, Ikorodu on **7.255** (Eng 1900-2100) rated 33443 at 2011 in Storrington.

Many more broadcasts to Europe may be heard in the **6MHz (49m)** band. Some come from R.Netherlands via Julich, Germany **6.045** (Eng 1130-1300), rated 43232 at 1133 in Newry & 55544 at 1215 in Herstmonceux; Deutsch Welle (DW) via Julich? **6.140** (Eng Service) 44333 at 1429 in Scunthorpe; Bayerischer Rundfunk, Germany **6.085** (Ger 24hrs) 44444 at 1840 in Colyton; Voice of Russia **5.950** (Eng) 43333 at 2000 in Morden; R.Yugoslavia, Belgrade **6.100** (Serb, Ger*, Fr, Eng 2030-2230 [*Serb replaces Ger on Sats]) 43433 at 2101 in E.Bristol; R.Sweden, Stockholm **6.065** (Sw [Eng 1830, 2030, 2230]) 55555 at 2050 in Seaton, Cornwall & SIO 444 at 2154 in N.Bristol; R.Canada Int via Skelton, UK **6.045** (Eng, Fr 2200-2300) 33333 at 2205 in Stalbridge; BBC via Rampisham, UK **6.195** (Eng 1700-0000) 44444 at 2205 in Northampton.

Some intended for other areas can also be received here. They include R.Canada Int (RCI) via Sackville **5.960** (Eng to USA, Mexico, Caribbean, Lat America 2300-0000), rated 33323 at 2300 in Morden; RCI via Sackville, Canada **6.175** (Eng to USA, Mexico, Caribbean, Lat America 2200-2330) 34422 at 2320 in E.Bristol; American Forces Network (AFN) via Puerto Rico **6.458** (Eng [u.s.b.]) 44444 at 0415 in Morpeth; ORTM Bamako, Mali **5.995** (Fr 0555-0748, 1757-0000) 55434 at 0619 in Guildford; WHRI South Bend, USA **5.745** (Eng to N.America 2100?-1000) 34333 at 0720 in Oxted; WEWN Birmingham, USA **5.825** (Eng to N.America 2200?-1400?) 44444 at 0722 in Oxted; WWCN Nashville, USA **5.935** (Eng to N.America 0000-1400?) 44333 at 0745 in Oxted.



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

List of Equipment Used

LIST OF EQUIPMENT USED - LM&S for November, December 2001, *January 2002.

- \$ * Vera Brindley, Woodhall Spa: Roberts R-867 or Sangean ATS-803A + r.w.
- \$ Robert Connolly, Kilkeel: JRC NRD-525 + Timewave DSP+ filter + Oatong AD-370 or Sangean ATS-803A.
- \$ Bernard Curtis, Stalbridge: Realistic DX-400 + rod or r.w. in loft.
- \$ David Edwardson, Wallsend: Trio R-600 + 2.5m x 2.5m fixed loop or 22m long trap dipole.
- \$ Stan Evans, Herstmonceux: Kenwood R-2000 + Balun + 11m wire in loft.
- \$ Robert Frost, Felixstowe: Panasonic F5410.
- \$ Geriant Gill (Llanfairfechan), while in the German Rhineland: Grundig Yacht Boy 400.
- \$ Bill Griffith, W.London: JRC NRD-535 + 25m wire.
- * Bill Griffith (W.London), while in Sydney, Australia: Sony ICF-SW55 + 10m wire.
- \$ Gerald Guest, Dudley: Roberts RC-818 + r.w.
- \$ David Hall, Morpeth: AOR AR7030 + Global AT-2000 + 13m wire.
- \$ Francis Hearne, N.Bristol: Sharp WQT370 + r.w.
- \$ Simon Hockenhuill, E.Bristol: Roberts R-876 or AKD HF-3 + 10m wire.
- * Simon Hockenhuill (E.Bristol), while in Coverack, Cornwall: Roberts R-617 or Ford 3000 car radio.
- \$ Robert Hughes, Liverpool: AOR AR7030 + 15m indoor wire or Drake RBE + RF Systems MTA on roof.
- \$ Sheila Hughes, Morden: Sony ICF-7600DS + home-built loop or Panasonic DR48 + 16m invert L.
- \$ Rhoderick Illman, Oxted: Kenwood R-5000 + r.w. or AN-1, Sony ICF-7600DS.
- * Brian Keyte, Bookham, Sy: AOR AR7030 + home-made loops.
- \$ Brian Keyte (Bookham, Sy), while in Messingham, N.Lincs: AOR AR7030 + small home-built loop.

- \$ Brian Keyte (Bookham, Sy), while at Culver Cliff, IoW: Alba TR2500 held close to a very long wire fence.
- \$ Brian Keyte (Bookham, Sy), while at Rhue by Ullapool, NW.Scotland: AOR AR7030 + top strand of wire fence.
- \$ Eddie McKeown, Newry: Grundig Yacht Boy 400 or Sangean ATS-818.
- \$ Philip Miller Tate, while in Charnmouth: Sony ICF-SW100.
- \$ George Millmore, Wootton, IoW: Racal RA17L + v.i.f. converter + loop or Sangean ATS-803A + loop.
- \$ Fred Pallant, Storrington: Trio R-2000 + Howes CTU8 a.t.u. + r.w.
- * John Parry, Larnaca, Cyprus: Realistic DX-384 or Yaesu FT-767 or Realistic DX-400 + r.w.
- \$ Claire Pinder, while in Appleby: JRC NRD-525 + a.t.u. + r.w.
- \$ Claire Pinder, while in Glasgow: Sony ICF-SW55.
- * Claire Pinder, while in Seaton, Cornwall: Sony ICF-SW55.
- \$ Peter Pollard, Rugby: Sony ICF-2001D + r.w.
- \$ S.Powell, Blackpool: Not stated.
- \$ Vic Prier, Colyton: Redifon R551N + a.t.u. + r.w. or loop in loft.
- \$ Richard Reynolds, Guildford: Sangean ATS-803A + a.t.u. + 10m "T" antenna or 60m loaded dipole or 11m dipole (all in loft) or loop.
- \$ Harry Richards, Barton-upon-Humber: Grundig Satellit 700 + AD270 or r.w. or Grundig Yacht Boy 400 or Matsui MR4099.
- \$ Ernie Strong, Ramsey (Camps): AKD HF3 or Yaesu FRG-8800 + a.t.u. + 30m wire.
- * Michael Wasley, Scunthorpe: Philips AW7404 radio/cassette recorder, or Panasonic RX-F7600 radio/cassette recorder or Teac T-H300 hi-fi tuner + loop or Grundig Yacht Boy 400.
- * Michael Wasley, while in Creetown, Galloway: Grundig Yacht Boy 400.
- \$ Thomas Williams, Truro: Grundig Yacht Boy 400 or Grundig Yacht Boy 205 or Sharp 5454 + r.w.
- \$ Fred Wilmschurst, Northampton: Icom IC-R70 + Global AT-1000 + r.w. in loft.

£99.95

LOG PERIODIC MLP32
 Freq. Range 100-1300MHz
 Length 1420mm Wide Band 16 Element directional beam which gives a maximum of 11-13Db Gain Forward and 15Db Gain Front to Back Ratio. Complete with mounting hardware. (The Ultimate Receiving Antenna - a must for the Dedicated Listener.)

ROTATOR AR-300XL
 * Rotation Torque-222Kg
 * Vertical Load-45Kg
 * Mast Size - 28-44mm
 * Control Box-230v AC
 * Cable-3 core
 * Direct Compass Bearings
 (Ideal for Light to Medium Beams, i.e. LOG PERIODIC above.)

£49.95

6" STAND OFF BRACKET
 Complete with 'U' Bolts

£6.00

9" stand off bracket £9.00

MD37 SKY WIRE (LONG WIRE BALUN KIT)
 25 METRES OF ENAMELLED WIRE INCLUDES 10M PATCH LEAD & INSULATOR

FOR USE ON WITH RECEIVER 0 - 40 Mhz. ALL MODE NO ATU REQUIRED 2 "S" POINTS GREATER SIGNAL THAN OTHER BALUNS. MATCHES ANY LONG WIRE TO 50 OHMS IMPROVED RECEPTION

£39.95

5' SWAGED POLES
 Heavy Duty Ali (1.2mm wall)

SINGLE 1 1/4"£7.00
 SET OF FOUR 1 1/4"£24.95
 SINGLE 1 1/2"£10.00
 SET OF FOUR 1 1/2"£34.95
 SINGLE 2"£15.00
 SET OF FOUR 2"£49.95

CONNECTORS

PL259/9..... 0.75 each
 PL259/6..... 0.75 each
 PL259/7 for mini 8 1.00 each
 BNC (Screw Type) 8 1.00 each
 BNC (Solder Type) 8 1.00 each
 N TYPE for N582.50 each
 N TYPE for RF213 ..2.50 each
 SO239 to BNC1.50 each
 PL259 to BNC2.00 each
 N TYPE to SO239 ..3.00 each

CABLE

RG213 MILITARY 0.85 per mtr.
 MINI 8 0.70 per mtr.
 RG58 STANDARD 0.35 per mtr.
 RG58 MILITARY 0.60 per mtr.

WEATHER SATELLITE ANTENNA

TURNSTILE 137
 Freq. 137.5 MHz
 Length 1000mm

This Antenna is designed for external use to receive weather satellite signals.

Complete with mounting hardware.

£39.95

£29.95

SUPER SCAN STICK
 Freq. Range 0-2000MHz
 Length 1000mm

It will receive all frequencies at all levels unlike a mono band antenna. It has 4 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals. (Ideal for the New Beginner and the Experienced Listener alike.)

£29.95

SUPER SCANAIR BASE (Airband)
 (Stainless Steel)
 Freq. Range Receive 117-140MHz
 Transmit 117-140MHz
 Length 825mm
 Connector-N TYPE

This is a transmitting & receiving antenna designed for the aircraft frequency range. (For the control tower & aircraft listener.)

£49.95

MULTI SCAN STICK II
 Freq. Range Receive (0-2000MHz) Transmit (144-146 MHz)
 Gain 4.00dbd (420-430 MHz) Gain 6.00dbd Length 1500mm
 Same as Super Scan Stick but with extra gain, makes it an even better antenna for the amateur and expert alike. (Ideal for the Ham Radio user)

£39.95

SUPER SCAN STICK II
 Freq. Range 0-2000 MHz.
 Length 1500mm.

This is designed for external use. It will receive all frequencies. at all levels unlike a mono band antenna. It has 8 capacitor loaded coils inside the vertical element to give maximum sensitivity to even the weakest of signals plus there is an extra 3db gain over the standard super scan stick. (For the expert who wants that extra sensitivity)

£39.95

MULTISCAN STICK
 Freq. Range Receive - 0-2000 MHz.
 Transmit 144 - 146 MHz gain 2.5 DBd
 420 - 430 MHz gain 4.5 DBd
 Length 1000 mm.

Although marginally compromising sensitivity the multi scan stick has within its transmitting capabilities plus gain makes it an excellent antenna for the amateur and expert alike.

Comes complete with mounting hardware and brackets. (Ideal for the amateur ham radio - user.)

£89.95

IVX 2000
 Freq. Range Receive - 0-2000 MHz.
 Transmit 50 - 52 MHz gain 2.00DBd
 144 - 146 MHz gain 4.00 DBh
 420 - 430 MHz gain 6.00 DBd
 Length 2.5 m.

For external use, but at a pinch can be used in the loft. It has been finely tuned to make this Antenna the best there is. It has stainless steel radials and hardware. (THE BEST)

MWA HF Wire Antenna Mk11
 Freq 0.05Mhz-40Mhz Adjustable comes with 25 metres of H/Grade flexweave antenna wire, 10 metres of military spec RG58 coax cable feeder, insulated guy rope, dog bone & choke balun. All Mods No A.T.U. required. Super Duper Short Wave Antenna.

£59.95

£29.95

SWP 2000 FREQ. 25 - 2000 MHz. Length 515mm.

Multiband good sensitivity for its small size. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. (Good for the car user who doesn't want an external antenna.)

£29.95

HF DISCONE
 Freq. Range 0.05-2000MHz
 Length 1840mm

Internal or External use (A Tri-Plane Antenna). Same as the Super Discone but with enhanced HF capabilities, comes complete with mounting hardware and brackets. (Ideal for the Short Wave H.F. Listener.)

£39.95

SWP HF30
 Freq. Range 0.05-30MHz Length 770mm

Although small, surprisingly sensitive for the H.F. user. Fitted with two suction cups for ease of fitting to any smooth surface (i.e. inside of car window) comes with 5 metres of mini coax and BNC connector. (Good for the car user who doesn't want an external antenna.)

£39.95

ROYAL DISCONE 2000
 (Stainless Steel)
 Freq. Range Receive 25-2000MHz
 Transmit 50-52MHz
 144-146MHz 430-440MHz 900-986MHz
 Length 1540mm
 Connector-N TYPE

The Ultimate Discone Design. 4.5DB GAIN OVER STANDARD DISCONE! Highly sensitive, with an amazing range of transmitting frequencies, comes complete with mounting hardware & brackets (The Best There is).

£49.95

SUPER DISCONE
 Freq. Range 25-2000MHz
 Length 1380mm

Internal or External use (A Tri-Plane Antenna). The angle of the ground planes are specially designed to give maximum receiving performance within the discone design. The Super Discone gives up to 3Db Gain over a standard conventional discone. Comes complete with mounting hardware and brackets. (Ideal for the Experienced Enthusiast.)

£39.95

TRI SCAN III
 Freq. Range 25-2000MHz Length 720mm

Desk Top Antenna for indoor use with triple vertical loaded coils. The tri-pod legs are helically wound so as to give it its own unique ground plane. Complete with 5mts of low loss coax and BNC plug. (Ideal for Desk Top Use.)

£39.95

MRW-100
 (Super Gainer) (Rubber Duck) Wideband extra sensitive Dedicated VHF/UHF all mode Length 400mm. PP £2.00

£19.95

MRW-40 (Rubber Duck)
 Dedicated for Civil & Military Airband VHF/UHF RX & TX Capabilities Length 215mm. PP £2.00

£49.95

MRP-2000 (Preamplifier)
 Freq Range 25-2000 Mhz 9-15v input (Battery not included) 14 db Gain. Complete with lead and BNC connectors.

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Bandscan Europe

Ireland's long wave station, Atlantic 252, is set to re-launch TEAMtalk 252 - an all-talk sports channel. TEAMtalk already hosts an online radio station at www.teamtalk.com Atlantic, operated by Ireland's Radio Tara, has been losing money - and listeners - over the last year. The deal, slated for completion at the end of November, will be the third such acquisition by TEAMtalk. Their press release goes on to say, "In February 2001, TEAMtalk acquired MMC Sport-Redaktion, the largest independent sports radio programmer in Germany, which supplies over 200 radio stations across Germany, Austria and Switzerland. This was followed by the acquisition in June 2001 of Hampson Radio, the leading UK in-store radio broadcaster with customers such as Asda and Moto. TEAMtalk also produces over 330 hours of sports audio in the UK, including a nine hour daily radio programme for Ladbroke's".



So, another sport-based radio hits the a.m. airwaves and joins talkSPORT, Five Live and Radio 4's sporting coverage on the long wave service with this proven format. Only time will tell what it means for the planned Delta 171 and MusicMann 279 long wave projects.

Culture secretary Tessa Jowell gave her seal of approval to five new radio and three new TV channels planned by the BBC. None of the stations will be available in analogue - only via Sky Digital and/or on DAB and online. The radios should begin to come on stream early in the year. Visit www.bbc.co.uk/digitalradio for more.

South Buckinghamshire's Eleveenseventy is in the process of metamorphosing into Swan FM. The Radio Authority gave its permission for the station to make the switch from a.m. to f.m. early last year and 107.4MHz for High Wycombe began carrying regular programming November 5th whilst 107.7MHz, serving Amersham, is expected up any time. The 1170kHz medium wave transmitter will be closed down on March 2nd.

ITV1 is finally available via Sky on Astra2 - your region appears on channel 103. November 5th saw full sound and picture trials from the various ITV regions. Although appearing to be free-to-air on a Sky digibox, all channels are soft-encrypted in VideoGuard to satisfy various rights issues. ITV1 officially launched via Sky on November 20th. Whilst testing, viewers were able to enjoy programmes from all the regions. This may no longer be the case. Try EPG channel 963 or 964 and you may get lucky and find ITV1 from your neighbouring regions there.

Be aware that only one version of each ITV region is being broadcast and as such, the local news opt-outs are not carried. In the case of Meridian TV this means that viewers in Southampton are stuck with the local news from Maidstone. ITV suggest switching to conventional TV during these periods - messy. The three transponders used by ITV are 10.832 and 10.891GHz horizontal and 10.906GHz vertical. At the time of writing, ITV2 is up on EPG channel 226. This may be liable to change.

Carriage via Sky is something that at least two of the ITV major players have been eager to avoid. Carlton and Granada are joint owners of ITV Digital (formerly known as OnDigital). With ITV now available via satellite, buying into terrestrial digital will seem an even less attractive option. Even before this latest move, ITV Digital were losing money.

Things look pretty bleak and if ITV Digital fold they would leave the digital terrestrial platform floundering. The government are apparently considering bailing out the venture should the worst happen. Another possibility is that the BBC and Channel 4, amongst others, would form a coalition and adopt the transmission system.

Channel 5 is to cease its analogue satellite broadcasts via Astra 1 at 19.2°E on December 31st, leaving CNN as the only English speaking channel from this location.

To Wales where, since November 5th, digital TV viewers have been able to access a new programming. English language channel, BBC 2W broadcasts 2030 - 2200 Monday to Friday via BBC2 for Wales. New programming, in addition to that already available on BBC 1 and 2 Wales, will include a nightly news bulletin at 2100 as well as other, specially commissioned material.

Finally, on the BBC front, digital viewers can now enjoy their regional news programmes from the start of the year. Up to now, *UK Today* aired after the main bulletins.

Yet another radio delivery platform is being touted as the next biggest thing. Luxembourg-based Global Satellite are promising a bouquet of 100 channels, direct from satellite, by 2005. Global hope to broadcast, not only to homes throughout Europe, but also to cars. This is no mean feat as a direct view of the satellite is required to maintain signal reception - not too much of a problem in open countryside - but in a built up area, a major obstacle - quite literally.

The plan is to broadcast each stream twice, eight seconds apart. The first signal is streamed into the receiver's memory and is used as a (seamless) backup if the second, primary signal fails. In more challenging environments - tunnels and the like - terrestrial repeaters will be used. Programmes, in all the major European languages, will be a mix of free, public service and advertise-funded channels and a raft of ad-free, subscription services. The US equivalents of Global, XM and Sirius, employ similar technology and expect to be operational by the end of the year.

If you live in the south-east and have been hearing an extremely strong Dutch-language station on 1296kHz, that'll be Hilversum's Radio Nationaal. Following difficulties in acquiring a medium wave frequency from the Dutch licensing authorities, National hired broadcast facilities, owned by Merlin Communications and based in Orfordness. Between 0400 and 1900UTC every day, Radio Nationaal broadcasts a mix of oldies and contemporary music, mostly by Dutch bands. Go to their website at www.radionationaal.nl and you'll be treated to a selection of pictures of the Orfordness site and the transmitter hall. The ad for the tee-shirt is also worth a look.

Afghan Update

Not Europe, however I thought you might appreciate an update on last month's piece.

Qatar-based Arabic news station, al-Jazeera, has been warned that if it does not stop airing the full, unedited video tapes from Osama Bin Laden, it will forfeit its right to broadcast into Europe. This, following worries that the messages contained coded instructions to al-Qaeda activists. If you have a sky minidish system, al-Jazeera is on channel 674.

The Balkh Province 1584kHz outlet that formerly carried Voice of Shariah was captured by the Northern Alliance on November 9th when the town Mazar-e-Sharif was seized from Taliban forces. The station now carries pro-alliance announcements interspersed with music. In the capital a transmitter has been activated and now carries Radio Kabul.

A new station, Voice of Afghanistan, began testing around November 17th on 9550kHz daily between 1330-1430UTC. Languages are Dari and Pashto and the transmitter is believed to be a hired facility in Samara. The backer, an Afghan businessman, wants to promote unity between all factions but rumours abound citing the CIA as the people behind this.

Meanwhile, the US government approved funding for setting up Radio Free Afghanistan. The station, to be run by Radio Free Europe/Radio Liberty, is rumoured to be planning on 980kHz from the EC-130 PsyOps aircraft for their initial broadcasts. Be aware that the media scene pertinent to Afghanistan is fluid and can change by the day.



And with that, I'll take this opportunity to wish you a belated Merry Christmas and a happy and peaceful year ahead.

Canadian correspondent Jacques d'Avignon shares with us his recent experiences of a mission to avoid interference.

With the exponential increase in radio pollution, not only in Europe, but world-wide, it is becoming more and more difficult for the serious DXer to have an interesting listening session from home. Every week a new RFI generating apparatus is installed in your house or in a house near you. The list will never be complete, but the microwave oven, the TV, the alarm system, the electronic air filter, the incandescent light dimmers and fluorescent light fixtures are but a few of the culprits.

For many winters now, our group of avid DXers, the 'North

appliances has significantly increased with the increasing number of year round residents. Another major source of interference for the I.w. listeners has appeared: the PLC (Power Line Control) signals that have increased in intensity on a high voltage power line located about 15km south of the DX site.

The Coe Hill winter site is located about 1500km inland from the Atlantic coast and as usual, during any DXpeditions, there are discussions held that it would be great if we could find a quieter site for our monthly DXpedition, and if the new site was closer to the East coast of Canada. Getting closer to the Atlantic coast would allow the I.w. and m.w. aficionados in our group to try and snag some elusive European and African broadcasters and intercept some interesting signals from the large n.d.b. array in use in that part of the world.

Yes, from the Coe Hill location we can intercept some faint m.w. signals from Europe. In addition to the stronger signals who are always present, we have heard n.d.b.s from Greenland and signals from the Russian Alpha navigation system. These sporadic

for a DXpedition. It helped greatly in our planning exercise to produce polar-equidistant maps for each site being considered. We used software written by Roger Hedlin SM3GSJ to produce

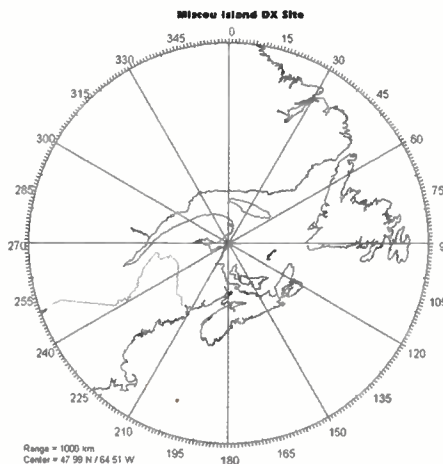


Fig. 1.1: Miscou's location with respect to the island of Newfoundland and the East coast of Canada.

these invaluable maps. They allowed us to visualise clearly the paths between North America and our target regions: Europe, North Africa and the Middle East. The maps are also useful when deciding the orientation of our antennas.

Another important factor that needed to be considered was the

main East Coast LORAN C transmitters. However, travel time was approximately five days and included a very costly ferry crossing to Newfoundland. Access by air was also investigated, but the cost was prohibitive.

The second site considered was Natashquan. This site is easily accessible by road, but is more than three long driving days away. Another negative factor was the landmass to the northeast that would interfere with a clear water path to Europe. The signal path to Europe, Africa and the Middle East would cross most of the Labrador landmass, which contains vast mineral deposits. Another minor factor was that the soil is a very thin layer and rocky in the area, but

obtaining a good ground for long wire antennas was of some concern.

This elimination process left us with only two possible sites: Miscou Island and the Gaspé Peninsula. Both sites are accessible by road in less than two days and offer fairly clear water paths.

Genesis Of A DXpedition- Miscou Capers - Part 1

of Seven DX Society', have rented a cottage in Coe Hill, Ontario, an area that is mostly inhabited mainly in summer by cottagers. The terrain allows us to lay out long wire antennas, 300-600m, and install other experimental antennas for testing purposes.

This location is normally quiet, but over the last year or so, the noise caused by electronic



Fig. 1.2: The DXpedition Cabin. Courtesy Ken Alexander.

intercepts have been made under difficult conditions and have whetted our appetite for more.

Preliminary Research

During the 2000/2001 DX season, many ideas were discussed and it soon became obvious that the time had come to seriously consider a week long East Coast DXpedition for the autumn of 2001. Some of the members were ready to join such an endeavour. It was also decided to make this DXpedition a I.w./m.w. only listening experience.

If you look carefully at the map of North America, many interesting sites on the East Coast of Canada become prime candidates

travel time required to reach each site from Ontario and Northern New York and the possible high cost of such travel. Three or four sites were considered: Natashquan, Quebec (50°11'N 61°47'W) on the north shore of the St. Lawrence River, St Anthony (51°23'N 56°05'W) at the Northern tip of the island of Newfoundland, the island of Miscou (48°00'N 64°32'W) in New Brunswick and finally the eastern tip of the Gaspé peninsula in the Gulf of St. Lawrence.

For each site, a full evaluation was undertaken, looking at the following: radio related factors, travel time required and travel cost of reaching the chosen site. The best site on the above list is undoubtedly St Anthony NF. This site is the closest to Europe and offers an unobstructed water path. It is also farthest from the

The Internet provided information on lodging possibilities on Miscou Island, and it soon became apparent that it was a choice site that required closer scrutiny. It was necessary not only to find out what type of accommodation and other amenities were available, but more important we had to ascertain that the site was relatively r.f. quiet.

On-site Visit

In mid-May 2001, Ken Alexander and I visited the Miscou Island site and the Gaspé Peninsula area before making a final decision on where to hold our Autumn 2001 DXpedition. The trip to Miscou was made in two days and the distance covered from Toronto, where Ken lives, was about 1600km.

We had a good look at the possible accommodation on Miscou Island and found out that the cottages we were interested in were not winterized.

Thus, our autumn trip would have to take place earlier than we had intended. A November DXpedition would be ideal, but out of the question; winter

comes early in that part of the world!

The cottages are located on a beach offering a perfect north-south orientation. The possibility of having a Beverage antenna aimed over the polar region into Asia was surely intriguing. The cottages are located on the West side of the small island. Thus antennas directed to Europe, Africa or the Middle East would be pointing over land, but for an insignificant 3km.

At mid-day, Ken and I installed a Wellbrook ALA1530 loop near the cottages and powered up a AR7030+ to do a band scan. It was so quiet that we thought for a few long minutes that the receiver had been damaged in transit! This site has to be the quietest s.w.l. site that I have encountered in my over half-century of listening. The only noise heard between stations was the receiver noise.

That same night we repeated the signal check and a band scan from a remote roadside on the island and again found the noise to be non-existent. We installed our Wellbrook loops on the ground along the shoulder of the road and did numerous band scans. Again, it was so quiet that the only discernible noise heard again between carriers was the internal noise of the receivers. I was able to hear my first Trans Atlantic n.d.b. FLO 270kHz in the Azores from this site. Most I.w. European and North African broadcasters were clearly audible. Ken also logged many European m.w. broadcasters during this evening session.

During the next few days we travelled from Miscou Island to the eastern tip of the Gaspé Peninsula. We stayed in Percé for a few days and found only one restaurant open out of about a hundred located in this town; the tourist season had not started yet!

While in the Gaspé area, we did two nights of band scans from a beach in Coin du Banc (48°31'N 64°12'W). We used the same equipment set-up that we had used in Miscou. The Coin du Banc site also has a clear path to Europe. Noise conditions were very similar as what we had found on Miscou Island and Ken was able to log VOA on m.w.

from their Kuwait transmitter site.

We searched for some possible rental sites in this Gaspé area, but we did not find anything that looked promising. So it was decided that Miscou Island would be the site of choice for the proposed 2001 Autumn DXpedition.

Concerns & Assessment

During our visit to Miscou Island, we looked around and noted what was available on site: grocery, restaurant, radio supply store, hospital, etc. Back home we made a list of electronic and other supplies we would have to bring with us and what could be purchased on site.

One thorny problem we identified during our visit to the Miscou site was that we would be required to bring portable masts with us, because the Miscou Island site is bare of trees or other possible antenna supports. This situation had to be tackled early, as it would influence the transportation method we would need. Most of us have small cars without roof racks and the inside dimensions of these cars do not allow us to load long mast sections! The answer to this dilemma is also contingent on answering the questions of how many and what type of antennas will we set-up.

Later In The Summer - 45 Days & Counting

Following the on-site visit in May, there was a frequent exchange of correspondence and telephone calls between the organiser of the DXpedition and the cottage resort to iron out the dates and the rental price. By late August the reservations had been

confirmed for a period of one week from September 28th to October 5th. We were told that the day we leave, the site would close for the winter!

By early August, the antenna farm design was still not finalised. In order to complete this task, one weekend was spent at our Coe Hill DXpedition site trying various options and arriving at an antenna farm design that could be set-up easily and would be sufficient for our listening needs. The final plan included the following: 300m long terminated Beverages (one with electrically controlled variable termination); Wellbrook ALA100 and ALA1530 loops. Two Wellbrook antenna splitters were used to distribute the signal from the antennas to the receivers.

This antenna farm design allowed us to avoid the use of masts except for the ALA100. We

inventory, worked on a cable map indicating all the necessary coaxial cables that would be required for a workable set-up. The cable map also helped us minimise the number of mismatches between BNC and u.h.f.-type cable connectors. This is the situation that has developed in our DX group with the large inventory of BNC-equipped Wellbrook splitters and antennas that our members have purchased in the last year.

Intolerable RFI

During the August weekend, when the final antenna set-up was being finalised, we made a shocking discovery - all of our 12V d.c. power supplies used for the antenna splitters and loop amplifiers were causing intolerable r.f.i. This specific r.f.i. had been detected before in Coe

Hill, but we had been unable to identify the source, it was right under our noses while we were looking all over the building and the outside power lines.

Naturally, this was unacceptable for optimum operation during the planned DXpedition, and it was then decided to operate all the equipment requiring 12V d.c. from a small lead-acid battery and recharge this battery

during our listening downtime. It was calculated that the battery had sufficient capacity to power our accessories for at least 15 hours before we needed to recharge the unit. This was ample for our needs.

