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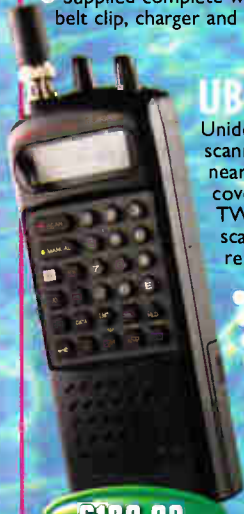
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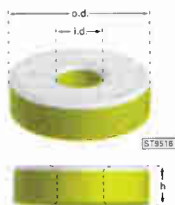
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Joe Carr K4IPV

Cover Subject

FREE - SCAN '98 Booklet
John Wilson checks out the
new d.s.p. software in the NRD-
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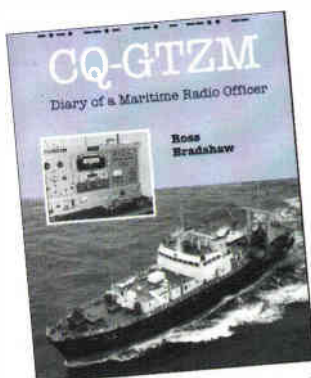
QSLs Ready

QSL cards for GB125BRC operational back on July 1st and 2nd 1995 have now been sent to the QSL bureau.

Anyone awaiting a card for this particular event, one of a series held in 1995, should ensure their QSL Sub Manager is supplied with an envelope. Anyone wishing to QSL direct should send cards to Ian Carter G0GRI, QTHR.

New Book

Now available from the SWM Book Store is CQ-GTZM, Diary of a Maritime Radio Officer by Ross Bradshaw. CQ-GTZM guides you through the diary of a radio officer during the period 1973-1979, providing a wealth of detail on the activities of maritime radio officers, the equipment that was used and detailed technical information about the equipment.



Readers will also find themselves engrossed by the record of a way of life that was unique. Order your copy now from the SWM Book Store for only £12.95.



André GM3VLB/P (left) and Jim GM4CHX showing the 'shack'.

OPERATION PABAY UPDATE

Back in the May 'Communiqué' pages, we mentioned that André GM3VLB would be operating from the Isle of Pabay between the 26-28th May 1998. The main purpose of this operation was to enable André and Jim GM4CHX to activate Pabay to add to their Islands of Scotland Award (IOSA) of islands activated. An additional target of at least 1000 QSOs was also set by André, for IOSA an 'Activator' must have at least 100 QSOs from the designated island.

The weather was not bad, but the Coastguard advised that winds with gusts of over 40knots could be expected, and they were! This made for an 'interesting' crossing to Pabay. Salt water and radio do not mix well so equipment was well protected on the journey across.

André set up camp near the jetty, where an old upturned boat proved most useful as a 'shack'. The well-proven VLB portable antenna was soon erected, although the rocky surface of Pabay caused a few problems. The antenna was very simple but most effective.

During the two and a half days of operation, all equipment worked extremely well and over 1000 QSOs were made. Although the nights were cold and the wind blew, André remained comfortable, no doubt inspired, by not infrequent intrusions of a well



know local liquor!

On the other hand, GM0PNS operated from the heights of luxury. A large barn, complete with an ample supply of 230V 50Hz (wind generated with inverters), located about 0.8km from André's location was used. A G5RV served as the antenna. Dave

MM0BGQ, now resident on Skye, helped to set up this station. Jim GM4CHX also operated this station under his own callsign. Although the stations were located quite close to each other, no mutual QRM was encountered.

However, much DX was worked, but maybe this had something to do with the QTH! It is hoped that Pabay will be on the air again next year.



André GM3VLB proudly showing off his Island of Pabay operation certificate.

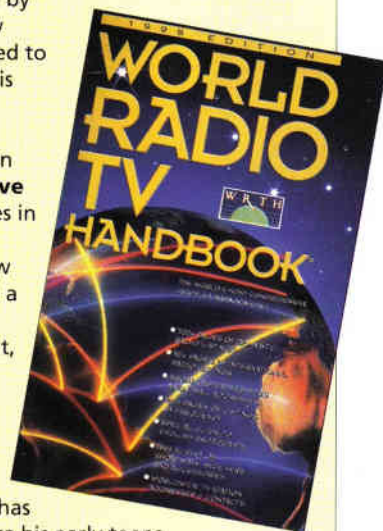
WORLD RADIO TV HANDBOOK CHANGES HANDS

In its 53rd Year, the licence to produce the famous *World Radio TV Handbook* has been acquired from BPI Communications Incorporated by WRTH Publications Ltd - a new company specifically established to continue the publication of this important work of reference.

The previous Amsterdam editorial offices have now been closed and **all operations have been moved** to Milton Keynes in the UK.

The previous editor, Andrew Sennitt, has decided to pursue a career as a freelance telecommunications consultant, and as a result, a new editor has been appointed. David Bobbett, has over 25 years of experience in telecommunications and the publishing world. David, who has been a short wave listener since his early teens, has previously been editor of the UK title *Ham Radio Today*, the UK national radio society's magazine *Radio Communication* as well as other telecommunications titles. As a telecommunications journalist he has also written extensively on a wide variety of broadcasting topics and is actively involved in the radio scene both as an s.w.l. and a licensed amateur radio operator.

The WRTH will remain substantially the same, although regular readers may want to look out for the new cover design, which now incorporates the universally known WRTH acronym for the first time. The *World Radio TV Handbook* is available from the SWM Book Store. See page 88 for details.



SMC ACQUIRE LOWE RECEIVERS

A recent deal was struck between Lowe Electronics of Matlock and SMC of Chandlers Ford. The production arm for the Lowe 'HF' series of receivers has been sold to South Midland Communications, according to an industry insider.

After eight highly successful years of production by Lowe, producing some 10000 units of the HF-150, which has been shipped all over the world it has become uneconomic to manufacture a limited product range.

This is due to Lowe only having a small manufacturing facility at Matlock and the strength of Sterling in recent times had meant reduced export sales.

SMC have an established thriving radio production line and the necessary expertise to maintain the high quality standards established by Lowe. They will continue to produce the HF-150 product line under the Lowe name and will be enhancing the model range. SMC and Lowe have a long association going back over 30 years, and were an ideal partner to carry on the production of the well established Lowe range. We understand that SMC will be concentrating on African markets with the HF-150.

DUAL & TRIPLE POWER SUPPLIES

Now available from Feedback Instruments, based at Crowborough, Sussex, are stylish, new TTi dual and triple output bench d.c. power supplies. Known as the EX354D and EX354T, the new power supplies deliver up to 280W from the dual unit and 305W from the triple.

Both the dual and triple output units have high resolution controls which make possible precise setting of voltage and current levels. These are indicated on accurate and legible digital meters, with separate voltage and current meters on each output.

Simultaneous metering of voltage and current provides accurate information at a glance. Line and load regulation are precise and consistent and the power supplies provide excellent transient response with low noise.

Find out more from **Feedback Instruments Ltd.**, who can be reached on **(01892) 653322**.



YOUR NEWS

Don't forget to keep sending me information of your new products (*photographs a definite must!*) as soon as details are released, together with any information on Open Days, Special Offers, New Catalogues and general items of news. Remember, mentions are **free**, so don't delay, send your news to **Zoë Crabb**, Communiqué, SWM, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PN today!

Send your news to Zoë Crabb at the Editorial Offices

ON THE MOVE

The **Leeds Amateur Radio (LAR) Communication Centre** have recently moved to new premises in East Ardsley, which is located between Exit 28 on the M62 and Exit 41 on the M1 and will soon be connected to the new A1-M1 link giving access from all directions. This move has been promoted by the fact that **Tom Beaumont** has now reached 65 and is moving into retirement.

Tom and his wife **Hazel** have been trading at the LAR Communication Centre for the past 22 years and during that time have made many friends, in the trade and customers. They would like to thank all those who have supported them over the years and hope that the same support will be extended to **Steve Pounder** and **David Wood G4TIW**, the new proprietors.

The new location for the LAR shop is **Bradford Road, East Ardsley, WF3 2DN. Tel: 0113-252 4586, FAX: 0113-253 6621**. Trading hours are 0930 - 1730 Monday to Saturday (closed on Wednesdays afternoons). There is ample parking on-site and a full range of amateur radio products on offer.

A VERY Special Event

Back in August 1995, **Peter John Neal G3WFO** died after a prolonged illness. Peter was one of the founder members of the **Nunsfield House Amateur Radio Group** and was instrumental in bringing about the, now famous, **Elvaston Castle National Radio Rally**. Peter worked tirelessly for both the Radio group and the **Nunsfield House Community Association** of which the **Amateur Radio Group** is part.

Peter constantly sought to improve the facilities for the Group and the Association and today, current members enjoy the fruits of Peter's hard work. As a result of this hard work and as a celebration of Peter's life and achievements, the Group will be operating a 24-hour Special Event Station from **1800 on Saturday 29th to 1800 on Sunday 30th August 1998**.

To make the event even more special, the station will be sponsored either per QSO or by a single donation. Peter was cared for by the Derby City Hospital and all money raised will be donated to the **Gastroenterology Research Fund** at the hospital.

A special QSL card will be available via the bureau. All contacts will be QSLed upon receipt of an incoming QSL card or Reception Report. Please look out for **GB2PJN** on air because the more stations worked, the more money will be raised!

Not to be missed!

The new 11th Edition of *Ferrell's Confidential Frequency Listing* is due out in November. However, if you missed the 10th Edition and cannot wait until the 11th edition to be on sale, the **SWM Book Store** are now clearing out copies of the 10th Edition at **£10 each inc. P&P**. Surely an offer not to be missed!

rallies

July 26: The Colchester Radio & Computer Rally is to be held at St Helena School, Sheepen Road, Colchester, adjacent to the Colchester bypass, Avenue of Remembrance. Doors open 1000 till 1600. There will be a wide range of radio and computer traders, amateur radio, car boot sale and a Bring & Buy. **RSGB Morse Tests** on demand - don't forget to bring two passport size photos. Admission is **£1.50**. There will be ample free parking and disabled parking which is adjacent to the entrance with full access for wheelchair users. **David Z1FRO** on **(01206) 369226**.

July 26: The Rugby Radio Rally will take place at the BP Truckstop, A5 Watling Street, Nr Rugby. **Arthur M0ASD** on **(01788) 550778** or **(0966) 433497**.

***August 2:** The **RSGB National Mobile Rally** is to be held at **Woburn Abbey**. Doors open 1000. **Norman Miller G3MNV**, **180 Warley Hill, Brentwood, Essex CM14 5HF**.

***August 9:** The **Flight Refuelling ARS Hamfest 98** will take place at the **Flight Refuelling Sports Centre, Merley, Wimborne, Dorset**. The event will run from 1000 till 1700 and will include the usual mix of traders, a Bring & Buy, craft exhibitors, car boot sale and field events. Overnight camping facilities are available for Saturday 8th. Talk-in will be on **S22**. **Richard Hogan G4VCQ** on **(01202) 691021**.

August 9: The **Derby & District Amateur Radio Society** are holding their 41st Annual **Derby Radio Rally & Computer Fair** at **Littleover Community School**. Doors open 0900 to 1600. There will be flea market tables, stands and refreshments. Tel/FAX: **(01332) 556878** or **(01332) 769837** or **g1vab@aol.com**

August 14: The **Cockenzie & Port Seton Amateur Radio Club** are holding their 5th Annual **Radio Junk Night** at the **Cockenzie & Port Seton Community Centre, South Seton Park, Port Seton, East Lothian**. Open from 1830 to 2130. Bring along your 'junk' and sell it yourself. Tables will be provided on a first come first served basis (no charge for the table). A raffle will be held at approx. 2100. Refreshments will also be available, and there is access for any disabled visitors. Entry fee is **£1** for all persons. All money will be donated to the **British Heart Foundation**. Further details from **Bob Glasgow GM4UYZ @ GB7EDN** or telephone on **(01875) 811723**.

August 16: The 9th Great Eastern Radio & Computer Rally is to be held at **Wallington Hall, Nr Kings Lynn**. Doors open at 1000 (0945 for disabled visitors). The event will feature **Amateur Radio**, computer and electronic component exhibitors, a Bring & Buy, and lots more. Food and drink is served all day. Talk-in on **S22**. There is also ample free parking. For further details or trader information, contact **Ian G0BMS** on **(01553) 765614**.

August 16: The 3rd **Cardiff Amateur Radio & Computer Fair** will be held at **The Star Sports & Recreation Centre, Splott, Cardiff**. Doors open 1030 till 1500. **Stuart Robinson GW0WMT** on **(01222) 613070**.

August 16: The **Stroud Radio Society Rally** will be held at **Archway School, Stroud, Glos**. Doors open 1030 (1000 for disabled visitors). There will be a

CONTINUED ON PAGE 7

New Publication

Twrog Press recently announced their new publication entitled



Recent Rigs & Receivers by Dave Morgan GW4KYZ. This publication covers equipment which has been marketed during the last three years and is priced at just **£3.50 post free.**

It is intended as a supplement to the *Rig Review* and the *Receiver Review*, which were also written by Dave Morgan and covered equipment dating back from 1996 to wartime surplus equipment. Both these publications are still available from Twrog Press at £5 post free. now in its 14th revision, is edited by Finn Krone.

To obtain your copies, contact **DSWCI, c/o Bent Nielsen, Egekrogen 14, DK 3500 Vaerloese, Denmark.** Costs are: 50 DKK, 8 USD, 5 GBP, 13 DEM of 10 IRCs per issue. However, if a DX club orders a total of 20 copies or more, a 15% discount is given. Cash notes are preferable.

UP & COMING RAE COURSES

Peter Buchan G3INR has informed the Newsdesk that an RAE class is to be held at **Sawston Village College**, starting in September 1998. For more information, telephone **(01223) 834492.**

John Beaumont G3NGD is again offering another Radio Amateurs' Certificate course starting in September at **North Trafford College**, Stretford. This course will run on a Wednesday afternoon for a duration of three hours per week for 36 weeks.

The RAE course (for resits in December) are Monday evenings 1800-2030, RAE course - Wednesday afternoons, 1300-1600 and Electronics Servicing for the Radio Amateur - Tuesday afternoon. Enrolment is 1-3 September 1998 or any Wednesday afternoon during July and August.

More information from John G3NGD, North Trafford College, Talbot Road, Stretford, Manchester M32 0XH, Tel: **0161-886 7077** or Admissions on **0161-886 7000.**

From September 1998, **Bexley College** is offering a course to teach the City & Guilds Radio Amateur's examination for the use of a transmitting licence authorised by the DTI. The course will run for an academic year, finishing in May 1999, with students being able to sit for the May '99 RAE.

SPECIAL EVENT GB98FLD

The Special (Special) Event Station **GB98FLD** will be operated by members of the **Leicester Radio Society (LRS)** at the Football world Cup 98 for



Footballers with Learning Disabilities. The tournament kicks off at Leicester City F.C. ground on the 30th July 98 with the final played there on 16th August 98.

There will be 16 countries taking part and the intervening matches will be played on club grounds throughout Leicestershire and neighbouring counties. The Society intend to be active on 80 to 10m s.s.b./c.w. and also on 70cm and 2m with as many modes as are practicable.

| | |
|----------------------|--|
| 30th July-4th August | from Leicester Radio Society HQ |
| 5th-12th August | from the World Cup Village, Victoria Park, Leicester |
| 13th-16th August | from LRS HQ |

A special QSL card has been printed to commemorate both the event and also this unique

The course is open to all, no previous knowledge of radio communication is required. The course will consist of evening classes devoted to: Morse tuition, Transmitting theory, Operational procedures, Licence regulations and short wave receiving. Interested enthusiasts should contact Guidance & Admissions on **(01322) 404000/404001.**

A Radio Amateur's Examination course is being held at **South Notts College**, Greythorn Drive, West Bridgford, Nottingham. Classes start on the 16th September and will be held every Wednesday evening from 1830 till 2100, leading to the RAE in May 1999. The course tutor is **Alan Lake G4DVW.** Contact him on **0115-938 2509** for further details.

The **City of London Amateur Radio Society** intend to run a Radio Amateur's Examination (RAE) evening course commencing September 1998 (for May 1999 exam). A beginners introduction to Morse will also be run concurrent with the RAE for those who want it. The venue will be in the Elephant and Castle area. Please contact **Tony Hearn G1UFX** on **0171-928 3481** for further details.

An RAE course is being run for members at the **Flight Refuelling Amateur Radio Society** at Wimborne, Dorset, starting on 29th September 1998. New members will be most welcome. **Ian Brotherton G2BDV** on **(01202) 886887** for full details.

callsign. QSL via the RSGB bureau or direct to **PO Box 49, Leicester, England.** Finally, the LRS would like to thank the RSGB and the RA for the issue of this Special (Special) Event Callsign. Thanks also to club member **Arthur GOTNI** for his work in gaining the callsign.

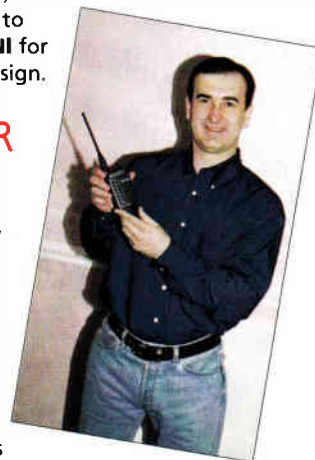
WS2000 WINNER

Shown proudly holding his new WS2000 wideband scanner (kindly donated by Waters & Stanton Electronics), is **David Silcock** of Wigan. David was recently presented his prize by new *SWM* Editor, Kevin Nice.

David, who works for a Wigan based company, has been reading *SWM* for some three years. He was both surprised and delighted to have been drawn from the hat of eager entrants.

David's main interests are satellite monitoring and scanning with his AR8000. Impressed with the small size of the WS2000 David says "there won't be many places I can't take it with me".

Well done David.



RADIO & TVDX NEWS

There are no plans for continued expansion of the existing analogue terrestrial services of the Norwegian NRK-2 and TV 2 channels and full countrywide coverage of these services will not be achieved. The situation is likely to change as terrestrial digital gradually takes over the network transmission in the future, or folk opt for DTH satellite reception. The v.h.f. NRK-1 service is gradually transferring to u.h.f. and then into digital terrestrial when that goes on-line.

Less happy news from RTE, Eire with the news that their Gort ch.1B transmitter - which reduced power in '97 - is scheduled to close end '98 and the chance of receiving the Irish Republic in Band 1 via Sporadic E will end. The 100kW e.r.p. transmitter was often received across Europe and even in SE UK via Tropospheric.

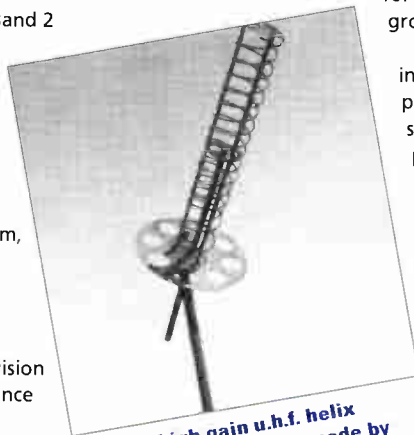
There's an expansion of TV in Cambodia with Japan putting nearly \$US13M into the National Television of Kampuchea (TVK) service, including a new broadcast centre at Phnom Penh and upgraded regional transmission facilities. A satellite uplink station is also under construction to achieve nationwide coverage.

In nearby Malaysia, the recently opened NTV-7 station has been instructed not to transmit foreign sourced programming during peak viewing times - the government requires that prime time TV programming takes up most of local air time.

Check out BBC Radio 1 via Band 2 Sporadic E this season with the BBC station having its own f.m. transmitter operating from Ibeza. Not so happy is Ramadham Radio Leeds, an RSL station that transmitted with 170W rather than the allowed 10W maximum, was found out and the Radio Authority has banned the station's broadcasts for a year - until February 1, 1999.

RSL-TV station Sunrise Television has been given a terrestrial licence to transmit Asian language programming and around the Ealing, Brent, Hounslow and Hillingdon area of West London Teletext and should be on the air by October '98.

Good news from the amateur radio press, planning easement for lattice towers has been passed in Virginia, USA, and now 23m



Here's a high gain u.h.f. helix wound for 240-320MHz, made by Astron Corporation in Sterling, USA and extensively used by the US Navy for their FleetSatCom birds.

masts in urban and 60m high structures in the sticks are now allowed (last year the writer was hit by local planning enforcement for a 1.2m dish the top only 2m above ground level!).

Interesting technical data was provided in the May '98 *Mobile and Cellular* trade publication relating to the airborne TV surveillance now carried out by several police forces. The Surrey Police have just invested in a 2.36GHz downlink analogue TV transmission system that downlinks omni-directional signals from an aircraft up to 10km distant - a new £7000 version under development will allow a tracking aerial from ground-air with greater distance potential.

Using the existing on-board vehicle video monitor the system cost has been reduced allowing the police crew to switch between their car camera or the microwave downlink. It's likely that the frequency used will change to the 3.4GHz band allowing two analogue or four digital video downlink channels (rather than the existing single channel at 2.36GHz). Problems currently arise with co-channel interference if several aircraft are operational.

Finally, in recent times I've received a couple of requests from readers of this magazine for addresses of possible suppliers for both u.h.f. TV and a.m.-m.w. ready built transmitters - I assume for mainland UK operation! A further 'phoned request sought circuit details for a medium wave transmitter. I'm sure this information can be sorted from RSGB, BATC or 'free' radio publications but I'm unable to help with requests for on-shore pirate station equipment!

AMSAT-UK

For all satellite enthusiasts, don't forget AMSAT-UK produce *Oscar News* which is published bi-monthly. The AMSAT-UK club call is GOAUK and Nets are held frequently on h.f. and v.h.f.

The AMSAT organisation is a world-wide group of amateur radio operators who share an active interest in building, launching and then communicating with each other through non-commercial amateur radio satellites. But you don't need to be budding satellite designers to join.

The **AMSAT-UK Colloquium '98**, an event held each year, enables members of AMSAT to enjoy a few days of technical education, a few beers and a natter with friends, plus being able to meet and discuss your problems with the 'stars' of the satellite world. Lectures are middle of the road and talks and demonstrations enable newcomers to get the most out of the hobby. It is also a fun weekend!

Colloquium '98 will be held at the University of Surrey, Guildford, Surrey, from Friday 31 July to Sunday 2 August 1998 inclusive. Also, prior to the Colloquium, the **Amateur Radio International Space Station Symposium** will also be held at the University of Surrey on 29 and 30th July. Registration for Colloquium '98 starts at 0900 on Friday 31 July, with the conference starting at 1030.

More information from **40 Downsview, Small Dole, Nr Henfield, West Sussex BN5 9YB.**



rallies

talk-in on S22 and admission is £1.50. There will also be a Bring & Buy. **Stuart G0GNM** on (01453) 752411 or **Steve G7EUW** on (01453) 758032.

August 23: The Telford Rally will be held this year at the Telford International Centre. There will be major dealers, a flea market, Bring & Buy, all in purpose built exhibition halls with good disabled access and plenty of space to move around. There will be catering, Morse testing and good local attractions including the famous Ironbridge Gorge Museum. **Jim G8UGL** on (01952) 684173 or **Tony M0AMP** on (01743) 235619, E-mail: zeroamp@hotmail.com

August 30: The Galashiels and DARS are holding their Open Day and Rally in the Volunteer Hall, St Johns Street, Galashiels, Scottish Borders from 1100 to 1600. There will be traders, refreshments, Bring & Buy, etc. **Jim GM7LUN** on (01896) 850245 or packet @ GB7JED.

August 31: The Huntingdonshire Amateur Radio Rally Annual Bank Holiday Monday Rally is to be held at Ernulf Community School, St Neots, Cambridgeshire (near Tesco Superstore on A428). Doors open 1000 to 1400 and admission is £1. There will be hot and cold refreshments available and a hall and car boot sale on handstanding. Talk-in on S22. **David Leech G7DIU** on (01480) 431333 (between 0900 and 2100).

***September 6:** The Lincoln Hamfest will be held at the Lincolnshire Showground. There will be the usual trade stands and a Bring & Buy. **Sue Middleton** on (01522) 525760.

September 6: The Bristol Computer & Radio Rally will be held at the Brunel Centre, Temple Meads Station, Bristol. Doors open 1030 until 1600 (from 1015 for disabled visitors). Admission is £1, accompanied children under 12 go in for free. There will be a large Bring & Buy, under £30 bring & Buy, refreshments, 150+ tables, table hire at £15 each and parking opposite in the NCP for £1. **Muriel Baker, 62 Court Farm Road, Whitchurch, Bristol BS14 0EG**, or telephone on (01275) 834282 (24 hour answerphone).

September 6: The Coleraine & District Amateur Radio Society will be holding their annual Radio Rally at the new venue of the Bohill Hotel & Country Club, located a short distance outside Coleraine on the main road to Bushmills and the Giants Causeway. Doors open at 1200 and admission is £1.50. Further information from **John M10AAZ** on (01265) 54930 or by E-mail john@m10aaz.force9.co.uk

September 6: The Annual Wight Wireless & Computer Rally will be held at the National Wireless Museum, Arreton Manor, Newport, Isle of Wight. Admission is free and so is the parking. **Douglas G3KPO** on (01983) 567665.

September 6: The Bury Radio Society's 14th Annual Rally will be held at the Castle Armoury (TA Centre), Castle St., Bury. Doors open 1030 (1000 for disabled visitors). Talk-in on S22, Morse tests, Bring & Buy and all the usual traders. Further information and booking forms from **Alan G0RFE** on (01706) 621263 or via E-mail: g0rfe@zen.co.uk

Send your news to Zoë Crabb at the Editorial Offices

ed's comments

SWM E-mail List Server

For some time now I have been considering whether or not *SWM* should have an Internet mailing list, whereby readers can exchange views, ideas and information with each other. Those of you who are familiar with ESL, WUN, SPOOKS and so on will be well aware of what I mean. For those who are unsure, in essence, the way it works is as follows. A mechanism is set-up so that a group of 'subscribers' receive copies of every message sent to the list. This enables anybody on the 'list' to both ask and answer questions to all simply by posting a message to the 'list'. Several readers have asked me to point them to such a forum recently. Who then, thinks a *SWM* list would be a good idea?

Youngest Reader

Some time ago, standing in for Dick, I wrote requesting that our youngest reader and short wave listener should write and let me know their details. Well, not only did I receive a letter, but I was sent a picture too, Young Katherine Thompson is seen here at the controls of her very comprehensive station. Those controls are a long reach for someone who's only nine months old. So, is Katherine our youngest reader?



Wow! - has a month gone by already? It is really hard to believe that it really is a about five weeks ago that I wrote my first Editorial. Lots has happened here and in the world of radio. A major show has taken place in Friedrichshafen, one that I had planned to attend but personal circumstances

prevented that, much to my dismay. A well loved British radio manufacturing operation has changed hands and a Broadcasting Station 'bible' has changed both editor and publisher.

Too Much Amateur Coverage?

I recently received a congratulatory E-mail from a reader who seemed dismayed that we are covering amateur radio as a special feature this month. He was concerned that *SWM* should not go down the path of our sister magazine *Practical Wireless* and just cover amateur radio. Well actually until 11 years ago our subject matter was totally amateur radio!

For the record, let me say, that whilst I am Editor of *Short Wave Magazine*, that just will not happen. *SWM* is a monitoring magazine aimed at a wide range of interest areas. *PW* is more than capable of providing all the coverage that radio amateurs require. However, I do feel that I am obliged to provide coverage for all of our readers specific areas of interest. It is due to this belief, that some time ago I came up with the idea of a rotating theme for issues based on the regular monthly column subjects. Thereby giving everyone a 'bite of the cherry' - fair? I hope so.

What You Read Ain't Necessarily What I Wrote!

That's what John Wilson, our esteemed reviewer wrote after we introduced some errors into his expertly crafted copy. He also went on to say, "There were several interesting typographical errors in my review of the NRD 545 which rather changed the sense of what I originally said. For example, the review reads "...surely usable 10Hz selectivity" whereas what I wrote was "...surely unusable 10Hz selectivity". The most glaring mistake was in the quoted dynamic range measured during the 2nd order intercept point tests. The magazine (*SWM*)



text quotes this as a mighty 204dB, which if true would really make designers sit up and think. I did check my submitted text and the figure should of course be 104dB (and it still isn't quite up to a Collins 515-1). But it's too late when it's gone to press."

Yes John, but I can apologise to you and our reader's now. Just think if we hadn't re-keyed it would have been correct.

But then there is an upside to this, the whole point of having an Editorial team is to meld a variety of different material from many differing sources into a seamless whole. I hope that's what you get as an end-product. We do try hard - so please forgive a few small errors every now and then.

Global Radio Guide

You will of now noticed, that the *Global Radio Guide* as promised last month has been replaced by *Scan '98*. Well, I was planning for *Scan '98* to be included with the September issue of *SWM*. Regrettably, due to unforeseen circumstances, we were unable to bring you the *Global Radio Guide*. So that you're not left without a cover mounted extra this month I have pulled *Scan '98* forward by a month. I hope you enjoy it. Next month to fill the open gap we will be bringing you a pull-out world-wide broadcasting guide. So all of you who were looking forward to the extra broadcast material, won't be disappointed.

Welcome Jo!

Before I forget, I must introduce a new member of the *SWM* team. Jo Williams joined us at the beginning of this issue as Editorial Assistant. She is rapidly getting up to speed, especially so as Zoë's on holiday enjoying the sun in distant lands - lucky for some. Any how, please join me in welcoming Jo to the fold.



Reader Survey

It is some five years since we last provided you with an easy way to show us what you think about *SWM*. This month we have a pull-out survey form to allow you to tell us, your valuable opinion. **Please** take the time to fill it in and return it to the address on the form. By doing so you will help me shape *SWM* for the future.

By returning the completed survey form, you are automatically entered into a draw that has first prize of both a Yupiteru MVT-7100 scanner and an RF Systems AA-150 h.f active antenna.

Kevin Nice

Dear Sir

Just a few words to say how much I enjoyed the article by Peter Bond on the early days of wideband receivers.

In the 70s, several of us lived eqi-distant from Upper Heyford, Brize Norton and Abingdon. We were all plane enthusiasts and had this desire to listen to the u.h.f. airband.

In the early days we got round the problem by either trying to tune the u.h.f. second and third harmonics on our analogue v.h.f. airband sets (this was surprisingly successful, especially at USAF bases) and then building simple u.h.f. t.r.f. sets using lecher line tuning - mixed results there!

The reaction to the arrival of the AR2001 was as described in the article. As soon as they emerged in the local shops they were snapped up. I still have mine, it works perfectly and I even still have the instructions. And no, it is not for sale!!

Perhaps we should run a competition for the oldest example still in use.

PS. The June edition was great!

John Pumfrey
West Sussex

Dear Sir

I have seen it quoted in a recent article, and also in some advertisements in *SWM*, that the initial letters AOR stand for "Authority on Radio".

A few years ago, I received some literature from Richard Hillier, the Sales Director of AOR (UK) Ltd, in which it states:

"In 1977, two dedicated Japanese Radio Amateurs, Mr. Takano and Mr. Oshima founded AOR, the letters of the company name being taken from one of their callsigns - JA1AOR. Their goal was to pursue excellence in radio design, and to market their ideas commercially."

As the highly satisfied owner of two AOR receivers, I can confirm that they did in fact achieve their goal, and their company is, without any doubt, an "Authority on Radio".

P. Rycraft
Suffolk

Well I put this to Richard Hillier, here is what he said - Ed. "AOR was formed by JA1AOR and JA1EXM, the company name 'AOR' being taken from the first callsign. There was a session of deciding what best fitted the callsign letters to describe the company objectives.

*'Authority On Radio' was the choice, however in the UK certain words such as **authority** and **royal** have special usage so the title is generally not used, alternatives such as 'Advancement On Radio' have been suggested.*

It is very pleasing to hear that we have satisfied owners of AOR products who feel that the company objectives have been met with our pioneering and innovative products."

***Richard Hillier**, UK Sales Director (G4NAD - No Apparent Defect?)*

Dear Sir

With reference to Mike Devereux's letter in the July issue of *SWM*, I was one of those who had a moan about the quality of the MVT-9000's manual and the poor way in which it tries to describe the workings of what is an excellent piece of equipment. You printed my letter in the June issue.

My radio is a genuine EU model, not 'grey' in

Dear Sir

I have just finished reading the June issue of *SWM*, from cover to cover.

Thank you for taking note of reader's comments about presentation. Much has already been said about some articles where the Art Editor has placed text over backgrounds that render the text un-readable.

I believe care must be exercised with modern methods of communication, just because some highly technical facility is available, just a few key strokes away, we must not get carried away. The secret of good communication is simplicity, clarity and understanding.

My previous comment can be equally applied to the new AR8200. A wonderfully clever piece of equipment it sounds from the excellent review, but are radio receivers becoming just a bit too clever for their own good? Surely the essence of a good receiver is to receive signals to the best of their ability and not to confuse the operator with an abundance of functions he/she may never use, just because modern microprocessors make them possible?

Alan Gardener summed it up by saying "if there's nothing to actually listen to, you can still usefully spend your time just fiddling with all the various options!"

In closing, may I wish Dick Ganderton all the best for the future and thank him for guiding the progressive improvement of this excellent publication during his Editorship.

Chris Daw
Bedford

origin and the manual I had supplied with my receiver is exactly as you show in the magazine. It is printed in Japan, not translated by a 'third party', and it does contain errors. For example:

Page 8: MONI button (monitor), 'Enables to listen easier when receiving a weak wave and intermittent listening'.

Page 55: All Memory Clear, "Clears the contents of memory and returns to default valve".

I could go on...

More to the point, however, is the fact that the manual is not 'user friendly'. It does not link the various functions in a cohesive manner, and the document will certainly not win a 'plain English' award.

Richard Wells' version is written in English and in a helpful way, explaining quite clearly what each function does. He clearly points out the fact, for example, that the a.c. adapter should not be used if alkaline batteries are fitted. In the Yupiteru manual, this important fact is hidden away in the middle of a list of trivial warnings on page five - and therefore is probably dismissed by most people!

If Mr Devereux would care to properly compare the two versions instead of trying to get a quick advert in for Nevada, I have no doubt which one would come out top.

Incidentally, although I did not purchase my receiver from Nevada, it was bought from a reputable dealer who I know sources from Nevada themselves.

Regards

Bob Elen
Coventry
bobelen@compuserve.com

Dear Sir

I have not really been in this hobby very long and have at the moment only got a Realistic PRO-62. I have found this to be a very good scanner and it has brought me many pleasures. I have found my Uncle's (Peter Rouse) last book (*Scanners 3*) has been very much of help to me. It has given me a good straight start to the hobby.

I have found that this magazine has proved to have great information and is an enjoyable read.

I have now decided I would like to try and purchase a short wave band receiver which receives all modes. The one problem I have found is that prices are very steep. I only really have a short budget. I have also got to wait for my results from my Amateur Novice B Exam, which I took on the 1st June. If I pass I will splash out on a 70cm transceiver.

Another problem I have is that I live in Doncaster (in S. Yorkshire). Now, in Doncaster, the last proper shop which sold equipment closed down last year. So far the only shop of which I have found is about an hours drive away.

People may say that mail order is the way to buy equipment. I find this gives you rather little choice. I prefer to browse around a shop and have a demonstration of each piece of equipment which I like. Does anyone know of any close shops?

R. Rouse
S. Yorkshire

I guess that a trip to Derbyshire will provide you with the shortest journey. Unless, that is, anyone knows different - Ed.

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

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



■ Gerry L Dexter c/o SWM EDITORIAL OFFICES, ARROWSMITH COURT, STATION APPROACH, BROADSTONE, DORSET BH18 8PW.
 ■ E-MAIL: gdexter@pwpublishing.ltd.uk

Bandscan America

The new station in Chile, **Voz Cristiana**, continues to run test broadcasts on 21.550, often signing on just before 1430 and sometimes running much of the day, although it may not be in operation every day. The fare is Christian music with IDs in English and Spanish.

Regular transmissions, including Portuguese to Brazil, may have begun by the time you read this. Keep an ear on

more inclined to maintain the strong transmitting presence in Ecuador, even if it may mean a huge move sometime in the future. The station also wants to increase the relays it uses in the UK and is still considering possibilities in Australia.

There seem to be more and more logs of Radio Tahiti lately, and at considerably better levels than before so apparently the station has been given new technological life and has escaped what had been predicted as certain death once the dilapidated short wave

Radio Asia Canada can be reached at: **Radio Asia Canada, 1-680 Progress Ave., Scarborough, ON, M1H 3A5, Canada.**

Radio Canada International has come into some government bucks - \$15 million over the next three years - to be used to improve or replace antenna towers at Sackville and refurbish its main studio facilities in Montreal. If you can manage to hear KWHR, the religious broadcaster in Hawaii owned by WHRI you might be able to sample an Indiana f.m. station!

At present, unsold time on KWHR's newest transmitter is being filled by rebroadcasting a couple of Indiana f.m. stations. WGTC-FM, licensed for New Carlisle-South Bend and Elkhart, Indiana. Also aired at times is WHPZ-FM (Bremen-South Bend) The station uses the slogan "Pulse FM". Both f.m.s are part of the LeSea Broadcasting (WHRI) group. Check 11.565 at various times.

Radio 88 Estereo in Perez Zeledon, Costa Rica, has made another appearance. This station popped up a year or so ago after purchasing the transmitter of Radio Rumbo, but didn't stay on the air very long. Now they say they'll be operating regularly on 6.075 (though they're currently being heard 3 or 4kHz below that).

The station relays local 88.5 f.m. The short wave is scheduled from 1000 (believed to be 1100 on Sundays) to 0500 close. The short wave transmitter is believed to be running 1.5kW. Reception reports can be sent to: **Apartado 827-8000, Perez Zeledon, Costa Rica.**

Keep checking 11.910 (and 11.905) for the coming appearance of WWBS, Macon, Georgia. This will be the latest in what seems a never ending parade of private US short wave broadcasters which seem to come on the air at the rate of about two a year.

Another new US short wave station due on the air late this summer or early in the fall will be operated by Allan Weiner, who has been involved in several pirate radio/shipboard operations in years past. WBCQ will use a 50kW transmitter in Maine and will sell air time in blocks to various groups, including 'free' radio broadcasters. A frequency for this one hasn't been announced yet.

That's it for this time. Back in three months with more news from the Western Hemisphere!

transmitter finally went silent. 15.170 is the only frequency in operation.

The new Mexican (well, new last year) has returned to the air after an absence of several months but activity still seems sporadic. XERTA operates on 4.800, as do a couple of other Latins, which can really kick up the QRM.

It appears that SODRE, the Uruguayan short wave station which has appeared regularly in the short

wave guidebooks almost since the medium became active, is not going to be around much longer.

The only active outlet is on 6.125 and the word is that there is no interest in keeping even this one, last frequency active. The station has long been just a shadow of its former self - years (and years!) ago it was heard loud and regularly in the United States, now it is a rare DX catch.

LRA36 - Radio Nacional Archangel San Gabriel is the only short wave broadcaster in Antarctica. It currently operates only on Mondays, Wednesdays and Fridays from 1900 to 2030 in Spanish and 230 to 2100 close in Portuguese. The station operates from Argentina's Antarctic territory on 15.476 with one kilowatt into a rhombic antenna.

Radio Asia Canada is an independently produced broadcast aimed at Sri Lanka's Tamil population. It is on the air daily from 2000 to 2059 on 15.560, 2200-2359 on 11.975, 0000 to 0159 on 9.560 and 0200 to 0359 on 9.700 Also Saturdays and Sundays 1800-1959 on 17.530.

Transmitting sites are still uncertain. The group has had an application for a medium wave licence turned down by Canada's communications authorities.

Q S L
Certificado de Sintonía

RADIO ESPERANZA, CE-609, Onda corta (SW) Banda de 49 m. en 6.090 KHz. de la ciudad de Temuco, en la República de Chile, certifica que al Sr. Andrew Johns de los ESTADOS UNIDOS de N.A. HA SINTONIZADO NUESTRA EMISORA, Radio Esperanza, el día 15 Julio 1999 a las 07.30 (Hora UTC) (Hora de Chile) y que su Informe de Sintonía es correcto y se ajusta a lo transmitido el día y hora indicados.

RADIO ESPERANZA, de Temuco, Chile, le agradece su Informe de Sintonía y le saluda fraternalmente en Cristo.

Eleazar H. Jara
 Eleazar H. Jara
 Firma y Sello Oficial



The new Voz Cristiana in Chile joins Radio Esperanza (6.090) as one of the few active broadcasters from this country.

Bolivian stations heard in North America lately.

| MHz | Station |
|-------|--------------------------|
| 3.200 | Radio 9 de Abril |
| 3.391 | Radio Emisora Camargo |
| 4.409 | Radio Eco |
| 4.471 | Radio Movima |
| 4.552 | Radiodifusora Tropico |
| 4.559 | Radioemisora Villamontes |
| 4.600 | Radio Perla del Acre |
| 4.633 | Radio 11 de Octubre |
| 4.649 | Radio Santa Ana |
| 4.682 | Radio Paititi |
| 4.702 | Radio Eco |
| 4.720 | Radio Abaroa |
| 4.732 | Radio La Palabra |
| 4.864 | Radio 16 de Marzo |
| 4.917 | Radio Minería |
| 4.925 | Radio San Miguel |
| 4.965 | Radio Juan XXIII |
| 5.504 | Radio 2 de Febrero |
| 5.952 | Radio Emisora Pio XII |
| 5.965 | Radio Nacional Huanuni |
| 6.025 | Radio Illimani |
| 6.085 | Radio San Gabriel |
| 6.105 | Radio Panamericana |
| 6.135 | Radio Santa Cruz |
| 6.155 | Radio Fides |
| 6.195 | Radio Carlos Palenque |

11.890, too. Their mailing address is: **Casilla 490, Santiago, Chile**, or E-mail vozing@interaccess.cl When full operations begin the programming will come from studios in Miami, Florida.

A new station in Brazil is Sistema LVB Mundial in Porto Alegre on 11.895 broadcasting religious programming on behalf of a religious group called Legião da Boa Vontage. Also new is Radio Nova Visao in Santa Maria, using 9.530 from as early as 1200. This one appears to be a religious broadcaster, too, as it is carrying some programming from Trans World Radio.

Ecuador's HCJB is being relayed by the UK's Merlin-operated transmitters from 1600 to 1700 on 15.350 in Russian, Uzbek and Tajik; 1700-1800 also on 15.360 in Russian, Ukrainian and Georgian and 2100-2200 on 12.020 in Arabic.

Incidentally, it now looks as though the new Quito airport - which threatens the existence of HCJB's huge transmitter site at Pifo - may be a long time happening, if it gets built at all. It is very likely that the present government of Ecuador may not go ahead with the project, but things could change if the government changes after the elections in August.

Meantime, it seems that HCJB is now

LM&S

All too often a wanted s.w. broadcast is marred by interference from a station on an adjacent channel. Listeners who use a simple set can do little to ease the problem but those with a more advanced receiver may achieve some success by using the single sideband (s.s.b.) mode.

If the interfering signal is on the low side of the wanted one select the upper sideband (u.s.b.) mode. Carefully adjust the main tuning control until the wanted transmission is clearly heard and the carrier is 'zero beat'. Select the lower sideband (l.s.b.) mode if the interfering signal is on the high side.

Long Wave Reports

Note: l.w. & m.w. frequencies in kHz; s.w. in MHz; Time in UTC (=GMT).

Unless otherwise stated, all logs were compiled during May.

Sky waves from the new Rikisutvarpid outlet at Gufuskalar, W.Iceland on **189kHz** were received at 0045UTC on May 15 by **Simon Hockenhill** in E.Bristol. The 300kW transmission rated SINPO 25342.

Whilst searching the band during daylight **David Stevenson** (Swansea) picked up for the first time ever a broadcast from Morocco (Medi-1) via Nardor (2000kW) on **171kHz**, which rated SIO 222.

Medium Wave Reports

There were no reports of broadcasts from m.w. stations in E.Canada and E.USA reaching our shores at night during May. This was not unexpected because the longer hours of daylight resulted in only a short period when the whole of the path over the Atlantic was in darkness.

Although the broadcasts from some of the many m.w. stations in the Middle East, N.Africa, Europe and Scandinavia reached the UK at night there was a marked deterioration in the SINPO ratings noted in the reports. Over in Co.Down, **Eddie McKeown** (Newry) kept a careful check on **520kHz** at night for the sky waves from the Bayerischer Rundfunk co-channel 0.2kW outlets at Hof and Würzburg in Bavaria but he only received them at 2313 on June 3 - they peaked 25211.

