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 ON SALE DECEMBER 28
 Next issue on sale January 25



DXTV SPECIAL
 by Keith Hammond & Garry Smith

- 24 WORLD-WIDE TV AT YOUR FINGERTIPS!**
 There has always been a certain fascination for receiving signals which are not normally available. Various hobbies have emerged, one of which is the reception of ordinary broadcast TV signals over vast distances - otherwise known as DXTV.
- 25 DXTV PROPAGATION**
 To some, the most spectacular of all is Sporadic-E propagation, which has a special charm and magic all of its own.
- 29 DXTV - THE COLUMN**
 Keith & Garry provide their DXTV log for October, along with reception reports and a list of useful websites and service information.
- 32 RECEIVING ANTENNAS**
 An efficient antenna is vital for it to be of any use. So, make sure you always use an appropriate antenna for the band you wish to DX on.
- 37 GIVE IT A GO!**
 As with most hobbies, the most difficult step is taking the initial plunge. Keith & Garry show you how.



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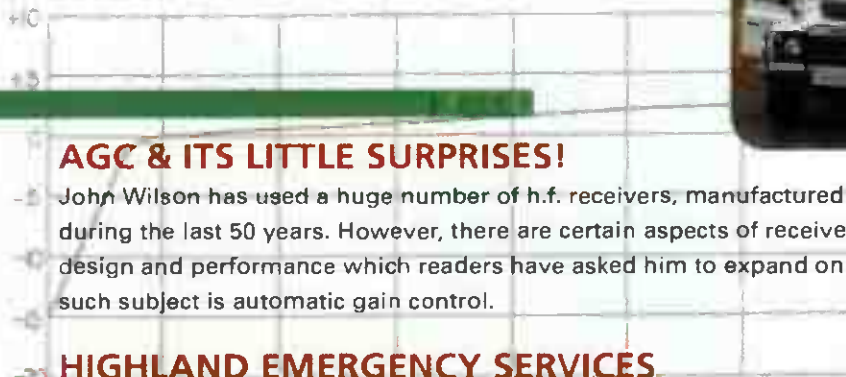
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DECIBELS



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John Wilson has used a huge number of h.f. receivers, manufactured during the last 50 years. However, there are certain aspects of receiver design and performance which readers have asked him to expand on - one such subject is automatic gain control.

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Dave Roberts examines the considerable communications challenge facing the Scottish Highland Emergency Services. A fascinating insight...

COMING NEXT MONTH IN SWM FEBRUARY

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- Timestep HRPT Receiving System Reviewed**



*contents subject to change

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SWM Services

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Subscriptions are available at £25 per annum to UK addresses, £40 in Europe and £44 (Airmail), £50 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £55 (UK), £60 (Europe) and £74 (rest of world), £35 (airmail).

Components For SWM Projects

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

Photocopies & Back Issues

We have a selection of back issues, covering the past three years of SWM. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for SWM are £2.99 each and photocopies are £2.99 per article. Binders are also available (each binder takes one volume) for £5.50 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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Orders for back numbers, binders and items from our Book Store should be sent to: **PW Publishing Ltd., FREEPOST, Post Sales Department, Arrowsmith Court, Station Approach, Broadstone Dorset BH18 8PW**, with details of your credit card or a cheque or postal order payable to PW Publishing Ltd. Cheques with overseas orders must be drawn on a London Clearing Bank and in Sterling. Credit card orders (Access, Mastercard, Eurocard, AMEX or Visa) are also welcome by telephone to Broadstone (01202) 659930. An answering machine will accept your order out of office hours and during busy periods in the office. You can also FAX an order, giving full details to: Broadstone (01202) 659950. The E-mail address is bookstore@pwpublishing.ltd.uk

Technical Help

We regret that due to editorial time strains, 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.

Season's Greetings

Hello and welcome to the January issue of *The Short Wave Magazine*. This year, unlike previously, January's SWM is published a few days after Christmas day, so I can only wish you a belated Merry Christmas. I hope you all were lucky enough to receive some radio goodies in your stocking. I did, but only because I finally treated myself to a TH-D7E hand-held amateur transceiver. I reviewed one in sister magazine *PW*, back in 1999, and was smitten. It's taken this long to save up though! Now I've got one, I can play with APRS in the car. If any of you licensed readers operate an APRS station, keep a look out for me.



well placed to provide us with a 'Bandscan Europe' filled with up to the minute news.

Welcome aboard Martin I wish you a long and happy association with SWM.

CD-ROM

You can't have missed the CD-ROM offer on the cover of this magazine. We are lucky to have had the co-operation of Paul Wey and PROMA which has resulted in us being able to



bring you this incredible collection of scanning information totalling over 400 pages.

If you have even the vaguest interest in Scanning than this CD will certainly be of value to you. I'm sorry, but those of you who don't have a computer that will read the CD, a *Windows*, *Mac* or *Linux* (Unix) computer is required, there is not planned to be a paper version. However, if there were sufficient demand...

New Look

I hope you like the new logo as featured on the cover. John Kitching, our ever patient Art Editor, spent many a troubled hour attempting to come up with a suitable design to satisfy the Editorial team. Thanks for your perseverance John and well done. The result, which combines our original logo from 1937 with a more up-to-date graphic, is in my opinion very pleasing. We've had to change the position of the title because of the way in which magazines are stocked on the shelves in newsagents, though the traditional one is still there this month so that you'll still be able to find us in our normal outlets.

It has been reported to us that some readers may have not been able to find a copy because of our title being obscured. Hopefully then, everyone who wants a copy of *SWM* will be able to find one.

I have some very good news on this front too. I have recently been informed that WH Smiths has increased their commitment in terms of the number of their stores that will stock *SWM*. Our exhaustive 'behind the scene' efforts seems to have to have to be paid off - to those of you that supplied vital feedback about which stores were causing you problems, thanks very much indeed.

Sad News

Very sad news indeed. I was informed early in December that our distinguished and long term author Joe Carr K4IPV had sadly passed away. Joe was a prolific writer and has had many books published here in the UK as well as in his native USA. Joe also wrote for many other UK magazines. I was due to meet Joe early next year on



one of his regular trips to our shores, a meeting I was really looking forward to. On the positive side, Joe's wife Bonnie has given her permission to allow us to publish the rest of Joe's work that we hold.



Finally

For a touch of festivity, I thought that I'd like to share with

you the Christmas card sent to the Editorial Offices by our cartoonist John Worthington, so here it is.

The very best Seasonal Greetings to all our readers and advertisers from every one of us here at *Short Wave Magazine*.

WV 73 Kevin

Martin Peters

This month sees a new regular author join us at *SWM*. Martin Peters takes over from Peter Shore, who has had to retire from being a *SWM* contributor due to pressures of work. Martin is

TOP
QSL**Dear Sir**

Recently, I purchased the October 2000 of your respected magazine and was intrigued to read the details of your visit to the V-Twin rally at Shaftesbury. I am pleased you saw the 'Spectrum Chart' and must apologise for its tatty-ness. Our Radio Society has been operating in the area for a number of years and most recently at Shaftesbury School. However, we moved to the Boys Club in 1999 and had our official Open Day back in February 2000. The event was opened by the Mayor, Mrs Janet Lowe, who I know is an avid supporter of the motorcycle rally, and is very grateful for the charitable fund raising that it carries out.

We like to consider ourselves part of the community and get involved in many local events. Recently we decided to raise the height of our h.f. antenna (a wire dipole) attached at one end to a large tree. Using some lateral thinking and trying to avoid using a projectile (we once used a rocket and frightened a local donkey!) we decided to ask

the local firemen. The Dorset Fire & Rescue Service agreed to assist on their training night and saw fit to require a suitable location for attempting a tree rescue. It caused a bit of a stir with the locals who thought there was really someone in distress in 'our' tree. However, both the Firemen and ourselves benefited from this rather unusual pairing.

Of course we do more 'normal' things associated with the hobby and if you or any of your readers would like more information about our activities, then check out our web site at www.bvars.org.uk or write to us, or indeed pop in if you are passing any Tuesday evening between 1930 and 2200 - we are extremely friendly.

By the way, thank you of your offer of a replacement chart, which we will be only too pleased to accept and display prominently!

Paul Smith G1SNI
Chairman Blackmore Vale ARS
Dorset

Paul, I'm glad you noticed my comments. A new chart is on its way to the club. - Ed.

Dear Sir

Although I have written for *SWM* a few times, I've never felt compelled to respond to a letter in my 'Angry of Darley Abbey' mode until I saw the one from your Australian correspondent about Boat Anchors and the pages wasted in *SWM*.

Apart from the fact the term annoys me, these are either Military or Classic Receivers - you must allow the 'ramblings' of a generation who grew up on the stuff. As a kid, I would have loved to have walked into a franchise dealership and bought the latest kit, happy in the knowledge that they had guys downstairs who could fix or at least humour my whimsical requests for mods where no mod was actually needed.

We learned our craft on that kit. I was lucky enough to end up at Lowes based on that experience. During the Eighties, JW had the foresight to allow his R&D Department free reign to innovate. This gave birth to the HF series of receivers, the HF-150 prompting an industry-wide rethink. When JT, a boat-owner himself, decamped to AOR, innovation went into free-fall, to create the AR7030. And why? We knew what we wanted from the pros and cons of the existing markets and a 'Wish List' from the high performance classics.

As for me, I'm glad to see our radio heritage represented in *SWM*. It gives readers a sense of place, knowing that product development is not a recent thing. So hands off JW. If he did not write as a Boat Anchor Authority, I could not write about spoiling his every effort...

Bob Ellis
Derby

I have only one point to make. Those who don't see the point, read, yes read, John's features and it all becomes clear - Ed.

Short Wave Magazine, January 2001

Dear Sir

With reference to Mr McLellan's letter in the November issue, which you replied to with great restraint...I have to say that I thoroughly endorse your point of view and the day that *SWM* becomes just a catalogue for new black boxes and their accessories, then we should all go home!

I don't believe its what newcomers to radio are looking for either. The reviews of high performance receivers of thirty to sixty years ago are not just fascinating from the point of view of how good analogue technology can perform and 'what a good drive they give', they serve a great practical purpose from the point of view of encouraging readers to obtain affordable equipment that can teach them practically about radio. For example, you can get hold of a classic receiver, be it an AR88, an Eddystone or Hallicrafters, etc. for between £50 and £150 - rather than having to shell out up to £1000 for a new black box!

Where are these young computer buffs Mr McLellan refers to, supposed to get this kind of fancy money from? Once you have a good old set, you can also learn a huge amount by restoring it to its

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.

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S I

You can also submit your letters by E-mail to:
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original performance at your leisure.

I do my s.w. broadcast DXing on an old Eddystone 830-9 which I have enjoyed restoring, also a Zenith Transoceanic B600. I do actually have a 'grey box', a Grundig Satellite 700, which is a great set, but not nearly so much fun to use as the others. So, please let's have more, not less of JW's type of classic receiver reviews please. Keep up the good work!

J. Duckworth
Herts

Dear Sir

Poor sad Mr M.R. McLellan who does not want to read JW's thoughts on the immortal AR88 (*SWM* November 2000). Will someone please tell him that valved sets are alive and well and are not only living in many parts of the country, but will continue to do so long after many of the current black boxes have been consigned to the attic or the 'For Sale' columns. That's why so few of them appear for sale.

In contrast, I see in the November issue that one advertiser says he is selling his new AOR AR8200 MkII "because it is too technical for my old brain". Wise man! Most of these modern boxes are grossly over complex and far too small to use easily.

In my case, I can make little sense of the front panel, logic or manual of my own scanner, a PRO-2039, whereas it has been vastly easier to work out how a complex Russian 17 valve receiver functioned (inside and outside) notwithstanding that the panel, manual and circuit were printed entirely in Cyrillic and I started out not knowing a word of Russian! Such a radio, at least thirty years old, must originally have cost thirty times the price of the scanner and is far nicer to use, even if it is also thirty times the weight!

Michael O'Beirne G8MOB
Surrey

Michael, not all of us have problems coming to terms with our scanners. You just need the correct 'mind set'. I personally find the AR8200, etc. easy to operate. However, controls on modern receivers are not intended to alter the r.f. performance characteristics like those on older sets did. In the main, they are there to ease frequency and mode selection, etc. - Ed.

Communications

Your News

Don't forget to keep sending me information on your new products, (with photographs), as soon as details are released, together with any information on Open Days, Special Offers, new catalogues, RAE courses and general items of news. Remember, mentions are free, so don't delay, send off your news to Zoë today.

radio ACTIVE

Radio Active

For the radio newcomer, *Radio Active*, also from the publishers of *Short Wave Magazine*, has an interesting and packed February issue. Features include 'Batteries not included - the Freeplay story', 'Cooking by Radio - just how this works', a look at the Icom R2 scanner plus the first European review of the Grundig Satellit 800 Millennium portable receiver.

So, if your appetite for radio isn't satisfied after reading this copy of *SWM*, then why not take a look at *Radio Active*, available from all good news agents or direct from the **SWM Book Store**, Tel: (01202) 659930.



Link To Lake

Lake Electronics have recently updated their web site. The site now includes a listing of 'vintage' radio items, books, magazines, valves and components. The range of amateur and s.w.l. kits and equipment includes QRP transceivers, tuners and the popular 'Novice' range. Visit Lake's new site at:

<http://ourworld.compuserve.com/homepages/radkit>

Alternatively, Lake can be reached at: **7 Middleton Close, Nuthall, Nottingham NG16 1BX, Tel: 0115-938 2509.**

Two Courses



Adrian Dening G4JBH has informed the *SWM* Newsdesk of two courses that will be running next year. The first course, entitled **A Scientific Approach To Global Communications** is being run from **16-20th April 2001** and is suitable for anyone with an interest in radio or physics. The course provides a useful revision opportunity for candidates sitting the RAE.

Elements of the course will include: the history of radio and basic electrical theory; what are radio wave and how do they travel; modulation and signal analysis techniques; users of radio spectrum; receivers - ancient and modern; satellites and radio astronomy and computers and their use in the radio environment.

Participants will be able to transmit during the weekend, as operation will be under a special Radio Amateur callsign - **GB2KRC**. Instruction in operating techniques and radio regulations will also be included in the timetable. The five day course costs £194 per adult, with a reduced charge of £161 for students under the age of 18. This

includes accommodation and full board at Kilve Court.

The second course, entitled **Around The World In 48 Hours**, is held **20-22nd April 2001**, and is for students in academic years 7/8. Students will begin by learning about the differences between sound and radio waves and the way in which a multitude of radio transmissions are

propagated around the Earth and beyond.

As well as gaining 'hands on' experience using electronic test equipment for the first time, participants will have the opportunity to speak with and send television pictures to other Radio Amateurs over the air. This weekend course costs £94, which includes accommodation and full board at Kilve Court.

Kilve Court is a Georgian house with modern extensions and facilities, situated in 25 acres of wooded grounds, near the North Somerset Coast - located 19km west of Bridgwater on the A39. The Education Department of Somerset County Council manages the centre.

For further information or to obtain an application form, please contact the Course Director **Adrian Dening G4JBH** on (01288) 331113 (evenings) or via E-mail to g4jbh@compuserve.com

New 17th Edition

The new 17th edition of *Radio Stations In The United Kingdom* (ISBN 09514723-9-9) is now available from the British DX Club. *Radio Stations In The UK* is a comprehensive 56-page directory of m.w. and f.m. radio stations in the UK. It covers all BBC, independent and long-term restricted service licence services and is a must for anyone interested in UK domestic radio - either as a casual radio listener or specialised DXer. This edition again includes a free supplementary guide to radio stations in the Republic of Ireland.

Radio Stations In The UK is available from BDXC's London HQ: **British DX Club, 126 Bargery Road, Catford, London SE6 2LR**. Price per copy: £3 sterling or seven IRCs or \$5 US/DM10. All prices include postage. For airmail outside Europe please add \$1 dollar or one IRC. Payment can be made by: UK Cheque/UK postal order payable to 'British DX Club', Eurocheque payable in pounds sterling to 'British DX Club' or International Reply Coupons. Full details also on the BDXC-UK web site at: <http://www.bdx.org.uk> Address any E-mail enquiries to: bdxc@hotmail.com



New Name

The Portland Amateur Radio Club have now changed their name to the **Swanage & Purbeck Amateur Radio Club** (SPARC for short). Meetings take place at 1930 on the third Thursday of each month at Harmans Cross Village Hall between Swanage and Corfe Castle. Interests of the club are varied. Members are into WEFAX, APRS, c.w., h.f. and, of course, computers. A Morse practice night is held on alternate Thursdays using the club call sign of MOBLJ. Contact **Peter Wakfield (Treasurer/Secretary)** on **(01929) 424413** or write to him at **19 Osmay Road, Swanage BH19 2JQ** for more details.

The Chosen One

Icom (UK) Ltd. are pleased to announce that the US Marine Corps has selected a special, modified version of its IC-446S licence-free, PMR446 radio for use as their new Infantry Squad Radio (ISR). The contract awarded to the company's fellow distributor Icom America, is to supply the US military with more than 13,000 units. The new model - called the IC-4008M - has only one small difference to the IC-446S, and that is that the frequencies have been changed for military use.

The IC-4008M is going to be used by the US military at infantry level to supplement hand and arm signals. This small, lightweight transceiver has an accompanying custom case so that it can be worn on the uniform.

Bob Carey, Vice President of Icom America said, "These are not off-the-shelf IC-446S's, but they're close. The only change made is that they have undergone frequency changes to operate on select US Marine Corps u.h.f. frequencies". Bob further added, "We're very pleased and honoured that the US Marine Corps have chosen Icom for this project. The Icom radio was heavily tested and selected over a field of other competing models".

Icom's IC-446S is built to meet JIS-4 water-resistant standards, so they're perfect for outdoor use. Already built to meet tough military specifications and sporting impressive features such as an automatic transponder system, a 'smart ring' to confirm that a call has been received and a foldaway antenna, the IC-446S has, since its launch, won numerous accolades against other brands of PMR446 radios.

This is not the first time that Icom have been awarded a contract with the US military. Only two years

ago Icom America won a multi-million dollar contract with the US Army for the provision of a 22000 quantity of IC-F3S v.h.f. transceivers - being supplied by specific Ranger, Airborne, Air Assault, Light Infantry and Mechanised Infantry units.

Icom (UK) Ltd. can be reached at **Sea Street, Herne Bay, Kent CT6 8LD, Tel: (01227) 741741, FAX: (01227) 741742** or check out their web site at: **www.icomuk.co.uk**

New Release

Yaesu are pleased to announce the VR-5000 wide-band all-mode receiver, which will provide general coverage reception from 100kHz to 2600MHz and operate in c.w., l.s.b., u.s.b., a.m., a.m.n., a.m.w., n.f. and w.f.m. modes.



Some new features include a bandscope, smart search, 2000 memory channels, plus a special bank of pre-programmed short wave broadcast band stations for quick tuning. There are currently no release dates in the UK, but it is expected by January 2001. Contact Yaesu at **Unit 12, Sun Valley Business Park, Winnall Close, Winchester, Hants SO23 0LB. www.yaesu.co.uk**

Maurice Jackson G2FMU

News has just arrived of the death of Maurice Jackson G2FMU who passed away suddenly on the 23rd November, aged 77. Maurice will be remembered by several generations of radio amateurs in and around his home town in Lancashire as a major influence in their lives, not only in his knowledge and encouragement of the hobby, but more for his wisdom and advice on how to build a life worth living by steering a straight course and instilling a sense of good citizenship in all who met him.

Maurice Jackson served in the Royal Navy during WW2 as a radar specialist officer, returning to England and becoming director of a prominent local radio company from which he retired some years ago. His exceptional knowledge as a professional in the electronics field was accompanied by a huge ability to convey that knowledge in a simple and direct form, and I shall be eternally grateful that I was privileged to work for and with Maurice Jackson in my early career. For large numbers of radio amateurs and enthusiasts, many of whom owe their careers to Maurice, the world will be a sadder place. Maurice Jackson lived respected, and has died regretted.

John Wilson G3PCY

Joe Carr K4IPV

Joseph J. Carr was born on November 5, 1943 in Washington DC. He grew up in Arlington, Virginia, and graduated from Washington-Lee High School in 1961. He attended Old Dominion University in 1969 where he met his wife Bonnie. They were married Dec. 26, 1969.

Joe was an electronics engineer who published more than 85 books and 700 articles since 1968. His books include popular books on electronics and technology, college level textbooks and professional technical/reference books and two books dealing with the holocaust. Joe also wrote popular monthly columns and feature articles in US magazines such as *Popular Electronics*, *Popular Communications*, *Nut n Volts* and *73*, plus magazines published this side of the Atlantic; *Short Wave Magazine*, *Elektron Electronics*, *Electronics World/Wireless World*, recently *Practical Wireless* and others. His works have been translated into Russian, Bulgarian, Swedish, Spanish, French, Dutch and German.

Joseph J. Carr received a Masters of Science in Electrical Engineering from George Washington University and a Bachelor of Science degree from the University of the State of New York (Regents College). He worked as a biomedical engineer for GW University Hospital, the FDA and as an engineer in avionics for Nav-Air, with experience in radar, electro-optics, sensors, open systems, computing and other disciplines. Prior to receiving his BS in 1978, he worked as an electronics technician for sixteen years. Most recently he worked as Head, Systems Engineering Branch, Marine Corps System Command. Joseph Carr left behind a loving wife, Bonnie, two children, Bucky and Julianne, and granddaughter, Amani Desirée Muntu.

He will be missed dearly.

rallies

January 21: The Oldham ARC Rally takes place today at Queen Elizabeth Hall, Civic Centre, West Street, Oldham, Lancs. All the usual traders will be in attendance. Bring & Buy, Morse tests on demand, refreshments and free parking. Doors open at 1100, 1030 for disabled visitors. Talk-in on S22. Geoff on **(01706) 846143** or E-mail: **m1aug@thersgb.net** or **Mike** on **(01706) 846143** or E-mail: **m1cvi@thersgb.net**

January 28: The Horncastle Amateur Radio, Electronics & Computer Fair is to be held at the Horncastle Youth Centre, The Old School, Cagthorpe, Horncastle, Lincs, (nr Horncastle Police Station). Admission just 50p. There will be Morse code tests and refreshments available. Information and bookings taken on **(01526) 860320** or **(07778) 274535**

February 4: The 16th South Essex ARS Radio Rally will be held at the Paddocks (situated at the end of the A130), Long Rd, Canvey Island, Essex. Doors open at 1030 and featured will be Amateur Radio, Computer and Electronic Component exhibitors. Home-made refreshments, free car parking with space outside main doors for disabled visitors. Details from **Brian Bellamy G7IIO** on **(01268) 756331** or E-mail: **briang7iio@yahoo.com**

February 11: The 10th Northern Cross Radio Rally takes place today at Thornes Park Athletics Stadium, Wakefield, West Yorkshire, just out of town on the Horbury road. Easy access from M1 J39 & J40 well signposted and with talk-in on 144 and 430MHz. Doors open 1100 (1030 for disabled and Bring & Buy). Usual attractions plus Morse tests on demand. **John G7JTH (01924) 251822** or E-mail: **rally@sandalmagna.demon.co.uk** Web site: **http://www.sandalmagna.demon.co.uk/rally/**

February 11: The Cambridge & District ARC Annual Radio, Computer Rally & Car Boot Sale takes place today at a new venue - Lurdsbridge Arena, Wimpole Road, Barton, Nr. Cambridge, opposite Mullards Radio Observatory on the A603 off J12 on the M11. Doors open 1000 for disabled visitors, 1030 general public. Admission is £1 50, £1 OAP/disabled and Under 14s free. Talk-in on S22. **Bob G0GVZ** on **(01223) 413401** or E-mail: **bob.grimes@btinternet.com**

February 11: Harwell ARS Radio and Computer Rally - Didcot Leisure Centre, Mereland Road, Didcot, signposted from A34. Talk-in on S22. car park, admission £1, doors open 1015 (disabled)/1030, trade stands, Bring & Buy, special interest groups, licensed bar, light refreshments and disabled facilities. Details from **Ann G8NVI** on **(01235) 816379** or E-mail: **annstevens@compuserve.com**



Bandscan Europe

To begin, thanks to Peter Shore for holding the Bandscan Europe torch up to now. Peter's will be a tough act to follow so here goes. A few words about me. Ten months the wrong side of 40; two kids, one wife, one rabbit; I've held an amateur radio licence since 1975 and been interested in all things radio since I was an egg. I work for BBC Monitoring at Caversham, near Reading.

Netherlands

So to business. Peter's tailpiece, so to speak, touched on the fact that Diana Janssen, co-presenter of Radio Netherland's excellent *Media Network*, was to leave.

In a surprise move, the station subsequently announced that the programme was to be dropped from their schedules with almost immediate effect. This is a great shame as, let's face it, a significant quantity of material carried on the world's external services can be pretty droll. *Media Network* broke the mould and delivered a fast-paced, well produced half hour of material of interest to short wave listeners.

It's not all bad news. The programme survives as a 'webzine'. Those of you with access to the Internet may wish to check this page on Radio Netherland's website - www.rnw.nl/realradio/index.html

Amsterdam, and commercial radio operators are fighting the regulatory body and its plans to auction off frequencies to the highest bidder. In years gone by, the Dutch government, having allocated frequencies to the state broadcasters, maintained that no more spectrum was available for commercial stations. They finally bowed to pressure and the commercial sector has thrived. Now these same radio stations will have to bid for their own frequencies and competition will be hot, with interest shown from the likes of Britain's GWR. A number of the incumbents, being small concerns, will be unable to match the bids of the conglomerates and are, not surprisingly, crying foul. The case continues.

Change At The Beeb

Closer to home the BBC announces plans for five new national radio services to run alongside Radios 1 to 5 and World Service. This, from their recent press release.

The new streams, available only in digital homes, will include a black music and news-based station aimed at young people; a station that draws on the BBC's unique archive of musical performances and interviews; a speech service offering drama, comedy, more archive classics and even programming for children.

In addition to these completely new services there'll be enhancements to existing ones. 5 Live Sports Plus will be an extension of the sports services currently offered by Radios 4 and 5. A national Asian network, building on the success of the BBC's Leicester-based service, completes the bouquet.

TV also gets a going over with the proposed scrapping of BBC Choice and Knowledge channels in favour of four new replacements - one entertainment, one cultural and two aimed at children. The plans await approval from the Secretary for Culture, Media and Sport and if all goes well, the services could start in the spring.

Crossed Field

Long wave radio from the Isle of Man took one step closer late September, with the completion of the public planning inquiry into the installation of the antenna. The proposed site is near Cranstal at the north of the island. The evidence has now gone the Inspector and he will be advising the government of his recommendations. In the event of a favourable outcome, work on the site, with its Crossed Field

Antenna (CFA), could start soon.

Talking of the CFA, in-situ demonstrations of this revolutionary device were due to take place from Telford, Shropshire, on 1143 and 936kHz with 1 - 2kW. The antenna is only a fraction of a wavelength high yet claims to have gain characteristics not dissimilar to a full quarter-wave mast radiator.

Several antennas are already up and running in Egypt but there is still a significant number of sceptics. Only when independent comparative tests have been carried out, fears of a high-level, technical scam can be finally laid to rest. That said, proving the system with 'low' power on medium wave is very different to persuading the CFA to function with a 500kW on long wave - watch this space.

Digital News

The Radio Authority announced November, that the licence for the Humberside digital multiplex has been awarded to EMAP - the sole applicant. In addition to BBC Radio Humberside, the raft of pop music stations on offer range from Classic Gold to Xfm - a total of eight in all. Perhaps I, along with the rest of the UK's population, won't buy that DAB tuner just yet.

From digital doldrums to digital delight with news that Rupert Murdoch's Sky TV empire is set to sign up their five millionth satellite subscriber around mid-November. Amazingly, well over four million homes are now digital, which means that Sky's analogue downlinks from the Astra 1 constellation are set for shut down in June.

Unfortunately for satellite enthusiasts, over on the Astra 2 digital platform, even the nominally free channels such as the BBC programming are soft-encrypted, requiring the purchase of a dedicated Sky receiver. If and when ITV finally signs up for distribution via Astra, it's "Goodbye OnDigital", and unqualified world domination, it would appear, for Messers Murdoch & Co.

Other News

What else has happened? Well, the people's revolution came and went in Serbia. Watch out for the re-emergence of their external service on short wave as they gain access to their transmitter site in Bosnia - 6.100, 9.620 and 11.870MHz were used in the past. The board at Eutelsat (no doubt with Uncle Sam's say so) has agreed to embrace Serbia, once more, to the fold. *Hotbird @13°E* would seem to be the favourite for this.

Finally

News from Moscow that Russia's federal troops have perfected a system designed to eliminate (literally) pirate radio broadcasters. Successfully trailed in Grozny, it is capable of detecting an offending transmission's precise location - from up to 3000km away - so that an artillery or missile and bomb strike can be inflicted upon the area. With it, the Feds have detected and eliminated several guerrilla radio stations. I wonder if the British Authorities will catch wind of this - Sunday morning hobby pirates take note.

And finally, finally - have a wonderful Christmas and a happy and peaceful new year.



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

LM&S

Since this is the first edition of 'LM&S' for 2001 I begin by wishing all readers a very Happy New Year. Throughout the year reports on reception will be very welcome here for inclusion in the data - please post them to reach me at the above address during the first week of the month following reception.

The reports for this issue were compiled during October. Quite a few of them were rendered 'no longer applicable' by the changes which the international broadcasters made to their short wave transmission schedules on October 28. Some of those changes have been included in the data herein and since 'LM&S' is based upon actual reception more of them are likely to be reported in the next few months.

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.

A broadcast from Bod, Romania on 153kHz was picked up on October 18 by Sheila Hughes (Morden) whilst on holiday in Winchelsea, Sussex. A man talking quickly in Romanian was heard under co-channel DLF via Donebach, Germany at 2015UTC - it rated SINPO 22222. Sheila says "I am always thrilled to pick up Bod, Romania on 153 and being further south and on the coast I had a feeling I might be lucky whilst on holiday and I wasn't disappointed." While there Sheila compiled an interesting log - see chart.

Commenting upon reception in this band during October Eddie McKeown (Newry) said "It was the best it has been for months". He logged seldom reported Bod, Romania on 153 as 22322 at 0025. Strangely, Gufuskalar, W.Iceland on 189 was weaker than usual - 24112 at 0030. His ratings for some of the other stations using this band were: Donebach on 153 - 35232 at 1542; Allouis 162 - 45344 at 1542; Bolshakovo 171 - 24112 at 2052; Oranienburg 177 - 22122 at 1543; Saarlouis 183 - 44444 at 1543; Droitwich 198 - 55555 at 1544; Munich 207 - 24111 at 1544; Roumoules 216 - 34233 at 1746; Polski R-1 225 - 44243 at 1747; Beidweiler 234 - 44243 at 1545; Kalundborg 243 - 32222 at 1746; Burg 261 - 32332 at 2050; Topolna 270 - 25122 at 0839; Sasnovy 279 - 35233 at 1745.

On the 31st, co-channel interference was observed on DLF via Donebach (500kW) on 153kHz at 2045 by Fred Pallant (Storrington) - it came from Bechar, Algeria (1000kW) which shares that frequency. Co-channel interference was also noted on DLF via Munich (500kW) from Azilal, Morocco (800kW) - both share 207kHz.

Medium Wave Reports

A report on m.w. transatlantic reception in the opposite direction was sent along by Mike Stonebridge (St.Lisidore, Canada). He says "Earlier this evening [23 October] there was an opening to Europe from my location here in northern Alberta. I heard audio on 864, 1053, 1107, 1377 and 1386. 836 was very faint, could just make out a man talking above the noise. 1107 was similar, though music could be heard underneath the talking. 1503 had faint music on it. 1314 was playing swing music, so probably Kvitsoy. On 1377 I could hear very faintly a female singing, language unknown. The best reception was on 1386 which had a man and a woman having a discussion and I made out a phone number, which gave a UK STD code. The language was English and they would talk for a few minutes and then play a pop record. Long deep fades, typical of transatlantic reception, were the norm".

Mike detected carriers on 25 other frequencies around midnight UTC. After several hours 1377 produced enough audio for him to identify it as French - probably Lille (300kW) but his reception on 1386 remains a mystery.

There were no reports of transatlantic reception here in the UK but the band was searched after dark by

some listeners for the sky waves from stations in the Middle East, N.Africa, Europe and Scandinavia. Some of their logs were quite extensive - see chart.

An improvement in propagation was evident and Eddie McKeown was surprised to log a number of stations under high powered regulars. After 0700UTC Brian Keyte (Gt.Bookham) heard Torshavn, Faeroe Is on 531; BBC R-4 via Plymouth 774; BBC R-5 via Towyn 990; also BBC Wales via Llandrindod Wells 1125, all of which were inaudible to him in recent months.

In a very welcome first report Jochen Groh (Plauen, Germany) has drawn attention to Hof and Wursberg on 729kHz (ex 520kHz); also Dillburg (Nurnberg) on 801kHz - all of which rate 55555 with him 24-hours a day. Listeners in the UK may well have difficulty in picking up the sky waves from them after dark because a number of stations in other countries share those frequencies.