15 Days & Counting

The last days before departure were busy. Ken ordered the missing connectors and adapters and the other electronic necessities. He also put the finishing touches to the variable terminations for the long wire and making a passive antenna splitter. Kevin was trying to get as much work done at the office as possible before leaving. Working at a real job for a living seems to interfere with vacations and DXpeditions! Jacques was fretting and thinking about what could go wrong and formulating plan 'B' and 'C' and...

to be continued...

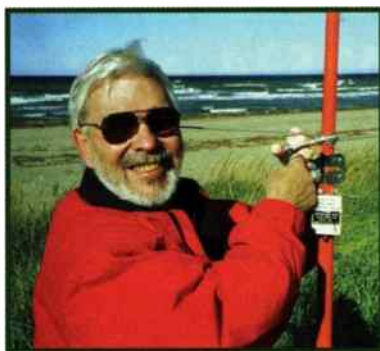


Fig. 1.3: Jacques d'Avignon. Courtesy Ken Alexander.



Fig. 1.4: Team member Ken Alexander. Courtesy Jacques d'Avignon.

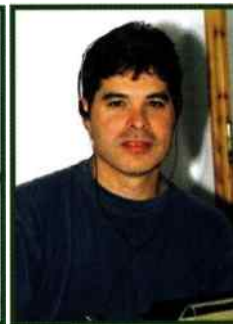


Fig. 1.5: Kevin Carey. Courtesy Jacques d'Avignon.

could easily transport a short collapsible mast for one side of this antenna and find on site some other support, or erect this loop as a triangle.

Down To The Wire

By mid-September we had the firm commitment of three avid I.w./m.w. listeners. The confirmed participants were: Ken Alexander, Toronto; Kevin Carey, Rochester NY (Kevin is the 'Below 500 kHz' columnist for *Monitoring Times*) and Jacques d'Avignon, propagation forecaster and dreamer/organiser of this DXpedition.

Final lists were drawn of the required tools and supplies, all the equipment was inventoried so that we would know exactly what was missing and needed to be purchased before departure. During our May visit, we had found a small electronic supply store and had taken a good look at what was available and then decided that we had better bring down all our basic and hard to find supplies.

Ken, using the cable and connector portion of the

More details of the Miscou DXpedition can be found at <http://dxpedition.tripod.ca/deepseaDX.html>

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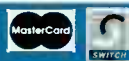


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N.B. Picture of radio above is not the latest model.

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DXTV & FM Sp

In previous 'DXTV epics' we have discussed the different types of propagation in some depth. This time we focus on the summertime phenomenon known as **Sporadic-E**, which also affects the f.m. band.

Throughout the summer

gather the equipment in readiness for the first signs of activity, which usually show in early May.

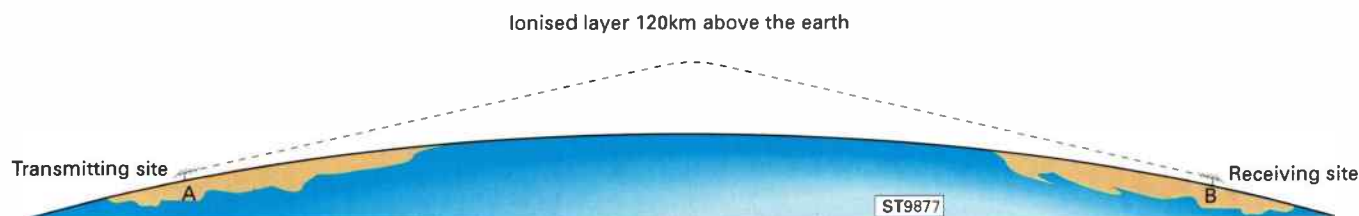
Chance Encounter

Over the years, countless enthusiasts have discovered the joys of Sporadic-E DXing,

been replaced by broadcasts from another station.

The scanner user may have also hit on Sporadic-E reception by chance, noting an ever changing spectacle of signals such as foreign communication channels, radio links and vision buzzes from various European TV

the summer, signals that would normally leave the Earth at a tangent and continue into space are refracted back to the Earth from ionised clouds formed within the E-layer, some 120km above the surface of the Earth (see **Fig. 1**). The hop or skip distance involved



months, signals are plentiful and strong so relatively simple antennas and equipment can be pressed into service. You may already have the basic equipment without realising and so the additional outlay may be minimal. Now is the time to

purely by accident. Tuning around the f.m. band during the summer months will often reveal a multitude of Spanish, Italian or even Arabic broadcasts. One minute the stations are audible, the next minute they have disappeared or have

Fig. 1: How the signal arrives at a distant receiving site via Sporadic-E propagation.

video carriers. On some days, activity can be present for hours on end, but totally absent on others.

Addictive

Reception is purely random in terms of intensity, duration, direction and distance. This is perhaps one of the fascinating aspects of Sporadic-E reception which gives it a charm all of its own. There is no doubt that Sporadic-E DXing can be highly addictive and usually there is no cure, apart from perhaps when the head of the house gives that ultimatum of choosing between her and the hobby!

Reception Distances

The section of the spectrum of particular interest to TV and f.m. DX enthusiasts lies between 45 and 110MHz. Throughout

will vary depending upon the angle of refraction, but it is typically between about 850 and 2000km. The shallower the angle, the greater the skip-distance.

For instance, in the United Kingdom, countries such as Russia, Ukraine, Sweden and Italy are more regularly encountered than, say, Belgium or the Netherlands (see **Fig. 2**).

Extreme-Range Reception

Occasionally, extreme-range Sporadic-E reception occurs with openings into the Middle East or even across the Atlantic into Canada and the USA. Throughout the summer of 2001, Iranian and Syrian TV broadcasts were frequently logged, even Lebanese f.m. broadcasts were encountered.

Some enthusiasts explain away such distant reception as 'double-hop', but prolonged examples of reception tends to question

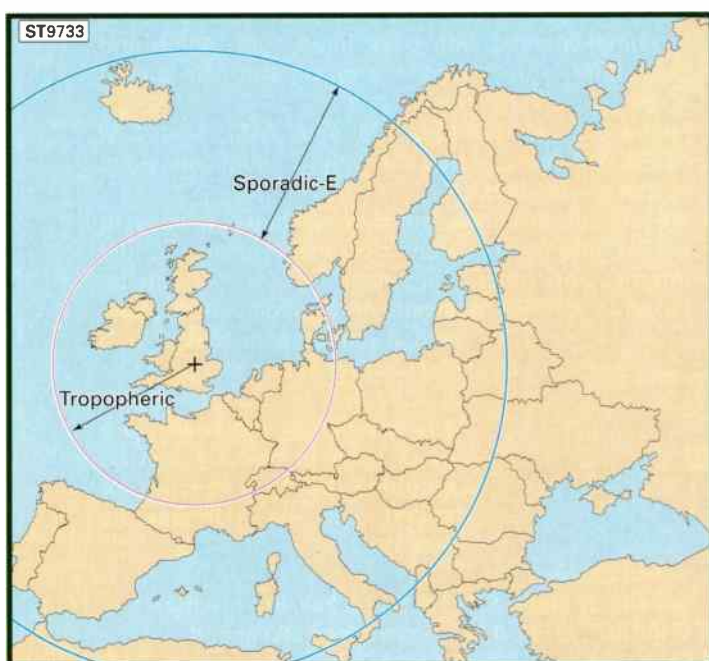


Fig. 2: Typical swathe of countries received in the United Kingdom via Sporadic-E propagation.

Special

This year's DXTV Special, brought to you by Keith Hamer and Garry Smith, concentrates on Sporadic-E DXing!

the chances of the 'bounces' being in the right place at the right time over such a lengthy period of time. It is thought that the ionised layers are much higher than the ones associated with 'normal' Sporadic-E propagation.

Duration

In the northern hemisphere, the main Sporadic-E 'season' occurs between early May and mid-September, while in the southern hemisphere it lasts between November and March. The actual duration of a particular period of reception is known as an 'opening', whether it lasts a matter of minutes or lingers intensely for several hours. Although Sporadic-E activity peaks during the summer months, it can occur without warning at any other time of the year, but usually such openings are isolated.

The random nature of Sporadic-E propagation means that reception can occur almost daily throughout the summer. However, several days can be expected where there is a lull in activity.

Volatile Activity

Sporadic-E signals may be refracted by more than one ionised cloud or within the cloud layer itself. This can create a multi-path phenomenon with constantly changing phase-distortion that is typical of Sporadic-E reception. These distortion effects cause rapid and dramatic changes in signal-strength combined with severe ghosting on pictures with distortion on sound, the degree of which can vary constantly. These effects seem more pronounced on the lower frequencies in Band I.

When TV signals are received, selective fading can occur with the chroma and sound components disappearing, sometimes through phase cancellation, even though the overall signal level seems sufficiently high. Reception above 70MHz tends to be more stable with gradual fading, not unlike tropospheric propagation which is associated with anti-cyclonic pressure systems.

Affected Frequencies

These are the typical frequency spans used by TV and f.m. broadcasters, which are frequently affected by Sporadic-E propagation.

MHz	Use
47-70	Western European TV
49-100	Russian and Eastern European TV
87-108	FM band
62-72	Old Eastern European f.m. band

Occasionally the m.u.f. (maximum usable frequency) rises above the f.m. band, effecting reception as high as 220MHz at the upper end of Band III. Such events are rare, but have been known.

FM DXing

An f.m. receiver with a digital readout is a 'must' in order to be able to identify stations with any degree of accuracy. The tuning range should extend from 87.5 to 108.0MHz. One with RDS will virtually identify the station for you!

Many car radios now have RDS thus making them ideal for mobile DXing. Note that Sporadic-E openings will be fewer the higher the frequency, so while the TV DXer is enjoying signals down on the lower Band I frequencies, the f.m. band may be totally inactive. Many f.m. enthusiasts tend to monitor 87.6MHz for initial signs of activity as it is clear of other broadcasts in the UK. Some enthusiasts now monitor 87.75MHz in their quest for transatlantic reception. This is the nominal Channel 6 sound carrier frequency used in the USA and Canada.

To receive the former OIRT f.m. band between 62 and 72MHz, which was once widely used throughout Eastern Europe, a scanner or a D-100 DX-TV converter is necessary. Many Eastern European countries are in the throes of migrating to the conventional, but now crowded 'Western' f.m. band, which lies between 87.5 and 108MHz. Fortunately, there are still plenty of stations using the 'old' band which becomes active at the drop of a hat. Traditional Rumanian and Bulgarian folklore music sounds rather haunting in stereo!

Some DXers manage to log

an incredible amount of stations using only the whip antenna of a portable receiver. Once the hobby takes hold, an outdoor antenna, rotatable of course, should be considered. It will certainly swell the number of logbook entries.

Bandwidth Reduction

One problem nowadays is the sheer number of f.m. stations operating throughout the United Kingdom, which means there are fewer gaps remaining on the dial for 'foreign' stations to emerge. They do, of course, and it is not uncommon for the local f.m. station to be forced off the air by a competitor located hundred kilometres away.

The use of a narrowed i.f. bandwidth can be exploited where weak signal reception is concerned. Bandwidth reduction helps lift low-level signals out of the noise and improves selectivity to enable weak stations to be resolved on frequencies adjacent to strong local ones.

Receivers with a switched i.f. bandwidth are commercially available, but the audio range is restricted when in the narrow mode. This is particularly noticeable with music broadcasts, but this is of little consequence when the aim is to resolve the wanted signal at any cost. It is possible to modify an existing receiver by adding the appropriate narrow bandwidth ceramic i.f. filters and associated switching, but care needs to be taken to avoid the pitfalls of instability and signal losses.

DXTV & FM Special

Welcome to Sporadic-E DXing!

TV DXing

During the early 1950s, few TV transmitters were operating so to experience the new social miracle called television, desperate 'telev viewers' erected large antenna systems at vast distances from Alexandra Palace. They soon learnt that constant reception was not possible and that weather conditions and other atmospheric influences dictated reception. While waiting for the rain to halt, they would sit grouped around the walnut-cased TV console, smoking pipes (and that was just the women), anxiously praying that conditions would be right to see Muffin The Mule clopping around on Annette Mills' piano.

Nowadays, Joe Lolife depends on his hi-tech life-support system - digital satellite TV displaying elongated heads. Clutching a dodgy burger in one hand and a SKY remote control in the other he flicks through

an endless supply of adult movie channels beaming down from the heavens, ignorant of the fact that reception anomalies his parents endured long ago still affect terrestrial television.

Since the mid-Eighties, Band 1 (40-70MHz) has been reasonably clear thanks to the demise of the 405-line system, thus making it an ideal band for exploring.

Summertime Disruption

Throughout the Sixties, the explosion in the number of European TV services in Band 1 meant that during the summer months BBC transmissions were marred by 'Continental Interference'. Few viewers realised what this term actually meant and little did they know that a far-flung transmitter operating in deepest Russia was responsible for disrupting their tennis from Wimbledon.

The big differences in

transmission characteristics between countries (the United Kingdom used 405-lines, while most of Europe used 625-lines) meant that the curious viewer could not simply tune into these 'foreign' programmes. Many TV technicians 'in the know' carried out the necessary modifications and were able to tune into broadcasts from all over Europe.

Vision IF Bandwidth Reduction

There is a limit to how much an incoming weak signal can be amplified. We mentioned earlier that i.f. bandwidth reduction can dramatically enhance weak f.m. radio signals and improve selectivity. The same concept can be applied to the reception of TV signals.

For domestic TV broadcasting, a wide vision i.f. bandwidth is required to produce a high-definition picture. Where the aim of the DX enthusiast is to secure a picture at any cost, then a

trade-off between definition and bandwidth is perfectly acceptable.

In the Seventies, many enthusiasts modified the system switching of dual-standard TV receivers to exploit the benefits of the narrower 405-line (3.0MHz) bandwidth for DX reception. This enabled vision carriers spaced less than 1MHz apart to be separated more easily as the i.f. saw less of the spectrum. Using the wider 625-line (6.0MHz) bandwidth resulted in both pictures floating over one another.

Resist re-aligning the vision i.f. circuitry of your domestic set unless you wish to lose the sound and chroma information. Nowadays, the complication of frequency-synthesised tuning systems makes tuner substitution and the possibility of receiver modification less attractive. Live chassis techniques still pose a danger when fitting additional switches and controls. Unless you are fully technically competent and aware of all the dangers that lurk within a TV receiver, it is best to leave well alone.

Suitable Receivers

The receiver is the most crucial part of the system, but performance nowadays seems to be inversely proportional to technological advance. The latest technology can be confusing to use. What is needed for TV DXing is a



A Slovenian PM5544 test card on Channel E3 during a bout of stable reception. The PM5544 is currently used by Denmark, the Netherlands, Belgium, Latvia, Estonia, Slovenia, Hungary and Slovakia. A version of the test card featuring a digital clock insert is known as the PM5534; this is currently broadcast by Iceland, Norway, Sweden and Denmark.



The Danish PM5534 with its exclusive style of identification.

good old-fashioned receiver with dial tuning and real knobs instead of a miniature keypad and menus with an accompaniment of weird electronic noises!

Choosing A Suitable Receiver

For Sporadic-E reception, a TV receiver covering 48-70MHz (v.h.f. Band I) is required. Many High-Street catalogue shops stock small-screen monochrome portables equipped with v.h.f. bands as standard, most featuring a simple rotary tuning mechanism. These sets are relatively cheap and make an ideal inroad to the hobby.

Examine the tuning scale before you buy, ensuring that it is scribed with the magic



The D-100 DX-TV converter. An optional alarm is available to warn of a Sporadic-E opening.

numbers 2-4 and 5-12. These refer to European Channels E2 to E4 in Band I (Lo-band) and Channels E5 to E12 in Band III (Hi-band). Occasionally, some scales are marked with channels 1-5 in Band I and 6-13 in Band III, depending on the country of origin.

Unfortunately, staff at many of the larger retail outlets haven't a clue as to what day it is, never mind what the product is or does, so try and come to some arrangement to return the receiver (some hope!) if it transpires that the v.h.f. part is not electrically active.

Most receivers will only resolve the UK's 6.0MHz sound, but this is no hardship if you happen to have a scanner capable of covering

the appropriate frequencies. Many current colour receivers cover v.h.f. TV frequencies, but some of the more upmarket ones are so feature-packed that these can be confusing to operate and are generally an operational hindrance to the DXer.

Multi-System Receivers

At first, these seem to be the obvious choice of receiver for the hobby, but bear in mind that NTSC signals are seldom encountered in Europe and most former Eastern-bloc countries are switching from SECAM to PAL. Such a receiver may be useful if you live in the south-east where French and Belgian signals abound for much of the time.

To receive French broadcasts, the receiver needs to be able to resolve SECAM System L with its sound and positive-going video. If French signals are viewed on a normal receiver, the video information will be reversed, i.e. it will resemble a photographic negative. The synchronisation will also be unstable.

Manual system selection is desirable as it can be used to determine which system is being received and therefore aid identification. Generally speaking, a multi-system receiver is best suited to strong and stable signal reception.

Features To Avoid

Avoid receivers with electronic search-tuning, especially if the search is in one direction only. A strong signal is often required before the search will stop and usually there is no way of identifying its channel or frequency.

Also avoid sets with video muting, which cannot be disabled. The set usually displays a blue screen when

the signal drops below a certain level. A combination of search-tuning and video muting is an absolute nightmare, so be warned. Some designs also suffer from inherent instability and patterning in the absence of a perfect signal. Some receivers may have a limited memory of only 16 channels, which may not be adequate in the long-term.

Some tuning systems feature an on-screen menu for accessing channels, but these can sometimes be complex, confusing and long-winded to set up. Receivers with direct channel access are more suited to u.h.f. DXing, thus allowing, say, Channel 46 to be obtained by pressing numbers 4 and 6 on the handset keypad. The actual vision frequency can be entered into some receivers, but you may need to constantly refer to a channel-versus-frequency list.

Video Recorders

Another way of resolving Band I signals is to use a video recorder already equipped with a v.h.f. tuner; many models over the years have had v.h.f. tuning as standard. The recorder can be used in the E-to-E mode to watch the results via the TV with the added bonus that DX pictures can be recorded. As with



Mounted at only 5m, this compact antenna has received signals in Band I from the Middle East and Australia and Band III from Algeria, Tunisia and Libya.

TV receivers, search-tuning and video-muting are also a problem with some video recorders.

VHF-UHF Up-Converters

These are as useful as a chocolate teapot as you need a strong DX signal present before you can reliably find its output. Another problem is patterning and the fact



A DXer's shack with f.m. receiver, scanner, D-100 converter and two TV receivers.



An adjustable Band I notch filter.

DXTV & FM Special

Welcome to Sporadic-E DXing!

TV DXing

(continued)

is patterning and the fact that the whole of Band I appears within the confine of three u.h.f. channels. In short, avoid them, unless you enjoy a desperate technical challenge!

PC Boards

These are readily and cheaply available covering v.h.f. frequencies, but there are drawbacks such as video-muting, not to mention the possibility of internally-generated r.f. interference by the computer itself.

Scanners

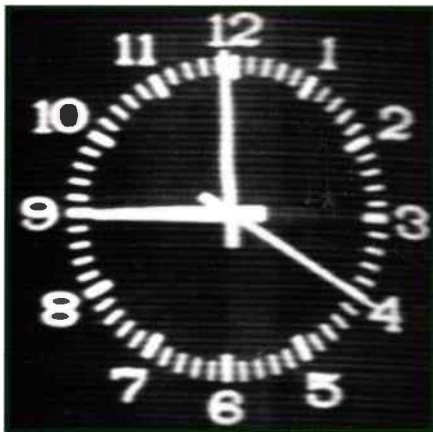
A scanner can precisely measure the frequency offset of a video signal. Using reference lists it is possible to accurately identify a transmitter in a particular country where several outlets may share the same nominal channel. Some scanners are available with a video output, but reports suggest that these tend to be 'deaf' and are only suited to local signal reception.

External Tuning System

Re-introduced last year, a commercially-available unit, the D-100, has attained world-wide popularity among serious enthusiasts for nearly two decades. Without modifying the receiver, it provides variable vision i.f. bandwidth and variable sound spacing. The required sound channel is simply

married to the incoming picture and heard via an f.m. receiver, irrespective of the vision bandwidth. The sound section can also be tuned to monitor non-TV broadcasts, such as the old OIRT f.m. band, while watching TV pictures in another part of the band!

Feeding the TV receiver via its antenna input, it exploits



Good-quality Sporadic-E reception from a Russian Channel R1 transmitter.

the double-superhet principle of operation where the TV functions as an additional i.f. Using an inexpensive portable TV as a monitor, the results can be dynamic to say the least!

Receiver Summary

A combination of TV receivers will often feature in a typical TV DXers equipment repertoire. The direct access type of tuning is more convenient at u.h.f. with its fixed channel spacing, but for exploring interleaved v.h.f. allocations, a simple rotary tuner is more suitable, such as the type found on small portables or the D-100 converter.

Receiv

All too frequently the receiving antenna is given little consideration.

Although perfect pictures can sometimes be received on a 6 inch nail, a proper antenna is recommended!

Half-Wave Dipole

The simplest form of antenna recommended for DXing is the half-wave dipole.

Dipoles should be mounted horizontally.

Crossed Dipoles

A half-wave dipole has bi-directional polar response, but to enjoy reasonable 'all-round' coverage a second one mounted at 90° is required. Crossed dipoles are popular in situations where a rotatable system is impractical due to restricted space. The outputs of the

"Don't be put off by awkward neighbours if wishing to erect a large Band I array"

Element length is inversely proportional to its operating frequency. Consequently, a Band I dipole will be almost twice the size as one cut for

crossed dipoles can be connected together to provide a reasonable all-round coverage or individually switched to allow some discrimination between signals arriving from different directions.

Band I TV:
2.540m total length (L).

FM Radio:
1.320m total length (L).

Antenna Height

As Sporadic-E signals tend to arrive at a slight angle, antenna height is not too crucial, but a minimum height of around 5m is advisable with an unobstructed view towards the horizon.

Multi-Element Arrays

Adding a reflector (a passive element) some distance to the rear of the dipole improves its effectiveness. Directors (also passive elements) mounted in front of the dipole improve the

the f.m. band. Do not be tempted to use a dipole on frequencies far removed from its nominal operating frequency. An f.m. dipole may still work in Band I, but not very efficiently.

Typical dipole measurements are as follows:-

The dipole rods can be made from 12.5mm diameter alloy tubing. Weatherproof dipole connector boxes should be used if the antenna is to be mounted outdoors.

ing Antennas

gain even further and makes the array more directional. For this reason, multi-element arrays should be rotatable, to home-in on the incoming signal.

Don't be put off by awkward neighbours if

"Even strong DX signals can cause cross-modulation within the amplifier"

wishing to erect a large Band I array. Remember that the antenna might look huge on the ground, but they were commonplace until the demise of the 405-line system.

Outdoor Arrays

It pays to apply a dollop of grease to the cable entry grommet of the dipole connector box to prevent ingress of moisture. Apply grease to all bolts and wing nuts on both antennas and clamps to facilitate

dismantling and cleaning at a later date.

Cable

Use 75Ω double-screened satellite cable between the antenna and the receiver to

ensure the maximum transfer of signal. Remember to solder the coaxial plug connection.

Amplifiers

The use of a mast-head amplifier for Sporadic-E DXing is tempting, but experience has shown that unless you live in a 'quiet' area, away from CB rigs and baby alarms, they can be more trouble than they are worth. Even strong DX signals can cause cross-modulation within the amplifier thus generating misleading

images and patterning throughout the band.

Notch Filters

The spectrum around 49-50MHz is nowadays full of r.f. junk. The chief offenders are baby alarms, radiating the sound of bedroom goings-on to all and sundry!

Even using a reduced i.f. bandwidth, these unwanted carriers can still encroach on 49.75MHz, the Channel R1 video frequency. A notch filter fitted at the antenna input of the receiver can dramatically reduce the interference level.

Logbooks

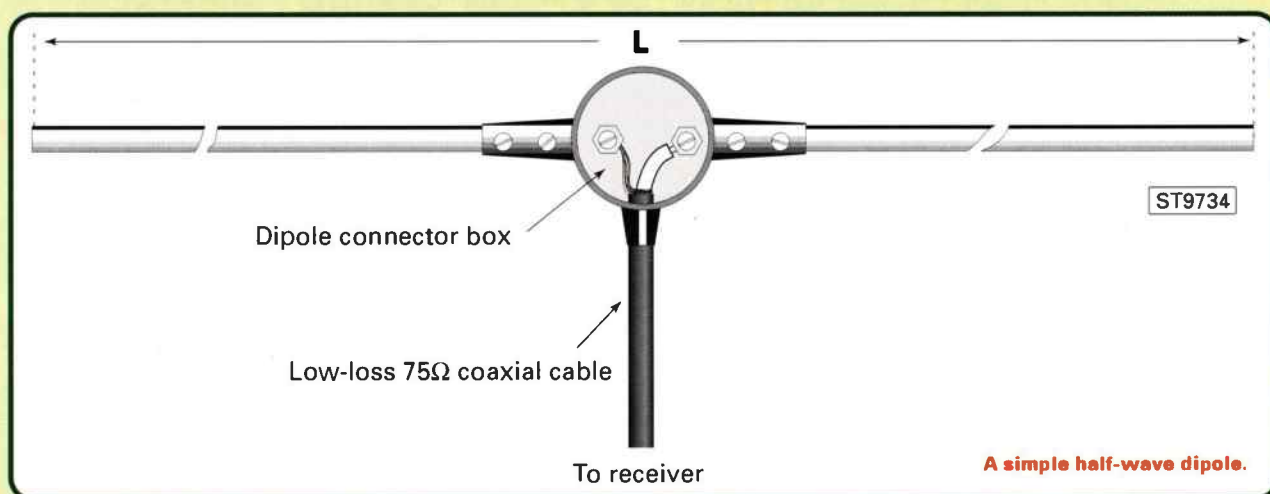
Most enthusiasts keep a diary of reception. It is useful when comparing notes with other enthusiasts, or for reminiscing when the season is over. Logging reception times in UTC (GMT) has world-wide approval and it may be advisable to have the shack clock displaying GMT

all year round. Some enthusiasts include weather details or even the atmospheric conditions prevailing at the time of reception.

Visual Record

In the case of TV reception, a photographic record of station graphics and test cards is a hobby in itself. Test cards have traditionally provided a useful identification function but, unfortunately, round the clock broadcasting has seen their demise in many countries. Nowadays, most countries include some form of on-screen logo, a luxury we did not have in the good old 1970s when identification was virtually impossible once programmes commenced.

The only drawback with logos is that TV services change them frequently. Also, many countries seem to display a similar '1' logo for their first network, just to confuse!



DXTV & FM Special

Welcome to Sporadic-E DXing!

TV Systems

Unlike radio where a typical receiver will work anywhere in the world, the situation is somewhat more complex with TV broadcasting. TV system make-up can differ between countries and a receiver designed for one system will not necessarily work on another. For example, a TV receiver designed for the UK market (System I) will not

produce sound when operated in Germany (System B). This is due to the difference in sound spacing. Until relatively recently, 405, 525, 625 and 819-line TV

525-line American Forces Network operating within Europe has been phased out. Nowadays only 625-line and 525-line systems exist, the latter (System M) is used extensively throughout the Americas and Japan, usually with NTSC colour. In Europe where 625-lines are the norm, the main differences lie in the spacing of the sound from the vision carrier. Colour systems can be either PAL or SECAM with many Eastern European

French System L
The most incompatible TV system is the one chosen by France. Positive-going video modulation is used, as opposed to universally adopted negative-going. This means a receiver not designed to receive the French system will display a negative picture with unstable synchronisation. The French system also has a.m. sound as opposed to f.m. intercarrier. It is

"There is no doubt that Sporadic-E DXing can be highly addictive"

systems existed within Europe. The French 819-line system and the 405-line system, used by the UK and Éire, were abandoned by the mid-1980s. More recently, the

countries abandoning the latter. Russia and Eastern Europe favour System D with its wider sound spacing than the rest of Europe (System B) or the UK and Eire (System I).

interesting to note that the UK's 405-line system and the former French 819-line systems both used positive-going video modulation with a.m. sound.

Television System Differences

Each combination of parameters has been designated a code letter and these are universally recognised throughout the World.

What To Expect On The Various Channels
Channel allocations vary between, and sometimes within, systems. To differentiate between

systems the channel number is assigned a prefix, for example, Channel R1, E2, L2, etc. Some countries such as Éire and Italy use letters instead of numbers for their v.h.f. channels. The list below

will give some idea as to how frequencies, systems and channel numbers relate in TV Bands I and II. To calculate the sound frequency, simply add the sound spacing of the appropriate system to the vision frequency shown. Note that some sound frequencies clash with video frequencies, for example, Channel E2 sound coincides with Italian Channel A video!

System	Lines	Field Freq. (Hz)	Video Mod.	Sound Mod.	Sound Spacing (MHz)
B/G/H	625	50	Negative	f.m.	+5.5
D/K	625	50	Negative	f.m.	+6.5
I	625	50	Negative	f.m.	+6.0
M	525	60	Negative	f.m.	+4.5
N	625	50	Negative	f.m.	+4.5
L	625	50	Positive	a.m.	+6.5*

* -6.5MHz below the vision carrier in Band I.

Further Information
The Internet provides a wealth of websites associated with the hobby. Using a good search-engine, simply enter either 'DXTV' or 'DX-TV' (a different selection may appear if you include the hyphen!).
The *World Radio TV Handbook* has lots of useful TV and f.m. transmitter listings but some of the information is rather scant and incomplete.

Vision Freq. (MHz)	Ch.	System	Used By
48.25	E2	B	Spain, Portugal, Norway, Sweden, Germany, Switzerland and Italy.
49.75	R1	D	Russia, Moldova, Lithuania, Ukraine, Belarus, Latvia, Hungary and the Czech Republic.
	E2a	B	Austria.
53.75	A	B	Italy.
55.25	E3	B	Spain, Portugal, Sweden, Norway, Iceland, Finland, Denmark, Germany, Switzerland, Slovenia, and Serbia.
	A2	M	USA and Canada.
55.75	L2	L	Corsica.
59.75	R2	D	Russia, Lithuania, Rumania, Ukraine, Belarus, Latvia, Hungary, Slovakia, the Czech Republic and Estonia.
60.50	L3	L	France.
61.25	A3	M	USA and Canada.
62.25	E4	B	Spain, Iceland, Norway, Sweden, Finland, Denmark, Germany, Switzerland, Morocco, Tunisia, Croatia and Austria.
	B	B	Italy.
63.75	L4	L	Corsica.
67.25	A4	M	USA and Canada.
77.25	R3	D	Russia, Rumania and various CIS countries.
	A5		MUSA and Canada.
82.25	C	B	Italy and Albania.
83.25	A6	M	USA and Canada.
85.25	R4	D	Russia and various CIS countries.
99.25	R5	D	Russia, Bulgaria and various CIS countries.