During daylight the ground waves from some m.w. local radio outlets reached quite distant places! Whilst on holiday near Inverness, **Brian Keyte** (Bookham) seized the opportunity to search the band. He used the top strand of wire on a roadside fence as an antenna for his AOR AR7030 receiver in the car and compiled an extensive log - see chart. He noticed that GEM on **934 & 999kHz** were using the ident 'Classic Gold GEM'; also that WABC announced 'Classic Gold WABC on **990 & 1017kHz**. From Ulster he heard the ident 'Heartbeat 1521AM instead of Radio 1521 Craigavon.

Short Wave Reports

The **25MHz (11m)** band was searched quite often by some listeners during May but they found no evidence of broadcasting activity.

Good use of the **21MHz (13m)** band is being made by some broadcasters. Noted during the morning were UAER, Dubai **21.605** (Ar to Eur 0615-1030), clearly heard at 0650 by **Frank Miles** in SW.London; Voice of Turkey **21.715** (Tur to W.Asia, Australia 0500-1000) logged as 45434 at 0720 in E.Bristol; Voice of Russia **21.790** (Eng [WS]), rated SIO222 at 0800 by **Tom Smyth** in Co.Fermanagh; R.Prague via

Rimavska Sobota **21.745** (Eng to Eur, M.East, Africa 0830-0857) 43333 at 0835 by **Bernard Curtis** in Stalbridge; BSKSA Saudi Arabia **21.495** (Ar [Holy Quran] to SE.Asia 0900-1200) 34333 at 0936 by **Rhoderick Illman** in Oxted; HCJB Quito, Ecuador **21.455** (Eng [u.s.b. + p.c.] to S.Pacific 0700-1100) 24443 at 0951 by **Richard Reynolds** in Guildford; UAER, Dubai **21.605** (Eng to Eur 1030-1100) 44444 at 1030 by **Gerald Guest** in Dudley; Vatican R, Italy **21.850** (Sp to S.America 1130-1200) SIO322 at 1145 by **Philip Rambaut** in Macclesfield.

After mid-day RAI Rome **21.520** (It to Africa 0600-1300) was 24122 at 1218 in Newry; BBC via Ascension Is **21.660** (Eng to W/E.S.Africa 1100-1700) 44443 at 1245 by **Stan Evans** in Herstmonceux; RFI via Issoudun? **21.580** (Fr to S.Africa 0900-1600) 44344 at 1430 by **Robert Hughes** in Liverpool; RAI Rome **21.535/21.710** (It [Football] to Lat Amer, Africa 1330-1700, Sun only) 44444 at 1445 by **Ernest Wiles** in NE.Bedford; DW via Kigali, Rwanda **21.560** (Ger to M.East 1400-1755) 33233 at 1615 by **Peter Pollard** in Rugby; UAER, Dubai **21.605** (Eng to Eur 1600-1640) 44444 at 1630 by **Robert Connolly** in Kilkeel; BBC via Cyprus **21.470** (Eng to E.Africa 1400-1700) 34434 at 1636 by **John Eaton** in Woking; RFI via Issoudun? **21.685** (Fr to N.America 1600-1900) 45544 at 1817 by **Darren Beasley** in Bridgwater; R.For Peace Int, Costa Rica **21.465** (Sp? to USA?) 34333 at 2110 by **Thomas Williams** in Truro.

Broadcasts from several continents may be received in the **17MHz (16m)** band at some time during the day. Noted before noon were the BBC via Masirah **17.790** (Eng to Asia 0600-0800), which was 34433 at 0800 in Herstmonceux; R.Australia via Shepparton **17.750** (Eng to Asia 0600-0900) 24333 at 0820 in Bridgwater; BBC via Skelton & Woofferton, UK **17.640** (Eng to E.Eur, M.East, E.Africa 0700-1500) 23342 at 1000 by **Vic Prier** in Colyton; BBC via Nakhon Sawan **17.790** (Eng to Asia 0800-1100) 24332 at 1001 in Oxted; Vatican R, Italy **17.700** (Port to S.America 1100-1130) SIO322 at 1100 in Macclesfield; R.Pakistan, Islamabad **17.835** (Eng to Eur 1100-1120) 44243 at 1105 in Newry; R.Sweden, Stockholm **17.870** (Eng to USA 1130-1200) 44434 at 1130 by Sheila Hughes in Morden; R.Bulgaria, Sofia **17.585** (Eng to Eur 1100-1200) 44334 at 1138 by Martin Dale in Stockport.

After mid-day Israel R, Jerusalem **17.535** (Eng to Eur, N.America 1400-1430) was logged as 54444 at 1428 by **Tony Hall** in Freshwater Bay; RCI via Sackville, Canada **17.820** (Eng, Fr to Eur, Africa 1330-1500 Mon-Sat) 32132 at 1440 in Liverpool; Africa No.1, Gabon **17.630** (Fr to W.Africa 0700-1100, 1200-1600) 43343 at 1524 in Woking; HCJB Quito, Ecuador **17.735** (Eng to Eur 1900-2300?) 44444 at 1940 in NE.Bedford; WYFR via Okeechobee, USA **17.555** (Ger, Eng to Eur, Africa 1900-2200) 44333 at 1945 in Rugby; R.Netherlands via Bonaire, Ned Antilles **17.605** (Eng to Africa 1830-2025) 33233 at 1952 by **Clare Pinder** in Appleby; R.New Zealand Int **17.675** (Eng to Pacific areas? 2052 [2107 Fri/Sat] -0457) 25433 at 2129 in

Guildford; BBC via Ascension Is **17.830** (Eng to W/C.Africa 0730-2100) 35333 at 2057 in E.Bristol; RCI via Sackville **17.820** (Eng to Eur, Africa 2000-2130) 43333 at 2100 in Stalbridge; R.Taipei Int via WYFR **17.750** (Eng to Eur 2200-2300) 24222 at 2225 in Truro; DW via Kigali, Rwanda

LONG WAVE CHART

| Freq (kHz) | Station | Country | Power (kW) | Listener |
|------------|---------------|------------|------------|-------------------|
| 153 | Donebach DLF | Germany | 500 | A,B*,C,D,E,F,H |
| 153 | Bod | Romania | 1200 | H |
| 162 | Allois | France | 2000 | A,B*,E,F,G,H |
| 171 | Nador Medi-1 | Morocco | 2000 | H |
| 171 | B'shakovo etc | Russia | 1200 | A,B*,D*,E,F,H |
| 177 | Oranienburg | Germany | 750 | A,B*,D*,E,F,H |
| 183 | Saarlouis | Germany | 2000 | A,B*,D,E,F,G,H |
| 189 | Gufuskalar | W.Iceland | 150 | C* |
| 198 | Droitwich BBC | UK | 500 | A,B*,D,E,G,H |
| 207 | Munich DLF | Germany | 500 | A,B*,C*,D,E,F,H |
| 216 | Roumoules RMC | S.France | 1400 | A,C,D,E,F,G,H |
| 225 | Raszyn Resv | Poland | ? | A,B*,C*,D*,E*,F |
| 234 | Beidweiler | Luxembourg | 2000 | A,B*,D,E,F,G |
| 243 | Kalundborg | Denmark | 300 | A,B*,C,D,E,F |
| 252 | Tripaza | Algeria | 1500 | A*,B*,D*,E*,H*,I* |
| 252 | Atlantic 252 | S.Ireland | 500 | A,D,E,F,G,H |
| 261 | Burg(R.Ropa) | Germany | 200 | E,F |
| 270 | Topolina | Czech Rep | 1500 | D*,E* |
| 279 | Sasnovy | Belarus | 500 | D*,E* |

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

Listeners:-

- (A) Martin Dale, Stockport.
- (B) John Eaton, Woking.
- (C) Simon Hockenhill, E.Bristol.
- (D) Sheila Hughes, Morden.
- (E) George Millmore, Wootton, IoW.
- (F) Fred Pallant, Storrington.
- (G) Tom Smyth, Co.Fermanagh.
- (H) David Stevenson, Swansea.
- (I) Thomas Williams, Truro.



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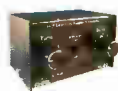


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TROPICAL BANDS CHART

| Freq (MHz) | Station | Country | UTC | DXer | Freq (MHz) | Station | Country | UTC | DXer |
|------------|----------------------|-------------|------|-----------------|------------|-----------------------|------------|------|---------|
| 4.775 | TWR Manzini | Swaziland | 0354 | E | 5.005 | R.Nacional, Bata | Eq. Guinea | 2049 | J,N |
| 4.777 | R.Gabon, Libreville | Gabon | 1942 | A,C,G,I,J,M,N | 5.009 | R.TV Malagasy | Madagascar | 1911 | C,J |
| 4.783 | RTM Bamako | Mali | 2026 | A,C,F,G,I,J,M,N | 5.010 | AIR Thiru'pura | India | 0022 | A,J |
| 4.800 | LNBS Maseru | Lesotho | 2105 | A,I | 5.020 | La V du Sahel, Niamey | Niger | 1929 | A,J |
| 4.815 | R.diff TV Burkina | Duagadougou | 1941 | A,C,I,J | 5.025 | R.Parakou | Benin | 1928 | C,H,J,L |
| 4.820 | R.Botswana, Gaborone | Botswana | 2130 | C,E,I,M,N | 5.025 | R.Rebelde, Habana | Cuba | 0627 | A,G,N |
| 4.828 | ZBC R-4 | Zimbabwe | 1940 | J,N | 5.025 | R.Uganda, Kampala | Uganda | 2049 | I,J |
| 4.830 | R.Botswana, Gaborone | Botswana | 2136 | I,N | 5.030 | AVR Latin America | Costa Rica | 0407 | A,E |
| 4.830 | R.Tachira | Venezuela | 0330 | A,D | 5.035 | R.Aparecida | Brazil | 0438 | E |
| 4.835 | R.Tezuitlan, Coban | Guatemala | 0005 | A | 5.035 | R.Banqui | C.Africa | 2050 | C,I,J,N |
| 4.835 | RTM Bamako | Mali | 1939 | A,C,E,J,N | 5.047 | R.Togo, Lome | Togo | 2015 | A,C,I,J |
| 4.840 | AIR Bombay | India | 0040 | A | 5.050 | R.Tanzania | Tanzania | 2050 | H,J |
| 4.845 | DRTM Nouakchott | Mauritania | 2205 | A,E,N | 5.060 | PBS Xinjiang, Urumqi | China | 2008 | L |
| 4.850 | R.Yaounde | Cameroon | 2022 | A,C,E,F,I,J | 5.075 | Caracol Bogota | Colombia | 0435 | A,E,N |
| 4.865 | PBS Lanzhou | China | 2207 | A,N | 5.100 | R.Liberia, Totota | Liberia | 1949 | E,J,L |
| 4.870 | R.Cotonou | Benin | 1937 | A,C,E,I,J,N | | | | | |
| 4.879 | R.Bangladesh | Bangladesh | 2351 | C | | | | | |
| 4.885 | KBC East Sce Nairobi | Kenya | 1832 | H,J | | | | | |
| 4.890 | RFI Paris | via Gabon | 0400 | I | | | | | |
| 4.915 | GBC-1, Accra | Ghana | 1945 | A,C,E,F,H,I,J,N | | | | | |
| 4.915 | KBC Cent Sce Nairobi | Kenya | 1845 | J | | | | | |
| 4.920 | R.Quito, Quito | Ecuador | 0505 | D,E | | | | | |
| 4.925 | R.Difusora, Taubate | Brazil | 0040 | A | | | | | |
| 4.930 | R.Internacional | Honduras | 0509 | E | | | | | |
| 4.935 | KBC Gen Sce Nairobi | Kenya | 2053 | C,E,H,J,K,N | | | | | |
| 4.945 | R.Difusora | Brazil | 0010 | A | | | | | |
| 4.950 | AIR Srinagar | India | 0045 | A | | | | | |
| 4.950 | VOA via Sao Tome | Sao Tome | 2053 | C,J,K,L | | | | | |
| 4.955 | R.Nac. de Colombia | Colombia | 0409 | A,E,N | | | | | |
| 4.965 | Christian Voice | Zambia | 2053 | A,I,J,L,N | | | | | |
| 4.975 | R.Uganda, Kampala | Uganda | 2051 | C,E,H,I,J,K,P | | | | | |
| 4.980 | PBS Xinjiang, Urumqi | China | 0130 | A | | | | | |
| 4.980 | Ecos del Torbes | Venezuela | 0020 | A,D,I | | | | | |
| 4.985 | R.Brazil Central | Brazil | 0232 | A,D,N | | | | | |

DXers:-

- (A) Robert Connelly, Kilkeel.
- (B) Bernard Curtis, Staibridge.
- (C) John Eaton, Woking.
- (D) David Edmondson, Wallsend.
- (E) David Hall, Morpeth.
- (F) Simon Hockenhill, E.Bristol.
- (G) Sheila Hughes, Morden.
- (H) Rhoderick Illman, Dxted.
- (I) Eddie McKeown, Newry.
- (J) Fred Pallant, Storrington.
- (K) Clare Pinder, while in Appleby.
- (L) Peter Pollard, Rugby.
- (M) Vic Prier, Colyton.
- (N) Richard Reynolds, Guildford.
- (O) Tom Smyth, Co.Fermanagh.
- (P) Norman Thompson, Dadby.

55555 at 1037 in Plymouth; R.Almaty, Kazakhstan **9.620** (Eng to ? 1100-1125) 55555 at 1100 by **Adam Farnsworth** in Bridgnorth.

After mid-day, R.Norway Int, Oslo **9.590** (Nor [Eng Sun] to Eur 1300-1330) was 44344 at 1300 in Appleby; BBC via Skelton, UK **9.410** (Eng to Eur, N/C.Africa 0300-0830, 1130-2230) 55545 at 1530 in E.Bristol; BSKSA Riyadh **9.730** (Ar to N/C.Africa 1600-1800) 43444 at 1556 in Woking; VOA via Morocco? **9.760** (Eng to Eur, M.East, N.Africa 1700-2200) 43333 at 1900 in Woodhall Spa; VOIRI Tehran, Iran **9.022** (Eng to Eur 1930-2030) 43333 at 1930 in Dudley; China R.Int, Beijing **9.920** (Eng to Eur 2000-2157) 43333 at 2000 in NE.Bedford; Israel R, Jerusalem **9.390** (Heb [Home Sce relay] to Eur, N.America 1600-2300) 44534 at 2030 in Colyton; R.Bulgaria, Sofia **9.700** (Eng to Eur 2100-2200) SIO444 at 2100 in Co.Fermanagh; R.Ukraine Int, Kiev **9.550** (Eng to Eur 2100-2200) 53533 at 2109 in Bridgwater; R.Australia via Shepparton **9.500** (Eng to Asia, Pacific 1430-2200) 23222 at 2125 in Truro; BBC via Sackville, Canada **9.590** (Eng to E.America 2200-0000) 34333 at 2220 in Kilkeel; R.Bulgaria, Sofia **9.485** (Eng to N.America 2300-0000) 54444 at 2300 by **Martin Cowin** in Kirkby Stephen.

Noted in the **7MHz (41m)** band during the early morning were RFI via Issoudun? **7.280** (Fr to Eur, M.East, Africa 0300-0800); heard at 0600 in SE.London; RFI Costa Rica **7.385** (Eng 24hrs) 41144 at 0615 by **David Hall** in Morpeth; VOA via Woofferton, UK **7.170** (Eng to Eur, N.Africa 0400-0700), rated 33343 at 0640 in Woking; R.Japan via Woofferton, UK **7.230** (Jap, Eng to E.Eur 0500-0700) 44444 at 0645 in Herstmonceux; WYFR via Okeechobee **7.355** (Eng to Eur, Africa 0600-0800) 43443 at 0707 in Plymouth; United Nations R. via Nexus, Italy **7.120** (Eng [u.s.b.] to Africa) 32433 at 0710 in Colyton; R.Vlaanderen Int, Belgium **7.290** (Eng to Eur, Australia, S.America 0730-0755) 44344 at 0730 in Appleby; Christian Science BC via WSHB **7.535** (Various to Eur 0400-0958 [Russ heard 0835]) SIO322 at 0835 in Macclesfield; Sudwestfunk via Rohrdorf **7.265** (Ger to Eur 24hrs) 55545 at 0915 in Stalbridge.

During the evening AIR via Aligarh? **7.410** (Hi, Eng 1745-2230) was 43232 at 1900 in Newry; Voice of Greece, Athens **7.515** (Eng to Eur 1900-1910) 44444 at 1908 in Woodhall Spa; RAI Rome **7.145** (Eng to Eur 1935-1955) 44444 at 1935 in Bridgnorth; R.Thailand via Udon Thani **7.210** (Eng to Eur 1900-1958) 21322 at 1951 in Stockport; R.Norway Int, Oslo **7.485** (Norw to Eur 2000-2030) 55555 at 2015 in Liverpool; VOIRI Tehran **7.260** (Eng to Eur, M.East 1930-2028) 53533 at 2025 in Bridgwater; Voice of Nigeria, Ikorodu **7.255** (Eng to W.Africa 1900-2100) 43453 at 2029 by **Fred Pallant** in Storrington; RCI via Skelton, UK **7.235** (Eng to Eur, Africa

2000-2130) 32322 at 2030 in Oadby; VOA via Selebi-Phikwe, Botswana **7.415** (Eng to Africa 1800-2230) 42222 at 2055 in Barton-upon-Humber.

Later, R.Moldova Int **7.520** (Eng to Eur 2130-2155) was 44333 at 2140 in Morden; BBC via Kranji, Singapore **7.110** (Eng to Asia 2200-0045) 43443 at 2205 in Kilkeel; VOA via ? **7.340** (Eng to Africa 2200-2230) 54444 at 2217 in Kirkby Stephen; Vatican R, Italy **7.305** (Eng to Asia, Pacific 2250?-2310?) SIO444 at 2258 in N.Bristol; DW via ? **7.285** (Eng to S.Asia 0200-0250) SIO222 at 0200 in Co.Fermanagh.

Some of the many broadcasts to Europe in the **6MHz (49m)** band were mentioned in the reports: R.Japan via Skelton, UK **5.975** (Eng 0600-0700) 55555 at 0615 in Stalbridge; WEWN Birmingham, USA **5.825** (Eng 0000-1000, also to USA), heard at 0645 in SW.London; R.Austria Int via Moosbrunn **6.155** (Eng 0730-0800) 54444 at 0735 in Plymouth; R.Nederlands via Julich **6.045** (Eng 1030-1225) 34444 at 1154 in Stockport; R.Austria Int, via Moosbrunn **6.155** (Eng 1230-1300) 44444 at 1230 in Morden; R.Prague, Czech Rep **5.930** (Eng 1600-1627) 34443 at 1600 in Galashiels; R.Sweden via Horby **6.065** (Eng 1730-1800) 54554 at 1740 in Herstmonceux; SRI via Lenk **6.165** (Eng, Fr, Ger, It 0400-1930) 44344 at 1900 in Appleby; R.Sweden via Horby **6.065** (Eng 1930-2000) 44444 at 1934 in Woodhall Spa; R.Finland via Pori **6.135** (Eng 2000-2030) 33333 at 2000 in Truro; Polish R, Warsaw **6.095** (Eng 1930-2030) 34243 at 2020 in Newry; China R.Int via Russia ? **6.950** (Ger, Eng 1900-2157) 44434 at 2025 in Freshwater Bay, low; R.Latvia Int, Riga **5.935** (Eng [News] 2030-2035 Mon-Fri) 54444 at 2030 in Kirkby Stephen; Deutschland R. Berlin **6.005** (Ger 24hrs) 32333 at 2030 in Rugby; RFI via ? **5.915** (Fr 2000-2100, also to USA) 44422 at 2039 in Oxted; RCI via Skelton, UK **5.995** (Fr, Eng 1900-2100, also to M.East, N.Africa) 44434 at 2050 in E.Bristol; R.Yugoslavia **6.100** (Eng 2100-2130) 53553 at 2112 in Bridgwater; R.Sweden via Horby **6.065** (Eng 2130-2158) 44343 at 2157 in Oadby.

Also noted were R.Nederlands via Flevo **6.020** (Eng to N.America 2330-0125) rated 44343 at 2350 in Barton-upon-Humber; R.Prague, Czech Rep. **5.930** (Eng to USA 0000-0027) SIO333 at 0022 in N.Bristol; R.Havana, Cuba **6.000** (Eng to N.America 0100-0500) 41144 at 0339 in Morpeth; R.Nederlands via Ned.Antilles **6.165** (Eng to N.America 0430-0525) SIO222 at 0430 in Co.Fermanagh; Caribbean Beacon, Anguilla **6.090** (Eng to N.America?) 23422 at 0632 in Guildford.

The Fairhaven RD500

A Second Look At An Intriguing Receiver

Having already reviewed the RD500 receiver last year, John Wilson was pleased when Fairhaven offered a second look following revisions to the original receiver. How could he refuse?

Although still called the RD500, there have been some real changes to the unit, the first being a decided upgrade in the external appearance. The finish on the case, and the addition of a neat styling touch in having the name Fairhaven incorporated on the top cover make the RD500 much more attractive to look at, and whilst I appreciate that this doesn't help the performance of a receiver, it does show that the makers are listening to what their customers are saying and actually doing something about it. More interesting to me was the change of first i.f. filter frequency and the upgrading of the filter specification to take account of my original observations about the non symmetrical nature of the i.f. response and the effect this had on the signal handling capabilities of the receiver.

It Ain't Heavy - Its just Heavier

When I lifted the RD500 I realised that this was heavier than I remembered and was impressed by the two N-type professional antenna connectors on the rear panel in addition to the original pair of SO-239 connectors, which you may recall were for connection of either a low impedance coaxial fed antenna for the l.f./m.f./h.f. ranges or a whip antenna at a higher impedance. You may also remember the clever use of both connectors at the same time to provide r.f. noise cancelling facilities. The two new connectors were labelled "48 to 860MHz" and "860 to 1750MHz" so here was something exciting, because I hadn't expected the test receiver to come equipped with this amazing frequency coverage. And amazing it is when you consider how compact the RD500 seems in



comparison to other receivers, even those which do a great deal less than the Fairhaven.

Since the v.h.f. and u.h.f. coverage were the most important additions since my first review, let's start with how the receiver performed up there in the wide open spaces. I had an immediate problem in that my Rohde & Schwarz SMY generator stops at 1040MHz so I couldn't carry out sensitivity measurements above that frequency. However, with a measured sensitivity at 1040MHz on narrow f.m. of -118dBm for 12dB SINAD, the receiver was clearly pretty hot, so I carried on down as shown in **Table 1**. The sensitivity was measured in dBm for 12dB SINAD with 3kHz deviation at 1kHz for f.m, the RD500 set to 'FMN', and with 60% modulation at 1kHz in a.m., with the RD500 set to 'AMN'. The receiver r.f. pre-amplifier was switched on during the tests.

Continued on page 20...



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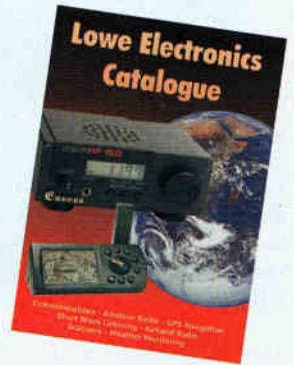
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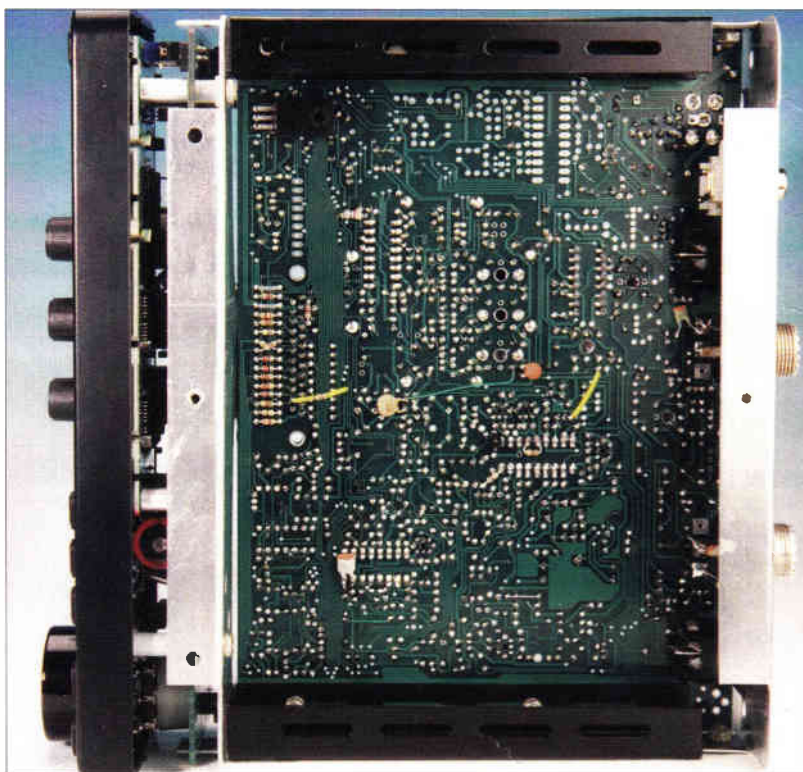
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With the covers off, under...

I encountered a gap between 590 and 670MHz where the receiver synthesiser was apparently not working.

Hot Little Receiver

As one of my colleagues from Exeter University often says to me "What's that in real microvolts?", and to give you some idea of the level of signals you will hear, -117dBm is equivalent to 0.3µV p.d. and that makes the RD500 a hot little receiver. Connected to a small log periodic I could hear signals over really long distances, and had the experience of tuning around during a sporadic-E opening when the

band between 50 and 80MHz was simply awash with broadcast and TV signals from Italy to the Baltic States. Mind you, the same opening meant that I couldn't carry out any EMC measurements on the open area test site, but that's another story. Great fun.

For those who may want to tune s.s.b. signals at v.h.f., I did find that the demodulated signal became more 'wobbly' as I tuned higher in frequency, which I put down to noise from the synthesiser, but on the 144MHz and 432MHz amateur bands there were no problems. I wouldn't

The front panel of the RD500 contains rather small buttons for direct frequency control. Small perhaps, but at least it has them - unlike some of the competition!

Table 1:

| MHz | FM(N) | AM(N) |
|------|--------|--------|
| 1040 | -118 | -112 |
| 940 | -116 | -111 |
| 840 | -118 | -113 |
| 740 | -118.5 | -114 |
| 540 | -120 | -116 |
| 440 | -122 | -118 |
| 340 | -123 | -120 |
| 240 | -122 | -119 |
| 140 | -123 | -119 |
| 80 | -121 | -117 |
| 50 | -119 | -115.5 |

however recommend trying to listen to s.s.b. or c.w. on 1296MHz - but who does? I suppose that may trigger a letter from a keen v.h.f. contest operator but I'll take a chance.

I did encounter one barnstorming internal spurious carrier on 600MHz, but that's the only one I fell over. I didn't have the time to tune the entire 1700MHz range in 100Hz steps, so if you find another sproggie, I'm sorry I missed it. Overall, I couldn't fail to be impressed by the performance of the RD500, and I find it hard to guess how it all fits in that tiny box.

Symmetry

Since the first i.f. filtering had been changed, I went back and re-measured the 3rd order intercept point at h.f. and found that the response was now symmetrical with a figure of +10dBm easily attained at 20kHz spacing, just as the handbook says. I also found that operating the RD500 became very easy once I had mastered the triple function keypad, and I do prefer this approach to the Zen simple layered menu system, even though that is ultimately more flexible and extendible. The RD500 keypad in particular can be a mite confusing when you have a single key labelled as 'A', '2', and 'BP FILT' or 'W', '9', 'CLK'. Despite the obvious increase in cost, it would have been better to engrave the

key tops with the numbers so that they were unmistakable, and had the second and third functions on the panel alongside. Don't get the idea that operation is very difficult, it isn't, but at first encounter you have to be very careful in determining which key is which.

Having said that, it's a delight to have all the receiver functions available right there on the panel, even with second and third

functions, but if I had been in a position to influence the design of the RD500 I would have insisted on a larger front panel in the first place so that all the controls could have had greater spacing between them. Going one step further, and suggesting the ultimate heresy to those who like micro styled receivers, if the RD500 was the same size and shape as, say an Icom receiver or the NRD-545, it would be an absolute stunner. But to go back to the keypad; Fairhaven can provide a small laptop type of keyboard which will plug into the PC interface socket on the rear panel, and this enables easy entry of data in a more familiar format. I haven't had the opportunity to try out the Windows based software from Fairhaven, but this



would probably fulfil all needs for easy operation of the receiver, as well as great flexibility in entering database details. It's worth mentioning that with two megabytes of memory fitted, you can store simply huge amounts of information and use it to drive the receiver. Imagine having the whole of "Passport to World Band Radio" or the Klingenfuss Guide right there in the receiver...what power.

It's British

As far as the million other functions and features which embellish the RD500 are concerned, I suggest that you go back to my original review rather than have the pages of the magazine filled with the same information this time around. All I can

say is that I was impressed with the RD500 at our first meeting, and I'm even more impressed

now. This is really innovative design and deserves success. I

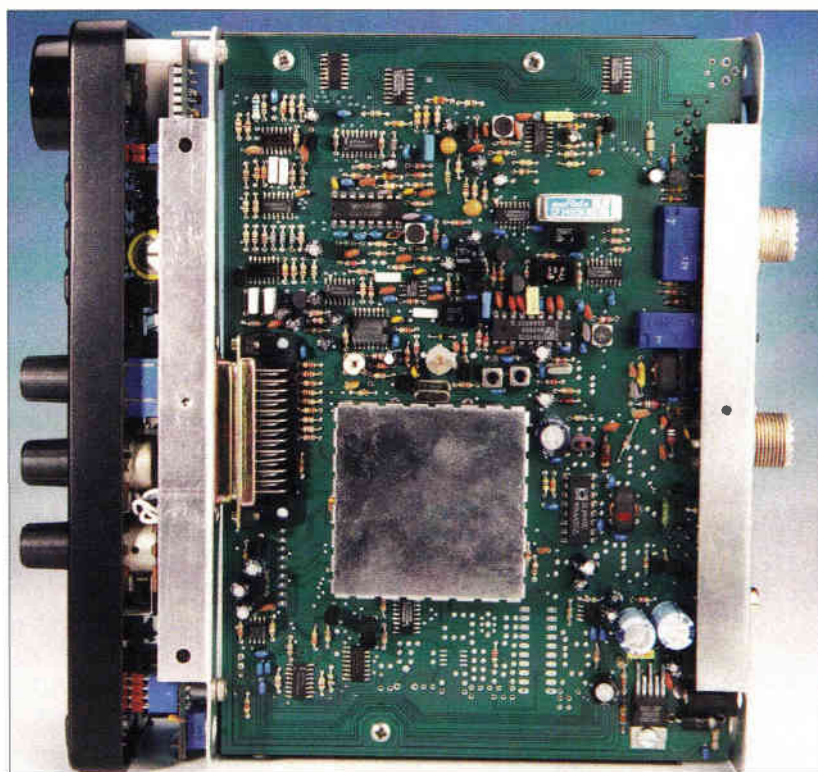
know of no other

receiver which



The infra-red remote control, yet more small buttons. This time including the alpha's too. Database programming has to be easier via a PC.

combines all the features found in the RD500, and this, coupled with the very wide frequency coverage, makes the RD500 a very tempting prospect for anyone looking for a single receiver to use as an entire listening system. And it's British, so there are people here who do things



other than spray beer over Belgian football fans and kick policemen unconscious.

Thanks again go to **Clive Buxton** at Fairhaven for supplying the review receiver. You can contact **Fairhaven** at **47 Dale Road, Spondon Deby D21 7DG. Tel: and FAX: (01332) 670707** or **E-mail: sales@fair-radio.demon.co.uk** For more information on the RD500, those of you who are Internet connected can take a look at **www.fair-radio.demon.co.uk**

Prices for the Fairhaven radios are as follows: RD500 - 500KB memory, h.f. receiver - £679; RD500V - 500KB memory, h.f./v.h.f./u.h.f. receiver - £799 and RD500VX - 2MB extended memory, h.f./v.h.f./u.h.f. receiver - £899. The V and VX models include video output and wideband f.m.). **SWM**

...and over.

We asked Clive Buxton to comment on John's review here's what he said:

"The range 590 to 670MHz is now catered for in all modes. The Synthesiser performance has been tweaked at u.h.f., since the prototype was sent out for review. We had hoped to send a later version to John but the SWM deadline prevented it. As with any receiver a few sproggies exist and if you spend a day or two tuning the whole 1.75GHz in 5Hz steps you will find a few, the important thing is that sproggies are kept away from amateur bands and away from 12.5kHz steps, so you can 'tune for miles' without experiencing problems." - **CB**

If you missed John's first look at the RD500, don't despair, back issues are available from the SWM Book Store at £2.75 each. - **Ed.**

On Another tack...

To those who think I have vanished like smoke from a hookah, bad news. I have simply moved house here in Devon and can't find my computer among the hundreds of boxes stacked in the barn.

We took the decision this time not to send out hundreds of change of address cards but to have the mail redirected for a year, during which time all the senders of letters will get my new address by return. Having also

lost the TV set in the chaos, I have now had three weeks of not being told about world disasters I can do nothing about and best of all have lived in a football free environment. I can strongly recommend it. In the process of ordering some new whizzy and expensive equipment from Rohde & Schwarz to extend my measurement capabilities up to 40GHz, I noticed in their catalogue an antenna called the TFD. Guess what - it's the T2FD in commercial form,

and the accompanying text extols the virtues of the antenna for NVIS use. That stands for Near Vertical Incident Signals (See page 39 May SWM - Ed.), and makes the T(2)FD perfect for h.f. communication within UK. It's always been said that for 80 metre working within UK and Europe, it's best to have a poor dipole which sends the signal straight up - I really must get one going on 80, but I have to find a high power resistive termination first. Any ideas? **JW**

Book Profiles

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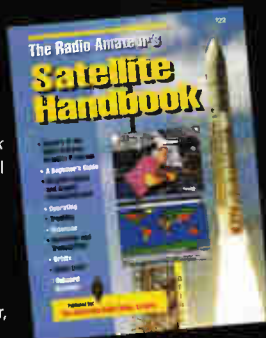
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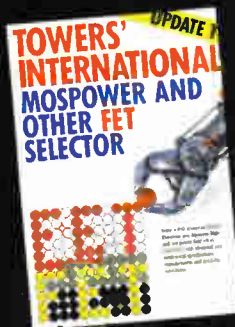
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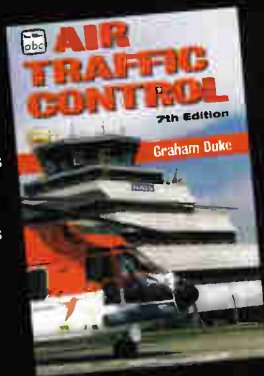
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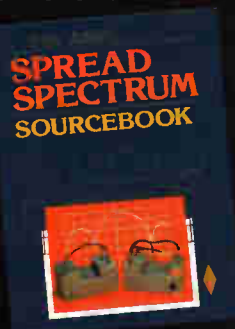
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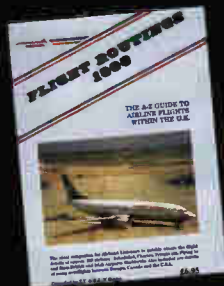
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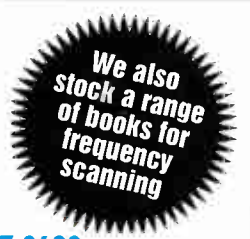
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Includes:
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Whip Antenna

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WATSON £49.95

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- * Size 84 x 55 x 60mm



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PRICE DOWN

£1199

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- * RS-232 Port

ICOM ICR-8500

£1549



- * 100kHz - 2GHz
- * SSB CW FM WFM AM
- * 1000 Memories
- * 4 IF Bandwidths
- * Alphanumeric display
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- * RS-232 interface
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- * Min tuning step 10Hz
- * 12v DC supply
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WATSON

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- * 1.6GHz GPS ant.
- * Low profile for car use.
- * Magnetic mount design
- * 6dB gain design
- * Guarantees improved range
- * BNC terminated coax.
- * OK for Garmin etc.

AOR AR-8000 Scanner



£269.95

PRICE MATCH

- * 500kHz - 1900MHz
- * WFM, NFM, SSB, AM
- * 1000 Memory Channels
- * 20 Search Banks
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PRICE MATCH



Yupiteru MVT-9000 £389

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£69.95

This portable active antenna covers 300kHz - 30MHz and also provides adjustable front-end selectivity. Ideal for use indoors and outside portable operation, it is the answer to those looking for a compact antenna system for short wave work.

24 Hour Digital WallClock £34.95

- + Temperature & Date
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SP-2000 £19.95

What better place to put a speaker. Clips easily onto any sun visor. Robust built-in aircraft-style speaker with panel volume control. Supplies with 5m cable fitted 3.5mm plug.

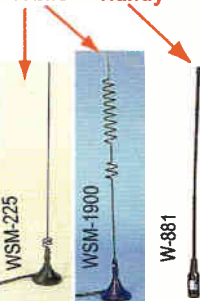


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For the very best in ATUs the AT-2000 has to be the choice. Hundreds in use around the UK - it's the best.



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- * Works with any receiver or transceiver
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- * Plugs directly into the headphone socket
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PRICE MATCH

New NRD-545 Receiver £1595



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- * Extensive filtering * Notch filter * Noise Blanker * Huge memory capacity * Pass Band Tuning * Our usual 10-day approval

OptoElectronics Scout £349.95

Reads nearby transmissions and stores each frequency in its memory. Download later or use to auto tune AR-8000, AR-8200 or IC-R10

- * 10MHz - 1.4GHz
- * 400 Memories
- * 255 hits record
- * Auto store/ recall
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WATSON FC-130 Counter 1MHz - 2.8GHz £79.95

This new model has a wide frequency range and is powered by internal ni-cads. External BNC socket with aerial makes it very sensitive. Supplied with AC charger, it is very well built. Don't be fooled by the price!

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- * Doesn't use nasty adhesive!

NEW

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+ FREE ACARS Software!



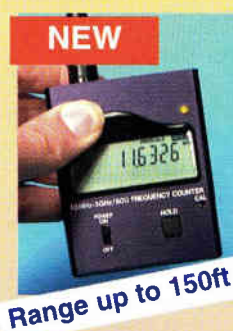
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NEW DSP Module £59.95

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- * Charger
- * Antenna

Yaesu FRG-100



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Save £80!

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- * 14 tuning steps
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- * Real-time band scope
- * Noise blanker
- * bypass memories
- * Inc. Ni-cad & Charger

WATSON WMM-1 Multimode Modem

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- * SSTV, Fax, RTTY
- * NAVTEX, SYNOP
- * Transmit and receive
- * Needs PC 286 or better
- * Includes software
- * No external power required
- * Connects to RS-232

£69.95



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explains
how you
can make
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for yourself
when re-
questing
a QSL
card
from
a Special
Event
Station.

Collecting QSL cards from Amateur Radio Special Event Stations is one of the fastest growing specialist interests of short wave listeners. It is not hard to see why, as Special Event Stations are usually one-off events, combining a piece of the history and geography of the United Kingdom and are usually on the air at weekends when most listeners are at home.

A glance at the list of stations licensed to be active on a typical weekend shows the reason for this attraction. There are scheduled operations from Castles, Steam Railways, Military Bases, Ships, School Fetes, Canals, Windmills, Scout camps, remote islands - the list is endless.

No wonder that hundreds of eager listeners scan the amateur bands at weekends chasing these jewels. They are pretty easy to locate too - just search for the pile-up of amateur stations trying desperately to get their call through and you can be pretty sure that you have found a Special Event Station using the special GB prefix.

Souvenir QSL Cards

Some Special Event Stations issue commemorative souvenir QSL cards to treasure, such as the ones issued by the Armed Services for the 50th anniversary of VE Day, the first ever amateur radio operation from inside the UK's Ballistic Missile Early Warning Station, the 50th Anniversary of the world speed

record for steam locomotives set by the *Mallard*, or the return of Captain Cook's Bark 'Endeavour' to her home port of Whitby.

If you were lucky enough to receive one of these cards, you will probably have it displayed on the shack wall or have it carefully mounted in a cherished album. Conversely, other GB stations are more interested in the popularity of the station on the air, with the design of a QSL card relegated to a very low priority.

However, a word of caution is in order. Unfortunately, it is a sad but true fact that the listener is being short-changed when it comes to receiving a QSL card from the hundreds



Event

ENGLISH HERITAGE

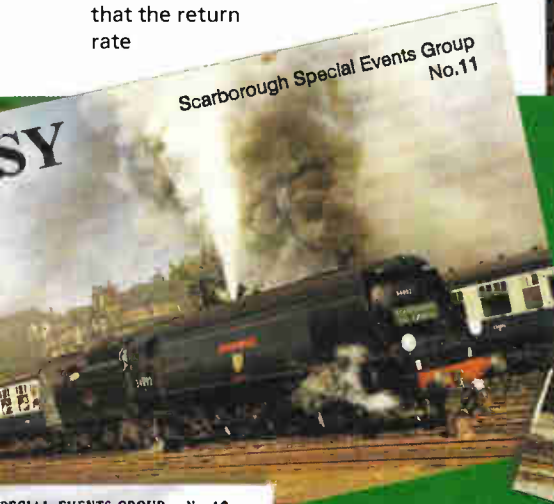
SCARBOROUGH SPECIAL EVENTS GROUP - No. 12

GBOEHS

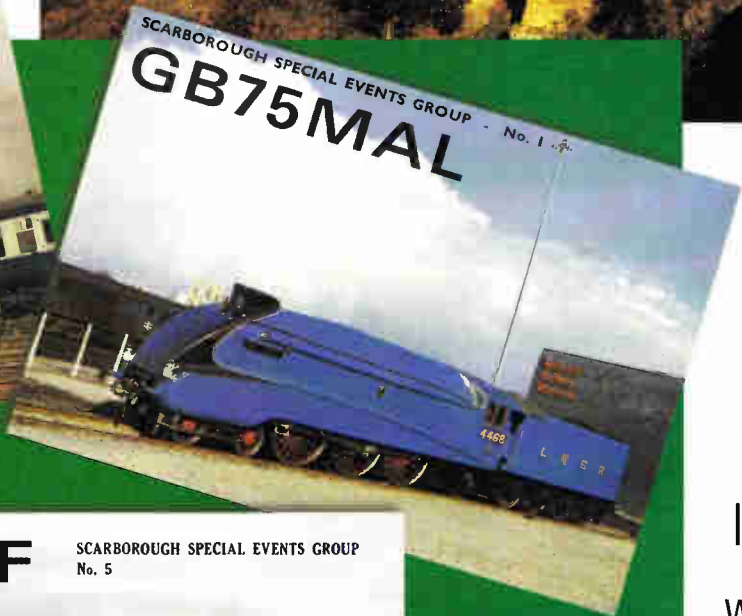


of Special Event Stations active annually in the UK. Experience shows that the return rate

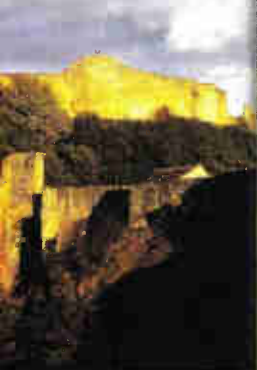
Scarborough Special Events Group No.11



SCARBOROUGH SPECIAL EVENTS GROUP - No. 1
GB75MAL



SCARBOROUGH SPECIAL EVENTS GROUP - No. 12
GBOEHS



GBOSF

SCARBOROUGH SPECIAL EVENTS GROUP No. 5



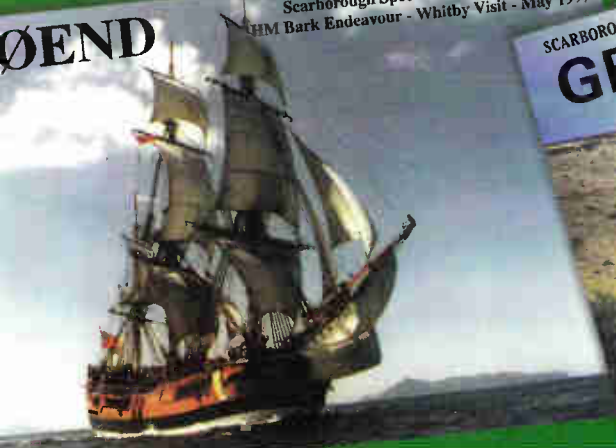
SCARBOROUGH FAYRE AND AIR DISPLAY, 1991



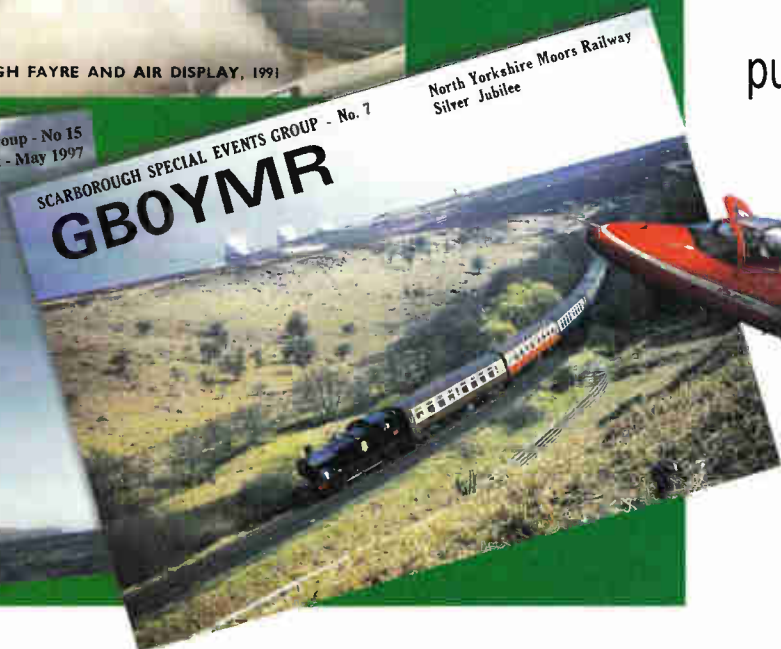
"If the organisers are really interested in listeners they will have sent advance information for publication"

Scarborough Special Events Group - No 15
HM Bark Endeavour - Whitby Visit - May 1997

ØEND



SCARBOROUGH SPECIAL EVENTS GROUP - No. 7
GBOYMR



North Yorkshire Moors Railway Silver Jubilee



"Always double-check that your report is 100% correct"



who wish to send a direct QSL to the station. Sadly, this kind of operation is becoming the exception rather than the norm.