The local radio scene attracted the attention of some listeners and the ground waves from several remarkably distant stations were received. After a gap of many months Brian Keyte found that BBC Cornwall via Redruth and Bodmin (630 & 657kHz); BBC R.Aberdeen on 990; ILR Valley's R. Ebbw Vale 1116; ILR Downtown R, Belfast 1026; ILR Tay AM via Dundee and Perth (1161 & 1184) were audible again.

Over on the Isle of Wight George Millmore (Wootton) picked up the ground waves from sixty stations including BBC Asian Netwk, Leicester on 837kHz (SIO 433); ILR R.XL, Birmingham 1296 (SIO 333); BBC Peterborough 1449 (SIO 211); BBC Merseyside 1485 (SIO 222). No doubt the clear sea paths account for the potent signals he received from BBC R.Jersey on 1026 (SIO 555) and R.Guernsey on 1116 (SIO 444), which are seldom logged by most other DXers.

Whilst on holiday in Torquay Simon Hockenull (E.Bristol) took the opportunity to search the band - see chart. He noticed that ILR Plymouth Sound AM is now using the ident Classic Gold, Plymouth 1152.

Short Wave Reports

No doubt many listeners will be glad that Deutsche Welle (DW) have included the 25MHz (11m) band in their winter schedule. Their broadcast on 25.740 (Ger to S:SE Asia? 0800?-1600?) reaches our shores most mornings. It was rated 35433 at 0935 by Vic Prier in Colyton, 44334 at 1020 by Bernard Curtis in Stalbridge and 25433 at 1126 in Storrington. Over in E.Canada Alan Roberts (Quebec) logged their transmission as 55555 at 1600UTC. DW may well be interested in reception reports from any area - send them to Radio Deutsche Welle, D-50588 Kohn, Germany.

The daily broadcasts to E.C.Africa by R.France International (RFI) on 25.820 (Fr 0900-1300UTC) could be heard here during October and early in November, so it seems likely they have been reaching the intended target area well and will continue during the winter period. Their transmissions have been received almost every day in Quebec - it rated 45444 at 1230UTC on October 26th. Reception here is variable because back scatter and other unreliable modes are involved. The SINPO ratings noted in the latest UK reports were 45533 [with echo] at 0900 in Colyton; 33333 at 1010 by Robert Connolly in Kilkeel; 44334 at 1020 in Stalbridge; 35533 at 1106 by Simon Hockenull in E.Bristol; 25443 at 1128 in Storrington; 34232 at 1142 in Newry; 35343 at 1135 by Peter Pollard in Rugby; 35343 at 1155 by Fred Wilmshurst in Northampton.

The 21MHz (13m) band has been included in quite a few of the winter schedules. R.Australia's broadcast to Pacific areas via Shepparton on 21.725 (Eng 0200-0900) has been audible here some mornings. It was rated 24222 at 0725 by David Edwardson in Wallsend & 32443 at 0835 in Colyton. From 0900 they broadcast to Asia via Shepparton on 21.820 (Eng 0900-1400). Their transmission was rated 43333 at 0955 by Stan Evans in Herstoncoeur; 33333 at 1105 in Stalbridge; also 22222 at 1305 by Thomas Williams in Truro.

Also mentioned in the reports were R.Norway Int. 21.725 (Norw to ? 0900-0925), rated 34333 at 0900 in Storrington; R.Pakistan 21.465 (Ur, Eng to Eur) 34333 at 1015 by Tom Winzor in Plymouth; R.Denmark via R.Norway 21.725 (Da to ? 0930-1000) 34333 at 0930 in

Storrington; R.Ext.Espana via Noblejas 21.570 (Sp to S.America 1000?-1700) 35333 at 1047 in Newry; Vatican R, Italy on 21.850 (Various to Lat.America?) 55455 at 1140 in Rugby; Swiss R.Int via Sottens 21.770 (Eng, Fr, It to Asia 1100-1330) 34433 at 1154 by Rhoderick Illman in Oxted; DW via Sri Lanka? 21.790 (Ger to Far East 1000-1355) 25242 at 1206 in Rugby; UAE, Dubai 21.605 (Eng to Eur 1330-1350) 44444 at 1345 by David Hall in Morpeth; Channel Africa, Johannesburg 21.725 (Eng to Africa, Eur? 1300?-1455) 35444 at 1339 in Northampton; BBC via Ascension Is 21.660 (Eng to Africa 1400-1700) 33333 at 1405 in Kilkeel; RAI Rome 21.520/21.535 (It (Football Comm)) 55545 at 1432 in E.Bristol; BBC via Cyprus 21.470 (Eng to Africa 1300-1700) SID 555 at 1500 by Tom Smyth in Co.Fermanagh; WYFR via Okeechobee, USA 21.525 (Eng, Fr to Eur, Africa 1600-1900) 33222 at 1640 by Sheila Hughes in Morden; R.For Peace Int (RFPI), Costa Rica 21.815 (Eng [u.s.b.] to N.America 1200-?) 44444 at 1830 in Quebec, Canada.

Noted in the 18MHz (15m) band were R.Denmark via R.Norway 18.950 (Da to M.East? 0830-0855), rated 35522 at 0840 in Colyton; R.Sweden 18.960 (Eng, Sw to N.America 1230-1430?) 54444 at 1227 in Plymouth; R.Denmark via R.Norway 18.950 (Da to N.America? 1230-1300) 45433 at 1242 in Northampton; WYFR Okeechobee, USA 18.980 (Eng to Africa, Eur 1600-2200?) 44444 at 1940 in Rugby; Christian Science BC via WSHB Cypress Creek 18.910 (Fr, Eng to E.C.Africa 1700?-2000) 55545 at 1950 in Stalbridge.

R.New Zealand's broadcasts to Pacific areas in the 17MHz (16m) band have reached the UK quite well most mornings. Their 100kW transmission from Rangitiki, N.Island on 17.675 (Eng 1850-0705) was rated 43333 at 0655 in Herstoncoeur. However, during the evening the propagation conditions are much less favourable and far from reliable. At best their transmission was 22222 at 1935 in Truro.

R.Australia's broadcasts to Asia have also been reaching the UK in this band. Their transmission from Shepparton on 17.750 (Eng 0000-0500, 0600-1100) was rated 34443 at 0725 in Wallsend & 14321 at 1047 in E.Bristol.

Also mentioned in the reports from UK listeners were R.Pakistan, Islamabad 17.520 (Ur, Eng to Eur) rated 34443 at 1021 in Plymouth; R.Sweden 17.870 (Eng to SE.Asia? 1330?-1355) 45444 at 1336 in Northampton; Vatican R, Italy 17.515 (Eng to Asia? 1345-1405) 34343 at 1355 in Newry; R.France Int via ? 17.620 (Eng to Africa? 1400-1456) 44444 at 1415 in Kilkeel & 44434 at 1443 by Tony Hall in Freshwater Bay, IoW; Vatican R, Italy 17.515 (Eng to Africa 1730-1800?) 45434 at 1740 in Colyton; Channel Africa via Meyerton 17.870 (Eng to W.Africa 1800-1830?) 44444 at 1800 in Morden; WHRI via Maine, USA 17.650 (Eng to Eur, M.East, Africa 1600?-2200) 44434 at 1853 by Vera Brindley in Woodhall Spa; HCJB Quito, Ecuador 17.680 (Eng to Eur 1900-2200) 55444 at 2000 by Clare Pinder in Glasgow; R.Nederlands via Bonaire, Ned.Antilles 17.605 (Eng to Africa 1830-2025) 44434 at 2010 in Rugby; BBC via Ascension Is 17.830 (Eng to Africa 0800-2100) 43444 at 2025 in Stalbridge.

Listeners -

- (A) Simon Hockenull, E.Bristol.
- (B) Sheila Hughes, while in Winchelsea.
- (C) Eddie McKeown, Newry
- (D) George Millmore, Wootton, IoW
- (E) Fred Pallant, Storrington
- (F) Tom Smyth, Co.Fermanagh.
- (G) Fred Wilmshurst, Northampton



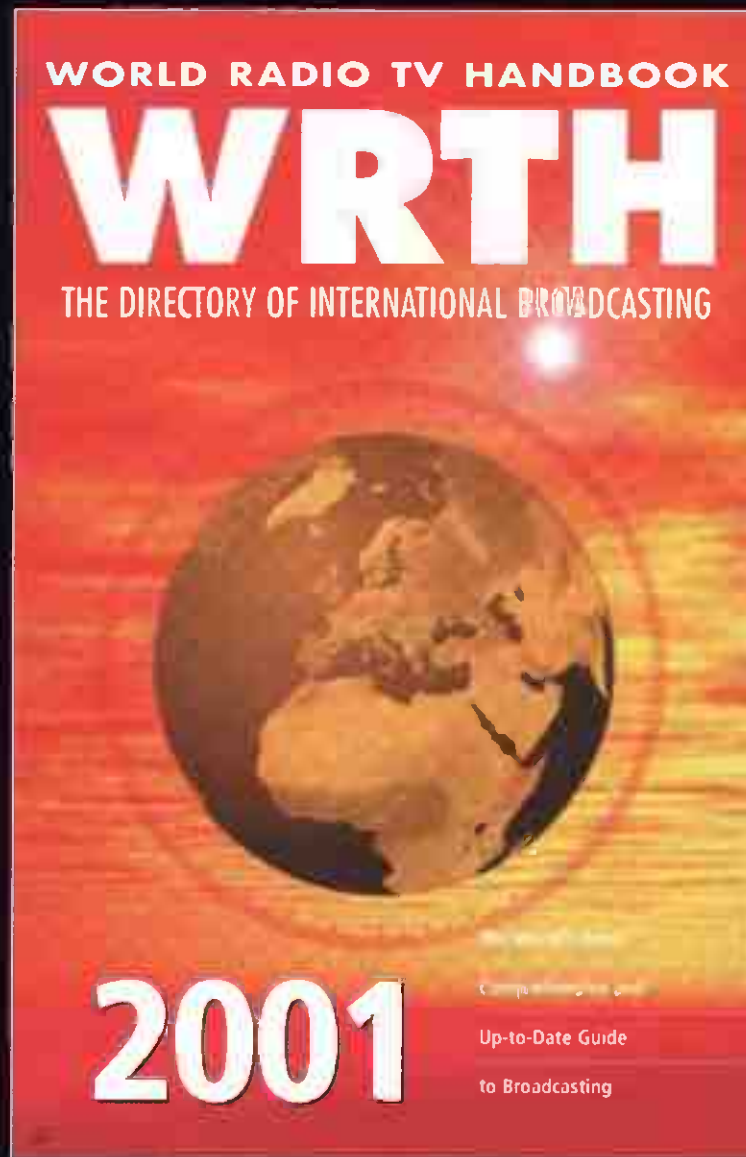
Long Wave Chart

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	E*
153	Donebach DLF	Germany	500	E*, C, D, F, G
153	Alal	Benin	1200	B*, A*
162	Allouis	France	2000	E, C, D, E*, F, G
171	Nador Med-1	Morocco	2000	E*
171	Stshlovc etc	Russia	1200	C*
177	Oranienburg	Germany	500	F*, C, D, G*
183	Saarouis	Germany	2000	E, C, D, E*, F, G
189	Gufuskalar	W.Iceland	50	C*
198	Droitwich BBC	UK	500	E, C, D, F, G
207	Munich DLF	Germany	500	F*, C, D, E*, G*
216	Roumoules RAI	S.France	1400	F*, C*, D, E*, F, G
225	Polski R-1	Poland	1	A*, B*, C*, E*, G*
234	Beidweiler	Luxembourg	2000	B, C, D, E*, F, G
243	Kalundborg	Denmark	300	E, C*, D, E*, G
252	Arabic 252	Iran	500	D*, F, G
261	Burg (RFPI)	Germany	85	A*, C*, D, E*, G*
270	Topolna	Czech Rep.	1500	A*, C, D, E*
279	Sasnovy	Belarus	500	C*, D, E*

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

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Tropical Bands Chart					
Freq (MHz)	Station	Country	UTC	DXer	
4.860	AIR Delhi	India	1643	L	
4.885	R Cl. de Co Para	Brazil	0404	E, H	
4.885	R Difusora Acrona	Brazil	0020	A	
4.890	KBC East Sea Nairobi	Kenya	1840	E	
4.890	R-1 Port	via Gabon	1400	H	
4.900	R Port Moresby	Pap N Guinea	1954	I	
4.935	Pakistan BC	Pakistan	1627	I	
4.905	Anhanguera	Brazil	0530	E	
4.915	ABC-1 Accra	Ghana	2:25	A, H, L	
4.915	KBC Cent Sea Nairobi	Kenya	1702	E, I	
4.920	AIR Chennai	India	1645	I	
4.935	KBC Gon Sea Nairobi	Kenya	1703	E, I	
4.940	AIR Gwahat	India	1641	I	
4.950	AIR Srinagar	India	1641	A, I	
4.950	VOA via Sao Tome	Sao Tome	1927	D, I, J, K, L	
4.950	R Cima	Dominion Rep	0545	E	
4.975	R Uganda, Kampala	Uganda	1957	E, H, L	
4.980	Ecos del Toros	Venezuela	0005	A	
5.005	R National, Bata	Eq Guinea	2017	D, I	
5.005	R Nepal, Kathmandu	Nepal	1622	A, I	
5.009	R TV Malagasy	Madagascar	2125	H	
5.010	AIR Thiruvananthapuram	India	0945	A, L	
5.020	La V du Sahel, Niamey	Niger	1936	D, I	
5.025	R Roselde, Habana	Cuba	0043	A	
5.025	R Uganda, Kampala	Uganda	2127	H	
5.035	R Bangui	C. Africa	1947	A, L	
5.047	R Togo, Lome	Togo	1940	A, H, L	
5.050	Hania 1 V of Strait	China	1850	I	
5.050	R Tanzania	Tanzania	2037	H, L	

Dxers:			
(A)	Robert Connolly, Killeel	(H)	Eddie McKeown, Newry
(B)	Bernard Curtis, Strabridge	(I)	Fred Pallant, Stranorlar
(C)	Stan Evans, Herstonceux	(J)	Clare Pinder, while in Appleby
(D)	Bill Griffith, W London	(K)	Clare Pinder, while in Glasgow
(E)	David Hall, Morceath	(L)	Vic Frier, Colyton
(F)	Simon Hockenhill, E Bristol		
(G)	Roderick Illman, Oxted		

There is much to interest the listener in the **15MHz (19m)** band. During the morning R. New Zealand's broadcast to Pacific areas on **15.175** (Eng 0705-1000) may reach the UK. It was rated 34433 at 0705 by **Gerald Guest** in Dudley & 33333 at 0950 in Truro. This is followed by a programme for troops in E. Timor (Eng 1000-1200).

R. Australia's broadcasts via Shepparton have been reaching the UK during the early morning on the following frequencies: **15.151** (Eng to Pacific, N. America 0200-0700) rated 44434 at 0650 in Herstonceux; **15.240** (Eng to Pacific areas 0000-0900) 44343 at 0838 in Northampton; **15.415** (Eng to Asia 0100-0400, 0600-0900) 43334 at 0845 in Stalbridge.

Also mentioned in the reports were the Voice of Armenia, Yerevan **15.270** (Various to Eur, M. East [Eng 0940-1000] Sun) rated 44333 at 0945 in Morden; **WWCR Nashville, USA 15.685** (Eng to N. America, Eur 1200-2200?) 33433 at 1505 in Morpeth & 44444 at 2035 in Rugby; R. Netherlands via Madagascar **15.595** (Eng to S. Asia 1430-1625) 24332 at 1620 in Newry; **VOIRI Tehran, Iran 15.084** (Home Sec relay) 45534 at 1735 in Colyton; **WEWN via Vandiver, USA 15.745** (Eng to Eur 1100-2100) 44444 at 1850 in Woodhall Spa; **VOA via Greenville, USA 15.580** (Eng to Africa 1800-2200) 44444 at 2112 in Freshwater Bay, IoW; **RCI via Sackville 15.325** (Eng to Eur, N & W. Africa 2100-2130 Sun) 44444 at 2123 in Oxted; **RAE Buenos Aires, Argentina 15.345** (Ger, Sp to Eur, Africa 2100-0000) 54554 at 2100 by **Bill Griffith** in W. London & 35533 at 2244 in Wallsend; **BBC via Ascension Is 15.400** (Eng to Africa 7-2300) 45433 at 2202 in Northampton.

Noted in the **13MHz (22m)** band during the morning were Swiss R. Int via Julich, Germany **13.635** (Fr, Ger, It, Eng to Africa 0600-0800) rated 22222 at 0730 in Morden; R. Australia via Shepparton **13.605** (Eng to Pacific 0800-1200) 24212 at 0902 in Newry; **Vatican R. Italy 13.765** (Eng to Eur? 0900?-1200 Sun) 33333 at 1000 in Truro.

Later, **Vatican R, Italy 13.765** (Eng to Africa 1730-1800?) was 31442 at 1745 in Colyton; **RCI via Sackville, Canada 13.650** (Fr, Eng to Eur, Africa 2000-2200) 44444 at 2015 in Stalbridge; R. Netherlands via Flevo **13.700** (Eng to Africa 1830-2025) 44444 at 2017 in Freshwater Bay, IoW; R. Havana Cuba **13.750** (Eng to Eur 2030-2130) 33233 at 2100 by **Clare Pinder** in Appleby; **WWCR Nashville, USA 13.845** (Eng to Africa 1400-0100) 24433 at 2149 in Oxted; **VOA via Selebi-Phikwe, Botswana 13.710** (Eng to Africa 1800-2230) 35444 at 2205 in Northampton.

R. Australia has also been reaching the UK in the **11MHz (25m)** band. Their transmissions from Shepparton were received on the following frequencies: **11.880** (Eng to E. Asia 0900-1100, Sat/Sun), rated 22222 at 0935 in Truro; **11.660** (Eng to Asia 1330? 1700) rated 44444 at 1500 in Morpeth & 34322 at 1620 in E. Bristol.

Also mentioned in the reports were **VOA via Tinian 11.995** (Eng to 7 0800-1000) 34434 at 0845 in Stalbridge; **World Harvest R. (WHRI) via Maine, USA 11.565** (Eng to Africa 0700-?) 45544 at 0901 in Northampton; R. Netherlands via Irkutsk **12.065** (Eng to Asia, Far East 0930-1025) 43333 at 1000 in Morden; R. Jordan via Al Karanah **11.690** (Eng to W. Eur, E. USA 1100-1400) 44344 at 1315 in Freshwater Bay, IoW; R. Netherlands via Tashkent **12.070** (Eng to S. Asia 1430-1625) 34443 at 1430 in Newry; R. Kuwait via Kabb **11.990** (Eng to Eur, N. America 1800-2100) 44333 at 1814 in Woodhall Spa; **AIR via Bangalore 11.620** (Eng to Eur 1745-1945) 44333 at 1825 in Colyton; **Voice of Israel, Jerusalem 11.605** (Eng to Eur, N. America 2000-2030) 55555 at 2000 in Appleby; R. Damascus, Syria **12.085** (Eng to America? 2130?-2205) 34333 at 2133 in Oxted.

R. Australia has also been reaching the UK in the **9MHz (31m)** band. Their transmission from Shepparton on **9.475** (Eng to Asia 1400?-1730?) was rated 45533 at 1435 in E. Bristol.

During the morning Swiss R. Int via Montsenery, Fr. Guiana **9.885** (Eng It, Ger, Fr to

Local Radio Chart					
Freq (kHz)	Station	ILR	e.m.p (kW)	Listener	
558	Spectrum, London	I	0.80	E, F, H, J	
595	R Solway	B	2.00	A, H	
603	Capital G, L. Torne	I	0.10	D, E, F, H, J	
630	R Bedfordshire (BCR)	B	0.20	B, D, E, F, H, J	
630	R Cornwall	B	2.00	A, C, E, F	
657	R Chwyd	B	2.00	A, E, F, H, J	
657	R Cornwall	B	0.50	A, C, E, F	
666	CI Gold 666, Exeter	I	0.34	A, B, C, E, F, J	
666	R York	B	0.80	A, E, H	
725	BBC Essex	B	0.20	D, E, F, H, J	
738	Hereford/Worcester	B	0.097	A, E, F, H, J	
756	R Cumbria	B	1.00	A, F, G, H	
756	The Magic 756 Powys	I	0.63	A, E, F, H, J	
785	BBC Essex	B	0.50	A, D, E, F, H, J	
774	R Kent	B	0.70	D, E, F, J	
774	R Leeds	B	0.50	H	
774	CI Gold 774 Glos	I	0.14	E, F, J	
792	CI Gold 792 Bedford	I	0.27	E, F, H, J	
792	R Fylde	B	1.00	A, I	
801	R Devon	B	2.00	A, B, C, E, F	
828	CI Gold 828 Luton	I	0.20	E, J	
828	Magic 828, Lincs	I	0.12	A, H	
878	Asian Netwk Saugally	B	0.20	A	
878	ZCR CI G Bourne Mth	I	0.27	C, F	
837	R Cumbria/Furness	B	1.50	A, H	
837	Asian Netwk Lincs	B	0.45	A, E, F, H, J	
855	R Devon	B	1.00	A, C, E, F, K	
855	R Lancashire	B	1.50	A, H	
855	R Norfolk, Postwick	B	1.50	E, H	
855	Sunshine 855, Lough	I	0.15	B, E, J	
873	R Norfolk, W Lynn	B	0.30	E, F, J	
936	Brune CG, W. Wilts	I	0.18	E, F, J	
935	Fresh AM, Havas	I	1.00	A, E, H	
945	CI Gold GEM Derby	I	0.20	A, E, H, J	
945	Capital G, Barnsley	I	0.75	A, D, E, F	
954	CI Gold 954 Torquay	I	0.32	E, F	
954	CI Gold 954, W. York	I	0.15	A, C, H, J	
963	Asian Sd, E Lincs	I	0.80	A, H	
963	Liberty R. Hackney	I	0.10	F, H, J	
972	Liberty R. Southal	I	1.00	A, B, E, F, J	
990	R Aberteon	B	1.00	E	
990	R Devon, L. Devon	B	1.00	A, B, C, E, F	
990	Magic AM, Dorchester	I	0.25	F, H	
990	C. G. W. W. Southampton	I	0.09	E, J	
999	C. G. G. F. M. Nutt'ham	I	0.25	E, H, J	
999	Magic 9-99 Pstn	I	0.80	A	
999	R Solent	B	1.00	C, E, F	
1017	C. G. W. ABC, Shropshire	I	0.70	A, E, H, J	
1026	R Cambridgeshire	B	0.50	E, F, H, J	
1026	Duranton R, Belfast	I	1.70	A, I	
1026	R Jersey	B	1.00	C, F	
1035	RTL C. W. F. 1035	I	1.00	E, F, J	
1035	R Sheffield	B	1.00	H	
1035	N Sound 7, Aberdeen	I	0.78	A	
1116	R Derby	B	1.20	A, H, J	
1116	R Guinesey	B	0.50	C, E, F	
1116	Valley R. Ebbw Vale	I	0.50	E	
1152	BC 1152 AM	I	23.50	E, F, J	
1152	Pitly 1152, Manchr	I	1.50	A	
1152	CI G, Plymouth 1152	I	0.32	C	
1152	CI G, Birmingham	I	3.00	J	
1152	R Bedfordshire (BCR)	B	0.10	E, I, J	
1152	Brunei CI G Swaindon	I	0.16	E	
1152	Magic 1161, Gornhill	I	0.35	A, H	
1152	Southern Counties R	B	1.00	D, E, F	
1151	Tay AM, Dundee	I	1.40	F	
1170	Magic 1173 Stockton	I	0.32	A, H	
1170	Capital G Portsmouth	I	0.50	E, F	

None Entries marked * were logged during darkness. All other entries were logged during daylight or at dawn/dusk

Listeners:-
 (A) Robert Connolly, Killeel.
 (B) Simon Hockenhill, E Bristol.
 (C) Simon Hockenhill, while in Torquay.
 (D) Sheila Hughes, while in Winchelsea.
 (E) Brian Kynin, Bookham.
 (F) George Millmore, Wotton, IoW.
 (G) Clare Pinder, Glasgow.
 (H) Harry Richards, Barton-upon-Humber.
 (I) Tom Smyth, Co Fermanagh.
 (J) Fred Wilmshurst, Northampton.
 (K) Tom Willuz, Plymouth.

Australia 0830-1030) was SIO 555 at 0830 in Co.Fermanagh; Christian Science BC via WSHB Cypress Creek, USA **9.860** (Sp, Eng to Eur 0800-1000) 54444 at 0834 in Plymouth; TWR Monte Carlo, Monaco **9.870** (Eng to Eur 0755-0920) 55555 at 0845 in Morden; R.Prague via Litomysl **9.880** (Ger to Eur 1100-1127) SIO 333 at 1056 by **Francis Hearne** in N.Bristol; R.Nederlands via Wertachtal, Germany **9.855** (Eng to Eur 1130-1325) 55555 at 1130 in Newry.

Later, the Voice of Turkey, Ankara **9.460** (Tur to Eur 0800-2200) was 45434 at 1725 in Colyton; Vatican R, Italy **9.645** (Fr to Africa?) 33333 at 1940 in Truro; VOIRI Tehran, Iran **9.022** (Eng to W.Eur 1930-2030) 24333 at 1953 in Oxted; China R.Int via **9.840** (Eng to Eur 2000-2200) 44334 at 2000 in Dudley; R.Cairo, Egypt **9.990** (Eng to Eur 2115-2245) 55444 at 2205 in Northampton; R.Nac del Paraguay **9.735** (Sp 0800-0400) 24552 at 2236 in Wallsend; American Forces R/TV Service (AFRTS) via Sicily **10.940** (Eng [u.s.b.] 24hrs?) 43333 at 2307 by **Martin Venner** in St.Austell.

Some of the broadcasts in the **7MHz (41m)** band are intended for listeners in Europe. Those noted came from Christian Science BC via WSHB Cypress Creek, USA **7.535** (Eng 0400?-1000?) 54445 at 0715 in Stalbridge; WWCN Nashville, USA **7.435** (Eng) 44444 at 0919 in Plymouth; R.Slovakia via Velke Kostolany **7.345** (Eng 1730-1755) SIO 555 at 1730 in Co.Fermanagh; AIR via Bangalore **7.410** (Eng 1745-1945) 35333 at 1900 in Colyton; RAI Rome **7.285** (Eng [News] 1935-1955) 54444 at 1938 in Freshwater Bay, IoW; R.Minsk, Belarus **7.210** (Eng, Ger, Russ? 1930?-2100?) 54554 at 2000 in W.London; V of the Mediterranean, Malta via Russia **7.440** (Eng 2000 2100) 34443 at 2003 in Newry; Voice of Russia **7.340** (Eng) 43334 at 2020 in Stalbridge; R.Polonia (Polish R), Warsaw **7.185** (Eng 2030-2130) 43333 at 2100 in Morden; R.Canada Int via Woofferton, UK **7.235** (Eng 2100?-Sun) 44444 at 2130 in Kilkeel; Voice of Turkey **7.190** (Tur 2000?-2300?) SIO 333 at 2227 in N.Bristol.

Although intended for listeners in N.America the broadcasts

from KTBN via Salt Lake City, USA **7.510** (Eng 0000-1600) rated 33333 at 0505 in Morpeth.

Many of the broadcasts in the **6MHz (49m)** band are intended for listeners in Europe. Mentioned in the reports were R.Japan via Skelton, UK **5.975** (Eng 0500-0600), rated 54434 at 0500 in Appleby & 55444 at 0500 in Glasgow; Deutsch Welle (DW) via Julich? **6.140** (Eng Service) SIO 444 at 0736 in N.Bristol, 45444 at 1432 in Northampton & SIO 555 at 1700 in Co.Fermanagh; R.Vlaanderen Int, Belgium **5.985** (Eng 0800-0830) 44444 at 0800 in Newry; R.Nederlands via Julich, Germany **6.045** (Eng 1130-1325) 45343 at 1140 in Newry; R.Austria Int. via Moosbrunn **6.155** (Various [Ger 1340]) 33333 at 1340 in Truro; R.Prague, Czech Rep. **5.930** (Eng 1700-1727) SIO 555 at 1700 in Co.Fermanagh; R.Austria Int. via Moosbrunn **6.155** (Various [Ger 1800]) 43433 at 1800 in Colyton; R.Japan via Skelton, UK **6.175** (Jap 1700-1900) 55545 at 1815 in Stalbridge; R.Vlaanderen Int, Brussels **5.910** (Eng 1830-1856) 44444 at 1830 in Morden; BBC via Rampisham, UK **6.195** (Eng 0400-0700, 1900-2300) 45434 at 1910 in E.Bristol; RAI Rome **5.970** (Eng [News] 1935-1955) 44444 at 1935 in Morden; Bayerischer Rundfunk, Germany **6.085** (Ger 24hrs) 55544 at 2021 in Northampton; Vatican R, Rome **5.880** (Eng) 44344 at 2106 in Oxted; R.Canada Int via Skelton, UK **5.995** (Eng 2100?-Sun) 34232 at 2116 in Oxted; R.Budapest, Hungary **6.025** (Eng 2200-2230) 43443 at 2200 in Morden; Deutschland R, Berlin **6.005** (Ger 24hrs) 55544 at 2205 in Northampton.

Whilst beaming to other areas VOA via Sao Tome **6.035** (Eng to W.Africa 2000 2300), rated 43443 at 2110 in Kilkeel; BBC via Sackville, Canada **6.175** (Eng to USA 2200-0500) 45544 at 2205 in E.Bristol; R.Nederlands via Bonaire, Ned.Antilles **6.165** (Eng to N.America 2330-0125, 0430-0525) 32223 at 0040 in Stalbridge; WGTG McCaysville, USA **5.085** (Eng to USA 2200-0600) 44444 at 0230 in Moreth; WEWN Birmingham, USA **5.825** (Eng to N.America 2200?-1400?) 44234 at 0410 in Rugby; WHRI South Bend, USA **5.745** (Eng to N.America 2100?-1000) 54344 at 0725 in Stalbridge.



The equipment list will feature in the February issue.