"Over the years, countless enthusiasts have discovered the joys of Sporadic-E DXing, purely by accident"

The *European FM Handbook* lists f.m. stations operating in Europe, Russia, Central Asia and North Africa. Further details may be obtained from www.fmdx.com The

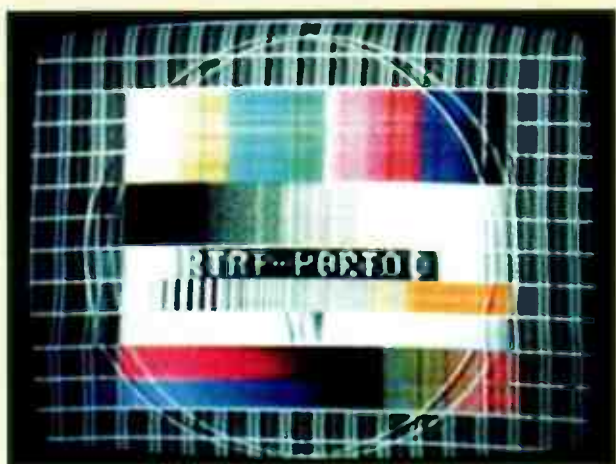
handbook is available from **Ab FM Media Plaza Ltd., Eskilomvägen 294, FIN-07880 Liljendal, Finland.**

A range of publications, covering virtually every aspect of the DXTV hobby, is

available direct from **HS Publications, 7 Epping Close, Derby DE22 4HR, Tel: (01332) 381699.** A full product catalogue, which includes details of the D-100, dipole connector boxes and

suitable DXing antennas, is available at £1. An electronic version of the catalogue is available free. Further details are shown on the www.test-cards.fsnet.co.uk website.

SWM



The Portuguese FuBK test card on Channel E3 with typical multi-path distortion. The FuBK is currently radiated by Estonia, Rumania and Finland.



A rare Albanian test card received on Channel C from the 100kW Tirana transmitter.

Soon after TV arrived here in Spring 1964, puzzling intermittent patterns began to appear on our screens. The cause of these became obvious when snatches of foreign speech began to accompany the phenomenon. Obviously foreign TV stations were being received.

From the pages of *Practical Television*, as it was then called, I learned that this was not unusual. The cause was what was known as Sporadic-E, intensely ionised regions developing in the E-layer of the atmosphere, causing TV transmissions to be reflected back to earth at a distance of 800-1600km. Even today, this phenomenon is not fully understood, but a number of

only French transmissions could be received on an unmodified 405-line TV. France at that time had an 819-line system, so that on a 405-line receiver the picture would be resolved twice, producing two elongated pictures side by side.

Other European stations could not be resolved at all. Not only did they use 625-lines, but the vision modulation was negative, while in Britain and France it was positive.

Cheap To Start

It was quite cheap to get started in the hobby. Slim-line dual standard TV sets were becoming available and as a result, there was little demand for the older 'tea chest' style

invariably of a.c./d.c. construction, the chassis being connected directly to the 240V mains and the valve heaters connected in series like Christmas tree lights. They were made this way, of course, not for the convenience of people still on d.c. supplies - even in those days there must have been extremely few, if any of these in existence, but to avoid the cost of a mains transformer.

Conversion involved reversing the vision detector diode to resolve the negatively modulated transmissions and changing the time constant components in the line time base to raise the frequency to 625-lines. A snag sometimes encountered was that, as the e.h.t. voltage for the tube was derived from an overwind on

transmissions, then these modifications had to be made switchable, which, with the live chassis, could cause safety problems.

Coils Retuned

European TV channels did not correspond with British equivalents, so often the tuner coils had to be retuned. This was usually a simple matter, removing the tuner switch revealed a hole into which a small screwdriver could be inserted to adjust the oscillator coil core. You often found that coils were not fitted to all the switch positions in the so called 13 channel tuner, but these were readily obtainable and easily clipped into place.

Some Bush receivers were popular for this conversion as

Old Time DX TV

W. J. Williamson takes us back to his early days of DX TV reception.

people were interested in these signals so that *Practical Television* soon had a regular column on the subject. As a hobby, it was still new enough to have a pioneering feel to it.

Although signals were sometimes extremely strong,

TVs, which could be obtained for little more than a nominal sum. These were suitable for conversion to European standards, but it was not something to be entered into lightly.

TV sets of the period were

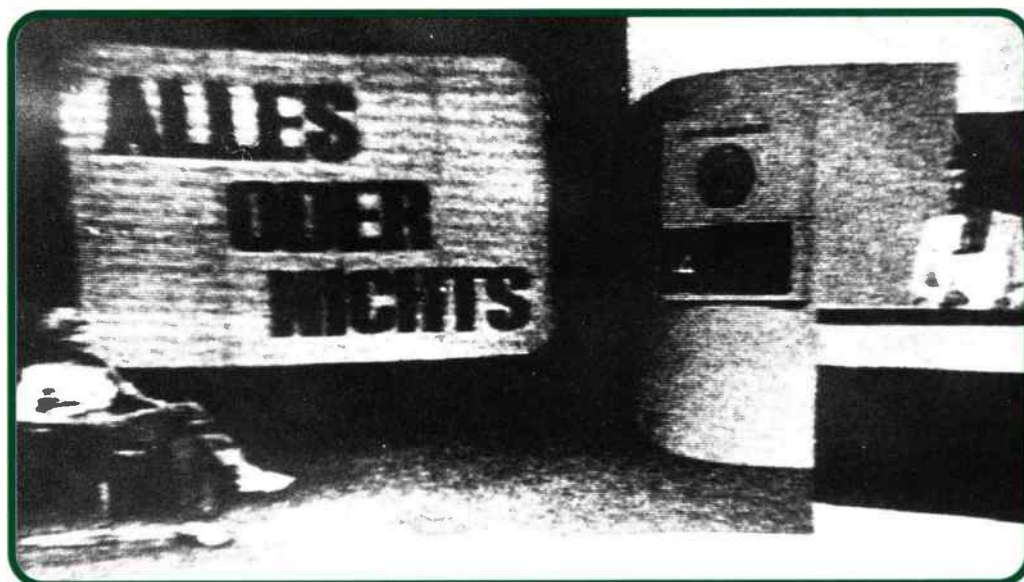
the line output transformer, raising the line frequency could result in low e.h.t. voltage.

Fortunately, this resulted in no more than the need to refocus the picture. If you wanted to retain the capability to resolve 405 and 819-line

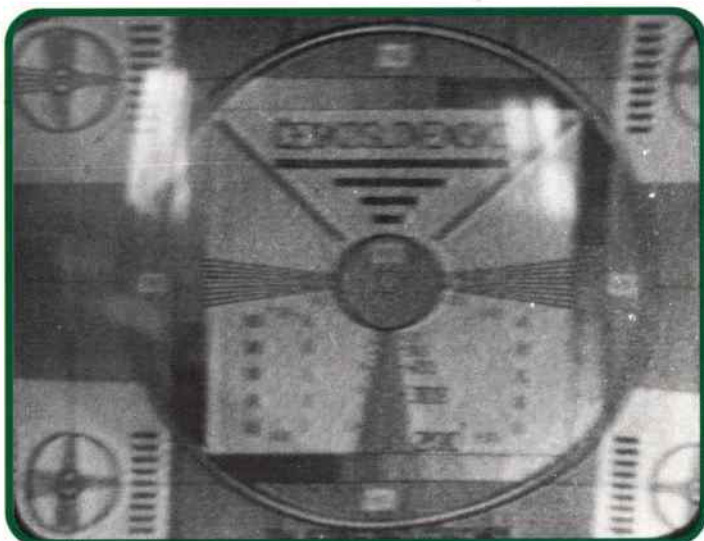
they had what were called incremental tuners which could be tuned continuously through the entire band. With most sets you were limited to the switched positions and a fine tuner which allowed a small amount of adjustment.

Having got your set up and running, it was only necessary to wait for the familiar patterns to appear on the screen. Spring and early summer were the best times for this, although it could occur at any time. On one memorable occasion, I was able to watch ski-jumping direct from Austria on New Year's Day.

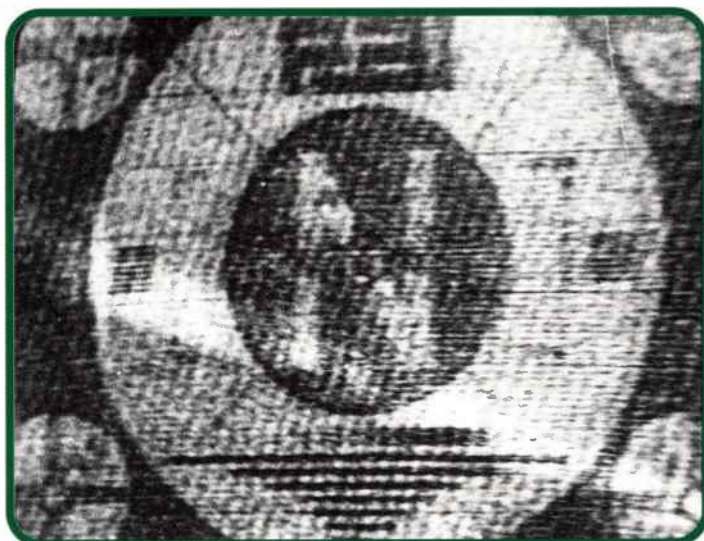
Signals were strong, but erratic, often lasting for only a few minutes before being replaced by another transmitter, or even another country. Sound reception was not usually obtainable as the European sound and vision carrier frequency spacing was different to the British standard. The sound was also f.m., while Britain still used a.m.



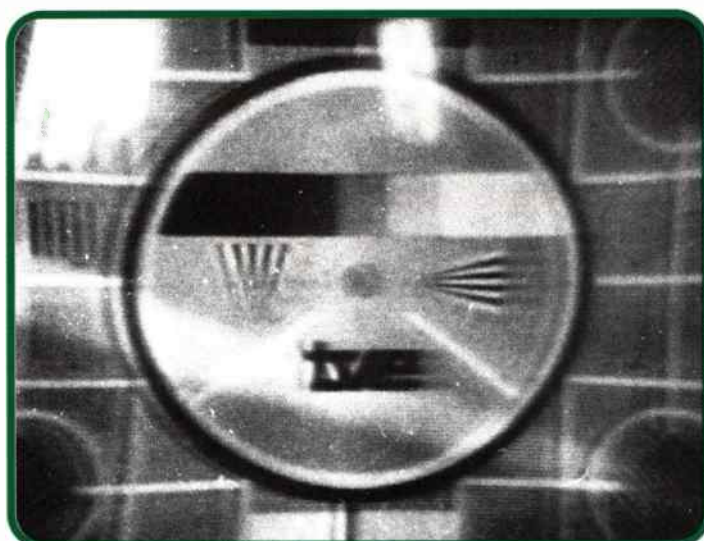
Alles Oder Nichts - All Or Nothing, a popular German Game show.



Czechoslovakian test card.



Italian test card.



Spanish test card.

Problem Overcome

Various suggestions were made for overcoming this problem, the simplest, though a rather inconvenient one, being to use another TV set tuned to the sound frequencies. Another mode by which remote TV stations could be received was what was termed tropospheric propagation. This was caused by refraction rather than reflection, the signal being sent round the earth's curvature during certain weather conditions, usually a high pressure area.

Signals were much weaker than those due to Sporadic-E, but were more stable, often lasting for hours, or even days. Distances were more limited, up to about 800km or so. On the other hand, unlike Sporadic-E, it was not limited to band 1. Band 3 and when it became available, u.h.f. transmissions could also be received.

From here, reception of Norway was possible, sometimes also Denmark and Germany. The extended viewing periods possible allowed a study of the programmes and I remember being surprised at how basic the Norwegian service was.

Programmes only started about 1800 and ended around 2200. Apart from the news and weather forecast, almost all the items broadcast were familiar British and American programmes with subtitles. The Danish service was similar, but the German was more developed.

Other Modes Possible

Other modes of reception were at least theoretically possible. Double hop Sporadic-E where the signal returns to earth to be reflected up and back down again raised the possibility of greatly extending the reception distance. (See page 22 for an alternative explanation of this effect - Ed.). Still, greater distances,

potentially world-wide, could be expected via F-layer reception at times of maximum sunspot activity. I never achieved either of these, but I did have some success with auroral propagation.

Unfortunately, pictures received in this way were severely distorted and would clear only for seconds at a time. I never managed to obtain any decent photographs or identify any of the countries involved.

In time, second-hand dual standard TVs became available at an acceptable price, which simplified the conversion process considerably. All that was necessary was to alter the switching system so that the set could be switched to 625-line operation while retaining the v.h.f. tuner in circuit.

Some sets allowed you to do this by simply tuning a switch on the rear of the tuner. If the set was not needed for British TV, the foreign sound could also be obtained by retuning the sound i.f. transformers. On the other hand, these sets had a broader i.f. bandwidth, so co-channel interference was more of a problem than with the earlier sets.

Receive Any Transmission

Today, multi-standard TVs are available which can receive any transmission without the need for any modification or any technical knowledge at all. They are, of course, extremely expensive and are effectively black boxes, no understanding of their workings being necessary, or, indeed, possible.

A parallel may be drawn here with amateur radio, which has progressed from the era of home construction and government surplus conversions to the almost universal use of ultra-sophisticated and extremely expensive professionally made equipment.

If I may be allowed a personal and perhaps slightly controversial opinion, I feel that in both cases the hobbies have been made less interesting as a result.

SWM








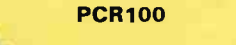


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	AR8000	The New Concept. Wide band all mode hand-held receiver with many microprocessor facilities, dot matrix display and computer compatibility.	£296.00
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	IC R8500	100kHz - 2GHz Continuous. All mode no gaps. 1000 Memories. 4IF band widths	£1440.00
	IC-R75E	Excellent all round for the professional listener	£629.00
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DX Television- The Column

By the third week in October, F2-layer activity made a spectacular appearance making world-wide TV reception a real possibility. An upsurge in Sporadic-E created an interesting situation with both types of propagation present on Channel E2 at times!

Daily Ritual

From October 16th, F2-layer reception became a daily ritual with E2 (48.25MHz) jammed with strong multiple images, sometimes with several stations battling. These were typically of Middle Eastern origin although broadcasts from Thailand and Malaysia have also been identified. Channel R1 (49.75MHz) became active on a few occasions - the m.u.f. (maximum usable frequency) even reached E3 (55.25MHz) on the 29th.

World-Wide Reception

The openings rapidly developed with signal levels soaring from zero to maximum in a matter of minutes. Signals were often visible by 0730UTC, with openings lasting six hours or more! World-wide reception occurred, with reports of European TV in Hawaii, Chinese TV in Finland, Norwegian TV in Australia and Australian TV in England!

On the 17th, strong signals emerged just before 0800UTC, with co-channel signals from Thailand and Iran, according to frequency offsets measured by **Tim Bucknall** (Congleton). An Arabic news programme with a woman presenter was confirmed as the Iranian second-network (IRIB-2) by the 'double arrowhead' logo in the top-right. By 0827, there were programme trailers being shown with pictures sandwiched between two horizontal white lines with Arabic text below.

The 25th was most eventful with Iran and Thailand co-channelling throughout the morning on E2. At 0922, there was evidence of weak syncs on Australian Channel A0 with pictures eventually visible for over ten minutes. Tim identified its 46.171MHz offset as commercial station RTQ-0, the 100kW outlet at Toowoomba in Queensland. Further signals emerged on the 26th and 27th.

Unusual Sound Carriers

On the 26th, activity affected R1 - this was confirmed as Russia by Tim who discovered an unsuppressed sound carrier spurii at 43.25MHz. Between 1130 and 1145, **Simon Hockenull** (Bristol) heard 'foreign' p.m.r. at 45.240MHz, which coincided with New Zealand's Channel NZ1 vision frequency. Spurious radiation from Niger FM station La Voix du Sahel, operating from Zinder on 91.30MHz, has been evident at 45.65MHz.

The Exotics Continue

Thailand was firmly established on E2 by 0740 on the 27th. At 0830 on E2 Simon identified a studio interview as Iran, with its upper-left '1' logo. By 0835 Syria, with its L-shaped logo in the lower-left of the screen, had won the battle.

Peter Barclay (Sunderland) followed it for over an hour; **Ian Milton** also identified it by comparing it with satellite pictures.

By 0850 on R1, Simon discovered at least three unidentified stations battling for victory on 49.740, 49.750 and 49.753MHz. At 1155 Tim identified Russian RTR motor racing, but the big surprise was Khazakstan TV on R1. F2

reception on E2 lingered past 1400. On the same day, European vision carriers were being received in Hawaii.

Rising MUF

By 0930 on the 28th, among the co-channel E2 signals fighting, IRIB-2 was identified, with sound heard at 1009 by Tim Bucknall. Activity continued on E2 until 1500.

On the 29th, **Peter Chalkley** (Luton) encountered phenomenal levels of signal from south-east Asia by 0700. Peter comments that his Icom IC-R2 scanner received them quite well on its 'rubber-duck' antenna.

Just before 0800 on E2, **Stephen Michie** (Bristol) saw an educational programme, with an empty sync bar. At 0807 **Peter Barber** (Coventry) spotted an analogue clock, thought to be Dubai, displaying UTC+4 hours, its hands then moving to UTC+12 hours! By 0930 Tim Bucknall discovered that the m.u.f. had breached E3 (55.25MHz), which briefly resulted in pictures. Simon Hockenull comments that Iran on 48.239 and 48.260MHz was still visible at 1350. Meanwhile, in northern India, **Lt. Col. Rana Roy** reported a French station identifying as TV5, which emerged on R1 between 1900 and 2230UTC.

Sporadic-E

During a selective opening to the south-east on the 1st, **Tom Crane** (Hawkwell) logged TVR-1 Rumania on R3 (77.25MHz). Weaker signals were visible on R2, possibly from the Rumanian second network.

More openings were evident on the 9th, 20th, 21st, 27th, 29th, 30th and 31st with strong Spanish signals featuring all of these dates. Many of the openings were sustained with activity comparing favourably with the main season.

October 30th was most impressive with over three hours of reception first noticed at 1020 by Stephen Michie, with a full complement of Italian stations, i.e. Tele A+, RAI UNO and TVA. From 1100, Peter Barclay found the band occupied with Spanish signals. In addition there were contributions from Portugal on E3 and also Canal Plus from Corsica and France on L2 and L3. By 1320, Sporadic-E from Spain on E2 was battling with F2 reception from Syria, a most unusual sight!

Tropospheric Reception

A new six-element Band III antenna now provides Tim Bucknall with Irish signals on tap. During an opening on the 10th he discovered line-pairing over Mt. Leinster on Channel F. The interfering signal was identified as NETWORK-2 but all the possibilities listed are 1kW or less!

On the 12th, Tom Crane resolved strong signals from the German Götterborner Höhe outlet on E2. During the same opening Peter Barber identified RTL Luxembourg on E7 from Dudelage while over in Bristol, Stephen Michie, logged TV Oost, the Dutch regional service on E22.

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.



Fig. 1: Syrian TV Clock caption with distinctive 'L-shape' logo. A similar, smaller logo is displayed in the lower left-hand corner of the picture.

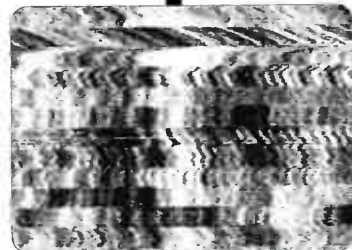


Fig. 2: Typical F2 reception with characteristic multiple images. The distinctive features of the PM5534 test card can be made out but it cannot be identified.



Fig. 3: The identification logo used in the top left-hand corner of the screen by IRIB-1 (Iran).



Fig. 4: The logo used by IRIB-2 in the top right-hand corner of the picture.

In the past we have featured two iterations of the Wavecom W41PC decoder. Now, due to the demand of those looking for a more affordable solution, I investigate the somewhat cheaper W40PC.

The W40PC's big brother costs nearly three times as much. Wavecom tell us that the actual software is the same. This is a serious hobbyist's or a indeed a low-end professional monitor's tool. This explains why they frequent government monitoring establishments both in the UK and many other countries around the globe.

If you are serious about data modes, and I do mean serious, then you will need much more than a shareware decoder. There are quite a few cheap solutions to be had, but if you want to investigate some of the more exotic modems used by utility and military networks around the globe, then your choice is limited. To be honest, it's limited to two manufactures, Wavecom

and Hoka. It's also important to say that you have to spend some serious money.

I've been a committed Hoka Code30 user for many years, I'm familiar and comfortable with its DOS user interface. I don't view the 486/66 PC that the Code30 is installed in as a general purpose machine instead the whole set-up is the decoder.

I have to admit to revisiting this outlook after exposure to the W40PC. I've been using this Wavecom entry level offering for a good few weeks and there's no doubt it is a joy to operate. Preparing this review was considerably easier thanks to the W40PC software having a graphical interface which runs in a Windows environment. To be specific *Windows 9X, NT and 2000*. This allows for easy screen capture and manipulation. Even if you're not reviewing the decoder, then there are still many benefits to its running under a GUI. The downsides of this approach, for instance the

remote control capabilities either. You see that way I could have run the decoder located at home from the Editorial Offices using the Internet to bridge our networks.

Mostly though, the W40PC shares most of the functionality of its senior sibling.

I digress, back to installing the card, there is only one hardware configuration possible, this is the I/O address of the card. The factory default is 0310 hex. There are only two jumpers used to select the address, but I left it as it was. It is possible to install up to four W40PC cards into one PC.

The software install was straightforward, the supplied CD autostarts and the install screen appears. Nothing out of the ordinary happened and the Wavecom software ended up in the default directory on my computer.

Final step is to start the W40PC software and let it know the I/O address of the card, or if you're lucky, cards. I have to

manual which comprises of some 220 pages. As there is much in common with the '40 and the '41 the W41PC Manual provides an excellent reference with useful information regarding each mode covered by the decoder. I suggest that even if you don't have a Wavecom decoder you will find this pdf format file very useful.

Lastly, the vital connection of audio from your receiver. As the W40PC has three possible inputs, via 50Ω BNC sockets for a.f., i.f. and discriminator. I was looking forward to checking the difference with each possibility. My work horse R8500 has all the necessary outputs you see. I have to admit to being rather disappointed when I discovered that although the W41PC caters for a 10.7MHz i.f., the W40 can only cope with a range from 14kHz to 1.5MHz - no broad bandwidth signals for me then! It's a shame since the W40PC offers an FFT window option of 24kHz span - just right the

Wavecom W40PC

Despite the title, you shouldn't be fooled into thinking that this Swiss made decoder is anywhere near the bottom of the pile. It just happens to be the cheapest offering from Wavecom. Kevin Nice shares his experiences.

Low-end Lowdown

interface not being able to run in real time seem to have been overcome. Wavecom appear to have done a good job on this front, mainly I suspect due to the twin 66MHz Motorola 56002 d.s.p. processors that operate in excess of 64MIPS. It certainly makes for a fast solution, that appears to require little of the host PC's resources.

Getting It Going

Thinking back a few weeks returns me to the fitting of the W40PC card and software. I installed the W40PC into an elderly, but perfectly adequate Pentium 200 mini-tower system with 52Mb of RAM. This computer runs *Windows 98* and is the general do everything PC in the shack. The card fitted pain free into the only AT (16bit) slot I had remaining. The W40PC's ability to reside with three other of it's kind is wasted on me. This is a pity as I would love to have tried a multiple card set-up.

Unfortunately, this baby brother to the formidable W41PC doesn't have the latter's

admit that there were many times I would like to have had an FFT screen running whilst I was attempting to



proliferation of p.s.k. modems that are taking over the h.f. bands.

Up And Running

After I'd connected the a.f. and discriminator leads to the radio, time for some action. First port of call was the FFT window for a view of the R8500's audio spectrum. I was presented with a very lively, rapidly updating spectrum display, which I must point out, I have come to enjoy greatly. Next step was to decode a signal. The first station I encountered was Northwood on 11.084MHz transmitting a Gale Warning Fax, the results can be seen in **Fig. 1**.

The user interface of the *continued on page 42*

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Tel: (01592) 756962 Fax: 01592 610451 Hours: Tue - Fri 9am - 5pm. Sat 9am - 4pm

NEW 2002 CATALOGUE
336 PAGES £2.95 carr. £1.25



The foremost guide to amateur radio products from the latest transceivers to the smallest of accessories. Full colour pages with comprehensive specifications, there is nothing else like it in the world! There is also some editorial and reviews. Three times the size of many magazines, yet it costs no more

SANYO WS-1000 WORLD SPACE DIGITAL RECEIVER



£149
Plus £8.00 Carr.

Comes complete with detachable mini flip-up dish and with 5m of cable. Receives digital broadcasts from the WorldSpace Satellite. Runs from supplied AC mains adaptor or optional batteries Audio output via internal mono speaker, external optional stereo headphones or stereo line out via phono connectors as well as a S/PDIF digital audio output. It also has 32 memories complete with remote control and a port for multimedia services. Amazing performance; amazing price.

HITACHI KH-WS1 WORLD SPACE DIGITAL RECEIVER

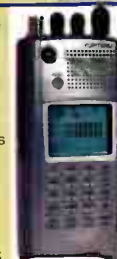
This radio has its own mini satellite dish and receives digital WorldSpace broadcast signals via the AfriStar satellite. As well as all the normal VHF FM programmes, you can switch to satellite broadcast signals from CNN, BBC, Bloomberg (multi language), World Radio networks 1 & 2, and lots more. High quality mono via the internal speaker and stereo via the headphone socket. Runs from AC, 4 x D cells (not supplied), or external 6V.

£149
Plus £8.00 Carr.



YUPITERU MVT-9000EU MK2 100kHz - 1.99GHz

Covering the complete radio spectrum from long wave to UHF, you have a complete station in your pocket. Features include NFM, WFM, NAM, WAM, LSB, USB, CW, * 7 Frequency steps * 1,000 Memories in 20 banks * 500 Pass memories * 10 Priority channels, * Band Scope display * Duplex receive function lets you hear both sides of the conversation * Fast tune function, * Built-in AM antenna * Dual frequency display * Fast keypad entry, * Rechargeable batteries, AC charger and helical antenna.



Phone
Plus £8.00 Carr.

Uniden-Bearcat UBC-220XLT



Ideal for general listening, this scanner covers all the major bands from 66MHz - 956MHz AM and FM. 200 memories and a very fast scanning speed make this a very attractive buy. You also get the flexible short antenna, AC charger and batteries. Very popular with Airband listeners.

£119
Plus £6.00 Carr.

AOR-8200 SERIES 2 500KHZ - 2040MHZ



This wide range scanner is fitted with a data port for computer control. Features include USB, LSB, CW, FM, WFM * Programmable steps * 1000 memories in 20 banks * Alphanumeric display * Built-in AM antenna * 8.33kHz steps for air band * Rechargeable ni-cads, AC charger and helical antenna.

Phone
Plus £6.00 Carr.

VR-120 RECEIVER

* 100kHz - 1300MHz * AM, FM, WFM * 12 Channel steps * 640 Memory Channels * 64 frequency skip channels * 21 Smart Search * 8 Search bands * 1 Priority channel * Dual watch * B-Character Alpha-tags * Preprogrammed broadcast frequencies * VFO search feature * PC programmable with optional ADMS-3 kit. * Antenna: BNC * Supply 9.0-13.8V DC * 2 x AA cells * Battery voltage: 2.2-3.5V DC (nominal 3V)



£159
Plus £8.00 Carr.

YUPITERU MVT-7100EX 100kHz - 1.65GHz



Probably the best value for money, it has stood the test of time and is very sensitive. Offers USB, LSB, CW, AM, FM, WFM, * 1,000 memories * 500 Pass channels * 12 Tuning steps * Fast scan speed * Rechargeable batteries, AC charger and telescopic antenna.

£229
Plus £8.00 Carr.

UBC-3000XLT

- * 25MHz to 1.3GHz
- * 400 Ch/20 Banks
- * 10 Priority Channels
- * Automatic store
- * Twin Turbo Scan & Search
- * Scan rate: 100 ch per sec
- * Data skip feature
- * Selectable Attenuator
- * Modes: AM, WFM, NFM
- * LCD with back light
- * Ext. spkr jack 3.5mm
- * Ext. earphone jack 2.5mm
- * Rechargeable battery (5hrs)
- * Power requirements 6.5V DC
- * Size 68 x 88 x 38mm
- * Weight 366g



£169
Plus £8.00 Carr.

AOR AR-8600



AOR's exciting new scanner:
* 500kHz - 2040MHz
* 1000 Memories
* 37ch sec scan
* RS232 PC interface fitted
* 10.7MHz IF for 8DU5500
* Accepts up to 5 slot-in cards
* Detachable MW bar aerial

* FM AM SSB CW
* 2000 pass frequencies
* 8.33kHz airband steps

Phone
Plus £8.00 Carr.

Fairhaven RD500VX Radio Database Receiver



£749
Plus £8.00 Carr.

The Fairhaven RD500VX is an advanced all mode, all band radio database receiver. It covers from 0 to 1750MHz with all mode capability. As well as the normal USB, LSB, CW, FM and AM modes it also includes synchronous AM, stereo FM, wideband FM, Data, TV sound and video.

Yupiteru MVT-7300



£259
Plus £6.00 Carr.

- * NFM, WFM, NAM, WAM, USB, LSB, CW
- * 521kHz - 1320MHz
- * 1,000 memory channels
- * High sensitivity
- * Signal strength meter
- * High speed scanning & searching
- * MONITOR button
- * Descrambler function
- * Telescopic rod antenna
- * Clock timer function
- * Variable colour display
- * Key illumination
- * Clone function
- * 8.33kHz airband spacing
- * 12V DC/230V AC mains

NOW WITH NICADS & CHARGER

BEARCAT UBC - 9000XLT BASE STATION



£239
Plus £8.00 Carr.