For some Special Event Stations, the s.w.l. does not even exist. You don't believe me? Then how many hours have you spent during last summer just waiting for the person on the microphone to give a QSL route for direct cards? If you are lucky then the operator will casually mention his own call - but this is usually gabbled so fast that you only manage to log part if it.

Listen Carefully

So how can listeners maximise their chances of receiving a QSL card from a Special Event Station? The most important attribute is to listen carefully and be very selective. Learn to discriminate between the responsible Special Event Stations and the casual station.

You are pretty safe with a large national organisation celebrating a major event, a special

from Special Event Stations to s.w.l. reports sent via the Bureau is around 33% at best.

Putting it another way, two out of every three cards sent to a GB station from a listener will end up in a rubbish bin, which will belong to either the QSL sub-manager, because the organisers have not bothered to send envelopes to collect the cards, or thrown away by the organisers themselves because they do not have any cards left to send.

It is my personal opinion that the failure of Special Event Stations to reply to s.w.l. cards is reaching the proportions of a national disgrace, and is bringing whole concept of GB stations into disrepute.

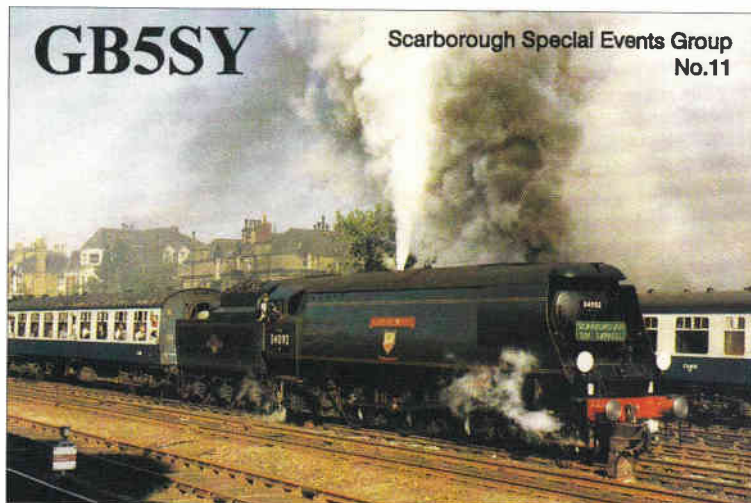
Experienced Operator

This action does not occur with all GB stations of course. The well-organised Special Event Station is a joy to listen to, and many listeners will stay tuned into an interesting GB station for hours.

An experienced operator at the microphone will control the pile-up, ensure that weaker stations have the opportunity to get through, tailor the length of his 'overs' to the size of the queue, give information concerning the reason for the celebration at regular intervals, and most importantly, announce a QSL route for any listeners

(special) GB callsign consisting of more than one figure in the callsign (such as GB75MAL) which indicates that the Radio-communications Agency recognises this as an event of particular national importance, or a known organisation from which

Continued on page 33...



"The most important attribute is to listen carefully and be very selective"

SCARBOROUGH SPECIAL EVENTS GROUP - No. 7

GB0YMR

North Yorkshire Moors Railway
Silver Jubilee



SCARBOROUGH SPECIAL EVENTS GROUP - No. 1

GB75MAL



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RING FOR SPECIAL OFFER
Full spec sheet available.



Yupiteru MVT-7100 - All mode switchable handheld HF/VHF/UHF scanning receiver. Covers 0.5-1650MHz. Features 1000 memories, over 500 pass memories, 10 limit search banks, 12 step sizes. Comes complete with earpiece, belt clip, wrist strap, rechargeable batteries, PSU, in-car adaptor and telescopic antenna.

RING FOR THIS MONTH'S SPECIAL OFFER



Radio shack DX-394 communications receiver - 150kHz to 30MHz base station AM, CW, USB, LSB communications receiver. Features include clock and timer, signal meter, 100+ memories, RF gain control and direct frequency entry. A steal at **£149.95** + £7 P&P.



Realistic PRO-2042 - AM/FM/WFM switchable base station HF/VHF/UHF scanning receiver. Covers 25-520 and 760-1300MHz. Features 1000 memories, 100 monitor channels, backlit orange LCD display. Scan rate of 50 channels/sec. **£249.95** + £10 P&P.



Yupiteru MVT-3300 - Latest Yupiteru scanner AM/FM switchable. Limited stock at **£149.95** + £5 P&P.



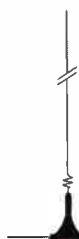
Super Syncro 1300 - 1100mAh Nickel Metal Hydride (NiMH) AA size rechargeable cells. No memory effect. Twice the capacity of NiCds. **£3.00** inc P&P.



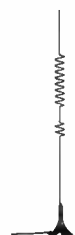
Skyscan Desktop Antenna Model Desk 1300 disconn - Built and designed for use with scanners. Coverage: 25 to 1300MHz. Total height 36" and 18" wide at widest point. Comes complete with 4m of RG58 coax cable and BNC connector. High performance antenna, ideal indoor or as a car antenna when vehicle is stationary. **£49.00** + £3 P&P.



Skyscan DX-V1300 base disconn - Most disconnes only have horizontal elements and this is the reason that they are not ideal for use with a scanner. Most of the transmissions that you are likely to receive on your scanner are transmitted from vertically mounted antennas. The DX-V1300 has both vertical and horizontal elements for maximum reception. Constructed from best quality stainless steel and aluminium and comes complete with mounting pole. **£49.95** + £3 P&P.



Airband mini-mag antenna - Civil (108-137MHz) and military (225-400MHz) dual band receive antenna featuring super strong miniature magnet and coax cable terminated in BNC connector. **£24.95** + £3 P&P



Wideband mini-mag antenna - Wideband (25-1300MHz) receive antenna featuring super strong miniature magnet and coax cable terminated in BNC connector. **£29.95** + £3 P&P.



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Palstar **COMBINED AM30 3-IN-1 UNIT**

- * ACTIVE ANTENNA MATCHER
- * SHORTWAVE PRE-AMPLIFIER
- * ACTIVE ANTENNA

£69.95

£6 p&p



SCANMASTER NOTCH FILTER SNF170

If your scanner is suffering from overloading, blocking or breakthrough then the SNF-170 could help. It's a tunable notch filter from 85-175MHz that will eliminate broadcast or public service breakthrough. Notch approx 30dB plus 70dB rejection below 1.7MHz.

Price**£27.95** £6.00 P&P

* ACTIVE ANTENNA MATCHER

Active electronics allow almost loss-less matching of your antenna to the receiver.

* SHORTWAVE PRE-AMPLIFIER

A variable gain and peak tune control it is possible to achieve best possible weak signal reception.

* ACTIVE ANTENNA

Using the Telescopic whip provided this unit will act as a stand alone active antenna ideal for use in flats, bedsits and situations where an outside antenna is impossible.

- Freq: 100kHz-30MHz
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Improve the reception of your scanner with this Japanese made low noise pre-amp. A fully adjustable gain control -6dB to +20dB ensures best possible performance. 3 band pass filters reduce out of band interference.

- 24 - 1500MHz
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- 3 bandpass filters
- Battery or 12V operation

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- Moving Map Graphics
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£339.00 PRICE MATCH

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- can be dash mounted for use in a vehicle or boat. This unit will tell you:-
- **Where you are • Where you've been • Where you're going**

- Includes:- LAT/LONG, UTM, Ordnance Survey, Swiss, Swedish, German & Maidenhead grids.

GPS 48

- 12 Channel Receive
- Database for Marine, Nautical, Nav aids, Cities, Radio Beacons, Buoys, etc
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AEA FAX II

A SOFTWARE PACKAGE THAT ALLOWS RECEPTION OF WEATHERFAX, NAVTEX, RTTY AND MORSE CODE

ALL YOU NEED is an SSB receiver & a PC.

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- Receives while you're away
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- Manipulate images after they are received
- No Amateur Licence or TNC needed!

£99 £4.75 P&P

ACCESSORIES

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- GPS II, 12, 45Power, Data Cable.....£22.33
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- GPS 38, IICarrying Case.....£11.75
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- Satellite navigation (with use of GPS)
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SCANMASTER DISCONE

A quality wideband stainless steel discone with frequency range of 25-1300MHz. Fitted with low loss 'N' type connector. Able to transmit on 2M & 70cms.

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SCANMASTER ACTIVE DISCONE

As above but with 20dB pre-amp.

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SCANMASTER DOUBLE DISCONE

A high performance wideband antenna, offering gain over a conventional discone. Stainless steel construction with standard PL259 connector, mounting pole plus brackets. Superior performance on Air, Marine and PMR bands.

- 25-1300MHz
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SCANMASTER ACTIVE DOUBLE DISCONE

As above but with 20dB pre-amp

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NOMAD PORTABLE RECEIVING ANTENNA

Fully portable flexible wire scanning receiving antenna covering both VHF & UHF.

- Length (approx) 1.5mtrs
- Optimised for airband
- 4mtr coaxial cable
- Fitted BNC

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SKYSCAN DESKTOP

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

£49.95
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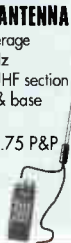


NEW SW2

INDOOR WIRE ANTENNA

- Wideband coverage
- 100 kHz-1 GHz
- Special VHF/UHF section
- For handheld & base scanners

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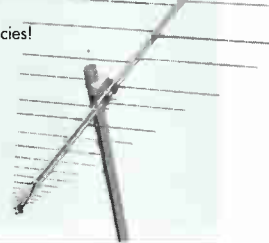


LP 1300

Log Periodic WideBand Beam Antenna

- Covers 105-1300MHz with over 8dB of gain at all frequencies!
- 16 elements (longest length being 1.4m)
- Fitted "N" type 50Ω socket
- Power rating: 500W transmit
- Gain 11-13 dBi F/B 15dB

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P&P £8



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| AOR AR7030 | HF Receiver | 569.00 |
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| DRAKE R8A | Communications Receiver + VHF Converter | 699.00 |
| DRAKE SW8 | HF Receiver | 399.00 |
| ICOM R72 | + Batt pack & Filters | 599.00 |
| JRC NRD 525 | HF Receiver | 499.00 |
| KENWOOD R-2000 | + VHF Converter | 395.00 |
| LOWE HF 225 + Extras 395.00 | | |
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| NR 56 VFI Shortwave Receiver 49.00 | | |
| REALISTIC DX394 HF Receiver 99.00 | | |
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| AOR AR 2002 | Base (25 - 550MHz) (800 - 1300MHz) 20 Channels | 185.00 |
| AOR AR 800E | Handheld (75 - 950MHz) | 99.00 |
| AOR AR 900 (UK) | Handheld (108 - 950MHz) 100 Channels | 99.00 |
| BEARCAT UBC 200XLI | Handheld (66 - 950MHz) with gaps | 125.00 |
| COMMETL 101 | Base (68 - 512MHz) with gaps 26 Channels | 95.00 |
| NETSET PRO 2029 | Base (68 - 512MHz) 60 Channels | 99.00 |
| NETSET PRO 46 | Handheld (66 - 965MHz) 100 Channels | 89.00 |
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| REALISTIC PRO 2039 | Base (68 - 960MHz) with gaps 200 Channels | 165.00 |
| REALISTIC PRO 2042 | Base (25 - 1300MHz) with gaps 1000 Channels | 179.00 |
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| REALISTIC PRO 9200 | Base (66 - 512MHz) 16 Channels | 85.00 |
| TRIDENT TR 2000 | Handheld (500kHz - 1200MHz) 500 Channels | 129.00 |
| TRIDENT TR 2200 | Handheld (100kHz - 2059MHz) 500 Channels | 149.00 |
| TRIDENT TR 4000 | Handheld (100kHz - 2059MHz) 1000 Channels | 199.00 |
| WIN 108 | Handheld Airband Scanner | 95.00 |
| YAESU FRG 9600 | 60 - 905 100 Channels | 299.00 |
| YUPIITERU VT 225 | Handheld Civil/Military Airband | 175.00 |
| YUPIITERU MVT 3100 | Handheld (143 - 960MHz) 100 Channels | 160.00 |
| YUPIITERU MVT 7000 | Handheld (100kHz - 1300MHz) 200 Channels | 145.00 |
| YUPIITERU MVT 7100 | Handheld (530kHz - 1650MHz) 1000 Channels | 175.00 |

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- 150kHz - 29.99MHz
- 87.5MHz - 108MHz
- 54 memories
- AM/FM/SSB
- AM Wide/Narrow filter
- RF gain control

£139.95

If you are looking for a really good no nonsense portable SW receiver that covers SSB - this set represents unbeatable value for money!

ICOM R8500



YES, we've got them IN STOCK!
This receiver is everything we hoped it would be, covering 100kHz - 2GHz and lots of features including computer control.
PAY BY 3 POST DATED CHEQUES! £516 each
Our Price ~~£1649.00~~ **£1548.00**

AOR SDU 5000



£699

PRICE MATCH

Get the most out of your AOR and Icom receiver. Supports AR 3000A, Icom R-8500, R-7100, R-7000, R-9000.

- Wideband Spectrum Monitor
- Displays Average, Peak, Max Levels
- Download to computer (with Hawk 5000 Software - not supplied)
- Can be used with any (wide) 10.7MHz IF output receiver
- Supplied c/w 12V DC Supply, RS232 Lead, BNC Patch Lead, Op Manual

YAESU FRG 100



£449

This receiver provides solid coverage from 50kHz to 30MHz with all mode reception of AM, SSB and CW. 50 fully tunable memory channels store frequency, mode and filter selections. The FRG-100 has twin 12 hour and 24 hour programmable clocks with on timer and sleep timer. The set requires 12V DC.

FM option available - add £33

JRC NRD 345



A cracking new receiver aimed at the Broadcast and Shortwave listener. JRC build some of the World's finest receivers and this is no exception. Designed to give clarity and interference free reception.

- AM synchronous detector
- Low noise PLL chip
- Wide dynamic range
- Sensitive receiver
- Noise blanker
- RS232 computer I/F
- 100 memories
- Clock/Timer functions
- Supplied c/w AC mains adaptor

£699

ROBERTS R861



£169.95

SYNTHESISED RECEIVER FM STEREO/MW/LW/SW PLL

- 307 memories (261 in SW, 18 each in MW/FM, 9 in LW + priority station)
- ATS auto scan & preset in priority pf signal strength in FM/MW/LW bands
- E2 PROM for memory
- FM stereo via earphones
- 29 pages SW stations memory, 9 memories in every page
- 8 characters for editing station name
- Built-in 42 world cities time+DST device
- Battery & signal strength indicator

SONY ICF-SW7600G



£125.00

PORTABLE SW RADIO

- Covers 153kHz - 30MHz
- AM/SSB/CW & 87.6 - 108MHz FM
- FM stereo via earphones
- 10 key Direct Access Tuning
- 22 Station presets
- LCD display
- Tone control
- External antenna & record jacks
- Clock/Timer -sleep & standby functions
- Includes compact reel antenna & carrying case

REALISTIC DX394



Special! **£149.00**
88 p&p
overs: 150kHz-30MHz
Receives: AM/CW/SSB

BOOKS

- UK Scanning Directory £18.50 p&p £2.75
- Scanning Secrets £16.95 p&p £2.75
- Scanner Busters 2 £6.00 p&p £1.25
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- Maplin Starting Electronics £9.99 p&p £1.75
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- Shortwave Listener's Guide £14.99 p&p £2.75
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OPTOELECTRONICS R-10 FM

- 30MHz-2GHz cont cover
- Nearfield Test Receiver
- Dual 10 segment bargraphs provide deviation & relative signal level indication
- Earphone supplied
- Excellent for bug detection
- Pocket sized
- Self tuning to strongest nearfield signal
- c/w antenna, NiCads & Charger

R-11 NEARFIELD FM TEST RECEIVER

Sweeps 30MHz to 2GHz in less than one second. Can lock onto a 5W UHF signal at 500ft. Listen to the signal on the built in speaker & display the general band and transmit frequency.

LOW LOSS COAX CABLE

We've imported these super low loss cables especially for scanner enthusiasts who want the very best reception from their external antenna.

- JAPANESE 5D-FB**
- Dia 8.1mm (Good to 3000MHz).....85p/MTR
- BNC Plug for 5D-FB£3.75
- PL 259 Plug for 5D-FB£1.40
- N Type for 5D-FB£3.95
- SIVA RH100**
- Dia 9.7mm 1.3dB loss (10mtr @ 1000MHz).....95p/MTR (p&p on request)

SHORTWAVE ANTENNAS

- EFW - Shortwave Antenna**
20 meter s/w receive end fed wire antenna. Balun fed, uses high quality "Flex Weave" copper wire. 1-30MHz
Price £59.95
- DLB - Shortwave Balun**
Matches end fed long wires to 50Ω coax, helps on rec. to reduce noise & interference. Transmits up to 100W. Fully moulded for full weather protection.
Price £39.95

TARGET HF-3



An British made shortwave receiver
● 30kHz-30MHz • All Modes • S Meter
£159.95 £8 P&P
TARGET HF-3M A special version of the HF3 with weatherproof interface, PC Cable & software. **£209.95** £8 P&P

AR-8200 ACCESSORIES

- SLOT CARDS for AR-8200**
- CT8200 CTSS£59.90
- EM8200 External Memory£49.90
- RU8200 Record/Play Back.....£49.90
- OTHER ACCESSORIES**
- CC8200 - Computer lead with level shift C/W free PC Windows Software & protocol listing on CD-ROM£69.90
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VR-60 PORTABLE DIGITAL RECORDER



- 60 mins record
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- Store 128 memories
- Link to your radio with adaptor lead (not supplied)

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PSR239

200 channel
VHF/AIR/UHF/900MHz
portable scanning receiver.

Specifications: ★ 200 programmable channels

Frequency range: ★ 68-88, 108-137 (AM), 137,174, 380-512, 806-960MHz

Features: ★ Access to 31,000 different frequencies ★ 10 key direct access ★ 10 scanning banks

for grouping frequencies ★ Direct access to desired scan bank while scanning ★ Upper and lower limits frequency search ★ Priority channel ★ Air band reception ★ One temporary monitor channel ★ 2 second scan delay

£159.95



PSR250

20 channel UHF/VHF portable scanning receiver.

Specifications: ★ 20 programmable channels

Frequency range: ★ 68-88, 137-174, 380-512MHz

Features: ★ Access to 22,000 frequencies ★ 10 key direct access ★ Channel lock-out ★ LCD back light on/off ★ 2 second scan delay

£79.95



PSR244

50 channel VHF/AIR/UHF portable scanning receiver.

Specifications: ★ 50 programmable channels

Frequency range: ★ 68-88, 108-137 (AM), 137-174, 380-512MHz

Features: ★ Access to 24,000 frequencies ★ 10 key direct access ★ Priority channel ★ Air band reception ★ One temporary monitor channel ★ 2 second scan delay

£129.95

**GRE HAVE BEEN
MANUFACTURING
SCANNING RECEIVERS
FOR THE PAST 25 YEARS
AND HAVE NOW JUST
LAUNCHED THEIR OWN
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AOR AR8000 Accessories

DX-8000 Narrow AM board

Want to improve performance on the AM Broadcast bands both MW & SW? We now have available a small PCB that fits internally within the AR8000 and allows the narrower SSB filters to be selected when in AM/NFM mode. This can greatly assist with AM listening on crowded short wave bands. Once the PCB is fitted the narrower filters can be selected by pressing the local button and deselected in the same way. This board is exclusive to ourselves and not available from any other distributor. For further details please give us a call or visit our web page. **Price £35.00.**

Jau-Scan 8000

New, low cost fully functional PC software (Windows 95). Fully functional but time limited demo available either by post or our web site. Currently the only package to support internal options fitted to the AR8000 (DX-8000 or DS-8000 for example). **Price £19.99.**

LC-8000 Leather Carry Case

As an option to the AOR soft case, we have available a robust leather case manufactured from high quality leather (yes it does smell of leather) that not only provides increased protection but can be worn on a belt for added security. **Price £15.00.**

For further information on these or any of our products please contact us via telephone, fax or e-mail. Our web pages at <http://www.javiation.co.uk> are updated on a regular basis with news and information on all the latest product releases.

Jau-232

RS232 Interface

Whilst the AR8000 was the main reason for us producing the JAV-232 it is compatible with the AR2700, IC-R10 and other Icom equipment, Alinco DJ-X10 and the Optoelectronics Scout together with any other receiver requiring a TTL interface. When used with the AR8000 the JAV-232 is unique in that it not only provides RS-232 computer capabilities but also squelch activated tape recording (AOR CU-8232 and CR-8000 in one unit!).

Main features:-

- Fully compatible with many receivers
 - Original Sumitomo Flat Flexible Cable (FFC) supplied for use with AR8000 and AR2700
 - Robust, compact metal die cast case
 - 1.0m high quality multicore cable
 - Well produced instruction manual
 - 6-pin Din output provides audio and squelch activated remote tape recording for AR8000
 - Demo versions of leading software included
- Price £69.99.**



you have received QSL cards previously.

Check how often the station mentions s.w.l.s and how often a direct QSL route is given. Has the event been publicised in the GB2RS *News Broadcast*, or in the *Short Wave Magazine*? If the organisers are really interested in listeners they will have sent advance information for publication. All these points are indicators to the quality of the operation and help you to assess your chances of receiving a QSL card.

If you are really interested in obtaining a QSL then send a card direct. Cards sent via the Bureau will get there eventually (if the station has deposited envelopes with the GB sub-manager) but it may well be one year later when all the allocated QSL cards have gone.

Providing high quality QSLs can cost around 15p per card. At the end of an operation many Special Event Stations will order just a few more than the amount required. You can guess what happens to the s.w.l. card which arrives 12 months later.



Always Double-Check

Always double-check that your report is 100% correct. Your aim is to make the job of the Station Manager as easy as possible, so that he can verify your report in the log, fill out a card, put it straight into your return envelope and drop it in the post.

A wrong date, or time written in BST instead of UTC, means that the manager has to search for your entry in the log. If you do not record a callsign in contact with the Special Event Station at the time of your report then the manager cannot even locate an



entry in the log.

Failure to enclose a stamped addressed envelope for a reply is the kiss of death! Some listeners just enclose a return stamp, which means that the manager is expected to provide an envelope and copy an address from your card. He will not usually do this.

Make It Personal

Finally, do write a few enthusiastic comments on your card, or enclose a letter to make it more personal. If you have a special interest in the

event then say why. Organisers of a GB station like to know if the information given over the air has been useful and interesting.

You may regard Amateur Radio Special Event Stations as a blessing or a curse. However, for the listener with perseverance, the rewards are great, with the added satisfaction that you have taken part in a piece of history brought to life through amateur radio. **SWM**



"The well-organised Special Event Station is a joy to listen to, and many listeners will stay tuned into an interesting GB station for hours"

Off and down

Rosina Brown documents the sad demise of a once thriving Amateur Radio Club.

Is this the future of Amateur Radio in the UK, no young interest?

Disbanding a club is always a sad business, especially when in the past it has enjoyed the support of 50 members with many years of radio communication between them. The Radio Club of Thanet (G2IC) was initiated in 1981 by Gerry Abrahams G4KEJ when he put an advertisement in the local paper for interested radio amateurs to attend a meeting.

Twenty four members packed-out a pub in The Square, Birchington, and two hours later the Club was born. Dave Arter G1NLQ who came out of the meeting as Vice President (Gerry Abrahams, President), vividly remembers the event, but not the name of the pub.



A thriving Radio Club of Thanet with President Ken Whiffin GNRNJ standing behind his XYL and Club secretary, Dave Arter G1NLQ is next to Ted Endersby G4DTA with his dog Varna.

Special Event Stations

Since that time, the Club had prospered and running Special Event Stations has brought back many happy - and some not so happy - memories for both operating Club members and thousands of their contacts. The 50th Anniversary of Dunkirk Special Event Station GB50DNK and M.Y. *Sundowner* GB50SUN ran over the month of May 1990.

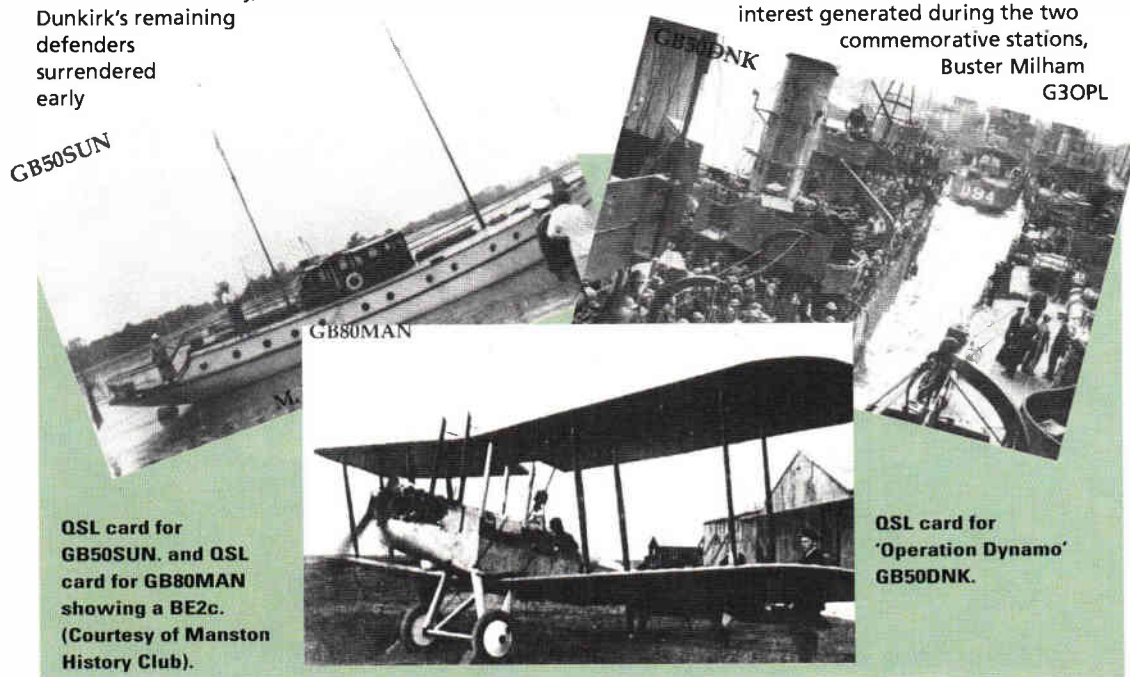
'Operation Dynamo' was officially sanctioned on 26 May, but Dunkirk's remaining defenders surrendered early

on 4th June. Particularly poignant for the Club was that almost a quarter of those rescued were landed at Ramsgate Harbour.

M.Y. *Sundowner*, one of the 'Little Ships' since restored by Ramsgate Maritime Museum, entered Dunkirk at 3.00pm on 1st June and secured alongside HMS Worcester. 130 and three crew were rescued. "9.00pm. Entered Ramsgate and discharged".

The two stations made 4053 contacts with 102 countries. Quite a month! Following the amount of interest generated during the two commemorative stations,

Buster Milham
G3OPL



QSL card for GB50SUN, and QSL card for GB80MAN showing a BE2c. (Courtesy of Manston History Club).

QSL card for 'Operation Dynamo' GB50DNK.

ear - QRT

compiled a report from letters he received from those involved in the Dunkirk evacuations. Personal accounts of those rescued and those doing the rescuing make riveting reading.

50th Anniversary

The 50th Anniversary of The Battle of Britain GB50MAN was run from a building on Manston airfield kindly loaned to the Club during July 1990. It was the first time the distinctive callsign had ever been issued, and was used with great pride by the Club.

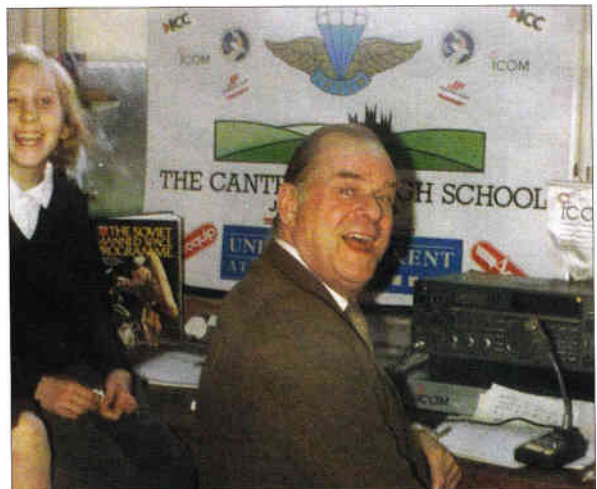
Because of the sensitive location of the station, participating members were required to attend a security course. But it was all worthwhile as 1295 contacts were made, 939 in the UK and 356 over

Lighthouse and GR5VE - The 50th Anniversary of VE Day.

The Club would like to acknowledge the support received from Thanet District Council in the setting up of some of their Special Event Stations.

Great Success

Most stations have been a great success,



The Juno Mission. Audrey G0CTQ keeps the log while Buster G3OPL operates GB4JUNO. Teachers and pupils at Canterbury High School try their hand at transmitting. (Courtesy Kentish Gazette).

30 countries over the operating week, and mostly on 80m.

A Special Event Station also covered the Juno Mission, 1991, when Helen Sharman was a crew member on MIR. The idea was to involve schools in the mission and a station was set up in conjunction with Canterbury High School. Buster Milham G3OPL, ably assisted by Audrey G0CTQ, was responsible for setting up this operation and a lot of interest was generated in amateur radio amongst both pupils and teachers.

Many smaller Special Event Stations have been organised by the Club over the years, including GB2SRW - Sarre Windmill, GB2RPS - Richborough Power Station's 30 Years Anniversary, GB2RRH - 175th Anniversary of The Royal Ramsgate Harbour, GB5DD - D Day Landings, GB2NFL - North Foreland

generating interest from all over the world, but however small the event, setting up and running a station is likened to a military operation. It involves a lot of organising and time and members are not always able to commit themselves.

Ken and Audrey Whiffin have been staunch members of the Club for 16 years and assisted in the sad task of winding it up. "The problem is", says an emotional Audrey, "the younger members in the Club lack the interest and commitment needed to take it into the 21st century."

On a lighter note, some great visits have been arranged for Club members

Buster G3OPL demonstrates that being a radio amateur is fun!



One of the Club's many appearances at a public event. All very relaxed - but this is the easy bit.

Continued on page 38...



NEW AR8200 *The Superior Concept*

The AR8200 incorporates many new features including the correct implementation of the new **8.33 kHz** airband channel step with innovative additions such as the optional **SLOT CARDS** for external memory capability, CTCSS, computer control and much more.

AOR products are renowned for innovation and carefully reflect the requirements of enthusiasts. In particular the new **AR8200** wide band all mode receiver has been designed with airband listening very much in mind.

8.33 kHz tuning step: International governing bodies have recently redefined the VHF airband tuning step to provide additional frequencies, **ultimately many older receivers will not be able to receive these new channels.** Latest information suggests that the new allocation will come into effect on 01.01.1999 for parts of Europe and one year later in the UK. Being at 'the cutting edge' the AR8200 supports **8.33 kHz** correctly implemented as eight-and-one-third kHz. This means that the AR8200 will tune the VHF airband displaying the following steps 118.0083(3), 118.0166(6), 118.0250(0) MHz, the end numbers are correctly forced to **33** then **66** then **00**. Most other receivers would incorrectly display **33** then **66** then **99** as the last digits so would quickly drop out of channel synchronisation, further tuning of other receivers would result in the end digits displaying **32, 65, 98** then **31, 64, 97** then **30, 64, 96** etc.

Selectivity is not a problem with the AR8200 as a **narrow AM bandwidth** is also supported (although undoubtedly the geographical allocation of tightly allocated channels will be taken into consideration by the governing bodies??). The AR8200 channel steps may also be programmed in multiples of 50 Hz in any mode. Extensive step-adjust and frequency offset facilities are also provided to ensure accurate tracking of the most obscure band plans. A wide frequency coverage is available from 530 kHz to 2040 MHz with no gaps.

A.F.C.: Automatic Frequency Control is included for spot on tuning ensuring that nothing is missed, this is especially useful for monitoring offset transmissions of London ATC etc without the need to retune.

Alpha text: A larger than average back lit LCD with contrast control provides operational data. Alphanumeric text comments of up to 12 characters may be added to memory channels, memory banks and search banks (for example **MANCHEST APP**) for easy identification reducing the need for a complex list or data base.

A text search feature simplifies recall of stored information.

Band scope: A high resolution signal meter and **multi-function band scope** is provided, this enables you to visually interrogate up to 10 MHz bandwidth at a time for activity, peak hold assists location of unusual or sporadic transmissions. **Flexible dynamic memory bank layout** is provided (memory banks may be varied in size between 10 and 90 channels each i.e. bank 'A' 80 channels / bank 'a' 20 channels with bank 'B' 40 channels / bank 'b' 60 channels etc). 1,000 memories, 20 memory banks, 40 search banks, select scan list, priority and lockout facilities are included. It is also possible to edit and delete individual memories, swap, copy, move and delete whole banks including dumping all data.

Computer control is available via a metallic side mounted robust connector and optional lead, an extensive RS232 command list is supported. A software package is under development which will be made available as an internet **free** download over the coming months. This connector also supports clone of data between two AR8200 along with tape output, detector output, mute and AGC. Optional **internal SLOT CARDS** (which fit into the AR8200 base) extend the AR8200 capability even further: **Memory slot card** (increase storage to 4,000 memories, 160 search banks). **CTCSS slot card** squelch & search. **Record chip slot card** (records up to 20 seconds of audio). **Tone eliminator slot card, Voice inverter card.**

The **side keypad** provides **four arrow keys presented as a single 'rocker'** resulting in more natural and intuitive navigation through the on-screen menus. Tuning is accomplished via a variety of controls including a side panel indented main tuning dial, arrow keys and keypad. The scratch resistant "military green" cabinet has a quality feel. **Supplied with:** NiCads, charger, cigar lead, whip aerial, MW bar, belt hook & screws, strap, operating manual

£399.00



Contact your dealer for full details & reserve your stock today!!!

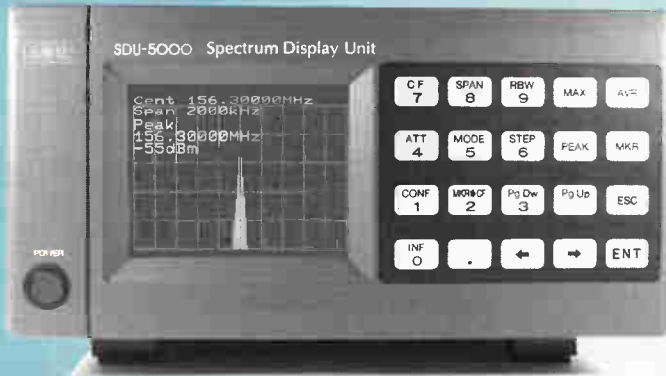


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ICOM receiver in an AOR advertisement...



It is not a common sight to see an **ICOM receiver** featured in an AOR advertisement, this is a special occasion demonstrating the **COMPATIBILITY** between the AOR SDU5000 Spectrum Display Unit with both AOR and ICOM receivers (AOR AR5000, AR3000A, ICOM R8500, R7100, R7000, R9000).



The SDU5000 Spectrum Display Unit adds a variety of features to extend your receiver's capabilities, such as visually identifying new active frequencies and taking measurements. The SDU5000 may be used with a number of receivers (which have a 10.7 MHz I.F. output) and provides a bandwidth up to ± 5 MHz in 1 kHz increments with a resolution of 5 kHz or 30 kHz.

The SDU5000 has been designed with both AOR and ICOM receivers in mind, the SDU5000 supports the **AOR AR5000**, **AR3000A** and **ICOM R8500**, **R7100**, **R7000** & **R9000**. The receiver's RS232 remote port connects directly to the SDU5000 to ensure the full potential of the SDU is exploited. Operation is extremely simple as the SDU5000 utilises an on screen menu system.

The SDU5000 remains compact due to the use of an internal 3.1" (79mm) HQM simple matrix 16 colour LCD 192 dot x 210 dot. An external home colour television with video input may also be connected (PAL or NTSC). Operation is from 12V d.c. with a suitable mains supply provided with the SDU along with connecting leads.

When using selected AOR and ICOM receivers, the frequency, mode (& attenuator with some sets) may be controlled from the SDU5000 so that a displayed frequency may be easily monitored when the cursor frequency of the SDU5000 is equal to the receive frequency of the radio. By using the cursor of the SDU5000, frequency and signal level can be read directly. This enables the SDU5000 to be used as a wide coverage spectrum monitor across the receiver range of the connected receiver (from 10 kHz to 2600 MHz using the AR5000) with DDS providing an accuracy of 100ppm. Dynamic range is 50 dB with an acceptable input level between -10dBm to -90dBm with selectable gain control.

The SDU5000 has a multiple processing function which displays Average Level, Peak Detection and Maximum Value Hold. Previously these professional features have only been available from expensive professional class spectrum analysers. Of course the SDU5000 also makes an excellent **band scope** so that adjacent channel activity may be constantly monitored, this is particularly popular with frequency management organisations.

The SDU5000 may also be connected to a PC where all controls are accessible and display data can be downloaded for record and later analysis, you may measure the frequency and signal strength of historical events! **SDU5000 £699**

Requirements

AR5000 receiver. Everything is supplied for straight forward connection of the RS232 and IF connections.

AR3000A 'PLUS' receiver. Everything is supplied for straight forward connection of the RS232 and IF connections.

AR3000A receiver. A small modification is required to the AR3000A in order to provide a 10.7 MHz I.F. output and AGC control. The SDU-RS232 lead is provided (with the SDU5000) along with a BNC-BNC patch lead.

AR3000 receiver. Requirements are the same as with the AR3000A however facilities are limited as the SDU will operate as a band scope only (there is no RS232 link between the SDU and AR3000).

ICOM R8500. This unit provides direct RS232 connection so that the lead provided (with the SDU5000) connects straight from the SDU5000 to the rear panel RS232 socket of the R8500. The IF patch lead will require the changing of one BNC plug as the ICOM IF input uses phono. Configure the ICR8500 as per the ICR7100 (address & baud rate), details are provided with the SDU5000.

ICOM R9000, R7100 & R7000 receivers. The optional ICOM CT17 communication interface (or equivalent) is required to connect between the SDU5000 and ICOM receiver. The RS232 lead connects between the SDU5000 and CT17. The IF patch lead will require the changing of one BNC plug as the ICOM IF input uses phono.



Other receivers. It may also be possible to connect the SDU5000 to other receivers which provide a suitable (wide) I.F. output at 10.7 MHz. It is possible to reprogramme the SDU5000 centre frequency (front panel) when using other receivers which use different IF frequencies (Kenwood, Yaesu etc) in the range of 5.7 to 15.6 MHz, however see the note at the end of the specification of the sales leaflet... in practical terms the IF should be between 8.2 - 13.2 MHz for a 5 MHz span.

For further details please contact your dealer. The following dealers are currently participating in a promotion so that display facilities are available (July - October 1998), please call them before travelling...

Haydon Communications, Edgware 0181 951 5781
 Haydon Communications, West Midlands 01384 481 681
 Waters & Stanton PLC, Essex 01702 206835
 Martin Lynch & Son, London 0181 566 1120
 Nevada Communications, Portsmouth 01705 662145
 ASK, London 0171 637 0353

HAWK5000 is an optional **Windows PC software package** designed specifically for the SDU5000. A graphical on-screen display provides access to the SDU5000 facilities along with recording of AVI video files to disk. A download demo of HAWK5000 is available from the AOR web site www.demon.co.uk/aor along with further information. A separate leaflet is also available on HAWK5000 to request. **HAWK5000 £49**



AR5000 True high performance, voted best wide band receiver by readers of the German "funk" magazine in 1997. Frequency coverage 10 kHz - 2600 MHz all mode with standard IF bandwidths of 220 kHz, 110 kHz, 30 kHz, 15 kHz, 6 kHz, 3.0 kHz. **£1345**

The enhanced **AR5000+3** includes AFC, Sync AM and noise blanker. Voted best wideband receiver in "funk" magazine 1998 **£1574**



Amateur Special

Family visit to Manston Airfield with a close up look at a Sea King Rescue helicopter - just before take-off!



Audrey G0CTQ takes a break from the radio to chat to other participants at a Kent local event.

and their families. The Coast Guard at St. Margarets Bay, Dover, was a most interesting and enjoyable evening out.

It is very reassuring to know that whenever we cross the shipping lanes in the channel, and we in Thanet do quite frequently, we are being watched

capable of reading the time on the clock in Calais - but only on a clear day!

Sea King Rescue

A visit particularly enjoyed by my son Andrew 2E1CPB - was to the Sea King Rescue helicopter then based at Manston. Being able to sit at the controls and actually meet the crew was a memorable occasion, especially when the alarm sounded for action stations during our tour around the craft.

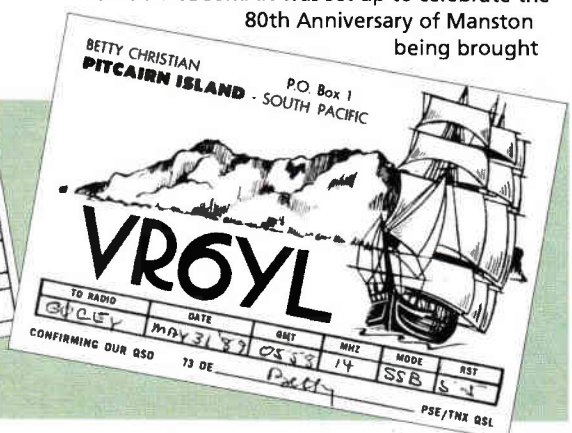
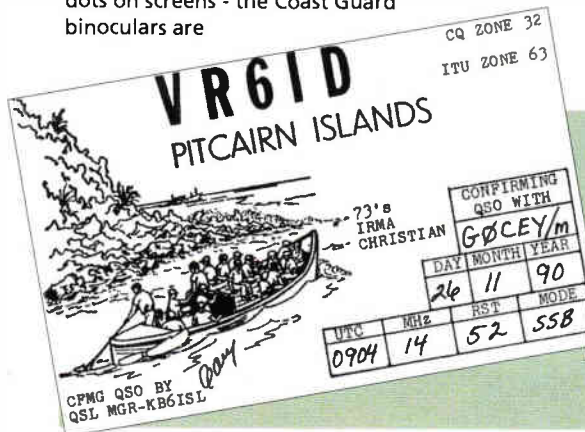
Seeing some of the less mobile amateurs beating a hasty retreat from the instantly crewed and engaged helicopter was a sight to behold, but very exciting. Following that visit we were on first name terms with the crew as they flew over our homes on one of their many rescue missions. The Sea King Rescue helicopter is sorely missed and Manston airfield hasn't been the same since it left and took up residence at Wattisham, Norfolk.