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

- Listeners -
 (A) Joachim Groh, Pflaen, Germany
 (B) Simon Hockenfull, E.Bristol
 (C) Simon Hockenfull, while in Torquay.
 (D) Sheila Hughes, while in Winchesea.
 (E) Brian Kayle, St Bopham
 (F) Eddie McKeever, Newry
 (G) George Millmore, Wootton IoW
 (H) Clare Pinder, while in Appleby
 (I) Clare Pinder, while in Glasgow
 (J) Tom Smyth, Co.Fermanagh
 (K) Fred Wilmshurst, Northampton

Medium Wave Chart				Medium Wave Chart					
Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
521	Ain Beita	Algeria	600/300	G*	1116	Bari	Italy	50	F*
531	Torshavn	Denmark	100	E	1126	La Poubere	Bulgaria	20	F*,G*
531	Berg	Germany	20	F*,G	1125	RNE via ?	Spain	?	G*
540	RNE via ?	Spain	?	G	1126	Blanchard Wills	UK	?	E
531	Berncastel	Switzerland	500	F*,J*,K*	1134	Zdravko (Croatia R)	Croatia	600/1200	F*,G*,K*
540	Wavre	Belgium	50/50	C,D,F*,G*,K*	1134	COPE via ?	Spain	2	F*,G*
540	Uad Benour	Morocco	600	F*,G*	1143	AN via ?	Germany	?	E*
541	Las Ternbes	Algeria	600	D*,G*	1143	COPE via ?	Spain	2	F*,G*
549	Trumut (DUF)	Germany	200	G*,K*	1152	RNE via ?	Spain	10	G*
558	Esopo	Finland	50	F*,G*	1179	Sovaberg	Sweden	600	F*,G*,K*
558	RNE via ?	Spain	?	F*,G*	1188	Kuame	Belgium	5	F*,G*
567	Talmonart (RTT)	Fin	500	C,D*,E*,F*,G*,J*,K*	1188	Szabolcs	Hungary	125	F*,G*
567	RNE via ?	Spain	?	G*	1197	Virgin via ?	UK	?	F*,G*,J*,K*
576	Munack (SDP)	Germany	500	F*,G*,K*	1205	dordeux	France	100	B*,F*,G*
576	Bremona (RNEC)	Spain	50	G*	1215	Virgin via ?	UK	?	G*,J*,K*
585	Paris (FP)	France	8	G*	1224	Vidin	Bulgaria	500	G*
585	Vladiv (RNE1)	Spain	200	B*,F*,G*	1224	Wolfsdal	Holland	50	F*
595	Trumut (BBC Scot)	UK	7	F*	1233	Nitra	Slovakia	40	F*
594	Frankfurt (HR)	Germany	1300/400	D*,F*	1233	Virgin via ?	UK	?	F*,K*
594	Muga	Portugal	100	G*	1242	Monsieille	France	150	B*,F*
603	Lyon	France	300	B*,D*,F*,G	1242	Virgin via ?	UK	?	F*
603	Seville (RNE5)	Spain	50	F*,G*	1251	Hamburg	Netherlands	10	F*,G*
603	Newcastle (BBC)	UK	2	E*,F*	1260	SER via ?	Spain	?	F*,G*
602	Athens (RTT?)	Greece	100	B*,C,E*,F*,G*,J*,K*	1269	Nieuw-oster (DJI)	Germany	600	F*,G*,K*
612	Sebas Agou	Morocco	300	G*	1278	Dublin (RTT?)	Ireland	10	C,D*,E*,F*,G*,J*,K*
612	RNE1 via ?	Spain	10	G*	1287	RTE via ?	Czech Rep	?	F*,G*
621	Wavre	Belgium	80	B*,C*,F*,G*,K*	1287	Lentac (SR)	Spain	10	F*,G*
630	Barcelona (OCRI)	Spain	50	F*,G*	1286	Villemard (COPE)	Spain	10	G*
630	Vigra	Norway	100	F*,G*	1286	Ordnings (BBC)	UK	500	E*,F*
630	Turis Djerdid	Tunisia	600	F*,G*	1305	RNE via ?	Spain	?	F*,G*
630	Prabal (Libice)	Czech	1500	F*,G*	1314	Kvitav	Norway	1200	B*,C*,F*,G*,K*
630	RNE1 via ?	Spain	?	F*,G*	1323	W. Braun (V.Pussiat)	Germany	1000/50	F*,K*
640	RNE1 via ?	Spain	10	F*,G*	1332	Rome	Italy	300	C,G*
640	Catanzaro (BBC)	UK	500	C,E*,F*,G*,K*	1341	Imagorvay (BBC)	N.Ireland	100	B*,D*,E*,G*,J*,K*
647	Napoli	Italy	120	F*,G*	1341	Tamara (RF)	Spain	2	G*
647	Madrid (RNE5)	Spain	20	F*,G*	1350	Canarys (Caldga)	Latvia	50	F*,G*
657	Wolfsdal (BBC Wales)	UK	2	E*,F*,J*,K*	1350	Madrid (RNE-FS)	Spain	600	B*,F*,G*
666	Moskirch (Rund SWF)	Germany	150	F*,K*	1366	Frankfurt (MNS-FS)	Is of Man	20	B*,E*,G*,J*,J
666	Silvane (Lithuan)	Lithuania	500	F*,K*	1377	...	France	300	C*,G*,K*
666	Porto	Portugal	135	F*,G*	1386	Bolshevik	Russia	2500	D*,F*,G*
671	HO (RF)	Holland	120	D*,F*,G*,K	1395	Filake	Albania	1000	F*
681	S. Il (RNF?)	Spain	500	F*,G*	1396	Lopk	Netherlands	120/40	C*,F*,G*,K*
681	Avana (Croatia I)	Yugoslavia	2000	F*,G*	1404	Bunt	France	20	C*,G*,K*
693	London (BBC)	UK	150	G	1413	RNE5 via ?	Spain	?	F*,G*
693	Ernst (BBC)	UK	1	J	1422	Helmwetter (DL)	Germany	1200/500	F*,G*,K*
707	Frankfurt (NR)	Germany	3	F*	1422	Vain era	Latvia	50	F*
707	TWR via Monco Carlo	Morocco	300	G*	1440	Monmouth (RTI)	Luxembourg	1200	C*,F*,G*,K*
711	Bilmes	France	300	C*,F*,G*,K*	1449	Rudess (BBC)	UK	2	E*,G*
720	Lisaga (BBCA)	N.Ireland	10	G*	1458	Filake	Albania	500	G*
720	Staz	Tunisia	200	G*	1467	Monia (Calk) (VWR)	Mexico	1000/400	D*,F*,G*
720	Loth Rd (BBCA)	UK	0.5	A	1467	Vovodard	Russia	25	E*
720	Loth (RTT)	France	10	C,E*,F*,G*,J	1478	Winn Rimmberg	Austria	600	D*,F*,G*
725	Het-Spale (BR)	Germany	0.5	A	1485	SER via ?	Spain	?	D*
725	W. rzburg (BR)	Germany	0.5	A	1491	Clement-Ferrand	France	20	C,D*,F*,G*,K*
725	RNE1 via ?	Spain	?	F*,G*	1491	St.Petersburg	Russia	1200	B*,D*,F*
738	Paris	France	4	G	1503	Rom	Italy	2	D*
738	Barcelona (RNE1)	Spain	500	F*,G*	1512	W. Hermann	Belgium	200	C,D*,F*,G*,K*
747	Rind (Mhz, Z)	Holland	400	C*,F*,G*,K*	1521	Kopel (Zatice)	Slovakia	800	F*,G*,K*
756	Braunschweig (DLF)	Germany	800/200	F*,G*	1530	Vatikan R	Italy	159 450	C,E*,F*,G*,K*
756	Redruth (BBC)	UK	2	F*,G*,J	1539	Montingon (EFF)	Germany	363/300	D*,F*,G*,K*
765	Sutans	Switzerland	500	F*,G*	1557	Nico	France	30	B*
774	Frankfurt (BBC)	Ireland	1	F*	1575	Genova	Italy	5	G*,K*
774	RNE1 via ?	Spain	?	F*,G*,K*	1576	SEF via ?	Spain	5	F*,G*,K*
774	Pf. Michael (BBC)	UK	1	E	1598	Hofzenberg (VCA)	Germany	150	F*,G*

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Off The Record

The Radio Authority is taking a close look at what they call Access Radio, in effect this is community non commercial radio with an emphasis on the broader aspects of education and social welfare matters. The implementation of these stations would involve new government legislation, the Radio Authority hope to bring a new imaginative and creative expansion to the most successful radio medium. Their aim is to create another strata to radio broadcasting not covered by existing ILR and BBC stations.

Not to be outdone, the BBC are considering making their local stations more local, many can be described as regional at the moment. The question of frequencies for both of these proposed new services have yet to be revealed.

Radio One Raided

Alas no, Broadcasting House did not forget to renew their licence for its pop station. According to Mike Terry of the British DX Club, the Radio One in question is at Austin, Texas, in the USA, and is one of the many micro-radio stations (f.m. pirates to us) that are popping up all over the place in the States.

Officers from the Federal Communications Commission accompanied by the state police raided their studios during October. No arrests were made, even though staff were on site, however all equipment was removed by enthusiastic agents, one of which even climbed their 14m tower to reach the antenna. Radio One at Austin broadcast on 94.3MHz and had been on air 24-hours a day for six months, a spokesman for the station said they planned to return.

Internet Radio

After last quarter's mention of the Internet, I received a mixed bag of mail - some for Internet radio and some against. I will concede that it is not exactly DX, but it does give a choice of stations that would be virtually impossible to hear on your radio.

I have recently joined BT 'Surf Time' that gives an inclusive rate for ISP connections at off peak times. So I can enjoy listening to these stations without running up extra units on my 'phone bill. You can get a list of Internet radio stations at www.internetradiolist.com - also the over 50s Saga holiday company have a middle of the road music station at their website www.saga.co.uk click on Prime Time Radio.

In some areas this is available on DAB. I have heard Dave Gillbee on air, he was known as Dave MacKaye during the days of offshore radio, working with Radio City and Britain Radio/Radio 355. Another source of on-line radio stations can be found at www.live365.com where provisions exist for you to run your own Internet radio should you wish.

Channel Travel Radio

This information radio station was located at Folkestone's Channel Tunnel Terminal and was established by Eurotunnel as an eight year RSL on 107.6MHz to benefit all cross channel travellers. It was opened about six years ago with programmes presented by ex-pirate personality Roger Day together with ambitious plans to extend the service on the M20 as far as Maidstone. These targets were never achieved, not did the service ever even reach Dover Docks.

The information was heavily biased towards the Channel Tunnel as they were paying the bills. They also seemed reluctant to mention the reasons for suspended or cancelled train departures, as they themselves were part of Eurotunnel's public relations department.

After rumours suggesting it may close unless financial backing could be found, it switched off just after midnight on 27 September after a few words of thanks from Station Manager Michaela Segol. Two similar services provided at Heathrow and Gatwick airports closed some years ago in much the same circumstances.

Radiofax Loses Case

Trevor Brook, the owner Radiofax, the one time pioneering technical and media information station, has been unsuccessful in his attempt to overcome UK's monopoly in short wave broadcasting. The court decided that as the British Government had allowed independent radio on m.w. and on f.m., it had fulfilled its obligation to allow competition in radio broadcasting and therefore was not acting against any personal freedom of rights.

After the hearing over which there is no appeal in the Court Of Human Rights, Mr Brook said: "To those with a grasp of what short wave

is, this is an example of comparing apples with oranges. Imagine a fictional country that happened to permit independent radio only on short wave. Would it make any sense to say they should not be required to allow independent stations on medium wave or f.m. He also commented that this raised a separate issue over the monopoly in s.w. broadcasting enjoyed by Merlin Communications and its legality in EC competition laws".

It seems that the Court regard the entire radio spectrum as a single entity with no consideration to the properties different parts of the spectrum actually have. Merlin may well have a monopoly in international short wave transmission in the UK, but taking the spectrum as a whole they are just one broadcaster among many.

One can hardly blame Merlin Communications for this situation they would hardly be brought to their knees by a handful of low powered independent s.w. stations. Also, Merlin are investing in new technology that could reverse the decline in short wave broadcasting and keep some aspects of our hobby going for many years to come.

Radio Pandora

Test broadcasts have been heard from Radio Pandora on 1611kHz around 2100UTC, they claim to be using 20W into a quarter wave wire antenna. I usually find Vatican Radio on this out of band frequency during the evenings. If you tune a bit lower, particularly on Wednesday evenings and at weekends to around 1650kHz, there are usually several Dutch pirates like Radio Barones, Utopia or Mario.

Radio Free London appears to be back to normal having had a series of problems over the summer months. They are still being heard on both 819kHz and 5.805MHz on Sundays. Two Irish pirate broadcast transmitters that left the air some months ago are now back on 549 and 1593kHz - these carry the programmes of United Christian Broadcasters.

Offshore Echo Magazine reports that 1960s Radio Caroline disc jockey Spangles Muldoon, also known as Chris Carey, has been in hospital after suffering a heart attack. He is serving a prison sentence for manufacturing and selling counterfeit satellite television cards.

Future Broadcasting

Harry Richards has written to me asking about the future of analogue radio stations after the impending switch to digital broadcasting? Considering the Radio Authority are continuing to licence new analogue stations, I suspect the change will be very gradual, particularly as there are several competing digital systems requiring different types of receivers.

There is DAB, then WorldSpace Radio, as featured in SWM and DRM (Digital Radio Mondiale) that incorporates a digital code within a standard a.m. signal. On top of this there is Internet radio and also stations carried via TV satellites. I personally find the concept of WorldSpace and DRM most interesting, how about you?

Former Radio Caroline and ILR presenter Roger (Twiggy) Day has let rip in a press article about what he thinks of independent radio and the way it has developed. He says he would expect radio to sound fresh, exciting and entertaining, but maintains that it is so boring and predictable that he no longer listens to the radio while in his car but resorts to playing CDs and mini discs.

Offshore Station Memories

For those that remember the British offshore radio stations and the personalities behind them, there is a very comprehensive and informative website compiled by Jonathan Myer called The Pirate Radio Hall Of Fame. The URL for this is www.offshoreradio.co.uk where there are 130 names, 117 DJ photographs and 80 offshore radio recordings.

Jon tells me that well over a 1000 different people access this site each month. To give myself a plug, I am there under my old radio name of Martin Kayne - complete with a photograph and a recording of myself on Radio 355 reading an advert for Stafford House computer courses during August 1967.

Another new website <http://freespace.virgin.net/line.design/radiorecords> has been established by Chris Edwards - that includes pirate radio documentary records and jingle packages, he says pictures and audio are coming soon.

Other pirate radio memories with a huge selection of pictures can be found at www.gunfleet.com including a brief history of London's Radio Jackie. If that were not enough, there is even a further selection of pirate radio pictures at www.offshore-radio.de



Oh no! Andy's back in a studio!

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Connector-N TYPE

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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)

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)

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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 amateurs 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)

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

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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.)

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AGC and its little surprises!

John Wilson has used a huge number of h.f. receivers, manufactured during the last 50 years. However, there are certain aspects of receiver design and performance which readers have asked him to expand on - one such subject is automatic gain control.

It is true to say that I have sat down and used a fair selection of h.f. receivers manufactured during the last 50 years, and have thoroughly enjoyed the experience, even when slightly disappointed or puzzled by the performance of certain models. When I was asked by the editor of *Short Wave Magazine* if I would write articles on the subject of receivers, I decided that I would try to put myself in the place of an average listener and describe my findings and feelings in everyday language without attempting to baffle anyone.

However, there are certain aspects of receiver design and performance on which readers have asked me to expand, and one of these subjects is automatic gain control (a.g.c. or a.v.c. in older receivers). There's no doubt at all that a good a.g.c. system makes listening to signals of widely varying levels a lot easier on the ear, but it has to be said that there are some a.g.c. systems which do not perform as they should, and the results can be very irritating indeed.

Classic Superhet

In the classic superhet h.f. receiver the input signal from the antenna at a level of a few microvolts is amplified, converted to a fixed intermediate frequency (i.f.) and further amplified before it reaches the stage at which the r.f. is demodulated to provide audio information. Swept up in this ultra simple description are all the alternatives such as multiple signal conversion, signals which are not straightforward audio and so on.

At the end of the i.f. chain, the incoming signal is now at a much higher level, often several volts in amplitude, and this is demodulated and further amplified to drive a loudspeaker or headphones. But this is the case for an antenna signal of a microvolt.

What happens if that signal rises by 60dB or so, in other words from 50 to 59? If the receiver had a linear gain characteristic, the resultant 60dB rise in audio output would blow your head off, so there has to be an automatic reduction of gain between the antenna and the demodulator, the a.g.c. system.

Simplest Form

In its simplest form, the a.g.c. system can derive a control voltage or current from the signal available at the end of the receiver chain and use this to control the gain of one or more earlier stages. Typically in our classic receiver, the r.f. and i.f. amplifiers would be controlled in this way by applying the a.g.c. to the control grid of a valve, to the gate of a single or dual

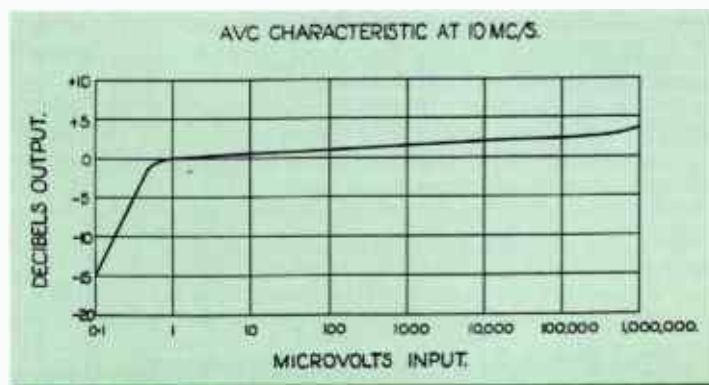


Fig. 1: Steady state a.g.c. response characteristics from the RA17L handbook.

gate f.e.t., or by other means such as control of a PIN diode attenuator.

It all sounds so simple, but there are hidden requirements for this control system. Consider initially what happens to an unmodulated carrier passing through our receiver. If the signal level at the antenna is, say, 10 μ V, there will be a steady control bias on the a.g.c. system.

If the antenna signal now slowly rises by 20dB over several seconds, as might be the case in slow signal level changes over an h.f. radio path, the a.g.c. bias will increase so as to maintain a constant signal level at the demodulator. All well so far, but suppose that instead of a slow rise and fall in signal strength we have a rapid rise and fall such as that caused by amplitude modulation of the received carrier - in other words a normal broadcast signal.

If the a.g.c. system response time is for example less than 1mS, then the gain control will quite happily follow the modulation of the incoming signal and effectively wipe out the modulation, or at least distort it considerably. Already we have to consider the effects of a.g.c. response times on receiver performance.

Time Constants

In order to minimise the peak flattening effect of a fast response a.g.c. system it is necessary to introduce time constants which will allow the a.g.c. to operate on slow fades, but not on rapid amplitude changes, and this is normally accomplished by R/C networks, but there is another aspect to consider. If we introduce time constants which slow down the rise of a.g.c. control at the first onset of a signal, the receiver will be operating at full gain until the a.g.c. rise time has been completed, and this will usually cause severe overload for the first

Continued on page 17...

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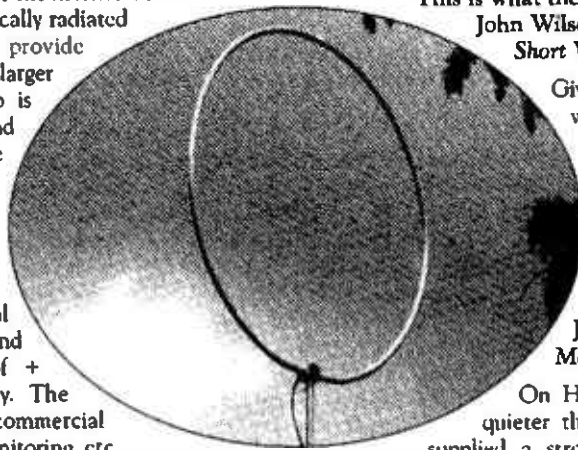
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This is what the experts say:-
John Wilson; November 2000,
Short Wave Magazine

Given the choice between an active whip and an active loop, I would take the loop every time. It is infinitely better than the whip in terms of E-field noise rejection, performs every bit as well if not better than the classic end fed wire, has very useful nulls for rejecting unwanted signals.

Jacques d'Avignon;
Monitoring Times

On HF the Wellbrook loop was not only quieter than my normal wire antenna, but it supplied a stronger and cleaner signal than that supplied by the active short dipole that I had been using for many years.

Supplied complete with Antenna Interface and a PSU.

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Continued from page 15

few milliseconds of signal which manifests itself to the listener as a loud click at the first arrival of the signal.

For a.m. listeners this may not become apparent because the carrier component of the signal is present most of the time, but for c.w. and/or s.s.b. signals the carrier is definitely not there, so each syllable of s.s.b. or each c.w. character would be preceded by a loud click as the receiver overloads.

Some receivers, often of the boat anchor variety, (to quote a recent letter to *Short Wave Magazine*), and usually containing hot thermionic devices (valves to you), tend to handle overload conditions rather better than those of the black box variety, and this is one of many reasons why the old beauties sound so nice in actual operation.

Choice Of Release

So; choice of the rise time (or attack) of the a.g.c. system is very important, but what of the other end of the signal burst? Once again, for a.m. the release time of the a.g.c. is not so critical, but for those signals without a constant carrier, i.e. c.w. and s.s.b., the choice of release (or decay) time is extremely important.

If the a.g.c. control ends at the end of each syllable or character, the receiver gain will immediately rise to maximum and the start of the next syllable will hit the receiver hard, possibly causing overload and clicks. The decay time therefore needs to be chosen such that the a.g.c. control is held between syllables or characters but restores the receiver gain when the sentence or message ends.

A good all-round choice for communications s.s.b. channels is one to two seconds, and this is often what you will find when you select a.g.c. slow on your receiver. However, (I always use lots of howevers) a further choice has to be made by the designer as to the way in which the a.g.c. control decays.

It was for a time fashionable to use what is known as a hang a.g.c. decay characteristic, in which the receiver gain is held at the level which existed at the end of the signal burst, and then switched abruptly back to full gain at the end of the hang period. This can work quite well if the hang time is always longer than the gap between sentences in s.s.b. or word spaces in c.w., but if there is a longer than usual gap between words, as for example when one is listening to h.f. ATCC signals, the sudden resumption of full receiver gain can result in the unsuspecting listener having a heart stopping moment as the receiver audio

erupts with full gain background noise.

I experienced and described this effect in my review of the HF-2050 receiver. Its not pleasant when it happens.

The ideal decay characteristic seems to be one in which the receiver gain is held down during the decay time and then is slowly increased back to full gain afterwards. The shape of the gain recovery curve affects the overall smoothness of the receiver performance, and those designers who get it right will have their receivers admired and respected by the listening fraternity (and sorority of course).

Joy & Despair

That's a very brief overview of a.g.c. systems, so let's go on to a simple question. Given that designers know their subject, why is it that there are such differences in the way various receivers behave in real life conditions? Why do some receivers give joy and others despair? Historically, testing the performance of a receiver a.g.c. system has been done by attaching a signal generator to the antenna input and an audio power meter to the speaker output.

Starting at zero level the r.f. input signal is increased in steps whilst the audio output is measured. Most a.g.c. systems are designed to have a threshold below which no a.g.c. control is developed so that at very low signal levels the receiver operates at full gain. When that threshold is exceeded by the input signal, often at a level of about one microvolt, a.g.c. begins to control receiver gain in such a way as to hold down the rise in audio output level over a very wide input signal range.

The results are usually quoted in receiver specifications as a.f. output level variation over a given input level range, e.g. an increase in signal level of 100dB above 1µV increases the a.f. output by less than 7dB (taken from the handbook for the RA17L). The resultant graph, sometimes included in the specification, is of the shape shown in Fig. 1 (taken from the handbook for another venerable boat anchor - the GEC BRT-400)...

This steady state method seems to be still in use today, but as you will see from my previous comments, it is perhaps not the correct way to assess a receiver's performance under c.w. or s.s.b. conditions, nor indeed under any kind of interrupted signal which does not have a continuous but slowly varying input signal. Following my own experiences with many

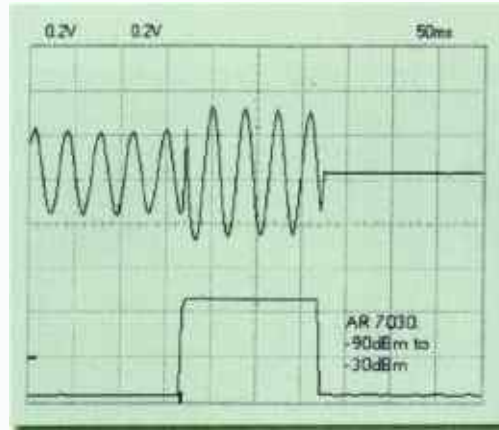


Fig. 3: A near perfect response from a good modern receiver - AOR's AR7030.

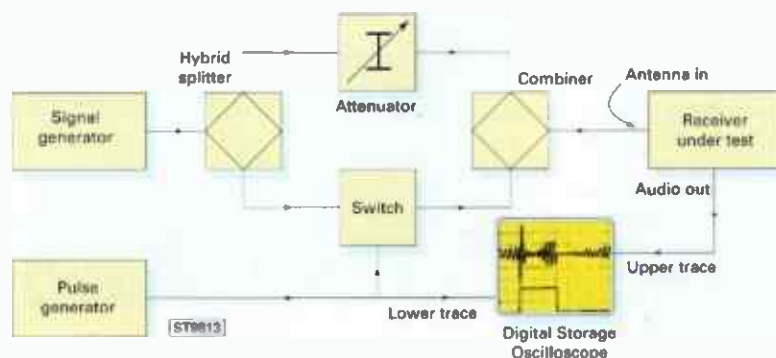


Fig. 2: John's dynamic a.g.c. test arrangement.

AGC and its little surprises

Continued from page 17

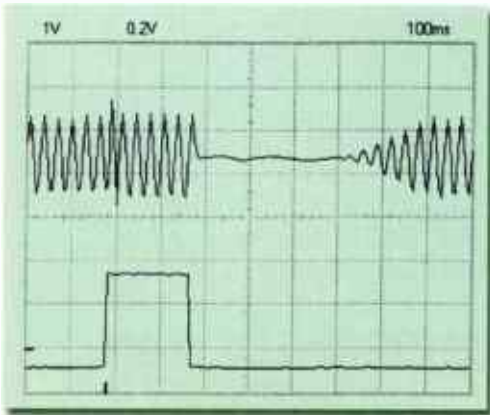


Fig. 4: The Collins 95S-1 has fully programmable a.g.c. characteristics, here's the result with the a.g.c. set to an attack time of 1ms, hang time of 300ms and recovery time of 200ms. It looks nearly perfect, but I noticed a click at the beginning.

receivers, and prompted by a request from a correspondent for more information on a.g.c. performance of reviewed receivers, I set about constructing what I hoped would be a better method of testing the dynamic performance of receivers rather than the static methods previously employed.

Final Test

My final test arrangement is shown in Fig. 2 and consists of a signal generator set to a

fixed level representative of a strong incoming r.f. signal to a receiver. Normally I set this level to produce an equivalent of 20dB over S9 (-53dBm) into the receiver. This signal has to be switched on and off rapidly and for this function I use a MiniCircuits balanced mixer with the signal generator connected to the r.f. input port, the switched signal taken from the local oscillator port and the actual switching pulse fed into the i.f. port as a positive going pulse d.c. coupled relative to ground (it could equally be a negative going pulse w.r.t. ground).

Output from the switch is taken to one input of a hybrid coupler and combined with a second feed from the signal generator fed via a switched attenuator. The attenuator is normally set to give -103dBm or about S4. The reason for switching between two fixed levels and not between no-signal and S9+20dB is that I wanted to ensure that the low level signal into the receiver was above the a.g.c. threshold.

A further advantage of having a constant low level input is that I can introduce fixed level broad band noise into the receiver and see how the a.g.c. responds to a large signal which suddenly appears above the noise level, but that's for the future.

Switching Pulse

The switching signal itself is produced by a fairly standard laboratory pulse generator, and I normally set this to give a signal burst of 150 to 200ms length with a rise and fall time of about 2ms. The leading edge of the switching pulse triggers a digital storage scope and is displayed on one channel, with the audio output from the receiver being displayed on the second channel.

I have taken the precaution of checking that there is perfect time coincidence between the pulse leading edge and the leading edge of the burst of r.f. into the receiver by connecting the r.f. output from the switch into the second channel of the storage scope in place of the audio from the receiver. That's the set-up - what do I hope to see from it?

The top trace in the illustrations is the audio output from the receiver, so for a reasonably sensitive receiver the audio should be clean and relatively noise free. The bottom trace shows the outline of the r.f. burst applied to the receiver input, so with a perfect a.g.c. system the audio output should not show any increase during the time when the r.f. input signal is increased by 50dB, and should show a clean recovery to the original audio level after the a.g.c. decay time when the r.f. level is reduced by 50dB back to its start level.

This is unlikely to be achieved in practice, but Fig. 3

shows the result from a good modern receiver, the AOR AR7030, with a 60dB change rather than the 50dB I quoted above, simply because this particular receiver will easily take a greater hammering than most. You can clearly see the audio output increase at the onset of the 60dB change in input level, but its clean and distortion-free, and is held to an audio increase of about 3.5dB.

At the end of the signal burst the audio output is held low because of the a.g.c. delay so the recovery doesn't show on the trace, but believe me its perfect when the recovery comes along, and you don't need fancy test equipment to prove this, just listen to an AR7030 and you can tell for yourself using the massive God-given computer resident in your skull.

Detailed Measurements

Having been privileged to use the Collins 95S-1 which had fully programmable a.g.c. characteristics, I took the opportunity to do some detailed measurements for our mutual information. Figure 4 shows the result with the a.g.c. set to an attack time of 1ms, hang time of 300ms and recovery time of 200ms. It looks nearly perfect, but I noticed a click at the beginning of each burst of r.f. and when I repeated the test with an attack time of 50ms as shown in Fig. 5 you can clearly see the large audio spike just after the start of the r.f. burst.

Closer investigation revealed that there was a fixed delay of 15ms between the onset of r.f. and the appearance of any a.g.c. action, presumably caused by the digital a.g.c. system in the 95S-1, and this explained my previous experiences when reviewing the receiver when I noticed that the a.g.c. caused severe pumping of the audio output when carrying out the two tone intercept point measurements.

The 95S-1 goes into serious uncontrolled overload for 15ms under strong signal conditions, but this would not show up under the traditional steady state a.g.c. tests. Beware receivers which click at the start of an s.s.b. syllable.

Before leaving the 95S-1 I tried to show the effect of the true hang a.g.c. response by programming a 300ms hang time and 1ms recovery time. Figure 6 will show you how the audio is held down for the hang time and

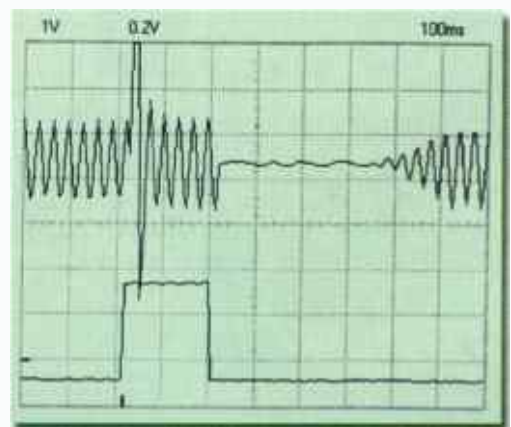


Fig. 5: Collins 95S-1 with an attack time of 50ms, you can clearly see the large audio spike just after the start of the r.f. burst.

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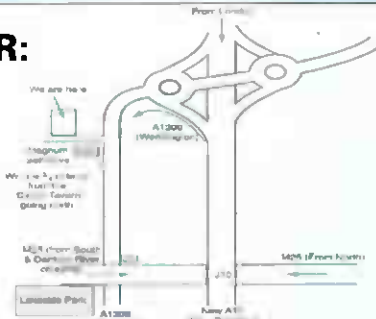
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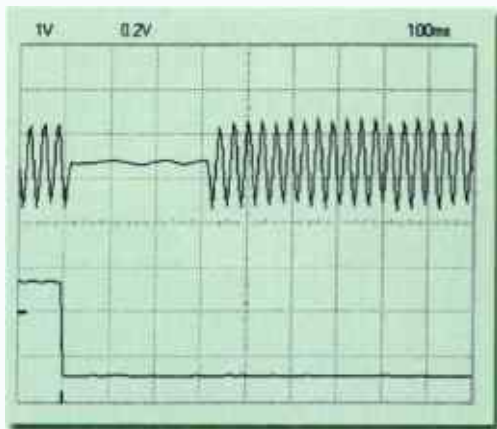


Fig. 6: The Collins 95S-1 and the effect of the true hang a.g.c. response with a 300ms hang duration and 1ms recovery time.

then recovers to full audio with a startling suddenness which causes ringing in the ears for the operator. Not recommended, but this is what happens in the Harris RF-590A as regular readers will remember from my recent review of this particular receiver.

Time To Expand

Readers will also remember my comments on the a.g.c. system in the RA17, so this is perhaps the time to expand on my

findings. Figure 7 shows the results with the RA17 a.g.c. set to short time constant. There is an initial large audio excursion followed by a shut-down of the audio and a final rise to a higher level than the original signal level.

At the end of the burst of r.f. the audio is at a low level (which is acceptable) followed by a slow return to normal audio output. Setting the RA17 a.g.c. time constant to long produced the result shown in Fig. 8 where the a.g.c. system is clearly unable to cope with the onset of the r.f. signal and produces a loud burst of audio followed by total paralysis a most odd effect for the poor listener.

Disabling the a.g.c. completely and using manual gain produced the results in Fig. 9 which shows that the RA17 performs well as a classic c.w. receiver without any a.g.c. control, but some of you may well ask In this case, what is the purpose of a.g.c. at all? Good question - ask Racal. (By the way, Fig. 9, shows the characteristic that was incorrectly portrayed by an erroneously duplicated graph Fig. 3 in John's RA17 feature in December's SWM - Ed.)

The RA17 performance on a.m. is no better. Take a look at Fig. 10 and you will see that the audio output behaves in exactly the same way as when used on s.s.b. As a final observation on the RA17 I have to tell you that I had to reduce the range of the r.f. burst to 40dB (from 93 to 53dBm) in order to get the receiver to produce anything like reasonable results; it simply wouldn't cope with a 60dB step in level, despite the good steady state measurements given in the handbook.

Enough of this complaining. I'm rather sorry I started looking at the RA17 in its early state, and have to say in my defence against the accusation that I am biased against Racal by reminding you that I rate the RA1792 as one of the finest h.f. receivers I have ever used.

Textbook Responses

From my necessarily limited collection of equipment, however, I did locate a receiver which produced textbook responses. Take a look at Fig. 11 which shows a perfect response to a 60dB step in r.f. level. The a.g.c. holds down the audio output rise to less than 2dB with no sign of a click or overload, and at the end of the r.f. burst the system waits for 200ms before bringing back the receiver gain in a smooth controlled manner. This is with the a.g.c. time constant set to fast.