The 9000XLT features Twin Turbo scan & search modes with 10 user definable priority channels. User selectable modes covering AM, FM and Wide FM modes. Selectable receiver attenuator, delay, Alpha tagging and data options are available direct from the keyboard. For unattended operation the 9000XLT has an automatic tape recorder ON/OFF and tape output feature!

AOR-7030 RECEIVER 0kHz - 32MHz



Phone
Plus £8.00 Carr.

Needing little introduction, this receiver has become a classic of design. Features USB, LSB, CW, AM, FM, * 100 Memories * Dual VFOs * Resolution to 10Hz * Clock and Timer * Variable Bandwidth * Wide Dynamic Range * Seamless Tuning using Single Loop DDS * Clear LCD Readout * Infrared Remote Controller * AC Power Supply.

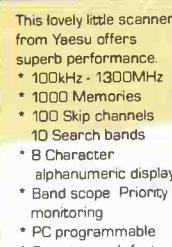
YAESU VR-5000



Phone
Plus £8.00 Carr.

Yaesu's exciting new scanner:
* 100kHz - 2599MHz * FM AM SSB CW
* Real-time band scope
* DSP Noise and notch filters (with optional QSP-1)
* 2000 Memories * Optional digital voice recorder
* Large digital display * Super HF performance
* Ultra sensitive * Fully programmable


YAESU VR-500



This lovely little scanner from Yaesu offers superb performance.
* 100kHz - 1300MHz
* 1000 Memories
* 100 Skip channels
* 10 Search bands
* B Character alphanumeric display
* Band scope Priority monitoring
* PC programmable
* Smart search feature
* Alpha numeric recall
* Size 58 x 95 x 24mm

£199
Plus £6.00 Carr.

ICOM IC-R8500
"EDITORS CHOICE"




£1295
Plus £8.00 Carr.

The IC-R8500 has a wide frequency range continuously from 0.1 to 2000MHz. It's ideal for the radio amateur or shortwave listener.

The IC-R8500's all mode capability allows reception of a variety of different modes, from the world over: SSB (USB, LSB), CW AM, FM and WFM are included, along with several 'speciality' modes, CW narrow, AM wide, AM narrow and FM narrow are available (Requires optional FL52A).

PCR-1000 10kHz - 1300MHz
COMPUTER CONTROLLED RECEIVER



£299
Plus £6.00 Carr.

Mode: USB, LSB, CW, AM, FM, WFM. Connect this up to your PC and enjoy high quality reception with an amazing station data base and memory log. Can be used remotely from PC. Requires PC (not included).

LAPTOP COMPATIBLE

STREET PILOT III

NEW FROM GARMIN

IT TALKS TO YOU



"TURN LEFT IN 2 MILES"

It talks to you and is supplied with street level mapping 32Mb storage card and card reader for quick PC programming. Examples of voice info are "turn left 2 miles", "take 2nd left at next roundabout", "house number 17 is on your left", "turn right in 300ft". These are in stock now.

Phone
Plus £9.00 Carr.

GARMIN GPS-V

WITH WAAS
for even greater accuracy



£469.95
Plus £6.00 Carr.

The GPS V is one versatile navigator that delivers automatic routing, detailed mapping and WAAS capability - all in a compact handheld GPS. It comes with the MapSource City Select CD, which gives you access to detailed street-level maps with locations of restaurants, hotels and other services. Use the GPS V to look up a location and it will automatically calculate a route and guide you to your destination with turn-by-turn directions and audible beeps that alert you to upcoming turns.

IC-R75 RECEIVER
30kHz - 60MHz

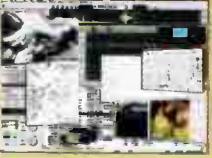


£579
Plus £8.00 Carr.

The IC-R75 has received rave reviews in the Amateur Radio Press. It's a very serious short wave receiver with coverage right up to the exciting 6m Ham Band. Features include USB, LSB, CW, AM, FM * 101 Memories * Super High Dynamic Range * Synchronous AM detection * Twin Pass band Tuning * Digital Signal Processing (with optional UT-106) * Automatic Notch Filter * 101 Alphanumeric Memories * RF Gain/Squelch * Clock * Numeric keypad * Altenuator * 2-level Pre-Amp * Scanning.

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Radio Control, DSP-Filter + Analysis Software
Need For Windows™ '95/'98/'ME/'2000 and NT 4.0



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Radiocom 5.1 (RC51-RC-HAM) £149.95 B
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GLOBAL AT-2000
ANTENNA TUNER



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Plus £6.00 Carr.

The classic wire antenna tuner for short wave listening. Covering 1.8 - 30MHz, it includes our exclusive Q-switch, which improves front-end selectivity. Just connect a random length of wire and connect a coax cable from ATU back to receiver.

Ten-Tec RX-340
Professional DSP HF Communications Receiver

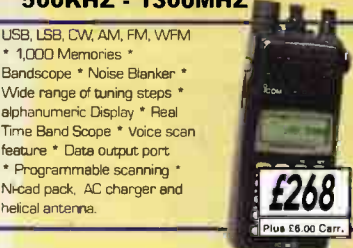


£3995
Plus £8.00 Carr.

I found this receiver to be the closest thing to perfection that has passed through my test facility over the last 10 years - and I heartily recommend it to you John Wilson - Short Wave Magazine.

The Ten-Tec RX-340 is a multi-mode, professional grade, general coverage synthesized receiver. It utilises extensive Digital Signal Processing (DSP), which brings the performance of commercial grade communications receivers into the affordable top end of the amateur market.

ICOM IC-R10E
500KHZ - 1300MHZ



USB, LSB, CW, AM, FM, WFM * 1,000 Memories * Bandscope * Noise Blanker * Wide range of tuning steps * alphanumeric Display * Real Time Band Scope * Voice scan feature * Data output port * Programmable scanning * Ni-cad pack, AC charger and helical antenna.

£268
Plus £6.00 Carr.


CAPTURE THAT FREQUENCY!
HUNTER 10MHz - 3GHz
Hunts down Frequencies



Supplied with telescopic antenna and AC battery charger. If you are within 200 ft or so of the handheld, you should be able to read off the frequency. Note it down and enter it in your scanner. It's that simple and it's pocket sized.

£59.95
Plus £5.00 Carr.

OPTOELECTRONICS
DS-1000 DIGITAL COUNTER



- * Frequency range: 10MHz - 2.6GHz
- * Resolution 100Hz
- * Signal strength -45dBm to -5dBm
- * 1,000 memories 65,000 hits per memory
- * Captures Digital & Analogue signals
- * Minimum 500uS RF pulse required
- * Reaction times (requires lead)
- * Display: 2x16 alphanumeric LCD (with backlight)
- * Signal strength displayed in dBm and bargraph
- * Built-in RS-232, direct connection to PC
- * Supply: Battery (5-6 hours), ext. 9V DC, 150mA

£599
Plus £8.00 Carr.

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VHF Airband Radio



Here's a compact handheld VHF airband, plus broadcast radio. We have sold many hundreds of this radio, and can now offer it at nearly half its original selling price. Requires 2 x AAA cells (not supplied).

£29.95
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Maplin catalogue price £49.95
(2000/2001 edition)

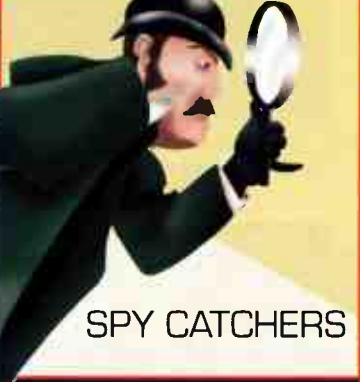
DMTR-21



The DMTR-21 the All Weather Solar/Dynamic/ Rechargeable Radio with Torch and Siren operates whatever the conditions. Does not become inoperable because the batteries run out. A variety of methods ensure that the internal Ni-Cad is charged even in the most demanding of conditions.

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Plus £2.00 Carr.

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NEARFIELD MONITORS



Zoom into any FM transmission between 30MHz and 900MHz and monitor the audio. It takes a fraction of a second. The WR-5001 comprises a complete receiver with auto tuning, skip button, squelch adjustment and built-in speaker. The WR-5002 is similar, but adds an auto-hold control and a bargraph signal meter. It also adds a CAV port for reaction tuning loom and AOR receivers fitted with this feature. These monitor receivers are designed for nearfield use and the range is from a few hundred metres to around 1km, depending on frequency and power of the transmitter.

WR-5001 £99.95 WR-5002 £159.95

SP-160 MOBILE / REMOTE
SPEAKER



- * 8 Ohms * Power rating 1.5W
- * 3m of lead
- * Fitted 3.5mm mono jack plug
- * Adjustable mobile mount
- * Size 97 x 67 x 27mm
- * Weight 165g (approx)

£9.95
Plus £2.00 Carr.

WATSON W-881
SUPER-GAINER



The W-881 Super Gainer is the one to choose for really long distance reception. High quality engineering and ergonomic design ensure that it is the natural replacement for those seeking to extend their receiver's range.

- * 25 - 1900MHz
- * 41 cm long
- * BNC Connector

£14.95
Plus £2.00 Carr.

WATSON WMM-3 MkII



New layout - for easier hook-up to computer and New modern chip - FX614 replaces old TM3105 New modes - CD with latest programs

Transmit & Receive: SSTV, PSK32, PACTOR, FAX, CW, RTTY, 1200 Baud Packet (using a variety of programs from CD-ROM)

£69.95
Plus £6.00 Carr.

MFJ-461
MORSE CODE READER



The MFJ-461 is a stand-alone pocket sized Morse code reader. Similar in size to the MFJ Morse tutors, all you do is hold it close to your receiver and it instantly displays CW on the 32 character high contrast LCD. It has automatic speed tracking, a serial port - if you wish to connect to a computer to display the text on a bigger screen. It can also be connected to your receiver's audio if required. Truly pocket sized at 57 x 82.5 x 15.9mm and 156g.

£84.95
Plus £8.00 Carr.

CB 80-CHANNEL HANDHELD
BOTH CEPT & UK CHANNELS!



This high performance compact CB handheld offers superb performance and with both CEPT and UK channels, can be used anywhere in Europe. LCD display, dual watch, scanning, emergency ch rubber duck etc. Requires 8 x AA cells or external 12V supply.

£79.95
Plus £8.00 Carr.

SPECIAL

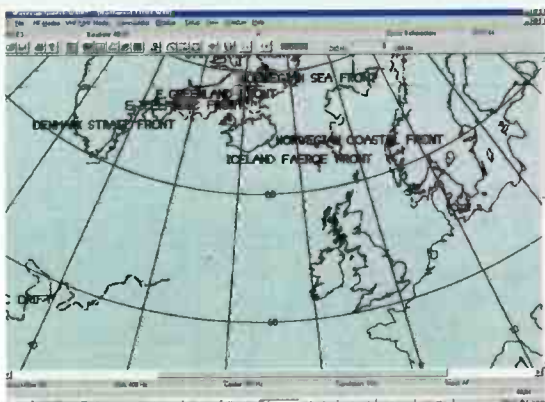


Fig. 1: Excellent FAX rendition.

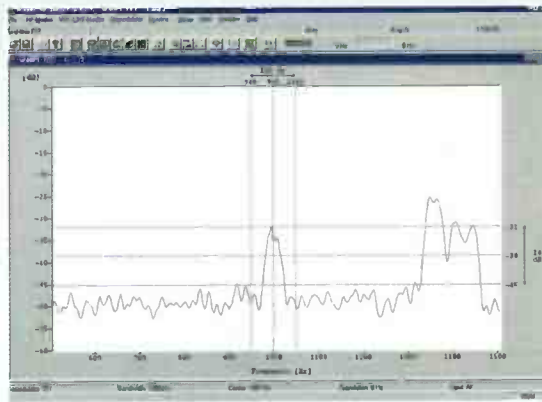


Fig. 5: Zoomed FFT showing the two standby tones.

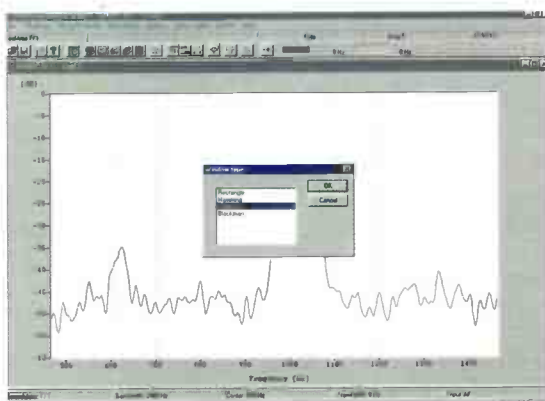


Fig. 2: The W40PC provides four windowing methods for FFT.

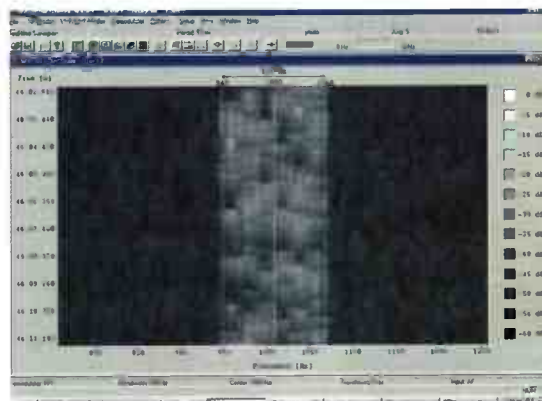


Fig. 6: Sonogram of the piccolo in traffic.

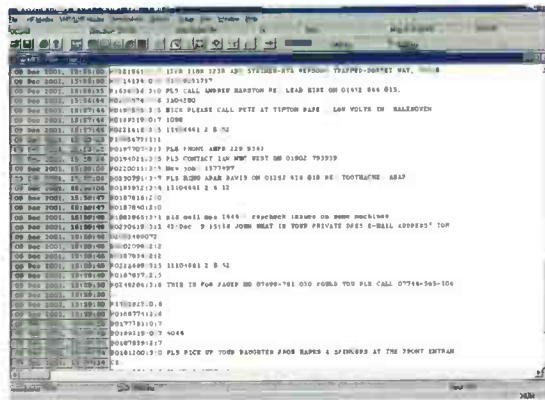


Fig. 3: The POCSAG module doing the business.

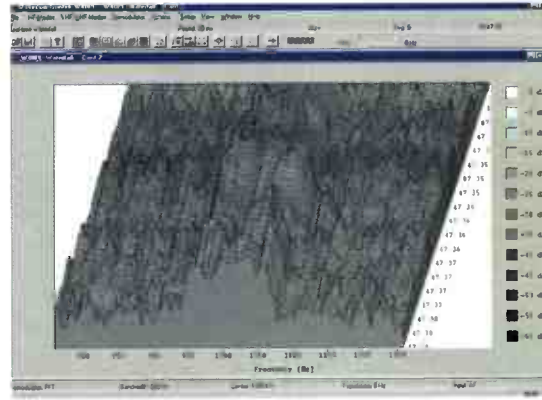


Fig. 7: Waterfall of same signal.

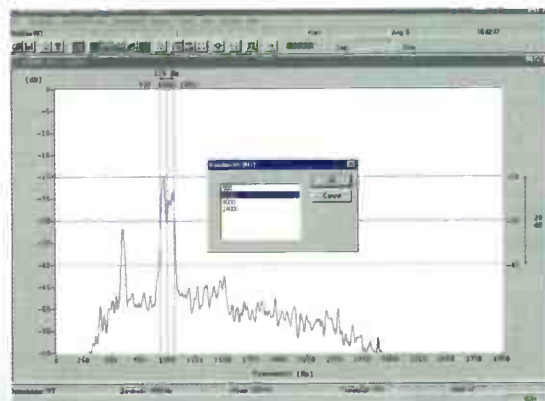


Fig. 4: The FFT module with measurement cursors in action. The bandwidth dialogue box ready to select 1000Hz span.

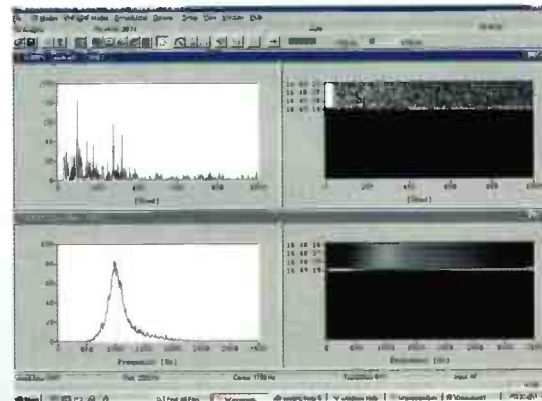


Fig. 8: FSK analysis module.

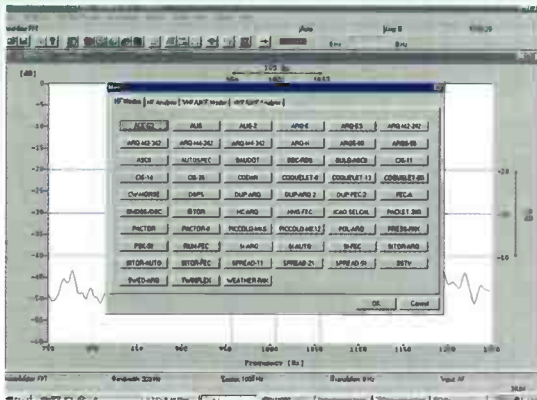


Fig. 9: The HF Modes selection.

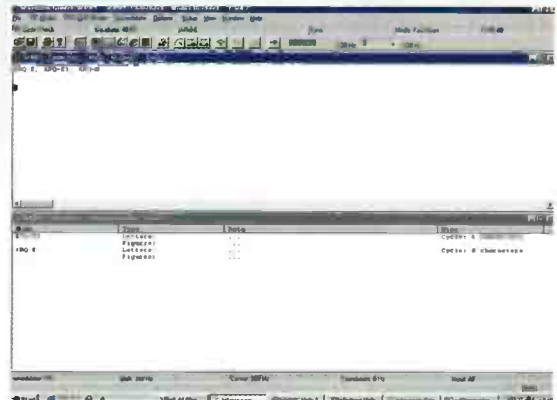


Fig. 13: The W4OPC Code Check, working on the signal.

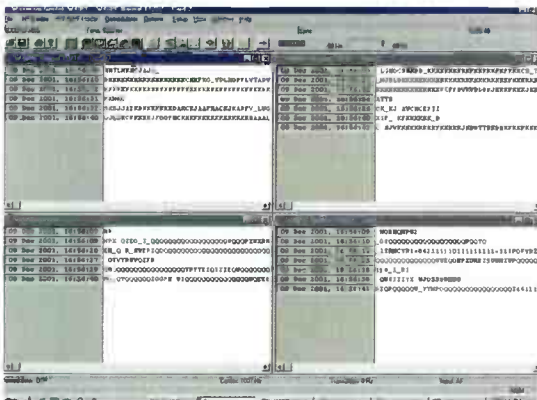


Fig. 10: Piccolo decode window.

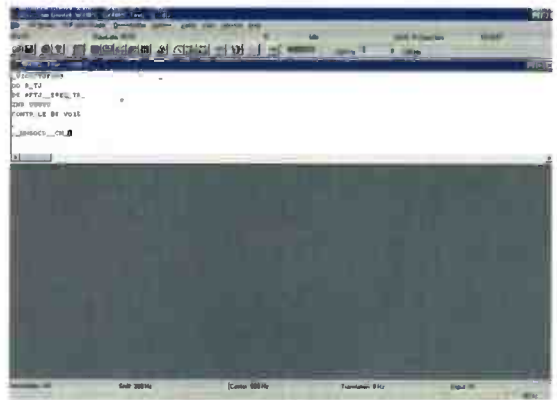


Fig. 14: Traffic from RFTJ, very noisy signal at this time.

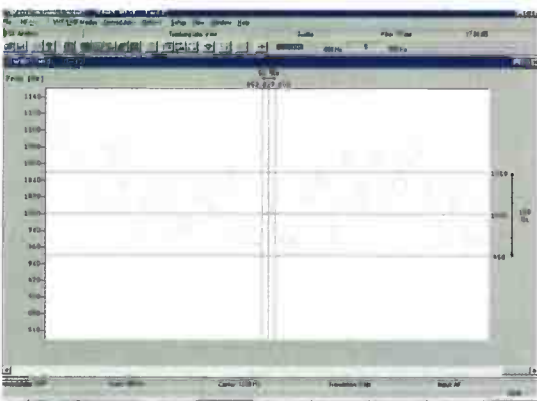


Fig. 11: MFSK Analysis.

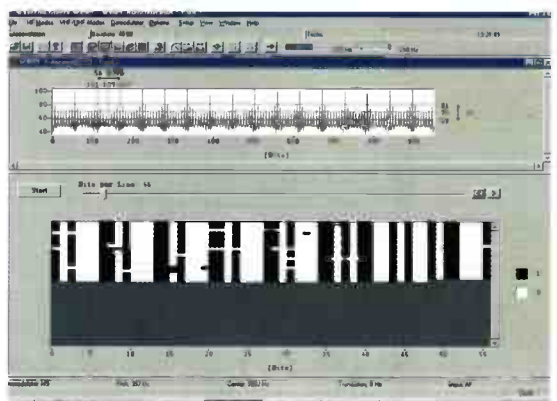


Fig. 15: ACF module in action.

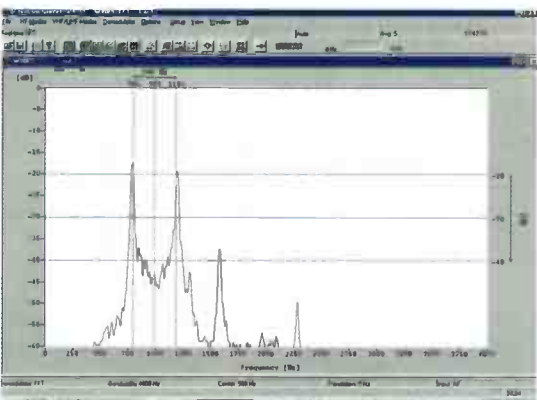


Fig. 12: ARQ-E3 on 10.9177MHz

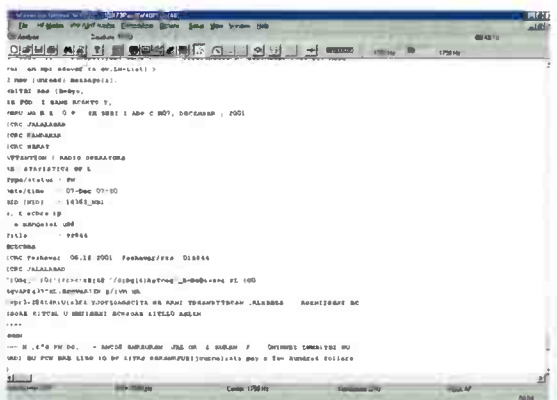


Fig. 16: ICRC traffic in Factor II. Monitored on 13.973MHz.

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YAESU
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AOR
3000A



LAST FEW!

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YUPITERU
MVT9000EU Mk II

The new improved Mark II version for:



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GARMIN
E MAP

Handheld version of the Street Pilot and comes with Data Lead, 16Mb Ram Card and UK Metro Guide on CD Rom



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TALKING GPS ARRIVING SOON

YAESU
VR120

100Hz-1300MHz AM/FM and WFM, a good all round pocket scanner with World Broadcast AM reception and a host of new features for a budget scanner



ML&S £159
£15.90 deposit
9 PAYMENTS £15.90

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W40PC is standard Windows and is convenient to operate. The most common functions are easily accessed via buttons, pull downs and even by clicking on a displayed value. For instance, baud rate, shift and centre frequency, to mention but three, have their current values displayed in the main window, they also have buttons in the toolbar below the menu and they are available from the 'Demodulator' pull down menu. Each decode mode/module comes with preset options to help reduce typing and speed up selection. The presets can be overridden by entering a value in the dialogue box which appears.

Additional to the FFT window, which offers a spectrum view (bandwidth) of 500, 1000 4000 and 24000Hz, choice of windowing algorithm (Fig. 2) and averaging option between 1 and 64 samples, there are 'real-time' sonagram and waterfall plots to allow relative signal level frequency and time to be displayed simultaneously. A very useful options when investigating multi-tone systems. All the spectrum views are provided with on-screen measurement cursors which are invoke by the click of the mouse - more on this later.

I was keen to investigate some v.h.f. systems and so tuned to an active POCSAG frequency and selected the appropriate module. The POCSAG module, in common with the others, displays various status devices and messages around the periphery of the decoding window Fig. 3. An important bar graph shows the decoders incoming signal level which is adjustable by pressing the button adjacent to the bar graph. There is an independent setting for each of the W40PC inputs.

To the right of the level display is a centre zero tuning indicator which provides indication of channel tone activity. In the case of the POCSAG module the span is $\pm 5400\text{Hz}$, in other words a bandwidth of 10.8kHz. This mode calls for use of the receivers wide n.b.f.m. filter - 12kHz and no audio filtering (de-emphasis) so I need to select the discriminator option for the W40PC. As most paging transmitters relay messages for tone, number and alpha numeric devices, there is a range of different data rates being broadcast. Best to set the Auto Speed option to 'On' also so I capture all message types I need to set the message option to auto. Once configured we're

off...as most of you will be aware, pager transmitters barely rest. Messages flood down the screen. Just out of curiosity, I attempt to decode via the a.f. input, which is taken from the R8500's record output. Nothing doing there due to the afore mentioned filtering. Wideband v.h.f. systems enthusiasts take note, you really do need a discriminator option!

A Bit More In-depth

Tuning around, led to my discovering an active two channel piccolo on 23.924420MHz. This m.f.s.k. system is a narrow band 6-tone sequential pair set-up. One of the channel was active sending on-line encrypted traffic the other was idling with its two centre tones alternating. A press of the FFT button and a bit of fine tuning gives us Fig. 4 here I'm using the 4kHz wide view to see all of the u.s.b. passband of my receiver. The active channel is centred on 1kHz with the engineering channel some 400Hz below. The window is in a frozen state, due to my having clicked in the display area to invoke the measuring cursors. You can see how narrow a spectrum segment the piccolo occupies. I wanted to zoom in closer, this is achieved by selecting one of the smaller spans available on the W40PC. The bandwidth dialogue was brought up by double clicking on the bandwidth box bottom left of the screen, selecting 1000 results in the close in view Fig. 5.

An alternate view of channel activity is given by Fig. 6, the Sonagram, which is a useful tool for observing the tone shift over a period of time. You can see very clearly the on-traffic status of the piccolo channel. I have again placed the measurement cursors around the active channel to show the bandwidth occupied and you will note that I'm slightly off centre with my tuning, by 8Hz. The waterfall display Fig. 7, is in this instance, not quite so useful a window, since the detail gets lost in spite of the intensity indication which is the same as that of the sonagram, note I've now selected the 500Hz width view.

Further signal investigation is possible by the use of the FSK Analysis module available by clicking on the tool button two positions to the left of the FFT. This results in the split screen Fig. 8 which provides a baud rate measurement at the top and a spectrum at bottom, both halves provide two and three axis views. The third axis in both cases being

time. It is possible to view the historical two axis view of the signal by clicking on the sonagram portion of your choice. There is a serious omission here in my opinion and this is that there is no ability to record more than windows length of signal, for later investigation. Nor is it possible capture raw data for repeated analysis at a later date.

At this stage there two options are open to me, I can either select the FSK Code Check button and allow the W40PC to repeat some of the steps we've just been through. Though this process is invisible to the user, the unit goes and checks the spectrum for active signals, calculates parameters such as shift, centre and speed displays these values and attempt to establish the mode in use. I'll get back to this shortly. Alternatively, since I know we're dealing with a piccolo, I can simply select the appropriate decoding window from the modes menu Fig. 9.

This done, we are presented with the piccolo decoding window Fig. 10. Here you can see there are four windows to cope with signalling characteristics of the piccolo mode. You'll see that none of the windows contain any intelligible text. As I mentioned earlier, the traffic is encrypted.

Lastly, while we've got an active piccolo a quick look at the MFSK Analysis module, this is the equivalent of the Code30 oscilloscope. I've positioned the measurement cursors to show both the channel bandwidth and the duration of a single tone - Fig. 11. Unfortunately, propagation was not good by this time and the channel has become quite noisy.

Automation

Time to check out the W40PC's FSK Code Check capability. I found a reasonable signal on 10.9177MHz, has that got you reaching for your *Ferrell's CFL* yet? You can see its spectrum in Fig. 12. Time to hit the Code Check button, a short while later the W40PC presented me with the screen Fig. 13. Unfortunately this station was idling. One of the characteristics of the French Forces network, of which this station is a member, is that they spend long periods of time on air in an idle condition to keep the frequency occupied. As both ARQ-E and ARQ-E3 produce the same bit pattern on idle the W40PC was stumped at this point. I therefore manually selected the correct mode, ARQ-E3 by double clicking on the

mode name in the bottom window a handy feature that. I left the decoder monitoring for a while and came back later to confirmation that I was indeed tuned to RFTJ in Dakar, Senegal Fig. 14. Whilst I was tuned to this station, it was a good opportunity to check out the auto correlation frequency (ACF) module. This is used to determine the bit repetition characteristics of a signal. The results can be seen in Fig. 15, which demonstrates that the repetition period for ARQ-E3 is indeed 56 bits. The lower half of the screen show the actual bit pattern with the screen width set to 56, i.e. the value derived from the top trace. This essential tool can be used to determine unknown modes as well as familiar ones.

It is beyond the scope of this review to cover all the modes that are featured with the W40PC, but there was one I just had to try. This is Pactor II as used by the International Committee of Red Cross. An active frequency is 13.973MHz, I hoped to catch some traffic from or regarding Afghanistan so I entered the frequency selected the Pactor II module on the W40PC and left it running while I went to bed. The next morning revealed success, take a look at Fig. 16.

Conclusion

With a product of this complexity, I could fill a whole magazine, looking at every feature, clearly this is not possible. The obvious question that needs to be answered is should you buy one? Returning to my comments at the beginning of the review, this is not a decoder for the beginner, you have to be a serious data mode enthusiast. I personally fit into that category and have little hesitation in recommending the W40PC, though I feel a one card system just isn't enough.