The Club's ties with Manston, however, are still strong. Special Event Station GB80MAN was set up to celebrate the 80th Anniversary of Manston being brought



and protected. And it's not all done by looking at dots on screens - the Coast Guard binoculars are

Two of four prized QSL cards received by Gordon G0CEY/m from the Pitcairn Islands.

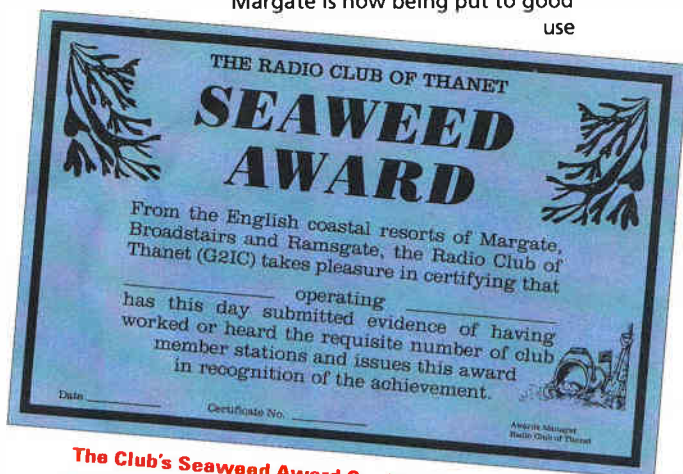




Ken G4RNJ presents the Club's donation for £401 to John Rayment from The Thanet Hospice. (Courtesy Kentish Gazette).

into existence as a Royal Naval Station in 1916.

The *Spitfire* Museum now housed at Manston, the separate Manston History Club and Exhibition are all well worth a visit, and Ken Whiffin G4RNJ, an ex-RAF man himself, is at present involved in the history section restoring a D4 Link trainer. The D2 Link trainer he recently restored for the ATC in Margate is now being put to good use



The Club's Seaweed Award Certificate awarded when 6 points have been accumulated,

by the Cadets.

Just before its opening in 1992, The Thanet Hospice played host to the club and members were delighted to raise in excess of £400. Needless to say,

QSL card GR5VE - commemorating the 8th May, 1945, the 50th Anniversary of VE Day.



Short Wave Magazine, August 1998

the newly opened hospice put the donation to good use.

Special QSOs

Apart from the thousands of world-wide contacts made by G2IC over the years, many other special QSOs have taken place by individual members. Buster G3OPL has made contact with the Vatican and has even discussed the weather with King Hussein of Jordan!

Gordon Cadey G0CEY wonders



QSL card GB50MAN. A very special call sign.

whether he is the only amateur who has had four contacts with residents living on the Pitcairn Islands. His first contact in 1989 was with Meralda Warren VR6MW, whose ancestors landed the HMS *Bounty* on January 17, 1790, and another in 1990 with Irma VR6ID and Betty Christian VR6YL no less - and from a mobile!

Gordon does know for certain, however, that he is the only member of the club to have operated from Baghdad on YI1BGD - and what a pile up that caused!

The Club's intention to operate from the Goodwin Sands had to be abandoned due to bad weather conditions, and had nothing to do with the notorious ghost ship that is said to haunt the sandbank - or so the participating members said.

Sunday Net

The Club will continue to hold its Sunday morning net on 10m when members are always happy to chat to anyone wanting to join in. This will please their short wave listeners who they know enjoy the regular Sunday morning natter. Some 360 of the club's Seaweed Awards have been earned, some by short wave listeners, and now that the club is no more they are well worth keeping.

The Radio Club of Thanet has over the years in its small way promoted Thanet as a holiday area. Through its Special Events Stations and appearances at public events it has generated thousands of contacts with fellow amateurs all over the UK and the world.

It has highlighted the island's history and has put the Isle of Thanet very much on the map. It will be sadly missed. **SWM**



"Buster G3OPL has made contact with the Vatican and has even discussed the weather with King Hussein of Jordan!"



Amateur Bands

Until recently, amateur radio was the only hobby involving world-wide communications. It is still the only one to be controlled by International Law, since the ITU allocate us our frequencies and define the criteria we must meet in order to hold an amateur licence. In their various ways, the national authorities - for us, the RA - test that UK amateurs meet the ITU's requirements.

At the next World Radio Conference, WRC 2001, those criteria are on the agenda. Nominally the Morse issue, over which at the moment the various national societies around the world are divided with a majority having their heads in the sand. The administrations are pressing for the abolition of a condition that is increasingly difficult to either justify or administer. Commercial interests also want our bands to let out for millions of pounds of profits.

If we go into WRC 2001 without a world-wide common position being agreed, then the commercial interests will press even harder for our bands to be re-allocated to them. In the limit, that pressure could well go to a call for amateur radio to be abolished, at least above 30MHz.

Remember, the B licensee has access to over 50000MHz worth of bands, while the h.f. bands tot up to a mere 2.99MHz in UK and a tad more in the USA, much of which is shared anyway. Already in one South American country, 430MHz has been lost to commercial pressure. Either amateur radio adapts - or it will die!

What can you and I do about this? In simple terms, **join your national society** (in UK, RSGB), so your subscription in part helps the costs of representing our interests both with the UK authorities and, via IARU, in the world scene. Back in 1947 at Atlantic City, amateur radio went to the conference in disarray and lost a lot - with the increase in pressure to steal our bands, the damage done to amateur radio will be much worse unless the world's national amateur societies stand shoulder-to-shoulder.

The RSGB isn't perfect, but it is our only hope. It has been fashionable for years, to see it as an anti-B licence and anti-s.w.l. Anyone who reads a copy of the RSGB's *Radcom* and notes down the amount of space given over to v.h.f. matters as against h.f. must admit the reverse is true.

On the other side, if B licensees and the listeners don't stand for the RSGB Council, they can't be elected! With nine seats on the RSGB Council to be contested this time we might see a major shake-up.

Harder?

Why, we are often asked, is it harder (or easier) for a listener to get to the top than a licensed amateur? Let's start by saying quite unequivocally that it's easier to hear 'em than to raise 'em.

In the first place, the DX station normally sits on a constant transmit frequency, but moves his receive frequency after a contact. Thus, he does two things: firstly this makes the savvy ops call off his transmit frequency so the chance of them getting their report is better, and secondly, by moving the receive frequency around he makes sure only the savvy ops call on the right frequency. Hence both ends have a better chance of completing the QSO.

Now, as far as the listener is concerned, many years of perusing listener logs sent in to this column, and of listening to pile-ups, has convinced me that given only that the listener is on the DX station frequency, even if the DX is weak in strength, the listener will eventually hear a 'moment of silence' in which the call sign will come through clearly.

As we've just seen, the transmitter has another hurdle to jump over, which is to be on the frequency on which the DX is listening, plus a third one which is to have a strong enough signal to overcome the QRM at the DX end. We might add that a proportion of loggings of DX are in fact of stations calling him! Yes, I've done that myself!

Letters

We can lead off this time with our anonymous correspondent, who has persuaded the OM to agree to antenna improvements, and now she asks what heights are favourable. Difficult, this!

Over ideal ground we would be looking for a horizontal antenna to be a half wave or multiples thereof. Where the boot pinches is that we aren't over perfect ground, and ground conductivity may vary markedly even within a normal small garden. Hence our radio ground level normally lurks somewhat beneath the soil we stand on.

In practice then, the best rule-of-thumb is the higher the better. With a vertical antenna, we have a different problem, namely that of obtaining a good enough earth for the thing to have a good image down below. Theoretically a quarter-wave vertical can have its feedpoint at ground level, but in practice even a vertical can do with a bit of elevation, but more to get it away from manmade noise sources and absorbers such as houses or trees.

28MHz was used by **Colin Dean** in Barnsley to hear 5X1T on sideband. At 21MHz he notes A41LS, A47RS, ET3AA, FH8CB, HL1IEG, OD5PN, PJ8DM, P43P, SU1SK, UL7BD, UN6P, YC6DEM, ZD7CTO, 3V8BB, 4L0CR, 5A1A, 5N1JNT, 7Q7DX, 9K2ZZ, 9M8RC and 9Q5TR. On 18MHz OD5NJ was recorded on c.w., plus sideband from AP2AGJ, AP2JZB, A41LZ, A92GE, BD4ED, BV5BG, CT3/DK4KL, HL3VQ, HZ1AB, 4S7BRG and 7K2BMJ.

Finally to Colin's pet 7MHz band for loggings on sideband of AP2KSD, A61AS, BV5BG, DS5RNM, EP3HR, HB0/DL1RWB, HS2CRU, JT1CO, OD5NH, RW9DE, SU3AM, SU3YM, SV2ASP/A(Mt Athos), TA1ZL, TZ6TT, T77WI, VK4MZ, YB2s YB0s, ZL4BD, ZS6P, 4L1AG, 4L0CR, 4S7BRG, 5N9CEN, 5Z4RL, 7J4AAL, 7K1WLE, 8Q7DF and 9K2AI.

To Oxford next, and **Paul Goodhall**. Paul has kept up his listening in the face of difficulties of the sort known as 'overtime' - but as he says the extra pennies will come in handy for summer holidays or new kit in the shack! On 7MHz Paul found Europeans in the early morning before work and AQ7DF in the early evening with TU5RP around bedtime.

While on May 25 he snagged ZL4OI at about 0600. Turning to 14MHz and discounting the run-of-the-mill Europeans, SO2DBO was heard in contact with KF4DQM/P/G, K1UQV, JT1BG, 8D7DF, EA8BIB, Z21KM, KB2PD, 9H4CM, 9K2ZZ, JA7AGO and JA7DYJ working 3B8BB, VK5ASA, KH6W7GMH, J47LAF, VA3LEN, W1DIG with a pile of EUs plus CN8NK, VE9ST/M, WF1N, W4RAZ, WZ1Y, VK7GKS, CT98IR, WH6CZD, KL7HSB and KL7AC in contact, VK6VS, VK6ARD, VK6NC, VO1XC, W9DC, 4X4JU, PT7BZ, KP2AD, TF8GX, K2OY, VE5OAD, VK7HQ, VK3AUS, W1CYB, 4X1AD, 8P6EX, JH1FNT, then a string of JAs working SV5/2YYO, N2WVB, N0JT, W8SM, K4WLB, K3LYB, KB3BYZ, KE1AC, K2STV, KK4EZ, N3WET.

Up to 18MHz for SM0OWX, W7DW, AA2ZL, W3KUD, 5B4FF, KP4IX, K2BS, W4OIZ, WB4FNH, W8KZM, W4UWC working VE1LT, K6LGC working W6EMY. Down on 80, Paul mentions the GB2RS broadcast on 3.650 - the first time anyone has ever mentioned GB2RS since I first began to write this piece. As a GB2RS newsreader myself, it's nice to know someone listens! Up again to 21MHz and US7IBJ, YCOFTD, KU4QN, JA7IC running a string, UN7BD and TA2IJ both CQing, VE3ODC, K3BSA, YV3EYE, W1AAE, YF7XND, JL2EZB, UR9IDX/PA and finally KF8AD.

We go now to the Isle of Sheppey, and **Ted Trowell**, who again stuck to the c.w. for as he expresses it: 'the odd spot of DX in between the odd spots of gardening!' On 14MHz Ted noted 7Z500, TK/DL5VBE, JW/DJ3KR and HS1R; at 18MHz N0FW in Minnesota, JA0ELA, 3B7RF, 9M2TO, CT3FT, CX2AAI, JF3PNO, and CT3/DK4KL.

On 21MHz Ted noted PY1DUB, 5B4WN, CO8LY, 4Z5FW, KP4P, VU2LO, EA8BUG, EA8/DK1OT, W5VUY, 9V1ZB, PP6CW, VU2AVG, 9V1BG, TU2XZ, 7Z500, PY7YN, LU9FAZ and PY4VB. 24MHz yielded KP2J, while mid-afternoon sniff on 28MHz turned up 3B7RF and 5B4/DL1CW. By and large, though, Ted, with all his experience on the bands since before WW2, reckons conditions were pretty poor.

Here & There

From Fiji, look out for 3D2WD and 3D2DA during their September activities - cards via DL6DK. For Nepal, K4VUD will be there again from July to November, QSLs to the home call.

Senator Barry Goldwater K7UGA, became a Silent Key on May 29, at the age of 89. He had been an active amateur since around 1921 and used his position to further the hobby in many ways.

We hear that South Africa has rejoined the UPU, so IRCs are now OK both to and from ZS.

Bouvet: WA4JQS indicates that the operation timed for December 1998/January 1999 has **not** been cancelled despite rumours to the contrary. The XQ0X San Ambrosio operation by CE0ZAM though has slipped to September due to transport problems.

Top Band operation is now open to the Fs, 1.810-1.850MHz, with the bottom 20kHz on a secondary basis.

QRT

That's it once again. You can send letters to me either at **Box 4 Newtown SY16 1ZZ** or to the E-mail address **gw3kfe@pwpublishing.ltd.uk** to reach me, as always, by the first of the month. For those old enough to remember, TTFN!

ROBERTS

R861



- RDS Multi-band digital preset stereo world radio
- PLL digital tuner with FM/MW/LW/SW wave band coverage
- 307 memories - (261 on SW, 18 MW, 18 FM, 9 on LW plus priority station)
- RDS (Radio Data System) station name
- SSB (USB/LSB) 40Hz/step fine tuning AM RF gain control
- Five tuning methods - direct frequency tuning, auto scan, manual tuning, memory recall, rotary tuning
- ATS (Auto Tuning System) - auto scan and pre-set stations in signal strength priority (FM/MW/LW)
- Continuous AM coverage 153kHz - 29.999MHz. **£200.00**

- PLL multi-band digital preset stereo world radio

- 5 tuning methods: direct frequency keying, auto-scan, manual scan, memory recall and rotary
- 45 preset stations
- Dual time clock/alarm
- Receive single side-band and CW transmissions
- Continuous AM coverage 150kHz - 29.999MHz

R827

£160.00

- PLL multi-band digital preset stereo world radio cassette recorder
- 5 tuning methods: direct frequency keying, auto-scan, manual scan, memory recall and rotary

- TIME RECORDING START
- 45 preset stations
- Dual time clock/alarm
- Receive single side-band and CW transmissions
- Continuous AM coverage 150kHz - 29.999MHz

RC828

£220.00

- LCD display for all important functions
- ATS (Automatic Tuning System) scans the waveband in use and puts the strongest signals into memory automatically (not on SW)



R876

- 5 tuning methods and 54 preset stations
- Dual time clock/alarm with precise setting
- Stereo FM via earphones (included)

- Countdown timer, stand-by function and adjustable sleep timer
- Key lock to stop accidental use
- Complete with auto dual voltage AC adaptor, portable short wave aerial, stereo earphones and soft carrying pouch

£130.00



R809

- PLL multi-band digital preset stereo world radio
- 5 tuning methods and 54 preset stations
- Dual time display
- Clock/alarm
- Complete with soft carrying pouch
- Continuous AM coverage 150kHz - 29.999MHz

£100.00

Contact Roberts Radio Ltd. for further details or local stockists

Tel: 01709 571722 Fax: 01709 571255

Introducing the

HF3S

SHORT WAVE RECEIVER

SLOW SCAN TELEVISION



JVFAX 7.1

Freeware is included in the package



WEATHERFAX

RTTY example

CQ CQ CQ CQ CQ DE TF1DL7UFR/P TF1DL7UFR/P
 CQ CQ CQ CQ CQ DE TF1DL7UFR/P TF1DL7UFR/P
 DL2BOE DL2BOE UR 598 QSL? DE TF1DL7UFR/P K
 GOOD MORNING HOW IS THE WEATHER WITH YOU?
 HERE IT IS CLOUDY BUT NOT TOO COLD DE TF1DL7UFR/P
 HAVE YOU HAD MANY QSO'S YET ? I HAVE 8 TODAY ALREADY
 I WILL SEND YOU QSL CARD HAVE ONE FROM YOU YET ?
 DE TF1DL7UFR/P
 MANY THANKS FOR QSO AND 73'S DE TF1DL7UFR/P

CW example

CQ CQ CQ de on5ig on5ig on5ig
 qrz? qrz? de on5ig on5ig on5ig k
 IZ2nu IZ2nu IZ2nu IZ2nu de on5ig
 rst 559 559 559 qth qth brugge brugge brugge
 name is rob rob rob rob
 wx vy cloudy temp abt 15c
 yes w! qsl also es trx fer ur card
 ok luk trx fer qso es w! qsl qsl ok ok
 73 73 luk de on5ig

HamComm 3.1

shareware is included in the package

SYNOPTIC RTTY example

CQ CQ CQ DE DDK2 DDK7 DDK9
 FREQUENCIES 4503 KHZ 7646 KHZ 101000 KHZ WEATHER
 AND SEA BULLETIN FOR THE EUROPEAN COASTS PART 1
 ISSUED BY MARINE WEATHER SERVICE HAMBURG
 03 04 1998 12 UTC: GENERAL SYNOPTIC SITUATION:
 LOW 1007 NORT CAPE MOVING EAST, DEEPENING
 HIGH 1023 CENTRAL SWEDEN REMOVING EAST. RIDGE 1020
 EAST OF ICELAND WEAKENING GALE CENTRE 962
 SOUTHWEST OF IRELAND MOVING NORTHEAST
 SLOWLY AND FILLING
 FINISTERRE (43.5N 908W) SST: 16C
 FR 18Z SHW 8-9 / 11 10 M SW /
 SA 00Z SHW 8 / 10-11 8 M SW /
 SA 06Z SHW 8 / 9-10 7 M RAIN /
 SA 12Z SHW 7 / 9-10 7 M RAIN /
 SA 18Z W 7-8 / 9 7 M TS /



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How low can you go?

Kelvin Law G4WMZ describes the activity on the recently allocated 136kHz amateur band. He tells of a great deal of activity on this band and the much fun to be had by participating. There are currently many more people equipped for listening than there are for transmitting and listener reports are welcomed by many stations.

A number of UK amateurs have been granted notices of variation to their normal amateur licences to permit experimentation on 73kHz since mid 1996. As of 30 June 1998 no more notices are being issued and the existing notices will expire on 30 June 2000 with the result that there is an increasing focus on 136kHz.

The newest amateur band was opened up to all UK Class A licensees on 30 January 1998 and runs from 135.7 to 137.8kHz. There is great potential for interesting experimentation.

Current Activity

With over 30 British amateurs with transmit capability, several of whom are consistently on the band, there is an almost certain chance of hearing something.

A wide variety of antennas are in use by transmitting amateurs. At least one station, G3PLX, is experimenting with Kite antennas, the other extreme being communication using earth rods instead of a conventional antenna. Many people are using existing antennas for other amateur bands for their initial experiments. Graham G3XTZ,

has even experimented with mobile operation, and has had a two-way contact over a distance of about 1km!

The main mode of operation is c.w. as the band is really too narrow for any of the conventional voice modes. Very slow c.w. is being used by some stations, with the Morse being read with an audio spectrum analyser, implemented in software.

There are a number of active stations in other European countries. EI0CF is often heard on the band, putting in a good signal from Malin Head on the North coast of Eire. On 26 March 1998 at 2140UTC EI0CF had a two way contact with OH1TN in Finland which probably represents the current European distance record at 1888km.

From Luxembourg LX1PD is a better signal than some UK stations. He is running 20 watts into a base-loaded inverted-L, 20m going straight up and a 40m horizontal wire.

There are some Finnish stations active and some have been worked from the UK. At least one German station is licensed on I.f. (Peter DJ8WL, who uses the callsign DA0LF on the 136kHz band). Peter makes test transmissions on some weekends, usually advertising his plans on the RSGB I.f. newsgroup.

A number of Swiss stations are also active but at the time of writing these have not been heard in the UK. France does not yet have an I.f. allocation but a



"...there is an increasing focus on 136kHz."

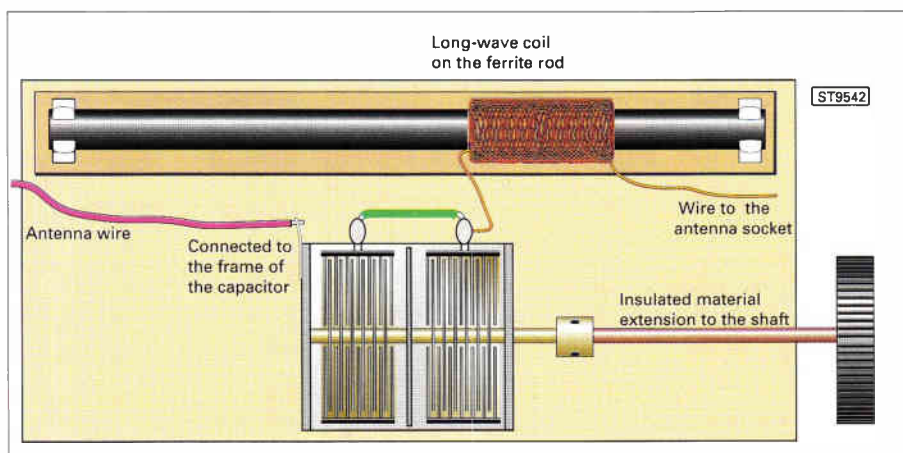


Fig. 1: A suggested layout

number of French stations have receive set-ups and work the UK crossband to 80m. Belgium received a 136kHz allocation on 12 February this year and there is already at least one station with the necessary permit active - ON7YD - admittedly with low power.

The latest country to receive an I.f. allocation is Italy, as from 15 April 1998.

As an example of what might be heard, at the time of writing (1910UTC on 14 April) G3LDO, Littlehampton; GX3WSC, Crawley; LX1PD, Luxembourg and G2AJV, Canterbury are all audible in north Cambridgeshire.

Receive Ready

Many existing receivers do work down to 100kHz or so but are often rather insensitive at I.f. It is well worth experimenting with whatever is available, often older receivers seem to perform better than more modern ones at I.f. A second option is to buy or build a converter, converting the I.f. signals to a higher frequency. I use an Icom R70 receiver, initially with a 15m length of wire. Even this simple set-up was adequate to receive signals from G3LDO on the south coast, however it is well worth constructing the antenna tuning unit described later before spending too much time listening for weak amateur signals.

There is much scope for experimentation with antennas. Almost any existing antenna can be used for receiving I.f. signals but at these frequencies any practical antenna will only be a fraction of a wavelength long. Typical antennas in use by active I.f. experimenters include end-fed wires, loop antennas, vertical whips, 80m dipoles with the feeders strapped together and so on. I currently use an end-fed wire brought to resonance with a very simple tuning unit, described later.

There is a signal, of German origin on 138.2kHz which is a useful signal source when trying out various antenna and receiver combinations. Try listening for this station when setting up your station. You should hear a steady carrier with bursts of modulation every 20 seconds or so. This station registers around S6 to S9 on the author's receiver, depending on the antenna in use.

In some locations, local noise can be a problem on the band. Sources of noise include every electrical appliance in your home, (and neighbouring houses). At my location the greatest noise sources are our low-energy light-bulbs. Some models of these appear to contain oscillators which blank out the entire band,

whereas others have no noticeable effect. If you do suffer from noise, check for local sources and if all else fails, try listening at different times of day. In general, at my location in East Anglia, the mornings are much quieter than the evenings. Many people are experimenting with loop antennas as these are often very good at rejecting local noise sources.

Make it Resonate!

At I.f., bringing the antenna to resonance makes a dramatic improvement in its performance, as much as 3 or 4 'S-points'. Fortunately, for receive, a very simple antenna tuning unit (a.t.u.) can be

assembled. All of the parts required could be salvaged from an old portable radio, provided it has long-wave coverage. The components required are the ferrite rod antenna (with its coils) and the tuning capacitor. If you wish to purchase new components, ferrite rod antennas and tuning capacitors are available from Maplin.

Having obtained your components, examine the ferrite rod antenna and identify the long wave coil. This will be the largest winding on the rod. Identify the start and finish of the winding. Ignore any other windings such as the medium wave coil and any coupling windings but try not to damage them as they may be required later.

Take the tuning capacitor and identify its connections. It will almost certainly have at least two separate sections. Wire both sections in parallel and then connect the capacitor in series with the long-wave coil. That's all there is to it! The series connected coil and capacitor are then placed in series with the antenna and the combination connects to the antenna input of your receiver, see Fig. 1. Listen for the German station referred to earlier and carefully vary the position of the variable capacitor until the signal peaks. If you find that the variable capacitor vanes are fully meshed then more inductance and/or capacitance is required. Try connecting the medium wave coil in series with the long-wave coil to see if there is any improvement. (You may need to reverse the connections to one of the windings) If you have a 500pF compression trimmer, try connecting this in parallel with the variable capacitor. Continue to experiment until you have what you feel is the best combination of inductance and capacitance. If the coils are moveable it is worth sliding them up and down the ferrite rod to find the best position, remembering to re-tune the capacitor each time. Once the optimum position is found the coils should be fixed in place with a drop of candle wax or similar.

If you do not have an earth connection to your receiver it's worth trying one. If you already have an earth, extra earth rods and wires may bring about an improvement.

Get Listening

Once you have peaked the antenna you are now ready to listen for your first amateur signals. Unless you live quite close to a transmitting amateur the signals you are looking for are likely to be much weaker than the commercial signal you used to tune the antenna.

Continued on page 49...

"Often older receivers seem to perform better than more modern ones at I.f."



WIN

an MVT-7100 wide-band scanner and an RF Systems AA-150 h.f. active antenna

Kindly donated by Lowe Electronics, together these prizes are worth £400

You will be entered automatically into the SWM prize draw by simply filling in this reader survey form. You can help us by letting us know your views on your favourite radio read. Please let us know how we can make SWM even more interesting to you.

Kevin Nice
Editor, Short Wave Magazine

This survey has been compiled and produced with the help of ICD Marketing Services Limited, a company specialising in this field. It is designed to provide us with a complete picture of the people who read our magazine and to help us focus our efforts on meeting the needs of all our readers as possible.

It is important that we involve as many of our readers as possible, so please spare us a few minutes of your time to complete this survey.

The questions are straightforward and you are under no obligation to answer them; some questions are about you and, if appropriate, your partner. Any information you provide will be treated with great care. It will be processed and held by ICD and will always be safeguarded under the terms and conditions of the Data Protection Act.

Your answers will be used, both by ICD and ourselves, for analytical and marketing purposes and may be passed on to other organisations. They may wish to send you details of products and services that are likely to be of interest to you, based on your answers. If you would prefer not to receive these offers, please tick the space at the end of this survey.



short wave magazine

BRITAIN'S BEST RADIO MAGAZINE

Section 1. Name & address. In order to enter the prize draw, you are required only to complete sections 1 & 2.

1. Please give your name in the way you should be addressed.

Mr Mrs Miss Ms Other

Surname _____

Forename _____

Address _____

Town _____

County _____

Postcode _____

Telephone _____ 0 1 _____

2. Marital Status

Single Married Divorced

Widowed Living with partner

Partner's surname _____

Partner's forename _____

3. Your date of birth

4. Partner's date of birth

5. Are you: Male Female

Section 2. About You & Short Wave Magazine

1. How many issues of SWM do you usually buy in a year?

1 2-4 5-7 8+ Every issue

2. When did you first buy SWM?

Within the last 12 months 2 years ago 3 years ago More than 3 years ago

3. How do you obtain your copy of SWM?

By subscription Home delivery Casual purchase Newsagent From an amateur radio dealer On firm order From a friend

4. How many other people usually read your copy of SWM?

None Three Six One Four Seven + Two Five

5. How many copies of the following magazines do you usually read or buy per year?

| | None | 1-3 | 3-6 | 6-9 | 9-12 |
|------------------------------|------|-----|-----|-----|------|
| Electronics & Wireless World | 01 | 10 | 19 | 28 | 37 |
| Ham Radio Today | 02 | 11 | 20 | 29 | 38 |
| Monitoring Times | 03 | 12 | 21 | 30 | 39 |
| Practical Wireless | 04 | 13 | 22 | 31 | 40 |
| PopCom | 05 | 14 | 23 | 32 | 41 |
| Radio Active | 06 | 15 | 24 | 33 | 42 |
| Radio Communications | 07 | 16 | 25 | 34 | 43 |
| Satellite Times | 08 | 17 | 26 | 35 | 44 |
| Others | 09 | 18 | 27 | 36 | 45 |

6. Do you own a home computer?

Yes No

7. If yes, which type(e.g. IBM PC compatible, Macintosh, etc..)?

386 486 Pentium Pentium II Mac Other

8. Do you have an e-mail address?

Yes No

If yes, then what is it?

9. Do you hold an Amateur Radio transmitting license?

Yes (Class A) Yes (Class B) Yes (Novice A) Yes (Novice B) No

10. How much do you spend on the radio hobby in an average year? (Including QSL expenses, books, equipment, rally visits, etc).

Under £50 £50-£100 £101-£250 £251-£500 £501-£1,000 Over £1,000

11. Have you ever bought anything from an advertisement in SWM?

Yes, accessories Yes, antennas Yes, books Yes, components Yes, major equipment No

12. How many Rallies/Amateur Radio shows do you visit each year?

None 1-2 3-4 5+

13. How do you rate your expertise in radio and electronics?

Beginner Average Experienced

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

AMSAT ISA WACRAL BARTG ISWL Radio station DX club BATC RAYNET Local club G-QRP RSGB None EDXC RIG Other

15. Are your other hobbies and interests technical or non-technical?

Technical Non-Technical

16. Do you read magazines about these hobbies?

Yes No

17. How interested are you in the following regular features in SWM? (1 = not interested, 10 = very interested)

| | | | |
|----------------------|----|----------------------------|----|
| Advertisements | 01 | Modifications to equipment | 18 |
| Bandscan - America | 02 | News (general) | 19 |
| Bandscan - Australia | 03 | Numbers stations | 20 |
| Bandscan - Europe | 04 | Off the Record | 21 |
| Beginner's series | 05 | Propagation | 22 |
| Book store | 06 | Rallies | 23 |

| | | | |
|--------------------------------|----|-----------------------|----|
| Club news | 07 | Readers' letters | 24 |
| Competitions | 08 | Reviews - HF Receiver | 25 |
| Computing related features | 09 | Reviews - Scanners | 26 |
| Constructional-minor equipment | 10 | Reviews - Software | 27 |
| Constructional-major equipment | 11 | Reviews - Accessories | 28 |
| Decode | 12 | Satellite TV news | 29 |
| DXTV | 13 | Scanning | 30 |
| Editorials | 14 | ShackWare | 31 |
| Historical features | 15 | Special offers | 32 |
| LM&S | 16 | SSB utilities | 33 |
| Maritime Beacons | 17 | Valved equipment | 34 |

18. On a scale of 1-10, how do you rate the technical content of SWM? (1= not technical enough, 10= too technical)

19. How do you rate the overall design and layout of SWM?

Poor Fair Good Excellent

20. What do you think of the design?

Poor Fair Good Excellent

21. Do you buy SWM because of the cover material?

Yes No

22. What subjects covered in SWM interest you the most?

Adverts News items Antennas Reviews Broadcast Scanning Constructional Utility Feature articles

23. What radio related subjects not covered by SWM would you like to see covered in SWM?

Advanced articles Historical Beginners articles Less technical matter Current radio developments Listeners logs Frequency details More technical matter General interest

Other (please state) _____

24. How closely do you read the advertisements in SWM?

Nearly all Some Occasional None

25. Where do you make your radio related purchases?

| | AOR | Low | Neveda | PWP | Tandy |
|-------------|-----|-----|--------|-----|-------|
| Accessories | 01 | 05 | 09 | 13 | 17 |
| Books | 02 | 06 | 10 | 14 | 18 |
| Radios | 03 | 07 | 11 | 15 | 19 |
| Software | 04 | 08 | 12 | 16 | 20 |

Other (please state) _____

26. Which of these do you listen to regularly?

Airband FAX Amateurs PMR Beacons SSTV Broadcast stations Telephones CW Utilities Data Weather satellites Emergency services Other

27. Do you think £2.75 is a fair amount to pay for SWM?

Yes No

28. How much more would you pay for:

| | Nothing | 20p | 50p | £1 |
|---------------------------------|---------|-----|-----|----|
| Cover gifts | 01 | 04 | 07 | 10 |
| More features on your interests | 02 | 05 | 08 | 11 |
| More pages | 03 | 06 | 09 | 12 |

29. Can you say briefly, how you would like us to improve SWM?

More competitions More special offers More pages Other

continue ►

Section 3. About You

LEISURE / MOTORING

1. Please write below the three magazines which you buy most regularly in order of preference and indicate whether bought at a newsagent, or on subscription (and whether you would consider taking out a subscription).

Table with columns for N/agent, Have Subs., and Cons Subs. for magazine subscriptions.

2. From the interest areas detailed below please indicate whether you currently subscribe or would consider subscribing to an appropriate quality publication magazine (Please tick all that apply):

Large table listing various interest areas like Angling, Antiques, Bicycles, etc., with columns for Have Subs. and Cons Subs.

3. Which of the following newspapers do you read?

Table listing newspapers like Daily Mail, Daily Star, etc., with columns for You and Ptnr.

4. Which of the following do you enjoy on a regular basis?

Table listing activities like Antiques/Fine Art, Betting, Bingo, etc., with columns for You and Ptnr.

5. Do you enjoy reading romantic fiction? (e.g. Mills & Boon)

Simple table with columns for You and Partner.

6. How many cars are there in your household?

Simple table with columns for One, Two, Three +.

7. For your private car(s), in which month did your car insurance cover begin? (Please write in month e.g. S|E|P|T)

Form for entering car insurance start months for You and Ptnr.

8. What type of home do you live in?

Table listing home types like Detached House, Flat/Maisonette, etc.

9. Is your home:

Table listing home status like Owned, Privately Rented, etc.

10. Are you planning to move home in the next 12 months?

Table with columns for Yes, No, Possibly.

11. If yes, will you be arranging a mortgage?

Table with columns for Yes, No, and Please tick if first time buyer.

12. Are you considering any of the following home improvements?

Table listing home improvements like Double glazing, Fitted kitchen, etc.

13. If you have household insurance, in which month do you renew your cover? (Please write in month e.g. S|E|P|T)

Form for entering household insurance renewal months for Home Contents and Buildings Insurance.

14. Do you make international telephone calls from home?

Table with columns for Frequently, Occasionally, Never.

15. Do you have or are you considering a mobile phone on any of the following networks?

Table listing mobile networks like Cellnet, Mercury One-2-One, Orange, Vodafone.

16. Do you have, or are you considering any of the following computer purchases?

Table listing computer purchases like PC with Windows, Internet/E-mail, Modem, CD-ROM.

MONEY & INVESTMENTS

17. Are you considering changing your Bank or Building Society current account?

Table with columns for Yes, Possibly, No.

18. Do you currently, or would you consider telephone / direct banking?

Table with columns for Already do, Would consider.

19. Do you / your partner have any of the following credit cards? (Please tick all that apply)

Table listing credit cards like Credit Card, Charge Card, Store Card, Gold Card.

20. Do you pay your monthly credit card balance in full?

Table with columns for Always, Usually, You, Ptnr.

21. Do you have or are you considering any of the following investments or financial provisions? (Please tick all that apply)

Table listing investments like Deposit Account, Life Insurance, Stocks/Shares, Pension Plan, Will.

22. Would you consider professional help in arranging your personal finances?

Table with columns for Yes, No, Unsure.

23. Do you foresee the need for a personal loan?

Table with columns for Yes, Possibly, No.

24. If you have a mortgage or loan, would you be interested in ways of reducing your monthly repayments?

Table with columns for Yes, Possibly.

SHOPPING

25. Have you in the past or would you consider buying goods by mail / over the telephone?

Table listing goods bought like Fashion, Books, Garden Products, Music, Vitamins/Health Supplements, Other.

26. Do you buy American whiskey?

Table with columns for You and Partner.

27. If you smoke please write in the name of the cigarette brand you and / or your partner smoke most often.

Form for entering cigarette brand names for You and Partner.

Important: Please sign below that you are a smoker aged 18 or over.

Your signature

Partner's signature

GENERAL INFORMATION

28. What is your occupation?

Table listing occupations like Director, Manager, Self-Employed, etc.

29. What is your approximate family income each year?

Table listing income brackets like Under £5,000, £5,000-£9,999, etc.

30. Do you regularly fly on business?

Table with columns for 1-3 times a year, Do not fly on business, 4+ times a year.

31. Please write in your children's date(s) of birth, starting with the oldest, and indicate whether male or female.

Table for entering children's birth dates and genders (Child 1 to 4).

32. Is anyone in your household affected by any of the following?

Table listing medical conditions like Asthma, Diabetes, Hayfever, etc.

33. If you have private medical insurance, when do you renew your cover?

Form for entering private medical insurance renewal month.

short wave magazine

BRITAIN'S BEST RADIO MAGAZINE

Thank you for completing this questionnaire. All information will be treated under the terms of the Data Protection Act. As already mentioned Short Wave Magazine & ICD may make your information available to other respected organisations who may wish to send you offers of products and services. Please tick here if you would prefer not to participate in this offer (). If you have any comments or queries about the products and services of Short Wave Magazine or the services of ICD Marketing Services Limited, please write to Short Wave Magazine, Arrow Smith Court, Station Approach, Broadstone, Dorset BH18 8PW or ICD Marketing Services Limited, Garden Floor, Bain House, 16 Connaught Place, London W2 2EP. V264

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HERE

(Please do not send correspondence to this address)

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Readership Survey
P O Box 903
Bristol
BS99 5ND**

short wave magazine

BRITAIN'S BEST RADIO MAGAZINE

Please Affix Tape Here

Fold Here First

Fold Here First

Fold Here Second

Fold Here Second

| Callsign | Location | Comments |
|----------|----------------|------------------------------|
| E10CF | Malin Head | Regular beacons |
| G2AJV | Canterbury | |
| G3GRO | Crawley | |
| G3KAU | Crawley | |
| G3KEV | Scarborough | |
| G3LDO | Littlehampton | Always a strong signal |
| G3PLX | Kendal | |
| G3UNT | Maidstone | Interesting Kite experiments |
| G3XTZ | Ashford, Middx | |
| G3YXM | Birmingham | |
| G4GVC | Leicester | |
| LX1PD | | Often heard at weekends |

box' equipment with only one commercial l.f. converter on the market so most equipment is home-made or adapted.

One of the most useful sources of up-to-date information is the RSGB LF Mailing List. This mailing list currently has about 90 members who regularly exchange information about their activities and equipment. If you have E-mail, sending the message 'subscribe rsgb_lf_group' to majordomo@blacksheep.org will give you access to this valuable source.

Another good source of information is the l.f. net on 80m.

Many of the more active l.f. stations meet at 0900 (local) on Saturday mornings at 3.720MHz. (The Royal Engineers net hands over the frequency to the l.f. net at this time so if you listen earlier don't be surprised if you hear a net which does not seem to feature any mention of l.f.) Listening to the net one can soon pick up on who is currently active and where. It is rather fun to watch 136kHz come alive as the 80m net winds up at around 1000.

If you are thinking of building equipment, or simply want a better understanding of l.f. techniques, the *LF Experimenter's Handbook*, published by the RSGB and stocked by the SWM Book Store, is about the only published work on the subject. This is bang up-to-date, having only recently been revised and updated.

Try These

Following are some useful Internet sites to try. A spectrum analyser programme incorporating a c.w. decoder can be found at

<http://members.aol.com/btf1>

This appears to be the full version but it is limited to running for a maximum of 15 minutes unless you register it for a fee of DM89

Mike Dennison G3XDV, has interesting material on his site, including spectrum analyser plots of many of the signals which can be heard on the band.

<http://www.dennison.demon.co.uk>

If you are licensed and want to build an l.f. transmitter then take a look at

<http://www.picks.force9.co.uk/shack.htm>

If you wish to see which stations are currently active on l.f., then <http://www.elec-eng.leeds.ac.uk/staff/eenc/Lfskeds.html> holds the answer.

Listen Out For

The list of stations is not intended to be an exhaustive list and there are new people coming on to the band every week. The stations listed here are those that I have frequently heard from East Anglia. There are many others active, some of whom will be better signals at your location than those listed here.

SWM



"One of the most useful sources of up-to-date information is the RSGB LF Mailing List."

In order to join in the fun you will need to be able to decode c.w. If you can already read c.w., no problem. If however you cannot, all is not lost. As many of the operators are using slow c.w. it is possible to literally write down the 'dits and dahs' and then decode them by referring to a printed listing of the Morse code. Another method is to use a spectrum analyser program to capture the c.w. -

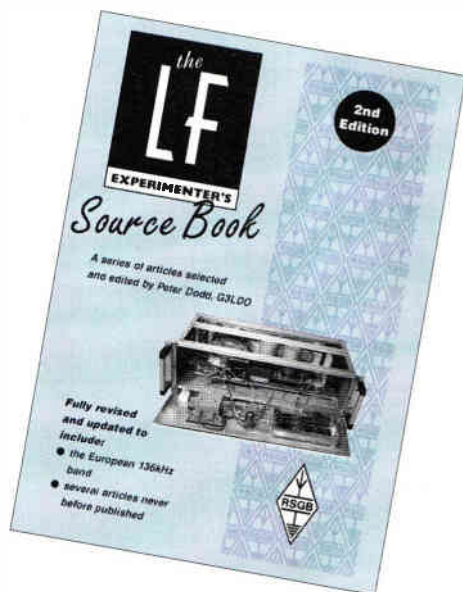


Fig. 2: The LF Experimenter's Source Book edited by Peter Dodd, G3LDO 2nd edition published March 1998. Now that there is a pan-European l.f. band at 136kHz, which is being introduced on a country by country basis, the opportunity has been taken to produce a book which will make it easy for the l.f. beginner to get on the air, and at the same time to provide real food for thought for the dedicated experimenter.

See the list of Internet sites at the end of this article for a starting point. (or you can use your favourite decoder! - Ed.)

Do remember to carefully log the stations you hear as listener reports will be welcomed by most transmitting stations. If you can give a comparison with other signals heard on the band your report will be even more valuable.

Info Sources

There are several sources of information on l.f. equipment and techniques. There is a lack of 'black

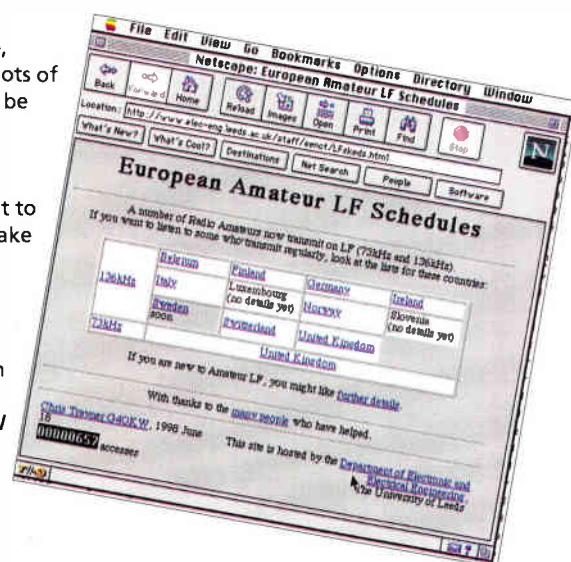


Fig. 3: The website at <http://www.elec-eng.leeds.ac.uk/staff/eenc/Lfskeds.html> beware of the case sensitivity in the address!

Monkey Business

NRD-545 Revisited

New ROMs in hand, JW picks up the thread with the JRC NRD-545 and its a.m. performance.

Continuing from last month with the NRD-545 and the a.m. distortion which caused me to blink a bit in my review. As you read in the last issue, JRC were very quick off the mark and the new ROMs (two of them) arrived in my hands together with clear instructions on how to change them. This was a joy because it made me take the outer cases from the NRD-545 and look in envy at the glowing quality of construction within.