With the a.g.c. set to slow, the graph looks exactly the same except for the longer delay before the a.g.c. brings back the gain to normal. There are loads of receivers I haven't been able to test, but this particular

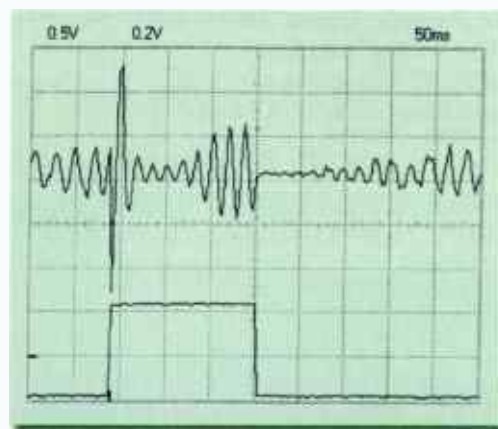


Fig. 7: The results with the RA17 a.g.c. set to short time constant.

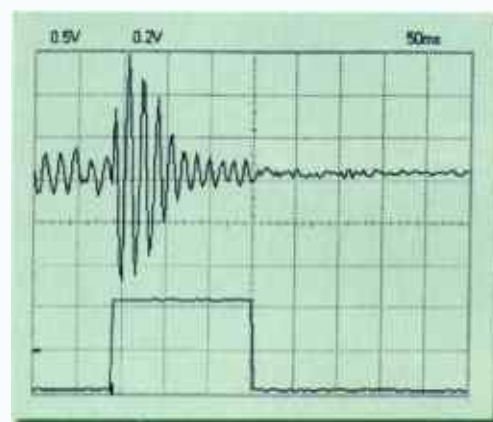


Fig. 8: The RA17 a.g.c. system is clearly unable to cope with the onset of the r.f. signal.

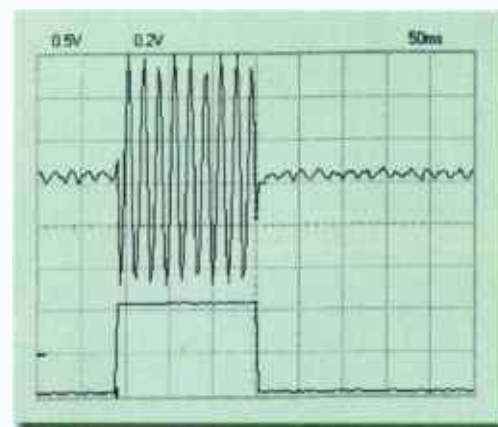


Fig. 9: RA17 performs well as a classic c.w. receiver without any a.g.c. control.

one has always stuck in my mind as being exceptionally nice to use. What is it? Not a Collins, or Racal, or Eddystone, in fact its not just a receiver, but the receiver side of an elderly Trio TS-900 transceiver dating from about 1972.

Trio at that time virtually hand-built the TS-900, intending to demonstrate the very best in design and technology, so its a great credit to that design team that the transceiver still stands out as one of the best ever made. Much of the TS-900 design philosophy

Short Wave Magazine, January 2001

AGC and its little surprises

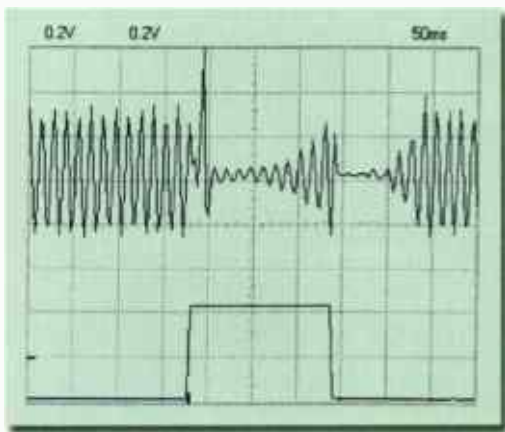


Fig. 10: The RA17 performance on a.m. is no better.

appeared in the later R-820 which helps to explain why that particular receiver still has the facility to surprise the user with its competence.

Important Qualities

What have I shown you? Receivers which vary in a.g.c. performance from dire to almost perfect, and I acknowledge that there are many more factors than the a.g.c. system alone which could have produced the results shown here, such as the overall delay through the receiver, the effect of changing group delay in filters depending on where the received signal is positioned relative to the edge of the filter passband,

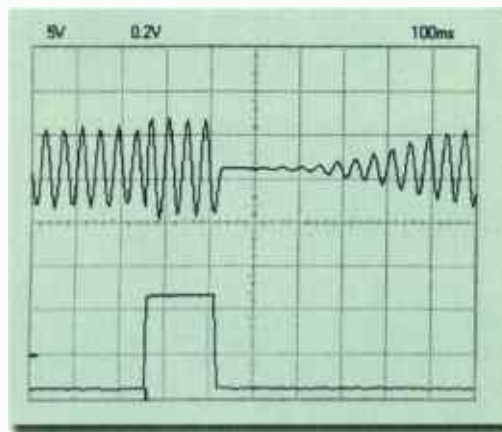


Fig. 11: The virtually hand-built TS-900 showing what could be done in 1972.

general overload performance and so on, but all I try to do is test a receiver as the general user will encounter it and try to locate some of the important qualities which any receiver should offer.

The loud click produced by the Collins 95S-1 for example demonstrates a design failing which should really not have happened, whilst the series of a.g.c. modifications introduced by Racal on the RA17 gives the game away that they did acknowledge that the original design was not fully sorted. As for you, the readers and users, learn to trust your ears and brain.

If a receiver sounds unpleasant or uncomfortable, despite the fact that it might be the very latest offering and full of digital didgeridoos, your ears are probably telling the truth and there's something wrong with it. Then go and buy an RA1792 or Collins 51S-1.

Happy Listening.

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At Your Fingertips!

by Keith Hamer & Garry Smith

Introduction

There has always been a certain fascination for receiving signals which are not normally available. Various hobbies have emerged, one of which is the reception of ordinary broadcast TV signals over vast distances. This is known as DXTV, with 'DX' being the international abbreviation for 'long-distance'.

The most spectacular and productive period for reception occurs throughout the summer months when the ionosphere's E-layer becomes highly volatile. In this article we explore the mechanisms as to how signals emerge sometimes thousands of miles from their intended service areas. Also, we will discuss what equipment is required for successfully resolving pictures and sound.

DXTV Is Born

In the early days of television, viewers were so desperate to receive the new BBC signals from London that receivers were sometimes installed more than 150km away from the Alexandra Palace transmitter. In many cases, reception was intermittent with weather conditions playing their part. It was not uncommon to only receive signals when the sun shone, unfortunately due to the dimness of the c.r.t. on those primitive receivers, sunlight was the last thing the viewer needed!

It was not until more BBC transmitters were installed throughout the country that TV took-off and reception could now be classed as 'local' where extended reception paths were no longer the norm.

In the late Thirties, 405-line BBC television pictures were received across the Atlantic in Long Island, New York. Was this a remarkable achievement? It seems so nowadays, when one considers the number of TV relays which surround us.

However, the transatlantic reception was all down to atmospheric influences - a period of high sunspot activity to be precise. An occurrence roughly every 11 years when the F2-layer becomes highly ionised.

A New Breed Of Viewer

There has always been the technical viewer with desires on receiving additional TV programmes. ITV made this possible in 1955 when the commercial network was established. Unlike the BBC, the ITV network offered regional programming and comprised of several different programme companies, sometimes two per station.

For instance, the Lichfield Channel 8 transmitter radiated ATV programmes on weekdays but ABC at the weekend, providing different faces and different captions. The Croydon Channel 9 transmitter broadcast Rediffusion during the week, but ATV at the weekend.

Due to the regional broadcasting, and also topography, some ITV transmissions overlapped and because many of the programmes were time-shifted this appealed to many viewers. Such viewers could enjoy a repeat of Michael Miles on *Take Your Pick*. Who needed video recorders in those days!

Even though the new broadcasts were on higher frequencies than those of the BBC, 'atmospherics' still affected fringe-area ITV viewers. Settled weather conditions would enhance the signal levels with a thick

pea-souper fog often producing perfect pictures.

Summer-Time Disruption

TV was firmly established by the Sixties and atmospheric influences, which were once accepted by viewers, were not to be tolerated by the new breed of TV society, especially by viewers to Wimbledon. No sooner had Judith Chalmers announced the start of the tennis, BBC-TV screens were wiped out with sloping white lines or the sound was drowned out by a loud rasping buzz. The atmospheric gremlins were at work again!

The disruption was all due to Sporadic-E, which is mainly a summer-time phenomenon. Signals from foreign Band I transmitters were being bounced back from an ionised E-layer some 120km above the surface of the Earth and being picked up by BBC antennas in this country.

Sporadic-E rarely affects Band III frequencies, so in an effort to provide interference-free reception, some transmitters duplicated BBC programmes in Band III. These served areas which would otherwise rely on Channel B2. Its sound channel was 48.25MHz, the same as the European Channel E2 vision frequency, hence the rasping buzz over the BBC sound.

Winter Hill, Emley Moor and Belmont all transmitted BBC programmes in Band III, which were otherwise served by the Channel B2 Holme Moss transmitter. The interference might have been worse. Most UK transmitters opted for vertical polarisation whereas in Europe horizontal was preferred.

In the tabloids, one irate viewer in Ramsgate demanded to know why in this day and age viewers had to tolerate 'foreign TV' interference. Over thirty years on, viewers in Margate and Ramsgate are still suffering, albeit at u.h.f.l

Receiving Pictures

With 405-line TV in Band I, it was common to hear announcements about Continental interference to BBC pictures. Although the signals from distant transmitters across Europe were amazingly strong at times, it was not possible to resolve the pictures simply by adjusting the fine-tuning or any other knobs found lurking, often beneath a flap below the screen. The reason was the differences in the technical characteristics between the TV systems employed throughout Europe and that of the UK.

Throughout Europe, where 625-lines with negative-going video was the norm, viewers in, say, Denmark might have had their local news offerings replaced by a Spanish bullfight with perfect sound and picture without any adjustment whatsoever to their receiver. This was because the two 625-line systems were compatible.

Not so in the UK where a 405-line system was used with positive-going video modulation, hence the masses of sloping white lines. France used an 819-line system, also with positive-going video, so on occasions images could be received on a TV receiver in the UK.

As the number of lines was roughly double, many 405-line time-bases would lock and produce two French pictures side by side. The French and UK sound modulation was similar too (a.m.) so sometimes French sound could be heard, but not accompanying the picture because of differences in the spacing of the carriers.

The UK 625-line system was in many ways similar to systems on the Continent but with a different sound spacing. Unlike in Europe, our 625-line transmissions were confined to u.h.f., when they were introduced in the early Sixties. Before then, the only way Continental pictures could be viewed was to modify an existing 405-line receiver.

405-Line Receiver Modifications

Modifications were somewhat involved. These included the reversal of the vision detector, adjustments to the biasing in the video output circuitry and increasing the line time-base frequency. The latter task could not be performed without problems.

Since the line output circuitry was tuned to a specific frequency for optimum EHT generation, some experimentation with what was known as the third-harmonic tuning was necessary. Dealing with extremely high voltages, you had to know what you were doing.

When dual-standard receivers became available they had all the ingredients of successful reception: a v.h.f. tuner, negative-going vision detection and a 625-line time-base. Although the 625-line section was only operable when u.h.f. was selected, it was a relatively simple matter to make the receiver function on v.h.f. 625-lines by making small mechanical modifications to the system switching.

SWM



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As well as satellite reception the receiver also receives medium wave (522-1620kHz), shortwave 1 (2.3-7.3MHz) & shortwave 2 (9.5-26.1MHz) and FM (87.5-108MHz) broadcasts.

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- * 100kHz - 2599MHz
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 - * Real-time band scope
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 - * 2000 Memories
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AOR 1000A Receiver

The AOR 1000A receiver is an excellent choice for anyone who wants a very complete portable receiver. Features include USB, LSB, CW, AM, FM. Full 50 channel pass search. Gated PEP. 100 memories. Wide range of tuning steps from 50Hz. RS-232C port. 100 memories. Backlit display. Channel pass filter. Backlit memory. Full stereo output. Ask for leaflet.



£749 Plus £7.50 Carr.

Special Offer



£149 Plus £6.00 Carr.

This new receiver covers 30kHz to 30MHz and is designed for SSB, CW and AM reception. A much improved version of the Target HF-3, it is fitted with 2.6kHz SSB filter, advanced mixer design, backlit display, active antenna facility, and computer output. Included in the package is a software disk and 12V AC mains adapter. Optional self-powered active antenna £59.95.

ICOM

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 * Automatic Notch Filter * 101 Alphanumeric Memories * RF Gain/Squelch * Clock * Numeric keypad * Attenuator * 2-level Pre-Amp * Scanning.



£595 Plus £7.50 Carr.

YAESU FRG-100 Receiver



£389 Plus £7.50 Carr.

The FRG-100 has stood the test of time. It offers full coverage of the short wave bands plus long wave and medium wave. It features, * USB, LSB, AM, CW, * 50 memories * 2 stage attenuator * Noise Blanker * Band Scanning * Memory Scanning * Dual Speed AGC * High and low impedance antenna inputs * Programmable steps from 10Hz - 1kHz * Optional Narrow Filters, PSU and FM board * BFO reverse for CW * Twin Clocks. Ask for leaflet.

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. Send for leaflet.



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Phone Plus £7.50 Carr.

This very wide range receiver offers a complete listener station in one package. Features include USB, LSB, CW, AM, FM, Video out * 5Hz step accuracy * Over 50,000 memories with 20 Alphanumeric Characters * Noise Blanker * Text Search * Pass Band Tuning * Stereo CW Reception * Notch & Peak Filter etc.

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100MHz - 1300MHz

Special Mk2 Version

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Phone
Plus £9.00 Carr.

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.



The ideal scanner for those who are mainly interested in VHF and UHF listening. Features include: FM, WFM, AM reception * 200 memories in 10 banks * 20 steps per sec scanning * 6 Tuning steps * Good sensitivity * Supplied with rechargeable n-cads and AC charger. Telescopic antenna included.



AGS-1200 Series 3
100MHz - 1300MHz

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 n-cads, AC charger and helical antenna.

Phone
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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 * N-cad pack, AC charger and helical antenna.



£129
Plus £7.50 Carr.

This lovely little scanner from Yaesu offers superb performance.
* 100kHz 1300MHz
* 1000 Memories
* 100 Step channels 10 Search bands
* 8 Character alphanumeric display
* Band scope Priority monitoring
* PC programmable
* Smart search feature
* Alpha numeric recall
* Size 58 x 95 x 24mm 220g



Sangean AT5-909

£149.95
Plus £8.00 Carr.



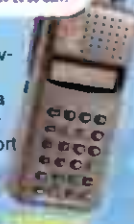
- * AM, USB, LSB, FM
- * 307 Memories
- * Five tuning methods
- * Auto tuning system (ATS)
- * E2 Prom memory back-up

- * AM RF gain control * Radio Data System (RDS)
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HANDHELD SCANNER

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ICOM
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
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Plus £8.00 Carr.

- * Digital multi-band receiver
- * 150-29999kHz, 87.5-108MHz
- * Five tuning methods
- * 54 memory presets
- * FM stereo via earphones
- * Dual time display
- * Signal strength indicator
- * AM wide/narrow filter
- * Adjustable Sleep Timer * Standby function * Adjustable RF Gain
- * BFO (beat frequency oscillator) for SSB and CW
- * Built-in tape recorder, Play, Record, Auto Stop, Normal/CRo2
- * Size 296 x 192 x 68mm * Weight: 200g without batteries



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Plus £8.00 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

W3-Desktop

The answer to those who want to improve the scanner performance using an indoor antenna. Covers 25 - 1300MHz and no noise coax cable terminated with BNC plug. **£49.95**



W5-Mobile Antenna

Just 0.9m high with magnetic base and 4m cable terminated with BNC plug. Covers 25 - 1300MHz and has a built-in check for tower locations. **£24.95**

SWL-DX-100

Covers 1.5 - 30MHz and is 50m long. With 10m under wire back to receive. An ideal general purpose antenna. **£25.95**



QIBS-A100

The world's first scanner to sport two scanning ranges 1.8-13MHz and 1.8-13MHz. It has a built-in antenna and a built-in antenna. **£8.95**



High Quality Coax System

A radio controlled clock at a price only W & S offers! Large display with signal strength indicator, 2 programmable alarms and more. **£9.95**



W3-9200 Weather Station

Self-contained indicating weather forecast pressure with 24-hour history (altitude adjustment), indoor and outdoor temperature, moon phase, time, day week alarm, table or wall mount, AA cells included, plus wires. Linked remote temp sensor. **£79.95**



W3-239

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QIBS-A100

The world's first scanner to sport two scanning ranges 1.8-13MHz and 1.8-13MHz. It has a built-in antenna and a built-in antenna. **£8.95**

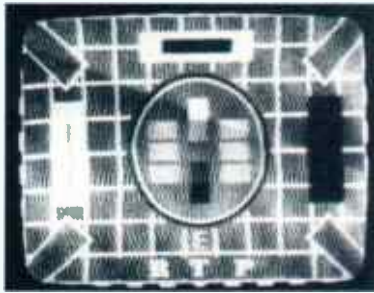


Fig. 6: The familiar BBC Test Card 'E', but this version was radiated by RTP in Portugal during the Sixties and was commonly received in Band I on Channels E2 and E3.

rapid fall-off in activity with perhaps very little reception the following day. Unfortunately, these intense 'super' openings tend to show infrequently, the last dramatic one was in November 1987 when strong u.h.f. signals from several transmitters in Czechoslovakia and Poland lasted more than a day.

Unlike Sporadic-E, reception often falls into a familiar pattern with certain transmitters appearing first. In Central England, for instance, Dutch and Belgian stations initially appear and if the opening progresses, German transmissions from outlets in the north and west of the country will follow. DXers in the north-east often encounter Scandinavian broadcasts first, followed by stations located in northern Germany, but less frequently from Belgium and France.

F2-Layer Propagation

World-wide reception is possible via this form of propagation during periods of high solar activity, peaking at 10 to 11-year intervals (*We are currently at what is expected to be the peak of the present cycle - Ed.*).

Magnetic storms within the Sun's photosphere radiate a tremendous amount of energy which is responsible for ionisation of the F2-layer.

When sufficiently ionised, this layer is capable of refracting signals back to Earth. The

ionisation density of the F2-layer is higher during the winter daytime than in summer when heat causes the gases within the layer to expand thus reducing its overall density. It is during the winter daytime that the m.u.f. (maximum usable frequency) attains its

highest level with the possibility of world-wide reception.

Distortion

Severe video distortion with smeary multiple images is a typical characteristic of F2 propagation. At the start of an opening, the weak pictures can appear relatively clear, but as the signal strengthens, the multiple-image distortion becomes more severe.

At times it is difficult to decide whether a scene is static or moving, let alone be able to identify test cards or captions! Naturally, identifying the source of a likely exotic transmission can sometimes prove difficult, even for the experienced DXer.

Polarisation

For most of the time, signals are by no means weak and can attain levels normally associated with Sporadic-E propagation. Polarisation-shift can occur and experience has shown that a vertical antenna can give improved results, often with greater picture clarity.

During the onset of an F2 opening, signals tend

to rapidly build up from zero-level to a fairly constant maximum strength within a matter of minutes. Similarly, reception can end rather suddenly with a complete fade-out over two to three minutes.

Reception Times

Refraction is most likely to occur when mid-day is approximately half-way between the transmitter and receiving site. This means that signals from the Far East are more likely to be encountered during the early morning from, say, 0700UTC rather than mid-afternoon. Likewise, signals from the West originating in Canada and the USA are more likely to emerge during the afternoon.

Frequencies & Distances

Reception is common on channels E2 and R1 just below 50MHz. Since the F2-layer is much higher than the E-layer, the skip-distance is considerably greater than with Sporadic-E ionisation. Reception distances can easily exceed 4000km.

During the period of activity between October 1988 and March 1992, signals were regularly received from Thailand, Malaysia, China, Iran and Egypt. Australia, New Zealand, Canada and the USA were also received, but less often.

The current F2 cycle has, so far, proved fairly productive. As this article is being written (towards the end of October 2000), strong Channel E2 signals are present with what appears to be lines of Arabic text. In South Africa, one enthusiast has regularly identified most European and Middle Eastern stations during a single opening. This has been possible by paying particular attention to the offset frequencies used by the various broadcasters. Of course, someone has to identify the station in the first place to collect this data.

A Great Circle map of the World is useful for assessing signal direction. (*There are a limited number of these available at £2 inc. P&P - Ed.*) Most enthusiasts find it hard to believe that in the UK, signals from Northern Australia usually arrive from the north-west!

Trans-Equatorial Propagation

This type of propagation is associated with the break-up of the F1 and F2 layers which occurs towards Sunset when they combine to form a single layer some 350km above the surface of the Earth. It is during this breaking up process that signal scattering takes place allowing the reception of Band I transmissions to occur over considerable distances.

Trans-Equatorial Propagation (TEP) normally favours a north-south signal path although east-west paths do occur around the Equatorial regions. Reception via TEP normally occurs within a limit of 40° north and south of the Equator but increased Sun-spot activity can greatly extend the range.

The optimum time for TEP is between 1700 and 1900UTC, although reception during the mid-afternoon is not unknown. The most favourable times of the year to see such propagation is around the equinoxes in Spring and Autumn.

SWM

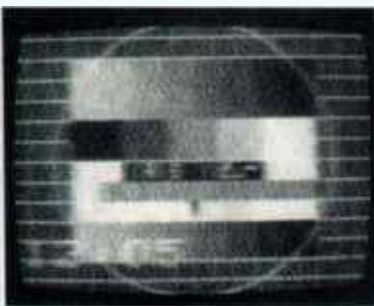


Fig. 7: Long-haul Sporadic-E reception from Iran on Channel E2.



Fig. 9: More F2 reception, this time from an unidentified Channel E2 Arabic station in the Middle East.

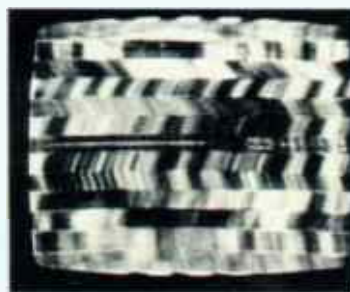


Fig. 8: F2-layer reception in the UK showing the Zimbabwe 'ZBC' PM5544 with multiple images. The E2 outlet at Gwelo is now closed.

KEITH HAMER & GARRY SMITH, 17 COLLINGHAM GARDENS, DERBY DE22 4FS

DXTV (The Column)

Reception Reports

Initial signs of F2 reception occurred on the 26th around 0800UTC when **Tom Crane** (Essex) resolved smeary pictures on Channel E2. Signals were also present on R1 but only at scanner level.

On the 27th, **Peter Barber** (Coventry) witnessed an F2 opening between 0828 and 1145. At 0909, **Stephen Michie** (Bristol) became aware of a cinemascope film with non-Arabic subtitles. Friday prayers, possibly from Iran, were seen at 1125.

On the 28th, signals from south-east Asia were present on E2 from 0820UTC. In the initial stages of the opening, **Peter Barclay** (Sunderland) and **Peter Chalkley** (Luton) saw a man bowing with his hands together, probably Thai in origin. In Derby, Thai lettering was seen among the multiple images around 0845. **Paul Davies** (Leeds) heard 6m amateurs in contact with Malaysia around the time of reception.

By 0830, **Ian Milton** (Ryton) had identified either an Iranian station (IRIB-2) or, most likely, Thailand (TV-3) by its offset of 48.2396MHz. Later, Dubai was tentatively identified by its 48.250MHz offset. The latter signal was noted co-channelling with one on 48.240MHz. Signals on Channel R1/C1 from Russia or China were also received using a scanner.

At one stage, a mystery logo in the lower left-hand corner was seen by **Tim Bucknall** (Congleton), consisting of a small line of Arabic with a small circle behind, not unlike the London Underground logo. Tim also saw Muslims praying.

Towards the end of the opening, a football match followed by the news, from Iran, was seen by several

enthusiasts. At times, an unidentified steady carrier was present on 48.268MHz.

On the 29th, Peter Chalkley witnessed F2 reception for over four hours. In Derby, Syrian (SYR-2) pictures were resolved at 0830. At 0950 on Channel E2, Stephen Michie noticed a programme followed by captions which were not of Arabic origin. Shortly after, Ian Milton identified Iran (IRIB-2) from its 48.2396MHz offset.

By 1015, there were at least two signals on E2, one with a greyish solid block logo in the top-right of the screen. Stephen Michie noted an oval studio set during a news programme at 1018, which was subsequently identified by Ian Milton as Iran (IRIB-1) by its 48.2604MHz offset.

At 0825 on the 30th, there was a female newsreader with Arabic script rolling through a black rectangle to her upper left. This was possibly Syria (SYR-2). By 0840 there was severe co-channelling.

At the start and close of the openings, pictures were relatively clear by F2 standards but at its strongest (within minutes after the opening commenced) there was the characteristic severe multiple-image effect associated with F2 propagation. Many enthusiasts have had their first taste of such exotic reception, finding it strange accepting that broadcasts from the Middle East and further afield are the norm.

Sync Bars

In the absence of a scanner to measure the frequency offsets to aid identification, examining the frame sync bar can provide vital clues. Adjust the 'vertical hold' control, until the sync bar hovers. On modern receivers, without such a luxury (!), the height can be reduced so that the sync bar shows. Of course heads become squashed, the display resembling that of a modern widescreen receiver!

Test signals are inserted within this sync bar, including teletext information, and its presentation varies between services. We now know that Syria (SYR-2) and TV9 in



SVF from the Faeroe Islands on E6, received via tropospheric enhancement by Calum Macleod, Isle of Lewis.



Finnish TV (YLE TV1) via Sporadic-E, captured by Stephen Michie. Note the very subtle 'I' logo (on this shot it is black) in the top-left.

F2 reception is back with a bang! Towards the end of October, exotics from the Middle East and south-east Asia flooded in daily with openings in excess of four hours. Sporadic-E openings were evident on several dates, the best being the 15th with strong, sustained reception from the Iberian Peninsula, Italy and Central Europe.



The new RAI 'butterfly' logo introduced in October, photographed by David Bocca Corsico Piccolino (Italy).

Continued on page 32...

DXTV Log For October

Reception reports this month have been supplied by Peter Chalkley (Luton), Stephen Michie (Bristol), Simon Hockenfull (Bristol), Tom Crane (Hawickwell), Garry Smith (Derby), Ian Milton (Ryton), Peter Barber (Coventry), Tim Bucknall (Congleton) and Paul Davies (Leeds).

Day	Log
1	Italy (Rai Uno) A at 1015, Spain (TFE 11) E2 at 1205. Reception via SpE
2	Denmark (DR TV) E2 with PM5534 at 0955. Unidentified analogue chann E2 at 1010. Both signals were via Meteor Shower (MS)
3	Unidentified film on E2 at 0831 via MS
5	Italy (Rai Uno) A at 0650, Spain (E2) at 1119. Both signals were via SpE
7	Unidentified programme on E2 at 0714 via MS
8	Unidentified programmes E2 at 0707, 0738 and 0841 via MS
9	Denmark (DR TV) E2 at 0734 via MS
10	Unidentified programme on E2 at 1702 via MS/Amp aft reception
15	Hungary (RTL KL) B/R2 at 0757, Italy (Rai Uno) A and B with morning news from 0842, Croatia (HRT-1) E4 with unidentified programme, Italy (TV4) (Rai Uno) A, Italy (TELE BI) E2, Spain E2, E3 and E4, Corina Canal Plus (L2 football) (reception) at 1037, France (Canal Plus) All reception via SpE
17	Saudi (SVT-1) E3 with PM5634 at 0919 via MS
20	Sweden (S4 with UR) (reception) at 1115 via MS, Italy (Rai Uno) A at 1324 via SpE, Italy (TV4) A between 1438 and 1955. Reception via SpE
21	Spain E2, E3 and E4 from 1248 via SpE, Portugal (RTP-1) E3 at 1430. All reception via SpE
22	Norway (NRK-1) E2 at 2002 via SpE, Argentina (E2) at 2005 via SpE
23	Denmark (DR TV) E2 at 0851 via MS
26	Unidentified F2 signals on E2 and R1 from C80C.
27	F2 signals from the Middle East on E2 between 0820 and 1200, including film. At 0909 unidentified Chinese programme film with non-Arabic subtitles and logo top-right
28	F2 signals from south-east Asia and the Middle East on E2. These include likely countries using E2 such as Thailand (TV-3) and IRIB-2, Dubai and Syria (SYR-2). F2 reception on R1 was possibly from Russia or China
29	F2 reception from the Middle East between 0815 and 1230 including Syria (SYR-2) and Iran (IRIB-1) and (IRIB-2). Unidentified non-Arabic programme and captions at 0950
30	F2 from the Middle East between 0825 and 1230 including Syria (SYR-2) E2
31	F2 from the Middle East between 0815 and 1230

DXTV SPECIAL DXTV SPECIAL DXTV SPECIAL DXTV SPECIAL DXTV SPECIAL DXTV SPECIAL DXTV SPECIAL DXTV SPECIAL DXTV SPECIAL

COMPLIMENTS OF THE SEASON TO ALL OUR CUSTOMERS & SUPPLIERS

AOR NEWS DESK - 10th anniversary year

The start of another new year provides an opportunity for reflection, especially now that the 'undisputed new millennium' has arrived. For AOR UK it is a noteworthy event as it marks the **10th anniversary** of the establishment of a formal UK base which was founded in 1991.

Our associate company AOR LTD Japan was founded back in 1977 and has represented over 20 years of innovation. The real breakthrough came in 1984 when the World's first continuous coverage wide band monitor receiver was launched, the AR2001. Development has not stood still with the launch of the AR3000A, AR5000 and the UK designed & built AR7030 short wave receiver which was launched early in 1996. In 2001 we look forward to further technological progression with two pioneering wide band 'black box' receivers aimed at the government & commercial market (one Japanese and the other UK designed)... in this internet connected era we are indeed moving along with the times and are confident the new units will represent further 'mile stones' of achievement.

If you have internet access, please take a look at our UK web site <www.aoruk.com>... it contains about 60MB of sales material, technical support bulletins, software, operating manuals, hints & tips, short wave guide and links to many key internet sites.

Nostalgia time, the small caption here is taken from the very first advert placed by AOR UK in the **JUNE 1991 SWM**, featuring the AR2000, AR2500, AR2800, AR3000 and accessories (courtesy of the PW/SWM archive... thanks!)

Just space here for a word of thanks to our customers & supporters, compliments of the season and have a happy new year... together we can look forward to the next ten years of business (and beyond) and the new products to come.



Richard Hillier G4NAD, UK Sales Director

NEW 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. Features include: strong metal cabinet, 8.33kHz channel steps for airband, 50Hz tuning increments, standard RS232 port with **free supporting PC software** from the AOR UK web site, optional slot cards, optional internal NiCad, 10.7MHz i.f. output and more! Size is 155(W) x 57(H) x 195(D) excl. projections, weight less than 2kg.



AR3000A - WIDE BAND RECEIVER

ARD-2 - ACARS & NAVTEX DECODER

If you think that data reception of aircraft ACARS and marine NAVTEX is only for experienced professional commercial operators, the ARD-2 may cause you to think again. This decoder & display unit has been designed with both the newcomer and experienced "go anywhere and everywhere" operators in mind.



The ARD-2 provides portable operation from internal batteries or external 12V d.c. without the need for a computer. The built-in LCD provides two lines of text with up to 32 characters of text per line and a scroll back buffer of 512 characters. **Free software** is available from the AOR UK web site.



When first released, the AR3000A provided an evolutionary step forward from the highly acclaimed AR3000, many major improvements have been implemented at the requests of enthusiastic listeners and commercial organisations.

Search and scan speed has been increased to an unprecedented 50 increments per second. All receive modes are provided with tuning rates programmable down to 50Hz. A standard RS232 port is provided with many software packages available (Searchlight from AOR with numerous packages from 3rd party providers). This unit has stood the test of time and is still well respected.

ORDERERS, HAVE A GREAT NEW YEAR - 10TH ANNIVERSARY YEAR

AR5000 - ALL MODE PERFORMANCE



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 available for commercial customers (for direction finding etc).

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 - SPECTRUM DISPLAY UNIT



The SDU5500 is an 'all new' Spectrum Display Unit and a worthy successor to the SDU5000 (which offered practical and cost effective monitoring). Coupled to the AR5000 receiver, it provides a spectrum display of 10MHz bandwidth anywhere between 10kHz and 2600MHz.

Already pressed into commercial usage by the government, the professionalism of the unit has truly been grasped. The SDU5500 supports a number of AOR and ICOM receivers, see above. In addition, the SDU5500 may be used with other receivers which offer a 10.7MHz i.f. output with suitably wide bandwidth, please refer to the colour leaflet for details. **Free internet download software** for the PC Windows operating system is available from our UK web site.