SWM

My sincere thanks...

to Carol Chuter at Sight System Ltd. for extending the loan period of the W40PC. You can obtain your W40PC from the UK agent **Sight Systems, Woods Way, Worthing, West Sussex BN12 4QY**, Tel: **(01903) 242001**, FAX: **(01903) 504494** for the sum of £1283 plus VAT and carriage. Sight Systems also have a web site at **www.sightsystems.co.uk**

RACAL

RA1772 The Best Ever?



JW compares the Racal RA1772 and the RA1792, in the best dual-stance, back-to-back.

My comments on Racal receivers having generated a good head of steam, the time came when I had the opportunity to check out an RA1772 and RA1792 side by side and at some leisure, the leisure being somewhat enforced by an emergency trip to the hospital for removal of an angry appendix. I laughed (carefully) when the surgeon told me I wouldn't be lifting anything for three months, thinking of the two Racal lumps waiting at home. My wife has now discovered the joys of heaving receivers around, and in the case of the RA1772, that means 22kg (about 50lbs) which is at least not in the same Mike Tyson class as the EK-07, but still heavier than the RA1792 at 14kg (31lbs).

Major Step Forward

The RA1772 represented a major step forward in receiver design, and I have already mentioned the articles by R.F.E. Winn of Racal published in the early 1970s which described the design criteria and the performance improvements over their earlier receivers such as the RA17. In many ways, the RA1771 and 1772 changed the direction of receiver design and the basic principles incorporated into these receivers by the Racal design team remained unchanged until the advent of digital signal processing, but even with the use of d.s.p. in the latter stages of receivers, the front-end design still represented best practice for r.f. performance.

However, I

said in my last article about statements made on a web site in the UK that I would check an RA1772 alongside an RA1792 and let you all know what I found. In this way, I would be comparing the true relative merits of the two receivers, rather than simply relying on scattered information and comment. So, let's play *The Weakest Link*.

Classic Looking

The RA1772 looks like a classic, housed in a 4U panel (7in high) - the photographs will show you the layout. Frequency display is at the top of the panel, with the frequency shown on red l.e.d.s which represented state-of-the-art technology in 1970, and which do give a bright easy-to-read display. MHz digits are not included in this display, but are shown by a mechanical readout directly coupled to the 'MHz' selector switch and consisting of a back illuminated translucent dial.

The least significant digit on the l.e.d. readout is 10Hz, and this is the smallest tuning

increment available to the user. Setting frequency therefore is a matter of turning a rotary switch to the wanted MHz number and then using the main tuning knob to tune over the 1MHz range selected. The tuning rate is two speed, selected by a switch alongside the knob, and this has a third position which locks the tuning to avoid inadvertent frequency changes.

I did notice that changing the tuning rate between fast and slow sometimes generated a transient which caused the synthesiser to jump frequency, and this can be quite annoying when you have been whizzing along in fast rate to get to a new frequency, and when near enough, you switch to slow rate and the frequency jumps by as much as 200kHz away from where you wanted to be. I checked with other owners of the RA1772 and they all confirmed that they had noticed the same effect.

Another odd effect when tuning is that the 'lock' lamp flashes all the time the tuning knob is being rotated, and the same 1772 owners reported that their receivers did the same thing. However, although it seemed odd at first, the receiver tunes perfectly



Most things are catered for on this well appointed rear panel.

smoothly and shows no sign of frequency 'wobble' as the lock lamp flashes, so I assume that the effect is quite normal and does not show a true fault condition (unless of course the lamp stays on all the time).

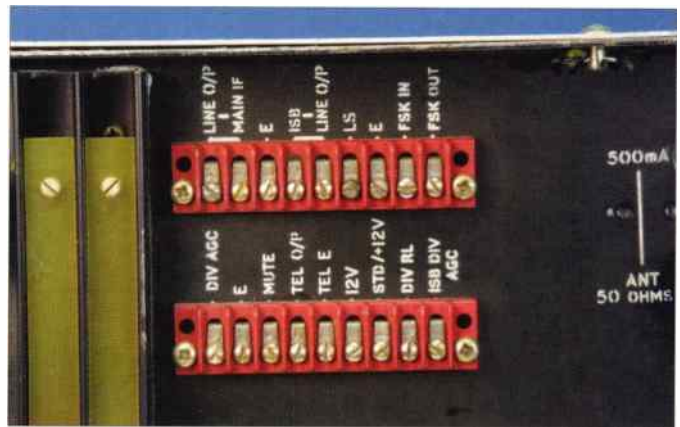
Returns To Zero

One tuning feature, which I found irritating, is that the synthesiser returns to zero when the receiver is switched on, so that you may be on 8.864MHz when you switched off, but the next time you want to listen, the display has reverted to 8.000MHz and you have to go through the rigmarole of tuning through 864kHz to get back to where you wanted to be.

Needless to say, in a British receiver of this vintage, the main tuning knob is a delight, being large and heavy enough and driving an enclosed shaft encoder with free running

bearings. It's almost 'Eddystone-like' in its action, and the lost art of 'spin and catch' can be used to the full, because the encoder does not have automatic speed-up to confuse the human brain. The tuning rates in the review receiver were 2.5kHz for one full turn of the knob in 'slow' tune, and 50kHz per full turn when in 'fast' tune. These two rates proved perfect in normal use.

The frequency display is flanked on the left by a small monitor loudspeaker with its on/off switch, and on the right by a moving coil meter which has ten different functions selected by a rotary switch immediately below it. The most used function for general listening would be the r.f. level measurement, but the review receiver had such a negative (below zero) offset on it that I was unable to check its accuracy and linearity.



Can't see it? You probably don't need it!

I could not investigate resetting the meter because the receiver was supplied with a handbook containing only operator instructions and no technical information at all, and despite promises from the supplier that a full handbook was 'on the way', it never arrived. Pity that, because there was another aspect of the receiver I wanted to

(separate u.s.b. and l.s.b.) filters obviously being for s.s.b. and i.s.b. use, the 8kHz for a.m. use, and the others dedicated to RTTY.

The configuration of the filter selection is that a.m. has only 8kHz with no access to any other bandwidths, l.s.b. has fixed 3kHz, whilst u.s.b. selectivity selection is diverted to a three position switch giving access to the 400Hz, 1.2kHz and 3kHz filters. There is no provision for c.w. on the mode switch, but you do have u.s.b. with tuneable b.f.o., which is fine for c.w. reception, as well as being there to allow data modes/RTTY with different tone spacing.

The narrow filters are offset from the carrier by 1kHz rather than the c.w. preferred 800Hz, which again points to their use for RTTY. The 100Hz filter is not available to the operator, being used as a carrier extraction filter for i.s.b.

The filter configuration means that this particular version of the RA1772 is not ideal as an a.m. receiver for short wave broadcast listening. The 8kHz wide a.m. filter works superbly well on strong medium wave and long wave stations, but even on these bands you can still hear sideband splatter from adjacent stations if you are trying to listen to something weaker. In practice, an a.m. bandwidth of 6kHz is about as wide as you need, with a 4kHz bandwidth for more difficult transmissions.

Of course, with a receiver of this class, the stability is such that you can use the i.s.b. facility and enjoy the facility of switching sidebands on an a.m. signal if you are trying to dig a

The receiver is so stable that I didn't use the a.f.c. very much during normal listening

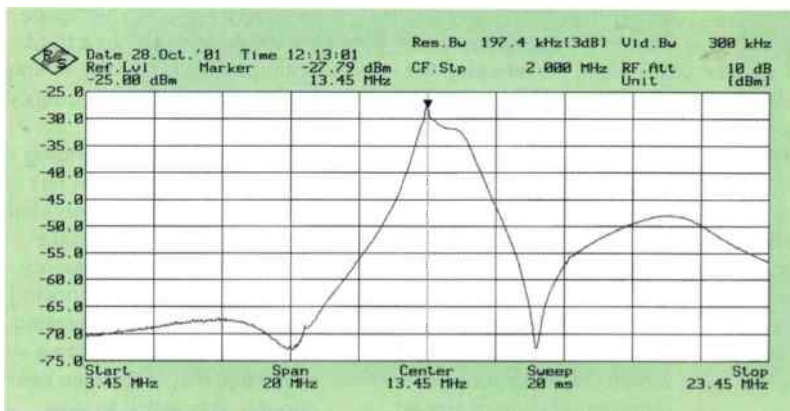


Fig. 2: RA1772 preselector response peaked on 13.5MHz.

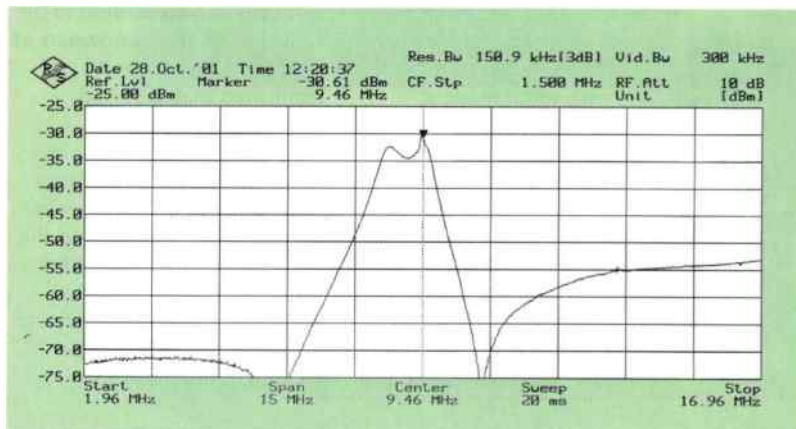


Fig. 1: RA1772 preselector response, peaked on 9.5MHz.

investigate, and that was the filter layout encountered in this unit.

My Cautionary Tale

This is where one of my usual cautionary tales begins. I have said often in these reviews that second user receivers from commercial or military origins may not all be the same, being manufactured to specific contract requirements. The RA1772 I have here is one of those 'specials' in that it seems to be heavily biased towards s.s.b. and RTTY operation. The filters actually fitted to the receiver are 100Hz, 400Hz, 1.2kHz, 3kHz and 8kHz with the 3kHz

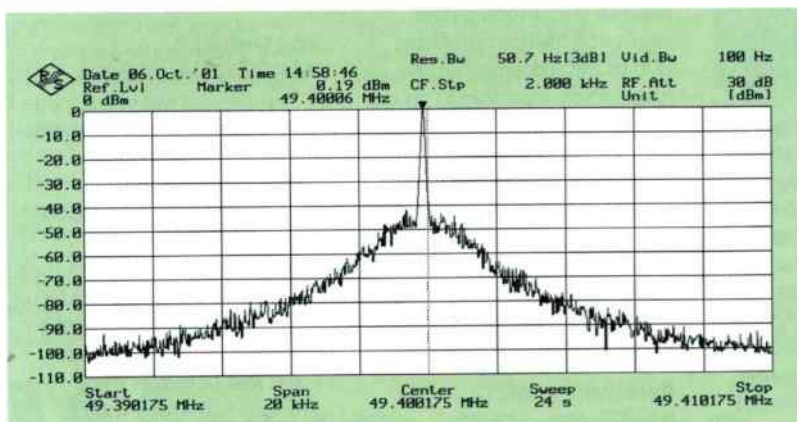
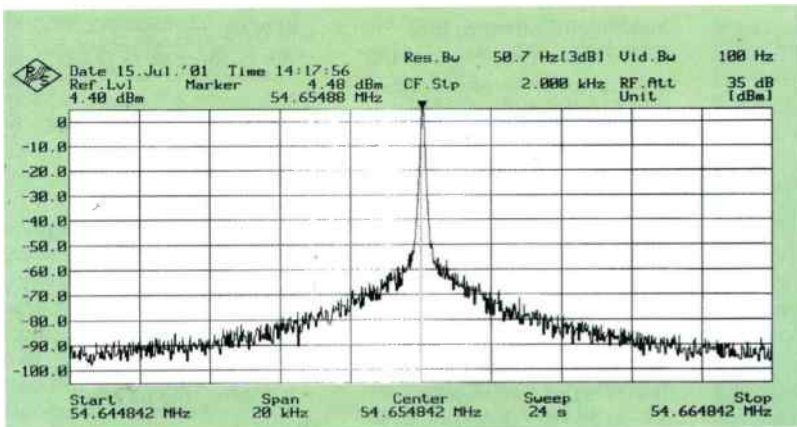


Fig. 3: Spectral purity of the RA1772 first conversion oscillator.

station ident out of tropical band noise, so all is not lost. Actually, when you get used to it, the selectivity arrangements work out quite well, even though it seems a bit strange at first.

signal), the downside was that when in a.f.c. mode the demodulated audio went down to a low level and I couldn't decide whether this was normal or a fault in the particular unit. If I learn more I will let you know.

One thing I did learn from the non-technical operator's manual that came with the receiver was how to read the

second hold time, the aircraft can't be heard because of the gain reduction and hold caused by Shanwick, so you are compelled to use the short a.g.c. time constant which then 'pumps' like mad.

The same comment incidentally applies to the RA1792, which uses the same hang system on long a.g.c. settings. Under these

criticism, but more as information for the unwary.

RF Tune

Final item on the front panel is the unobtrusive knob labelled 'RF Tune' which controls the preselector unit (if fitted). As the handbook says "Under normal receiving conditions the receiver may be operated set to wide-band, i.e. without r.f. tuning" and this is quite true in practice. Setting the knob to the 'WB' position bypasses the preselector, but the RA1772 has such good r.f. performance that Racal go on to say "Strong signals greater than 100mV e.m.f. may produce cross modulation or intermodulation".

100mV e.m.f. is a very big signal indeed, and under most listening conditions you wouldn't need the extra out-of-band selectivity offered by the preselector, which in any case degrades the noise floor of the receiver by around 6dB. However, use of the preselector improves the second order dynamic range by 13dB, and intercept point (6.5/7MHz) by a massive 32dB, so it's a nice feature to have around when the going really gets tough.

Internally, the preselector is mightily impressive, and that little knob is turning multiple sections of variable capacitor. I wouldn't want to tackle re-alignment in a hurry, but it's a joy to see in the flesh, as it were.

Covered With Connectors

Around to the rear panel, which is a professional's dream, being covered with connectors for every possible eventuality as you might see from the photograph. I won't fill the pages with a detailed listing, but as far as I can see,

I found measuring the a.g.c. performance was made easy thanks to the access to the a.g.c. lines

Stay Put

Having mentioned stability, I found that the review receiver was fitted with the highest stability master oscillator available from the options list, and that together with a.f.c., makes this a receiver you can simply leave on a signal forever and know that it will stay put. For utility monitoring, this is a real bonus, whilst for data modes it is an absolute treat.

However, the a.f.c. didn't endear itself to me because when selected, although it held the receiver against the transmitted signal drifting (or to put it another way, the receiver would track a drifting

codes which tell you what variant the receiver happens to be. However, reading the code (RA1772/X/S3/R/ B3/O/C) confirmed that the receiver in my hands was very much a special order unit.

The a.f.c. system works on full or reduced carrier, so handles both conventional a.m. and pilot carrier i.s.b. equally well, but as I have said, the receiver is so stable that I didn't use the a.f.c. very much during normal listening. To the left of the centrally located tuning knob is the a.g.c. switch, selecting slow, fast, or off.

The handbook doesn't give any detail as to a.g.c. attack and decay times, but the article

circumstances, most operators would turn off the a.g.c. and use the manual i.f. gain control, but you then have to 'ride the knob' to listen to both sides of the traffic.

A note in the manual shows how the 1772 can be modified so as to add the i.f. gain control to the a.g.c. line as a 'pedestal' and I for one would make incorporation of the modification my first task should I be fortunate enough to own an RA1772. Fortunately? Absolutely, the 1772 is a very fine receiver, and my comments are not to be taken as

RA1772 Sensitivity Results

Frequency (MHz)	Mode	Bandwidth (kHz)	Sensitivity (dBm)
0.900	u.s.b.	3	-121
0.900	a.m.	8	-111
6.5	u.s.b.	3	-121 (wideband) -120 (preselector)
9.5	u.s.b.	3	-121 (wideband) -112 (preselector)
14.5	u.s.b.	3	-119 (wideband) -114 (preselector)
21.5	u.s.b.	3	-119 (wideband) -114 (preselector)
28.5	u.s.b.	3	-119 (wideband) -114 (preselector)

whatever you may want to access in the receiver is right there on the panel, and I found measuring the a.g.c. performance was made easy thanks to the access to the a.g.c. lines.

Internal construction is a clear indication that the RA1772 is a son of the RA17 because the synthesiser section is contained in a rough cast/machined alloy structure which forms the entire base plate of the receiver and is very much in the RA17 tradition. Above this, all the r.f., i.f. and audio sections are built on individual circuit boards, each board dropping into its individual screened box, but being pivoted so that the board can be raised for measurement or repair without being disconnected from the wiring harness.

The harnesses themselves cause me a little worry because they are made up of very thin insulated wire and coaxial cable, which after 30 years in a hot enclosure, show signs of brittleness and require careful handling. That said, at least each component is easy to access and replace, but be aware that you would have to have the necessary repair skills to locate and fix a fault (and a full technical manual).

Circuit Architecture

The RA1772 led the way in what became the new 'classic' circuit architecture with use of

high level mixing to a high (35.4MHz) i.f. and then second conversion to a lower i.f., in the case of the 1772 at 1.4MHz, where the filtering and gain took place. The fully tunable synthesiser was a definite first for Racal and must have caused some head-scratching amongst other receiver manufacturers as to how Racal had achieved the rapid tuning rates whilst maintaining stability and frequency accuracy. If I ever get full circuit information, I will try to cover the various design aspects in greater detail, but for now will content myself with saying that the 1772 really represented 'state-of-the-art' design when it appeared over thirty years ago.

Performance Measurements

I carried out my usual range of measurements on the RA1772 and RA1792 with the two receivers side by side on the bench. The RA1792 had its r.f. amplifier linked in so as to



Hardwired construction.

make it equivalent to the RA1772, and the effects of the preselector on sensitivity were investigated. Sensitivity is given as the input level in dBm for 12dB SINAD in s.s.b. and for a.m. using 60% modulation at 1kHz.

The RA1792 returned a sensitivity of -121dBm in s.s.b./3kHz which remained virtually constant across the same tuning ranges as above. The effect of the preselector on the RA1772 sensitivity is plain to see, although the result at 9.5MHz is probably due to misalignment of the preselector, something I could not correct in the absence of technical information.

Minimum discernible signal (i.e. the noise floor of the receiver) taken as the signal input required to raise the no-signal noise output from the receiver by 3dB, using s.s.b. mode in 3kHz bandwidth.

Receiver	MDS
RA1772	-132dBm
RA1792	-133dBm

Third order intercept point and dynamic range are measured using two low noise crystal sources at 14.038 and 14.058MHz, resolving the third order product at 14.018 and 14.078MHz. My previous results for the RA1792 were taken when I was attempting to normalise all measurements to a corrected receiver sensitivity of -117dBm, but since then I thought it more meaningful to test the receivers exactly as they present themselves, and in the case of the two receivers under test I compare the results in this configuration. And how did they compare?

3rd Order I.P.

RA1772	+33dBm
RA1792	+34dBm

3rd Order dynamic range.

RA1772	110dB
RA1792	111dB

Second order intercept point and dynamic range measured using two signals at 6.5

and 7MHz, resolving the 2nd order product at 13.5MHz.

2nd Order I.P.

RA1772	+50dBm
RA1792	+66dBm

2nd Order dynamic range.

RA1772	91dB
RA1792	97dB

However, using the preselector in the RA1772 and peaking it at 13.5MHz, the picture changed.

2nd Order I.P.

RA1772:	+82dBm
---------	--------

2nd Order dynamic range.

RA1772:	104dB
---------	-------

Which just goes to show the beneficial effects on second order out-of-band intermodulation performance granted by a tuned preselector, although in the RA1772 the preselector does introduce some loss between the antenna input and the r.f. amplifier. I measured this loss as 10dB at 9.5MHz which explains the loss of measured sensitivity at this frequency and 5.6dB at 13.5MHz. The overall preselector passbands at these frequencies are shown in **Fig. 1** and **Fig. 2**.

Spectral purity (Phase noise) of the first conversion oscillator is best illustrated by spectrum analyser plots of the 20kHz span around the oscillator operating frequency. The spectrum of the RA1772 is shown in **Fig. 3**, whilst **Fig. 4** shows the corresponding spectrum for the RA1792 and you should be able to see that the RA1792 is considerably cleaner at close-in spacings, but at ± 10 kHz the noise levels are much the same.

Actual reciprocal mixing measurements show that the RA1792 is 5dBc/Hz better than the 1772 at ± 5 kHz, about equal at ± 10 kHz, but at ± 50 kHz the 1772 is actually 12dBc/Hz better than the RA1792. Just to put the whole phase noise debate into perspective, however, take a look at **Fig. 5** which shows a plot of the Kenwood TS-900 of similar vintage to the two Racal receivers, but uses a Collins conversion system with a crystal oscillator for the first conversion.

Now that really is low noise, and at $\pm 5\text{kHz}$ spacing the TS-900 is an impressive $29\text{dBc}/\text{Hz}$ better than the RA1772 and $24\text{dBc}/\text{Hz}$ better than the RA1792. That's why the real DX listeners still use the Collins R390 or, if they are lucky enough to have one, a Collins 515-1.

System Performance

Having mentioned the a.g.c., I took my usual look at the system performance with a stepped r.f. input signal and found that the RA1772 behaved much as the RA1792, except that the RA1772 seemed to have a longer attack time in both slow and fast a.g.c. settings. This manifested itself as a click on the leading edge of an s.s.b. signal and can be seen in Fig. 6, with the audio output being less controlled than that of the RA1792 under the same conditions.

I measured the a.g.c. line on the rear connector of the RA1772 and Fig. 7 shows that the attack time is extremely long at about 30ms, certainly much longer than permissible for proper s.s.b. performance. The attack time in a.g.c. short

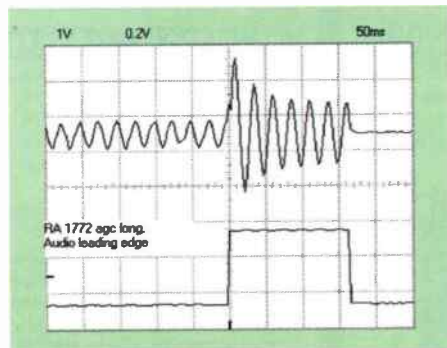


Fig. 6: A click on the leading edge of an s.s.b. signal produced by the RA1772 a.g.c. system.

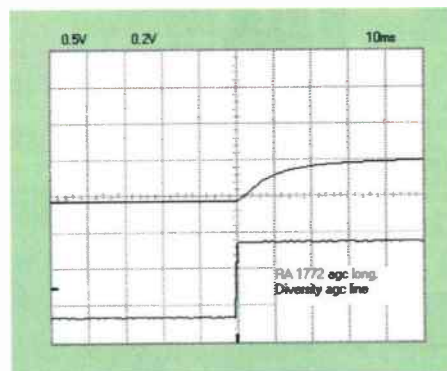


Fig. 7: RA1772 very slow a.g.c. attack time.

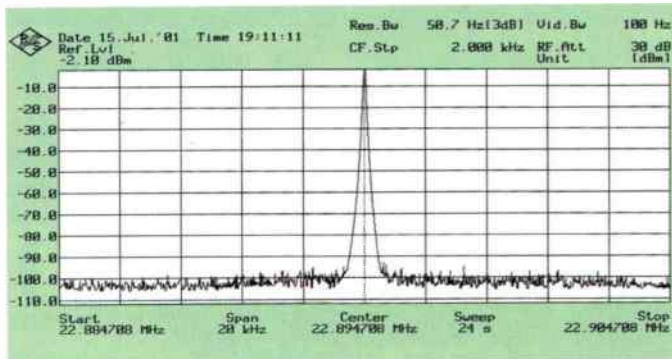


Fig. 5: Kenwood TS-900 spectral purity of the first conversion oscillator for comparison.

setting is still of the order of 10ms which is a bit better, but should ideally be around 2 to 3ms for better performance.

The other problem with the long a.g.c. setting was the paralysis of the receiver if a sharp spike was received, and with my wife's electric fence in action, the RA1772 was a pain to use - but that's the fault of her sheep, not the receiver.

Overall Conclusions

I know that I promised a comparison with the RA17 as well as these two receivers, but space really doesn't permit this. The RA1772 and RA1792 have been compared on 'Keith's Vintage Racal Web Site', with the RA1792 taking a bit of a hammering whilst the RA1772 is praised to the rafters.

My own direct comparison tests indicate that they are both fine receivers with virtually identical performance, but there is no getting away from the fact that the RA1792 is a later model than the RA1772 and has significant operational advantages in that the tuning is continuous, you have direct keypad frequency entry and a bank of memory channels. It's also much easier to read the panel of the RA1792 because of the use of a large i.c.d. panel to show what's going on,

even though this is best achieved in the back-lit version.

The RA1772 scores by having a good preselector built-in (but not in all of them), which certainly improves the out-of-band second order intermodulation performance, and of course the going price for a second user RA1772 is about half that of an equivalent RA1792.

As for the other comments on the same web site about the RA1792 being a 'cost competitive and cheap receiver', when you take a look at both receivers side by side, and having some fair experience of producing h.f. receivers of my own, it is clear that the RA1792 could well have been cheaper to produce than the RA1772 when you assess the complexity of the cable harnesses, multi section compartments and machining work required in the earlier receiver, let alone the amount of hand wiring which had to be done.

Lower cost production does not mean a lower quality unit, and the simple truth is that the RA1792 is every bit as good as the RA1772 in all areas which matter, and is better in many other respects. And so back to the question of how Racal quote their sensitivity figures and the "15dB S/N is better than 10dB S/N" comments seen here and there.

The RA1772 manual makes it quite clear that Racal specified sensitivity as a S+N/N ratio for a fixed input signal of $1\mu\text{V}$ e.m.f. In more modern terms this means a level of $0.5\mu\text{V}$ PD (i.e. when the generator is terminated in a 50Ω load), or unequivocally a level of 113dBm. The 'Vintage Racal Web Site' now contains

some measured results for the RA1772 which, I have to say, confuse me greatly, since it gives a sensitivity for 15dB S/N ratio at 14.5MHz as $1.27\mu\text{V}$ PD for a.m., and $1.5\mu\text{V}$ PD for s.s.b.

This does not accord with my own measurements, so I checked the RA1772 and RA1792 which I had on my test bench and measured (for 15dB S+N/N ratio) the following:

RA1772 u.s.b., 14.5MHz, 3kHz bandwidth, $0.4\mu\text{V}$ for 15dB

RA1792 u.s.b., 14.5MHz, 3kHz bandwidth, $0.4\mu\text{V}$ for 15dB

Coming at it from the other direction, I fed $1\mu\text{V}$ e.m.f. into the receivers and measured them both as giving 18dB SINAD in u.s.b. - exactly equal in both cases. The one thing which really puzzles me about the web site information is that the figures quoted show the a.m. sensitivity to be better than the s.s.b. sensitivity. Surely this cannot be so??

I measured the a.m. sensitivity under the Racal defined modulation depth of 70% (yes, 70%) to be $1.25\mu\text{V}$ PD which compares with the web site figure of $1.27\mu\text{V}$, but the s.s.b. figures on the web site are incomprehensible. By this time I decided that I'd had enough of the whole business and so I wish you all a fond goodnight.

What To Choose?

If I were to choose a receiver that represented a 'landmark' design I would have the RA1772 since it led the way to modern techniques. If I were to choose a receiver to use in anger it would be the RA1792, but in the end they perform equally well and there isn't a candle between them. The web site denigration of the RA1792 is, frankly, an insult to Racal and the intelligence of my readers.

I normally end 'Caveat Emptor', but in this case it has to be 'Caveat Lector' when applied to the Internet. (I know it should probably be a derivative of Pervolvo, but my Latin is long gone).

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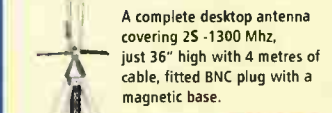
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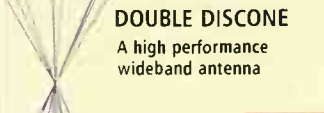
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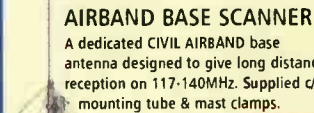


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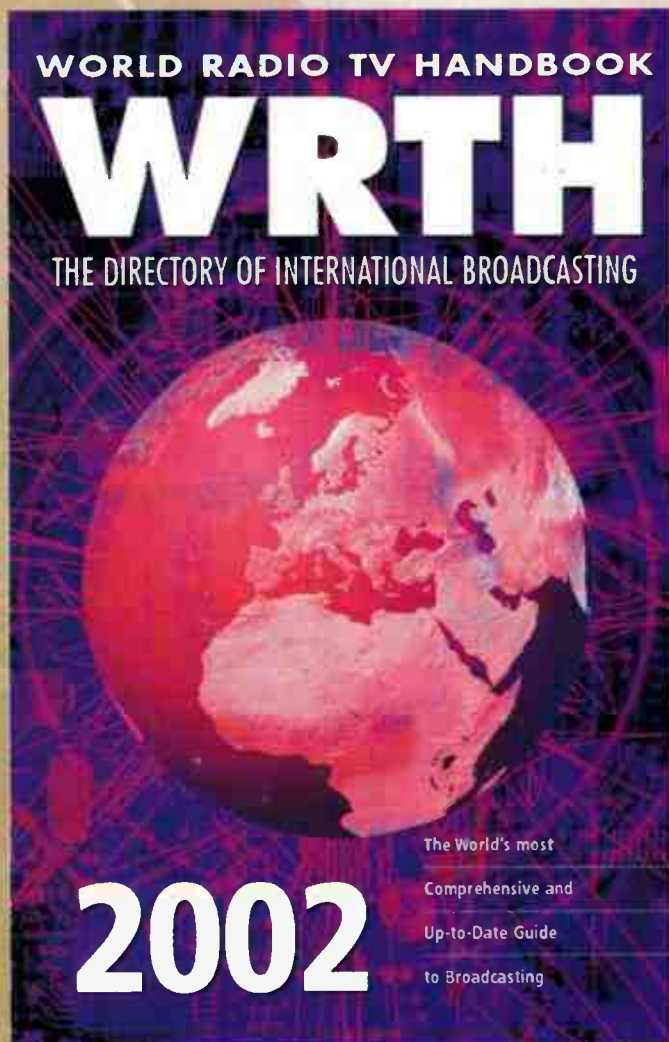
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PUBLISHED DECEMBER 2001

Modern times

Bob Ellis...topical rants just how they should be...