I think I have said before that I would like to have a clear plastic cover for JRC receivers just so that I could sit and admire the internal finish. However, down to earth and easily remove the existing ROM chips, one from behind the front panel and one on a plug-in card in the main body of the receiver. Switch on and hope that I had taken the necessary static protection precautions and there we are, back

in business. First measurement using a generator and my ears showed that the previous blank hole at $\pm 400\text{Hz}$ has gone and the awful distortion seems to have largely vanished, so clearly the new demodulation algorithm has worked. Now to the "monkey chatter". In order to generate a reference signal rather than listen to broadcasts on a crowded band I used an f.m. receiver tuned to Radio 4 as the modulation source and externally modulated my signal generator at 60% a.m. to act as the transmitter. With the generator set to 1MHz at a level to give an S9 reading on the

receiver I tuned the NRD-545 around the signal very carefully and found that the "monkey chatter" effect was still there at up to $\pm 8\text{kHz}$ from the centre frequency. However, it was at a relatively low level so the situation had improved considerably on the original tests.

Odd Effect

I then returned to a conventional single 1kHz tone modulation and found an odd effect in that the d.s.p. filtering worked extremely precisely, for example with the 6kHz bandwidth selected, the demodulated audio dropped off sharply at $\pm 3\text{kHz}$ from the centre frequency. Similarly, selecting the 4.5kHz filter gave the drop off at $\pm 2.25\text{kHz}$ from centre. However, the 'S meter' reading only went down from S9 to S7 where it remained for a further $\pm 1\text{kHz}$ until falling to S1 or less. Remaining in the background I could still hear the 1kHz audio until at $\pm 5\text{kHz}$ it too disappeared, almost as if there was a 10kHz filter somewhere in the i.f. chain which was finally chopping off the signal - perhaps the 455kHz single filter at the front of the i.f. chain?

I then went back to the broadcast bands and took another listen on and around 909kHz where I had originally found the apparent problems. Sure enough the "monkey chatter" was still there, but being cautious in these matters I then did a spectrum analysis using a Rohde & Schwarz test receiver and discovered to my consternation that the BBC were radiating discernible sideband energy at up to 8 or 9kHz from 909kHz. Taking a listen on the Fairhaven RD500 which was alongside the NRD-545 I decided that although "monkey chatter" was evident on the '545, it was also present to some extent on the RD500, so my conclusion is that the new ROMs in the '545 have largely cured the problems and the '545 was working as it should. Well done JRC.

Clinical Sound

Having had the opportunity to do more listening with the NRD-545, rather than conducting tests, I find that the recovered audio sounds a bit 'clinical' to my ears. At first it simply sounded peculiar, but I soon discovered that the internal loudspeaker is doing the receiver no favours at all, and plugging in a half decent external speaker stopped my eyes watering every time an announcer produced a sibilant during the news. The knife edge transitional selectivity of the d.s.p. system does change the sound we may be accustomed to hearing, and I would like the time to do some listening

Continued on page 54...



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Q-TEK APOLLO 2000

A brilliant new compact indoor antenna that covers 0-1650MHz and is just 20" tall (collapsed). Supplied with coax and BNC plug fitted.

ONLY **£49.95** P&P £5

Comments from John Griffiths
I have to say that I'm not a fan of indoor antennas like this as earlier desk mounted antennas tended to look like a mad scientist invention. However, I was surprised by the quality of construction of this piece of equipment and it appears to be up to the job it is designed to do. Without getting technical, the Apollo 2000 claims to be able to cover 0-1650MHz. I used it between 108-400MHz: approx and was surprised by what it was able to do. It produced clean copy and there was good reproduction with very little breakthrough.



Q-TEK D.C. 2000

A high performance wideband antenna offering superb performance from 25-2000MHz. Transmit range: 6m, 2m, 70cm, 32cm & 23cm (power handling 200W). Fitted with low loss 'N' type connector. Supplied with mounting brackets.

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Comments from John Griffiths
Putting the DC.2000 up gave me a tremendous boost to all signals with the ancient AR-2000 coming alive! Signals were well received and I found that I wandered out of airband - my usual haunt - into all manner of areas that previously have been less than good here due to my location!

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Comments from John Griffiths
I mounted this on my AR-2000 and was well pleased with the results on HF. Verdict? A clear winner and well worth the reasonable outlay.

SCANMASTER SP-55

Boost reception of your scanner with this pre-amp. 25-1500MHz, variable gain, band pass filters.

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Comments from John Griffiths
Results were able to be looked at in terms of a cheap, low cost ATU and I can report that it is certainly good! At under £50, it must be the cheapest on the market and would suit an enthusiast looking at putting an ATU on a capable scanner.

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For HF:- this unit utilises 6 independent HF "inductively" shortened verticals and has a separate wire connection for using the internal MLB (Magnetic Balun).

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Comments from John Griffiths

In rounding up, the intruder performed better than I expected and with little fuss in mounting and connecting up. It appears rugged enough to live out of doors and will also fit nicely on the wall - perhaps an outside wall being the ideal though I have to admit having no problems with my inside one. I found it a pleasing addition to my set-up - with cable correctly mounted and run - it should look professional and very much a part of the kit in the shack. I would suggest that this is the antenna many of us have long been looking for and therefore have no hesitation at all in saying it is definitely the business.



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Monkey Business

Continued from page 50...

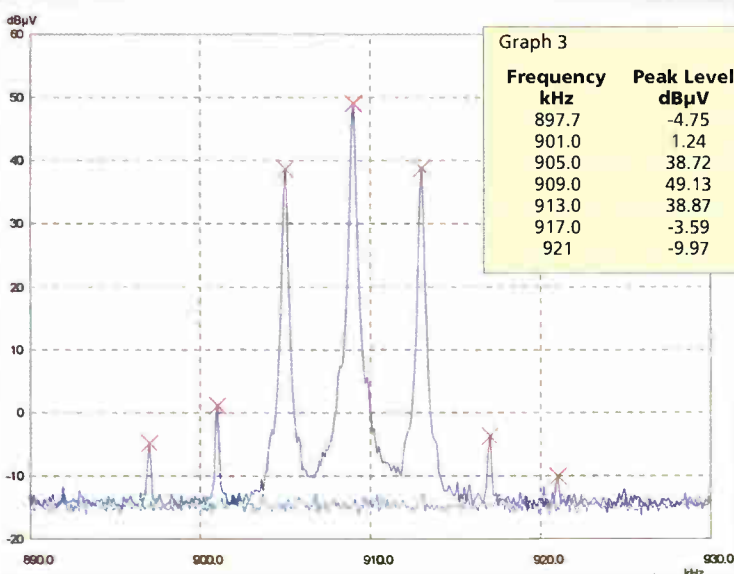
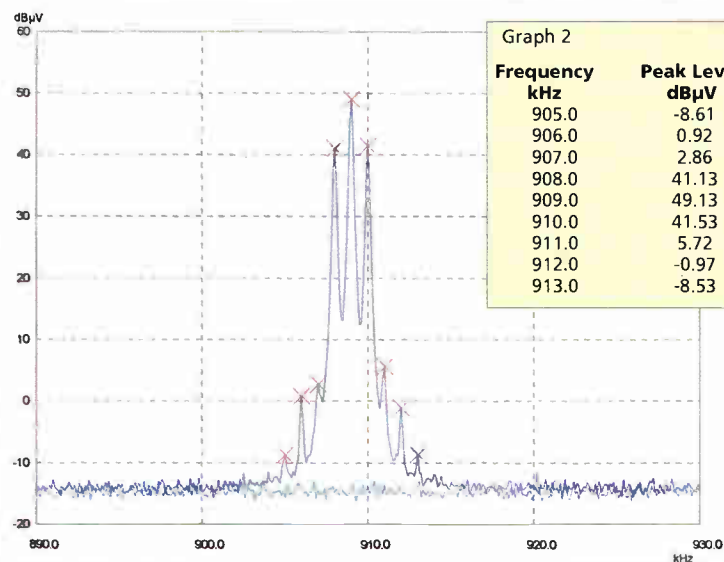
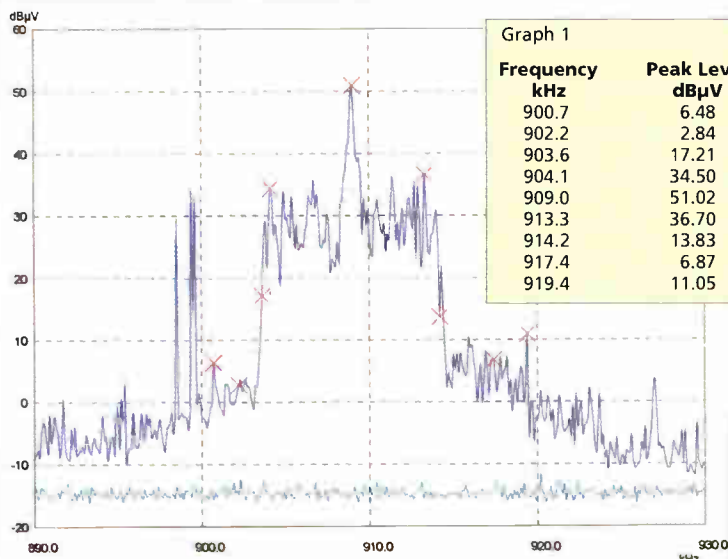
through a d.s.p. filter which has variable slope on the passband edges to see if that would please my ears a bit more. But for DX listening, the NRD-545 is fine, and you can be sure that buying JRC quality of manufacture will

bring you great satisfaction. I'm now possibly a little closer to accepting d.s.p. filtering for my own use, but my listening is for idle pleasure rather than DX chasing, and I still feel that a 'conventional' IF section with crystal or mechanical filters at **both** ends of the chain will suit my ageing ears rather better.

Final Thoughts

The NRD-545 would be welcome in any listener's station. It is sheer delight to use, well proportioned and with very pleasing styling and appearance. The construction both inside and out is a tribute to JRC engineering skill and experience, and in all the receiver is a worthy successor to a long line of successful designs. For s.s.b. and c.w. listening it is hard to beat, and most of the d.s.p. based features are well thought out and easy to use. My original misgivings about the recovered a.m. audio were quickly addressed by JRC and the corrective action worked well. Most

users would be well advised to connect an external loudspeaker for general listening and forget the rather 'peaky squeaker' mounted inside the top cover. As for my other little reservation, I heard on the Radio 4 news this morning (July 1st) that there is concern among world wild life organisations that the Orang-Utangs of Indonesia may well become extinct in the next few years. I don't think that 'monkey chatter' will necessarily follow them to extinction just yet.



Splatter and the BBC

The plot **Graph 1** shows Off-air analysis of BBC on 909kHz. Note carrier amplitude in table and amazingly sharp (apparent) sideband cut-off at ± 5 kHz. But average sideband energy is at +30dBmV. There is still energy, verified by listening to ensure that it is indeed the 909kHz modulation, at ± 9 kHz from the carrier and at a level of +5dBmV. This is only 25dB down on the main sideband energy. So it's not surprising that there is sideband 'chatter'.

Now take a look at **Graph 2**, a test signal (generated at the lab) at 909kHz modulated at 60% by a 1kHz tone. Even though harmonics of the modulation signal are apparent, it is clear that testing with a signal generator will never show up the kind of problems encountered on air with real signals.

Looking at **Graph 3**, which is just for reference and shows 60% modulation at 4kHz, it demonstrates quite well the effect of modulating signal harmonics. Even Rohde & Schwarz need watching...

Finally, I can still hear BBC modulation splash at up to 15kHz from the carrier, but I can't push the complaint too far, can I?

SWM

Toroids, Binoculars, Rods and Beads

How To Use Ferrite and Powdered Iron Cores **Part 1: The Basics**

This month, Joe Carr K4IPV, looks at a very important but often overlooked and misunderstood component from the world of inductors and wire-wound assemblies.

Powdered-iron and ferrite cores are used as forms to make a variety of inductors, transformers, BALUNS, EMI chokes, RF chokes and a host of other coil products. The nature of these forms makes it rather easy to construct workable and accurate components using a bit of wire and a touch of imagination. In this series we will take a look at how to use toroid cores, binocular cores, ferrite rods, choke bobbins and ferrite beads.

Materials Used in Cores

Understanding the nature and properties of powdered iron and ferrite cores is necessary to get the most out of your projects. Before looking at the cores themselves, let's first look at the materials that are used in their manufacture.

Powdered Iron

Powdered iron cores are made of ferrous materials that are powdered and then formed into a shape with some sort of binding material. Two main types of material are used: carbonyl irons and hydrogen reduced irons. The carbonyl forms offer superior temperature stability, and have permeability (μ) values from 1 to 35 μ . These components are often used in broadband transformers and broadband coils, with high Q

| TYPE | μ | COLOR CODE | MATERIAL |
|------|-------|--------------|------------------|
| 26 | 75 | Yellow/White | Hydrogen Reduced |
| 3 | 35 | Grey | Carbonyl HP |
| 15 | 25 | Red/White | Carbonyl GS6 |
| 1 | 20 | Blue | Carbonyl C |
| 2 | 10 | Red | Carbonyl E |
| 7 | 9 | White | Carbonyl TH |
| 6 | 8 | Yellow | Carbonyl SF |
| 10 | 6 | Black | Powdered iron SF |
| 12 | 3 | Green/White | Synthetic oxide |
| 17 | 3 | Blue/Yellow | Carbonyl |
| 0 | 1 | Tan | Phenolic |

Table 1.1:

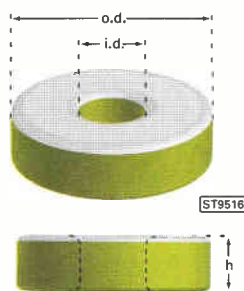


Fig. 1.2: The toroid shaped core.

values, up to frequencies of 200 or 300MHz. Carbonyl cores are often used in high power BALUN transformers. The hydrogen reduced types have lower Q values than carbonyl cores, but offer values of permeability up to about 90. They are used in low frequency chokes and inductors, and as electromagnetic interference (EMI) filters.

The various materials used for powdered iron cores are designated by both a number system and a color-code system.

Figure 1.1 shows the material type numbers, color codes and approximate frequency ranges of the most common forms of powdered iron core. The characteristics of each type are given in Table 1.1, while some common uses of each type are given in Table 1.2.

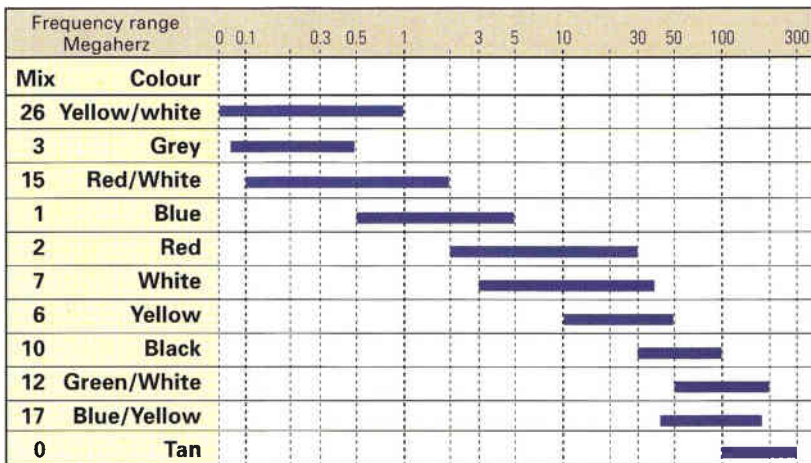


Fig. 1.1: Colour code and frequency coverage of common powdered iron cores.

Ferrite Materials

Although the name 'ferrite' implies ferrous (iron based) materials, these cores are actually made of some more exotic compounds of nickel-zinc and manganese-zinc. The nickel-zinc cores have a high volume resistivity, fairly decent stability, and relatively high Q factors. They typically have permeability (μ) values of 125 to 850 μ . The manganese-zinc cores have lower volume resistivity, with high Q values between 1 and 1000kHz. These materials are used in power transformers, switched power supplies, and EMI filters. They offer high attenuation to frequencies in the 20MHz and upwards range.

Continued on page 58...

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This receiver is set to take the market by storm. Rave reviews. DSP as standard. 1000 memories, all mode, high sensitivity and wide dynamic range.
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or 36 mths @ £31.65

ROBERTS R-861

All mode, short wave plus VHF portable receiver. RDS. AM narrow filter, stereo.
OUR PRICE £195.00



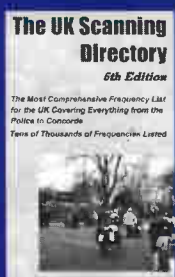
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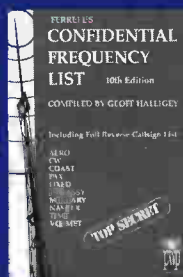


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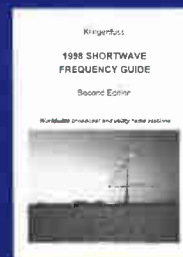
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How To Use Ferrite and Powdered Iron Cores

Continued from page 55

| Type | Uses |
|------|--|
| 26 | High permeability, used in EMI filters, DC chokes and switched DC power supplies. |
| 3 | High-Q coils and transformers between 50 and 500kHz. |
| 15 | Good Q, high stability. Commonly used in l.w./m.w. and 160m amateur applications. |
| 1 | High volume resistivity. Used for lower frequency applications. |
| 2 | High volume resistivity. Commonly used for inductors and transformers in the 3-30MHz h.f. bands. |
| 7 | Used for h.f. and low-end v.h.f. inductors and transformers. |
| 6 | Offers higher Q between 30 and 50MHz, but is used for h.f. and low v.h.f. band inductors and transformers. |
| 10 | Good Q and high stability for use in inductors and transformers between 40 and 100MHz. |
| 12 | Good Q but only moderate stability for inductors and transformers between 50 and 100MHz. |
| 17 | Similar to Type 12, but has better temperature stability and lower Q. |
| 0 | High-Q applications above 200MHz. The actual inductance is more sensitive to winding technique than other types. |

| Material | μ | Uses |
|----------|-------|---|
| 43 | 850 | Inductors and wideband transformers up to 50MHz. |
| 61 | 125 | Wideband transformers to 200MHz, with high Q between 200kHz and 15MHz. |
| 63 | 40 | High Q applications over 15 and 25MHz |
| 67 | 40 | High Q applications between 10 and 80MHz, and wideband applications to 200MHz. |
| 68 | 20 | High Q resonant LC tank circuits between 80 and 180MHz. It is also used in wideband amplifiers and transformers. |
| 72 | 2000 | High Q applications to 500kHz. It is also used for EMI reduction of frequencies between 500kHz and 50MHz. |
| 75 | 5000 | Low-loss operation between 1 and 1000kHz. Applications include pulse transformers, wideband transformers, and EMI filters to attenuate 500kHz to 20MHz. |
| 77 | 2000 | Wideband transformers between 1 and 1000kHz. EMI attenuation filters between 500kHz and 50MHz. |
| F | 3000 | Similar to type 77. |
| J | 5000 | Low-loss operation between 1 and 1000kHz. Applications include pulse transformers, wideband transformers, and EMI filters to attenuate 500kHz to 20MHz. |

Table 1.2:

Table 1.3:

| Mix | 26 | 3 | 15 | 1 | 2 | 7 | 6 | 10 | 12 | 17 | 0 | |
|--------------------|--------------|-------------|-----------|---------|---------|----------|----------|------------------|-------------|-------------|----------|------|
| Colour | Yellow/White | Grey | Red/White | Blue | Red | White | Yellow | Black | Green/White | Blue/Yellow | Tan | |
| Material | H Reduced | Carb. HP | Carb. GS6 | Carb. C | Carb. E | Carb. TH | Carb. SF | Powdered Iron SF | Syn.Oxide | Carb. | Phenolic | |
| Frequency (MHz) | 0 - 1 | 0.05 - 0.50 | 0.10 - 2 | 0.5 - 5 | 2 - 30 | 3 - 35 | 10 - 50 | 30 - 100 | 50 - 200 | 40 - 180 | 100-300 | |
| μ | 75 | 35 | 25 | 20 | 10 | 9 | 8 | 6 | 4 | 4 | 1 | |
| Temp Coef.(PPM/°C) | 825 | 370 | 190 | 280 | 95 | 30 | 35 | 150 | 170 | 50 | 0 | |
| A_L Values | | | | | | | | | | | | |
| Core Size | T-12 | N/A | 60 | 50 | 48 | 20 | 18.0 | 17.0 | 12.0 | 7.5 | 7.5 | 3.0 |
| | T-16 | 145 | 61 | 55 | 44 | 22 | N/A | 19.0 | 13.0 | 8.0 | 8.0 | 3.0 |
| | T-20 | 180 | 76 | 65 | 52 | 27 | 24.0 | 22.0 | 16.0 | 10.0 | 10.0 | 3.5 |
| | T-25 | 235 | 100 | 85 | 70 | 34 | 29.0 | 27.0 | 19.0 | 12.0 | 12.0 | 4.5 |
| | T-30 | 325 | 140 | 93 | 85 | 43 | 37.0 | 36.0 | 25.0 | 16.0 | 16.0 | 6.0 |
| | T-37 | 275 | 120 | 90 | 80 | 40 | 32.0 | 30.0 | 25.0 | 15.0 | 15.0 | 4.9 |
| | T-44 | 360 | 180 | 160 | 105 | 52 | 46.0 | 42.0 | 33.0 | 18.5 | 18.5 | 6.5 |
| | T-50 | 320 | 175 | 135 | 100 | 49 | 43.0 | 40.0 | 31.0 | 18.0 | 18.0 | 6.4 |
| | T-68 | 420 | 195 | 180 | 115 | 57 | 52.0 | 47.0 | 32.0 | 21.0 | 21.0 | 7.5 |
| | T-80 | 450 | 180 | 170 | 115 | 55 | 50.0 | 45.0 | 32.0 | 22.0 | 22.0 | 8.5 |
| | T-94 | 590 | 248 | 200 | 160 | 84 | N/A | 70.0 | 58.0 | 32.0 | N/A | 10.6 |
| | T-106 | 900 | 450 | 345 | 325 | 135 | 133.0 | 116.0 | N/A | N/A | N/A | 19.0 |
| | T-130 | 785 | 350 | 250 | 200 | 110 | 103.0 | 96.0 | N/A | N/A | N/A | 15.0 |
| T-157 | 870 | 420 | 360 | 320 | 140 | N/A | 115.0 | N/A | N/A | N/A | N/A | |
| T-184 | 1640 | 720 | N/A | 500 | 240 | N/A | 195.0 | N/A | N/A | N/A | N/A | |
| T-200 | 895 | 425 | N/A | 250 | 120 | 105.0 | 100.0 | N/A | N/A | N/A | N/A | |

Table 1.4: Characteristics of powdered iron toroid cores.

Making the Calculations

There are two basic issues when making coils and transformers:

- 1) How to calculate how many turns are needed to achieve a required inductance, and...
- 2) How do you find the inductance of a coil once the number of turns are known (short of measuring it on an inductance bridge, of course).

To find the number of turns required to achieve a required inductance requires knowledge of a parameter of the material called the A_L factor. The basic equations are:

1. Ferrite materials:

$$N = 1000 \sqrt{\frac{L \text{ (mH)}}{A_L \text{ (mH/1000t)}}} \quad (1)$$

2. Powdered iron materials:

$$N = 100 \sqrt{\frac{L \text{ (}\mu\text{H)}}{A_L \text{ (}\mu\text{H/100t)}}} \quad (2)$$

Where:

N is the number of turns

L(μ H) is the inductance in microhenrys (μ H)

L(mH) is the inductance in millihenrys (mH)

A_L is an attribute of the core material

To find the inductance of an existing coil, where the number of turns is known, solve Equations (1) and (2) for the value of inductance.

There are also some v.h.f./u.h.f. materials in which the inductance is calculated in terms of nanohenrys per turn (nH/t). **Table 1.3** shows the properties and uses of several different popular ferrite cores.

Now that we've laid the foundation by considering the materials, let's look at the different types of core that are available. Keep in mind that not all types of core are available in all types of powdered iron or ferrite material.

Toroid Cores

The toroid core gets its name from the fact that it's basic shape is the torous (which is neither a bull nor an American Ford automobile). The word torous is a fancy way of saying the core is doughnut shaped (at least, American doughnuts...the hole isn't punched out of the centre in some countries). **Figure 1.2** shows the basic torous shape in the unlikely event

| Core Size | Outside diameter (o.d.) | | Inside diameter (i.d.) | | Height (H) | |
|-----------|-------------------------|---------|------------------------|--------|------------|--------|
| | (in.) | (mm) | (in.) | (mm) | (in.) | (mm) |
| T-12 | 0.125 | 3.175 | 0.062 | 1.575 | 0.05 | 1.270 |
| T-16 | 0.160 | 4.064 | 0.078 | 1.981 | 0.06 | 1.524 |
| T-20 | 0.200 | 5.080 | 0.088 | 2.235 | 0.07 | 1.778 |
| T-25 | 0.250 | 6.350 | 0.12 | 3.048 | 0.096 | 2.438 |
| T-30 | 0.307 | 7.798 | 0.151 | 3.835 | 0.128 | 3.251 |
| T-37 | 0.375 | 9.525 | 0.205 | 5.207 | 0.128 | 3.251 |
| T-44 | 0.440 | 11.176 | 0.229 | 5.817 | 0.159 | 4.039 |
| T-50 | 0.500 | 12.700 | 0.300 | 7.620 | 0.190 | 4.826 |
| T-68 | 0.690 | 17.526 | 0.370 | 9.398 | 0.190 | 4.826 |
| T-80 | 0.795 | 20.193 | 0.495 | 12.573 | 0.250 | 6.350 |
| T-94 | 0.942 | 23.927 | 0.560 | 14.224 | 0.312 | 7.925 |
| T-106 | 1.060 | 26.924 | 0.570 | 14.478 | 0.437 | 11.100 |
| T-130 | 1.300 | 33.020 | 0.780 | 19.812 | 0.437 | 11.100 |
| T-157 | 1.570 | 39.878 | 0.950 | 24.130 | 0.570 | 14.478 |
| T-184 | 1.840 | 46.736 | 0.950 | 24.130 | 0.710 | 18.034 |
| T-200 | 2.000 | 50.800 | 1.250 | 31.750 | 0.550 | 13.970 |
| T-200A | 2.000 | 50.800 | 1.250 | 31.750 | 1.000 | 25.400 |
| T-225 | 2.250 | 57.150 | 1.400 | 35.560 | 0.550 | 13.970 |
| T-225A | 2.250 | 57.150 | 1.400 | 35.560 | 1.000 | 25.400 |
| T-300 | 3.000 | 76.200 | 1.920 | 48.768 | 0.500 | 12.700 |
| T-300A | 3.000 | 76.200 | 1.920 | 48.768 | 1.000 | 25.400 |
| T-400 | 4.000 | 101.600 | 2.250 | 57.150 | 0.650 | 16.510 |
| T-400A | 4.000 | 101.600 | 2.250 | 57.150 | 1.000 | 25.400 |
| T-500 | 5.200 | 132.080 | 3.080 | 78.232 | 0.800 | 20.320 |

Table 1.5: Dimensions of powdered iron toroid cores.

| Wire size (s.w.g) | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 |
|-------------------|-----|-----|------|-----|------|------|------|-----|-------|------|-------|------|------|------|------|
| (mm) | 2.0 | 1.5 | 1.25 | 0.9 | 0.71 | 0.56 | 0.45 | 0.4 | 0.315 | 0.25 | 0.224 | 0.2 | | | |
| T-12 | 0 | 0 | 1 | 1 | 1 | 2 | 4 | 5 | 8 | 11 | 15 | 21 | 29 | 37 | 47 |
| T-16 | 0 | 1 | 1 | 1 | 3 | 3 | 5 | 8 | 11 | 16 | 21 | 29 | 38 | 49 | 63 |
| T-20 | 1 | 1 | 1 | 3 | 4 | 5 | 6 | 9 | 14 | 18 | 25 | 33 | 43 | 56 | 72 |
| T-25 | 1 | 1 | 3 | 4 | 5 | 7 | 11 | 15 | 21 | 28 | 37 | 48 | 62 | 79 | 101 |
| T-30 | 1 | 3 | 4 | 5 | 7 | 11 | 15 | 21 | 28 | 37 | 48 | 62 | 78 | 101 | 129 |
| T-37 | 3 | 5 | 7 | 9 | 12 | 17 | 23 | 31 | 41 | 53 | 67 | 87 | 110 | 140 | 177 |
| T-44 | 5 | 6 | 7 | 10 | 15 | 20 | 27 | 35 | 46 | 60 | 76 | 97 | 124 | 157 | 199 |
| T-50 | 6 | 8 | 11 | 16 | 21 | 28 | 37 | 49 | 63 | 81 | 103 | 131 | 166 | 210 | 265 |
| T-68 | 9 | 12 | 15 | 21 | 28 | 36 | 47 | 61 | 79 | 101 | 127 | 162 | 205 | 257 | 325 |
| T-80 | 12 | 17 | 23 | 30 | 39 | 51 | 66 | 84 | 108 | 137 | 172 | 219 | 276 | 347 | 438 |
| T-94 | 14 | 20 | 27 | 35 | 45 | 58 | 75 | 96 | 123 | 156 | 195 | 248 | 313 | 393 | 496 |
| T-106 | 14 | 20 | 27 | 35 | 45 | 58 | 75 | 96 | 123 | 156 | 195 | 248 | 313 | 393 | 496 |
| T-130 | 23 | 30 | 40 | 51 | 66 | 83 | 107 | 137 | 173 | 220 | 275 | 348 | 439 | 550 | 693 |
| T-157 | 29 | 38 | 50 | 64 | 82 | 104 | 132 | 168 | 213 | 270 | 336 | 426 | 536 | 672 | 846 |
| T-184 | 29 | 38 | 50 | 64 | 82 | 104 | 132 | 168 | 213 | 270 | 336 | 426 | 536 | 672 | 846 |
| T-200 | 41 | 53 | 68 | 86 | 109 | 139 | 176 | 223 | 282 | 357 | 445 | 562 | 707 | 886 | 1115 |
| T-225 | 46 | 60 | 77 | 98 | 123 | 156 | 198 | 250 | 317 | 400 | 499 | 631 | 793 | 993 | 1250 |
| T-300 | 66 | 85 | 108 | 137 | 172 | 217 | 274 | 347 | 438 | 553 | 688 | 870 | 1093 | 1368 | 1721 |
| T-400 | 79 | 100 | 127 | 161 | 202 | 255 | 322 | 407 | 513 | 648 | 806 | 1018 | 1278 | 1543 | 2013 |
| T-520 | 110 | 149 | 160 | 223 | 279 | 349 | 443 | 559 | 706 | 889 | 1105 | 1396 | 1753 | 2192 | 2758 |

Table 1.6: Number of wires (SWG) that can be accommodated by the various cores.

Continued on page 60

that you are not familiar with doughnuts.

The main feature that makes toroid cores so attractive in radio construction is that it is inherently self-shielding. This effect is a function of the toroidal shape. As a result, it is possible to mount toroidal inductors in close proximity to each other without fear of coupling between them. The toroidal inductor can also be mounted closer to other components than forms of inductor. Although in some cases you will want to mount adjacent coils at right angles to each other (as is done with normal slug-tuned or solenoid-wound air core coils), it is often the case that the toroid coils can be mounted in the same plane.

Three dimensions and the A_L value are the critical attributes of a toroid core. The dimensions are outside diameter (o.d.), inside diameter (i.d.) and height (h). The A_L value is a function of the size of the core and the material.

Table 1.4 shows the standard forms of powdered iron toroid core and their critical parameters. The 'T-xx' number refers to the size of the core (the 'T' denotes a powdered iron core). The values in the main body of **Table 1.4** are the A_L values used to calculate the number of turns.

The type number of any given toroid core is made up of the T-number (which gives size) and the material type. For example, a T-50-2 core is made of type 2 material, and will operate on the 2 to 30 MHz band. It has an A_L value of 49 (see **Table 1.4**). The dimensions (inches and millimeters) of the standard cores are given in **Table 1.5**.

Example

Calculate the number of turns required for a $3.3\mu\text{H}$ inductor for an m.w. interference filter for a receiver. Use the T-50-15 core. **Table 1.4** shows that the T-50-15 core has an A_L value of 135.

$$N = 100 \sqrt{\frac{L (\mu\text{H})}{A_L}}$$

$$N = 100 \sqrt{\frac{3.3\mu\text{H}}{135}}$$

$$N = 100 \sqrt{0.24} = (100)(0.155) = 15.5 \text{ turns}$$

Table 1.4 shows the approximate number of turns that can be accommodated by each size toroid core as a function of wire size.

It is customary to use enamelled or similar insulation types of wire to wind the coils (although

| Material | 43 | 61 | 63 | 67 | 68 | 72 | 75 | 77 | F | J |
|------------------|------|------|------|------|------|------|------|------|------|------|
| (μ) | 850 | 125 | 250 | 40 | 20 | 2M | 5M | 2M | 3M | 5M |
| Core Size | | | | | | | | | | |
| FT-23 | 188 | 24.8 | 7.9 | 7.8 | 4 | 396 | 990 | 356 | N/A | N/A |
| FT-37 | 420 | 55.3 | 17.7 | 17.7 | 8.8 | 884 | 2210 | 796 | N/A | N/A |
| FT-50 | 523 | 68 | 22 | 22 | 11 | 1100 | 2750 | 990 | N/A | N/A |
| FT-50A | 570 | 75 | 24 | 24 | 12 | 1200 | 2990 | 1080 | N/A | N/A |
| FT-50B | 1140 | 150 | 48 | 48 | 12 | 2400 | N/A | 2160 | N/A | N/A |
| FT-82 | 557 | 73.3 | 22.4 | 22.4 | 11.7 | 1170 | 3020 | 1060 | N/A | 3020 |
| FT-87A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3700 | 6040 |
| FT-114 | 603 | 79.3 | 25.4 | 25.4 | N/A | 1270 | 3170 | 1140 | 1902 | 3170 |
| FT-114A | N/A | 146 | N/A | N/A | N/A | 2340 | N/A | N/A | N/A | N/A |
| FT-140 | 952 | 140 | 45 | 45 | N/A | 2250 | 6736 | 2340 | N/A | 6736 |
| FT-150 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2640 | 4400 |
| FT-150A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 5020 | 8370 |
| FT-193A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 4460 | 7435 |
| FT-240 | 1240 | 173 | 53 | 53 | N/A | 3130 | 6845 | 3130 | N/A | 6845 |

Note: M = 1000 000 when used in the ' μ ' parameter

Table 1.7: Characteristics of ferrite toroid cores.

| Core Size | Outside diameter (o.d.) | | Inside diameter (i.d.) | | Height (H) | |
|-----------|-------------------------|--------|------------------------|--------|------------|--------|
| | (in.) | (mm) | (in.) | (mm) | (in.) | (mm) |
| FT-23 | 0.230 | 5.842 | 0.120 | 3.048 | 0.060 | 1.524 |
| FT-37 | 0.375 | 9.525 | 0.187 | 4.750 | 0.125 | 3.175 |
| FT-50 | 0.500 | 12.700 | 0.281 | 7.137 | 0.188 | 4.775 |
| FT-50A | 0.500 | 12.700 | 0.312 | 7.925 | 0.250 | 6.350 |
| FT-50B | 0.500 | 12.700 | 0.312 | 7.925 | 0.500 | 12.700 |
| FT-82 | 0.825 | 20.955 | 0.520 | 13.208 | 0.250 | 6.350 |
| FT-87A | 0.870 | 22.098 | 0.540 | 13.716 | 0.500 | 12.700 |
| FT-114 | 1.142 | 29.007 | 0.750 | 19.050 | 0.295 | 7.493 |
| FT-114A | 1.142 | 29.007 | 0.750 | 19.050 | 0.545 | 13.843 |
| FT-140 | 1.400 | 35.560 | 0.900 | 22.860 | 0.500 | 12.700 |
| FT-150 | 1.500 | 38.100 | 0.750 | 19.050 | 0.250 | 6.350 |
| FT-150A | 1.500 | 38.100 | 0.750 | 19.050 | 0.500 | 12.700 |
| FT-193A | 1.932 | 49.073 | 1.250 | 31.750 | 0.750 | 19.050 |
| FT-240 | 2.400 | 60.960 | 1.400 | 35.560 | 0.500 | 12.700 |

Table 1.8: Dimensions of ferrite toroid cores.

I've used PVC insulated hook-up wire, even though neither customary nor desirable).

The A_L values and sizes for ferrite toroid cores are shown in **Tables 1.7** and **1.8**, respectively. Keep in mind that the A_L values for ferrite are specified in millihenrys per thousand turns (mH/1000t), rather than the microhenrys per hundred turns ($\mu\text{H}/100\text{t}$) used for powdered iron cores.

Connections...

I can be contacted at P.O. Box 1099, Falls Church, VA, 22041, USA, or via E-mail at carrjj@aol.com

Next Month...

Next month I will continue the discussion of cores by looking at the methods for winding and mounting toroidal inductors and transformers.

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Part 2 Next Month: Winding and Mounting.

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| SPA4 | Scanner Preamp. 4 to 1300MHz wideband for discones etc. | £15.90 |

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| DFD4 | Add-on Digital Readout for superhet receivers / transceivers | £49.90 |
| PMB4 | Adds 5 extra frequency offsets to DFD4 | £9.90 |
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73 from Dave G4KQH, Technical Manager.

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SSB Utilities

In the June issue there was an article from me about USAF Reach callsigns. So far, I have had only a few comments about the article, so I guess that it must have been just about right. There is a minor correction to part of the article. In the article, on page 44 of June's *SWM*, there is a map at the bottom of the page which shows the locations of the USAF GHFS sites. **Michael Murray** writes to comment about the map, and says that the location for MacDill is wrong. And I have to admit that he is right; MacDill is in Florida, and is about half-way down the Gulf Coast. I also notice that Yokota is spelt wrong on the map. However, in my defence, I should add that I down-loaded the map from a USAF web-page about the GHFS!

Antennas

Nick Mundy writes with some questions about Geoff Schofield's antenna diagram of in the June 'SSB Utilities'. Nick says that he has an almost identical set-up, and wants to clarify my recommendations of an a.t.u. for both antennas. Nick's set-up is slightly different, in that he has a balun which (allegedly) would provide an optimum impedance match across all frequencies, and that would not, therefore, need an a.t.u.

Well, I have two comments to make about baluns. The first is that I have seen some grandiose claims for baluns, and some very extravagant counter-claims. I am never sure which to believe, and I am of the opinion that a little bit of experimentation is a good thing - you get to know about your antenna, feeder and equipment, and almost always improve your set-up. I use a standard full-size G5RV, which has a small balun fitted to convert from 300Ω twin-feeder to standard 50Ω coaxial cable, but I have never had to change it or adjust it. I also use an a.t.u., and the results speak for themselves - I have logged all continents and also Antarctica, so I must be doing something right.

My second comment is simply that my system works very well, and I do not see the need to change it by adding or removing bits of it. If you have a balun in your system, what happens to the signals when you remove the balun? I have no idea myself, but I would be happy to read about your experiences, and to pass them on to other readers. Nick also says that he is plagued by a constant S7 buzz, which he refers to as frying eggs! This covers the lower 5MHz of the h.f. spectrum, and makes listening nearly impossible. He says that his initial thoughts were that it could be power-line noise, although his next door neighbour doesn't suffer from the same problem with their antenna. This fact means that the source of the problem is almost certainly something internal to your own home. Nick has already tried other battery-powered receivers on the same antenna, but still gets the same noise level. Nick wonders whether an a.t.u. might help under these circumstances, or whether it would just boost the noise as well?

Well, Nick, adding an a.t.u. to this set-up will simply increase the noise level as well as the desired signals. The only answer to this dilemma is to eliminate the interference at its source. The interference is obviously electrical, so you need to work your way round the house switching things on and off until you find the item that makes the interference go away. Likely candidates are dimmer-switches and central-heating thermostats.

Beacons

A few months back, **Paul Churchill** asked if I knew of a source for aircraft reporting points world-wide or any web sites relating to this aspect of h.f. airband listening.

Peter Cleall E-mailed me with a list of suitable web-addresses which should help. He says that Mark Zee's Irish Aviation web-site contains a lot of interesting information for those listening to the aeronautical bands. Try any (or all!) of the following:

<http://ireland.iol.ie/~markzee> (Irish Aviation web site),
<http://www.iol.ie/~markzee/atl.htm> (Atlantic crossings),
<http://www.iol.ie/~markzee/wand.htm> (Worldwide Air Navigation Database);

<http://home.sol.no/~stabel/aerohtm.htm> (Tore Stabells Aero listening page - the beacons are listed right at the end).

Another suggestion comes from **Andre Brandao** in Portugal who wrote the successful *Airnav* aircraft tracking program. The program includes a database of 32000 beacons around the world. I am in the midst of preparing a review of this software for *SWM*, so keep your eyes open for that appearing soon.

Letters

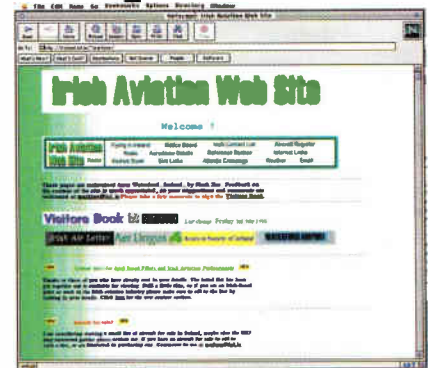
The first letter this month comes from **Martin Powell** in Wales who uses a Realistic DX-392, and wants to know the secret to hearing aircraft communications from the Pacific rim. Well, Martin, there was a big article about just this subject last year in *SWM*, so maybe you should speak with the *SWM* Book Store about back issues. Martin says that he has a list of frequencies for the area, so I am not going to list them all here.

Martin's receiver is certainly good enough to hear signals from that part of the world, his antenna is a simple random wire suspended around the room, so maybe you could try some sort of external long-wire antenna. I know that many people have problems with erecting external antennas (local planning rules, and so on), so maybe you could try a simple wire antenna which can be quickly re-wound when not in use. This would show if you can, at least hear, the signals.

As regards timings for hearing stations from the Pacific, I have always found the mid- to late-afternoons to be best for Brisbane and Auckland on 5.643MHz, and the same time-frame for San Francisco on 5.547MHz. One thing worth remembering is that although it is afternoon here in the UK, it is the early hours of the morning in the Pacific, so there are fewer flights to hear anyway. Good luck Martin, and let us know what you hear.

Mr. Allen from Gloucestershire writes to say that he has a Realistic DX-394 receiver, and wants some advice about antennas and general reception. He also says that he has a problem with reception, in that whenever any electrical socket or television in his house is switched on, he loses reception. Mr Allen does not explain if this loss of reception is due to interference or due to loss of power to the receiver. In either case, I would recommend trying to run the receiver from an independent power source (such as a battery), which will remove one of the unknowns from the problem. I helped a fellow listener a few years ago who suffered a similar problem. We used a long mains extension lead to run electrical power from various sockets in his house, and found that the mains supply to one room was faulty, and once it was fixed by a qualified electrician, his reception improved.

Mr Allen says that his external antenna is a HF-30 (which I presume is a Q-Tek HF-30 vertical), but he is unable to install an external long-wire. I would suggest trying a simple active antenna in a window space to see if you can improve reception that way. As I have said in the past, an active antenna boosts the signal and the noise, so this may not be an ideal solution. An alternative is a simple wire around the room (which I have used with quite some success while staying in hotels!), which can be removed when not in use.



Mark Zee's Irish Aviation site. Above, home page, below a web links page.



MilAir

Further to my comments last month, AH from Newquay has sent me further information regarding the aircraft activities at St. Mawgan - thanks for the detailed letter. Aircraft involved with Exercise Co-operative Bear, (see list last month), are expected to fly 14 to 18 missions a day, (8 - 11 September), in an exercise area that covers the Southwest approaches of the UK and parts of Southern Wales. Further participants to add to the list are: Bulgarian AF AN-26, Danish AF C-130 and Russian AF IL-76. It's a long way to St. Mawgan for most of us but it looks like being quite an exercise!

Further information from AH refers to the St. Mawgan Air Show, which takes place on the 5th August. His local paper lists two aircraft that are currently expected for the show, both are rare visitors to St. Mawgan. A B-52H from the 2nd Bomb Wing based at Barksdale, and a United States Navy E-6A from the squadron SCW-1, based at Tinker.

Lastly, AH reports on the activity at St. Mawgan during exercise Brilliant Foil. Around 20 Tornado F3s, from 11 and 25 Squadrons were based for the exercise. They were noted using the callsigns NITRO1 - 6 and RAZOR1 - 3, (11 Sqn) and JAVELIN1 - 6 and SAVAGE1 - 3, (25 Sqn).