**FOR FURTHER DETAILS, PLEASE VISIT YOUR DEALER,
CALL FOR A LEAFLET OR VISIT THE AOR UK WEB SITE AT
www.aoruk.com**

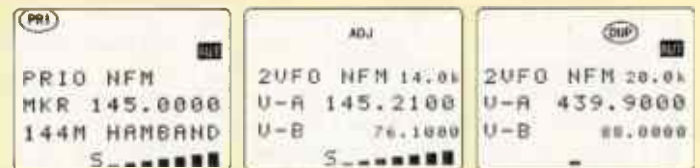
AR8200 SERIES-2

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. It has not been easy improving on what many thought to be the ultimate, however the AR8200 SERIES-2 does provide even more with nothing taken away.



A Temperature Compensated Crystal Oscillator (TCXO) now forms the heart of the AR8200 SERIES-2, this ensures **high stability with minimal internal spurious**. Performance too has seen the AOR R&D team fine tuning the design for **best sensitivity and strong signal handling** over the extremely wide coverage of 530kHz to 2040MHz (all mode receive without gaps). The aerial has also been replaced by a **telescopic whip** on a swivel base, this ensures the best results, a medium wave bar aerial is also provided as standard. The list of features is vast, tuning step sizes are programmable in all modes down to 50Hz with comprehensive step adjust and correctly implemented 8.33kHz for the new VHF airband spacing.

Connection to a computer is possible with the optional 8200PC lead/interface with **free PC software** available from the AOR web site. Unique optional slot cards further enhance the features list.



AR7030 - SHORT WAVE RECEIVER



Little introduction required for this 'landmark' UK designed & built short wave receiver. Very popular and currently being deployed commercially all over the world in volume! When existing stocks run out, the latest production will provide stock in April 2001.

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

AOR Tel: 01773 880788 Fax: 01773 880780
info@aoruk.com www.aoruk.com E&OE

ving Antennas

Such an antenna, mounted horizontally atop an alloy mast at a height of 6m, provided some excellent examples of Sporadic-E reception during the 2000 Sporadic-E season. Signals from the Middle East were resolved during several openings on Channel E2, while Albanian signals on 82.25MHz were encountered several times, not to mention many f.m. stations.

Multi-element arrays are available, but Band I antennas comprising more than five elements are rarely used by DXers because of their size. Other Band I antennas used by enthusiasts include indoor loop antennas formed from a half-wave dipole and crossed dipoles for loft use. The former antenna is capable of producing impressive nulls to help reject local interference when carefully orientated.

The crossed dipoles may be connected together to provide multi-directional coverage or used separately feeding the receiver via a simple two-way antenna switch to select the reception direction. Alternatively, the antennas could feed two separate receivers, often allowing two different countries sharing the same frequency to be viewed. Incidentally, polarisation-shift can occur with Sporadic-E polarisation so a vertical dipole is often a useful additional antenna.

Band III DXing

Unlike the rest of the World where Band III is mainly for TV use, the UK has to be different - we have p.m.r. (private mobile radio). This means that Band III DXing can be a problem due to p.m.r. allocations throughout the band.

Fortunately, there are gaps between each group of allocations designed to protect European TV transmissions from potential interference, but it is debatable how successful this is in practice. The gaps correspond to European video frequencies, but reception is only really successful when using a reduced vision i.f. bandwidth.

Band III antennas are fairly compact, so multi-element types can be used to provide a reasonable gain. A four or six-element array is effective, although antennas with 13 elements, or more, are commercially available.

With the introduction of DAB (Digital Audio Broadcasting) at the top end of Band III, at least one manufacturer is producing a log-periodic antenna which will cover the whole of Band III. Although it is advertised as a DAB antenna, in reality it will also provide u.h.f. coverage!

UHF DXing

Successful DX reception at u.h.f. frequencies is largely influenced by factors such as local terrain and the geographical location of the receiving site. At some locations, extreme fringe reception may be enjoyed on a daily basis from certain Continental transmitters, while in others it may be a struggle even under enhanced conditions.

In any situation, an efficient antenna is essential which should be mounted as high as possible. Fortunately, many enthusiasts find an antenna mounted at chimney height, or around the 10m mark, can provide good results.

UHF Arrays

Every manufacturer produces u.h.f. antennas in wideband and

grouped versions. The latter type of antenna tends to exhibit a greater forward gain for a given number of elements than the wideband version. While the majority of enthusiasts prefer the use of a wideband u.h.f. array for operational ease, a grouped antenna could be exploited to provide maximum gain and optimum results from a particular station if reception is feasible on a regular basis. Wideband antennas at u.h.f. tend to fall into two main categories: the Continental-style Yagi (Lambda array) and the Wideband Grid.

Continental-Style Yagi

This type of array is easily recognised by its large reflector assembly and its chain of X-director assemblies affixed to a long boom. Inherent in its design, the highest gain occurs towards the upper end of its operating bandwidth, this being typically 16dB with the wideband version.

The increasing gain towards the upper end of the u.h.f. spectrum produces a progressively sharper signal acceptance angle. This means its optimum directional performance will be achieved on the higher u.h.f. frequencies rather than on the lower channels throughout Group A.

Wideband Grid

The grid is relatively compact by comparison and consists of four stacked dipole assemblies mounted in front of a rectangular mesh reflector. The grid maintains a more uniform level of forward gain throughout the u.h.f. spectrum than the Yagi. Typically, the grid design can offer a gain of around 10dB at the lower end of Group A, rising to a peak of about 13dB throughout Group B.

The grid is also available with a 'launch' director element mounted in front of each dipole assembly. This helps improve the gain level throughout the higher u.h.f. channels.

The grid is less costly and more compact than the long Yagi and for this reason it is a popular choice among enthusiasts. Its wide signal capture angle of around 60° may be seen by purists as a drawback, although many enthusiasts find this a plus point in terms of not having to continually rotate the antenna.

The front-to-back ratio is typically 25 to 30dB with either design. Most manufacturers market both types of array, usually with slight variations and subtle disguises.

Log-Periodic

One wideband u.h.f. antenna making a comeback is the log-periodic. All the elements function as dipoles which respond to different frequencies, so at a given frequency only part of the array actually contributes to the gain. It has an exceptionally clean polar response with very few side lobes and virtually constant gain throughout the u.h.f. spectrum. However, it fails to seek the approval of enthusiasts due to its low forward gain of around 8dB for a 20-element array.

Masts, Planning Permission & Nasty Neighbours

A simple pole mast can be used to support a wideband dipole or the version with the reflector. This can be fixed to the side of a building, for example, a shed. Manual rotation can be achieved by leaving the V-bolts slightly loose but lock-nutted.



A wideband u.h.f. grid for receiving channels 21 to 69.



A wideband 'H' antenna covering 45-110MHz. Immediately above this, a wideband u.h.f. grid has been added.



A seven-element antenna covering Bands I and II.



Chimney-mounted antenna system used by Martin Dale in Stockport. The lower array covers all v.h.f. frequencies in Bands I, II and III. The u.h.f. array is a wideband grid.

Scanner Spect

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The latest handheld from Yupiteru. New smaller size - see review *Shurtwae Magazine* October 2000

- 520kHz - 1.32GHz
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- 10 Memory Banks
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- Descramble function
- Clock timer
- Signal strength meter
- Auto memory write
- Power 3AAs, 4.5V DC
- Size - 120H x 60W x 32Dmm
- Weight - 310g
- Supplied with Mains adaptor, NiCads, Belt clip

£289 £8 p&p

MVT-3300

The MVT 3300 receiver has excellent performance and covers up to 1000MHz with selectable modes.

- 66-88MHz, 108-170MHz, 300-470MHz, 806-1000MHz
- Modes: AM/NFM
- Steps - 5, 6.25, 10, 12.5, 25kHz
- Memories - 200
- Band memories - 10 (user re-programmable)
- Priority channels - 10
- Scan/Search speed - 30/sec
- Requires 4 x AA batteries
- Supplied with Antenna, Earpiece, Carrying strap and built-in desk stand

~~£159~~ **£129** £8 p&p

MVT-9000EU

Yupiteru's flagship model, with a range exceeding 2000MHz and a real time bandscope.

- 500kHz - 2039MHz
- 1000 Memory Channels
- All modes - AM, FM, N-AM, AM, SB, USB, CW
- Scanning steps 50Hz - 5kHz
- Duplex receive capability - hear split frequency signals easily with VFOs
- Fast tune facility gives 10 times function for quick tuning
- Built-in ferrite rod antenna for AM broadcast reception

• OP90 Soft Case £17.95 | £2p&p

£369 £8 p&p

MVT-7100

Probably the most powerful handheld Scanner. It's easy to use and can receive just about anything you like!

- 530kHz - 1.650MHz
- AM/FM/WFM/SSB/CW
- 1000 memories
- Steps 50Hz, 100Hz for tuning LSB & USB
- Size - 155H x 64.4W x 32Dmm
- Weight - 320g
- Supplied with NiCads, mains charger, 12VDC cigar lead, belt clip and carry strap

• OP51 Soft Case £17.95 | £2 p&p

£249

Price Match £8 p&p

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DJ-X2 a micro-sized go anywhere scanner small enough to fit comfortably into a shirt pocket and yet its in-built speaker gives amazing clarity of audio from the sensitive receiver. Take it with you to airshows, boat shows, on holiday - its discrete size enabling reception just about anywhere, without attracting unwanted attention.

Its easy to use, with a host of optional accessories and enough power for the most demanding user.

For airband enthusiasts the Alinco DJ-X2 has the new 8.33kHz Civil Airband Channels.

This has to be
'THE SCANNER' of year 2000!

- Receives: 522kHz - 999.995MHz
AM WFM NFM
- Selectable scan modes
- Audio descrambler
- Bug detector - detects presence and frequency of bug giving audible warning
- Selectable internal/ext. antenna
- Internal or external supply
- Program Search banks
- Illuminated backlight display
- 2 performance modes
easy and expert
- RX attenuator
- Auto power off mode
- Priority channel monitoring
- Squelch control
- Volume control
- Optional accessories



DJ-X10E
Wideband
scan receiver

- Receives: 100kHz - 2500MHz
- VHF/UHF mode reception
AM - WFM - NFM - SSB - CW
- 1200 memory channels
- Channel scope spectrum display that allows monitoring of 40 ch.
- Channel scope peak search
- Advanced scanning features:
Programmed scan (up to 10 groups)
Programmed memory scan
Any channel scan - Wide scan (not found ch. (miss) scanners) - VFO search
Dual VFO search - Band excursion scan
Priority scan - Any channel skip scan
- User friendly features
Help messages - Personalised Channel names - Memory cloning
Auto memory write scan - Beginner /Expert mode - Memory tune mode

- Timer functions auto on/off facility
- Battery save facility
- Squelch control • Dual VFOs
- Stylish cabinet with large speaker
- A super sensitive receiver
- Facilities for cloning another set
- Built-in 24 hour clock
- Switchable attenuator
- Selectable control beep tone



£239.95 £8 p&p

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DJ-X10E includes FREE

- Mains drop in charger For easy and convenient use
- Nicad battery pack 4.8V DC 700mAh
- NiCad battery pack
- Belt clip
- Carrying strap
- Flexible low profile antenna



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A heavy-duty clamp which is particularly useful for loft-mounted arrays.



Using three heavy-duty clamps and a little mechanical ingenuity, a pivot assembly can be made in order to raise and lower a pole mast.



A u.h.f. mast-head amplifier produced by 'Fringe Electronics'. The 'Supreme' wideband unit features low-noise coupled with high-gain thus making it an ideal addition to any DX set-up.



The power supply unit designed to be used with the Fringe Electronics u.h.f. mast-head amplifier.

With a little mechanical ingenuity, some form of simple pivot could be made using heavy-duty clamps, thus enabling the pole to be raised and lowered.

If the bank balance permits, a professional tower can be obtained, but you will require planning permission. Unfortunately, in this country we have the NIMBY (not-in-my-backyard) brigade. Erect something higher than an 200mm plastic garden gnome and the neighbours usually go berserk; councillors and MPs will become involved and society as we

know it will be destroyed.

A viewer made adverse remarks about a small amateur radio installation next door to her. Apparently it was an eyesore if she stood on tiptoe peering at it through her upstairs lavatory window. She was convinced that her ex-council house would be virtually worthless if she had to sell it. She did not seem to care about the rusting caravan on her driveway.

Many years ago when the 405-line system was in full swing, antennas used for BBC-1 channels 1 to 5 were in some cases far larger than ones required for Band I DXing. The 'H' antennas seen in the London area (and there are still many examples around) were massive, with reflectors in excess of three metres long. There are still some fine examples of multi-element

Band I antennas in reasonable condition throughout the country, so don't be too shy to erect a large array!

Amplifiers

An amplifier or booster will not always perform the miracle one would hope for. What we have to bear in mind is that commercially-available amplifiers are intended to boost weak signals in fringe areas in the absence of strong local transmissions. Excessive signal input can lead to cross-modulation problems, generating false signals from the local TV or f.m. transmissions at various points throughout the band.

Amplifiers produce the best signal-to-noise ratio when installed at mast-head, but if you live close to a high-power transmitter, it may be more beneficial to connect one at the set-end, as and when the need arises. To keep cable losses to a bare minimum, install satellite-grade cable via the shortest possible route.

For optimum results, select an amplifier with a bandwidth which matches that of the antenna, i.e. for u.h.f. DXing do not use a wideband amplifier where a grouped version will do. For DX purposes, select an amplifier with the lowest noise figure rather than the highest gain.

Band I Problems

The temptation of installing an amplifier at the mast-head for Band I reception should be resisted. Again, a much better idea is to use satellite-grade coaxial cable for the download. Nowadays, it is relatively inexpensive, has double screening to reduce interference pick-up and its low-loss means that dispensing with the amplifier is of no great loss. Personal experience

has shown that the band is much 'cleaner' and void of the patches of f.m. splatter such amplifiers tend to introduce.

Interference throughout Band I is a fact of life these days. Computer radiation, baby alarms, pirate radio links and

cordless telephones all contribute to the DXer's nightmare. A reduced vision i.f. bandwidth can help immensely since the r.f. spectrum 'seen' by the receiver is far less than it would be if a conventional receiver was used with its inherently wideband i.f.

Notch Filters

Most enthusiasts are plagued with baby alarms operating around 49MHz so some way of attenuating these signals is vital. The strong steady carrier generated by these 'bugging' devices obliterates R1 signals and, if strong enough, can affect E2. A notch filter (see right) is fitted as close as possible to the antenna input of the receiver to avoid interference pick-up. The notch filter can be carefully tuned until the interfering signal is at a minimum.

During the last Sporadic-E season, using such a filter allowed R1 signals to be easily resolved, albeit with some attenuation. Without the filter the signals were completely obliterated. Occasionally an interfering signal is present on the same frequency as the wanted broadcast. In this instance, a notch filter is of little use since it will also remove the wanted signal.



A fully-screened tunable Band I notch filter, a vital tool to remove interfering signals.

Manufacturers Of Antennas & Amplifiers

Here is a list of the UK's leading manufacturers of antennas, amplifiers and DXTV equipment. Details of retailers in your area may be found in local telephone directories or magazine advertisements.



A four-channel attenuator produced by Alcad, type FR-401.

SWM

Triax UK Ltd., Abergorki Industrial Estate, Treorchy, Rhondda, South Wales CF42 6DL, Tel: (0845) 6010578.

Maxview Ltd., Setchy, Kings Lynn, Norfolk PE33 0AT, Tel:(01553) 810376.

Antiference Ltd., Eastern Avenue, Lichfield, Staffordshire W513 75B, Tel: (01543) 267155.

Blake Aerials Ltd., 177/183 Rutland Road, Sheffield S3 9PT, Tel: 0114-275 9729.

Labgear Ltd., P.O. Box 182, Abbey Walk, Cambridge CB1 2QN, Tel: (01223) 366521.

HS Publications, 7 Epping Close, Derby DE22 4HR, Tel: (01332) 381699.

(D-100 Converter, Band I antennas, notch filters and technical publications). An illustrated catalogue is available, price 75p (or three IRCs from overseas). This company supplies to the Trade and individual DX enthusiasts and offers help and advice whenever possible.

Give It A Go!

As with most hobbies, the most difficult step is taking the initial plunge. Below is a list of things you need to know to enjoy Sporadic-E reception, the most spectacular propagation of them all.

- 1) Sporadic-E occurs during the summer months between May and September.
- 2) A TV receiver or converter with manual tuning, covering v.h.f. Band I, is required.
- 3) A Band I antenna, preferably wideband, mounted at a height of around 6m should provide good results.
- 4) An amplifier is not necessary.
- 5) A Band I notch filter is vital these days as every other home seems to have a baby alarm, even if they don't have a baby.
- 6) Patience (for the days when there are no signals!).

Greater Challenges

In the early Eighties there were the scare stories that Band I would close within a short space of time to make way for increased 6m amateur activity in Europe and for various new p.m.r. services in the UK. Poland has deserted Band I, but more recently, Band I has seen the opening of new transmitters on Channel E2, thus creating new challenges, for example Syria, Iran, Thailand, Portugal (RTP-2), and Greece (private stations).

In Band III, most Channel E12 outlets across Europe have moved to u.h.f., having been cleared for DAB services.

Over the past few years u.h.f. DXing has changed radically. The u.h.f. band is more congested, particularly with the introduction of digital terrestrial broadcasts and RSL (Restricted Service Licence) stations. In some ways this is bad news for the DXer, but looking at the situation in a positive light, it has become more of a technical challenge.

Blank Channels

Until recently we have advocated checking normally blank u.h.f. channels to see if signals were emerging, thus indicating that a tropospheric lift was in the making.

Unfortunately, digital terrestrial signals, introduced in the summer of 1998, have complicated the situation somewhat. Most main transmitters were allocated six multiplexes, which basically means that ten channels are now blocked by local broadcasts.

The digital signals, as such, on these multiplexes cannot be seen as you tune through the band.

The digital multiplexes resemble blank channels, although if you carefully scrutinise the snow effect it looks slightly more intense than a channel that is truly void of transmissions.

This may still give the impression that signals will still get through the digital 'snow'. In reality it depends on the level of the digital signal. If it is 'local' level (over 40dBµV) it will make it virtually impossible for other signals to penetrate.

If you have found that some of your semi-local relays seem to have vanished over the past year or so, then the intrusion of digital signals is likely to be the cause. Some digital multiplexes are in the throes of changing frequency, so do

not assume that your existing precious channels will be safe!

Digital transmitter lists are available from the broadcasting authorities which show which channels each multiplex is using at your local transmitter. Do not be misled by the e.r.p. of the digital multiplexes. Compared with the main analogue transmitters, some of which have an e.r.p. of 1000kW, the digital e.r.p.s seem reassuringly low, for example, 5kW or less. However, their potency and destructive effect on co-channel analogue transmissions, even high-power ones, should not be underestimated.

Even weak digital signals can have some impact on co-channel analogue signals, be it semi-local or DX reception. In some cases the incoming analogue picture will take on a snowy appearance, even though its level may be high. Without the digital signal present, the received analogue picture might be perfect, depending on its strength.

FM DXing

This is a spin-off from the DXTV hobby but it is surprising how many enthusiasts indulge. During Sporadic-E and tropospheric openings the f.m. radio band can become highly active, thus creating a hobby in its own right.

Nowadays receivers with RDS can ease the problems of identifying the source of transmission. Note that the former OIRT is still active between 63 and 72MHz. Many enthusiasts prefer to go 'mobile' and drive to some elevated vantage point using the car radio to seek out signals.

The more serious f.m. DXers use rotatable multi-element arrays, some upwards of eight elements. By reducing the i.f. bandwidth down to 50kHz, the signal threshold level and selectivity are dramatically improved. This means that many distant signals, which are virtually undetectable on a receiver with a conventional i.f. bandwidth, are readily present using bandwidth reduction.

Care must be taken with modifications of this nature as the RDS will fail to work correctly if the bandwidth is reduced too much. Also, the sound quality is reduced because of the bandwidth reduction; this is more noticeable on music.

SWM



Further Reading

The SWM Book Store stocks **DX-TV For Beginners** and **Guide To DXTV** which cover most of the aspects associated with DXTV including interference removal, the setting up of a shack, identifying reception, etc.

Masts covers the different aspects such as safety and constructing one's own, from a simple pole mast to more complicated structures.

For archive fans there are publications such as **The Story Of BBC Colour Television**, **The First 30 Years Of BBC-2** and **The First Thirty Years Of BBC-tv Graphics**. Station identification captions and test cards from around the World may be found in **Guide To World-Wide TV Test Cards - Edition 3**.

Shortwave Magazine DXTV Special Jan 2000



New ML&S

Dressler active antennas

The full range of Dressler antennas are now available from ML&S.

ARA 40

Technical performance

Frequency range 40kHz-40MHz at full performance 40MHz-108MHz
2.3dB gain
Output impedance 50-75 ohm coaxial
Connector to fit PL comes as the standard. Other standards can be fitted upon request
Gain 5dB +/-0.2dBs
Intercept Point -45dBm IP 3rd order (10MHz/12V)
DC power supply 11.5-13 volt DC at 70mA typ. (230V mains adaptor for 12V DC is supplied with the antenna)
Mast diameter 30-50mm can be fitted
Dimensions **ARA40** 115cm total length with glassfibre whip. Antenna tube 40mm x 140mm
ARA40 TEL 125cm total length with telescopic whip extended. 45cm minimum length. Antenna tube 40mm x 140mm
 Ideal for portable radio

£139

ARA 60

Technical performance

Frequency range 40kHz-60MHz (full performance) 60-120MHz
2.3dB less gain
Output impedance 50-75 ohm coaxial
Connector to fit PL type delivered as standard. Other standards can be fitted on request
Gain 13dB +/-0.2dBs
Intercept Point +50dBm IP 3rd order (10MHz/12V)
DC power supply 11.5-13 volt DC at 80mA typ. (230V/12V DC stabilised mains adaptor is supplied with the antenna)
Mast diameter 30-50mm can be fitted
Dimensions 115cm total length. Antenna tube 50mm x 160mm
 Ideal for base stations

£169

ARA 2000

Technical performance

Frequency range 50-2000MHz
Output impedance 50-75 ohms coaxial
Gain 18dB -1000MHz
 18dB -4000MHz
 16dB -2000MHz
Noise figure 1.5-2dB -1000MHz
 1.8-2.5dB -1500MHz
 2.5-4dB -2000MHz
3rd order IP +35dB typical
Output impedance 50-75 ohms coaxial
Connector standards N type connector at the antenna. BNC male connector to the receiver
Power supply 12V DC at 160mA DC. Power supply for 230V AC is delivered comes with the antenna
Dimensions Length 450mm. Diameter 90mm
Weight 2kg
 Mains wall plug adaptor (230V A/12V DC). Interface unit (remote supply unit) 12m coaxial cable and mast mounting clamps

£169

This outstanding range is ideal for use with all base station receivers, the ICR-8500, AR-5000, PCR-1000, NRD-545, FRG-100 & more! Beautifully constructed and designed in Germany - we are pleased to be appointed for this range of products.

NOW BACK IN STOCK!

SEE THE NEW 'SHOPPING BASKET' ML&S WE

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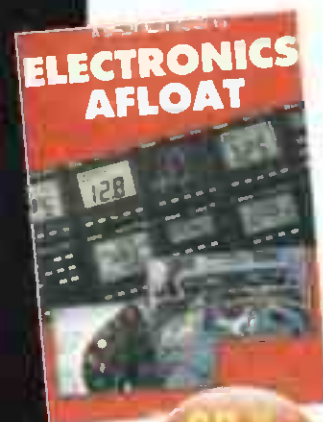
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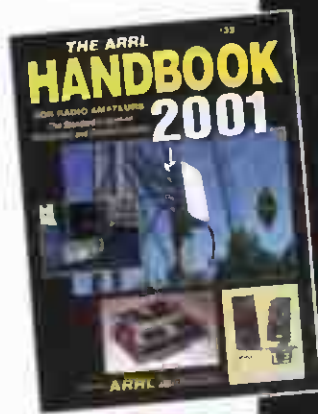


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OATONG	FL2 FILTER	£60.00	KENWOOD	TM V7E DUAL BAND TRANSCEIVER	£250.00	YAESU	FT-225RD 2M BASE MULTIMODE	£325.00
DIAMOND	GSV-3000 PSU	£100.00	KENWOOD	TR-851E 70cm Multi-Mode	£325.00	YAESU	FT-2500M 50w 2m MOBILE	£200.00
DIAWA	CNVV 518 2KW CROSS METER ATU	£199.00	KENWOOD	TS-140S HF 100W BASE/MOBILE	£399.00	YAESU	FT-250MK11 2M Multi-mode	£195.00
DIAWA	ROTOR MR-750U HEAVY DUTY	£250.00	KENWOOD	TS-680 HF 6M BASE/MOBILE	£395.00	YAESU	FT 290R MK11	£275.00
DRAKE	DRAKE 2700 ATU 2 SKW (MINT CONDITION)	£295.00	KENWOOD	TS-890 SAT TRANSCEIVER HF/6M	£695.00	YAESU	FT 3000M 70w 2m MOBILE TRANS	£225.00
DRAKE	DRAKE L7 LINEAR AMP (MINT CONDITION)	£899.00	KENWOOD	TS-811E 70cm MULTI MODE TRANSCEIVER	£400.00	YAESU	FT-480R 2M MULTIMODE	£220.00
DRAKE	R-8 RECEIVER (MINT)	£550.00	KENWOOD	TS-890 SAT 100w HF BASE TRANSCEIVER	£850.00	YAESU	FT-530 270cm HANDY	£175.00
HEATHERLITE	2M EXPLORER 2m AMPLIFIER	£399.00	KENWOOD	TS-870 DSP HF/BASE TRANSCEIVER	£999.00	YAESU	FT-690MK11 6M MULTI MODE TRANSCEIVER	£295.00
ICOM	IC-207 DUAL BAND MOBILE	£216.00	KENWOOD	TS-940SAT HF BUILT IN ATU BASE	£750.00	YAESU	FT-726R 270cm TRANSCEIVER	£599.00
ICOM	IC-229M 2M MOBILE	£120.00	KENWOOD	TS-90SD SD DIGITAL 150W TRANSCEIVER	£1,250.00	YAESU	FT-736R AC 2M/6M/70CM BASE	£799.00
ICOM	IC-251E AC 2M Multi-mode	£325.00	KENWOOD	TS-960S HF 150w BASE BUILT IN ATU	£999.00	YAESU	FT-736R AC 2M/70CM BASE	£599.00
ICOM	IC-275H 2M 100W BASE TRANSCEIVER	£350.00	KENWOOD	TS-960SDX HF 150w TRANS (FLAG SHIP)	£1,799.00	YAESU	FT-757GX	£395.00
ICOM	IC-3J UHF MINI HANDY	£89.00	KENWOOD	VFO-180 VFO	£80.00	YAESU	FT-757GX11	£425.00
ICOM	IC-475E AC 25W MULTIMODE 70CM BASE	£525.00	KENWOOD	EXPLORER AMP	£999.00	YAESU	FT-840 HF MOBILE BASE TRANSCEIVER	£490.00
ICOM	IC-706MK1 TRANSCEIVER	£499.00	LINEAR AMP	HF-225 RECEIVER	£225.00	YAESU	FT-847 HF/6M/2M/70cm/4m	£999.00
ICOM	IC-706MK11 DSP TRANSCEIVER	£599.00	LOWE	AR-108 AIRBAND HANDY	£50.00	YAESU	FT-8500 DUAL BAND MOBILE TRANS 50w	£295.00
ICOM	IC-706MK11G (AS NEW!)	£799.00	MAYCOM	1278 TNC Incl SSVT	£225.00	YAESU	FT 900 HF MOBILE/BASE FACE OFF	£525.00
ICOM	IC-725 HF MOBILE 100w	£400.00	MFJ	MFJ-2599 ANTENNA ANALYZER	£175.00	YAESU	FT-900AT BOXED	£85.00
ICOM	IC-726 HF MOBILE 100w	£425.00	MFJ	MFJ-7848 DSP FILTER	£150.00	YAESU	FT-901 Deluxe model Transceiver	£300.00
ICOM	IC-729 TRANSCEIVER HF/50MHz	£425.00	MFJ	MFJ-962 1.5KW ATU	£175.00	YAESU	FT-902 Deluxe model Transceiver	£300.00
ICOM	IC-735 HF 100W	£450.00	MFJ	MFJ-989 ATU 3KW INPUT	£220.00	YAESU	FT-920 AF HF-50 MHz BASE TRANSCEIVER	£899.00
ICOM	IC 746 HF/50/2M 100w	£999.00	MFJ	Microwave mod's 144/100 100w 2m	£120.00	YAESU	FT-990 TRANSCEIVER AC HF BASE	£755.00
ICOM	IC-756 HF/6M BASE TRANSCEIVER	£1,050.00	MICRO MOD	D3010 430 450MHz AMP/FILTER 100W	£200.00	YAESU	FT 990 TRANSCEIVER DC HF BASE	£805.00
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ICOM	R-72 RECEIVER AC	£450.00	SSB ELECTRON LTD	SSB 23CM TRANSVERTER	£499.00	YUPIERU		
ICOM	R-72 RECEIVER DC	£400.00	SUMMERKAMP	PF630MK1 6M MULTIMODE	£210.00			
ICOM	R-75 RECEIVER	£450.00						

Highland Emergency Services

Dave Roberts examines the considerable communications challenge facing the Scottish Highland Emergency Services.

used to spend a fair bit of time in Belgium - a country of over ten million inhabitants and just over eleven thousand square miles in area - well, it can get crowded. With no mountains and a very temperate climate, communication systems in the kingdom are busy, but not a particular challenge.

The emergency services there have the communications infrastructure commensurate with a densely populated nation. Communications are not the biggest problem for the authorities to tackle. Mobile 'phones work well in all areas - v.h.f. and u.h.f. systems have been in place for decades.

A Contrast

Now consider a contrast. An area of over nine thousand eight hundred square miles. A resident population of just over two hundred and five thousand of which about twenty per cent live in one town, the area's capital. Many mountains, the highest of which rises to over four thousand four hundred feet. Vast unpopulated areas. Some of the most difficult weather conditions imaginable with extremes of temperature and biblically high winds. You get the picture.

This place is right here in the United Kingdom. It is the Highland Region of Scotland. Now, the emergency services in the area all have their own communications systems which may eventually come under one TETRA umbrella, but until that comes about, they are all operating their own radio services which give them cover in the area.

This cover can never be total throughout the Highland Region, but does provide acceptable service along most roads. There are, however, other emergency services in this, the remotest of locations in Great Britain. The fourth emergency service is not a car recovery and repair company. The fourth service is Her Majesty's Coastguard and obviously they have a communications infrastructure of their own.

Local Authority

In every area of the UK there is a local authority Emergency Planning Department and the Highland Region is no exception. The big difference is, that in the Highlands, the conditions are as I have just described. The area presents unique problems to the Emergency Planners based in Inverness.

For it is at Inverness that the administrative headquarters of Highland Council are located and it is just outside Inverness town centre that the Emergency Centre can be found. Originally constructed in 1941 as a Filter Centre for the Royal Air Force, by

the end of the war the centre was fed by information from 75 Chain Home Radar stations and had responsibility for the whole of Scotland and Northern England.

The information collated there, would then be passed to the Operations Centre nearby for action to be taken. The building, which is basically subterranean, was used by the Royal Observer Corps after the war and by the local Civil Defence Corps. It was also used as a council store.

During the Cold War it was decided that the building should be used as an emergency centre to co-ordinate protection of the local population should a war occur. Renovation of the building was completed in 1991 just in time to celebrate the end of the Cold War for which it had been refurbished. Now the Emergency Centre is occupied by the Highland Council Emergency Planning Unit.



The Highland region covered by the Emergency Services.

Interior of the Emergency Control vehicle.



Taken Seriously

A visit into the building reveals the extent to which emergency planning for this area has to be taken seriously. The advent of mobile 'phones in the UK have not made a tremendous difference to the Highland Region as much of it is still in a 'no service' area as far as 'cell-phones' are concerned.

So, to enable communications within a piece of real estate that could be the centre of some disaster takes some ingenuity. Remote voice relays and data nodes can be deployed, but where do they have to go to ensure good contact? Experience has equipped operators with a head start as to some locations where the necessary equipment could be sent to provide a relay but the Emergency Centre are likely to use the path profiling computer program to give them information as to where it would be sensible to deploy the equipment to ensure a good r.f. path.

Down in the Centre there are conference rooms, a control room with operator positions for all the emergency services together with other groups that may have to be called in to deal with any specific task. The composition of the emergency team would depend on the type of emergency to be dealt with. The Centre also provides administration

and computer support, E-mail, a geographical information system, a resources database and a flood warning system.

All these staff need feeding so there is a kitchen and dining area, also provided are showers and so on. The Centre is equipped with a workshop and equipment stores for the various portable

equipment boxes which include a cabinet with radio and other facilities to run a reception centre for evacuees.

Problems Of Communication

If you've never visited the area you should by now have an idea of the problems of communication throughout this pretty vast and sparsely populated area. The Highland Council takes communications seriously and has an extensive communication system of it's own which has dovetailed with some requirements of the area's Emergency Planners.