"Dear Editor, Why oh why do you insist on running features about boat anchors and the sad folk who insist on keeping them. Surely our hobby should be about adopting the latest technology..."

Perhaps it should. And don't call me Shirley.

Those of you who have followed these nostalgia pieces will be happy to read that once you have run out of memories, all you are left with is the here and now. In the heap I call home, our hobby is finally under control. It has taken just forty years to achieve this. From radio rooms full of classic AR88s, HROs and the groundbreaking backbreaking RA17 to just the AR7030 on the top of the bookcase.

I have even lost the antenna wire. Loops, Zepps and Inverted Ls have gone. As have the days when I could stand a draughty shack, happy to wait for the Racal, a pre-synthesised AGA, to warm up to blood heat eventually doing the same for me.

Creature Comfort

Creature comfort is the name of the game now. I can take my place in the snug of *The*

Phase and Jitter and bore for Britain about double-glazing. Having had it done, there is no easy way to get the download in without voiding the guarantee. All my precisely engineered copper wire has given over to nothing more than the whip on the back of the AR7030. In fact, there is little around the place to suggest how the hobby once took over my life. It still does sometimes, but listen, Doctor, I can handle it. OK?

Yes, I know. The whip is a compromise. Yes, I did work alongside JT and JW up at Matlock as an ARSE

pack my Listener's Guide in the same box as their highly developed receivers without thinking it devalued the radio in any way. And yes, I'm using the whip when I'm supposed to steeped in antenna folklore...

Not All Bad

It can't be all bad. When GBR celebrated 75 years on 16kHz with a Morse message, I did just hear it on my whip - all of 0.00005333 of a wavelength long. Only trouble is I can't read Morse. And my maths is rather questionable, so I can save

Archers on a Sunday to be lost dithering up and down 80m. I need my fix of G2CVV reading an ever-expanding GB2RS news bulletin in a time slot that has always remained the same. He must have done about 1700 of these since I first heard him as The Thinking Ham's Trevor MacDonald on a.m. via a John's Radio 19 Set. Boat-anchors again, sorry...

Then there's the chap who has just bought the latest top-of-the-line all-bander who feels all that d.s.p. technology will be vastly improved if he uses his Shure Triple Four, pronounced as one word. He thinks this as all the lads (lads?) on the 'net agree with him. Those flimsy mikes you get with a £3000 rig these days are not up to the job.

As I write this, I hear another chap who has only just got around to clearing away the dog's bowl, basket and lead after the poor beast



(Amateur Radio Service Engineer) in the quondam days of the HF-225 development. Yes they did ask me - little me! - to take the prototypes home to get the opinion of someone who had s.w.l. diagnosed as a terminal illness. Yes, they did

you a stamp if the decimal point is a few places out. Corrections to robert.ellis@talk21.com No prizes.

I'll tell everyone that I really don't get the time to listen around, but habit forces the hour before *The*

went silent key last year. I really identified with this as so many people experience genuine grief over the loss of a pet. My heart went out to him until he said he'd kept the dog's clippers to do his own hair with. You can't write stuff like this. You can

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IC-PCR1000 100kHz-1300MHz, all mode PC communications receiver.....	£325.00
IC-R75 30kHz-60MHz, AMS, AM, FM, USB, LSB, RTTY, CW.....	£645.00
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ICR 8500 100 khz to 2000 Mhz.....	£1250.00

YAESU

VR-500 Compact handy 500kHz-1300MHz all mode **£195.00**

VR-5000 100 kHz to 2599 Mhz all mode..... **£679.95**

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AR8600 (New) Inc. PSU.....	£650.00
SDU5500 New version of SDU5000 including PSU.....	£799.00

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lock Galton and Simpson, Muir and Norden, Smith and Jones with Ben Elton as Team Leader in a darkened room and tell them to write a sketch like this and they couldn't. Nothing prepares you for life as it is lived. And there is nothing like life on Eighty...

What Can Be Said?

The chap who proudly proclaims all his kit is home-brew, that is, he made it all himself, talking to the guy who only buys black boxes, that is, branded kit from a shop. Silence. Shop Bought Ham has nothing to say to Home-brew Man. Without brand loyalty, a dealer to have a go at or a range of Fascinating Mods to try over the bank holiday, there is no conversation. Shop Bought Stan will say, "Well er, good effort there, sounds really nice. Anyway, must sign this end, 'phones ringing...". I never heard it. Perhaps the TX gain has been knocked

back by the end-stopping a.l.c. produced by the phenomenal output of a "shuretriplefour".

Flirted With Digital

I have flirted with digital. I heard the recent DRM tests that gave short wave mono f.m. quality. Hang on a bit. At the peak of the last sunspot cycle, VOA used 26.040MHz for a while. Sprain your wrist switching over to 13kHz bandwidth on the Racal or click WIDE on the R-1000 of blessed memory and you got er, mono f.m. quality.

I have been firmly corrected that the digital signal has similar bandwidth to current a.m. senders, but even if it has an ordinary wireless sees DRM as hideously over modulated a.m. that upsets the a.g.c. system causing it to appear over-loud and spread compared to the a.m.'er on the next channel, leaking nicely into the skirts of the a.m. filter, no matter

how good it is.

More spectrum space for broadcasters - less of an issue as so much Utility is up on satellite now - and phase-locked detection provides all the quality you need for the next generation of listeners brought up on MP3 audio via computer speakers.

I thought short wave wireless was meant to be cost effective for the listener. That is, man in under-developed country listening on a Grundig Yacht Boy which has already cost him an unreal proportion of his monthly income. If he has a local ISP, will he really sign up for Internet Radio for the cost of an AR7030 based on UK prices? Will he be ready for the "when it's good, it's very good - when it's average, it's pretty grim" quality of downloaded audio? Will economies of scale kick in enough to put Digital in the Grundig price range? Is it true Grundig was going to introduce a lease-only receiver and call it the

Rent Boy? It's radio, Jim, but not as I know it...

As the BBC pulls out of America and SRI trumpets its killing of short wave as a real development, I wonder who it's all for now.

It does leave a few clear channels, though. Channels that can fill with US Evangelists. No matter how bad a day I have had at work, Brother Stair (6.110MHz around 1600UTC) has had a worse one. And it's all my fault. When the day comes and the faithful are taken up in the final rapture, I won't be among them. Unless I send \$30...

According to the good Brother, the computer Year 2000 issue was an 'Act Of God' to get us all thinking. And all my fault. You can't beat this stuff. An hour of this puts a whole new slant on the news when you go back to Radio Four. And short wave must be doing something right. I haven't bought a newspaper in ten years... **SWM**

PRACTICAL WIRELESS

The UK's only independent Amateur Radio Magazine

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TWO REVIEWS

- * Helen Watt 2E0AVH gets to grips with the IC-718 h.f. transceiver
- * Richard Newton GORSN takes to the v.h.f./u.h.f. bands with Yaesu's brand new transceiver - the FT-7100M

TIPS AND IDEAS

- * Tex Swann G1TEX presents more of your handy hints and tips to help you get the most out of your radio hobby

CENTENARY CELEBRATIONS

- * Join Rob Mannion G3XFD when he reports on his visit to the Poldhu Amateur Radio club's Marconi centenary celebrations

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● Amateur Radio Waves ● Bargain Basement ● Club News ● Keylines ● News ● Radio Scene ● Valve & Vintage and much, much more!

* contents subject to change

CAN YOU AFFORD TO MISS IT? FEBRUARY 2002 ISSUE ON SALE 10 JANUARY...PLACE YOUR ORDER TODAY!

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.

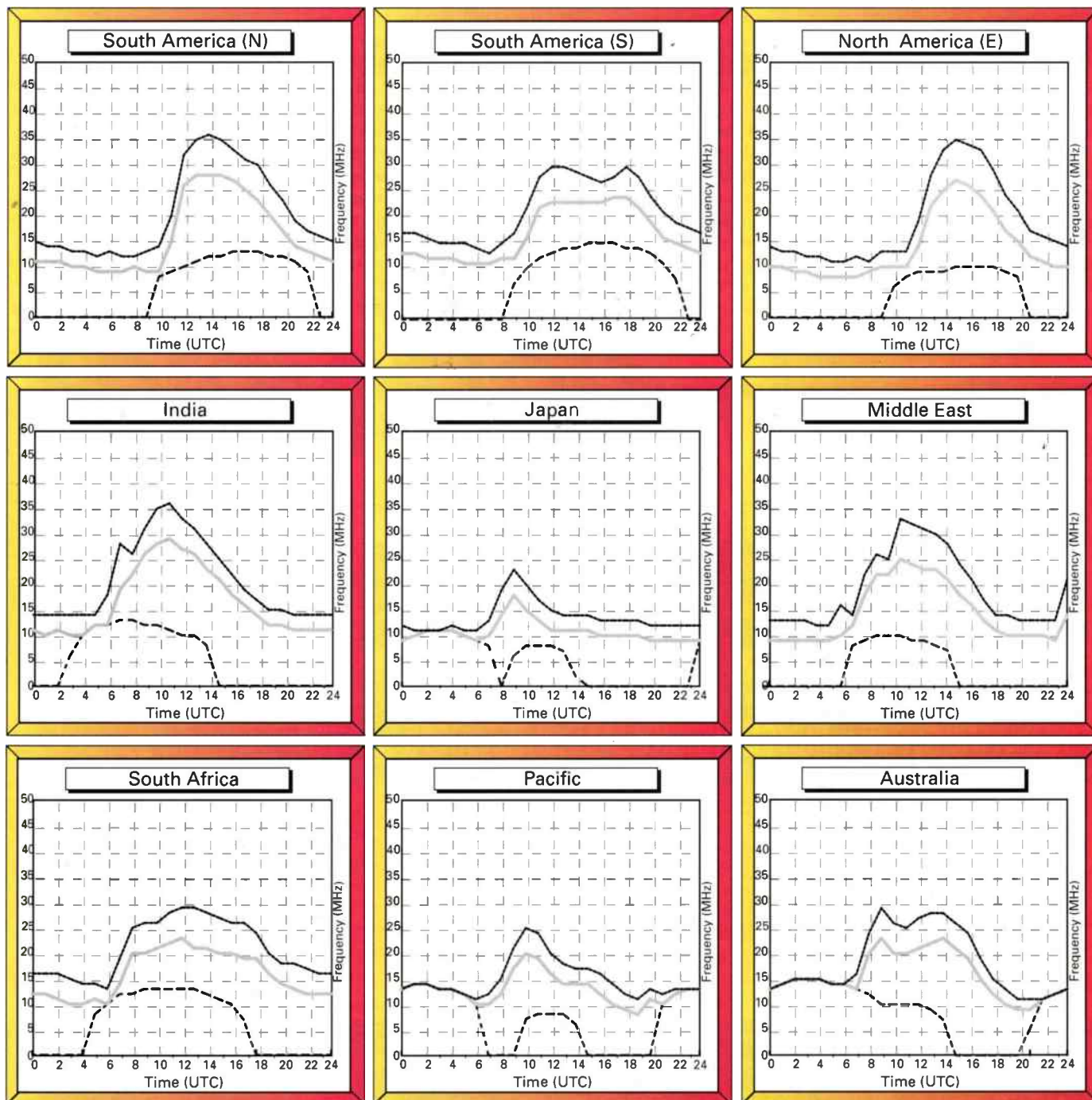
Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50%

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.

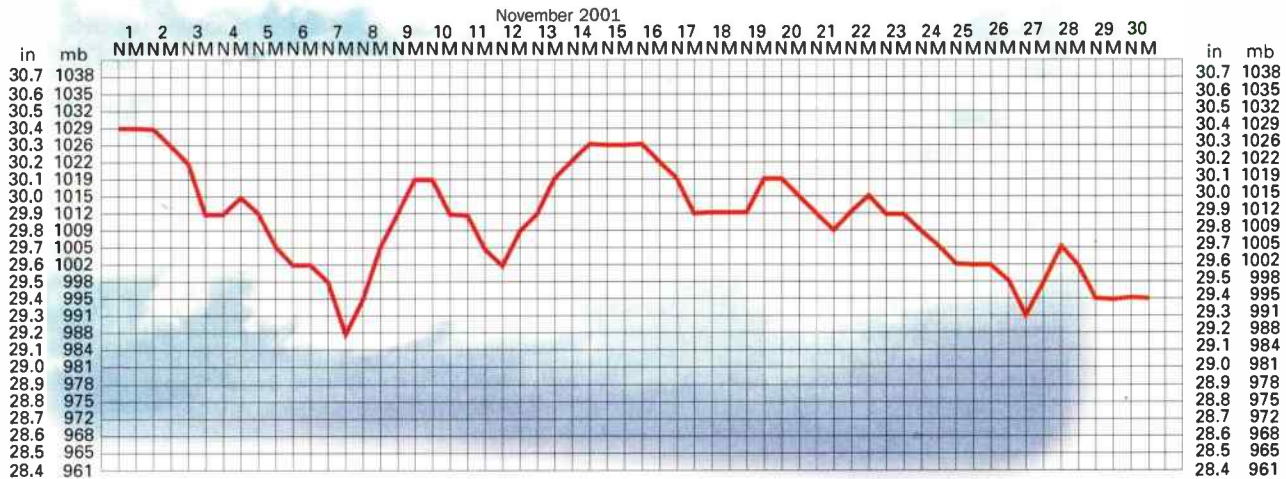
January 2002
Circuits to London



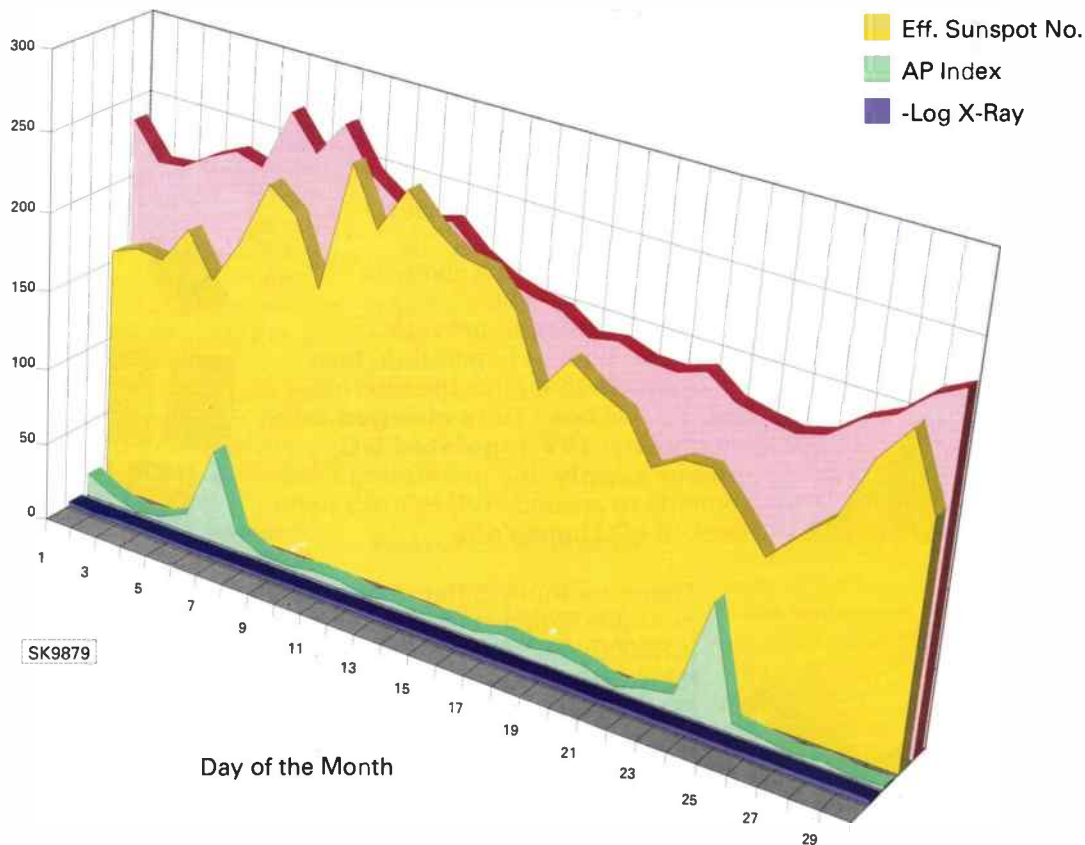
SK9878

Propagation Extra

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



November 2001 Data



guide to the chart

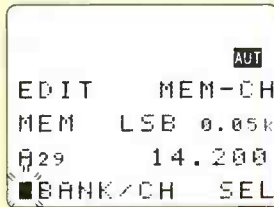
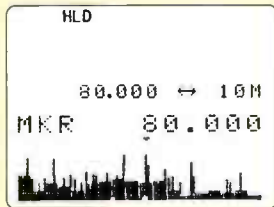
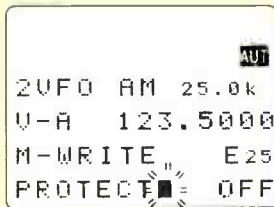
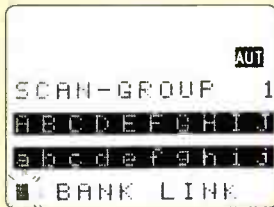
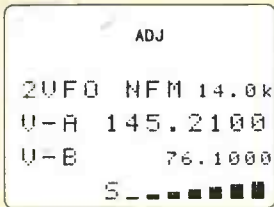
The 10.7cm solar radio flux is used as an indicator of the general level of solar activity.

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.



*High sensitivity design

AR8600

MOBILE - BASE - TRANS-PORTABLE

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 AR200 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 spuri 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 spuri** 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 - up to FIVE HOURS portable operation from the BP8600 optional internal battery

There are many qualities which make the AR8600 a unique award winning package, as a trans-portable receiver the optional internal battery pack (BP8600 £49.00 inc VAT, carriage extra) extends the versatility even further. When travelling to an airport, airshow, racetrack or wherever, the ability to remove the receiver from the vehicles power and carry on monitoring without the need for a separate hand-portable receiver is a great plus point.

Initially designed to provide up to two hours of operation, tests have shown that once the internal battery has been **fully charged** using an optional **15V regulated DC power supply**, the monitoring time extends to around **FIVE HOURS** (with back-lit LCD lamps off).



There are many other options available: mobile mounting bracket (MM8600), tape record lead (CR5000), RS232 lead (8600PC), free PC software from the AOR web site (or available on CD-ROM priced at £5), five slot cards (CTCSS, tone eliminator, record/playback, external memory, analogue voice inversion), Collins mechanical substitute IF filters for SSB and AM. If you are undecided whether you need a hand-portable receiver or a base station, take a closer look at the AR8600... virtually two concepts in one compact cabinet.

Note: Operational times are for guidance but depend upon the style of operation (volume level, backlight, scanning etc) and are not guaranteed.

AR7030 - THE PROFESSIONAL CHOICE



The AR7030 is a tremendously popular short wave all mode receiver, (0 - 32MHz), **still beating off the competition.**

AR7030, the professional choice.

Excellent strong signal handling, low noise local oscillator (producing extremely low reciprocal mixing figures) and excellent audio fidelity. Receiver of the Year 1996/97 WRTH, 5-star award and editors choice Passport to World Band Radio for several successive years.

DRM - digital AM radio below 30MHz

As reported in the October 2001 issue of *SWM* (following our attendance at the IFA exhibition in Berlin), the Fraunhofer institute selected the AR7030 receiver for DRM evaluation by broadcasters (Fraunhofer is the DRM software development team). Their choice was based upon the exceptional performance / price delivery, in particular excellent strong signal handling, good AGC characteristics, low noise and fast access to virtually every feature via PC control.

Following IFA, Fraunhofer contacted AOR UK requesting technical assistance with accurate signal meter reading via PC and we were able to provide measurement techniques, PC procedures and suggestions for alignment following their DRM modifications.

Fraunhofer then commented on the s-meter accuracy: *This is very good news. So we get +1.5/-2.5 dB in short wave which should be sufficient for the field tests... I think this is much better than anybody expected. Our software now already includes the signal strength measurement, thanks a lot for your support.*

Further comment from Fraunhofer suggested that other short wave receivers (of a similar cost) were really quite poor in s-meter accuracy. By comparison, each AR7030 has an individually calibrated AGC table during manufacturer so that repeatability is ensured and is able to satisfy professional broadcasters for field-strength measurements.

The s-meter measurement details are available free from the technical bulletin section of the AOR UK web site:

<http://www.aoruk.com/7030bulletin.htm>

Further information on DRM, the part played by the AR7030 and Fraunhofer is available from: <http://www.aoruk.com/drm.htm>
The DRM consortium web site is located at: <http://www.drm.org>

AR7030, the professional choice with meaningful support!



★★★★ **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.

AR8200 Series-2



The **AR8200** represented a beacon when first released, technology marches forward with the AR8200 Series-2 keeping the innovative concept and forward thinking alive and bright.

530kHz - 2040MHz all modes (WFM, USB, LSB, CW, AM, narrow AM, wide AM, NFM, super narrow FM), no gaps with computer port (via optional 8200PC), free PC software via the AOR web sites. The list of features is vast, including 8.33kHz airband channel steps, automode selection bandplan (with override), optional slot cards.

Supplied with: Extensively illustrated 'English language' operating manual, 1000mAh NiCad rechargeable batteries, mains charger, DC lead for car use, belt hook, wrist strap, telescopic whip aerial, medium wave bar aerial.

AOR (UK) LTD 4E East Mill, Bridgefoot, Belper, Derbyshire, DE56 2UA England



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info@aoruk.com www.aoruk.com E&OE

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

Satellite TV News

Much of the World's attention has been concentrated - not surprisingly - on the Afghan conflict these past weeks and satellite activity has reflected this trend. During early November, news outflowing via satellite had been essentially uplinked from Pakistan, however November 8th saw Kabul allow journalists into the capital and it is conceivable that limited video journalist activity may also be permitted from 'inside' the country soon. The Pakistan based uplinks on *Europe*Sat-1*, 45°E, have only offered news reports straight to camera or VTR packages sent back to their respective TV HQ, but two developments produced more interesting footage.

Northern Coalition

October 20th and a live Sky feed was noticed from the Northern Coalition front line in North Afghanistan. Quickly checking across 45°E and at 12.523GHz-V (SR 5632 + 3/4) colour bars appeared with ident 'KHUJ A BAHUDDIN'. The line-up (rehearsal) picture inside a ruined cottage showed fluctuating luminance suggesting a camera problem, but a wide shot revealed a flickering lantern. As soon as the report had finished, a quick flick of colour bars and carrier off, obviously to conserve batteries and to minimise the Taliban from taking pot shots! This feed via SISLINK 12, UKI-33. Another development, however, is the use of portable uplink equipment utilising the Immarsat satellite fleet.

Several live picture feeds have been seen on the national news, albeit with 'sticking' pictures from areas inside the fire zone. Reporters have been using the video conferencing unit type 'TH2 Videophone' in conjunction with a 'Gan' terminal and strapping two of the normal single 64Kbits/s channels into a wider 128Kbits/s allows a limited quality live camera report to be transmitted live into TV networks world-wide.

The TH2 is very small, easily portable and uses only a small foldup antenna. CNN have been exploiting the new technology extensively and as compression techniques improve image quality, so I feel we could possibly predict the end of the large dish sat uplink truck within the news reporting environment - this could well happen within a couple of years!

Back into satellite orbit and from mid October the declared war on terrorism took a new slant with posted Antrax spores arriving in offices and government departments around the USA and elsewhere. The secretary to Dan Rather (anchor man for the CBS news) fell early victim and the regular CBS Newspath via *NSS-K*, 21.5°W evening of October 18th carried studio technical rehearsals on video whilst the sound channel carried emotional live audio from a CBS staff meeting at the New York studio - I suspect this for the benefit of CBS affiliates and not for general monitoring.

During the prolonged debate, Dan Rather spoke at length in support of the CBS staff and the condition of his personal secretary (he is very supportive for the team that keep the programmes rolling, particularly the live OBS). The *CBS Newspath* is normally carried on 21°W at 11.489GHz-V, 5632+3/4 from about 1700.

Mid October and **Roy Carman** (Dorking) conducted a scan across the *Eutelsat SESAT* sat @ 36°E checking for activity. Roy struck lucky at 11.491GHz-H (SR 5770 + FEC 5/6) finding a compact digital bouquet identifying 'DANA 1' and 'DANA 2' from a small NBC sat uplink expedition into wildest Northern Afghanistan, the extreme contrasts between mountain and desert. The CBS team met with Mujahadeen fighters who were unaware of the New York atrocities when shown that week's *Time Life* magazine. Onwards in two battered jeeps - one an ex Russian Army 'acquisition' - and interviews with the various fighter groups all seemed unaware and expressing astonishment at the September 11th attack.

At a command centre, old Russian Army radios were in use communicating with bands of freedom fighters all using hand-helds. Eventually the CBS expedition ended up overlooking the Talaiban forward positions, the local defences resembled World War One trenches, tanks dug in though with many anti-tank launchers and ammunition. Odd that as the CBS crew made their way across the rugged terrain, the local folk continued their daily toil on the unforgiving land - as a military man Roy commented he wouldn't like fighting on this terrain, "Terrifyingly beautiful, but as with all things of that description, highly dangerous"!

Concert

One emotional event out of New York on our UK evening of October 28th was the 'Family Memorial Concert' at Ground Zero, that tragic site in Lower Manhattan where the WTC twin towers collapsed September 11 and several thousand people just disappeared...many well known personalities attended the concert and addresses in support for those bereaved. The gathering and performers stood - many in tears, anguish, faces in deeper thought or without expression amongst the wreckage and a backdrop of rubble, smoke still rising and the NY Fire Department spraying water over the debris of the human disaster.

Dramatic as these sightings are, I must emphasise once more that a satellite dish for such reception need not be large. A note from **Rini de Weijze** (Holland) shows that he is using the Humax satellite tuner 5300 and an 850mm dish, not forgetting our 13°E reporter **Edmund Spicer** (Littlehampton) is in the running with a Manhattan Digiplaza and a 650mm dented vintage Amstrad dish!

As the military reprisals continue, North America is slowly ticking back to normal and November 4th saw the Globecast bouquet on *NSS-K*, Channel 1, 11.590GHz-V (SR 20145+3/4) carry a lively match in the Canadian Ice Hockey League. The feed carried several promotion trails for a series of other matches with teams across North America, the November 4th event featured the 'Oilers' and it was fast moving slick action, this transmitted over the Atlantic circuit for recording into a time-shifted Channel 5 sports programme after midnight!

And as I type these lines evening of November 9th, a 'Reuters NY' lease on *NSS-K* is carrying proceedings, speeches, etc. from the UN, New York - 11.550GHz-H, 5632+3/4. A reporter fronts the package from outside the main UN building, the transmission service ident is an unusual 'H5mCh4' and is part of an Arabic language package for an unknown Gulf broadcaster.

It was Littlehampton's Edmund that helped a problem at the college where I work. The students are currently installing a LPAM studio and couldn't find the *Astra* digital downlink for the 'Students Broadcast Network' (SBN) at the advised 12.402GHz-H spot. Edmund to the rescue with news that on *Astra-2*, 28.2°E, 12.344GHz (EPG 894) carries the SBN service, having transferred from the earlier 19°E analogue service.

Eutelsat W1 @ 10°E, a rather neglected satellite, is mainly dedicated to Turkish analogue and digital TV channels, but it does carry APTN news, recent footage showed the new King of Jordan visiting Germany which APTN carried for Egyptian TV - 12.629GHz-V, 5632+3/4. A quiet backwater in the sky has been the *Telecom 8°W* slot, but with the new *Atlantic Bird-2* arriving courtesy Eutelsat so things are humming. Though broadcast services are carried mainly within the Ku-band section, the 12.500-12.720GHz *Telecom* band on this sat is now increasingly active with corporate and news feeds, it's worth checking for BBC regional feeds for example that have now deserted the favoured hunting ground of the old *Telecom 3°E* slot.

Tragedy

Tragedy struck the European Alps when following a collision inside the St. Gotthard Tunnel, fire broke out and many people died in the resulting blaze and vehicle pile-up. *Intelsat 801* @ 34/5°W carried a French news live broadcast October 25th from the mouth of the tunnel including shots from inside with firemen clearing the grisly remains aware that the tunnel roof was severely weakened. This on 11.025GHz-V (5632+3/4). A few days later another report was seen by Roy Carman carried on *Atlantic Bird-2* for Swiss TV - 12.630GHz-H (6111+3/4).

A channel that has enjoyed a high profile publicity in recent weeks has been the Arabic 'Al Jazeera', perhaps best described as the Arabic version of CNN. 'Al Jazeera' of course was the only broadcaster allowed to operate out of Kabul during the Afghan hostilities being a mouthpiece for the Taliban. 'Al Jazeera' even appears on now over *Astra 28°E* digital on Sky EPG 674. 'Al Jazeera' is carried on the *Arabsat-3A* 'hot spot' @ 26°E, but it's goodbye to analogue now from 'Al Jazeera' as the final analogue transmissions from this channel, until recently on *Eutelsat W2*, 16°E have now ceased.

A final report from the *International Space Station*, its activities somewhat eclipsed by the Asian crisis, but life is well in Space! NASA-TV offered live pictures recently via the *PanAmSat PAS-3R*, 43°W showing both American (Astronauts) and Russian (Cosmonauts) spacemen floating around in space near to their space station, they've been using a new boom arm apparently and pictures were - as ever, truly excellent. Transmissions included shots from both the Houston and Russian Korolev control rooms. These pictures on 12.634GHz-H and a strange SR 19846 + FEC 7/8.

There's far more coming down from satellite than *The Simpsons!*



Armourers aboard the *US Enterprise* assemble missiles from kit form for delivery into Kabul.



The missile is fitted underneath a jet fighter just prior to launch.



As the sun sets over the Indian Ocean, flight controllers stand sentinel before waving another aircraft into the evening sky.



This is the CNN reporting position on a hotel roof in Islamabad.



Most of the world's broadcasters are represented in Pakistan.



An attractive German reporter prepares for her Afghan update over RTL's uplink.



Sky News at the front line in Northern Afghanistan.



Just a Washington update over *NSS-K* - but on the White House roof just left of the flagpole and first chimney three security folk are hard at work...



Test card from Pakistan.