Various airfield attacks took place with the following aircraft being noted:

| | | |
|---------------------|------------------|------------|
| POLECAT1 - 4 | Hawk T.1A | 100 Sqn |
| OUIZ1 - 2 | Jaguar GR.1A | 54 Sqn |
| PAGAN1 - 2 | Harrier GR.7 | 20 (R) Sqn |
| REBEL1 - 3? | Jaguar GR.1A | 41 Sqn |
| RATTLER3 - 4 | Sea Harrier FA.2 | 800 Sqn |

Also some French AF Mirage 2000s, (believed to be from EC 003), attacked as he was leaving the airfield so no callsigns were noted. Frequencies heard in use were: London Military **244.375, 254.225, 262.975, 275.35, 277.125** and **283.525**. 11 Squadron were heard using their Air-to-Air frequencies on **242.5** and **243.275** and 25 Squadron were operating Air-to-Air on **244.825**. Also noted during the visit was Search and Rescue Sea Kings of 203 (R) Squadron using 282.8 and 123.1, both of which are Search and Rescue common frequencies.

Unidentified Callsigns?

As 99.9% of my mail is from male enthusiasts it was a pleasant surprise to get a letter from Marie in Yorkshire. She asks if readers can identify the callsign/registration **N225SF**, (US Civil), which was heard on the 12 April *en route* across the Atlantic to Frobisher Bay. Marie has checked her reference books but can find no record of this US registration. The flight would appear to be operating a

This month's photograph shows an Edwards NC-141A



mission for the US military, possibly for Air Mobility Command. In recent weeks several other odd civil registrations have been noted on anonymous C-130s, believed to be *en route* to the Gulf and it has been suggested that they may be operated (allegedly), by another American agency? Any comments anyone?

Also heard and unidentified on the 13th April was the callsign **BOBBY61 Flight**, this appeared to be a tanker with a flight of four of five fighters in tow. They proceeded to call Swanwick for an Ocean crossing in the block between Flight Level 250 and 270. My records show that BOBBY is the main callsign used by KC-135Rs of the 22nd Air Refuelling Wing from McConnell Air Force Base. So presumably this was the tanker allocated to escort and refuel a deployment of fighters back to the USA. The aircraft was using its own callsign rather than one of the deployment callsigns such as TREND or CLAN, etc.

Lastly, Marie also queries the callsign Navigator 9873 and was under the impression it was a military flight. I am sorry to disappoint you but I believe it is the callsign of the Swedish Airline, Nova airlines. Sorry, to mention a civil callsign in this column.

8.33kHz Spacing

This is a subject that is obviously still causing concern amongst radio listeners as I have once again received several letters asking for information. (See my comments in the 'MilAir' column, March 98). Regular readers will be aware that two radios equipped with this spacing have been announced in the UK. The AOR AR8200, (reviewed in June *SWM*), and the AP-1000, this shows that the manufacturers are fully aware of the forthcoming changes.

The latest information to reach me is that the proposed introduction into Europe of this new spacing on the 1st January 1999 is to be delayed. Not only are some EEC countries unable to comply with this deadline, many of the American airlines which operate Trans Atlantic routes into Europe have requested a delay. Most of them have stated that there was no way they were going to have their aircraft refitted with the new equipment by that date. I understand that most US carriers have requested a delay of up to one year for the implementation date. The European committee who are in charge of the implementation of this new spacing have agreed to the delay, but as yet no actual date has been decided. This of course means that the UK start date which was to be in the first six month of the year 2000 is now also likely to be delayed accordingly.

Air Guard Eagles

Slightly off our patch, but Jim who is in the RAF, visited Keflavik in early April aboard a Lyneham based Hercules. He was more

than happy to find some Florida Air National Guard/159th FS F-15A Eagles, stationed there on temporary deployment. They were using the Air to Air frequency **297.6** and the callsigns **MIAMI** and **PELICAN** were noted.

I had hoped to include some pictures from Mildenhall show this month but due to family illness I couldn't go. As I understand there was a rather nice Edwards NC-141A present, our photo this month is - "One I prepared earlier!"

London Military

Martin from near Woking has asked if the London Military Air Traffic Centre will eventually move to the new Centre at

Swanwick. This new site is located close to the M27, between Southampton and Portsmouth. As far as I am aware the powers that be don't have any real idea when the civil Air Traffic will move there let alone the military. There have been numerous delays

to the centre's development and it now looks like it will not be operational until the new Millennium and possibly as late as 2002! As far as I am aware there are no current plans to move the London Military Control Centre from West Drayton to Swanwick.

Frequency Focus

Not strictly Military Air, but a reader sends me news of a couple of new ATIS frequencies that have been noted during May. Belfast City is now using 136.625 and Norwich is using 128.625. Also, Fairford's old Meteo (weather information), frequency has been withdrawn (358.6), and aircraft on deployment to Fairford are now using the Mildenhall Meteo frequency of 257.75MHz.

New Publications from the RSGB

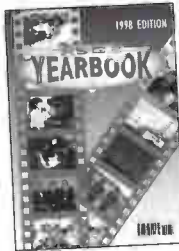
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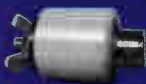
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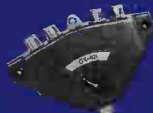
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How to use the Propagation Charts.

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

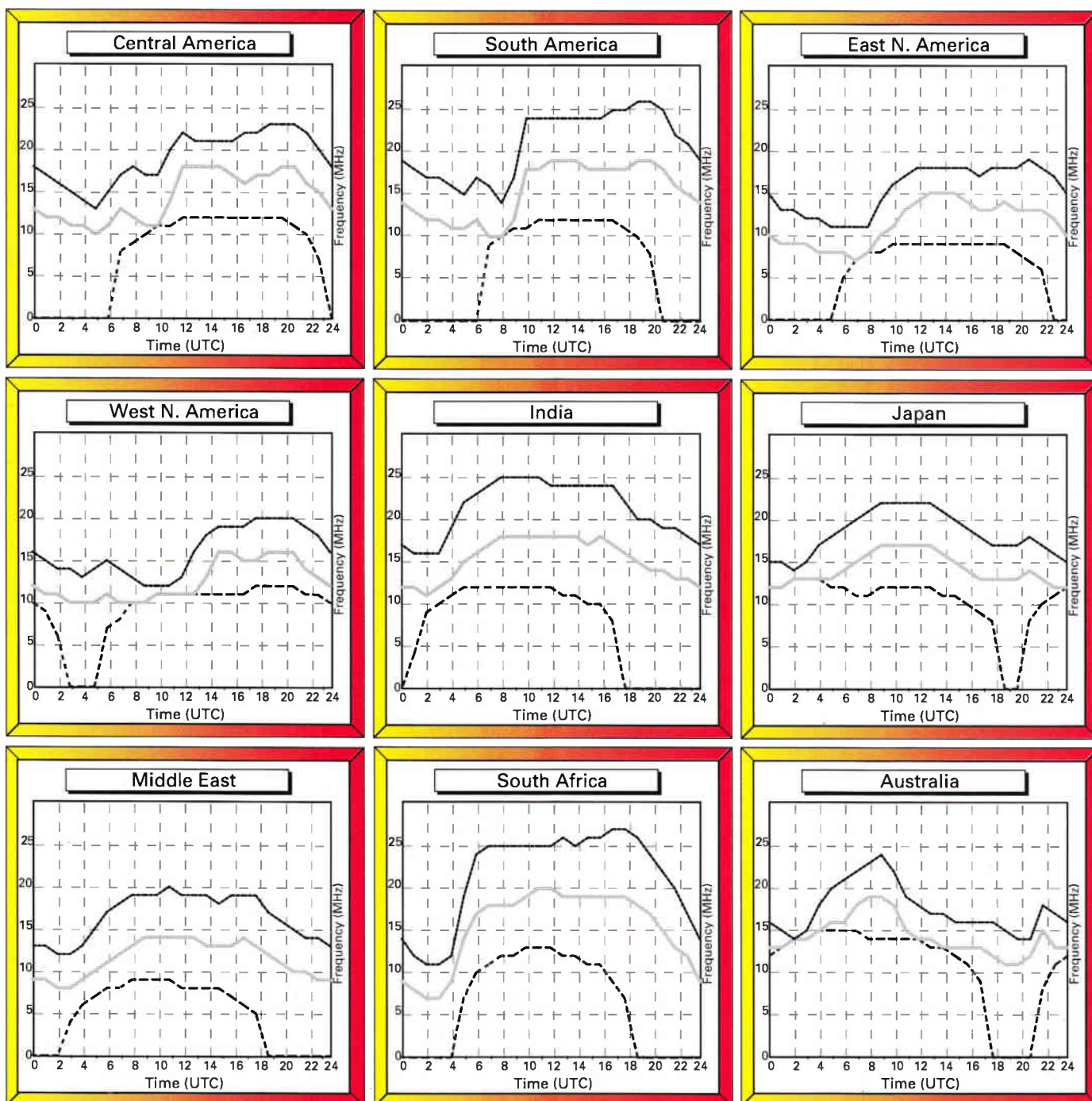
Lastly, the upper dashed line, represents the maximum usable frequency (MUF) a 50%

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.

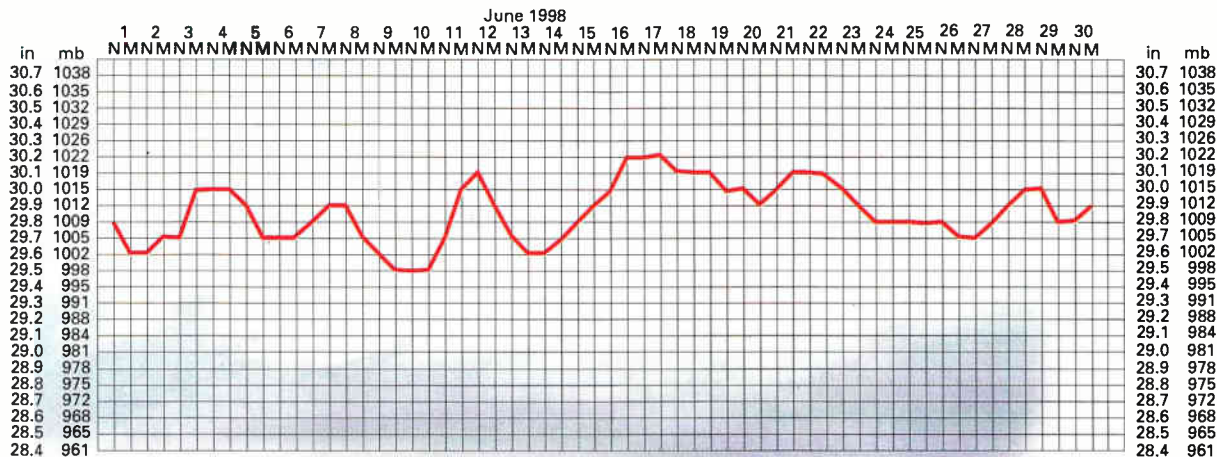
Good luck and happy listening.

August 1998
Circuits to London

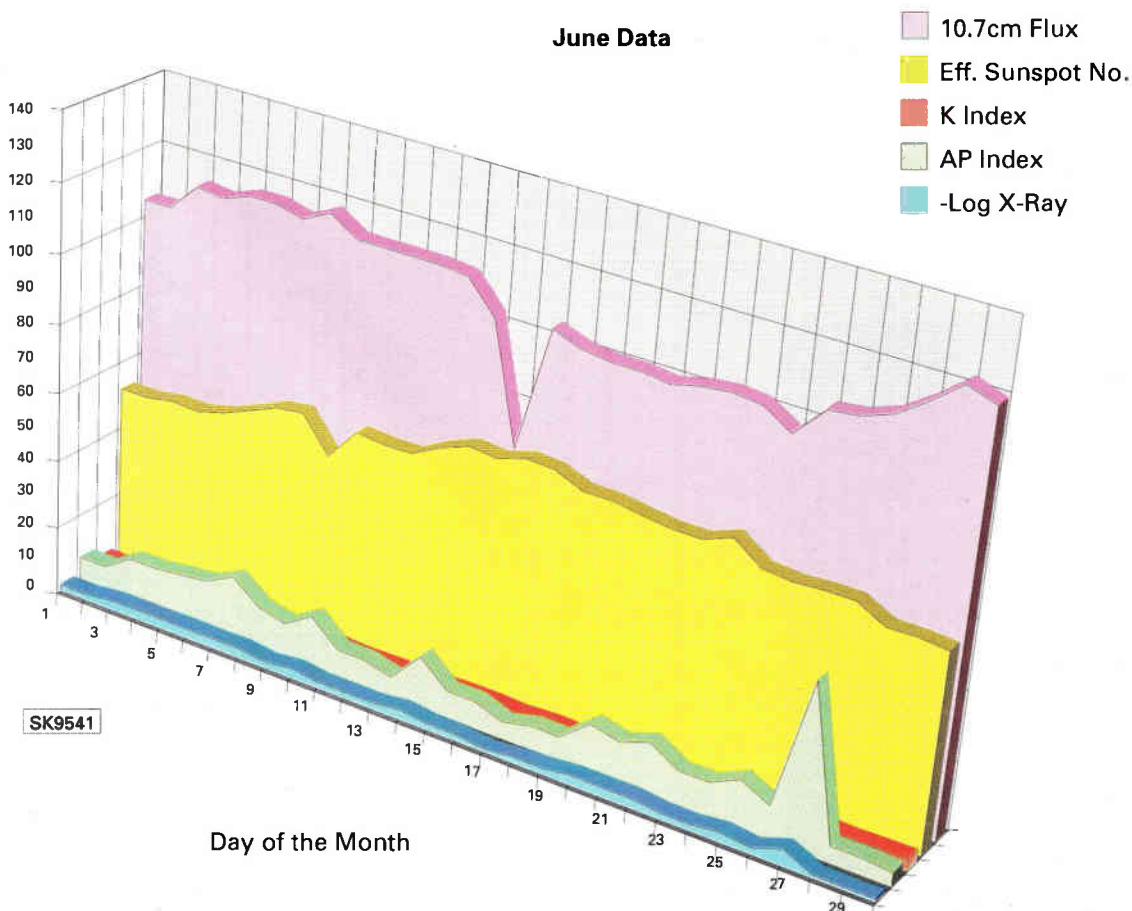


Propagation Extra

Ron Ham's barometric pressure chart, taken at Storrington, W. Sussex, June 1998.



June Data



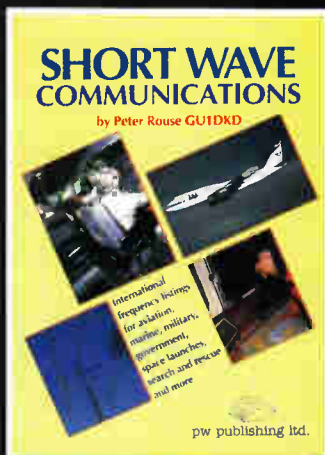
guide to the chart

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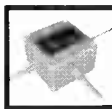
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Airband



Abbreviations

| | |
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| AIC | Aeronautical Information Circular |
| a.t.i.s. | automatic terminal information service |
| CAA | Civil Aviation Authority |
| FL | flight level |
| ft | feet |
| GASIL | General Aviation Safety Information Leaflet |
| h.f. | high frequency |
| LATCC | London Area & Terminal Control Centre |
| MHz | megahertz |
| Mil | Military |
| MoD | Ministry of Defence |
| QFE | altimeter pressure setting, reads zero when on aerodrome |
| ScOACC | Scottish & Oceanic Area Control Centre |
| SID | Standard Instrument Departure |
| v.o.r. | very high frequency omnidirectional radio range |

B.17 'Sally-B'.
Christine Mlynck.



The 'Freedom of the Air'. That's what they once said. Sounds good, but hardly applicable in today's crowded airspace. My Museum is based within a couple of miles of the site that perhaps we could call the birthplace of British aviation - Hendon.

Here, Claude Grahame-White started an aerodrome, flying school and aircraft factory. At one time, aircraft were made up the road in Colindale. They must have stopped the traffic (most of it horse-drawn) on the main (A5) road to deliver aircraft to the aerodrome!

Later the site became RAF Hendon but no-one would try to fly from there today (except for occasional helicopters). Well within the Heathrow Control Zone, the area is just too crowded.

In fact, all that remains of the site is the RAF Museum, Hendon, established 1972 in some of the original hangars (refurbished of course). Even older hangars lie in a poor state of repair. No-one else wants them, why can't the MoD donate them to the Museum before they disintegrate?

Other reminders of past aeronautical life are the Grahame Park housing estate, Aerodrome Road, (alongside which the police have their Hendon college) and Aeroville, a housing block once intended as an hotel for aerodrome passengers. Even the Joint Services Air Trooping Centre has now disappeared.

Why this history lesson? Last month I explained that various Rules of the Air governed flight, so even outside of controlled airspace one does not truly have Freedom of the Air any longer. Not like in Grahame-White's day. This was in answer to a question from **L. Moverley** (London).

Even outside controlled airspace, you are not out of touch. There is still the Flight Information Service from either LATCC or ScOACC (even that name has changed, once ScATCC, the Scottish Air Traffic Control Centre). They can only tell you about other traffic known to them and they don't have radar. But, they can also check the weather at destination, file and amend flight plans, and sometimes tell you if danger areas are active.

Another function of this service is to arrange initial contact with the Military Middle Airspace Radar Service, which I describe below under 'Frequency & Operational News'.

London frequencies are 125.475 (north of airway B1), 124.6 (east of A47 and south of B1) and 124.75 (west of A47 and south of B1); Scottish ones are 119.875 (to the south), 126.25 (in north) and 127.275MHz (to the west).

Receiver Hardware

Stuck in a block of flats in Preston, I'm not surprised that **K. Sharples** suffers from electrical noise interfering with radio reception. What can be done about it? An outdoor antenna would certainly help, although the landlord won't agree in this case. Presumably, that decision is for aesthetic reasons.

It also helps transmitting antennas to keep interference away from adjacent buildings, a good point to emphasise when a licensed amateur applies for planning permission. I'm not sure that interference is properly a matter for local authorities, but they seldom understand about it. Regrettably, this incorrectly forces amateurs to stick with loft antennas - thus increasing the chance of interference!

Back to reception,

though. KS noted my earlier references to noise-cancelling headsets and wonders if these would help. Well, not really, but there is a lesson to learn from them.

These headsets only cancel out audible background noise, the sort you'd hear if you walked into the cockpit without wearing a headset. They incorporate a microphone that picks up the ambient noise, which is then amplified. You ask, amplified (louder!) noise, what's the good of that? The trick is to make the amplified version of the sound cancel out the original.

This is done by phase reversal and understanding it in full requires delving into physics. If you imagine a sound wave as seen on an oscilloscope, it has peaks that then fall through zero and continue to give a trough (really an upside down peak) before the pattern repeats. If a peak and a trough come along at the same time then, added together, they cancel out. If a signal peak of 1V is mixed with another signal trough at minus 1V, then the sum total is zero.

It's all very well cancelling out background audible noise in this way. The pilots hears the air traffic controller's signal plus amplified noise that's 'upside-down' in phase compared to the audible background noise. The real background noise that gets inside the headset is cancelled by the out-of-phase amplified version.

This has the disadvantage that the headset contains complicated active devices requiring a source of power (batteries, perhaps). Also, important noises such as warning alarms can be difficult to hear. Strange, though, that the crew never miss the purser entering the cockpit to offer them first pickings from the first-class passengers' cheese tray!

Follow-Ups & Foul-Ups

Apologies for misprints in June. Under 'Radio Procedures' if the runway has a significant slope, the **threshold** QFE is stated. This is because each end is at a different height above sea level, hence a different QFE applies. It takes less than 30ft to make 1hPa (hectopascal, was millibar) difference.

'Frequency & Operational News'. In controlled airspace, new reporting points are GILOK, LECKI & KOMOK.

What Lesson?

What lesson can be learned about radio interference? The 'noise' consists of radio waves, emitted by all the modern paraphernalia crammed into a built-up area. Standing in the room, you hear nothing, but, to a radio receiver, all sorts of background interference is there. What KS needs is some sort of antenna that cancels out unwanted interference - just like the noise-cancelling headset gets rid of unwanted background sounds.

On h.f. this can be done. It just so happens that the noise emission from nearby equipment tends to have certain characteristics that distinguish it from the wanted signal. For a start, a particular source of noise would lie in a definite direction, so a directional antenna could reduce the amount of interference received.

Also, and I again draw on some physics theory, the interference will tend to arrive from particular angles to the horizon, again giving scope for discrimination by a suitable antenna. Its polarisation could also be different from that of the wanted signal.

Noise-cancelling antennas usually have a recognisable element to catch the weak, wanted signal. Then there's a smaller element to sample the stronger local noise. Finally, the noise is changed to its 'upside-down' phase before being mixed with the wanted signal.

Don't forget that the wanted signal also contains the noise!

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So, what do we have now? It's (Wanted Signal + Noise) - Noise = Wanted Signal. The subtraction actually means mixing in an out-of-phase 'upside-down' version of the noise. In practice, such devices have controls to get the phasing and amplification just right.

I can't recommend any particular commercial offering, so I suggest you try the various advertisers in *SWM* to see what's available. All replies to readers' letters appear in this column, I regret that no direct correspondence is possible.

Frequency & Operational News

Information from the CAA either in the form of **Martin Sutton**, A/C 57/1998 or **GASIL 3** of 1998.

Aerodromes: Belfast City (wasn't it once called Harbour?) has new a.t.i.s. 136.625MHz. Cardiff loses runway 03/21. Haverfordwest's runway 04/22 became 03/21 when magnetic North moved. Norwich has new a.t.i.s. 128.625MHz. Southport (Birkdale Sands) has been reactivated. I remember seeing flights from there when on family holidays in the early 1960s and my 1968 copy of *Poolley's* lists it. When did it close?

If positioning from Stansted to Gatwick, the Dover or Lydd SIDs are expected. Positioning implies getting an empty aircraft to the correct place to start its next revenue-earning sector; loaded Stansted-Gatwick flights are not anticipated! There was once a Heathrow-Gatwick helicopter service but that didn't last long. At Stornoway the runway 18 localiser (ISV, 110.9MHz) has been withdrawn.

Air-to-Air refuelling areas. Many changes mean that several have been renumbered. I'm not sure how many readers are interested in these, so if you want me to list them all - write in and I will! For further details on anything seen in 'Frequency & Operational News' please write in and don't forget to say which issue of *SWM* you are referring to.

Airways: A new un-named significant point has been

introduced on B3 between the BUZAD reporting point and Brookmans Park v.o.r. beacon. Where UA2, UB4 and UL613 cross the international Upper Information Region boundary in the English Channel off Dover, the point has been named DEVAL. New point (is it, or was there one there some time ago?) KENET is on UG1 between BASET and the Compton v.o.r. New point on UP2 is BUNCE, between NUMPO and NIGIT.

Controlled Airspace: LATCC loses 136.4MHz. Various airways have altered frequency under control of the Bristol Suite at LATCC (i.e. that part of London Airways in the Bristol area, nothing to do with Bristol Airport itself).

Uncontrolled airspace: All aircraft in middle airspace (FL100-240 except Brize Norton, base FL150) are welcome to call the Military Middle Airspace Radar Service. Part of this, Northern Off-Route Co-Ordination Area, was originally called Northern Radar Advisory Service Area. In England, the west is on frequency 135.15 and east 135.275MHz, both London Mil. Scotland is on 134.3MHz, Scottish Mil, a frequency on which Brize Radar also participates in the scheme.

All letters and information received up to June 9 have been included in 'Airband.' The next three deadlines (for topical information) are August 10, September 7 and October 5. Replies always appear in this column and it is regretted that no direct correspondence is possible.



Pottier P170RS.
Christine Mlynek.

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

Satellite TV News

Football, football everywhere, if you like World Cup Football then the mid-June satellite airwaves have been full of it (you can't even escape with Band 1 TVDX as June Sporadic E brings them in as well! - perhaps of more interest to sat-zappers is the newly slotted *Intelsat 801* @ 31.5°W that has produced several UK bound dedicated feeds, there's the 'ITV MCR WC'98' (ITV Master Control World Cup '98) @ 10.968GHz vert. and a 'mobile' SNG truck that appears at 11.026GHz vert which has carried uplink site idents such as 'Scottish Team Hotel' and 'English Hotel', St. Remy de Provence.



Intelsat K produced this test pattern feeding into the German TV network.

Time served s.w.l.s will recall the days of Cold War radio jamming. A more subtle and as yet totally unpreventable form of jamming has now been 'seen'. It's thanks to **Alan Davidson** (Scotland) that an early sighting of the recently launched *NILESAT-1* @ 7°W has been logged and carrying Libyan TV on two transponders (11.859 and 11.974GHz vert) but during the daytime transmissions of June 3/4 jamming on the downlink was noted.

Libyan TV carries extensive coverage of military activity and triumph interspersed with Colonel Gadaffi speeches, clearly this rhetoric isn't favoured by unknown parties who have been uplinking interfering signals onto the satellite which in turn mixes with the 'real' Libyan uplink, the satellite then downlinks corrupted pictures and sound.

I checked out the signals of June 7 and found pictures but



Egyptian Space Channel on Eutelsat 16°E, a concert from Luxor during the desert night, laser beams, the Sphinx and the Pyramids - an impressive setting.

no audio, only modulation-free carriers at 6.6, 7.2 and 7.8MHz. Reception can be touchy since a mega strong Telecom 2A is at 8°W! Last year there were reports of MED-TV jammed on *Eutelsat II F2* from a suspected Turkish uplink site and at the present time the Chinese *Apstar-1* @ 138°E has suffered jamming on a transponder used by AP Holdings for stockbroking and financial data transfer (suggestions of uplink site involvement in Taiwan or Macau).

The evening of May 25th produced a live broadcast concert with an orchestra placed around the feet of the Sphinx at Luxor, Egypt. The Egyptian Space Channel carried via *Eutelsat II F3*, 16°E, 11.178GHz vertical a classical music concert, opera and during intervals the presentation of cultural awards to various individuals.

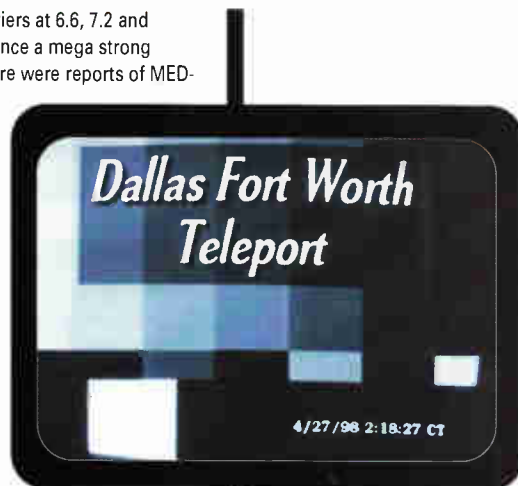
The backdrop of this desert entertainment included the illuminated Pyramids enhanced with laser beams and other lighting effects against a black Egyptian sky. A remarkable and impressive show which was also carried for European distribution over *Eutelsat II F2*, 7°E using SIS (sound in synchs). **Roy Carman** (Sandown, IoW) also viewed the concert and says that Egyptian TV have carried similar concerts from this unique venue in the past.

Satellites are communications tools, unfortunately, they carry bad news as well as good. This was illustrated on June 3rd when a Northbound German express train was derailed South of Hannover and over 100 people were killed. At least two analogue uplink trucks were soon deployed on-site to relay scenes of metal and human carnage to Germany and the rest of Europe.

Major carrier was the *Kopernicus DFS-2* satellite @ 28.5°E and the NDR-1 truck maintained constant picture output up to midnight for at least two days after the crash. During clearance of the debris evening of the 5th the workers gathered round the foot of a rescue crane for some minutes in what seemed an occasion of prayer.

John Womersley (Bradford) is another digital satellite zapper and has sent a listing of input parameters to establish pictures on the Nokia 9600 receiver. He mentions a reliable source of media news - radio, TV, satellite, etc. is *Media Scan* from Radio Sweden transmitted on the 1st and 3rd Tuesday each month in Medium Wave -1179kHz at 1330, 1830, 2030UTC and also at 13°E via satellite - *Eutelsat II F1*, NBC Europe, 10.987GHz vertical transponder on the 7.56MHz audio subcarrier.

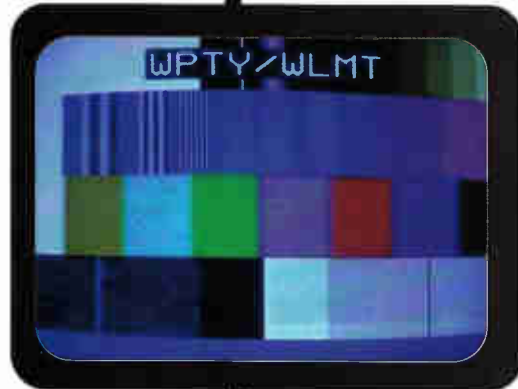
Dean Rogers (Abbeywood, SE2) must be in his



Fort Worth is the home of Tandy - and also a satellite teleport(4)



All sorts of sports appears from the 'USA' destined for the various PAY-TV channels in Europe.



WPTY Ident from WLMT.

heaven now with football everywhere, Dean watches sports across the Clarke Belt and in May through early June found athletics, Grand Prix, tennis and mountainbike trials. The 24 hours *Le Mans* race was extensively featured on several satellites, a BT uplink out of France ended up on *Intelsat K* @ 21.5°W which offered continuous track and pit coverage through late Saturday June 6 up to about midnight UK time, then recommenced early am on June 7.

The night-time racing was a basic coverage of headlight glare though pit action with turbo-quick wheel changes and instant repairs using hand-held cameras was really exciting. (My local garage charges £24 an hour labour, I wish they'd used *Le Mans* engineers - a full service and oil change would cost under £2.50).

A few days earlier the French Grand Prix May 31 dramatic exciting motor bike action on the *Paul Ricard* circuit from midday onwards - again via *Intelsat K* - though it's worth checking the Telecom birds for original uplink offerings from the race track to studio. The latter may of course be in SECAM whereas outbound European feeds will undoubtedly be in either PAL or NTSC.

I'm in the process of re-organising my equipment, a couple of new Manhattan receivers and modifying my larger 1.5m dish for C-Band, as a consequence a couple of my older manually tuned receivers, an SR-50LT and RR-50 have now found homes with Roy Carman and **Jim Scofield**, both on the loW. Roy is another sports enthusiast particularly rugby and football - the 20th May Football Champions League Cup Final was logged on *Eutelsat II F4* - 7°E, Telecom 2C - 3°E, Telecom 2d - 5°W, *Intelsat K* - 21.5°W, *Intelsat 801* - 31.5°W!

Sky News often carry analogue feeds Eastbound from the States on *Intelsat K*, May 22 and a live report in from the latest school massacre, May 24 and violence this time on an EBU distribution feed via 7°E showing scenes of destruction and violence in Jakarta, Indonesia.

Gentler news the same day came just down the road from my location, the end of the Whitbread Round the World yacht race at Ocean Village, Southampton. I noticed two analogue feeds outbound, one a live action OB (outside broadcast) of the yachts returning into the quayside at 11.540GHz horizontal and the APTV (Associated Press) generic feed with commentary at 11.498GHz hor.

Orbital News

Following the division of Intelsat, so Eutelsat have announced that the commercial and regulatory sides of their operation will be split - though still based in France. Proposals will be on the table by mid '99 and in practice by end 2001.

Astra 2A planned for a Proton launch into 28.2°E slot for the start of BSKYB digital has suffered more delays and now it's reckoned to launch by end August. The delays are caused by the problems resulting from the Proton/*AsiaSat-3*, 4th stage booster which failed to correctly orbit the satellite.

A new analogue Astra channel is in the pipeline with an Asian TV service soon - Sunrise Television that operates in London as Sunrise Radio has been offered transponder capacity by SES to target Asian communities and homes across Europe. The Indian satellite service ZEE-TV has gone onto the New York Stock Exchange seeking \$100M to expand their TV empire both across India and overseas.

The Italian PAY-TV digital TV platform Telepiu may be into competition soon with a rival digital service that is being discussed between the state broadcaster RAI and Telecom Italia. Canal+ have considerable financial interests with the Telepiu operation and the new platform will break that monopoly. The RAI consortium have also had discussions with the Canal+ French rival digital platform 'Television Par Satellite' (TPS) with a view to further co-operation between the services.

Hughes Space have received an order of a 15kW HS-702 satellite from Telesat Canada that is reckoned to be the World's highest powered bird. It will carry 48 trdrs in Ku and 36 trdr in C-Band and reckoning an operational life of 15 years. To be known as ANIK-F, the bird will slot at 107.3°W and the high powers required will be obtained from the new high efficiency dual junction Gallium Arsenide solar cells.

Wenlock Burton (Australia) E-mailed to say that the Galaxy Pay-TV satellite operation announced liquidation May 18th after five years owing \$A700M, at the time of writing programmes were still on-air though with only 90,000 subscribers it was likely to close down.

Muppet TV may soon air as Jim Henson/Hallmark are planning the 'Kermit Channel' launching this September initially targetting Central America and Asia with other regions in the pipeline if the channel is popular. The well known Worldwide Television News (WTN) has been bought out by APTV for nearly £35M and maybe absorbed into APTV with many job losses at WTN.

World-wide operates from facilities in both London and New York. FTTV (Financial Times Television) is also to close since it was dropped by CNBC and will cease its London operation by mid July.

Mention above of the loss of *AsiaSat-3* on December 25th last after the 4th stage booster failed has resulted in a replacement *AsiaSat-3R* order from Hughes with the insurance payout. The original *AsiaSat-3* bird went into an unusable orbit and written off.

Hughes now have fired on-board rockets to exit the craft - now called *HGS-1* - from the Earth and to successfully orbit the moon to hopefully achieve an improved orbital path on return to the Earth. The early May salvage attempts were successful, another lunar orbit burn has been actioned to improve still further the geostationary orbit and then to utilise the brand new satellite in a useful telecommunications role.

More solar panel problems aboard the *PAS-6* craft at 43°W which has lost 40% power availability. The co-slotted *PAS-3R* has now been pressed into service downlinking into Central/South America the SKY DTH service. A replacement *PAS-6B* is due to launch Winter '98 though as a temporary measure, dishes are being changed from the typical 900mm to 1.5m types.



21°W digi feed for ABC News, London.



Tara TV on 34°W digi.



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Decode

If you're into the more advanced decoding modes and enjoy the challenge of trying to identify new signals, you'll be interested in some new software. Brown Bear Software have just released a new analysis program called *Analyzer 2000*. This is an amazing product packed with features to help you take apart just about any audio signal.

The program provides fast, high resolution time/frequency analysis of audio signals via the PC's ordinary sound card. The speed of analysis is so good that it can handle real-time signal processing at sample rates from 8kHz right through to 44.1kHz! This is really quick and means it should be able to comfortably handle any data signal that you can find on the h.f. bands.

One of the features that gives this program the edge over some other analysis tools is the versatile display system. This gives you access to several analysis tools at the same time which means that you can identify the signals much faster. In a typical set-up, the main part of the screen is taken-up with a spectrum analyser display. This can then be supplemented with a waterfall style spectrograph immediately below the main screen. This is rather aptly called a sonogram which links well with the sonic signature that it provides. With this sort of analysis power you will not be surprised to hear that *Analyzer 2000* needs a fairly rapid PC.

The minimum processor spec. suggested by Brown Bear is a 486DX100, but you'll get much better results with 166MHz Pentium or better. You will also need *Windows95* or *NT 4.0* as your operating system. The sound card requirements are not particularly demanding with just a standard 16-bit card required. You will also need a modern graphics system capable of running 256 colours with 800 x 600 pixel resolution. Although this is a fairly high spec., prices are plummeting at an amazing rate at the moment and 166MHz PCs are becoming common place. Installing and running the program follows standard *Windows95* conventions, so is very straightforward.

There was also a comprehensive help file to guide you through the program's features. With everything ready to go you can start taking signals apart. When you first start you have to select a signal source - this can be set to sound card or .WAV file. The sound card option is for when you want to monitor and analyse a live signal. The .WAV file option is for processing sounds that have been previously saved in this .WAV format.

If you want to check-out a new signal I would recommend that you start with a .WAV file as you can play and replay the same piece over again until you have it cracked. It's also a good idea to use a .WAV file to find your way around *Analyzer 2000* as it's much more predictable than using a live signal.

If you want a supply of .WAV files for utility signals take a look at the Utility files section of the WUN Web site. Here you'll find an excellent selection of .WAV files covering most of the common complex modes. Once you have your wave file you can use the standard cassette recorder style start, stop and rewind controls to play the signal back for analysis. I've shown a few screen shots of some typical utility transmissions. To help you get started I'll run through how I produced the multi-channel v.f.t. display.

First you need to visit the WUN site and get the appropriate .WAV file. If you want to short-cut the search the full address for this file is

<http://www.gem.net/~berri/wun/files/sounds/usafvft.wav>

With the file downloaded, start *Analyzer 2000*, select wavtbl and the display should burst into life. Before you can start analysing you need to make a few adjustments to improve the visibility of the important characteristics.

First thing to do is hit the Average button or select Average from the Tools menu. This causes the spectrum analyser to average the display which stops it jumping around quite so much. Next you need to go to the Options menu and select FFT Control, whereupon a dialogue box should appear. If it doesn't you may find that it's lurking at the bottom of your screen and you just have to drag it up and maximise it.

The FFT control panel is where you make the adjustments to increase the visibility of the important parts of your signal. The settings to go for are fs[kHz] 11.025kHz (this is pre-set by the .WAV file), Size 2048, Points 512, Overlap 16, Window Blackman. This should produce a frequency resolution of 7Hz and time resolution of 5.805ms.

If all has gone well you should find your display looks very similar to Fig. 4. The next step is to make some measurements to work out some of the important parameters of the signal. First of all you will see that there are 12 channels - the two outer ones show very faintly. This is likely to be due to some over-filtering in the receiver. The next thing to check is the shift used for each channel and the spacing between the channels. This is dead easy thanks to the excellent markers provided with *Analyzer 2000*.

Next, either freeze the display using the View menu, or wait until the end of the file playback. Now just click on the blue vertical marker and move the pointer so that it's lined-up over the left hand centre of one channel, then click the red marker and move it to the right hand centre of the same channel. The coloured display at the top will then indicate the two frequencies and, more importantly, the difference between them.

This is a bit fiddly, but I reckon the shift is close to 50Hz. To measure the spacing between channels you just pick-up the red marker and move it to the left hand centre of the next channel - I make this 210Hz. You can see just how powerful this program is for analysing and fingerprinting data signals. The next characteristic to measure is the baud rate used for each of the channels. To do this you need carry out some 'time analysis' using the sonogram display. The best way to determine the baud rate is to first of all measure the period of the shortest data bit you can find in the signal.

This will in effect be a signal binary digit and we can use this to

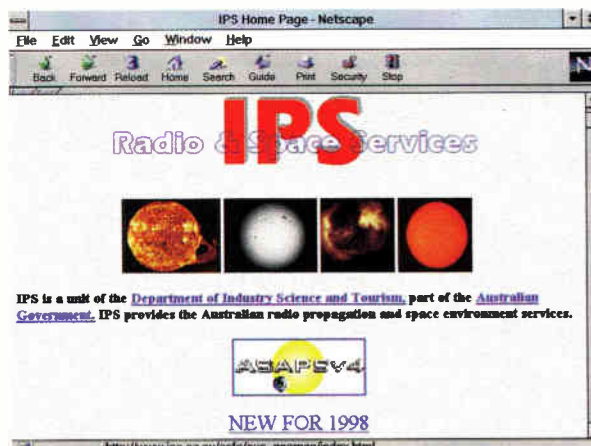


Fig. 1: IPS Web Site.

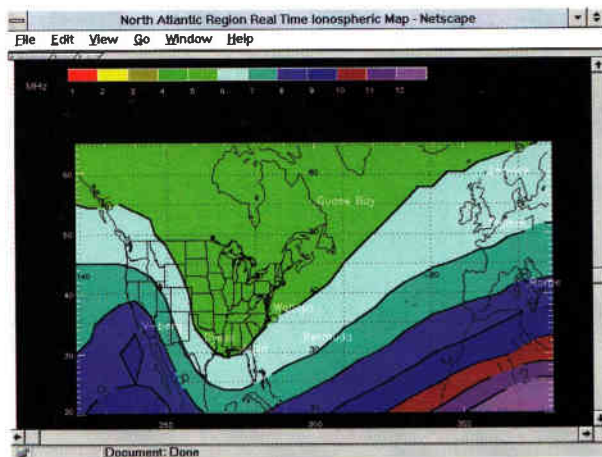


Fig. 2: IPS Real-Time Propagation Map.

calculate the speed. To do this first turn-off the red and blue solid markers by clicking on the appropriate buttons. Now hit the red dotted marker, and move the cursor to the centre of one edge of the shortest bit. Now do the same with the blue marker and move it to the centre of the other edge. You will now find the absolute time shown for each marker plus the all important difference.

When I tried this the difference figure came out at about 20ms. If you then divide this figure into 1000 the result will be the bit rate of the signal e.g. $1000/20 = 50$. If you're finding this a bit tricky try running through the same process but analyse the RTTY file from the WUN site. You should find that uses 850Hz shift and a smallest bit of 20ms so give 50baud. So you can see that, in just a few minutes, you can determine most of the vital statistics of just about any data signal.

Of course, once you've done all this you can switch to your decoder with the correct mode and try and decode the data. However, you will find that most of the fun is in identifying the mode. Once you've mastered the technique of analysis from a .WAV file you can then move on to dealing with signals in real time. To do this you just select 'sndblstDrv' as the signal source. You can also choose to save the live signal if you wish for further analysis later.

To give you a taste of things to come there is a Morse decoder built-in to the program. This is a novel application that uses the analysis software to pick-out and decode Morse signals. The reason I say this is a taster is because there are plans to include an f.s.k./p.s.k. demodulator and 'bit analysis' in a future version. Other goodies to come are a facility to accept a low i.f. signal (11.025kHz \pm 5kHz) for analysis direct from d.s.p. based receivers.

There are also plans for full baseband analysis with constellation diagram, phase diagram and frequency diagram for signal classification. Needless to say, *Analyzer 2000* is not free, but you can get your hands on a demo version that has a self extending start-up delay and the program automatically shuts down after 15 minutes operation. This is plenty enough time to let you see the potential of the program. You can of course re-start the program immediately it closes down. However, there's nothing you can do about the ever lengthening start-up delay. If you want to get the full package, it is very reasonably priced at \$98US or DM180.

To find out more you can contact Brown Bear at: **Brown Bear Software, Thomas Braunstorfer and Martin Hisch, GbR St-Sylvester-Str. 15A 85661 Forstinning** or E-mail: **MHBAER@AOL.COM** and **BTF1@AOL.COM** If you want to try the demo version of the program you can download it from: **<http://member1.aol.com/btf1/Analyser2000.html>** Please note that the last character of btf1 is the number one not an l or ll

SkySpy Update

I've just received an upgrade for *SkySpy*, the excellent ACARS program taking it up to version 1.1. The main benefit of this version is the inclusion of a comprehensive help file that was absent from the initial release. This addition provides essential help for new users and experts alike. If you want to get yourself a copy of *SkySpy* take a look at Pervisell's advert on page 80 of this magazine or pay a visit to their excellent Web site which can be found at **<http://www.pervisell.com>** The current price for *SkySpy* is £24.99.

Sound Source

One of the aids that can really help those new to the data modes is a recording of the various signal types. I say this because by far the best signal analysis tool around is sat on your shoulders! I really mean it. If you ever get the chance to tune around the bands

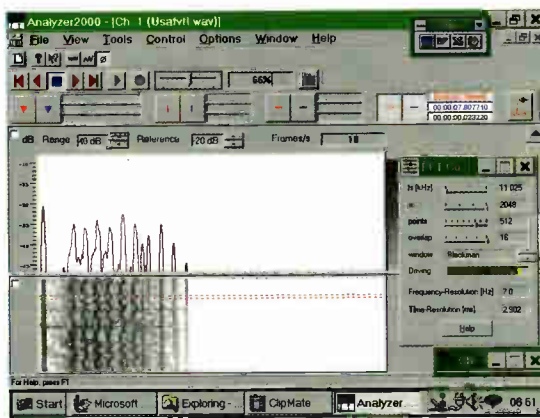
in the company of an experienced listener you will find that he or she can identify most of the modes almost instantaneously. Of course decoding the signals is a different story, but if you can learn to identify signals by ear you will save yourself a lot of time. First of all this skill means that you can quickly identify the particular signal type from all the general mush. But perhaps more interestingly it enables you to quickly eliminate common modes so you can find those new or unusual signals to challenge your analysis skills.