The Scottish Office also inherited the frequencies of the old Royal Observer Corps and these now form the backbone of the Emergency Voice

Network, a low band v.h.f. system which consists of five radio channels running through an extensive network of repeater sites and relays located at suitable locations in the region. There is also a low band simplex channel available for use. This, however, is only the very basis of the organisation.

A large part of the Emergency Planning budget has to be spent on communications because of the nature of the terrain to be covered. To this end the Highland Emergency Communications group was formed. A fancy title for an operation which is extremely cost effective, it being staffed by volunteers from all parts of the region who can be called out to provide emergency communications

and support to emergency services.

Must Be Licensed

The strength of the system is in its simplicity. The volunteers, who are all required to be licensed radio amateurs, are trained in all aspects of the communications systems that the authority has at its disposal. These include the Emergency Voice Network which uses Phillips (now Simoco) equipment, the Council's 'phone system and satellite 'phones.

Both the Highland Council's Emergency Planning Officer, Brian Downie and his Deputy, Grant Horsley, are licensed amateur radio operators and it was their realisation that amateur licences have access to a plethora of frequencies and modes that made it apparent that to include amateur radio as part of any emergency plan made common sense, practically and financially.

So now the Highland Emergency Communications Group comprises 57 licensed amateur volunteers who work and train with Emergency Planning and other council staff. In addition to the Emergency Centre at Inverness there are seven outstations at Wick, Golspie, Dingwall, Fort William, Nairn, Kingussie and at Portree on the Isle of Skye.

Office Equipment

The outstations are situated in the council offices at those locations and generally consist of basic office equipment including desks and chairs for staff, photocopier and a small



The Emergency Control Vehicle parked up at a hilltop site.



Back at base.



Stacked and ready to go.



Highland Emergency Services

Hard at work aboard 'Porkie'.



switchboard and telephone equipment. There is also an Alinco 2m/70cm dual-band radio and a packet station and computer which uses the popular TNC2 and Procomm communications program to link outstations to Inverness for the transmission of data that may be unsuitable for voice transmission or for non crucial administration purposes.

The v.h.f. sets used for the packet are Icom IC-V200 rigs. An Emergency Voice Network/Council radio is also installed. In the outstations equipment store there will also be found a small, but very heavy box containing a battery supply, which is constantly on top up charge, another TNC2 and another Alinco dual-band rig.

Also stored is a small portable mast with a dual-band collinear and guys. Together this box of tricks and antenna can be deployed with a member of the group to provide either cross band voice relay or a portable packet node.

Looking further into the outstation's store will reveal a box containing another Philips Council/EVN radio with a cigarette lighter plug and a 'magmount' antenna. This box would be plugged into any vehicle that needed to be sent to a location and needed radio communications. Together with reflective tabards and other equipment the outstations are kept stocked with comms gear to keep them on air until the arrival of members of the Emergency Planning staff and other comms volunteers.

The idea being that should a problem occur then the local staff and communications group members would be called out to deal locally and at the same time staff would be called into man the Emergency Centre and to get support to those at the location of the incident as soon as possible. This would generally mean getting the Emergency Control Vehicle on the road and out to the locale to provide more comms facilities, equipment and staff.

Fancy Kit

Now this vehicle is a fancy piece of kit. Basically it is a long wheelbase Land Rover (*actually, to be precise, it's a Defender 130, but unless you are as fanatical about Land Rovers as me, you probably won't worry - Ed.*) with an office built on the back. The equipment line up in the back of this communications truck is pretty impressive.

Thought has been given to the concept that the

vehicle may well have to operate for some time without support and all the equipment carried in the truck can either be powered from the Land Rover's own supply or via an external 3.5kVA generator which is carried in the back and is usually fired up when the vehicle arrives at the scene of an incident.

Of course the truck can also be hooked up to a

local power source. The staff, however, find it a bit of a mouthful to keep referring to the truck as The ECV or Land Rover and call it 'Porkie'. No it's not a misprint... 'Porkie'. So called because of the number of antennas mounted all over it. So from now on... 'Porkie' it is.

OK, so what is installed in 'Porkie'. Well, up at the driver's end there is a control box for the Highland Council's own systems plus the EVN frequencies and 'cellphone' handsets for both Vodaphone and Cellnet, but the real business end of 'Porkie' is in the office block on the back. In addition to the generator which is deployed out of the way when on scene, there is a dual-band collinear antenna mounted on a mast and also two pump-up masts mounted on the vehicle.

Guys and other ancillary items are also stowed in lockers in the rear. Operating as a mobile comms centre, 'Porkie' has the usual kind of office equipment that would be found anywhere with pens and stationery and other ephemera to deal with the administration duties. There are the two 'cellphones' which can be hooked up to the FAX machine. Also included is a laptop PC which is used as a packet terminal together with a Tiny 2 TNC.

A Philips control box for the council and EVN systems is utilised from the back of the vehicle when it arrives on scene. There are Alinco dual-band radios for packet and for the voice communications on amateur bands. A Navico marine v.h.f. radio is available for Coastguard use and other equipment is fitted to provide assistance to police and fire authorities should such a request be made by them.

Logical Layout

All the gear is logically positioned and well laid out with power being supplied to the equipment from clearly positioned 12V power terminals. Power isolation switches are fitted and a comprehensive anti-theft alarm system and, of course, fire extinguishers are provided too. The antennas on the roof include whips for all the emergency services should they need to temporarily install their equipment for use by their staff.

When an incident is running, the interior of 'Porkie' can turn out to be a very busy working

Continued on page 50...

Short Wave Magazine, January 2001

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Highland Emergency Services



...continued
from page 48

environment indeed. Handling both packet messages and voice communications between the emergency planner at the actual scene of the incident generating a high work load. Usually two operators staff the vehicle, as often there is a queue of personnel from all services needing either voice or data traffic handling or just asking for messages to be sent or received via the FAX.

A satellite 'phone is also deployed in the vehicle as many areas in the Highland Region are not within coverage of any other system. The cost of running the satellite 'phone does not make it the preferred mode of communication for ordering takeaway meals!

Call For Deployment

So, typically on receipt of a call for deployment the emergency planning staff would attend the Emergency Centre, if not already there, and commence call-out of the Highland Emergency Communications Group. The selection of those required to turn out would depend on the location of the incident.

There would obviously be no point in immediately calling out the operators on Skye if the incident was at Wick. Generally the call-out would include those residing in the Inverness area, as a priority would be to ensure that the Emergency Centre itself is manned. If the incident lasted several days then consideration would be given to calling out those further afield and not already involved, simply to relieve those on duty in Inverness.

The folks attending the centre would be briefed on the incident and it's location and given specific tasks. It could well be that a couple of volunteers may be tasked with obtaining detailed maps of the area and then to run the path profiling program to provide the location to which remote nodes should be deployed in order to establish data and/or voice links from the EOC to 'Porkie' at the area of the incident.

Once this had been established then others would have to take to the road, and sometimes, to the hills with the very heavy equipment boxes and antennas to set up the link. This can be the least exiting part of being a volunteer, being sat on a remote rain swept hill minding a box of tricks and a mast for hours on end. It can also be one of the most vital deployments.

It could also be, for example, that the Social Services have had to establish a reception centre in a local school or hall. The reception centre comms box then has to be set up at that location in order that information on evacuees and other welfare matters can be exchanged. Trust me, everyone is kept busy at an incident.

Emergency Services Tested

At 0307 on Friday 19 March 1999 an accident occurred which tested all the emergency services in the region. An alert was called into Pentland Coastguard from the Multitank *Ascania* a chemical tanker, registered in Tuvalu, transiting the north British mainland coast. The crew reported a fire in

the engine room, which was then sealed and flooded with CO₂ gas. All power was shut off and the ship was drifting some 6.4km north west of Dunnet Head and the weather was getting worse.

This in itself was a grim enough situation, but the *Ascania* was carrying 76 tonnes of bunker fuel, 20 tonnes of fuel oil...and a cargo of 1750 tonnes of vinyl acetate. The main concern was that the fire would spread to the cargo. If vinyl acetate gets too hot the stuff goes up in a fair imitation of a small nuclear bomb.

Understandably, by now, the crew had been winched off. Anchors had been dropped and the vessel, still on fire, was rolling in heavy seas. All emergency services attended the north west coast as by now the ship had drifted nearer land.

The Emergency Planners attended the scene and the Communications Group were called out as were the WRVS. The EOC at Inverness was staffed by the operators and 'Porkie' and a crew attended the village of Dunnet where the emergency was being controlled locally. An air, sea and land exclusion zone was established due to the risk of explosion and over 200 people were evacuated from their homes and businesses for the duration of the emergency.

The Emergency Comms group working with Emergency Planners and the services assisted with operation of a reception centre and, of course, liaison between the other services at the scene. The radio systems established by the ECG behaved themselves allowing evacuees data to be made available to the Centre in Inverness where enquiries were received on a helpline from those seeking information about friends and relations who could not be contacted at their homes due to their evacuation.

Emergency Planners liaising with the emergency service personnel were able to pass traffic to 'Porkie' via hand-held radios on low band simplex and then the communicators in the vehicle were able to deal with the 'nuts and bolts' of the traffic thereby leaving the EPOs (Emergency Planning Officers) free to concentrate on more pressing matters. The fire eventually extinguished and a serious disaster averted, the *Ascania* was towed to Scapa Flow, Orkney, for unloading and examination.

The fact that this operation went smoothly as far as the safety and evacuation of locals were concerned was in no small measure due to the high level of training that the volunteers have been given by the staff at the Highland Region Emergency Planning Department and the assistance of Norman Baird, almost a full time volunteer.

Weekend Training

Local training is carried out in the different areas throughout the year and, normally twice a year, weekend training is held at the Emergency Centre for all volunteers. As the entire group do not normally meet, other than for the weekend training in Inverness, there tends to be some social activity in the evenings after a weekend course.

This has been known to lead to sore heads the following morning as people head for home. Everyone involved enjoy their participation in the group and the experience gained pays dividends both for the individual and for the Highland Council who now have a valuable and cost effective resource.

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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.

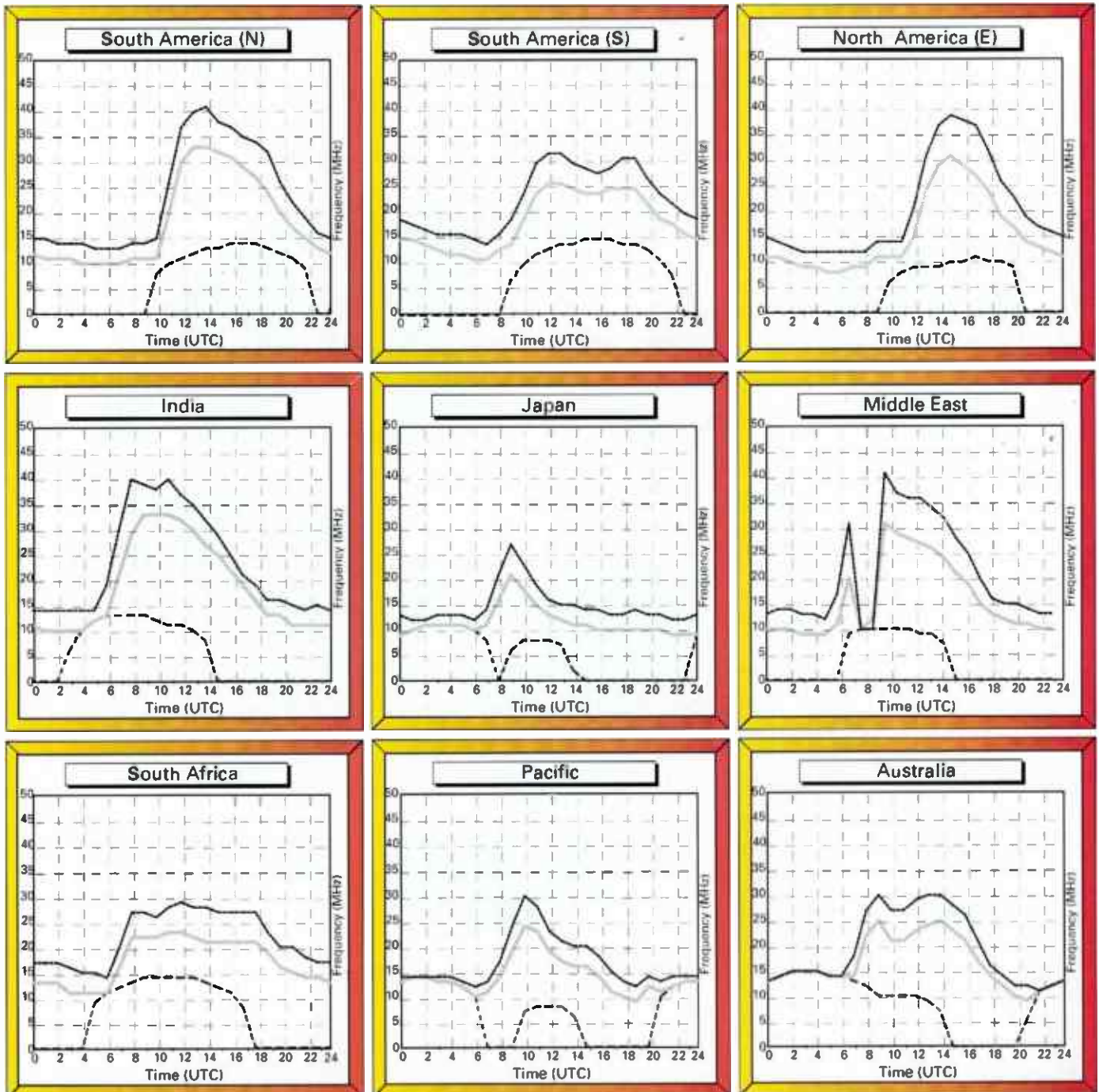
Lastly, the upper dashed line represents the maximum usable frequency (MUF), a 50%

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.

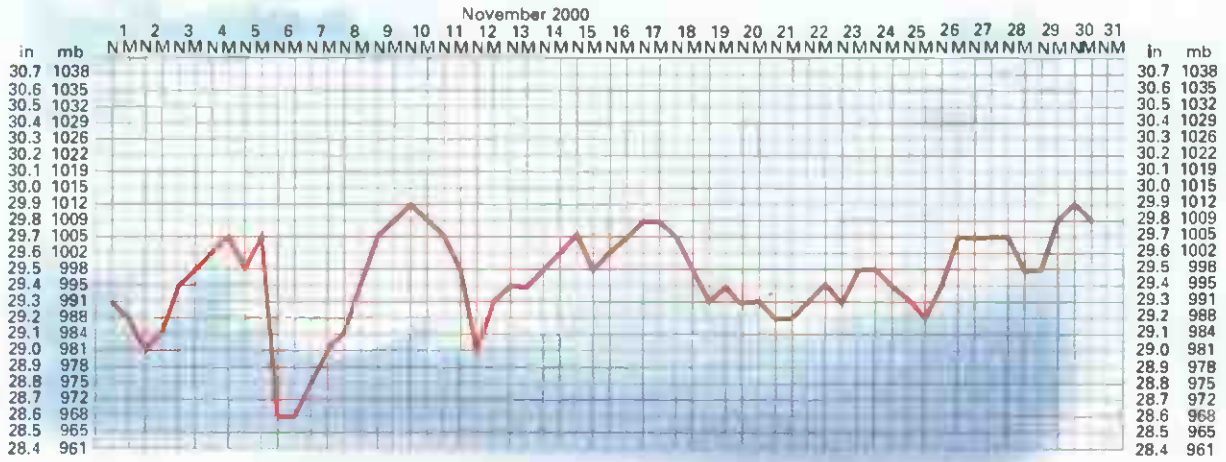
Good luck and happy listening.

January 2001
Circuits to London



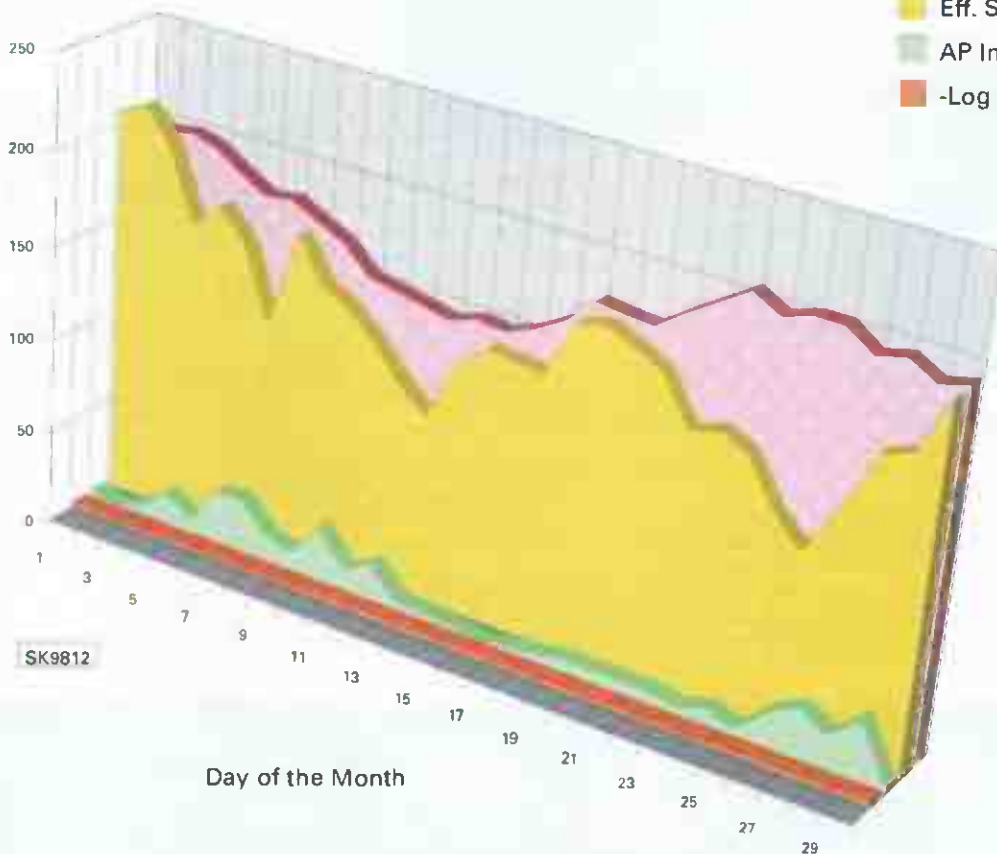
Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, November 2000.



November Data

- 10.7cm Flux
- Eff. Sunspot No.
- AP Index
- Log X-Ray



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

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

Satellite TV News

The last few weeks of October into early November have been extremely busy across the satellite arc and as I bang the keyboard so the recount continues in Florida over the closeness of the presidential election vote and with news of voting irregularities.

The run up to the election of November 8th followed the usual American hype and with many of the candidates' meetings being transmitted over the Atlantic circuits into Europe.

The main carrier that I monitored was the *NSS-K* sat @ 21.5° with the Reuters lease @ 11.462GHz-V open almost full-time though checking out other spots revealed catches such as the 'EBU Feed Path 11' @ 11.533GHz-H running SR 26000+ FEC 3/4. Interesting in the post voting lull and turnout

reports to see the outputs of various TV stations around the 'States usually fronted with colour bars/test cards and their own idents being fed over the Atlantic circuits - almost better than terrestrial TVDXing!

In the middle of the presidential election feeds over *NSS-K* I found a rather out of place OB (outside broadcast), that of floodlit horse racing ex Dortmund Germany - 1815 - 11.461GHz-H @ 6116+3/4, uplinked by SNG truck DFA-52.

For our readers across the UK it's been a period of rain, winds, more rain and then floods. At this moment the nearby River Test is full and localised flooding has been present for several days not 30 yards from me - though fortunately down a slight hill. Less fortunate was my large

Triax Unix 92 W on a 3m mast that 'did a banana' before collapsing and my 1.2m Ku-band dish somehow clunked over about five divisions on the positioner throwing all listed settings into doubt.

No doubt about my neighbour who lost part of his roof! But with the weather problems so the ITV regionals have been very active bringing back live pictures for their news and magazine programmes. Both

Anglia and Meridian have been using their leased BT trucks over the regular *Intelsat 801* (31.5°W) slots.

One dramatic news feed from Meridian over their TES-43, 10.998GHz-V showed Fred Dinaage linking into *Meridian Tonight* from an upstairs bedroom in a wrecked house on Hayling Island, the rain pouring down on him. But this was only part of the human misery. Over many nights pictures revealed the extensive flooding in Selsey, Lewes, Eastbourne, the Meon Valley and other damp venues.

One remarkable picture was of an RNLI inflatable rescue boat cruising up a high street past the local supermarket, I think this was Lewes. October 30th and once more the shingle banks breaching and extensive flooding at Selsey, this dramatic feed was seen via the SISLink SNG truck 'SIS 35 UKI 495' rimmomng on 11.068GHz-H - the winds were fierce with the reporter having difficulty in standing against the gale.

The weather drama was hardly eclipsed by the railways, leaves on the lines, trees across the tracks and - Hatfield - a train left the tracks due to a rail fracture leaving four dead. With other minor derailments and then a mail train jumps red lights, lands on other trucks jamming under a bridge, it was not a good period for the rail companies - or for their clients.

Not surprisingly both *801* and *Eutelsat 2F3* @ 21.5°E were humming with satellite feeds for several days after the 18th October Hatfield derailment. I noted TES-42 operating for Anglia at Hatfield on the 19th - 10.983GHz-V, 5632+3/4 - with a feed for their evening news programme and their reporter viewing from a nearby bridge the recovery and repair operation.

The Welham Green, Hatfield train crash produced an 'unusual sighting by Roy Carman (Dorking) on the 17th October over the

21.5°E *2F3* satellite, though the news report covered the crash and the aftermath, it was uplinked from the site in 525-lines NTSC, the USA standard - this on 11.678GHz-H @ 5632+3/4.

The Middle East has unfortunately maintained a high profile of violence between Palestinians and the Israeli forces. A scattering of news footage feeds has been logged across the Clarke Belt from *NSS-K* in the West across to *Eutelsat W4* @ 36°E. APTN were seen uplinking out of the Gaza Strip on October 11th via *Hot Bird* @ 13°E and using a familiar 12.581GHz-H

(5632+3/4) - the usual pictures of Arabic youth hurling stones and Israeli soldiers returning fire with rubber bullets. Notice that many of the Palestinians are using slings to accelerate their projectiles, a basic weapon dating back to the Bible.

October 14th and a visit here by our old friend Roy Carman produced an interesting news (?) feed over the Reuters 11.462GHz-V, 5632+3/4 lease. This featured Bill Clinton walking from the White House to his car, the motorcade through all the Washington streets to an eventual large airfield (Andrews AFB?) where *Air Force 1* awaited, warming up. Bill waves and enters aircraft which zooms away into the clouds.

The picture then slants as the operator puts the camera down, the tape then rewinds indicating that it was played out from the airfield back to base. The camera was positioned to the very last car, at each road stop an FBI jeep pulled into the outside lane to prevent a potential assassin from driving alongside the president's car.

We presumed that the tape was a recording for training purposes or to archive any attempt to harm the president and I suspect was not intended for trans-Atlantic transmission into



Another *NSS-K* news feed for both American and European satellite distribution.

FBI heavies hovering by the door on the American *Air Force 1* prior to President Clinton boarding.



Al-Manar TV news, protesting crowds on the West Bank and damage caused to an American warship in the port of Aden (Crater), via the Lebanese bouquet on *Arabsat-3A*, 26°E.



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Europe, more likely pluggery somewhere fed the signal to a) the FBI and b) to Reuters uplink site! The president was en route for the Middle Eastern summit talks at the Egyptian Red Sea resort on the 15/16/17th October. Coverage was intense into the American networks with successive Westbound feeds carried over NSS-K. Unfortunately for Bill Clinton, peace in the Middle East during his presidential office has still evaded him - but he has tried.

Al-Manar TV within the Arabsat 3A Lebanese digital package @ 11.785GHz-V, 27500+3/4 has maintained a violent anti-Israeli dialogue over the continued violence with edited propaganda video footage liberally sprinkled across their transmissions. If any reader is studying Middle Eastern politics, then this is one transmission to watch - news from the Arabic viewpoint, occasional inflammatory rhetoric from political leaders and some of the highest technical quality video on Arabic TV today. Al Manar has incidentally also taken capacity on Nilesat-101 @ 11.823GHz-V (27500+3/4).

I have previously mentioned the very busy NSS-K Reuters 11.462GHz-V digital lease and the amount of signal carriage. Once more the NASA-TV coverage was linked into Europe over this frequency with pictures of the latest space shuttle launch - STS-92 - and its rendezvous with the International Space Station.

There is a high degree of confidence now in live reportage and several cameras are now carried on board for full in flight pictures, docking with the space station and astronaut activity on and about the shuttle/station complex. The shuttle crew had to spend an extra day on the spacecraft as high ground winds delayed the landing back on earth until the 23rd. Very unusual, but the Globecast digital bouquet also on NSS-K carried the STS-92 activity in parallel with the above nominated Reuters lease, Globecast operate at 11.590GHz-V, SR 20145+3/4.

The presentation includes video displays continuously updated showing the flight path of the space station about 336km high and interesting that it tracks over the central South UK heading SE. It's clearly visible with the naked eye at nightfall as a moving very bright spot - the station still in sunlight.

Whilst in space launch mode, the Bayerischer Rundfunk analogue transponder on Astra 1 @ 19.2°E (11.141GHz-H, PAL, audio 7.02/7.20MHz) carried the successful launch of Europe's star-1 in the very early hours of October 29th, the craft slotting at 45°E to provide coverage of Europe, Asia, the Middle East and India in Ku-Telecom band. This German channel carries the full English commentary plus French comms talk without German translated additives as offered from the Arianespace TV programme output ex Kourou, French Guinea.

If readers are aware of Kourou launches around midnight UK time then check out the above analogue transponder as BR will usually carry the Kourou TV output live plus incidental control room chat prior to the launch during its week-nights Space Night programming. With the gradual close-down of Sky-TV analogue transmissions on 19°E, the occasional Kourou launch has also been featured - of an Astra series satellite - on one of the recently Sky closed down transponders. The French Telecom-2A bird, 8°W was also reported as carrying Kourou output on 12.592GHz-H @ 27500+3/4.

Eutelsat 2F3 was seen transmitting a news package October 16th concerning the large oil rig Regalia then moored near to an Exxon refinery - this apparently was about to be towed into the Barents Sea to undertake lifting operations on the sunk Russian sub Kirsik aided by Norwegian divers - a news item mid November indicated that the Winter gales had ceased operations until the spring.

For Spanish folk or students of Iberian languages it might be worth a check out on PanAmSat-3R (PAS-3R) @ 43°W. Several programmes within a Galavision bouquet have now gone into the clear - ECO, Ritmo, TeleHit, Telenovelas and Galavision - are now available @ 12.584GHz-V running SR 27500 + 3/4. And whilst out West, the Iranian TV channel 'NITV' has fired up on telstar-11 (previously Orion) at 37.5°W with a very unusual SR - 2222 and FEC 3/4 - and it's in the clear.

And finally zooming back to 7°W and the NileSat 101/102 slot,

the ART have just initiated a new digital package including B4U Movies-Middle East, The Filipino Channel, Cartoon Network, LBC Europe and the Jordan Satellite Channel. It's on 11.900GHz-V at the common 27500+3/4 but a tricky satellite to find.

Orbital News

With the SE Asian economy now pulling out of recession, there's an increasing demand for communications and Intelsat are wheeling in more satellite capacity over the next couple of years. The current 3° spacing between adjacent satellites is being reduced to a 2° spacing and squeezing in more birds - bigger dishes will now be required to obtain the narrower beamwidths to minimise adjacent satellite interference! By Spring 2003 the stacking pattern will be Intelsat 802 @ 174°E, 702 @ 176°E, 602 @ 178°E and 701 @ 180°E. The 702 bird has already been repositioned.

Controversy continues in the 'States over their use of the 8-VSB digital standard with public denouncements of continued use of the 'Frankenstein' standard! Broadcasters however feel that the COFDM system will offer greater flexibility for future digital transmissions and will match the general international use of COFDM.

After the great Ostankino Tower blaze in Moscow, August last, the Bonum 36°E satellite is being used to provide TV links for the NTV TV channel to several temporary replacement ground transmitters whilst the 320m high tower is repaired over the next 12 months. A scattering of terrestrial transmitters is now providing temporary programme reception across the Moscow area. The cause of the fire was overloaded transmission coaxial cables - citing the silicone covered NTV transmitter feeder as the main culprit - plus the three hour delay in isolating power supplies to the tower.

The satellite channel CNBC-Europe has just launched a Turkish language variation to the mainline channel called 'CNBC-e'. The new channel will present business and financial market info from the European area in the studios of the Istanbul TV station 'Kanal E'. All presentation and production for the opt-out service will be sourced in Istanbul though CNBC will retain full editorial control.

The Boeing Aircraft Company are now developing special satellite antennas for fitting to aircraft providing full 2-way data communications capability. The flat profile antennas comprise many etched dipole elements (typically 1550 receive, 870 transmit) and already the receiver version is in use with the transmit version ready end 2001. The following year should see about 400 aircraft thus fitted and rising to 1000 in 2003.

Interactive 2-way services via the Astra satellite system in Ka-band should become reality in 2001 and onwards with small dishes designed and made by Norsat International Inc (Canadian

firm). The initial order is for 10,000 Ka-band outdoor units and the EMS company making the indoor/set-top electronics. Makers claim that rain-fade will be no problem. Though Ka-band is recognised the preserve for satellite comms, a report in *Via Satellite* claims that the American firm 'Satellite and Engineering Inc' (SEE) are supplying Ka-band terrestrial MMDS system with 8000 already in use. Distances of 80km are being claimed.



Live reporting from a railway crash scene at Hatfield, via Intelsat 801.



October 6th, the day after the Belgrade riots that overthrew President Sloba, the new President Vojislav Kostunica talks to his new subjects with a live 'phone-in via the Express-3A satellite (Serbian transmitter distribution link) @ 11°W - 11.462GHz-H.



Al-Manar TV news, protesting crowds on the West Bank and damage caused to an American warship



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Aero List

In the July issue I mentioned a list of aeronautical h.f. frequencies that had been compiled by Risto Hirvonen in Finland. He placed the listing on his web-site (see 'Web Watch' for details) so that listeners could acquire a copy, and maybe provide updates and new information for the list.

Risto has recently announced on the Internet that he is in the final stages of a major update to the list, and by the time that this column arrives on your doormat in late December (or maybe early January if the usual Christmas postal delays occur!), the latest version of the list will be available for download.

For those of you who have not seen the list before, it is a list of stations with an aeronautical connection, running from just over 2MHz to just under 30MHz. Some of the aeronautical connections are a bit tenuous, but I am always of the opinion that it is better to have too much than not enough!

It is a colossal listing which runs to about 130 pages of text. Fortunately, the file is available to download as a ZIP which reduces the file from over 400K to under 70K. I am sure that Risto would like to hear from SWM readers with updates and corrections.

Santa Maria ATC

Last month I mentioned the set-up at Shanwick concerning the way they operate - the radio operating is done at Ballygheen in Ireland and the air traffic controlling at Prestwick, and the two sites are joined by a dedicated 'phone-link. This brought forth two very quick responses from people involved in the aeronautical h.f. ATC operations from different sides of the system.

First up is Luis Filipe Santos who actually works at the Oceanic Aeronautical Control Centre (OACC) at Santa Maria in the Azores. He E-mailed me to correct one of my comments in the last issue, where I said that 'the [h.f.] controllers are probably at the same site as the v.h.f./u.h.f. controllers'. Luis points out that when you hear Santa Maria ATC on h.f. you are listening to the 'radio operators', not air traffic controllers. He goes on to explain that both the controllers and radio operators are in the same large room, but working from opposite sides of the room. Luis has a web-page devoted to the Santa Maria OACC which includes some pictures of their radio station.

In the same article concerning Shanwick in November 2000 SWM, I mentioned briefly the advances in satellite telecommunications that allowed pilots to talk directly to the ATC controllers at Prestwick. The aircraft can call the controllers via satellite, but there is no way for the controllers to call a specific aircraft. Dudley Baker E-mailed me to explain how things are changing faster than I imagined.

Oudley sent a copy of a document from the NATS web-page which gives details of how a planned satellite tracking system works - this is known as Automatic Dependent Surveillance (AOS). This is a mostly satellite-based system, so it is beyond the scope of this column, but it does explain how the system works during trails and in practice.

For those who are interested in the AOS system, I have also provided web-page details. Oudley also mentioned that the company he works for are currently planning to install Honeywell/Racal equipment to several Airtours aircraft to allow them to use the new AOS system.

SCOPE Command

Last month I briefly mentioned some changes in the structure and set-up of the US Forces Global High Frequency System (GHFS). Richard Patterson reported hearing GHFS stations working various aircraft and also passing EAMs, but not being quite sure who they were when they signed off!