■ JERRY GLENWRIGHT, 56 DENBIGH ROAD, NORWICH NR2 3HH

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

Shackware

Season's greetings and a warm welcome to 'ShackWare'. Lots to get through, so without further ado, let's open the mailbag...

Lawrence Alexander of Ludlow writes "I've been interested in collecting old computers for quite a while now and my question is about my most recent acquisition, a Cambridge Z88. I usually scour car boot sales for potential machines to swell my collection, but this one came from the refuse tip! I put batteries in it, reset it and hey presto, it worked!

The machine has some built-in applications such as BBC BASIC and a calendar, but I can't seem to get the serial port to work - if that's what it is. The word processor is called *Pipedream* and if nothing else the machine is the ultimate personal organiser. Even if the serial port doesn't work, there's still the rather interesting expansion bus which I imagine could be used for a variety of things such as a c.w. decoder, or interfacing switches for robotics and control, but without a pin-out chart it's useless. Nice to know there's someone else interested in stone age computers!"

Ah, the good old Z88. Just when the media had written off 'Uncle' Clive Sinclair who'd been forced to sell his company and even the rights to his own name to Alan Sugar's Amstrad, he came bouncing back with the marvellous Z88, an excellent laptop computer by anyone's standards, with sophisticated built-in and integrated applications. Though the computer featured the traditional Sinclair rubber-key keyboard, the Z88's is actually very usable and journalists took to it with a will! I had one of the first review machines and it's still giving sterling service.

It has to be said though that without a suitable manual, you're not going to get very far. Operation is quite complex and the serial port is a hybrid. So let's deal with the latter first. Assuming a 25-pin connector on your PC (Lawrence mentioned a 286 PC in his letter) here's how the pins tie together for null-modem data transfer (Z88 to PC): 2-3, 3-2, 4-5, 5-4, 7-7, 8-20, 9-8. From these numbers, it can be seen that pin 2 is Tx, pin 3 Rx, pin 4 RTS, pin 5 CTS, pin 7 GND, pin 8 DCD and pin 9 DTR. A simple way to guarantee transfer success is to link up pins 2, 3 and 7 as outlined above and tie together pins 4, 8 and 20 on the PC side. Be sure to set the Z88's serial port for Xon/Xoff (ie. software handshaking) when connecting using this simple three-wire connection.

Do not use pin 1 which provides +5V even when the machine is switched off - a sure way to drain the batteries. Incidentally, a d.c. transformer such as those from catalogue shop Argos which provides a regular 6V at 300mA is perfectly adequate to power the computer when you're at home and will save the batteries when you're linking the machine to your PC.

Next step is to acquire a textbook devoted to the Z88's ins and outs. I have a copy of *Z88 Magic* by Viv Gerhardi, Gill Gerhardi and Andy Berry, published by Kuma Computers (ISBN 074570137X). Though this is undoubtedly out-of-print, you can probably find a copy by rummaging in second-hand book shops or checking the listings on Ebay.

Finally, with an Internet connection, be sure to use your favourite search engine to locate some of the many web sites devoted to the Z88. These offer hardware and software for sale and download and provide all kinds of useful information. Have fun!

And now a very interesting letter which sadly was mislaid when we moved from our first Norwich address at Copeman Street, but which came to light only yesterday when I was emptying boxes of books after putting up some shelves (at least, I don't recall answering this letter in a previous column!).

F.E. Woods of Liverpool has an excellent collection of old machines, all of which are in use in his beautifully equipped shack (I know it's beautifully equipped because Mr Woods enclosed pictures). He writes: "My computers are a Pentium 90 and a 486 33MHz which are fine, plus a Commodore 64 with disk and tape drives, an Amiga A600 (two floppy drives, no hard disk) and an Epson PX16 laptop (luggable, with twin floppy drive unit).

The Commodore 64 is currently decoding Morse, RTTY and SSTV using software from Technical Software, but any other software for this computer would be great. I also need any documentation for the Amiga. I have *Workbench 3.0*, but I need info on the hardware as well as software related to radio such as weather satellites, satellite tracking and radio astronomy.

Although I use some modern radio equipment - an HF-225 and a PRO-2006 for decoding - most of my radio equipment is quite old: five Eddystone receivers. The valve theme is extended to frequency measurement with a Second World War BC221, output recording with a Ferrograph 4AN (owned new since 1960) and a small valve oscilloscope".

Thank you for that interesting letter, Mr Woods and I apologise again for mislaying it. I'll have a rummage on the web and feel confident that I can point you in the direction of some Amiga information and possibly software. If any reader has any software or information that could help I'm happy to forward it.

Tandy Time

Last time, I made a brief mention of my Tandy TRS80 Model 4 computer newly-acquired from an Ebay auction. No sooner had that issue gone on the shelves than **Les Buckley G3PTX** of Home Products British Made Golf Accessories in Hyde, Cheshire, E-mailed to say "I am an avid *SWM* reader. I notice in this month's magazine you have acquired a Tandy computer. We have here a fair amount of Tandy programs from our old Tandy computer days. These are a mixture of games, business programs, etc., and are on either 5.25in floppies or cassettes. Should these be of interest to you, I would be pleased to dispatch same. No charge of course, just a good home required".

A very kind offer indeed and regular readers can, I'm sure, guess my response! I E-mailed an emphatic 'thanks' and 'yes please' to Les and then thought no more about it until a week or so later when an enormous parcel was delivered to my house. Inside was a huge collection of high-quality software for the Tandy computer, including a word processor, assembler and accounts software and much more. Some of this I've already had a chance to try, other items await their turn, but all of it I can assure Les, has found a very good home indeed and will be used to the full. Once again, thanks Les, that truly was most kind of you!

Old OSs Never Die!

Also that brief mention of CP/M in my closing paragraph last time about the Tandy TRS80 Model 4 prompted **Steve James** of Hartlepool to ask: "What actually is CP/M? I bought an Amstrad PCW8256 word processor about 18 months ago from an ad in the local newspaper. It does all I want of it which is mainly typing letters and keeping a track of household finances - dull stuff, I know. However, in the shoebox of disks that came with the computer, there was one marked CP/M. When I try to use this disk I get some very odd messages and then a simple prompt and cursor. Whatever I type after that seems to have no effect. Is CP/M useful for anything?"

CP/M is an operating system for Z80-based micros (the Z80 is an 8-bit microprocessor from Zilog, made exceedingly popular in the 1980s in computers such as the Sinclair Spectrum). The letters 'CP/M' form an acronym which stands for Control Program [for] Micros and, believe it or not, Steve, it was once the foremost operating system for small computers.

When first released it was, in fact, truly revolutionary: a 'proper' manufacturer-independent operating system for any Z80 computer with 64K RAM. If your machine ran CP/M, you could tap into a vast library of high-quality 'serious' software: word processors, spreadsheets, databases, business statistics calculators, programming languages and the like. Some hardware manufacturers of 6502-based computers (a rival 8-bit microprocessor from Intel) such as Acorn even went as far as to provide add-on Z80 co-processors just so that their machines would be able to run CP/M - a big selling point in corporate and possibly educational eyes.

CP/M's star faded somewhat during the home computer boom when each machine had a proprietary operating system, dulled by a large margin with the introduction and subsequent success of MSDOS from Microsoft (largely, it's fair to say, a rip-off of CP/M) and forgotten utterly during the world domination years of Windows.

Nowadays, CP/M is not terribly useful (forgive me CP/M aficionados!) and interesting only to those of us who like to mess about with computer obscurities. However, if you do decide to explore its possibilities Steve, simply type 'CP/M' into your favourite search engine on the web - there are lots of other enthusiasts out there! Sybex published a good book entitled *Mastering CP/M* by Alan Miller and there are many collections of CP/M shareware and public domain software available from PD libraries (have a free read of the small ads in computer mags in your favourite newsagent) and the web.

And Finally

That's it for this time. Keep your letters and queries coming, I enjoy every one! I hope you've had a peaceful and pleasant Christmas and that you have a pleasant New Year and, as always, good listening!

■ PETER BOND, c/o EDITORIAL OFFICES, BROADSTONE

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Sky High

A noticeable drop in my general correspondence during October has indicated that many of you are not out and about as much since the attacks in America. Information on the military side has been quite good considering the increased security around the UK, but I think followers of the Civil Airbands have all hibernated, just four E-mails in the whole of the month!

Afghanistan

As predicted, the amount of aviation information coming out of the conflict in Afghanistan is relatively small, it's not the same as the Gulf War with CNN sitting on top of every hill or building, sending back pictures of Cruise Missiles passing their hotel windows! The amount of television coverage is reduced to bombed out buildings, (much of Kabul, etc., already seemed to look like that), plus the more recent pictures of blanket bombing by the B-52s.

A fair percentage of transport flights and other traffic has routed south through airfields such as Ramstein and Aviano, which in itself has brought a renewed interest in h.f. listening, (see later). Nevertheless, there has still been a number of movements of note through the UK, possibly not all connected with the conflict, but all worth a mention.

KC-135/KC-10 tankers out of Moron in Spain, (various units), have been regularly visiting UK airspace. On refuelling missions they have been using the callsign ETHYL, (see last month), dropping into Mildenhall and then heading back to Moron. Tankers out of Moron, when on maintenance or other missions (non-refuelling), appear to have been using the callsign ROVING.

A U-2S was noted arriving at Fairford in early November, leaving on the 4th Nov, using

the usual positioning callsign DEUCE, in this case DEUCE 30 - nice to see a U-2 back in the UK! Ramstein C-21s (86 AW), who for years have used the callsign SPAR, have recently been heard also using the callsign TIGER.

Two E-8Cs passed through Mildenhall using the callsigns MULEY 22 and 33. A third was heard by **Jim L** on h.f. inbound to Souda Bay, calling MULEY 11. Whilst USAF E-3 AWACS are deployed for operations in and around the area of conflict, five NATO AWACS have been

including national carriers. Swissair have been bailed out by the Swiss government, but as a major shareholder, their problems spelt the end for Sabena.

Canada's second biggest airline, Canada 3000, have also been rescued at the last minute and Ansett of Australia, who also reported serious problems, have had a financial injection and are to continue operations as a restructured company. Many other airlines have laid off staff and withdrawn aircraft from service and there are now literally hundreds of extra airliners stored at various sites around the Arizona and California deserts.

It has been argued for many years that airlines have kept air fares at artificially high levels, but it now seems that those that operate the high-turnover, low-profit policy are those who have come out of this crisis successfully. With Ryan Air and EasyJet both reporting a rise in profits in very difficult times. Is there a lesson to be learned and are we to see a major shift in the way airlines financially structure and price themselves in the future?

HF - The Long Distance Informant

Whenever there has been a conflict in recent years such as the Gulf War or Kosovo there has generally been an increased interest in airband listening, the recent attacks in the USA and the following conflict are no exception. An event such as this starts to expand people's listening interests and my 'Sky High' correspondence most definitely reflects that. With the hoped increase in UK traffic well down on some people's expectations, it is noticeable that I have had a number of letters/E-mails from airband listeners who are

interested in moving from their usual listening medium of v.h.f./u.h.f. to expand their horizons to h.f.

Apart from the loyal readership of *SWM* and the 'Sky High' column, there are always a number of occasional readers and those who are new to the hobby. With this reader percentage changing fairly regularly, it means that without any doubt the question I am asked the most, (almost monthly), is what is the best radio/antenna for airband listening. Now this links me to the letters from the people above who ask about expanding into the h.f. airbands.

The switch from v.h.f./u.h.f. to h.f. can initially be immediately successful or very frustrating, but ultimately it can provide the Civil and Military h.f. enthusiast with some very rewarding results. To be able to hear aircraft from the far side of the planet instead of the local airfield can be a very enlightening and rewarding experience, but does sometimes require an element of patience. For the prospective h.f. listener, if at all possible try and share some time with someone who already has an h.f. set-up, several hours spent listening in will soon convince you if the world of h.f. is for you.

As regards equipment, well this depends on how seriously you are going to get into the hobby and perhaps most importantly, your budget. If you can afford a new £1000 plus receiver that's fine, but as three of my correspondents have indicated that they are all on a limited budget, I would approach it one of two ways, both of which involve second-hand equipment.

A good starting point would be a portable h.f. set such as a Sangean ATS-803 or a Sony 2001. These radios both perform reasonably well and can be found second-hand for under a £100. If you're serious about h.f. and your budget can run a bit higher, I would look to

Snippets

Marham appears to have been allocated 344.9 as Radar frequency, this was reported to me during 2000 as a Lakenheath Aux frequency, but that now has to be very doubtful.

A new Tower frequency, 133.425 has been noted at Oxford Kidlington, replacing 118.875.

The frequency used by Shannon Oceanic for clearances 121.7, has been replaced by 119.075.

The ATIS at Shoreham has changed from 132.4 to 125.3.

deployed to the USA to provide back-up airborne cover.

On h.f., 13.254 has again been active with aircraft inbound to Diego Garcia and one source has suggested that 11.186 has also been used. Several aircraft inbound to Diego Garcia were heard attempting to contact, RED CROWN and TRINITY SWORD, to pass inbound information? By early November, calls to these frequencies were reported much less frequently, possibly due to a deterioration in the propagation conditions.

Whilst there is little doubt that a number of airlines were suffering financial difficulties before the attacks of September 11th, the events of that day have proved the final straw for several airlines

Currently seeking action in the skies over Afghanistan, this month's photo is an F-14 Tomcat, in this instance in the markings of the US Naval Air Warfare Centre.



buy a second-hand base station such as the Icom R-71E or the JRC NRD-525. Both these sets are superb performers and you should be able to pick them up for under £400.

If you're wary of buying second-hand, some dealers will offer a short warranty on used equipment. In my experience I have bought about a dozen radios over the years, usually from the *SWM* 'Trading Post' and up till now I have encountered no problems with used kit. We'll have a look at h.f. antennas next month - my thanks to **Andy L, Bill, Martin A, Martin S, Lee T and Big Brother!**

Croughton

Following on from the comments in this column in recent months, having spoken to those who know in the USA, I can confirm that although extensive maintenance has been carried out at Croughton and transmission facilities still remain operational, as a USAF **GHFS station**, it is only operated remotely from Andrews. My questions regarding Cyprus Flight Watch last month have been answered by the NOTAM information in Graham's 'SSB Utilities' column.

Iridium

In recent years, the Iridium Satellite Company in the USA

has launched the only global satellite communications system capable of reaching every part of the earth giving complete coverage including the Oceans and Polar regions. In simple, the Iridium system can provide voice or data communications from anywhere to anywhere on the globe.

Through a network of 66 low-earth orbiting satellites operated by the Boeing company, they can provide essential and comprehensive world-wide coverage to a number of customers in both the civil and military environments, not least of which is the US Department of Defense. With some available resources within the Iridium Satellite system, the recent events in America prompted the following proposal which could have far reaching consequences for the future of flight safety within the aviation industry.

The recent hijacks and subsequent crashes have proved that no matter how strong Black Boxes are, they can still be irretrievably damaged in massive impacts, thereby removing essential data from the investigations of the Air Crash Investigators and the Federal Authorities. The novel idea that Iridium have come up with is to have a live feed via satellite from the Cockpit Voice Recorder and the Flight Data Recorder to a computer/recording system on the ground. This in

theory could be applied to thousands of airliners/aircraft all airborne at the same time.

To quote Iridium's Chairman, Dan Colussy, "With existing systems, officials on the ground have only limited visibility into what is happening inside an aircraft in flight. Using its global footprint and voice and data capabilities, combined with existing commercially available equipment, Iridium gives ground personnel unrestricted access in real time to vital voice and data communications from the aircraft".

So in theory, during a hijack a pilot could quickly squawk the hijack code alerting Air Traffic on the ground. They would presumably have a hot line to the ground satellite station, (or remote facility), who could then call up a live link to the aircraft's cockpit voice recorder and within say less than a minute have live audio from the hijacked aircraft. If you also placed a voice recorder within the cabin it would provide those on the ground with a tremendous tool in the fight against terrorism. It may sadly not be able to prevent the destruction of that aircraft, but would most certainly help prevent such attacks that took place on the 11th September.

A live link from the Flight Data Recorder, (Black Box), would be of incredible help to all concerned. Not only would

information be available immediately, thereby giving instant diagnosis to a live situation, but in the event of a crash, the investigators could begin instant analysis of the data. In the past, we have seen situations where recovery of the Black box has taken days, even weeks, and with every hour that passes, it means that in the event of it being an aircraft's component that has failed, prevention of another similar accident is delayed until the data can be recovered, (if at all).

In the event of a situation where it is an undiagnosed fault on the aircraft that is endangering its crew and passengers, engineers on the ground could monitor the live link to some of the aircraft's systems and may be able to diagnose and correct a problem before it reaches a stage where it could endanger the aircraft. If the theory of such a system could be put into practice, the implications for flight safety and the avoidance of loss of human life could be enormous!

The relevance of this story was brought home very swiftly with news of the Airbus crash in Queens, New York. Once again the Black Box was damaged and it took three days before they could access the data, with a live link they could have had it in minutes - my thanks to **Richard at AOR** who alerted me to this interesting information.

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Amateur Bands

The Right Antenna?

Perhaps this isn't the season to think about antennas. Much better to be snug and warm indoors rather than cold and shivering hanging precariously onto a ladder. But hey, isn't that part of the fun of amateur radio?

My usual receiving antenna is a classic long wire, which is strung out in from west to east. It is connected to the radio by coaxial cable and is uses the house cold water piping as the counterpoise. As it's tuned to 1.8MHz, there's the best part of 40m of wire trailing off down the garden, although only about 3m above ground. The reason for this detailed description is that, whilst monitoring 28MHz during a recent contest, I switched from the long wire to my long dormant 29MHz vertical. Did that make a difference!

Despite the vertical being only about 5m long and not particularly high, received signal strengths were many 'S' points up compared to the long wire. A practical reminder that size isn't everything. It's important for a good match between antenna and radio. Proof of the pudding? Here is a selection of stations logged on 28MHz over the contest weekend and ensuing weeks, (DX Zone in brackets).

Europe	F5AMH (14) France - 9H0WW (15) Malta - UT4EK (16) Ukraine - TF3IRA (40) Iceland
Asia	UP0L (17) Kazakhstan - H2G (Op. 5B4AGC) (20) Cyprus - 7Z1AC (21) Saudi Arabia
Oceania	VK2CZ (30) Australia - ZL4NR (32) New Zealand
Africa	3V8BB (33) Tunisia - J28VS (34) Djibouti - D44TC (35) Cape Verdi - D2BB (36) Angola
South America	PY5JO (11) Brazil - LU6ETB (13) Argentina
North America	VO2WL (2) Canada - K7RI (3) USA - N8TR (4) USA - VE2ZP (5) Canada - V31MX (6) Belize - C6AKO (8) Bahamas

Radio Energy

A resonant antenna that presents the right impedance will allow the maximum amount of radio energy that hits it to reach the receiver. And remember, a passive antenna doesn't generate any additional noise, so it definitely helps to have as efficient an antenna system as possible for the band you want to monitor.

If you want some further reading, the late Joe Carr's *Receiving Antenna Handbook* is well worth a peruse.

Some other exotica was worked by **Harry GM4WZD** from Skye on 21MHz using a home-brew 300W linear driven by a TS-430S into a 3-element beam. The stations were A52DA (22) in Bhutan, south east of the Himalayas and F0/HG9B (32) on the Austral Islands, in the middle of the southern Pacific.

Contests

I've never been a great one for participating in contests, although I've given many a station a point or two. But you don't have to take part to make use of them. Contests are very helpful for evaluating the performance

of your own station. A big contest will generate world-wide activity. In a relatively short time, it will be possible to identify those parts of the world from where signals come booming in, and those from where signals are weaker.

Don't be misled by the usual 59 report (readability 5 - signal strength 9 - both the maximum possible) that contestants give each other. In practice, the 59 report is used to confirm the receipt of the other station's details and is used even when the stations have really struggled to pass information due to very weak and barely readable signals. The report is invariably followed by a number. Often the number of the station's contacts so far, but sometimes the station's power output or the DZ zone the station is in, depending on the requirements of the contest.

What was pleasing recently was to hear one contest participant ask for a true reception report. When told it was a solid 'plus twenty' (20dB above S9) he re-entered the fray, confident that he was putting out a good signal. It has to be said that, with everything turned up for maximum smoke, the audio quality of one or two contestants' signals is pretty awful.

ISWL

In the last column I made brief reference to the **International Short Wave League (ISWL)** and mentioned that it was a major player in the listening world. What I didn't realise was that it has been around since 1946! The League caters for interests in both broadcast and amateur radio and publishes a monthly journal appropriately named *Monitor*. It organises contests and awards throughout the year.

Future Events

J13DST will be operating as J13DST/6 from Miyako Island (one of the Ryukyu chain of Islands between Japan and Taiwan) over the new year from December 29th for a week.

Well into the future is an IOTA DXpedition to Cham Island (off east coast of Vietnam near Da Nang) scheduled 6 days from April 17th.

Not quite so far away in time is a DXpedition scheduled for the January February period to Niger (U5) in central northern Africa. Most of the country is desert with savannah in the south, and most of its meagre

income is from foreign aid. The web site for the DXpedition is www.qsl.net/niger-2002 to which further information will be added as the details are finalised.

Do write in with your logs or about any other amateur radio matters. Please address correspondence to **Clive Hardy, SWM, PW Publishing Ltd., Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW** or to clive@pwpublishing.ltd.uk If you write, a daytime phone number would be very helpful. Good listening!



DX zones around North America

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SSB Utilities

At the start of November, British Airways and Air France both restarted their trans-Atlantic Concorde services. This heralded much press coverage, including live TV footage of a flight departing from London Heathrow airport.

Prior to the resumption or scheduled flights, there was an extra British Airways flight on 22nd October with engineers, managers, press and VIPs on board. This flight was heard by **Harry Bygate** using the callsign 'Speedbird Concorde 9093C'.

On Wednesday 7th November flights from Paris and London headed for New York. However, on this day there was another Concorde flight from London to Paris which attracted much less attention. Prime Minister Tony Blair flew to New York to meet with President Bush, this flight landed at Andrews AFB just outside Washington DC. Does anybody know the callsign used by this flight? If it follows the usual pattern for chartered Concorde flights, the callsign should be in the 'Speedbird 9000' series.

The flight of Concorde always attracts much attention, so it is worth reminding readers of the flight schedules so that they have a better chance of hearing the flights.

Flight **BAW0001** (usually using the callsign 'Speedbird Concorde 1') departs from London Heathrow at 1030 local time and arrives in New York at 0925 local time. The return flight, **BAW0002**, departs New York at 1215pm local time and arrives at Heathrow at 2110. These flights to and from New York operate on every day, except Saturday.

From 1st December until 13th April 2002, British Airways will operate a once a week scheduled Barbados service from Heathrow, departing Saturdays at 0930 and arriving in Barbados at 0945. This uses flight-number **BAW0273**. The return flight will depart Barbados on Saturdays at 1145 and arrive at Heathrow at 2000, operating as **BAW0272**.

It should be fairly obvious that listeners should be able to hear at least one Concorde flight per day crossing the Atlantic.

Across the Channel, Air France has restarted their own services to New York. Flight **AFR0002** departs from Charles de Gaulle airport at 1020 local time and arrives in New York at 0825 local time, this flight can be heard using the callsign 'Air France Concorde 1'. The return flight is **AFR0001** which departs from New York at 0955 and arrives back in Paris at 1950 local time. Don't forget that Paris is one hour ahead of the UK, so remember this when you tune-in for these flights.

All these flights can be heard most days on the NAT network on **5.649** and **8.879MHz**, in the late morning as they head towards New York, or in the early evening as they make the return flight.

African Network II

In the November 2001 issue of *SWM*, I mentioned the experiences of **Lennart Wennberg** from Sweden who monitors the AFI network on 11.300MHz. He has E-mailed me again after seeing his name mentioned in *SWM* (glad to oblige Lennart. If anyone else would like the same, send me a letter with questions, news or comments!). Lennart has been in contact again with Barbara Green from Kenya Airways, and she sent him some aeronautical documents and charts relating to flights in and around Africa.

Lennart also had some comments relating to **Roy Walker's** observations that 11.300MHz sounds chaotic. Lennart says that when he flew with Kenya Airways he noted that the AFI network was always very busy with

aircraft traffic. Lennart also says that Tripoli's Selcall system has been out-of-order for quite a while, he has heard Tripoli ATC say their regrets to pilots requesting a Selcall check.



Concorde landing after a successful test flight 17 July 2001. *Courtesy NewsCast.*

Metaphor

For the past few years the USAFE air base at Ramstein in Germany has operated a h.f. station with the callsign 'Metaphor'. This station has been heard on a number of frequencies, working with various Ramstein-based aircraft, ranging from VIP transport aircraft, to cargo transport aircraft, and in some instances with 'special operations' aircraft operating in southern Europe.

Towards the end of October 2001, a NOTAM appeared which gave details of two new frequencies for 'Metaphor', as well as details of their operational hours. The sudden appearance of a NOTAM may have something to do with the aid flights being flown from Ramstein each night. There are a number of C-17A Globemaster IIIs based there, and each night a number of them fly off to Afghanistan to make food-drops. These 14-hours missions require several mid-air refuellings, usually over the Black Sea, probably from KC-10 and KC-135 aircraft operating from Turkey (but this is unconfirmed).

Prior to events in Afghanistan, 'Metaphor' was known to operate on the following h.f. frequencies - 4.616, 4.770, 5.919, 6.819, 6.870, 7.919, 14.682 (all MHz u.s.b., frequencies courtesy of *Military Air Scan 2001*). The two new frequencies do seem to be rather odd choices - **6.730MHz** is used by several other agencies (including the RAF, USAF, German Air Force and a Russian VOLMET station), while **9.022MHz** is frequently blocked by the 'Voice of the Islamic Republic of Iran' on 9.023MHz. The NOTAM indicates that these frequencies will be active until the end of January 2002, but with the events in Afghanistan in the past few days, such operations may be terminated earlier than planned.

Metaphor NOTAM

AIR/GROUND FACILITY CHANGED BANN-B HF STATION (CALLSIGN: METAPHOR) PROVIDES HF VOICE FREQUENCY SUPPORT TO ALL US AIRCREWS, GROUND STATIONS, ON 6730 KHZ AND 9022 KHZ. HOURS OF OPERATION ARE 0500 - 2100Z DAILY. PHONE PATCH SUPPORT WILL BE SUPPORTED AS WELL. 29 OCT 12:16 UNTIL 24 JAN 00:01 2002

Web Watch

British Airways - <http://www.british-airways.com>
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Info in Orbit

My impression of autumn so far (mid-November) has been that of having had more sunnier days than autumn last year. In 2000 we were subjected to long periods of torrential rain that caused unprecedented floods. Pictures from the WXSATs - especially high resolution images - showed evidence of flooding throughout Britain and Europe. That was last year's crisis!

Attempted Rescue of RESURS & NOAA-14

RESURS 01-N4 ceased normal a.p.t. (low resolution image transmissions) in late August/early September, leaving us with occasional brief bursts of telemetry. A program of tests got underway in mid-October. **Eugene Flitman** is the leading software engineer at the Space Monitoring Information Support Laboratory of the Space Research Institute in Moscow, and he confirmed that the WXSAT had been switched on for short periods.

Douglas Deans reported recording a transmission lasting about five minutes (at 0941UTC on 18 October) while the satellite was over Russia. Douglas reported hearing an un-modulated carrier being transmitted, with a few clear blips that he presumed indicated that commanding was in progress. Unfortunately, it seems that the process failed and RESURS remains off. Officially, RESURS has not been abandoned; 'Orbit' messages (the Russian equivalent of NOAA TBUS messages) continue to be issued, listing the transmission frequency.

NOAA-14's AVHRR (the advanced very high resolution radiometer that uses an optical telescope to produce the images that we receive) experienced a serious problem in mid-October with its scanning motor. All the AVHRR data in high resolution images (and therefore a.p.t. transmissions) became severely degraded and unusable most of the time.

NOAA satellite controllers and the support staff studied recorded data from the spacecraft, and on 1 November, the AVHRR Temperature Control Electronics (TCE) for the heater and louver was disabled in an attempt to alter the thermal environment to try to regain normal scan motor performance. This is the type of problem previously experienced with *NOAA-15* where, under certain thermal conditions, a reduced cooling effect caused

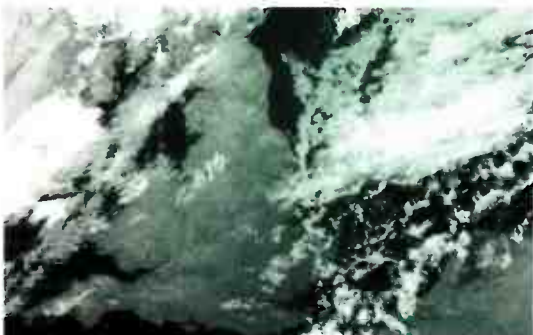


Fig. 1: NOAA-15 1821UTC 9 November 2001, channel 4 infra-red.

problems with the scanner's motor. Unfortunately, the change did not result in a scanner motor torque decrease, as had been hoped.

The TCE was re-enabled on November 6, along with an attempt to re-phase instrument data with the spacecraft telemetry formatter (the Manipulated Instrument Rate Processor or MIRP) - basically meaning that images were not synchronised properly. As at mid-November, scan motor performance remains the same, with no improved scan line synchronisation - but analysis and troubleshooting is continuing.

NOAA-M Launch Delayed

The US Air Force Titan 2 rocket (G-14) will launch the polar-orbiting *NOAA-M* weather satellite from Vandenberg Air Force Base in California - but no earlier than May 2002. Launch date was postponed from May 2001, then delayed further to August as a 'ripple' effect from the postponement of launching previous Titan 2 missions. A confirmed date is still pending. Thanks to Douglas Deans for pointing this out.

Meteor 3M-N1 Launch?

METEOR 3M-N1 has also had a long period of postponed launches, but should be in orbit by the time this is published - scheduled launch date 30 November. A Ukrainian Zenit 2 rocket will launch the *METEOR 3M-N1* Earth observation spacecraft from its launch site at Baikonur Cosmodrome in Kazakhstan. The payload includes NASA's Stratospheric Aerosol and Gas Experiment-3 (SAGE-3) instrument, as well as several secondary payloads. Unfortunately it is not carrying an a.p.t. system.