Getting back to the point, there aren't too many sources of data recordings. Probably the most comprehensive is the Klingenfuss double CD. The full title is *CD Recording Of Modulation Types* and it's a very comprehensive collection of data signals that are all properly identified. In addition to helping you learn to recognise the sounds of different signals you can also use the CD to help you get accustomed to your decoder. The ideal way to do this is to play the CD through a portable CD player and plug the 3.5mm jack of your decoder into the earphone jack of the CD player.

The great beauty of this system is that you can keep repeating the same signal till you've cracked the decoding. The only problem with the Klingenfuss CD is getting hold of a copy. Because the market is fairly small very few suppliers seem to keep it. An alternative for those of you with Internet access is to visit the WUN Web site I mentioned earlier.

If you go to the Utility Files, Sounds page, you will find a wide selection of pre-recorded sound bytes for lots of data modes. These can either be played within your Web browser or you can download the files. To do this with most browsers you hold down the shift key whilst you double-click on the icon. Your browser will then ask you to select a directory to save the sound as a .WAV file.

Once you've got the file you can use any standard *Windows* .WAV player to play it back through your sound card. If you have an external decoder you can test it by connecting your decoder to the headphone output of your sound card. If you're running *HAMCOMM/RadioRaft* or other DOS based decoders you can't use the .WAV file to test your decoder.



Propagation On-Line

Regular readers will know that I've featured propagation tools on a number of occasions but most of this has focused on a number of programs that can be run on your computer. However, there is another method available to those of you with Internet access. Take a visit to the Australian IPS page at

<http://www.ips.oz.au/> There you will find a host of advanced propagation information. Not only does this site cover the obvious Australian interest, but you can get data for all parts of the globe. You can even get real-time maps showing all manner of useful data. One that I've shown here is a real-time ionospheric map showing the conditions from London on June 13th. You can even produce customised reports right down to producing a global point-to-point prediction. This latter feature does require a Java enabled browser but is well worth a go.

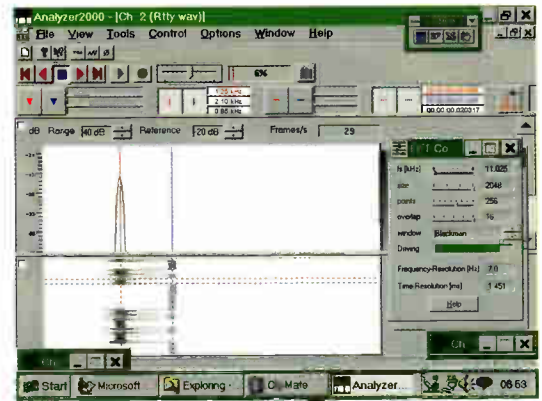
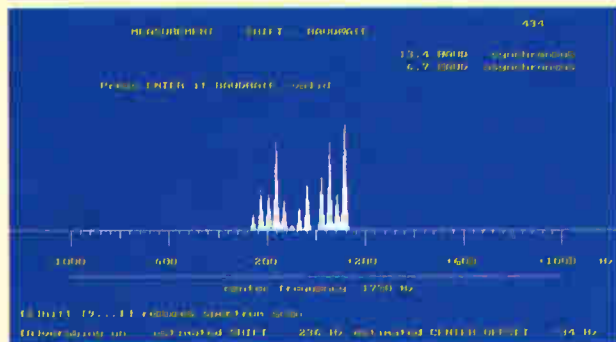


Fig. 3: Analyzer 2000 with RTTY Signal.

Fig. 4: Multi-channel analysis.

At last, you can SEE what you are hearing!



Press F5 and walk into a new world

Decoding what you hear on your radio receiver has been a difficult - and expensive task. You could have chosen black boxes which work - but are limited in their coverage and can soon become near obsolete. You could go the software route, using excellent, but limited shareware programs. Which sometimes need a degree in computer science and the patience of Job to set up and keep in tune. Doesn't it make sense to use the power you already have in your PC? To harness that power and, with Hoka Code3 GOLD's superfast software, plug in to professional style monitoring?

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Info in Orbit

Shortly before the launch of *NOAA-K*, I contacted Wayne Winston, a NOAA/NESDIS meteorologist, who told me that the a.p.t. transmitter would be activated very shortly after launch. The first 'official' images from *NOAA-K* were obtained by NOAA staff on 13 May, from channel 2, one of two visible channels of the AVHRR (advanced very high resolution radiometer), the six channel visible/infrared imager. The image was captured just minutes after the visible channels were enabled - which was approximately two hours after the launch of *NOAA-K*.

Once confirmed in orbit it was renamed *NOAA-15*. The plan is for *NOAA-15* to replace *NOAA-12* as the 'morning' satellite. This is fine for those with high resolution image-receiving hardware (h.r.p.t.) - those transmitters are working fine. Unfortunately, users of the low resolution (a.p.t.) images transmitted in the 137MHz band may find themselves unable to obtain quality images due to the non-nominal deployment of the antenna. We must hope that efforts being made to re-deploy the antenna will be successful.

To identify the region you need a map of the north Pacific Ocean near the Bering Sea. The image shows the southern area of the Kamchatka Peninsula.

The images shown in **Fig. 2** and **Fig. 3** were obtained simultaneously on 21 May and show the same scene viewed



Fig. 1: NOAA-15 first official image from NOAA on 13 May at 2050UTC.

through different sensors. Channel 2 (visible) image is shown in **Fig. 2**, and **Fig. 3** shows the Advanced Microwave Sounding Unit (AMSU) image - centred around 50GHz (50300MHz) - imaging the same region. The AMSU collects radiated data in this microwave region and helps to build temperature and humidity profiles of the atmosphere. Resolution is around 48km.

My thanks to the National Oceanic and Atmospheric Administration (NOAA) for the use of these images.

People equipped with h.r.p.t. systems are delighted with the image quality; I was pleased to receive some high resolution images from **Peter Schoen** of Germany within a few days of the launch. Peter kindly sent several print-outs including **Fig. 4**.

Current WXSATs

In mid-May, without warning, *METEOR 3-5* stopped transmitting. With the additional problems with *NOAA-15*'s a.p.t. we were left for a few days with just *NOAAs-12* and *14*, together with occasional transmissions from *SICH-1*. I logged my longest ever received signal from *SICH-1* on 28 May during a south-bound pass at 1155UTC. Despite the high quality of the signal, I was not able to record or process it due to experiments being made with a second antenna. With the low signal strength from *NOAA-15*, as received on my standard crossed-dipole, I had decided to resurrect my old UoSAT-2 (2m) antenna for some experiments on satellite reception. The experiments were successful - I logged many satellites - but did not have any recorder operating for the unexpected *SICH-1* transmission!

On 3 June a call from **Brian Dudman** of Harrow alerted me to an unexpected transmission from *METEOR 2-21* near the end of its north-bound pass at 1505UTC. When operating, *METEOR 2-21* does not provide a 'clean' a.p.t. signal; it has an antenna problem resulting in irregular reception - similar to that experienced with *NOAA-15*. From that time, *METEOR 2-21* has continued to transmit during the sunlight portion of its orbit. My suspicion is that no official 'commanding' has occurred with either *METEOR* WXSAT. **Figure 5**

Fig. 2: NOAA-15 21 May (orbit 112) showing AVHRR channel 2 (visible).

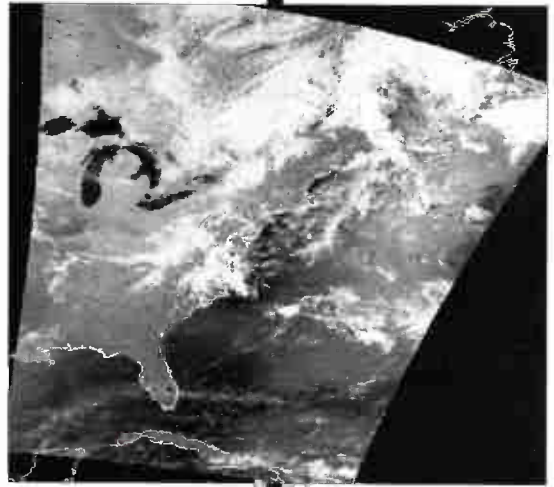


Fig. 3: NOAA-15 uncalibrated AMSU A1 channel-3 image.

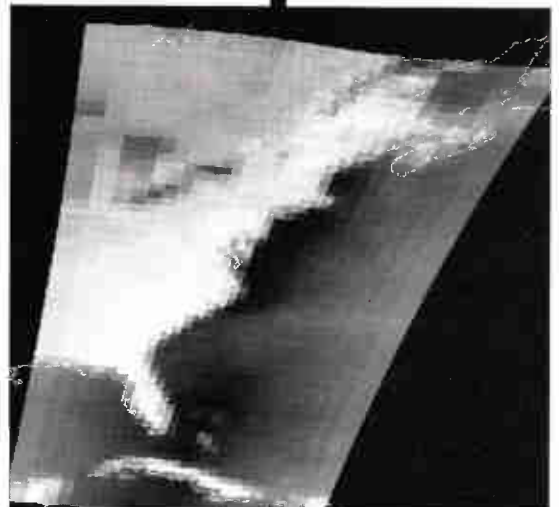
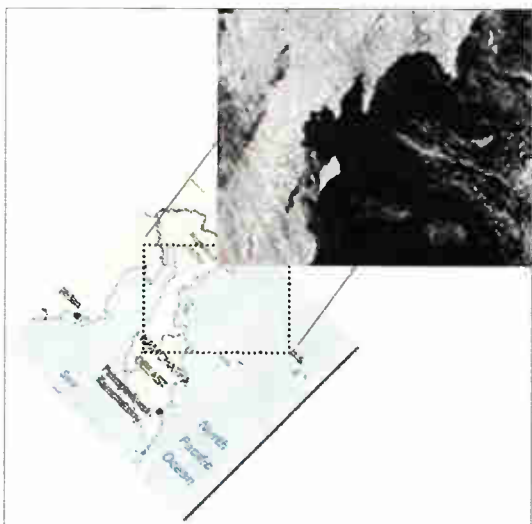


Fig. 4: NOAA-15 h.r.p.t. image of UK on 18 May at 1840UTC from Peter Schoen.



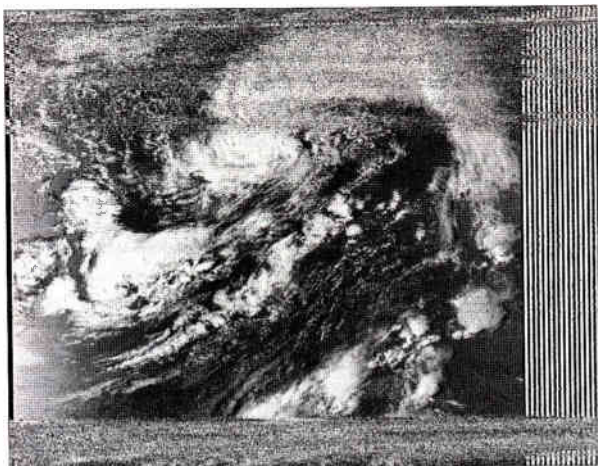


Fig. 5: METEOR 2-21
1645UTC 3 June.

shows the image that I received from the WXSAT's following pass.

RESURS a.p.t. Operations?

It is apparently possible that the next RESURS imaging satellite - due to be launched on 23 June - may transmit imagery in a.p.t. format on 137.30MHz.

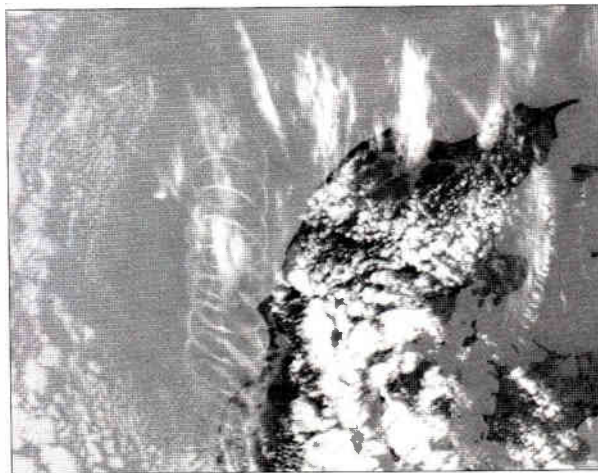
Unfortunately I have

no confirmation of this; the figures available from the official site: http://sputnik.infospace.ru/resurs/eng/resurs_1.htm give 8.192GHz as the official downlink frequency for this series. Keep listening!

The visitor from London

Brian has been a regular correspondent for some years and during a recent journey to the westcountry he popped in for a short visit. Marion (my better half) took a picture of the two of us - see Fig. 6. The Yagi is not easy to see in this picture but it is fixed to a tripod and pointing where no satellites can be heard! If pointed towards the camera, the American GOES-8 WXSAT can be heard! I plan to do a feature on GOES-8 pictures next month - based on my reception from Plymouth.

Fig. 7: 'Contrail'
(h.r.p.t.) over
Denmark from
Dave Cawley.



at the moment covering North Sea/Atlantic approaches".

Ian Solly of Ramsgate uses a PCR1000. He sent some coloured NOAA images, of which Fig. 8 was received on 13 April.

Frequencies

NOAA-14 transmits a.p.t. on 137.62MHz
NOAA-12 and NOAA-15 transmit a.p.t. on 137.50MHz
NOAAs transmit beacon data on 137.77 or 136.77MHz
METEOR 3-5 (or '2-21) use 137.85MHz
OKEAN-4 and SICH-1 use 137.40MHz
METEOSAT-6 (geostationary) uses 1.691 and 1.6945GHz for WEFAX
GOES-8 (western horizon) uses 1.691GHz for WEFAX
MIR uses 143.625MHz for voice.

Frequently Asked Questions

A letter from a correspondent in Leicester posed questions right across the spectrum of WXSAT monitoring. With the hope that the answers

Fig. 8: NOAA-14
13 April from Ian
Solly.



are of interest to people who have only recently started the hobby, I have included some of my responses here.

Footprints:

Q: Why are satellite footprints so much larger than the actual area covered by the picture?

Ans: Two different topics are in-play here. A

satellite's footprint is simply the area on earth over which the satellite is above the local horizon. The size of the footprint is therefore a function of the satellite's height above earth; for example, MIR has a much smaller footprint than METEOR 3-5 because its orbit is so much lower. Some satellites carry imaging equipment designed to scan a specific width of track of land (or sea) below - called the swath width. The specifications of the onboard equipment largely define this track width. If current Kepler elements are used to update a satellite tracking program (hopefully, no more than a week or so old, and definitely no older than one month) then the satellite should be near the centre of the footprint, unless the scanner is offset - as is the case with the OKEAN and SICH radar scanners.



Fig. 6: Brian Dudman and me (right) with Yagi.

Down-converters:

Q: Where can one buy a down-converter? Ans: Good question! These devices are used to convert the 1.691GHz band signal from METEOSAT (down) to 137.50MHz, permitting it to feed a standard 137MHz WXSAT receiver. The output is a WEFAX signal which can be decoded with the usual WXSAT-decoding software. The Remote Imaging Group is developing a down-converter and I hope to have details for inclusion in this column in a later edition.

My own enquiries of four companies listed as producing WXSAT hardware produced an unbelievably low response. Only Timestep Weather Systems replied; I am still trying to establish contact with other suppliers, some of whom appear to have gone out of business. I welcome any comments or suggestions from any readers regarding companies of which I may be unaware.



Fig. 9: MIR.

Sound cards:

Q: Can these really decode WXSAT images? Ans: Yes - with suitable software. You still need a good WXSAT receiver fed by a suitable antenna in order to provide a quality signal. The signal is then fed to the 'line input' of a sound card and a 'WXSAT' sound-card decoding program will extract the image - after all the parameters have been set correctly. The most likely problem scenario is for a beginner to modify a general-purpose scanner to increase its intermediate-frequency bandwidth for WXSAT reception, then to use an unsuitable antenna with a soundcard. No amount of program parameter adjustment can correct for poor quality signals received from a poor antenna feeding an unsuitable receiver!

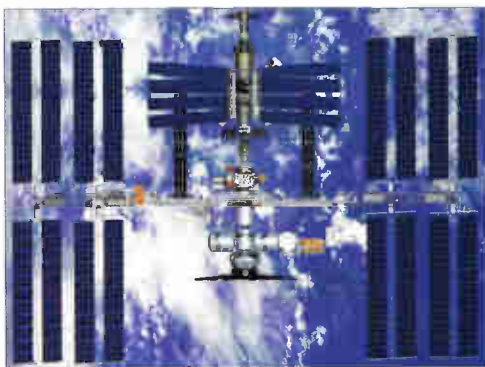


Fig. 10: ISS International Space Station.

Stop Press

NOAA-15

On the morning of 17 June I was amazed to receive an excellent quality a.p.t. image from NOAA-15 at 0755UTC. I sent an E-mail to the WXSAT forum on the Internet, and later confirmation from NOAA was that just two hours prior to my observation, the v.h.f. antenna had apparently 'flipped' into place on its own accord! **Figure 11** shows a section of this first superb image from NOAA-15.



Fig. 11: NOAA-15 0755UTC on 17 June from Plymouth, UK.

NOAAs 9, 10, 11 and 13?

Q: Why can't I hear these satellites when all NOAAs operate on 137.50 and 137.62MHz? Ans: The word missing here is 'operational'. The only operational NOAA WXSATs that transmit on one or other of these frequencies are NOAAs 12, 14 and 15 - as regularly listed at the end of this column. NOAA-13 is totally defunct (battery failure); some of the other NOAAs do have continued, limited operations but do not transmit data on a.p.t. frequencies.

Image differences between satellites

Comment: "The best images seem to be from METEOR. NOAA images are more fuzzy - even on a clear pass." Response: The images sent by the correspondent were provided as printouts, and the writer was comparing NOAA infra-red with METEOR visible. In the early stages of examining NOAA images - perhaps the first use of unfamiliar software - the user must aim to produce two adjacent images from NOAA WXSATs. During the day, one is from the visible-light sensor and the other is an infra-red (thermal) image. Each can be improved by image contrast enhancement. METEOR 3-5 normally transmits visible-light images only (to be accurate, the sensor band is not identical to the NOAA visible-light band) - so these cannot be realistically compared with infra-red images.

MIR - The Future

I am but one of many people who monitor *MIR* both visually (when it comes over Britain during the night while being illuminated by the sun) and by radio (see frequency list at the end of this column). Within a year or two, *MIR* will be replaced by the International Space Station - which will also be visible from Britain. The Russian Space Agency (RSA) currently plans to allow *MIR*'s orbit to decay from its current orbital height (368 to 379km as at mid-June), down to about 150km, at which time the cosmonauts will abandon the station and it will re-enter the atmosphere in some form of controlled descent(!)

International Space Station (ISS)

Representatives of all the nations involved in the International Space Station have agreed to officially target a November 1998 launch for the first station component, and to revise launch target dates for the remainder of the 43-Flight station assembly plan. In meetings of the Space Station Control Board and the Heads-of-Agency on 30 and 31 May at NASA's Kennedy Space Centre, all station partners agreed to target launch dates of 20 November for the Control Module (named *Zarya* - Russian word for sunrise) and 3 December for Shuttle mission STS-88 with *Unity*.

Although the new dates move the launch of the first station component, *Zarya*, from June to November, the target dates agreed upon for many major station milestones during the latter portions of the five-year assembly plan are little changed.

Shuttle Launch Schedule

STS-88 *Endeavour*: scheduled launch date 3 December for the first flight of the International Space Station - *Unity*. Orbit inclination 51.6°

STS-93 *Columbia*: 21 January 1999
Advanced X-ray Astrophysics Facility.

Kepler elements - MIR and Shuttle

1. For a print-out of the latest WXSAT elements, *MIR*, and the Shuttle (if in orbit), send a stamped addressed envelope and secured 20p coin or separate, extra stamp. Transmission frequencies are given for operating satellites. This data originates from NASA. Kepler elements are sent by return-of-post.

2. I also send monthly Kepler print-outs to many people. To join the list please send a 'subscription' of £1 (secured, plus four self-addressed, stamped envelopes) for four editions.

3. You can have the data as a computer disk file containing recent elements for the WXSATs, and a large file holding elements for thousands of satellites. A print-out is included, identifying NASA catalogue numbers (for the WXSATs, amateur radio satellites, and others of general interest), ideal for automatic updating of your tracking software. Please enclose a secure 50p with your PC-formatted disk and stamped envelope.

Attention - 123!

E NIGMA is the European Numbers Intelligence Gathering and Monitoring Association, however, we no longer restrict our interests solely to Europe. Numbers stations operate world-wide, although Europe is, and always has been, the 'hot-bed' of activity.

In April's column we mentioned Britain's own M16, and several readers wrote in to tell us they had monitored E3, Lincolnshire Poacher - named after its tuning signal. These transmissions are primarily aimed at the Middle East and many are jammed by the target country.

Britain's intelligence interests in the Far East are served by E3's sister station, E4, Cherry Ripe - again named after its tuning signal. Both use identical formats: 200 pairs of 5-figure groups lasting 35 minutes, sent in u.s.b. The ten minute tuning period commences on the hour, consisting of the tuning signal interspersed with a 5-figure - not entirely random - header. An original touch is the use of 'chimes' marking the start and end of each message.

Scheduling is quite different for the two stations. Reception of E4 in Europe is variable, and can be good when conditions are favourable. Transmitters are located in the Far East, and our monitors, in Australia, Japan, Singapore and South Korea report strong signals.

The poem *Cherry Ripe* was written by Robert Herrick (1591-1674). Perhaps you can spot the cryptic clue and guess the main target country:

"Cherry-ripe, ripe, ripe, I cry,
Full and fair ones, come and buy;
If so be, you ask me where
They do grow? I answer: There.
Where my Julia's lips do smile,
There's the land or cherry isle,
Whose plantations fully show
All the year, where cherries grow."

At present, transmissions are Monday to Friday only:-

| Time | MHz |
|------|------------------------|
| 1000 | 10.452//15.624//17.499 |
| 1100 | 9.263//14.469//15.624 |
| 1200 | 8.320//12.056//13.866 |
| 1300 | 7.484//11.570//13.866 |
| 2200 | 9.263//12.056//15.624 |
| 2300 | 17.499//20.474//23.461 |
| 0000 | 15.624//19.884//22.108 |
| 0100 | 15.624//19.884//21.866 |

Note that some of these are in broadcast bands!

Live Numbers

Although live announcers are almost a thing of the past - exceptions being the Bored People (V20) and the Babbler (V21) - which may not be a Numbers station - live Morse is alive and well! Stations known to occasionally use live, or recorded hand-keyed Morse at M10, M14 and M53. Towering above these, however, is M1 and its relatives, M45 and M50 (not to mention S21 which is voice-sampled).

M1 is a most complex and very active station, and all its transmissions are sent by hand live. Many schedules operate,

and several formats are used. What we call the 'A' network is the easiest to keep track of, as for over 25 years the schedule has remained unchanged, apart from the dropping of its parallel frequencies a while ago. Six transmissions per week:-

| Schedule No | Sun | Tue | Tue | Thu | Thu | Sat |
|---------------------|-------|-------|-------|-------|-------|----------|
| | 0700 | 1800 | 2000 | 1800 | 2000 | 1500UTC |
| 025 May-Aug | 6.780 | 5.280 | 4.905 | 5.280 | 4.905 | 6.434MHz |
| 463 Sep-Oct/Mar-Apr | 6.508 | 5.474 | 5.107 | 5.474 | 5.017 | 6.261MHz |
| 197 Nov-Feb | 5.465 | 5.320 | 4.490 | 5.320 | 4.490 | 5.810MHz |

A distinctive 'two-tone' modulation is used, the carrier being keyed. At the end of each month, the Saturday and both Thursday transmissions use a different format, conducting a live **two-way** exchange with other operators on another frequency. Keying errors are commonplace, but usually corrected, and unusually for numbers stations, messages are never repeated - all transmissions carry different messages. There is no ordinary 'spy' station.

The 'B' network is much more active and runs many schedules which come and go, some operating annual cycles and parallel frequencies. The 'C' network is rarer than the others and operates no obvious schedule, so is only found by chance. Like 'A' end-of-month transmissions, this uses odd formats and two-way communication.

G2/M4/E23 - Swedish Rhapsody

While on the subject of musical introductions, perhaps Swedish Rhapsody is the most famous of them all. The tune is deceptive, as this station does not come from Sweden, however, its first two letters could be the same! The tune is played on a musical box, which, like the Cuckoo Clock is virtually a national symbol.

Operated by one of the most secretive and little-known organisations, there can be no doubt that the choice of such a seemingly inappropriate melody is no accident. Could a certain part-Swedish arch-cryptographer be responsible for this? Could the little girl's voice which reads out the numbers be the voice of his daughter? We may never know the answers, but we can be sure that everything in the Numbers Station sphere has its purpose - however, purposeless it may seem to outsiders.

This station which has been with us since the early 60s at least, which is noted for its inscrutability - where schedules barely change over the years, and where the ending of the Cold War had no effect on its activity - has recently undergone a radical change. We **may** have heard the last of that familiar musical box and that young fraulein's voice on Mon 18 May at 1300 on 6.507MHz. Ever since then, all voice transmissions have changed their format and use another familiar voice - that of American Cynthia! Signals of turmoil began on 6 April when transmissions were completely rescheduled.

The new schedule seems to have settled down now and is still on a monthly basis and still includes Morse transmissions. Activity seems to be restricted to Mondays, Wednesdays and Thursdays between 0800 and 1400. All transmissions are 45 mins duration and start on the hour. Frequencies are the same, those noted so far being: 4.832, 5.340, 5.748, 6.200, 6.507, 7.250, 8.188MHz. Any logs would be appreciated.

ENIGMA Booklet

As numbers stations rarely identify themselves and all behave differently, the subject can appear very confusing. To help simplify identification and scheduling, we are producing a reference booklet, which will also give advice on how to find some of the more elusive transmissions. Please contact us at the above address if interested.

Many thanks to all those who have written in, especially: **John** (Cheltenham) for hints concerning Swedish Rhapsody, **EB** (Warks) for locating another M23 schedule and **Vassily** in Moscow for translating the Buzzer message - which we'll publish in full next time around. **JN** (Cumbria) - the Spanish station you heard on 5.417 at 0700 is V2 using its regular Sunday slot. (It normally sends three messages, each of 150 groups). Both V2 and its Morse equivalent M8 are very active.

Faders Located!

Thanks to **RN** (Bucks) we can now confirm that these mysterious transmissions - as covered in our last column - are operated by US Air Force. The small h.f. site at RAF Mildenhall is the source of faders on 9.125/9.126, 6.875 and 5.347MHz. Sometimes operating two in parallel. These 7.5s bursts of an unknown mode, appear to sometimes receive 'replies' from distant sites.

Another, very likely site is the large USAF transmitting station at Barford St. John, heavily

used by the US State Dept. and CIA, but this hasn't yet been checked. Can anyone in MilAir circles enlighten us further?

While on the object of odd noises, can anyone help us with The Pip (XX). This is another of those seemingly pointless signals - consisting of nothing more than an endlessly repeating amplitude modulated 'pip'.

Pips are sent at the rate of 65 per minute, the carrier remaining off during the intervals. It tries to give the impression it is a time signal. It is not. Best reception is European evenings and

early mornings. Operates on 5.450MHz 0530-1400, then on 3.757MHz 1400-0530. Amateurs using the 80m band must be very familiar with it.

We recently had a report that a break in transmission was followed by a short message delivered by a male Slavic speaker. It is possible that the Pip could be related to the Buzzer (S28/XB) which we mentioned in April. Talking of which, does the 'word' BROMAL mean anything to anybody? It certainly does to the operators of the Buzzer.

DX Television

Multiple Sporadic-E openings to the Middle East has made May 1998 seem the best introduction to a DX season ever! Openings to the south-east and into Eastern Europe have predominated, although many of these have been short-lived.

Tropospheric reception at u.h.f. has produced some outstanding signals from Scandinavia and Germany. Consequently there are lots of interesting reports. In addition, there were also reports of TEP (Trans-Equatorial Propagation), Meteor-Shower and Auroral activity during the month, the latter noted in Finland by **Perti Salonen** on May 5th.

Logos

As anticipated, many stations have changed their on-screen identification logos, particularly those in Eastern Europe. Most seem to share a common theme - a number one!

Mystery logos include a striped '1' on Channel R2 (top-right), thought to be YT-1 Ukraine. Enthusiasts should note that Moldova are using two new stylised logos both featuring the letters 'tvm'. They no longer identify as 'TRM'.

Arabic Highlights

So far, SYR-2 Channel E2 from Homs in the north-west of Syria has been the star performer here in Derby. Identified at least four times by its large and distinctive L-shape logo in the lower-left of the screen, it has been logged more times than Spain!

On May 27th the same Syrian programme was also present an E4 which is rather a mystery since the E4 outlets broadcast only the first network. Perhaps both networks combine during the morning period. A similar event occurred last year.

On the 19th at 0531, Arabic text was found lurking beneath the Serbian news programme. When the signal fully emerged there was a scene showing a man wearing a T-shirt sporting Arabic wording.

In the top-left of the picture a broken ellipse logo was present. A similar logo is used by Turkey's TV6 network which has a transmitter on E3 but if Turkey was its origin the Arabic text is somewhat a mystery.

Mystery E2 Signal

A cartoon emerged on Channel E2 during an opening to the Ukraine on May 17th at 1501. The sound channel seemed to be of Slavonic origin and a white '1' logo appeared in the top-right of the picture.

Tim Bucknall (Congleton, Cheshire) saw a similar signal and thought it was Portugal. However, the Portuguese 'RTP' logo sits in the top-left of the screen. The direction of the

signal here seemed to peak to the east/south-east. A similar E2 signal was noted in 1996.

Sporadic-E Reports

May 19th was quite eventful despite the unearthly hour when the opening began! At 0331, Italian RAI UNO signal were seen on IA and IB. By 0531, Serbia (RTS-1) was established on E3 with the 'BECITA' news programme but in the background a second signal with Arabic script was observed.

Over on E4, Croatia (HRT-1) was strong with 'Danas' schedules followed by their Breakfast TV show called 'Dobro Jutro' (*Good Morning*). By 0556, Slovenia (SLO-1) had taken over E3 with panoramic views and weather reports from various tourist resorts and towns.

Peter Barber (Coventry) spotted this one sporting an additional logo consisting of two flower petal shapes in the top-left quadrant of the picture. Early morning cartoons from TV Nova (Czech Republic) were seen at 0640 by **Stephen Michie** (Bristol).

The new RTL Klub network came through later on R2 at 0655, identified by **Stephen Roger Bunney** (Romsey, Hampshire) also reports this new signal.

Simon Hockenull (Bristol) also logged this and a co-channel signal from Moldova with a 'tvm' logo and clock two hours ahead. By 0800, private Italian stations VIDEO (on Channel E2) and TVA (Channel IA) with its 'Napoli' identification symbol were logged, along with the return of RAI UNO on IA and IB.

At 0837, a weak E2 signal was located and when it emerged from the noise, the 'Syria' logo forming an L-shape in the left of the screen was seen. Although struggling to attain P2 quality there was no doubt about its origin. By lunchtime, Norwegian and Swedish signals dominated Channels E2, E3 and E4.

An opening between 0730 and 1600 was experienced on the 29th. At 0730, weak signals from Syria on E2 were discovered lasting well over an hour. Italian RAI UNO signals then emerged (on IA and IB) accompanied by Serbia E3 and Croatia E4 around 0845.

Peter Barber (Coventry) resolved signals from VIDEO, the Italian private station broadcasting from Ercolano in the Naples area. This operates with quite a large frequency offset and is visible just below channel E2.

German ARD-1 signals were also present on E2 at the time and could easily be separated from the Italian transmission using a D-100 Converter set for narrow-bandwidth i.f. By 1000, Croatia E4 and TV Nova from the Czech Republic on R2 were present.

By 1156, Lithuanian R2 was identified by the distinctive square clock with LTV logo finally going onto programmes at 1200. An Arabic programme from Syria re-appeared on E2 complete with sound lasting almost 30 minutes before being swamped by tennis from Sweden.

At 1220, over on R2, colour bars with a tone were resolved. This signal is thought to have originated in Belarus. This was replaced with Moldova using two different logos. Both featured the letters 'tvm' in the top-left of the picture but the style of the letter 'v' differed.

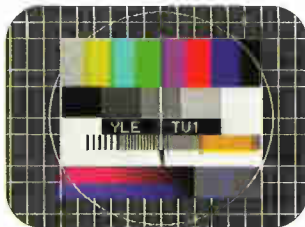


Fig. 1: The FuBK electronic test card radiated by YLE TV1 in Finland.



Fig. 2: Identification caption used by the Finnish MTV-3 network.



Fig. 3: The MTV-3 FuBK from Finland.



Fig. 4: Identification caption used by the bilingual Finnish/Swedish TV network, FST.

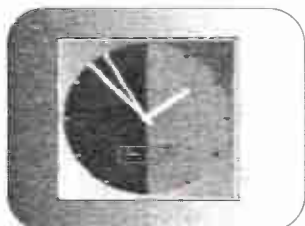


Fig. 5: Clock caption received on May 27th from LTV Lithuania.

Moldova was also seen on R3 before being replaced by Rumania. From 1350, Peter Barber watched extended reception from Norway showing football, ballet and a film.

Tropospheric Reception

Between May 9th and 21st, the UK was awash with strong tropospheric signals, particularly down the east coast. During this period, **Tom Crane** (Hawkwell, Essex) successfully identified local Dutch stations TV Zeeland (E54), TV Gelderland (E58), TV Drenthe (E25), TV Flevoland (E26), TV Noord (E36) plus the Belgian low-power Télé Bruxelles relay on E36.

On May 19th, German stations VOX (E57) and RTL+ (E52) were resolved. WEST-3 signals were so strong on Channel E53 that his local Dover Ch4 picture was demolished! On May 18th at 2300, Tom Crane noticed a twirling satellite antenna logo on E36 and thinks this could have been TV Oost, another Dutch private station.

Dutch stations were also identified by **Peter Barclay** (Sunderland). These included TV Drenthe (E25), TV Friesland (E28) and TV Noord (E36). Peter wrote to say that many German and Danish signals remained throughout the night on May 16th. From 1800, Danish TV-2 UHF signals were located on Channels E22, E26, E27, E28, E30, E33, E35 and E40.

Martin Dale (Stockport) reported Irish stations between May 12th and 17th in Band with RTE-1 on Channel E and E29 plus NETWORK-2 on Channel H and E33. On May 12th, Stephen Michie (Bristol) spotted an unidentified Dutch regional station on E35 showing text, possibly TV Noord.

Ian Milton (Ryton, Tyne and Wear) reports many Swedish and Danish stations during the period. On the 17th at 0920, a mystery station on Channel E50 emerged for about five minutes with a logo resembling LTV which is used by Lithuania TV.

The most interesting aspect was the sound spacing of 5.5MHz rather than the System D/K spacing of 6.5MHz. The only station we know operating in the Baltic region which has adopted the Western European 5.5MHz spacing with PAL colour is Tallinn on Channel R45 relaying TV1 with 600kW e.r.p.

More TEP

In northern India, **Lt. Col. Rana Roy** has experienced more TEP (Trans-Equatorial Propagation) reception from south-east Asia with no fewer than thirty-five sightings since the end of March. These are thought to have originated in Thailand and have occurred between 1400 and 1800, local time with characteristic smeary and fluttery images. Only on a few occasions has the propagation supported the sound channel.

Sporadic-E activity occurred on May 14th at 1845 with an unidentified CIS station on Channel R1. There was an identification logo in the lower right-hand corner which looked like 'AK'.

FM Reports

Mike Gaskin (Cornwall) reports Spanish and North African f.m. stations on May 21st and 27th and Swedish and Norwegian outlets on the 29th up to 1300. Tim Bucknall (Congleton) was holidaying in Pembrokeshire at the end of May in a rather secluded spot void of local signals.

Many Irish stations were present including WLR on 97.5MHz from Waterford and County Sound on 103.3MHz from Cork. On May 24th at around 2000, Spanish and French stations were heard.

May Sporadic-E Log

The collective log includes reports supplied by **Stephen Michie** (Bristol), **Ian Milton** (Ryton, Tyne and Wear), **Peter Barclay** (Sunderland), **Simon Hockenhill** (Bristol) and **Peter Barber** (Coventry). All times are shown in UTC.

| Day | Log |
|-----|---|
| 1 | Spain (TVE-1) E2 and E4 between 1430 and 1730. |
| 3 | Italy (RAI UNO) IA; Unid Coloured news reader from south-east at 0935. |
| 4 | Netherlands (NED-1) E4 with 'ZENDER LOPIK' FuBK test card at 0430. |
| 5 | Germany (ARD-1) E2 'Wetter' caption/weather forecast 0355-0405; Spain E2 'Telediarío' news at 0631; Unid RI and R2 at 1000. |
| 6 | Italy (RAI UNO) IA and IB at 1000. |
| 12 | Italy (RAI UNO) IA and IB and Italy (VIDEO) E2 at 2058. |
| 14 | Spain E3 1922-1924. |
| 15 | Portugal (RTP-1) E2, E3 and E4 from 1525; Spain E2, E3 and E4 from 1645. Italy (RAI UNO) IA; Italy (VIDEO) E2 from 1749. |
| 17 | Denmark (DR-TV) E3 with PM5534 test card at 0637; Italy (RAI UNO) IA at 1416; Rumania (TVR-1) R2 at 1416; Unid E2 cartoon with Slavonic sound at 1454 from south-east; Unid R2 with 'YTH' news and striped '1' logo top-right at 1454; Italy (VIDEO) E2 at 1526. |
| 18 | Norway (NRK-1) E2 with 'Steigen' PM5534 at 0730. |
| 19 | Italy (RAI UNO) IA and IB at 0331; Serbia (RTS-1) with 'BECTH' news at 0531; Arabic signal on E3 with ellipse logo at 0532; Croatia (HRT-1) E4; Slovenia (SLO-1) E3; Hungary (RTL Klub) R2; Czech Republic (TV Nova) R2. |
| 20 | Serbia at 1645. |
| 23 | Italy (RAI UNO) IA and IB at 1620. |
| 25 | Denmark E3 on PM5534 at 0948; Sweden (SVT-1) E2 educational programme with 'UR' logo; Finland (YLE-1) E3 with 'YLE TV1' FuBK test card at 0715; Norway E4 with 'Hadsel' PM5534 at 0904. |
| 26 | Norway E4 at 0937; Denmark E3 text pages at 1245. |
| 27 | Syria (SYR-2) E2 0805-0845; Syria (SYR-1) E4 0815-0835; Ukraine (YT-2) R1 with '1+1' logo from 1720; Italy (RAI UNO) IA at 1726; Rumania (TVR-1) R3 at 1740. |
| 28 | Italy (VIDEO) E2 at 0455. |
| 29 | Syria (SYR-2) E2 0730-0840; Italy (RAI UNO) IA and IB from 0845; Italy (VIDEO) E2; Serbia E3; Croatia E4; Germany (ARD-1) E2; Czech Republic (TV Nova) R2; Lithuania (LTV) R2 with clock at 1156; Denmark E3 and E4 at 1220; Moldova (TVM) R2 and R3; Rumania (TVR-1) R3; Ukraine (YT-2) R1 with '1+1' logo; Norway E2 from 1350. |
| 31 | Italy (VIDEO) E2 at 1745. |



Fig. 6: RUV programme schedule received via Sporadic-E from Iceland.



Fig. 7: Programme from Syria, with L-shape identification (vertically in English and across in Arabic) in the lower left-hand corner, received in Derby during May.



Fig. 8: One of the new series of logos introduced by Central TV in the Midlands. This one, showing smoke rising from a chimney forming the letter 'N', is often shown prior to Coronation Street.

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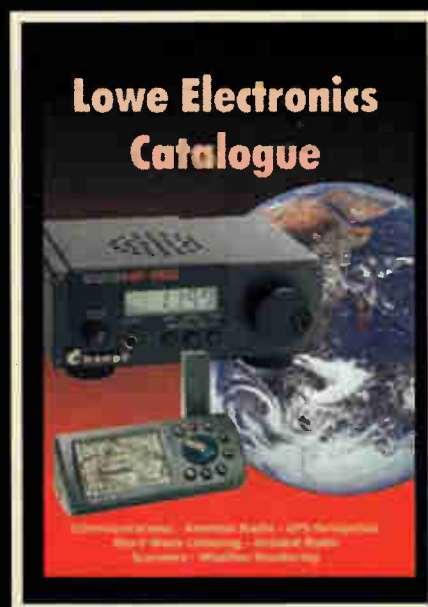
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Mr Brown's experience is probably the reason why.



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Introduction

Hello and welcome to the world of scanners and scanning. We, here at *Short Wave Magazine*, have produced this booklet for both newcomers and old hands alike. Hopefully there is something within its pages for all of you. Unfortunately it is beyond the scope of such a small booklet to explain all the 'ins and outs' of a subject so vast as scanning. This short introduction, however makes an attempt to answer some of the most fundamental questions.

There are books dedicated to the subject and these include frequency guides, explanations of radio communication systems in general, and specifics related to monitoring specific services. What I intend to do here is to provide a starting point. By using the increasingly popular format of the FAQ (frequently asked questions), I hope to enable you to quickly get an idea as to what the hobby of scanning is all about.

Also included in this guide is a digest of past reviews of current scanners, both hand-held and base station.

For those of you who like to experiment there are two classical scanning antennas. The ubiquitous discone for non-directional listening and a log periodic beam for directional use. Both of these antennas are much cheaper than their commercial alternatives and should give the brave amongst you hours of 'playing' and learning.

Scan 98 SWM

Scan 98 FAQ Is Scanning Legal?

You can legally buy and own a scanner. You can use it to listen to broadcasts from the world's many broadcasters, both radio and TV - though you won't see a picture. You may legally listen to radio amateurs in conversation with each other around the world on a variety of bands ranging from long waves to microwaves. For most of the population - that's it! Generally speaking everything else is illegal including listening to CBers doing their thing, too.

The actual position in law is something like this. You may not listen to any service or part of the spectrum unless you possess a licence to do so. The DTI have a leaflet, *RA169*, which explains. This document in turn refers you to the *Wireless Telegraphy Act* section 5(b). It is this somewhat aged act that governs the monitoring and interception of radio signal and traffic in the UK. There is another act of Parliament the *Interception of Telecommunications Act*, that also governs radio interception and this relates specifically to Cellular Telephones.


So, it all looks pretty grim for *SWM* readers and scanner owners. This need not be the case. The key to this hobby is discretion. If you don't tell anyone what you've picked-up, then no-one will know! So using your scanner discretely and wisely allows you to gain maximum enjoyment and return on your investment in the latest radio.

It is also worth noting that, technically speaking, sharing information

In basic terms a (radio) scanner is a self-contained, computer controlled radio. They come in two basic types, hand-held and base station.



Technically speaking, sharing information with others can be considered as incitement to commit an offence. So the utmost care is required with this hobby.



with others can be considered as incitement to commit an offence. So the utmost care is required with this particular hobby.

I will observe however that those who would bring a prosecution about have far better things to do than hunting down casual users of scanners and other monitoring equipment.

If, on the other hand, your interest in interception is somewhat more sinister and you wish to turn anything you may hear into personal gain, then watch out!

So, everybody with an interest in radio monitoring, please take this advice - be careful.

What is A Scanner?

In basic terms a (radio) scanner is a self-contained, computer controlled radio. They come in two basic types, hand-held and base station.

What Frequency Coverage Do I Need?

Well that depends on what you want to listen to. If, say, you know for sure that you only ever want listen to civil airlines in the UK and an airport just down the road from your home, then you will only need a receiver that covers a limited chunk of the whole spectrum. Specifically 108 - 137MHz. You will only need a receiver with an a.m. detector as this is the mode used by aircraft and ground stations.

All well and good then! Just so long as you **know** that you won't ever get tempted or interested by anything else - can you be sure?

My own opinion is that, if you are a raw beginner, then acquire, as cheap, as possible, a set that will cover your primary and initial area of interest. Use this set to develop you knowledge and skill. You will then be in a position to make a much more informed judgement as to what parts of the spectrum hold your interest. Don't

forget to keep your eye on the 'Trading Post' in *SWM* and 'Bargain Basement' in *Practical Wireless* for those cheap starter scanners. You'll be amazed at how cheaply you can get going.

What Does Search Mode Do?