What has happened is that some of the 14 world-wide GHFS

stations have changed to allow remote control from other GHFS stations. The most recent change (mid October 2000, in fact) was when Croughton GHFS 'signed off' as a station in its own right. It is now controlled remotely from Andrews AFB in Washington DC. This is not strictly true, as there was a cut-over period with a reduced number of operators at Croughton, who were able to handle communications with aircraft when the operators at Andrews GHFS were having problems.

As time has passed all the bugs have been ironed out of the system and most of the time that you hear Croughton now, it is actually a radio operator at Andrews GHFS who is talking. Andrews GHFS has also taken control of several other GHFS stations, so that is why you sometimes hear the operator use the wrong station name. Listeners still report hearing 'Croughton GHFS', but it is the operators at Andrews GHFS controlling Croughton remotely.

This remote-control operation is part of a world-wide change to the GHFS system, and like all US military projects it has a code-name - SCOPE Command. The 'SCOPE' part of the project stands for 'System Capable of Planned Expansion'.

SCOPE Command is a program of the High Frequency Global Communication System (HFGCS) System program office (SPO). It is an upgrade and modernisation programme that will upgrade all 14 high frequency (h.f.) ground stations world-wide to support four unique missions: USAF Global, Mystic Star, Inter-American Air Forces Telecommunications Network (SITFAA), and Defense Communications System (DCS) h.f. entry.

United States Air Force (USAF) Global supports a wide range of users by providing air-ground-air, ship-to-shore, broadcast and Automatic Link Establishment (ALE) capability to various DoD customers. Mystic Star provides h.f. communications for the President, Vice-President, cabinet members and other senior government and military officials while aboard Special Air Mission aircraft.

SITFAA is a combined Spanish/English/Portuguese language network which supports Air Force users in 18 countries in North, Central and South-America, and provides voice and data h.f. links. DCS h.f. entry is a system which provides h.f. communications services for tactical units in areas of the world where DCS connectivity is unavailable or insufficient.

The present United States Air force (USAF) High Frequency Radio system installed during the 1960s and 1970s is becoming logistically unsupportable. The SCOPE Command is a program for modernising the current SCOPE Control, SCOPE Pattern and SCOPE Signal III radio systems. SCOPE Command will replace older h.f. radios and associated control equipment using state of the art commercial off-the-shelf/non-developmental items and the latest computerised control techniques.

The SCOPE Command h.f. radio system will function as totally integrated h.f. radio equipment. The 14 ground stations will allow remote or local operator selection of operating frequencies, sideband selection, transmitter power, antenna selection and azimuth selection for directional antennas, half or full duplex operation, and initiation of an Automatic Link Establishment (ALE) sequence.

The Rockwell-Collins web-page which includes details of the SCOPE Command equipment (see 'Web Watch' on this page for the URL) gives some details of the new equipment. The transmit subsystem includes a 4kW solid-state power-amplifier and omnidirectional and rotatable log-periodic antennas. Impressive, to say the least.

This all raises a few interesting questions - I have never heard of SITFAA before, and I have never seen any mention of it on the Internet. In fact, a search of the Internet for 'SITFAA' returned only three matches, all relating to the SCOPE Command project! Has anyone ever heard of this system before, or can anyone supply a list of h.f. frequencies used by the SITFAA system.

Web Watch

SCOPE Command
<http://jftc.fhu.disa.mil/ftsccommand.htm>

<http://www.collins.rockwell.com/content/pdf/771.pdf>

http://www.andrews.af.mil/89cg/789ca/System_Flight/scope_command.htm

Risto Hirvonen's Aerolist
<http://www.ute-monitor.org/aerolist>

Santa Maria ATC
www.terravista.pt/aguualto/2009

Automatic Dependent Surveillance
<http://www.sdd.nats.co.uk/oceanic.htm>

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Amateur Bands

I was hunting a missing document recently and came across a pre-War Hammarlund leaflet giving details of how to build a complete station using Hammarlund components and what the Yanks used to call 'tubes', (transistors were invented post WW2).

I searched for and found my one f.e.t. receiver, then scurried off for a new PP3 (yes, I forgot to switch it off before I put it away!).

Comparing the one f.e.t. receiver against the TS-440S and the TS-520S in terms of performance, I rediscovered the pleasure and skill in using a simple rig. About ten years' worth of forgotten skills were recalled, but - and this is the point - the one f.e.t. was able to hear and copy everything the big 'un could, with the only proviso, a need for headphones - which the XYL heartily applauds! I tried a high-impedance pair, and then went to a low impedance set: an output transformer from the junk-box and lo! I could use them too.

Since then I've built a direct conversion receiver for which I bought everything, and I still had change out of a tenner. Why not start with a kit like Hands, Kanga, Lake or Walford (note - this is just a small selection of kits available) - all have been around for years. A soldering iron and a pair of fine-nosed pliers are both probably in the 'domestic emergencies' toolbox already and clippers are in the bathroom. Once built, learn how to drive it - skill that many of the operators of the £1000 boxes never learn!

Even that's not the bottom limit. Find an old transistor receiver covering a band of interest (usually 40 and 20), now grab a 'trannie' with a reasonable tuning knob. Switch them both on. Set the old 'un to, say 14MHz, and tune the trannie (with it's audio right down) until you hear it's beat note. Carefully tune them about until you are definitely on the band, and mark the dials. Adjust the 'gain' by changing spacing and/or orientation. When we ran the HPX Ladder, two of the top scorers used this method.

This is simply to correct Mr McLellan in NSW (VK) who seemed to believe that an old receiver is less sensitive. Maybe he also thinks the colour of the paintwork determines the dynamic range! Perhaps we put people off our hobby by stressing high 'start-up' costs.

Our anonymous correspondent chimes in here, asking how she can satisfy herself the receiver is sensitive enough. Given something like an SX28, HRQ or AR88 you connect 'antenna' to a carbon resistor and twiddle the 'antenna peaking' front panel control. The received 'sharsh' will peak up somewhere telling you the receiver can hear the resistor noise.

Modern receivers usually delete this variable capacitor in the interests of cheapness, so you have to twiddle say, an a.t.u. to achieve the effect. This is a severe test at h.f. because the external noise is far greater than that of the carbon resistor. It is not a test at v.h.f./u.h.f. where the band noise is much lower.

The Mail

We must start this time with a very special mention for young Peter Goodhall who goes into hospital on November 28 for corneal grafts - so by the time readers see this - just a spot of good luck plus the hopes of all our readers should be enough to see vision restored to both eyes.

The next letter I opened was from Harry Richards in Barton-on-Humber. Harry recalls the 'leeway' on the dial of the early post-WW2 receivers. He first found amateur signals right at the high frequency end of the scale.

Two possibilities - one of hearing Top Band, the other hearing 80m phone by way of the second harmonic of the local oscillator. Of course these signals were almost all a.m. - if you were on sideband you could rely on a remark like "There seems to be something wrong with your mod, QM!" As for that 'leeway', a works test generator might go down to a microvolt, the serviceman's test oscillator would be much poorer, but neither would be calibrated to better than ±2% in frequency terms when new! And of course the idea of regular recalibration was still to come.

The next letter came from EI7GW with some QSL addresses. YR0DCF via K1BV; CO8JY via KD9C; EY8CQ via DJ1SKO; V31JZ via

NN7A; SV1BSX via F2VX; 4K9W via DL6KVA; UK8IZ via IK2OPR; F5YE via W5SV; CX1JJJ via CX2AM and CO8TW via EA3FOV.

John Collins in Birmingham comments on the theft of an Enigma machine from Bletchley Park on April Fool's Day and returned to Jeremy Paxman of BBC TV. On a different tack, while listening on 7MHz John heard lots of moans about Telford rally - one suspects most of the moaners failed to find all the stalls. The cost escalation suggested by the previous venue was totally unacceptable in any language.

For me, Telford was 'made' by once again meeting up with Chris EI7AAB from Fingal club - and of course both Telford and Llandudno produced meetings with readers. Sadly, I doubt whether I'll be able to attend many rallies in 2001.

Expeditions

There are noises being made of three expeditions to Conway Reef. February 5-15 sees the YT1AD group, while April 5-24 is being pencilled in by SM7PKK's group and lo! VK4FW intends to go there too. How daft can we get? The most sensible proposal heard is to try for Mellish Reef.

An interesting thought surfaces - on 7 January 2001 look out for possible North Korea, P5 activity. The second full week of February 2001 offers CE0X San Felix activity - three-four stations at the kW level.

The 3B6RF operation was a busted flush thanks to, quote, 'unexpected elections' in Mauritius. They hope for a successful operation in May.

The Isle of Sheppey, via Ted Trowell, offers damp greetings from 'sunny Sheppey' - judging from recent TV broadcasts it would take a DXpedition to sail there! On the bands, 7MHz showed C31BO, ET3VIC and 4W/K7BV and 10MHz yielded VU2BGS, OD5OK1MU, XT2QW and JO6RUP.

Up again for 14MHz to produce, in mid-afternoon, VQ9GB, KH0/NH7V, JR2DQL and at 1900 JA7AKH and 8Q7AB, leaving 2100 for VQ8AV, PY7HQ, FP/N8KR, HK3AXY, YK1AH, JK1KNB and HS4BPQ (cards via E21E1C).

Carrying on up we reach 18MHz for QY2H, XU7AAV, XT2QW, KP2J and PJ8/K7ZUM before heading up to 21MHz and 9M6BAA, FR5FD, J38AH, FP/K8DD and XT2QW. A morning on 24MHz gave Ted a brace of JAs and later on VQ9GB, VQ9QM, ZF2AH, ZP6CW and PY1OTO, while the 10m openings included PZ5RA, HC5YC, 3W7CW, KH6DX/M, 5R80 (via 5R8FL), FP/W8IQ, JY5HX, KP4TF, VP5/LA4DCA, DL2GGC/YV5, KH6CC, KG6QK, VE7NF, VE7EQD, KH6ND/KH5, KL7HF and VP9/GW3YDX - as usual all c.w.

On a different tack, G2HKU says he was told by his friend ON7BW that their national society UBA has been granted the additional title 'Royal'.

We've already mentioned the younger Goodhall. Father Paul seems to have managed to log most of what was about - though I suspect those sharp younger ears will have helped Pa to find some of them! Changing the subject, they've finished their history of Oxford & D club after a little over a year. They sent me a complimentary copy of the CD-ROM and just as soon as my other machine is updated, I'll be able to read it, but my grandson's XYL chose just the right moment to produce, so his priorities have changed!

Thanks

To everyone who enquired after my health, and in particular Godfrey G4GLM of 'Airband' column fame - my XYL is still wondering how to turn the pic into three dimensions!

Conclusion

That's it for another time. Please keep the input rolling in. I don't often comment on the jokes and other more personal bits, but I do appreciate them. As always, to arrive by the first of the month at Box 4, Newtown SY16 1ZZ.

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Airband

This year's Christmas Quiz poses a simple question: identify the folding aeroplane in the photo. So as not to make it too easy, Chris took the picture from an angle that is deliberately uninformative! I hope readers join me in thanking her for continuing to embellish my column with her artistic efforts.

Make sure your answer reaches me at the above address by the February 5 deadline. I shall pick the winner from all correct answers by random selection. My decision is final, no correspondence will be entered into and the Editor will doubtless surprise us with his choice of prize.

The winner will be announced in the April *SWM*. When submitting an entry, why not make it worthwhile and also include a question or some information that you'd like to see printed here?

Receiver Hardware

When scanning through any particular band, it is only necessary to know the first channel frequency and the step size.

Why, then, do so many commercial receivers make things complicated? Many sets will round the entered frequency to the nearest whole multiple of the step size. Some go as far as to offer complex facilities to 'offset' the start of the scan in order to circumvent the problem that has been created. Then they dare to claim this as a 'special feature!' Please, scanner manufacturers, why?

Now that 8.33kHz channels are with us, I can quote the following receivers as offering this narrower spacing: Alinco DJ-X2; AOR AR8200; AOR AR8600 (a newcomer to my list, see review in November's *SWM*); Yupiteru MVT-7300. Can anyone add to these?

For various reasons, it helps to operate two receivers at once, rather than to scan between two frequencies. Typical transport aircraft cockpits have two v.h.f. sets, making transfers between frequencies easy and enabling, say, company operations or a weather broadcast to be tuned in while not losing touch with air traffic control.

At some aerodromes, controllers might work two frequencies such as u.h.f. for military traffic and v.h.f. for civil MATZ penetration. That's why a civil aircraft's call might be met with "Stand by for the controller" who is already busy on another channel.

If you have the luxury of two sets, and if each has an earpiece socket, you too could listen to a mixture of the output from both without needing to build an audio mixer! All you do is take stereo headphones and wire each earphone separately to a mono jack plug suitable for one receiver. Then, receiver one can be heard in the left ear and receiver two in the right ear. Your brain does the mixing. Please note that this is not suitable for listeners with one-sided deafness, they will unfortunately need a proper mixer to get both sounds into their 'good' ear.

I made a simple connecting lead, so there's no need to re-wire good headphones (I quote suitable Maplin part numbers).

Start with a length of twin, individually screened, audio cable (XR21X). This looks like two runs of ordinary screened lead that have been stuck together, side-by-side, along their entire lengths. This is much thinner than radio coaxial cable and is unsuitable for r.f., the impedance being non-standard. In fact, the low-impedance audio doesn't need screening at all but I use this cable as it's strong and easy to wire up to the connectors.

Separate the two cable halves at one end. Each of the resulting arms will go to one receiver, so ensure that the length is suitable for your needs. The remaining part of the cable, still joined, goes to the headphones. The entire effort will make a huge 'Y' shape.

At the end of each arm, solder a plug to match the receivers, usually a 3.5mm mono jack (HF81C). Solder the braid first, applying a heat sink to prevent the insulation from melting. Locking forceps (GU91Y) are ideal for this. I also bolster the strength of the cable, where it is gripped by the plug, by applying heat-shrink sleeving first. More sleeving insulates the inner core where it is soldered to the plug's terminal. Remember, don't solder a thing until you've confirmed that the plug's screw-on

barrel has been slid back over the cable waiting its turn to join the finished product!

The other end of the cable is made up to a stereo line jack socket, usually 6.35mm (HH22Y). Both braids go to the body of the socket, the rpd core is the right channel, the other core goes to the tip connection (a brass appearance terminal) for the left channel. Before connecting up, check for freedom from short circuits by applying a multimeter (on

ohms range) across each jack plug in turn.

Procedures

By reporting untoward occurrences, lessons can be learnt and safety enhanced. Such an event is described in *GASIL* 5 of 2000 from the CAA. Two controllers each seemed to have different responsibilities for the runway. One controller allowed a vehicle to cross when the other cleared a flight for takeoff. Aerodrome Control, callsign Tower, should be the only authority controlling the runway, for landing, departing and taxiing aircraft as well as operations vehicles.

In November I stated the usual aeronautical convention that standard altimeter (pressure) setting is 1013.25hPa or 29.92 inHg. This causes the altimeter to read flight level (counted in hundreds of feet, FL100 looks like 10000ft on the instrument). This setting only applies where the aircraft is too high to need to worry about terrain clearance, so precise altitude doesn't matter.

The hazard is collision with other aircraft, but this is



Abbreviations

AIP	Aeronautical Information Publication
ATZ	Aerodrome Traffic Zone
C	Celsius
CAA	Civil Aviation Authority
DAIAS	Danger Area Activity Information Service
FL	flight level
ft	feet
GASIL	General Aviation Safety Information Leaflet
h.f.	high frequency
Hg	mercury
hPa	hectopascals
ins	inches
kHz	kilohertz
LARS	Lower Airspace Radar Service
lb	pounds
MATZ	Military Aerodrome Traffic Zone
MHz	megahertz
mm	millimetres
r.f.	radio frequency
u.h.f.	ultra high frequency
v.f.o.	variable frequency oscillator
v.h.f.	very high frequency

Airband

Continued from page 61

prevented by all flights operating at the same standard pressure setting. Hence, FL60 and FL70 are always separated by 1000ft no matter what the actual prevailing atmospheric pressure is.

D. Atkinson (Manchester) has worked as an engineer. The standard atmosphere applies to aviation, meteorology and physics, but engineers take an approximation of 1000hPa or 14.7lb/ins². I don't have any mechanical engineering reference book and had to rely on my scientific references.

Penguin Dictionary of Science gives normal or standard atmosphere at 0°C, 45° latitude and sea level as the same as aviation standard pressure, the imperial measurement being a more precise 14.72lb/ins² than used by engineers. *Geigy Scientific Tables* confirm the aviation hPa value and remind us that 760torr (mm Hg) is another measurement for the same thing. I think that D.A.'s engineering tables are a working approximation, correct to within 1.4%.

Also in November I reported on sporadic use of Bentwaters (confirmed by a photo that I saw in the *Evening Star* local newspaper). John Hawkins G8BXB (Ipswich) asks if I meant nearby Woodbridge. Can you send me a photo from there, John, so that I can compare the two? He also starts me wondering if local authorities can apply pressure to close small airports in order to protect their own assets. This suggestion comes to mind because Ipswich (the only grass runway from which I've operated) closed, nearby Norwich remains. I don't know the answer to that, can any informed reader demonstrate that this purely theoretical idea is wrong? Let me make it clear that I'm only interested in obtaining the facts, I'm not trying to make any allegation.

At first I was upset that my flight radio licence was 'restricted.' What couldn't I do that a 'general' one permitted? True, I stayed with v.h.f. as I didn't need the h.f. endorsement.

It appears that the 'general' licence is as lost in the mists of time as crystal-controlled 144MHz amateur transmitters with v.f.o. receivers and the need to 'tune the band from low to high for any calls'. Now, who remembers those days? In my Museum is an aeronautical set working on the same principle! Its operation required a 'general' licence, nowadays obsolete as these sets are no longer legal in the air.

Information Sources

Various charts and official frequency lists are on sale by mail order to the public. I list suppliers on my *Airband Factsheet* which is itself available free of charge if you send a pre-paid self-addressed envelope (to hold two A4 sheets) to the Broadstone editorial office (not to me!).

For instance, North Sea helicopter frequencies are shown on half-million topographical charts from the CAA. An item in *GASIL* 5 of 2000 explains that one such frequency, Anglia Sector (125.27 and 128.92MHz) is actually controlled from Aberdeen.

Frequency & Operational News

Martin Sutton (CAA) and *GASIL* 5 of 2000 inform us that Dunsfold aerodrome has closed, along with its DAAIS for D130 Longmoor and LARS. Farnborough's new ATIS is on 128.4, Kemble has a new ATZ, contact 118.9MHz where activity at neighbouring Aston Down gliding site is also available. London City's ATIS is now 136.35 (was 127.95MHz, clarifies last month's news), although the *AiP* doesn't yet reflect this - so further changes are possible. Papa Westray has a new runway 07/25. Southampton's 128.85MHz also serves as Solent Radar. Updating the previous information (November 2000), Stansted Director (was Radar) is on 126.95, Essex Radar is on 120.625MHz (it hasn't been withdrawn). Swansea remains on 119.7MHz but the Tower/Approach facility has been removed leaving just v.h.f. direction finding.

All letters received up to November 8 have been answered. The next three deadlines (for topical information) are January 8, February 5 and March 12. Replies always appear in this column and it is regretted that no direct correspondence is possible.

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 See Page 2



Scanning Scene

They don't have to give away vouchers for cereal bowls any more do they? These days any offhand remark made in a pub about motor fuel can spark an instant shortage with people topping up their tanks so that they can get to work to earn money to pay more tax, etc. Well, it seems that a certain level of discontent will endure for some time yet. This, coupled with the near collapse of the rail network and other road disruption means that to be informed is to be ahead of the game.

Well folks, to stay ahead of the game you need information and with radio gear at hand we have a head start. A friend of mine who as part of his job has to have a multi channel radio (a Cleartone model actually) monitoring different police frequencies, overheard a highly coded transmission: "Tesco's have just had a package". Cryptic eh! No stupid member of the public will figure out what that meant at midnight. So he filled up straight away. Simple but effective.

Most forces are still employing unencrypted traffic and far be it from me to suggest that you could listen to them, so to this effect all I can say is that most of their frequencies are in the current *UK Scanning Directory* and also are available from Paul Wey's PROMA.

Other Frequencies

In addition to the police, there are other frequencies that can provide information. So let's start low. Firstly, the CB frequencies. I know that the fuel tanker drivers will have mobile 'phones, but you can bet a lot of them have CB sets fitted and will be talking of road conditions to each other.

Also, find your local 'mould' frequencies in the 70MHz range (see the *SWM/PROMA CD for details too - Ed.*) and you could well hear the military tankers on those channels. Then there are other specific authorities. The British Pipeline Agency have a national allocation of 85.125MHz f.m. with an input of 71.625MHz, their official allocated callsign is not surprisingly 'Petrol'.

They also have another allocation on 446.450MHz f.m. This agency run the national underground pipeline system that can ferry fuel around the country without tankers or, hopefully, hassle. So, there may be some action there.

Customs and Excise are going to be involved in any future difficulty regarding fuel. The reason being that fuel is an excisable commodity. I remember that when one of the Pipeline Agency lines developed a fault and started leaking, the Customs & Excise were first at the site. Far be it from me to suggest that you should listen to any of this stuff, but in addition to the police frequencies, there are many Customs and Excise frequencies that would possibly be worth listening to if it were not unlawful to do so.

Some of these are: 68.2375, 81.750, 81.7625, 81.775, 82.050, 440.775, 440.825, 440.850, 440.87, 446.125, 447.8125, 456.500, 459.100MHz. The modulation method is f.m.

Likewise, motor fuel retailers and distribution depots have radio systems.

MHz	
164.0875	some Sainsbury stores
165.300	some Tesco stores
167.4625	Tesco stores (input 172.2625)
167.725	some Tesco stores
169.1875	some Asda stores
169.150	some Safeway stores
453.850	paired with 460.350 some Tesco stores
459.425	some Tesco stores
462.050	some Tesco stores
461.3125	some Tesco stores
again f.m.	

The oil distribution depots also have many frequencies. There are so many of them that to list them would be pointless, but if you have such a depot in your area then

search 453, 456 and 459MHz for their output frequencies.

If you have difficulty in finding fuel for the vehicle, it will always be worth listening to the 2m and 70cm amateur bands as the guys natter to each other as to where juice can be found. If you are listening then you can find it too. If you have a pager monitoring facility then run that as well and may your tanks remain full.

Baddies Arrested

At the risk of not being topical (*SWM* article lead times are about six weeks ahead of publication) I have just heard a news bulletin that a group of baddies have just been arrested trying to carry out a spectacular robbery of diamonds to the value of more millions than my overdraft, at the Greenwich Dome thingy. They had one of their boys on the other side of the river with a radio scanning the police frequencies. No doubt while he was listening to the Met. trunked system and simplex frequencies the cops were using encrypted stuff, mobile 'phones and possibly were put on an exclusive talkgroup by the Dome operators on the Dome's own TETRA system. I've got some frequencies for De Beers here (de diamond people not de brewery) but I'm not selling the details.

System Security

TETRA, of course, has good system security as a by product of it's complexity and technical sophistication. A TETRA unit can be totally isolated so that it cannot receive or transmit anything at all. This can easily be done by the dispatcher's terminal. This affords careless users a good safety net.

I remember that a few years ago in a small provincial town the traffic wardens operated from a small rented office in the town centre. When they went home at the end of the day, it was their habit to leave the hand-held radios on the windowsill. No prizes for guessing that one night the window was broken and all the sets went missing.

Some nights later at about 0100 the police radio operator was sparked into life by a slurred voice calling, "Big fight in the Market Square - **ooover and out**". Then, "Hellooo...ooover and out". This sort of stuff carried on for about another fifteen minutes with the voice becoming more slurred. Finally, he shouted for them to arrest a frightful drunk in the town...and he gave his own name. He was well known to the police who went to his home and found him asleep in bed with the radio, still turned on, on his bedside table. Not a bright boy.

Helicopter Frequencies

I have had a request from **Steve Brown** who works for Tynesound Radio who is after the air to ground to air frequencies for their helicopter. I could not get back to your E-mail address Steve so I think this is what you are after. I believe that the uplink is on 141.140MHz and the helicopter transmits on 468.4625MHz. I hope that this is of use to you.

Paul Wey from PROMA is trying to identify the users of the following frequencies. Does anyone have any ideas as to who is using them?

MHz	Location
453.750/460.275	Newcastle
453.800/460.300	Cheltenham
453.825/460.325	Southampton
453.875/460.375	Wolverhampton
453.950/460.450	Southampton
453.975/460.475	Newcastle
456.025/461.525	Reading
456.350/461.850	Newcastle
456.375/461.875	Portsmouth
456.450/461.950	Daventry
456.525/462.025	Henley on Thames
456.650/461.150	Nottingham
456.700/462.200	Nottinghamshire or Derbyshire
456.750/462.250	Birmingham
456.775/462.275	Nottingham
456.875/462.375	Nottingham
456.875/462.375	Nottingham
460.325	Birmingham City Centre
461.325	Gloucester shopping centre security
461.3875	Blackpool

Maybe you can help Paul with that lot.

Scan Around

Being interested in what other people are listening to, I would really like to hear from anyone who has heard anything really spectacular or interesting while scanning around. Anonymity guaranteed, if required, but I know other readers would like to know. Have you heard anything newsworthy or exciting. Do let me know. Is the retired bank manager who provided the 'Squidgy' tape reading this. Looking forward to hearing from you.

And Finally

Finally, I get my post late here and as I am just about to mail this offering to Kevin a letter has arrived from **Dave Robson** from Kent. Dave has been listening on his AOR AR8000 to 30 and 31MHz. Yes, you are right. You are listening to taxis and service companies in those frequency ranges. I was also listening myself that week in that frequency region and heard police and medics ("He's had a reaction to a bee sting"). It's worth listening right up as far as about 35MHz where I have heard stuff. I always scan in 5kHz steps and half the fun is listening to the accents.

To save time in checking whether the band is open, it's always worth tuning to 29.620MHz f.m. and if you can hear the amateur repeater, W10J, near Boston, then there is a good chance that the band is open. Fun ain't it.

Happy New Year!

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Info in Orbit

The storms and floods that started in late October and continued through November 2000 across Britain and Europe were dramatically imaged by the weather satellites (WXSATs). A few days before the second of the major storms arrived, forecasts from the Meteorological Office indicated that it would be a major weather event.

By the morning of Sunday 29 October, severe weather warnings were broadcast, so I had a careful look at each of my dishes. The large METEOSAT dish that I use for Primary Data reception is inherently heavy, weighed down on its base, and is not too exposed, so I chose to leave it alone. The satellite television dish is also at ground level, and after some thought, I decided not to dismantle it because it is bolted firmly to the ground.

In order to see as much of the sky as possible, my high resolution (h.r.p.t.) system is deliberately situated in the most exposed position that the yard can provide - so for safety I removed the dish. With help from my better half (wife), we unbolting it, removed the feed and pre-amp and took it indoors.

Just before dismantling it, I recorded the slow approach of the storm that afternoon - see Fig. 1. The winds increased through the night and the sheer noise of it tearing across the landscape was more than enough to prevent anyone sleeping. The cloud seen along the front stretched right across the Atlantic and down towards South America!

Winds reaching 147.2kmh^{-1} (92mph) were recorded in Plymouth, and some cities further east recorded 153.6kmh^{-1} (96mph) winds. A very loud crash outside the house caused some anxiety(!), but it turned out to be a neighbour's patio table that had been left outside during their absence. Much was my relief!

The following day revealed the sheer horror of the floods that followed in its wake. Figure 2 shows the view of Europe from METEOSAT-7 a day or two after the storm passed Britain.

After confirming that winds later in the week were not expected to be so severe, we replaced the dish and feed. A low elevation pass from NOAA-16 quickly confirmed that the system was in operation. The high resolution image from METEOSAT-7 at mid-day on 30 October showed the extent of the weather front. Frank Flanagan of Wexford sent Fig. 3, a NOAA-12 picture showing an infra-red view of the scene.

Current WXSATs

NOAA-16 was scheduled to have the a.p.t. (low resolution - automatic picture transmission) re-activated around 7 November, following a period of a few weeks during which time the 137.62MHz transmission would have been in conflict with that of NOAA-14. It was apparently a further day or two before transmissions were resumed, and when they did, reports of weak signals were numerous.

One typical report came from Dale Ireland, noting that a weak signal had been received in America even during a high elevation pass. Understandably, there was much concern, and many such reports were sent to the two WXSAT Internet mailing lists.

The event coincided with a long holiday weekend in America, but Wayne Winston of NOAA sent a note pointing out: "NOAA-16 is still not an operational spacecraft, and is in its testing and checkout phase; this situation does not endanger the health and safety of the spacecraft. Thus, no special 'crisis management' actions are being taken to investigate or resolve this problem over the weekend. Also, Friday was a Federal holiday in the US, so it is a three-day weekend. NOAA and NASA engineers will be examining the

spacecraft telemetry shortly to determine what the problem is, in a cool-headed manner".

Transmissions of NOAA-16 high resolution data continued throughout the period, but I did notice with surprise that after one such high elevation pass, my a.p.t. receiver had not heard anything from NOAA-16. The other NOAA WXSATs - NOAA-12, NOAA-14 and NOAA-15 - continued as they have done, with imagery from NOAA-15 remaining largely unusable.

The ageing Russian WXSAT METEOR 3-5 has been travelling north-bound during these autumnal days, switching off during the approach to the north polar region where the ground below experiences low and then zero illumination.

Figure 4 shows my latest picture illustrating the low level of sunlight and the vertical 'illumination' bars on the right-side of the image.

Those who are recent converts to the science (art?) of WXSAT monitoring may not realise that these ever-changing bars are digital indicators of the aperture opening of the radiation sensor on the spacecraft's imaging system, and can be interpreted as a binary counter.

Pictures consist of a.p.t. line scans, each containing a sequence of vertical lines (shown at left), picture data, black and white bars (columns) which apparently change position, and a grey scale. At one time there was a specific number of vertical lines which could identify the satellite. By carefully watching the changing columns, it may be realised that they are associated with the brightness, or level of solar illumination, of the scene below.

By the end of the transmission (top of the image), prior to entering the dark northern-hemisphere 'night time', the black column is at its widest, representing a fully open aperture. These changing bars (technically referred to as edge-code), are shown in the picture and can be interpreted as a binary indicator.

There are six columns, and black is considered to represent a 1, with white as 0. Therefore with the aperture fully open (for lowest light levels), all six black bars represent the binary number 111111. Conversely, in full illumination, the aperture is fully open - represented by 000000.

These binary numbers translate to 'normal' numbers (base 10) ranging from 63 to 0. Analysing 'backwards' for this pass, the sequence of 63, 62, 61, etc., can be counted.

- 111111 (63 decimal) wide open - all black
- 111110 (62 decimal)
- 111101 (61)
- 111100 (60)
- 111011 (59)
-
- 000000 (0) minimal opening - all white

This indicator has been shown by the **Ketters Group**



Fig. 1: NOAA-16 high resolution image 1342UTC 28 October from Plymouth.



Fig. 2: METEOSAT-7 1202UTC 30 October 2000.



Fig. 3: NOAA-12 1605UTC 30 October from Frank Flanagan.



Fig. 4: METEOR 3-5 1342UTC 12 November.



Fig. 5: NOAA-15 early image comparing channels 2 and 3A data. See also <http://www.noaanews.noaa.gov/stories/images/noaa-1-firstupdate.jpg>



Fig. 6: NOAA-16 22 October h.r.p.t. image of Switzerland from Cedric Roberts.

to correlate well with the amount of solar illumination at the point below the satellite (the 'sub-satellite' point). The late (and sadly missed) Geoffrey Perry first established this analysis. The other routinely transmitting Russian WXSAT *RESURS 01-N4* continues its sun-synchronous south-bound passes during the afternoon.

NOAA-16 Channel 3A

Wayne Winston of NOAA has provided Fig. 5, an interesting side-by-side comparison of the ability of the AVHRR (Advanced Very High Resolution Radiometer) channel 3A to distinguish between clouds

and snow/ice. Wayne points out that although there was no infra-red to confirm this, the high altitude clouds over central Greenland near the top of the 3A image are seen, but are not apparent over snow in the channel 2 image.

Correspondence

The European floods have provided a focus for many WXSAT monitors. Cedric Roberts sent Fig. 6 - a high resolution image from NOAA-16 recorded on 22 October, showing the flooding of the river Po in the Alpine region. He wrote "I was struck by the width of the river Po in the area where all of the floods occurred in the last week". Lake Garda is located at the top of Italy, and below it, the river Po runs right across the country.

Roger Ray of Telford sent several h.r.p.t. images, from which I selected Fig. 7 because it shows the same region as Fig. 6 from Cedric Roberts, but as recorded from NOAA-12 last June. The river is barely distinguishable in this summer-time image.

METEOSAT Schedule Changes

A new schedule of transmissions from *METEOSAT-7* became operational on 28 November. Issued too late for inclusion last month, the changes are, as expected, minimal. All the changes involve the channel A2 transmissions (1694.5MHz). Let us review *METEOSAT-7* transmissions in order to put this in perspective.