Recent infra-red images of Europe from *NOAA-15* have been spectacular. The coldest day of the year, or at least the first snow of the season, was on 9 November, when blizzards were experienced in northern Scotland. Later that day some of the clouds cleared to reveal the scene. **Figure 1** is the infra-red image that I received during the early evening, and shows some of the snow, as well as warmer rivers in western Europe.

Crater Revealed By NOAA-15

Jim Martin of Indiana, USA, noticed a most unusual feature in an image he received from *NOAA-15* on 22 October at 2322UTC. **Dale Ireland** (a regular correspondent to the WXSAT mailing list) identified the feature as the Manicouagan Crater that scientists calculate is approximately 206 to 214 million years old. It is one of the largest found preserved in good shape on Earth. Unlike other craters found elsewhere on Earth, atmospheric



Fig. 2: NOAA-15 image of crater in North America from Jim Martin.



Fig. 3: NASA image of Manicouagan crater.

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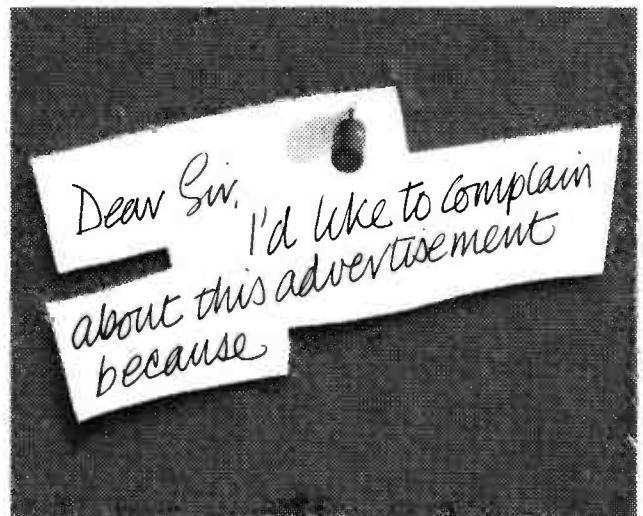
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erosion has not damaged it. It has been measured as 70km in diameter, although the original outer rim of the crater was about 100km wide. There is a lake-shaped ring inside, and the impacted rock in the centre is made of metamorphic and igneous rock that is more resistant to erosion than the surrounding material.

David Brooks received the *NOAA-15* morning pass, **Fig. 3**, showing sun-glint - the white reflection - off two rivers on and near the boundary between Suriname and French Guyana, on the South American continent. The one on the right, and longer of the two, is actually on the boundary and is called Maroni. The shorter (and brighter) is in French Guyana. Tropical storm *Jerry* is dramatically shown as it approached Barbados in October.

US Hurricane Season

The hurricane season in America brought a number of images from readers of my column in the American *Monitoring Times*. The magazine carries a limited number of images, so I occasionally include one or two received from across the Atlantic in this column.

Joseph Gresham sent me images from *NOAA-12* and *NOAA-16* showing hurricane *Michelle*. *NOAA-12* gave the best image on 3 November. Hurricane *Michelle* had 135mph winds as it headed towards Cuba. The second image is from *NOAA-16* on 5 November (visible-light) showing the run-off from the 50mm of rain where the storm came ashore.

One day after the storm hit, all the mud ran into the Gulf. Joseph has been monitoring WXSAT imagery for four years, using GOES WEFAX and a.p.t. He decided to upgrade to GOES GVAR (a separate high resolution data stream) using the Aquila system and has appreciated its quality.

Cedric Roberts commented that he was "astonished to find the Alps still clear of snow, despite the fact that we are now into November". Cedric is more than just a monitor of the weather, he has been running an officially recognised station, and continues to keep records. He adds: "Much of Europe has, like ourselves, been enjoying exceptionally warm weather in October. My climate station in Halesowen recorded its warmest October since records began in 1956, and England in general saw the highest mean daily temperatures since data first appeared in the mid 17th century. My night time minimum for the month was as high as 7.1°C, 7.7°C above the expected October value. No air or ground frost at all was recorded, the last time for this being in 1969, and we had neither snow nor sleet at any time - quite exceptional events". Cedric recorded the early afternoon h.r.p.t. pass from *NOAA-16* on November 3rd and enlarged the section containing the Alpine region, as seen in **Fig. 7**. This shows a remarkable absence of Alpine snow for this time of the year.

Clive Finnis received **Fig. 8** - an easterly pass from *METEOR 3-5* showing the eastern Mediterranean sea, and including as far east as the Gulf of Aqaba. I have not got a modern atlas of the region, but my 20-year old *Schools and Colleges* atlas is less detailed than is revealed in Clive's image, in which small islands are clearly resolved.

Clive uses a **Paul Hayes** designed QFH antenna in his loft, with a home-boxed RIG pre-amp feeding a Timestep receiver and decoder.

METEOR 3-5 only transmits in sunlight, and during December it passes across Britain before sunrise and after sunset, and will therefore be silent. By early January it should be passing north-bound over Britain during the afternoon and - if switched on - should recommence transmissions during the earlier part of January passes before entering the darkness of the north polar region.

New Timestep HRPT Receiver

A new high resolution picture telemetry receiver has recently been released by Timestep, and I have had an opportunity to give it a look over. The new unit has a number of significant enhancements compared to the previous unit, including synthesised frequencies, controlled i.f. filtering and gain-control modifications. It appears to mark a new phase in the development of such receivers and by virtue of the numerous improvements over previous models, is a new product that cannot be produced by upgrading earlier receivers.

The receiver includes the necessary circuitry to process the 10-channel data stream from the Chinese *FENGYUN-1C* WXSAT, and I received the module required to decode CHRPT data as well. I was able to test the new receiver within hours of its arrival, and confirm that it worked extremely well. There is one significant factor to consider with *FENGYUN-1C* transmissions: signal strength is down by about half! My h.r.p.t. dish was deformed during a sudden windy spell last year, and although I removed the worst of the deformation - which enabled me to receive the NOAA transmissions without problems - the poor figure of the dish reduces *FENGYUN* signal strength reception to the limits. This means that although I can still receive a moderate image, there is significant noise.

A normal dish should not show such a high noise level, and it remains for me to once more de-mount the dish and attempt to correct the figure.

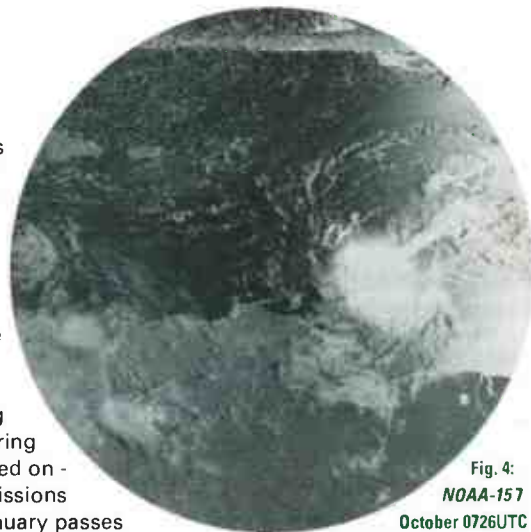


Fig. 4:
NOAA-157
October 0726UTC
from David Brooks.

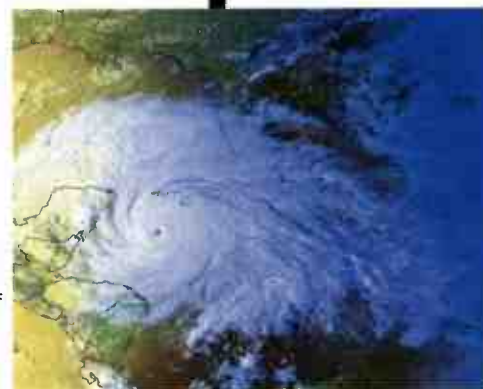


Fig. 5: *NOAA-123* November
hurricane *Michelle* near
Cuba from Joseph Gresham.



Fig. 6: *NOAA-165* November
hurricane *Michelle* near Cuba.

Consequently, the small coverage shown in **Fig. 9** represents a relatively clear portion of the image. Contact Timestep on **(01803) 833366** or **sales@time-step.com** for price details.

The Co-ordination Group For Meteorological Satellites

It was probably inevitable that the huge benefits that resulted from the launch of the world's first WXSAT - the polar orbiting *TIROS* - followed by the first geostationary WXSAT - *ATS-1* (Applications Technology Satellite) - would encourage other major countries to plan similar satellites. The Co-ordination Group for Meteorological Satellites (CGMS) is a forum in which satellite operators from countries with WXSAT programs work jointly with the World Meteorological Organisation, on the technical operational aspects of the global network.

To ensure maximum efficiency and usefulness, there has to be proper coordination in the design of satellites and in the procedures for data acquisition and dissemination. The actual design of individual WXSATs is based on national and regional requirements for data and services, so some differences are inevitable. However, regular meetings of the group have permitted the gathering and exchange of results during the course of the development of each system, and a considerable measure of coordination has been achieved.

This network of meteorological satellites, of which technical and operational co-ordination is the objective of CGMS, constitutes a major portion of the space-based subsystem in the Global Observing System (GOS) of the World Weather Watch (WWW). The design evolved during the period from 1965 to 1978 as a part of the Global Atmosphere Research Programme (GARP).

The GARP and WWW are the responses of the WMO and International Council of Scientific Unions (ICSU) to three resolutions of the General Assembly of the United Nations, calling for international programmes in Meteorology for the benefit of mankind. WWW is a continuing programme of WMO to assist meteorological services in all parts of the world in operational and research functions by making available basic meteorological and other relevant data.

CGMS members contributed to the implementation of the first GARP Global Experiment (FGGE) by developing the network of five geostationary satellites. FGGE was started in September 1978 with a build-up phase, followed by a 12 months operational phase starting 1 December 1978.

Approximately 70% of the Earth's surface is water, and even land areas have many regions which are sparsely inhabited. The polar-orbiting satellite system provides the data needed to fill-in the gaps of surface and atmospheric temperature profiles over areas not adequately covered by conventional observing systems - particularly in the Southern Hemisphere, and in high latitudes in the Arctic and Antarctic.

In near-polar orbits, spacecraft are able to acquire

data from all parts of the globe in the course of a series of successive revolutions. Their sensors acquire higher resolution data, both spatially and spectrally, than the high-altitude geostationary satellites. Polar-orbiting satellites are principally used to obtain specific sets of observations of three main types: daily global cloud cover; accurate quantitative measurements of surface temperature, and most important, the vertical variation of temperature and water vapour in the atmosphere.

International Space Station

John Locker has been photographing the *ISS* during favourable opportunities when it passes over Britain, and some of his images have included the Shuttle when docked during missions. One of John's photographs shows several of the components - see **Fig. 10**. The difficulties in photographing a fast-moving spacecraft via a telescope should not be underestimated. I am aware of software that will drive my telescope (an LX200) and permit intermittent viewing of satellites, such as the *ISS*, but it is a significant achievement even using such software - let alone without!

SWM is published around Christmas, so I want to sincerely thank the large number of contributors who have kindly E-mailed images and information about their systems during the last year. I am glad that many are regular contributors. I also

want to thank editor Kevin for permitting me to use extra images each month. Long-term readers will be pleased to know that I started part-time work in late October - my first job application since the house move. We must hope that the New Year will bring peace <soapbox mode off>!

Fig. 10: ISS 18 October photographed from the Wirral.

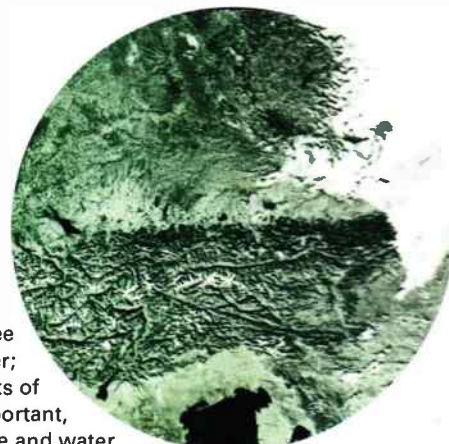


Fig. 7: NOAA-16 afternoon pass showing the Alps - from Cedric Roberts.

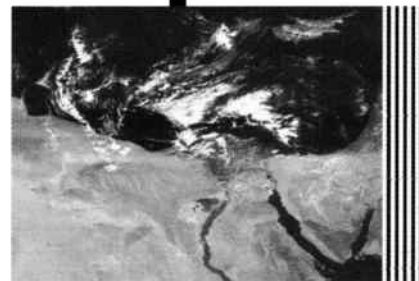


Fig. 8: METEOR 3-5 0924UTC on 21 October from Clive Finnis.



Fig. 9: FENGYUN-1C 1845UTC 4 November 2001.



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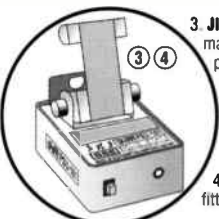
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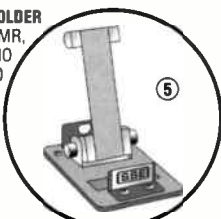
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Decode

Let's start this month with a question from **Derek Shipman**. He asks what's the difference between GMT and UTC, they seem to be the same, so why have different names? The simple answer is they are not the same, so here's the explanation.

GMT has its origins way back in the industrial revolution and provided a vital reference for the civilised world. The key point about GMT is that it is based on the rotation of the Earth. Whilst this is generally fine, things go a bit astray when you start trying to make very precise measurements based on this standard. The problem arises from the Earth's rather erratic rotation that varies by a few thousands of a second daily.

The solution was to change over to highly accurate caesium-beam atomic clocks. The result was the introduction of Co-ordinated Universal Time (UTC), which became effective on January 1, 1972. As from that date, the humble second acquired a new definition: The second is the duration of 9,192,631,770 periods of the radiation corresponding to the transition between the two-hyperfine levels of the ground state of the caesium 133 atom!

Interference Follow-up

Len Wooley has written explaining how he managed to tame his interference problems. Using a methodical approach, Len managed to work out that the prime offender in his shack was his flatbed document scanner. As he was unlikely to need this when he was listening, the solution was dead easy, disconnect it!

I also received an interesting note from **John Terry** of **Hitek Electronic Materials Ltd**. They are manufacturers of specialist screening and shielding supplies and sell a very comprehensive range of the very types of ferrites I described recently. Although



Hitek web site - lots of useful ferrites.

many of the products have a minimum order value of £30, their kits are specifically designed for low volume sales.

A good example is their Ferrite Clip-On Kit which, at £12.99 plus VAT, contains a selection of 12, round, square and toroidal clip-on ferrites. This kit is ideal for use in a typical Decode station. To find out more, visit their web site at

<http://www.hitekstore.co.uk/acatalog/> If you know of any other good suppliers, please drop me a line.

Oops Wrong Data!

Some of you probably read my report on the Chinese press FAX stations thinking I'd finally lost the plot! I have to come clean and report that I really didn't check this out properly. Those of you who've been around a while will have recognised this as the Japanese Kyodo News Agency. The transmissions on 16.97MHz are broadcast from Tokyo whilst 17.431 and 16.035MHz originate from Singapore. Although the broadcasts are in Japanese at the start of the transmissions, they usually say Kyodo News Agency Japan in English at some point. My thanks to **Martin Walsh** and **Alan Barke** for putting me back on track.

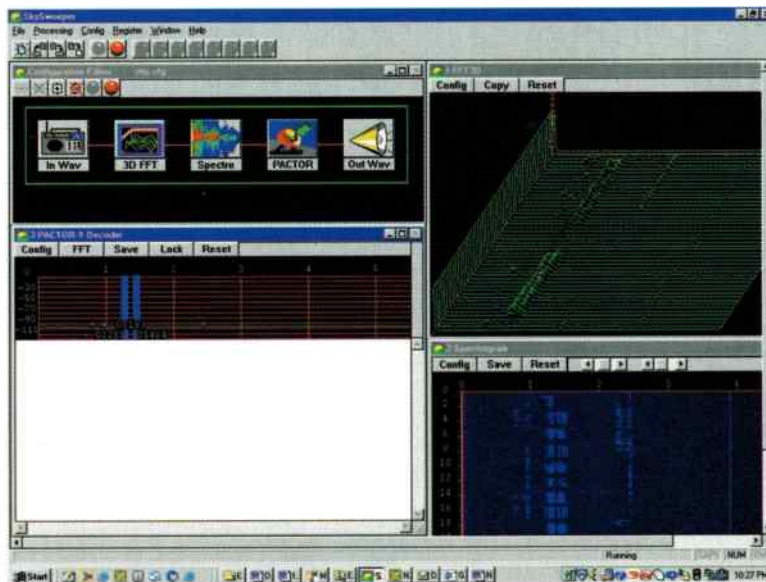
SkySweep 2.5

Those nice people at *Skysweeper* continue to develop a constant stream of improvements and new features. Those who already have *SkySweeper* will be pleased to hear that v2.5 is a free upgrade. This latest version adds two new modes to the ever-growing



Primary frequency standards
Caesium Beam Atomic Clock.

SkySweeper's new
Factor mode.



impressive range - they are MFSK16 and FACTOR-I.

The new FACTOR decoder provides the listen mode for both FACTOR-1 ARQ and FEC transmissions and can handle Huffman coded and 8-bit ASCII coding (Huffman set as a default). You will usually find ASCII used for selective calls with Huffman being used for other types of FACTOR signals. The decoder uses the digital PLL synchronisation technology for bit synchronisation and neural network for detection.

Tuning is really easy as the decoder automatically searches for active signals between 0Hz and 5kHz, though this can be set to a narrower range if necessary. Once the software detects an active signal, it will automatically lock-on and start printing the decoded text.

The MFSK16 is a rather specialist mode, but the implementation is similar to FACTOR as it automatically scans for and locks-on to active signals. If you would like to get a copy or find out more, take a look at Pervisell's web site www.pervisell.com

Pervisell are the UK agents for *SkySweeper* and the current price for the full version is just £59.99. The last two versions of *SkySweeper* included a new mode they call *SkyBoost*. I've spoken to my contact at *SkySweeper* and they confirm that the mode is in use commercially but, for obvious reasons, they're not prepared to give any details. If you've managed to track down any of these signals, please drop me a line with the details.

FFT Windows

I've had a couple of queries on this, so I think an update is in order. Let's start with a very brief catch-up. In my recent tutorial I described how the FFT routine takes a number of samples from a signal and then subdivides them to carry out a series of calculations designed to give the frequency content of the signal. Whilst this system works remarkably well, there are a few compromises that can sometimes make a real mess of the analysis.

The most significant of these relates to the value of the signal at the start and end of each sample. If the sample size and sample rate work out well, you can have an almost perfect match between the end of one sample at the start of the next. In this case, the analysis works very well. However, if the signal and sample size don't fit well, you can end up with a sudden change at the end where the two samples are put together. This results in a whole load of spurious signals appearing in the output that makes the result difficult to interpret.

The clever way around this is to use a technique called windowing. This is where each sample is multiplied by a special windowing function designed to make sure the signal level at the start and end of each sample are the same, usually zero. As you can probably imagine, there are countless different ways to do this. For example, you could have a very rapid transition to and from zero or you could use a gentler

KYODO NEWS

1994年 9月 2日 (金曜日)

Morning (1)

105日の製造業務停止

慎重に検討した。

対策についての検討会を

かかった」として文書で厳

すべき点もあったとし

も、開発・販売促進業者

は、被害体罰などに改訂

のエイサイ(本社東京部)

は、妥協した時の判断

したヤマサ醤油(本社千

葉県)と、販売促進提議先

ソリブジン(共同開発)

会見で、ソリブジンを審

当時の判断は「妥当」と厚生省

分発委の記者

までの百五日間で、これまでで最も長い処分。

命合書を交付した。期間は五日から十二月十八日

同社岡山工場を休業品の製造業務停止処分とする

しなかつた点などが重要法違反に当たるとして、

で、厚生省は一日、臨床試験中の死亡例二例を報告

ソリブジンと抗がん剤の併用による被害事件

日本商事(本社大阪市)が開発した抗ウイルス剤

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approach.

You won't be surprised to learn that there has been a huge amount of scientific work in this area to try and find the ideal window for a wide range of different types of signal. If you have any software that uses FFT routines, you will no doubt have seen the various window names appearing in the options.

Very few programs come with any explanation as to which one you should be using, hence this short feature. As a starter, I've shown here most of the common window types along with their characteristics:

Hanning: Good resolution of spectral peaks and good rejection of sidelobes - a good starting point for most signals.

Hamming: Provides finer resolution of spectral peaks than Hanning, but poorer rejection of sidelobes at low signal levels.

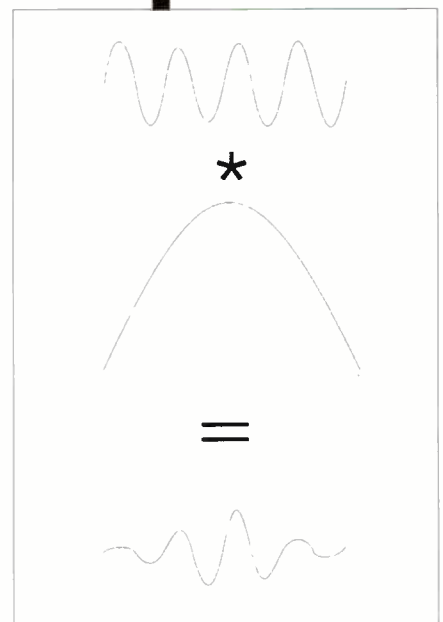
Blackman: Peak resolution is not as fine as Hanning, but the response shape flares out less at lower levels and rejection of sidelobes is better.

Blackman-Harris: The peak resolution is similar to the regular Blackman, but the response shape flares out even less at lower levels.

Flat-Top: This has the broadest peak resolution, but the best amplitude accuracy of any of these windows. It has a fairly straight response shape at high and middle levels, then flares out like the Hamming at lower levels poor sidelobe rejection. This window is particularly useful for measuring signal amplitude when there are no adjacent signals to cause interference.

Japanese FAX from Kyodo.

FFT Window used to smooth samples.



■ DAVE ROBERTS c/o SWM EDITORIAL OFFICES, BROADSTONE

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

Scanning Scene

Firstly this month a correspondent called **Mike** asks me to point out that although anyone listening to transmissions other than legal broadcast, amateur or CB commits an offence under the Wireless Telegraphy Act, there are also more serious offences under other legislation including anti terrorism laws. So, Mike suggests that these days it pays to be more discrete than normal when using receiving equipment and engaging in the hobby in general. I guess that scanning has always been an 'underground' type of pastime and it seems that it will have to become even more so.

Something Of Interest

As the low v.h.f. transmissions have been booming in from the USA, I thought that I would just scan around there hoping to find something of interest. So it was on the afternoon of 3rd November that I happened across a strong transmission on 42.120MHz f.m. Obviously a police control, the operator was speaking of a Peterbilt truck driving erratically on I-70. This is where it's handy to have a good map of the USA and Canada to hand. Mine is a Rand McNally roadmap that I bought in Houston, Texas, but they are for sale in good book shops here in the UK.

Delving around I came to the conclusion that I was monitoring the Missouri State Highway Patrol. I recorded the

received audio onto the hard drive of my computer and dug out the E-mail address of the Missouri State Highway Patrol and mailed them the audio clip and a reception report.

Three days later I received a comprehensive verification of my reception report from the Highway Patrol's Director of Communications, James Biggerstaff. He confirmed that the traffic had been transmitted from their Station located at Troop F, Jefferson City, Missouri. The transmitter in use was a Professional Electronics Company 3kW unit (yes, three kilowatts!) feeding a four element stacked dipole array.

The MSHP are licensed for 15kW, but run less power than that to extend equipment life. James also said that I may overhear one of their eight similar stations on 42.060, 42.380 and 42.580MHz. He says that for a real challenge I should listen out for their mobile input on 42.220, 42.240, 42.260, 42.320 and 42.780. Now that would be exotic.

James wrote that they were pleased to receive the report. They are going to use it and the audio clip as an aid to their in-service dispatcher training, illustrating just how far the signals can travel and to emphasise that signals are received by others than the officers for whom they are intended.

James also gave me the

radio operator's name and enclosed a copy of their 'Call for Service' report pertaining to the incident. This is essentially the incident log taken from their command and control computer. Each incident is given a CFS number pertaining to the date. In the UK these would be called Incident, Log or URN (Unique Reference Number) entries. The CFS Report shows that the Final Disposition of the incident was R2, which I imagine means 'No Trace'. The Primary Unit is shown as FLOG, which I believe indicates that observations were put out for the vehicle.

Now don't try this at home. I can't believe that the Old Bill in Central Milton Keynes would be all that thrilled if you E-mailed them

with a clip of the audio that you received on your 'Yupii' recalling the punch up outside the night club at The Point and asking for a QSL card.

In fact, it's a fair bet that your world would turn high intensity blue in short order as your front door was mashed at 0500 by the boys armed with a Big W to search for your scanner and wake you up the po-lease way.

Enterprising?

Did anyone catch the Sky news broadcast in late October? It featured an item whereby some enterprising tribesman on the Afghan/Pakistan border was charging people to use his amateur radio (it looked like a Yaesu FT-840 to me?) to talk with relations and friends in the war zone who had access to similar equipment. I am told that the frequency display read 7.425MHz and I believe that transmissions of this type have been heard on that frequency on u.s.b.

It also appears that they may have altered the frequency a bit and could also be using 29.000 u.s.b. and 29.730MHz u.s.b. as well. Now what will the Afghan amateur radio authority have to say about that I wonder... Oh I forgot - there isn't one, or any other kind of authority either which is why the opposing forces are using marine band hand-held radios to insult each other's mothers across the front line.

A cellular alternative?



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My Life Enhanced

It had to be done... I bought a Kenwood TH-F7E. I felt that my life would be enhanced by it's ownership. And I was right. Believe it or not there are actually modifications for this radio already. A few of these excellent little scanner/transceivers have been purchased by friends of mine and one of them, a brave soul, has already carried out the mod which involves removing two tiny components from the minute circuit board. He has 20/20 vision and tells me that he had to call for a big magnifying lens so that he could see what he was at.

The mod worked and the A band of the radio now has extended coverage across the v.h.f. and u.h.f. ranges. This presents some advantages in that the set will now transmit on PMR446 and other commercial frequencies. The other advantage to scannists is that the A band now covers the 150MHz range which, for instance, enables the A band to monitor v.h.f. marine band and the B band to hear h.f. frequencies (5.680 u.s.b. perhaps) simultaneously.

A very useful modification, but one that I don't have the eyesight to attempt, (let alone hands steady enough - it's all the wine). It, of course, invalidates the warranty. I have suggested to Iain that he may consider modding my set for me, but he has now realised just how close he came to melting his F7E and is considering reversion therapy.

Going Green

Finally, BT Cellnet seem to be getting all green. Some of their masts have been seen to have jolly little bird nesting boxes bolted to them. The boxes are cunningly labelled

with the BT Cellnet logo just so that the dicky birds know just who's providing their accommodation. Alternatively, it could be evidence that BT are losing confidence in the product and are considering training up carrier pigeons to replace some of their cellular services.

I remember being surprised about thirty years ago when I discovered that the British Transport Police were using pigeons to transport some of their written communications. Yes, this would be around the time that NASA were concluding their moon missions. You remember, they used to have live TV from the moon! Even now all these years later I reckon that we are still playing catch up in the communications field.

Happy New Year.

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Page: 1

CFS NUMBER: 011103-450
DATE/TIME SENT: Sat Nov 03 09:48:34
10:54:58
DATE/TIME REC'D: Sat Nov 03 09:47:38
DATE/TIME CMPL: Sat Nov 03

INC CODE DESCRIPTION: CARELESS AND IMPRUDENT DRIVING
INC CODE: TCI IN PROG: INC ADDRESS: U: I70 EB 128MM
APT NO: COL BLDG: CITY: FBN COMP NAME: COL COMM
PHONE: BUS NAME: COMP ADDRESS:
PRI: 2 HOW REC'D: T RES PHONE: OFF CONTACT:
CALLTAKER: moorem1 PH LINE: WEAPON: ALARM:
DISPATCHER: stephb
FINAL DISPOSITION: R2
PRIMARY UNIT: FLOG
UNITS ATTACHED: FLOG
COMMENTS:
11/03/01 09:47:45 moorem1 Address changed to U: I70 EB 128MM at 09:47
11/03/01 09:48:29 moorem1 TAILGATING, ERATIC SWITCHING LANES,
SPEEDING THROUGH COL, ,GRN PETERBILT T/T NAME OF RUSH TRUCKING, NO
LIC INFO 11/03/01 10:06:54 stephb DISPATCHED
UNIT ACTIVITY ASSOCIATED WITH CALL:
UNIT STATUS TIME
FLOG DISPATCHED 10:07:09
FLOG 10_8 10:28:04

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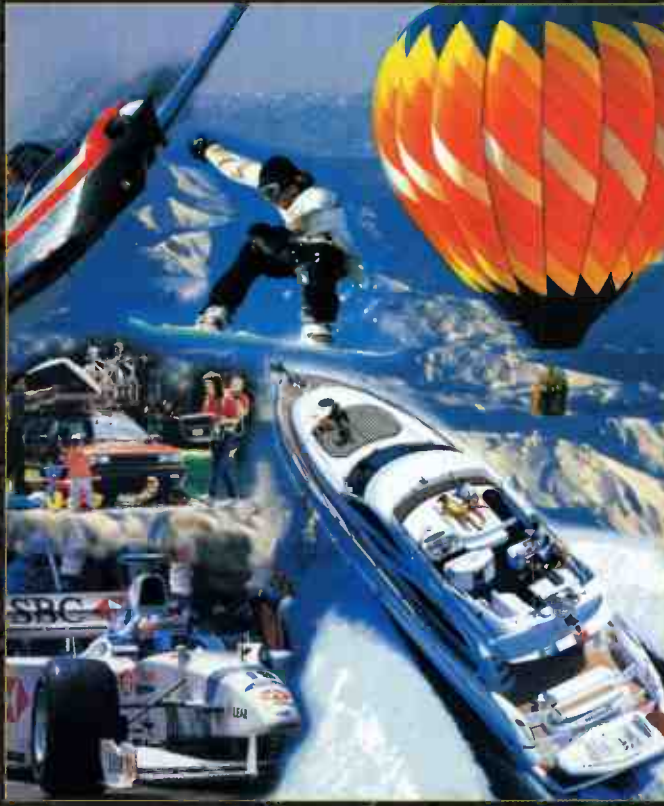
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