Transmissions in the 1691MHz band from this geostationary WXSAT are WEFAX only, and can be received using a small dish or multi-element Yagi. I sometimes use a 45-element 1691MHz Yagi, with a good quality pre-amp, and this produces a good signal. WEFAX transmissions can be received on both channels, so if you are setting up a *METEOSAT* system for the first time - ensure it can be set for both.

The lower frequency is referred to as channel A1, and the upper as channel A2. Channel A1 is reserved for WEFAX images and includes purely 'home' produced images. Channel A2 includes home produced and selected whole-disc WEFAX images and WEFAX from other geostationary WXSATS.

METEOSAT-7 WEFAX should be seen as an essential part of any serious WXSAT monitor's hardware. Channel-A2's Primary Data images are mostly encrypted - and therefore not usable without a decryption unit - they do include a valuable series of non-encrypted images from GOES, *METEOSAT-5* (over India), and GMS. In my view, these foreign image transmissions justify the cost of installation of PDU hardware.

The new schedule exchanges and modifies the times of a few WEFAX and PDU transmissions, for example, those for the synoptic hour 0600UTC the whole-disc DTOT (infra-red) and ETOT (water vapour) transmissions are swapped with the PDU AW (water vapour) images. Comparable changes are made during later hours at 0900, 1200, 1500, 1800 and 2100UTC. Those using PROsat-II (which can switch between channels A1 and A2 for selected images), and any other comparable programs, may need to re-set the software to take account of the changes.

'WEFAX to LRIT' - NOAA Meeting In America

The National Oceanographic and Atmospheric Administration organised a 'Users Meeting' for 14 November (just after our press deadline!) in Washington, Maryland, USA, for users of the US GOES WEFAX transmission service. The National Environmental Satellite, Data and Information Service (NESDIS) has accepted the Low Rate Information Transmission (LRIT) Global Specification as the new standard to replace the current WEFAX data transmission format (currently used on most



Fig. 7: NOAA-1220 Junco Alps region from Roger Ray.

geostationary WXSATs).

This new digital format will replace the existing (WEFAX) analogue format. The meeting was expected to provide WEFAX users and equipment manufacturers with information on NESDIS' plans for implementing LRIT, and to stimulate discussions on the present and future application of the Global Specification. NESDIS was to emphasise the impacts on the current service and receiving stations.

The purpose of this meeting was to present the technical characteristics of the follow-on digital LRIT transmission service that will be aboard the GOES-N (GOES-13) spacecraft to be launched in late 2002. Also for discussion were the modifications needed for current receiving sites and the cost of LRIT receivers, possible scenarios for the transition from analogue WEFAX to digital LRIT within the GOES-East and GOES-West reception 'footprints' and to provide a forum for user input to transition scenarios directly to NOAA.

International Space Station

In recent weeks, more than one person has written requesting continued information on the progress of the ISS, particularly with regard to transmissions. A reader from Reading specifically asked about frequencies planned - or currently in use - by ISS astronauts, together with monthly updates on telemetry and communications frequencies, and background material.

For the last few days since the first occupants of the ISS arrived on station, the old MIR frequency of 143.625MHz has been re-activated. I had not anticipated this frequency being re-used, but a notification from Sven Grahn advised that it was the first time that such a transmission from the ISS had been detected. I checked the frequency on the next available pass - and bingo!

STS-98 Atlantis Launch 18 January 2001

Construction of the ISS is scheduled to continue for several years. Individual modules have been, or are still being manufactured and tested. The Laboratory Module - see Fig. 8 - is the centrepiece of the International Space Station, where unprecedented science experiments will be performed in the near zero gravity of space.

The Module is constructed of fabricated aluminium, and measures 8.5m long and 4.3m in diameter. It consists of three cylindrical sections and two end-cones with hatches that will be mated to other station components. A 0.5m diameter window is located on one side of the centre module segment. This pressurised module is designed to accommodate pressurised payloads, having a capacity of 24 rack locations.

Kepler Elements - WXSATs, MIR & Shuttle

If you want a computer disk file containing recent elements for the WXSATs, AMSATs and others of general interest, together with a large file holding elements for thousands of satellites please enclose 50p with a PC-formatted disk and stamped envelope. A print-out is included that identifies NASA catalogue numbers for the WXSATs. The disk file is ideal for automatic updating of tracking software.



Fig. 8: ISS US Destiny Laboratory Module.

The Laboratory Module is scheduled for launch no earlier than 18 January 2001, aboard shuttle mission STS-98, station assembly flight 5A. An exterior waffle pattern strengthens the hull of the lab. The exterior is covered by a debris shield blanket made of a material similar to that used in bulletproof vests on Earth. A thin aluminium debris shield will then be placed over the blanket for additional protection.

The Shuttle Pack that I have been maintaining for some years, is now being modified to feature the ISS and provide the latest launch dates and construction status. It should be completed by January.

The Storms - Extra

Figure 9 shows the latest picture received during clear skies. Swollen rivers are distinguished in this image.



Fig. 9: NOAA-14 h.r.p.t. 1550UTC 12 November - the floods!

Frequencies

- NOAA-14 and NOAA-16 transmit a.p.t. on 137.62MHz.
- NOAA-12 and NOAA-15 transmit a.p.t. on 137.50MHz.
- METEOR 3-5 transmits a.p.t. on 137.30MHz.
- OKEAN-O, OKEAN-4 and SICH-1 may use 137.40MHz for brief transmissions.
- RESURS 01#4 transmits a.p.t. on 137.85MHz.
- METEOSAT-7 (geostationary) uses 1691 and 1694.5MHz for WEFAX.

■ PETER BOND c/o EDITORIAL OFFICES, BROADSTONE

■ E-MAIL: milair@pwpublishing.ltd.uk

MilAir

Well, my year of not quite making it to MilAir events continued - I had managed to keep two days free, (and some petrol), to attempt to go to the September Air Combat Power exercises at St. Mawgan, but needless to say, along with a number of other events this year, it was cancelled.

It is my opinion that last year's Kosovo crisis drained our financial military resources more than perhaps some in the echelons of power would care to admit! Let's hope I am more successful in 2001. Talking of 2001, (which it will almost be by the time you read this), The Royal International Air Tattoo 2001, will for a second year be held at RAF Cottesmore, the dates being the 28th/29th July.

The latest estimate for the extensive resurfacing work at Fairford, is that it is not now expected to be completed until the Spring of 2002. Having mentioned Fairford, although I have some firm ideas, I do not intend to add to the widespread speculation, (especially on the Internet), as to what MilAir activity will be occurring at Fairford once the work is completed!

RAF 'Have Quick'

Having mentioned the conflict in Kosovo, many readers will be aware that the RAF/MOD considered that some of their tactical radio communications may have been compromised whilst in the Balkans. How extensive this problem was is uncertain, but the RAF most definitely suffered difficulties. Perhaps the more serious scenario was the lack of secure communications between certain NATO air-arms due to incompatibility of equipment.

The bottom line was that with secure communications not always possible, transmissions 'in the clear' could be monitored by anyone with a wideband scanner. This was obviously a known problem, and as recently as 1996, a contract was placed with a UK company to supply the RAF with a additional number of 'Have Quick II' (ECCM) radios. This system that has been used by the USAF for some time and also on a limited basis by the RAF and the Royal Navy. Basically, 'Have Quick' is a modified u.h.f. radio that has been upgraded to include an element of electronic counter-countermeasures capability, (ECCM).

The 'Have Quick 2' system works by using a group of 16 pre-set frequencies which can be allocated to several networks, (Net A, Net B, etc.), this is achieved by using a differential timing signal. The two parties agree on which 'Have Quick' Net to use, it is then pre-selected on their aircraft's radio.

Once the two pilots establish contact, they select the 'Have Quick' button on their radio control panel, which activates a mini computer within the aircraft's radio. Then, by inserting a time signal, they begin rapidly cycling from one frequency to the next. Effectively, the timing signal cuts the transmission into segments, each segment is then broadcast on a different frequency, they are then re-assembled by the receiving radio. The two pilots conduct a normal conversation while their respective 'Have Quick' radio computers swap the frequencies for them.

The result is a partially secure means of communication. It is quite possible for more than one net to be used at once by independent operators, by inserting different timing signals there is no conflict between the Nets, even though they are using the same frequencies.

To the listener, the transmission is very quickly swapped between the frequencies so that only a very brief snippet of conversation can be heard on any single frequency. By using several radios simultaneously, (at least three or more with the correct frequencies selected), it is possible for a MilAir listener to monitor a reasonable percentage of the HQ II transmissions. The

operational theory being that by the time the opposition forces had locked onto the correct Net/time signal, the attacking aircraft will be long gone with the tactical aspect of their mission completed. It should be noted that if more than one Net is in use then it makes monitoring much more difficult.

To the MilAir listener the introduction of further 'Have Quick II' radios will hopefully only make a limited difference. All general air traffic communications will remain in the clear and as with current USAF operations, the RAF will most likely use the system primarily during tactical training and exercises. What percentage of tactical communications will be given the 'Have Quick' treatment remains to be seen, but the MilAir listener with the right equipment should still be able to monitor some of the HQ II communications.

And so to the future, technology has moved on since HQ II and the RAF's March 2000 announcement appears to indicate that they are intending to buy a more advanced 'Have Quick', (or similar) system, developed in the USA. Initial reports indicate that this is computer encoded/scrambled system which cannot be monitored from ordinary scanners - in which case, those of you who have mastered HQ II, may well have to think again!

London Mil

Since the changes to London Military in the Autumn of 1999, along with several friends and SWM correspondents, I have been monitoring the frequencies in use quite closely. After a year of monitoring, it now appears to be fairly obvious that it is most likely that the number of available ATC suites at London Military were reduced during this apparent restructuring. Despite the fact that several new frequencies were introduced, a significant number have not been noted since the Autumn change round.

All the following frequencies were noted during 1999 but have not been noted since 1st January 2000: 254.225, 277.125, 279.175, 279.225, 279.475, 281.225, 285.175, 292.525. (I have received one unconfirmed report for both 277.125 and 279.475 during that period). In the case of some of the Special Task Cell frequencies, it is not uncommon for them to go unreported for six months or more, but to have no reports at all in almost a year indicates that many of these frequencies have either been withdrawn or possibly have been reduced to a standby status.

A bit of an enigma, (as far as I am concerned), is the London Military West frequency 255.925. Now, this was included in two lists sent to me in January 2000, but despite extensive monitoring in the early months of the year, I personally never heard it in use. All went quiet until June 2000 when it was reported in use by two readers who heard a pair of Lakenheath F-15s given this frequency by London as a discrete for some air combat manoeuvres.

Once again it went quiet until late September and then the frequency was reported on six occasions over two weeks in both the North and South of England. In the month since then there have once again been no reports and I can only assume that it is a standby frequency that is only allocated for use on odd occasions? Even though I have had the frequency in the box since January, I have still not heard it in use - as ever your comments would be most welcome.



With the cold winter months upon us, I thought that our photograph would be drawn from the archives and warmer climates, in this case sunny Florida. Under blue skies is an F-106A of the Florida Air National Guard seen on the ramp at Jacksonville in 1986.



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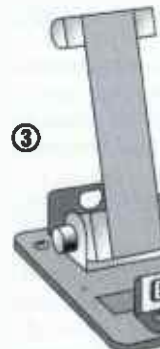


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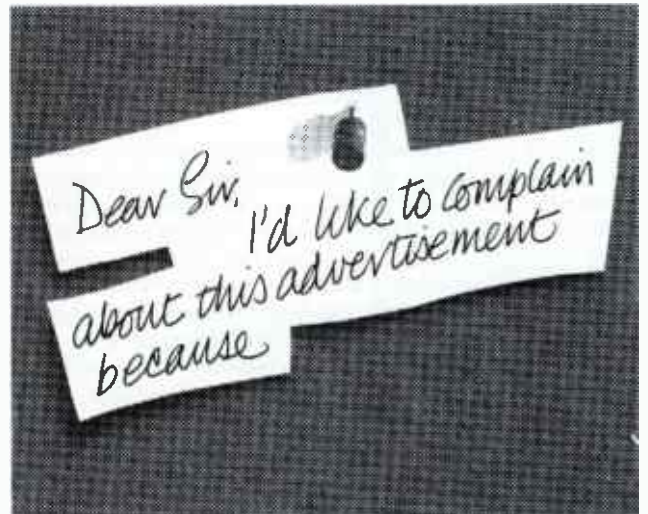
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ShackWare

Hello and a warm welcome to 'ShackWare', the bi-monthly column devoted to computers in the shack (especially the oldest!). No doubt many of you are recovering from the recent floods and now, at the onset of winter, is probably a good time for some annual antenna maintenance, so here's a tip from the world of Land Rovers (my other love).

WD40 is good for shifting stubborn nuts and bolts on antenna brackets, but it's expensive stuff. Try brewing your own penetrating oil by mixing a pint of ordinary diesel with a pint of domestic paraffin. Stir well and store in a suitable container which is clearly marked to show what the disgusting mixture within actually is.

Home-brewing your own penetrating oil in this way is easy, safe (if you take proper precautions) and enormously cheaper than buying the commercial stuff. And now let's bring on the silicon...

Finders Keepers?

Boot sale finds are always at the forefront of the subject matter in the letters I receive and this month is no exception. One, however, stood out as being just a little bit different. One of the first things I did after moving to Norfolk was to investigate the local second-hand shops, the boot and jumble sales and so on for sources of good 'junk'. We soon located the weekly 'five-acre boot sale' a few miles north-west of Norwich.

One Sunday, about a month ago, I was there, rummaging around as usual, when I spotted a really exotic find - a boxed Tatung Einstein beneath a pile of household junk. It was the work of a moment to make my way over to it and have a look.

The box was tatty but inside was a pristine single-drive Einstein, though without its start-up disks and manuals. I inquired how much and was told a 'fiver'. Fine, except I had about 75p in loose change in my pocket and Angela had the real cash in her purse - groan! I toyed with the idea of asking her for £5 but abandoned it as more or less hopeless.

I began to walk away, but suddenly determination got the better of me. I turned and dashed back...to find some other bloke just reaching down for the machine. I hung back and waited. He inquired the price, pulled out a 'fiver' and bought it!

How I cursed...a truly rare beast missed. It bugged me for an hour or two but gradually I forgot about it until, two weeks later, a letter arrived from Mr M. of Aylsham, Norfolk. (anonymous, because he has a wife too), who wrote to tell me he'd found a Tatung Einstein at a boot sale and could I tell him anything about the machine - how weird is that?

I replied, explaining that I was there when he bought it and had almost bought it myself. To cut a long story short, he said he didn't really want it but had bought it simply as a rare novelty and would I like it? You can guess the answer and so now, it's safely stashed away awaiting the moment when we move to our new house and I set up a shack again (of which, more later).

And for anyone else who locates an Einstein, here's a potted history to get you started. The machine was another attempt by an early-1980s British company to cash in on the home computer boom. Unlike some of the offerings of the day however, the Einstein was a very high-spec computer with a full complement of I/O ports, one or two built-in 3in disk drives, an excellent keyboard, sprite-based graphics and such novelties as a ROM-based machine code monitor (matched only by the BBC B). A Z80 processor provided CP/M compatibility giving the Einstein user access to thousands of high-quality applications - in theory at least.

Another exceptional novelty was the Spectrum emulator which allowed the Einstein to run 'Speccy' software. Though Sinclair's computer was universally dismissed as a toy, it did sport some of the best software (yes, games!) available at that time. The Spectrum emulator provided Einstein owners with the best of both worlds.

Price, however, was not in its favour, and computers other than Tatung's £499 machine (compare with the Beeb at £399 and the 'Speccy' at £129) attracted the Christmas present buyers. Gradually it faded, though it never quite disappeared altogether. A user group existed until just a year or two ago (and may still) and there are several web sites devoted to the machine. The best is www.tecomp.co.uk a brilliant feature of which is the digitised on-line versions of the Einstein manuals which I found very useful.

No doubt pics of the new addition will appear in the forthcoming 'ShackWare' special. Not sure how useful it will be in the shack, but I'll keep you posted.

Mailbag

A couple of nice easy ones this time. First up is **Michael Ford** of Newcastle-under-Lyme, Staffs, who writes "I have been involved in short wave listening for many years and my interest has always been broadcast and clandestine stations. I have always been fascinated though by the various RTTY and c.w. stations and have often considered expanding my interests to include utility decoding. My requirements would be c.w. and RTTY as a minimum plus whatever else the decoder had available. One of the models I have considered is the Momentum Easy Reader MC1100.

"At present I have an old Atari 520 ST computer and monitor which I have no use for and I was thinking of selling it to free up some finances to contribute toward the purchase of a c.w./RTTY decoder. However, it occurred to me that it might be a good idea to see if decent decoding software was available for the Atari before I got rid of it".

Selling your ST to buy a decoder! You've got an excellent decoder sitting right there on your desktop and one which can do a whole lot more besides, including keeping a database of the numbers stations you hear which will enable you to search for interesting correlations in the data once you have enough of it logged.

Seriously though, the Atari ST is an excellent and adaptable machine and certainly one of the best to come out of the 'home computing years'. Given that selling it will realise no more than about £25 (if you're lucky) the best thing you can do is to acquire a copy of Dave Miller's highly competent ST decode software *FaxCode*. The program offers c.w. and RTTY as well as FAX reception, performs exceptionally well, can save received data direct to disk files for further examination and is available as shareware (yes, you even get to try it before you buy it) with a registration price of just £6.

You'll also need to build a simple 'comparator' interface (30 minutes on the kitchen table with a few discrete components) and Dave supplies a circuit diagram. Send a cheque or postal order for six pounds to **Dave Miller at 33 Springfield Park, Twyford, Reading, Berkshire RG10 9JG**. And no, I'm not a relation of his, I just recognise good software at bargain prices when I see it!

Admittedly, Dave has moved on to programming the PC now (and at last contact was working on an all-modes soundcard decoder to beat all others) but his earlier effort is well worth acquiring. Good luck, Michael.

Charlie Watson also has a question about a recent acquisition. "My brother-in-law gave me a Cambridge Z88 computer which is a kind of early laptop machine made by Clive Sinclair, I think. (*Cambridge Computers - I used to work for the company in Scotland that assembled them - Ed*) After a look on the web I managed to find some sites which had files and other information for this computer and I even downloaded a c.w. decoder which I transferred to the Z88 with its PC link cable.

All was well until I realised just how quickly the machine was eating batteries - especially when I'm using it to communicate. I've tried NiCads but they're even worse and when the power drops so does all my data and settings! I'd like to get a power adapter of some description but I have no idea what to get. Can you help?"

While many computers of this type use relatively exotic power supplies which provide say, 9V a.c. or 15V d.c., and are therefore either expensive or difficult to find (but easy to make!), the good old Z88 uses simple 6V d.c. and any of the small switchable regulated adapters with an output around 300mA will work perfectly well.

I powered my Z88 with a multi-range adapter from Argos which cost (I think) about £3.99. One small point: check the polarity of the tip because if memory serves, it's negative not positive.

And Finally

By the time you read this we will have moved again and the new address appears at the head of the page. I'm hoping to get my shack set up as quickly as possible so do keep your letters coming. Until next time, good listening.

■ MIKE RICHARDS G4WNC, PO BOX 1863, RINGWOOD, HANTS BH24 3XD
 ■ E-MAIL: decode@pwpublishing.ltd.uk ■ Web: <http://www.mikespage@btinternet.co.uk>

Decode

With the winter weather well and truly with us now is the time to really get stuck into some serious decoding. In this month's column I've found lots of software to keep you busy - some new, some not so new, but there should be something for everyone!

The new web site is proving to be very popular and well worth the effort to update. Keep a close watch on the site and please let me know what else you'd like added.

Synop Weather Analysis

Those of you that have had a go at using the excellent MMTY RTTY package will have discovered that a lot of the weather information sent by the likes of Hamburg Meteo is encoded. Watching five digit number groups rolling across the screen is hardly captivating, so I thought you'd be interested to see how these numbers can be transformed into maps!

If you want to try manually decoding these groups of numbers, it can be done, but you need a good reference book to translate the codes. Probably the best place to start is with Joerg Klingenfuss' *Radio Data Code Manual*. This excellent book is packed full of fascinating data for anyone seriously into decoding. However, in section 3.10 of the 16th Edition you will find a basic explanation of the code along with the information you need to create a manual translation.

If you've really got lots of time on your hands and have some programming experience you could even write your own decoding software. If you do succeed with this, please write and let me know and I'll give you a mention in the column. Anyway, for most of us we will have to rely on someone else's software efforts to do the decoding for us.

Fortunately, there's some excellent software available to really bring your weather data to life. The real star performer for those with a Windows PC is *Digital Atmosphere* available from: <http://www.weathergraphics.com>

This is an amazingly versatile program that's provided as shareware so you can evaluate it for free. What's more, registration is a very reasonable \$68 so it's well worth a good look. To run the program you just need a 486 or later processor running *Windows 95/98* or NT with 4Mb of RAM and 25Mb of hard disk space.

For Mac users, *Digital Atmosphere* has been successfully tested under Mac OS 7.0 running *SoftWindows*, so it really is flexible. The version tested here was 2.3.3 which was released in November this year, but you should find the new *Digital Atmosphere 2000* available by the time this gets into print - I'll give you an update on that later.

I must admit I was really impressed at the power of this program. It contains customised digital mapping with 3.2km resolution for the entire globe. This is supplemented with world-wide topography with 48km resolution so you can really bring your maps to life in full colour.

Digital Atmosphere is set up to be able to import and display a very wide range of weather data including SAO, METAR, SYNOP, SHIP and AIREP. The wide range means it can handle just about all the information that you can receive on the h.f. bands from the coded weather stations.

Although the *Digital Atmosphere* is distributed as shareware, this is very clearly a professional package and is used by weather organisations and the media to process raw weather data. You will see that there's even an option to display TV style weather information from the raw data.

When you come to download the program, you will find it's a fairly large file at around 7Mb, so it may take a while depending on the type of Internet connection you have. If you'd rather not use this route or don't have an Internet connection, you can order the program on CD-ROM direct from **Weather Graphics Technologies, PO Box 450211, Garland TX 75045 USA, Phone (888) 388 0070**. They take international credit card orders and charge around \$15 for delivery so this should be an easy way to order.

Colour Weather Maps

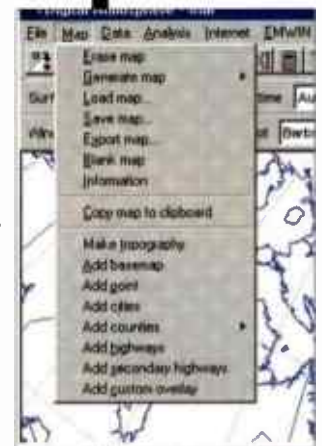
Let's just run through what you have to do to turn those weather RTTY signals into full colour weather maps. The first step is capturing the data and you can use any RTTY program that can be set to send the decoded output to a text file. Most will do this easily and my current favourite is MMTY - see my review in 'Decode' from a month or two ago.

In this program you just choose 'Log RX file' from the File menu. This will send all the decoded output to the chosen file. You can check that this is working by opening the saved file in a simple text editor like *Notepad* and you should see all the decoded text laid-out as it was on the screen.

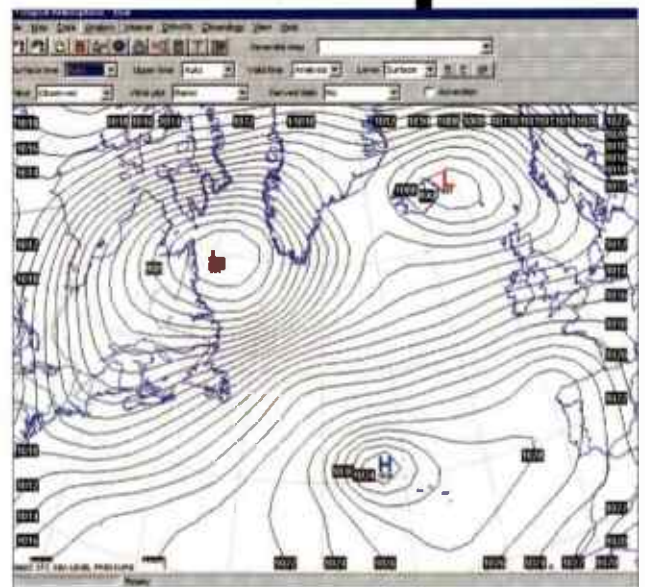
If this is OK, the next step is to leave the RTTY program decoding a station like Hamburg Meteo on 7.88MHz and go and do something interesting! When you come back you should have a good stock of up-to-date data to work with. Make a note of the file name and location of this log file and start *Digital Atmosphere*.



Analysis Menu Detail.



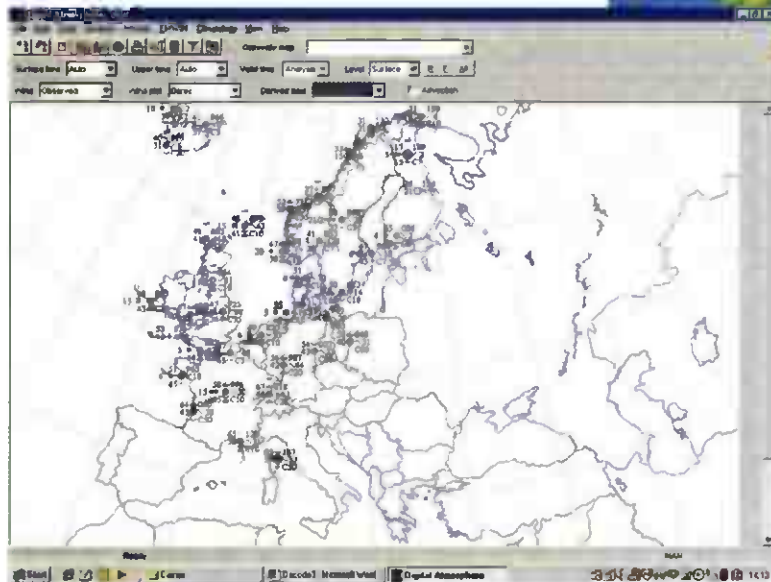
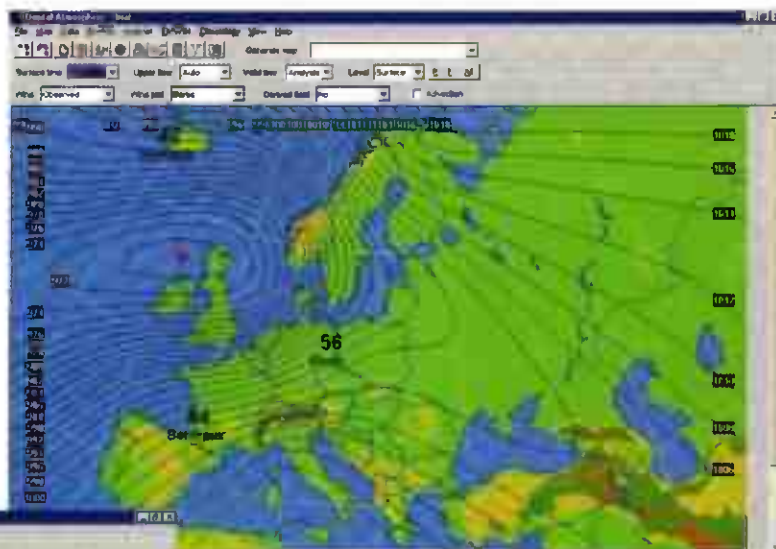
Map Menu Detail.



Digital Atmosphere station details for the Atlantic.

Importing your data is really easy - all you have to do is hit the Import File icon at the top left of the screen or choose File - Import a File. You will then be presented with a conventional Windows file selection menu where you can go and find the log file you saved containing your data. When this is done, *Digital Atmosphere* will process your data and get it ready for analysis.

The next step is to choose the map you want to use to display your data. If you used Hamburg Meteo, there's a good chance that the received data is going to be based on readings taken in Europe. Click on the Generate a Map down-arrow and you will be presented with a list of all the main geographical areas - choose Europe. Depending on the speed of your PC, a map should now start to appear on the screen. This is used as the background for your data plots.



Next you need to see what data you've got and the best way to do that is to go to the Data menu and select Data Plots. This should produce a load of numeric data on your map and shows the location of the stations supplying information in your data set. Depending on how this looks, you may need to choose a different map, i.e. UK to get better coverage.

If you don't see any data at all, it may be because your data refers to a different part of the world. In that case you need to try some other maps until you find your data.

When you're happy with your choice of map, choose the Map menu and select Erase Map - this clears the screen of the station data, but leaves the map outlines in place. Now you're ready for your first analysis plot.

Go to the Analysis menu and choose 'Pressure/Height' followed by 'Sea Level pressure'. If all is well you should now see a detailed pressure analysis based on your data. It's important to make sure you have lots of data points in the area that interests you or you may get false results. Once you've mastered this you can start plotting a whole range of parameters using the Analysis menu.

If you need to clear the map just go to 'Map' and choose Erase map and you can start with your next plot. If you have a plot you'd like to save or print-out, *Digital Atmosphere* has a number of options to help out. You can just hit the Print button for print-outs or

choose Maps - Export to save pictures. I wouldn't recommend the simple Save command because it uses the Bit Map format, which tends to create very large files of around 2.7Mb as opposed to the 263Kb files produced using JPEG compression.

If you want to spice-up your maps you can add the topography - open the Map menu and choose Make Topography. This takes a little while, even on a fast PC, so if you have an older model I

Full Colour Plot of Europe.

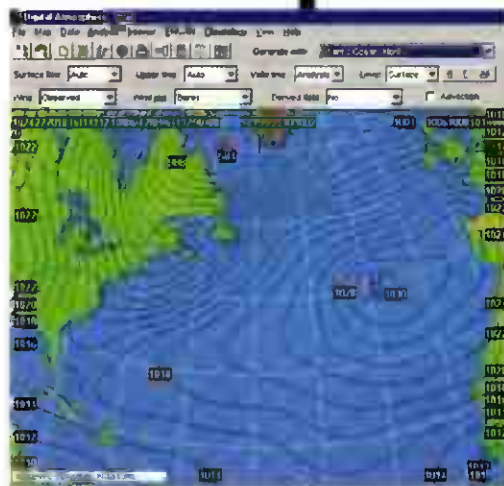
Digital Atmosphere Station details.

should make a cup of tea at this point! When the PC's finished you can then plot whatever you like on this impressive background.

If you're running an older PC that's struggling with *Digital Atmosphere* there is an alternative - *Meteocode*. This program by Andrew Jeffreys is getting a bit long in the tooth, but it still works very well and, because it works in DOS, will run on almost anything! You can get a demo version from: <http://www.fortunecity.com/skyscraper/quantum/103/metcode.zip>

The method of using the program is very similar to *Digital Atmosphere*, but without the frills. You just need some data in a text file and *Meteocode* can be set to either decode it to plain text or plot the results on a map. The conversion to plain text can provide a useful double-check if you're trying your hand at some manual decoding.

That's about it for this month, but don't forget to keep an eye on the web page and let me know of any new software or neat ways of using the ones I've already covered.



Full Colour Plot of the Atlantic.

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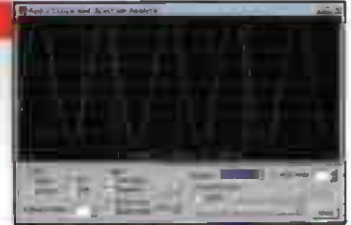
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Construction of externals	WR-1000e/WR-1550e - 3100e - external RS232/PCMCIA (optional)		
Frequency range	0.5-1300 MHz	0.15-1500 MHz	0.15-1500 MHz
Modes	AM,SSB/CW,FM-N,FM-W	AM,LSB,USB,CW,FM-N,FM-W	AM,LSB,USB,CW,FM-N,FM-W
Tuning resolution	100 Hz (5 Hz BFO)	10 Hz (1Hz for SSB and CW)	10 Hz (1Hz for SSB and CW)
IF bandwidths	6 kHz (AM/SSB), 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 6 kHz (AM) 17 kHz (FM-N), 230 kHz (W)	2.5 kHz(SSB/CW), 6 kHz (AM) 17 kHz (FM-N), 230 kHz (W)
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Scanning speed	10 ch/sec (AM), 50 ch/sec (FM)		
Audio output on card	200mW	200mW	200mW
Max on one motherboard	8 cards	8 cards	6-8 cards (please ask)
Dynamic range	65 dB	70 dB	85dB
IF shift (passband tuning)	no	±2 kHz	±2 kHz
DSP In hardware	no - use optional DS software		
IRQ required	no	no	yes (for ISA card)
Spectrum Scope	yes	yes	yes
Visitone	yes	yes	yes
Published software API	yes	yes	yes (also DSP)
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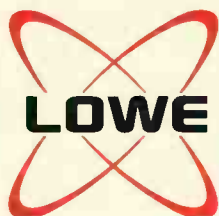


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