On most recent scanners, the user is provided with the ability to manually tune the radio to a directly entered (via the keyboard) frequency. This is useful if you want only to monitor one frequency. Most of these sets also allow you to tune up and down in frequency by a selectable step size. Such as 5, 10, 12.5, 25kHz and so on.

The Search facility provided by these radios is an extension of this feature, which allows you to define a lower and upper frequency limit and set the scanner automatically stepping between these boundaries. Usually you are able to set the scanner running up or down (incrementing or decrementing the current frequency value by the step size) once the other limit is reached the whole process starts again.

If a signal is received (or rather present on one of the stepped frequencies when that frequency is selected) during the Search sequence and it is strong enough to 'break' the squelch then the scanner will stop its sequencing. This may be momentarily or until the user instigates the search to be continued or until the signal disappears - this is radio and setting dependant.

It is common to use search mode to identify frequencies of interest for subsequent programming of the receiver's Scan memories.

Isn't That Scan Mode?

Scan mode differs some what from Search mode.

Originally, in the dim and distant past, scanners were rather more simple that the radios that they have now evolved into. Early scanners consisted of a few, ten or so, memory



Search And Rescue operations, motor sport events, large industrial site communications to name but a small selection. The fun is finding things in your area.

locations into which frequencies could be programmed. There was no direct entry without actually programming a memory location. These scanners would only, in fact, cycle around their bank of memories. This is just what scan mode on the latest types does too. These days, the user is able to select one or more of the many banks of memories provided by the latest radios, 1000 memories is nominal, and set the scanner running through. With each step the content of each memory is loaded into the synthesiser (the part of the scanner used to control the frequency being monitored) and for a preset time the scanner stays on that channel then moving on to the next and the next and so on. If a signal is present then it will be heard, just so long as it can 'break' the squelch.

Unlike older radios, today's sets allow a whole host of parameters other than frequency to be programmed into the memory locations, this such as bandwidth, mode, descriptive text on more expensive (£1000+) sets a.f.c., to name but a few.

Since modern scanners have many - typically ten - banks it is possible on some models to enable two, all or somewhere in between, of the banks for a scan session. This is a useful feature as it allows you to plan groups of frequencies around certain banks. For instance, you might have all the local ground-to-air frequencies in one bank and the coast guard frequencies in another. If you happened to want to listen exclusively to these two types of transmission, then you could select the two specific banks only.

What Can I Listen To?

In theory, if a service is using radio communication within the spectrum covered by your receiver, then you will be able to **detect** it. Just so long as you are 'in range'. Quite a sweeping statement, and there are a lot of qualifiers and exceptions - as you might expect. Once you've excluded

all the special cases, which takes us back to the scope of this booklet and not having the room for all the details, then that still leaves a very large array of transmission that you can both detect and resolve - actually listen to.

A quick look though the *UK Scanning Directory* - see the rear of this guide for details - will show you the full extent of what's out there. But to summarise the types of transmission that don't need more than just a scanner and some (lots) patience.

It is worth pointing out at this stage, that signals that are generally of interest to scanner users are both v.h.f./u.h.f. that is above 30MHz in frequency and are relatively low powered. They also tend to utilise omnidirectional antenna systems, (not beams). These factors conspire, especially when the listener uses a set-top antenna, like the one supplied with your scanner, to limit the range of usable signals to about 12-16km.

This is a rule of thumb, but to better it requires work on your antenna system. Both v.h.f. and u.h.f. signals can be considered as 'line-of-sight' only. This is not strictly true, and there are various modes of propagation that increase range, but for now we will consider it to be the case.

Okay, ground rules set, what traffic is it **possible** to listen to? Aircraft, civil and military, airports tower, radar, ground crews, taxis, outside broadcasts, radio microphones, security guards, emergency services, breakdown services, delivery services, satellite up/down links, military exercises, air cadets, Search And Rescue operations, motor sport events, large industrial site communications to name but a small selection. The fun is finding things in your area.

Please don't forget to enjoy this hobby to the full discretion is the key.

Now read on and enjoy. 73 (best wishes)
Kevin Nice G7TZC BR596787
Editor Short Wave Magazine

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Alinco DJ-X10 Wide Band Communications Receiver



Alinco is not usually one of the first names to spring to mind when enthusiasts discuss scanning receivers. However, they have been around for some time now, and although their previous offerings have not sold in particularly large volumes, things may change with the introduction of the DJ-X10.

It's Got The Looks

The styling of the unit is different from the usual offerings, with its black, orange and gold colour scheme. The outer case measures approximately 60 x 150 x 30mm with a strip of four rubber function buttons and the volume and squelch controls down the left hand side. The front fascia is split into three main sections with the numerical keypad occupying the bottom third, i.c.d. display the middle and the speaker grill, power and additional function buttons filling the remaining space at the top. The top of the case has a BNC antenna socket, external speaker and 'Clone' sockets and a multi-function rotary control knob. The right hand side of the case has a socket for external power, whilst the rear of the case features a battery pack release catch and belt clip fixings. The supplied NiCad battery pack forms part of the case and is very securely held in place by a latching mechanism. It has external charging con-

nections and fits very neatly into a special desk mounting charger unit, which is supplied with the receiver. I liked this idea, but I would have preferred it if the scanner had been positioned at a slight angle to make the display more readable and the bottom row of keypad buttons more accessible.

Second Functions

As with all hand-held scanners most buttons have second or third uses,


which are enabled by pressing a separate function button. This is located at the top of the strip of four buttons on the left-hand edge of the receiver, the other three buttons being used to activate the monitor, bandscope and backlight functions. In use I found the size and location of the function button to be a bit fiddly, although I was pleased to find that it had a 'Latching' action which made second function operations that bit easier to perform.

Another slight criticism was the liberal distribution of controls around the edge of the loudspeaker grill. These are used to enable the scan



Alan Gardener has been putting the new Alinco DJ-X10 Wide Band Communications Receiver through its paces.

"I would have preferred the greater level of prominence to have been reserved for other controls such as the function button."



programming, v.f.o., and memory modes. I found the location of these buttons a bit confusing and would have preferred the greater level of prominence to have been reserved for other controls such as the function button. I also found cancelling some of the modes of operation a bit confusing. For example, one type of search could be cancelled by pressing the same button, whilst another required the v.f.o. button to be pressed. I guess that, in some respects, this criticism is just down to personal taste.

Main Features

The DJ-X10 has all the features you would expect from a radio in this price range, including frequency coverage from 100kHz to 2GHz, reception of a.m, n.b.f.m, w.b.f.m, u.s.b, l.s.b. and c.w., Preset tuning step sizes of 50Hz, 100Hz, 1, 2, 5, 6.25, 9, 10, 12.5, 15, 20, 25, 30, 50, 100, 125, 150, 200, 250 & 500kHz. Beginner mode, Help menu, Auto Bandplan mode and step size adjustment, On/Off Auto Timer, Clock, Key Lock, Priority Watch and Attenuator. A couple of points to note are that the 8.33kHz step size recently proposed for aircraft communications is not included and my attempts to offset 25kHz channel spacings by 12.5kHz were strongly resisted.

A nice touch is the inclusion of a 'help' menu. This is intended to give a useful reminder of how to enable certain functions, which should be of particular interest to new owners.

Memories

The DJ-X10 has 1200 memory channels arranged in three sets of ten banks with 40 channels in each bank - additionally each memory is capable of being alphanumerically tagged with a description of up to eight characters. Scanning modes include: 'Memory Scan', 'Programmed Memory Scan', 'Selected Mode Scan' and 'VFO Scan' as well as the more usual search facility for locating new frequencies complete with auto-memory write function. The auto-memory write function

worked well with lots of local signals being automatically stored in one of the memory banks. All the usual memory functions are present, with the ability to 'link' or 'lock-out' various permutations. A number of special 'set' menus are used to enter, edit and copy memory contents. I found it took a bit of time to initially get used to some of these menus. However, after a while it became almost second nature and I soon found that I could quickly manipulate memory contents. The number of memory locations available to the user can make the maintenance of contents difficult, especially if you need to reload all of them from scratch, perhaps after pressing the reset button. This is where a computer interface can come in handy, and although the user guide makes reference to a 'clone' function, I was not able to obtain any further information about its facilities or any ability to interface the radio to a PC. (*Nevada have informed us that Alinco are currently working on a PC program for this scanner and expect to have it ready in the near future. Ed.*)

Display

The liquid crystal display shows a lot of information, including frequency, channel number, mode, volume and squelch levels as well as providing a bandscope facility which allows you to 'see' activity upto 40 channels away from the received frequency. Unfortunately the amount of space available to each of these functions is a little bit limited and when added to the rather restricted viewing angle of the display it does make reading some of the information difficult. This is made worse by the fact that Alinco have only chosen to make the display contrast adjustment operate only in the 'Demo Mode'. This can be very frustrating. (*Nevada have pointed out that the contrast can be set and stored to the operator's personal preference. Although the display is typical of an l.c.d., they have noticed that artificial lighting can cause glare due to reflection from the display front. Rotating the set slightly so that the light doesn't hit the display at right angles can help. Ed.*)

Unlike some other hand-



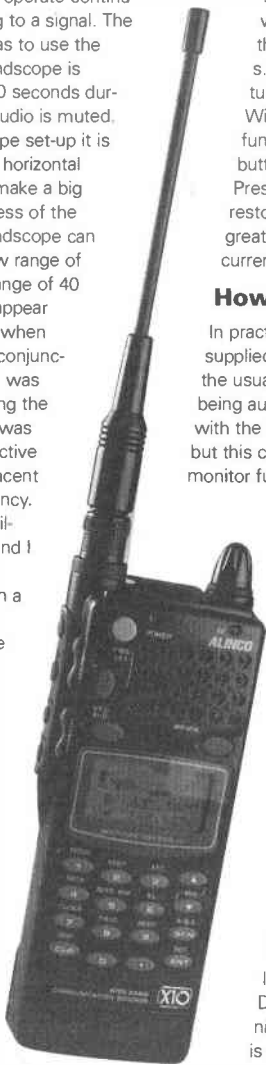
holds the bandscope cannot operate continuously whilst you are listening to a signal. The best compromise I found was to use the interval mode where the bandscope is updated about once every 10 seconds during which time the receive audio is muted. By fiddling with the bandscope set-up it is also possible to improve the horizontal scale resolution, which can make a big improvement to the usefulness of the display. The range of the bandscope can be toggled between a narrow range of seven channels or a wider range of 40 channels. Watching signals appear and scroll across the screen when the bandscope was used in conjunction with the search function was very entertaining, and by using the combinations of functions it was possible to jump quickly to active frequencies on channels adjacent to the current receive frequency.

The search functions available were well thought out and I particularly like the ability to quickly set-up a search within a pre-set range by setting the upper and lower limits on the twin v.f.o.

Where Are The Knobs?

One of the features I liked the most was the lack of the rotary volume and squelch controls. Alinco have chosen to replace these with two electronic 'Rocker' switches located on, but inset from, the left hand side panel. The volume and squelch settings are changed by pressing the appropriate edge of the 'Rocker' switches which vary the levels as indicated on the l.c.d. display.

The volume control worked very well but I would have preferred to have been able to make a slightly finer adjustment to the squelch settings. This was not quite as big a problem as it could have been due to another nice feature. As with most hand-held scanning receivers the DJ-X10 has a monitor button. When this is pressed the squelch is disabled so that weak signals can be monitored more easily. Now anyone who has used a



scanner for short wave reception will know that you have to disable the squelch when listening to weak s.s.b. transmissions, normally by turning the squelch control fully off. With the DJ-X10 you can press the function key and then the monitor button to disable the squelch. Pressing the monitor button again restores normal operation. This is a great time saver and I just wish that my current hand-held had this facility.

How Well Does It Work?

In practice the receive sensitivity with the supplied antenna was adequate, with all the usual airband and amateur signals being audible. I did notice a slight problem with the coarseness of the squelch setting, but this could be improved by using the monitor function when listening to weak signals that would otherwise have caused the squelch to 'chop'. Performance on the short wave bands was good with several broadcast stations being clearly audible using just the supplied antenna. Connecting a few metres of wire to the antenna socket made a big improvement, with many amateur s.s.b. stations being received. The 50Hz tuning step size made the fine resolution of speech reasonably easy, but may still be too coarse for the reception of certain types of data signals.

Summary

I was presently surprised by the DJ-X10. Its styling is good, it feels nice to handle and the performance is comparable to that of similar models in the price range. I felt that the only real problem was associated with the small size of l.c.d. display and its limited viewing angle. This factor aside the DJ-X10 is worth taking a look at if you are considering buying a new hand-held scanner.

Nevada Communications, 189 London Road, North End, Portsmouth PO2 9AE. Tel: (01705) 662145. FAX: (01705) 690626 provided the review model. The DJ-X10E costs £295.

Original review published in SWM September 1996

"Connecting a few metres of wire to the antenna socket made a big improvement, with many amateur s.s.b. stations being received."



AOR AR5000 All Mode

Alan Gardener reflects that it seems that new receivers are a bit like buses, you wait a long time for a manufacturer to produce a new design, and when they do, two or three tend to come along at once. AOR are proving the theory - first there was the AR7030 h.f. receiver, now it's the turn of their flagship, the AR5000.

It was about a month after I had bought my original AR3000 that I first heard whispers about a new higher specification model being developed. But it is only now, several years later, that the AR5000 has appeared - with very wide frequency coverage, all mode reception, extensive Search and Scan facilities, 1000 memory channels, RS-232 computer control port, and - yes, you've guessed it - I was very keen to try one.

First Impressions

The first thing that struck me was the size and weight of the unit. The basic cabinet measures approximately 217 x 260 x 85mm with the feet and loudspeaker port extending the height by a further 40mm. The weight is in the region of 3.5kg, which combined with the metal case gives the unit a professional 'feel' and stops it sliding across the table as soon as you touch the tuning dial.

The front panel has all the usual controls you would expect but is dominated by the large liquid crystal main display, mechanical 'S-meter' and tuning knob. The display is illuminated with a soft green back light which makes the l.c.d. look very attractive, but unfortunately it doesn't do much for the red portion of the 'S-meter' scale and pointer.

The rear panel has two antenna ports, a 10.7MHz i.f. output, 10MHz external frequency reference input, remote RS-232 connector, mute control socket, external speaker jack, accessory connector and a d.c. input socket used to power the unit from the external 12V power unit provided or from a 13.5V car supply.

Wide Coverage

The frequency range of the receiver is specified as being from 5kHz (yes five kilohertz) to 2.6GHz. This is an amazing span and unlike most other wide band receivers it uses separate Varicap tuned r.f. stages to provide vital front end pre-selection for a large part of this range. This is particularly important in con-

junction with a good dynamic range and a low noise synthesised local oscillator in order to minimise unwanted intermodulation products.

RF Performance

In practice, the AR5000 does seem to be fairly resistant to intermodulation problems. The third order intercept point at 100kHz signal spacing was found to be good for a v.h.f./u.h.f. receiver. I achieved significantly better figures at around 6-10MHz with the pre-amp switched off. This gave good performance during the evening on the 40m amateur band where other receivers I have used in the past have suffered from the very strong broadcast band signals on adjacent frequencies. Receive sensitivity was very good and remained fairly constant throughout.

Listening on short wave was a pleasure and the smooth tuning offered by the 1Hz step size and the Numerically Controlled Oscillator made it seem as if a conventional analogue v.f.o. was being used (without the frequency drift normally associated with such designs). As an indication of the receiver's frequency stability I tuned to BBC Radio 4 on 198kHz and by selecting u.s.b. produced a very slow beat signal that remained constant over several hours. Tuning around the 5-100kHz frequency range I was surprised at just how many signals were audible. In fact this proved to be more of an eye opener than the v.h.f./u.h.f. range. The only features I missed compared to my dedicated h.f. receiver were the pass-band tuning, i.f. notch filter and noise blanker. The latter would have been particularly useful for mobile operation.

(The later AR5000+3 features a noise blanker in addition on synchronous a.m. and a.f.c.)



0 Wideband Receiver



Manual Operation

The main tuning dial step size is selectable from 1Hz to 999.999999kHz, which makes it very easy to set a suitable tuning rate for the current mode of operation. Five different v.f.o.s are available, all of which can be personalised, making it easy to swap between h.f. and v.h.f./u.h.f. operation. The small rotary sub-dial, which has 'click' positions, can also be used in conjunction with the main tuning dial. I found it particularly useful to set this to tune at normal channel spacing on v.h.f./u.h.f. and the main dial to tune in-between. I would like to have been able to programme the sub-dial step size directly but it is currently only possible to use either pre-defined step sizes or 10 times the main dial rate. To prevent the receiver being inadvertently knocked off frequency during operation a small lever is provided to increase the amount of friction on the main tuning dial.

Six different i.f. filter bandwidths of 220, 110, 30, 15, 6 & 3kHz are provided as standard (500Hz for c.w. is an extra option). These can be either manually or automatically selected depending on the mode in use. I found this very useful, especially on the v.h.f./u.h.f. ranges where the 6 or 15kHz fil-

ters accommodated 12.5 or 25kHz channel spacing, the 110kHz filter allowed me to listen to f.m. broadcast stations tucked between stronger local ones and the 30kHz filter was almost ideal for weather satellites, although some form of a.f.c. would have put 'icing on the cake' as far as orbiting satellites were concerned.

(The later AR5000+3 features a.f.c. in addition on synchronous a.m. and a noise blanker)

Too Many Second Functions?

Unfortunately one of the main problems associated with complex equipment and small control panels is the need for second function keys and sub-menus. It would be ideal if every function had a separate control knob or key, but in the case of the AR5000 this would quite easily run into more than a hundred or so. Obviously the manufacturer has to compromise somewhere along the line but it is nice from an operational point of view if all the main functions are immediately accessible rather than via a series of different button presses.

The most serious gripe about the operating system on the review AR5000 was the method of manual mode selection. A separate mode button is provided and one quick press puts the receiver into automatic mode selection. When this is in operation the exact mode is determined by an internally stored bandplan which resets the mode, tuning step size and i.f. filter bandwidth as the dial frequency changes. In order to manually change just the mode you have to press the mode button and hold it in for longer than a second. This brings up a sub-menu on the l.c.d. display which you scroll through by means of the rotary dial or Up/Down keys. The correct mode is then con-

Continued on page 13...

Comment

(A few of Alan's 'niggles' have been addressed in production units and a new version, the AR5000+3 is now available in addition to the standard unit. The '+3' version features a.f.c., synchronous a.m. and a noise blanker. The price is marginally higher than the standard unit.

All sets now feature EEPROM Bank switching, which effectively provides two data maps in one set, resulting in 20000 memory channels, 20 scan banks, 10 v.f.o.s and 40 search banks! an optional 4-way automatic antenna switch is also available. RH AOR).

Ray Fautley G3ASG 'comes clean' and describes the skeleton that he's been hiding away for a long time. Here he shows you how to calculate the dimensions involved.



The Skeleton D

The Skeleton Antenna gets its name because it's just the 'bare bones' of a complete disccone antenna. A disccone antenna is essentially a horizontal disc mounted vertically above the apex of a cone as in Fig. 1. This vertically polarised antenna has proved to be very effective for use with v.h.f. and u.h.f. scanning receivers due to its broadband and omnidirectional characteristics, together with peak performance at a very low angle to the horizontal.

To what extent could the antenna be 'skeletonised' whilst still retaining its desirable characteristics? What compromises would be acceptable? My own experience of the disccone type of antenna was to design a suitable u.h.f. antenna for military use. The minimum number of elements that could be used to represent the disc and the cone, whilst retaining the required specification bandwidth, was found to be four for each part.

The 'disc' elements are essentially just two strips (or wires for the lower frequency versions) of twice the design dimension D , soldered together at their centres at right angles to each other. Further, it was found that each disc element D should be mounted vertically above each sloping cone element L , spaced by dimension S (at the apex). The last dimension necessary for the design of the antenna was the angle between the legs. This was found to be 40° to give near horizontal radiation and provide a feed-point of 50Ω .

Resulting Design

The resulting design gave a useful bandwidth of up to 25% above the lowest useful frequency. More simply, if the lowest usable frequency was f (MHz) then the antenna could be used successfully up to $1.25 \times f$. It had to be fairly

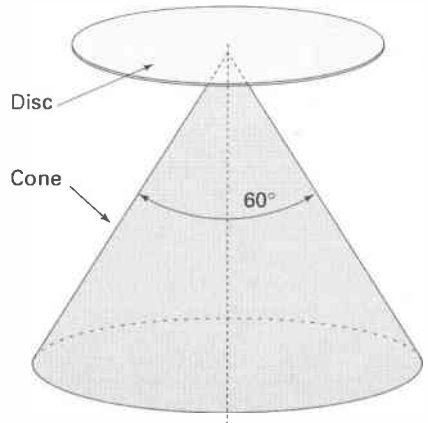


Fig. 1: The 'standard' disccone antenna is, as its name suggests, made up from a disc element and a cone element.

rugged but light in weight and very easy to transport. My first thought had been to use metal rods or tubes, but these would neces-

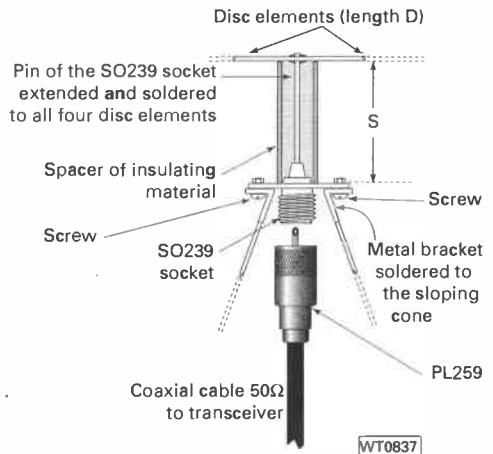


Fig. 2: A more detailed view of the feedpoint of the skeleton disccone antenna.

sarily have to be made into a suitable flat pack for carrying about. This requirement would mean that the elements would have to be screwed together to assemble and

Discone Antenna



then unscrewed each time to repack - a bit time consuming.

Further thoughts lead me to utilise the type of metal strip used in manufacturing flexible steel rules. By using several strips riveted together for the first part of the sloping sides at the top of the cone, one less for the next part and so on, more strength was added to the weakest part at the top of the cone. This is where high winds would produce most leverage and consequently, metal fatigue.

The skeleton disc mounted above the cone consisted of strips of the same material, riveted together in a similar way. A conical plastics moulding contained the ends of the sloping sides and the disc parts, separated by the necessary spacing. Due to the flexibility of the strips, all the elements could be folded downwards from the moulded cone and inserted into a soft plastics pocket for transport.

As this antenna is a reciprocal device (useful for both receiving and transmitting) it should be very attractive to amateurs with an interest in h.f. DX because of its low radiation angle. Of course, a full discone at these frequencies would be ridiculously large and very heavy, but a skeleton version becomes much more of a possibility as wires could be used instead of solid metal sheets!

Desirable Feature

Solid versions of discone antennas have the very desirable feature of operating over several octaves above a lowest frequency, which depends upon the dimensions of the disc and

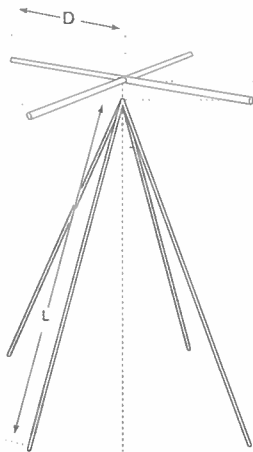


Fig. 3: The skeleton discone antenna is slightly different, in that the apex angle is less, and the top elements are larger than the equivalent discone elements.

the cone sides. If we restrict operation to a single amateur band, the skeletonised version becomes practical because, although its bandwidth is no longer several octaves, it is still 25% of the design frequency.

For example an antenna designed for the 14MHz band would have a bandwidth of some 3.5MHz with a standing wave ratio (s.w.r.) not exceeding about 1.5:1 for an optimum terminal resistance of 50Ω . This means that it would be usable from 14MHz to about 17.5MHz. As the antenna is unbalanced with regard to earth it is suitable for direct connection of 50Ω coaxial cable.

The coaxial cable inner wire is connected to the four skeleton disc elements and the cable outer screen to the four skeleton cone elements as shown in Fig. 2.

How do we go about designing these skeleton antennas? Well, the only thing to think about is 'what is the lowest frequency that I want the antenna to work at?' This lowest frequency will determine the dimensions of the antenna elements. The dimen-

"As this antenna is a reciprocal device, it should be very attractive to amateurs with an interest in h.f. DX because of its low radiation angle."

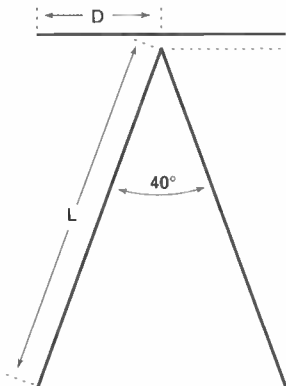
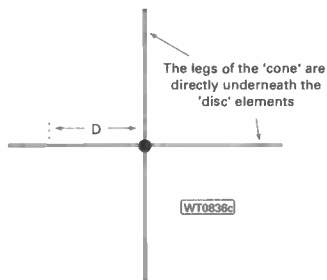
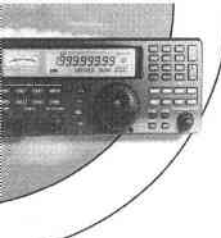


Fig. 4: The skeleton discone antenna viewed in the side (a), and from above (b), for clarity.



"The useful bandwidth of the antenna will be from 144 to 180 MHz."



The Skeleton Disccone Antenna

sions are shown in side and top views of Fig. 3 and Fig. 4 respectively.

Design Procedure

Now let's have a look at the design procedure. First you must decide the lowest frequency of operation (f_{min}) for the antenna. From which, the design frequency, f_D is obtained via the formula:

$f_D = 0.8 \times f_{min}$
where both f_{min} and f_D are both measured in MHz.

Next, calculate the length of the sloping sides (of the cone) L measured in metres via the equation:

$$L (m) = 75 \div f_D$$

$$S = \frac{L^{0.75}}{27}$$

The length of the horizontal elements D, also measured in metres, may be calculated now (this is also the diameter of a full disc) using the formula:

$$D(m) = 0.85 \times L$$

The last dimension we need to calculate is the spacing between the horizontal elements and the apex of the sloping sides, S, again measured in metres from the equation:

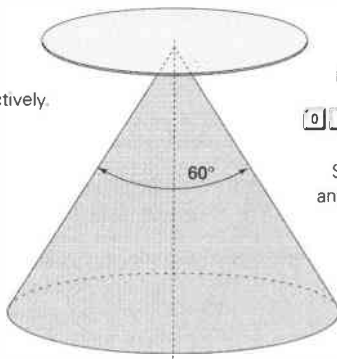
When constructing the antenna, the angle between the sloping sides and a vertical from the centre of the horizontal elements should be 20°. So the angle between any two sloping sides (the cone angle - Ed.) will be 40°. The effective upper frequency f_{max} of the antenna will be:

$$f_{max} = 1.25 \times f_{min}$$

So, the effective bandwidth is from f_{min} to f_{max} .

Worked Example

Let's look at a design for use in the 144MHz (2m) amateur band which is 144 to 146MHz. The design frequency f_D for an f_{min} of 144MHz is:



$f_D = 0.8 \times f_{min} = 0.8 \times 144$ (MHz)
On the calculator this would look like:

$$0.8 \times 144 = 115.2$$

So the design frequency of the antenna is 115.2MHz

Next find the length of the sloping legs L:

where
 $L(m) = 75 \div f_D$

On the calculator we have

$$75 \div 115.2 = 0.6510416$$

The legs will each be 0.651m (651mm) long. Now calculate the length of each horizontal element D:

$$D = 0.85 \times 0.651$$

On the calculator

$$0.85 \times 0.651 = 0.55335$$

So each horizontal will be 0.553m (553mm) long.

The final calculation will be to find the spacing S in metres.

$$S = \frac{(0.651)^{0.75}}{27} = \frac{0.724745857}{27}$$

On the calculator the keystrokes are:

$$0.651^{0.75} \div 27 = 0.026842439$$

The spacing S will be 0.0268 metres (27mm) The maximum useable frequency will be:

$$f_{max} = 1.25 \times F_{min}$$

On the calculator we have:

$$1.25 \times 144 = 180$$

The useful bandwidth of the antenna will be from 144 to 180MHz. If this antenna is made from 6mm diameter rod or tube, preferably copper which has been painted to prevent oxidation, it should be a self-supporting structure.

This article was originally published in the March 1998 Antennas in Action section of Practical Wireless.

AOR AR5000 Wideband All Mode Receiver



FROM PAGE 9

firmed by pressing the Enter key.

I would have preferred to be able to quickly press the mode button and toggle through to the next mode on each press rather than having to mess about with three separate buttons. A long press on the mode button would select the automatic mode.

The current method of operation is particularly frustrating because if you accidentally select the automatic mode it also resets the i.f. bandwidth and Step size, each of which takes two or three button presses to restore to the previous value.

(The later production units from about 1996/97 featured this change and select auto mode by pressing and holding the key, a quick press allowing manual selection.)

Special Facilities

Okay, that's the moan over - now on to some of the better bits hidden amongst the sub-menus. One unusual feature is the DTMF display function, this allows the receiver to decode DTMF tone signals and display them as a series of digits. A CTCSS decode function is also available as an option. *(So is the voice inverter).*

Another unusual facility is the 'Tone' eliminator. This allows the squelch circuit to ignore signals with constant frequency tones on them. The frequency range is tuneable from 400Hz to 4.4kHz and rumour has it that it was included to prevent the search or scan functions stopping on trunk signalling channels used on Japanese railway systems. One use I found for it was to mute the audio on certain v.h.f. transmissions which carry supervisory signalling tones. It would have been nice if it could also have been used as an audio notch filter on the h.f. bands.

The audio bandwidth, pre-emphasis time constants and a.g.c. rate is also adjustable and I found that this made a big difference to the intelligibility of weak signals especially when using s.s.b. or c.w. In addition the squelch control can be set to operate as an r.f. gain control which also makes h.f. reception that bit more enjoyable.

The front-end r.f. pre-selector stages can be manually tuned using a sub-menu. I found that this didn't make much improvement to weak

signals, as the automatic tuning always seemed to be spot on. However I did find a use for it on the 2m amateur band, where I could off-tune it in order make use of the r.f. band-pass characteristic to stop a very strong local packet station from blocking the receiver whilst listening to the output of a repeater. This proved to be much more effective than turning off the pre-amp or switching the attenuator on.

I was not able to try the RS-232 remote control option, but it does support 19200 baud rate, which should speed up any external computer controlled scanning functions.

(Various software packages are now available including Spectrum-Master from AOR, the RS-232 Protocol Book is provided as standard with the receiver.)

Search and Scan

Turning to some of the search and scan features I was interested to find that it was possible to link various search ranges by means of a separate sub-menu. This gave the option of setting up and storing up to 20 different sets of linked search bands and ten sets of memory scan banks, along with characteristics such as delay times, level and voice sensitive squelch operation and the automatic storage of active frequencies found during a search. This effectively allows the operator to set up different 'personalities' for the search and scan function - the only problem is remembering which one is in operation, as the display won't tell you. *(A group number is displayed on later production units).*

Contents of memories and search bands can be identified with short alpha-numeric titles of up to eight characters and this is a great memory jogger if you have a lot of channels programmed in. The search and scan speeds can be increased up to 45 channels per second by selecting the 'Cyber-Scan' option. This replaces the frequency display with the word 'Cyber Scan' whilst the search is running, and only displays the frequency or alpha-numeric title once an active frequency has been found. This can be a bit inconvenient if the search doesn't stop, as you are not really too sure what is happening. It would be nice to have the moving frequency display for reassurance that a search is running correctly.

Original Review published in SWM June 1996

Summary

I found the r.f. performance of the receiver to be very good, making it suitable for professional as well as top of the range hobbyist use. Any criticisms should be judged against the large number of facilities on offer, as I believe most people could think of at least one feature on their favourite piece of equipment that they would change given the opportunity. I thought the way some of the controls and sub-menus operated were a bit inconsistent, and it took some time to get used to them. However I'm sure that if I could afford to buy an AR5000, I would be able to adjust my operating habits to suit. The review model and additional technical support during the review period was provided by **AOR (UK) Ltd., 4E East Mill, Bridgefoot, Belper, Derbyshire DE56 2UA. Tel: (01773) 880788.**



Icom IC-R10

Alan Gardener just couldn't wait to get his paws on the potential replacement for his trusty IC-R1, did the new IC-R10 fit the bill? Read on to see how it fared.

I had been looking forward to reviewing the new Icom IC-R10 since it was first advertised, so when I received the 'phone call from SWM to tell me that they had been able to get hold of one, I was delighted.

Good Looking

Well the IC-R10 looks great - the design is based on Icom's current range of hand-held Amateur Radio transceivers which look very sturdy and fit nicely into the palm of your hand. The case measures approx. 59 x 130 x 32mm (w x h x d), which makes it a lot smaller than most of the competition. However it's not quite tiny enough to lose in the pocket of a pair of jeans, but it does allow the keyboard to be big enough to be operated by even the largest of fingers.

The bottom half of the front fascia contains the keyboard which is arranged in four columns of five rows. As is the case with most scanning receivers, nearly all the keys have second functions. On the IC-R10 these are selected by pressing a key on the left hand side of the case. Unfortunately, the function key has to be held in whilst buttons on the keyboard are pressed, preventing single-handed operation, a disadvantage if you wish to use it dash mounted in a car. Just above the keyboard is the l.c.d. display, which has provision for up to two lines of alpha-numeric text as well as various symbols representing different operating modes and user options. An automatic backlight mode allows the display and keyboard to light for approximately two seconds each time a button is depressed or a signal received. This is a

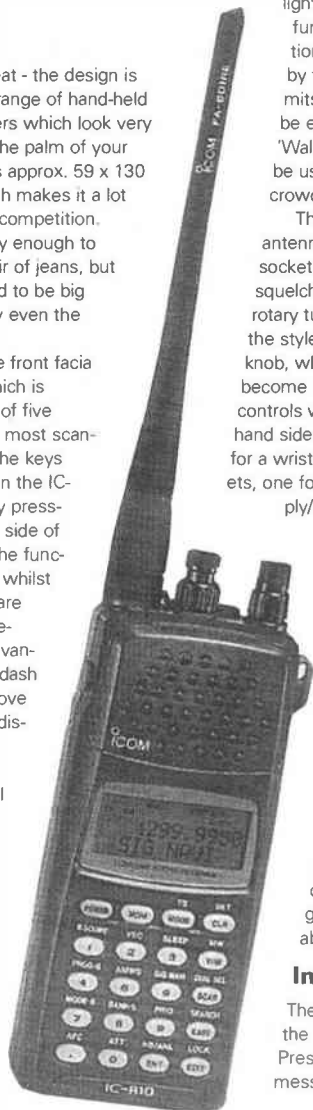
very handy facility, but it would have been even better if a photocell had been built in so that the light only operated when it was required. If you wish to preserve battery life I would recommend turning the backlight off using the 'Set' menu function. The remaining top section of the front panel is occupied by the loudspeaker, which permits a reasonable level of audio to be emitted, but a cheap pair of 'Walkman' style earphones would be useful during operation in crowded places.

The top of the case has a BNC antenna socket, 3.5mm earphone socket, concentric volume and squelch controls and a separate rotary tuning knob. I particularly liked the style and position of the tuning knob, which didn't cause my fingers to become wedged between the adjacent controls when I turned it. On the right hand side of the case there is provision for a wrist lanyard, and two further sockets, one for an external 12V power supply/charger and the other for a computer interface - a thank goodness Icom have fitted one! Actually there are two (Clone and CI-V port) but more of that later.

At the rear of the case the battery compartment can be accessed by lifting off a panel which reveals four AA-sized NiCad cells. A small switch hidden between the cells allows you to turn off the charger circuit if you wish to substitute dry cells. Very handy if the NiCads go flat whilst you are out and about.

In Use

The power button is located in the top left of the keyboard. Pressing it brings up a 'welcome' message on the l.c.d. display.



The main features of the receiver are: All mode reception over the frequency range 500kHz to 1.300GHz; 1000 memories which can be individually alpha-numerically tagged; variable tuning step size; etc. So what's it like to use?

Search or Scan

Rather than differentiating between 'Search' (where the receiver automatically tunes between pre-defined frequency limits with a given step size) and 'Scan' (where the receiver tunes to specific pre-defined frequencies and modes stored in pre-set memory locations). Icom have chosen to call everything 'Scan'. The only difference being the way in which the various scan modes are initiated. The more observant will, by now, have spotted a button on the front panel marked 'Search' - so what is going on?

The 'Search' function allows the operator to perform an alpha-numeric text search of memory titles and contents - all very handy if you can't remember which one of the 1000 memories contains your local airport tower frequency. Memories and search bands can be edited and copied by use of a special 'Edit' button. To speed up the process you should consider the special cloning software and cable that Icom can supply. This plugs into the earphone socket and permits the contents of the memories to be edited and downloaded from a PC. You can also use the cloning facility to copy the entire receiver set-up to another IC-R10 if you wish, another nice touch.

Easy Operation

The IC-R10 also has an 'Easy' program button which I found confusing, as it appeared to operate in a similar manner to normal method of operation - but perhaps I'm just being a bit too critical. Memory banks are labelled A-Q, with bank R being used to store frequencies which are to be excluded from searches and Bank Q being used to store the contents of the 'Auto Memory Write' search function. This works really well, especially when used in conjunction with the 'VSC' or audio scan function which only stops a search or scan on signals with audio present. The 'Auto Memory Write' finds busy frequencies by searching through pre-defined frequency ranges and automatically writes active frequencies into memory.

Unlike some receivers which have similar facilities, Icom have made sure that frequencies only get written once into memory - so

you don't end up with a local paging frequency in all of the 100 memory locations set aside for the function. A great time saver if you can't continuously monitor the airwaves. Even better if you own an Optoelectronics 'Scout' as you can plug it directly into the CI-V computer port. The CI-V interface is good news if you are interested in external control of the receiver, although it does require a simple interface unit if you want to connect it to a computer's RS-232 port.

Tuning Around

All of these facilities nearly compensate for the moderately slow search rate of approximately 17 channels per second, and the painfully slow scan rate of approximately 7 channels per second. A good range of tuning step sizes can be selected and in addition a user defined step size can also be programmed in increments of 100Hz up to a maximum of 999.99kHz. Unfortunately this does not permit the 8.33kHz step size being considered as the future standard for v.h.f. aircraft communications, although 6.25kHz steps are provided and frequencies offset by half channels can be entered. In some instances this can improve the tuning rate during frequency searches.

Noise And The Lack Of It

Another nice touch is that Icom have provided an Automatic Noise Blanker for use on a.m. signals and a Noise Blanker for use when u.s.b., l.s.b. or c.w. is selected. The ANL function worked very well and removed nearly all of the ignition interference on a.m. short wave broadcast signals when I tried using the receiver in my car. The NB function was much less successful and in some cases actually made the reception of s.s.b. signals worse. A lot seemed to depend on the type and level of interference present.

One other interesting feature was that the squelch control doubled up as an r.f. gain control when s.s.b. or c.w. was selected. I always found that I needed maximum r.f. gain, so the control knob had to be reset every time a.m., w.b.f.m. or n.b.f.m. signals were being received. I think in practice the attenuator function is more likely to be used than the variable gain control, especially if an external antenna is in use.

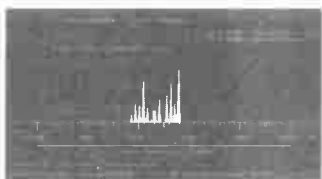
A Bit Wide

Listening to stations in busy segments of the radio spectrum presented a problem. The i.f. filter bandwidths of 15kHz (a.m. and n.b.f.m.)



"The ANL function worked very well and removed nearly all of the ignition interference on a.m. short wave broadcast signals when I tried using the receiver in my car."

At last, you can SEE what you are hearing!



Press F5 and walk into a new world

Decoding what you hear on your radio receiver has been a difficult - and expensive task. You could have chosen black boxes which work - but are limited in their coverage and can soon become near obsolete. You could go the software route, using excellent, but limited shareware programs. Which sometimes need a degree in computer science and the patience of Job to set up and keep in tune. Doesn't it make sense to use the power you already have in your PC? To harness that power and, with Hoka Code3 GOLD's superfast software, plug in to professional style monitoring?

Press F5 and walk into a new world

At Hoka, we have been working for a year on our new Code3 GOLD program. We wanted to make it decode more easily and quickly. So we borrowed the advanced software Digital Signal Processing from our professional Code30 software (don't even ask the cost!) and we matched this with the latest surface mount miniaturised electronics for the hardware interface. We made it possible to plug in to the serial port of your PC without an adaptor. We supported all four COM ports. We even tapped the PC for a power supply!

Press F5 and walk into a new world

What happens when you tune in is simply magic. Pressing F5 brings up your own spectrum analyser to show shift and baud speeds. Press enter and Code3 GOLD jumps into decoding mode and begins to decode. Even if your signal is one of the very few not available via Hoka, you are told what it is. Now, a new world of information opens up to you. Pilots sending flight data on ACARS, the fascinating world of pagers, packet systems, ship's messages and slow scan TV. Met station weather maps - even the special 2400Hz modulated tone system from geostationary satellites. Did we mention that with Code3 GOLD you'll be able to decode nearly every decodable system on short wave?

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Icom IC-R10

and 4kHz (s.s.b./c.w.) are just a bit too wide for average use. This makes it difficult to listen to signals without adjacent channel interference from strong signals, particularly if 12.5kHz spacing is in use on the v.h.f. and u.h.f. bands, or you are trying to monitor s.s.b. transmissions on a typical short wave amateur band.

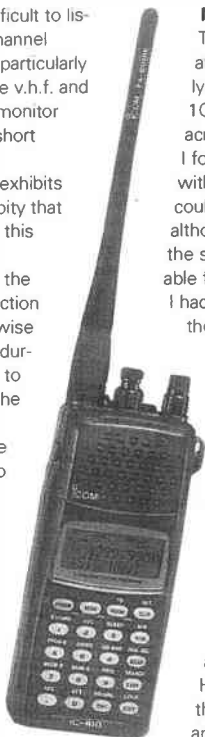
Interesting enough the IC-R1 exhibits the same sort of problem - it's a pity that Icom didn't quite manage to fix it this time around.

The wide i.f. filter also makes the Automatic Frequency Control function less effective than it might otherwise have been. The a.f.c. only works during n.b.f.m. operation and seems to have a range of approx. ± 5 kHz. The idea being that if a signal is received slightly off frequency the a.f.c. function retunes the radio to ensure perfect reception. Now this would be great if the receiver had a really narrow i.f. filter as it would prevent off-tune signals from sounding distorted, but the existing i.f. filter is so wide that signals 5kHz off-tune easily fall within the i.f. passband. I would have preferred the a.f.c. function to have a wider lock range and work on a.m. as well as n.b.f.m. which would have made it possible to use a much narrower i.f. filter, especially for v.h.f. airband reception, where most receiver designs use a wider than normal i.f. bandwidth in order to permit the reception of offset transmissions which are used in this band. The real icing on the cake would have been w.b.f.m. operation with a.f.c., as this would appeal to satellite enthusiasts who have to contend with doppler shift on orbiting satellites and counter-surveillance operatives trying to locate simple bugging devices, which have a tendency to drift in frequency.

Looking Either Side

The 'Bandscope' function allows you to 'see' activity up to ± 100 kHz either side of the frequency the receiver is tuned to. This equates to approximately five channels either side of the centre frequency, however the i.f. filter bandwidth is so great that half the screen is filled when a strong local signal is being

received. The Bandscope circuit is also used to provide a fast search facility which Icom call 'Signal Navigation'.



Measured Performance

The measured receive sensitivity was average. The performance fell off fairly dramatically below 1MHz and above 1GHz but was reasonably consistent across the remaining frequency range. I found that most signals I could hear with other modern hand-held scanners could also be heard on the IC-R10, although short wave performance with the supplied antenna was really only suitable for a.m. broadcast station reception. I had to connect a few metres of wire to the antenna socket before I could really start to hear the weaker amateur and utility stations below 30MHz.

The intermodulation performance was not quite as good as I would have hoped for and I had difficulty obtaining consistent intermodulation measurements at close frequency spacings. This was partially due to v.c.o. phase noise which tended to be particularly noticeable on s.s.b. signals above a few hundred MHz and the i.f. filter performance. However at larger frequency spacings the results seemed to be much better and I can only assume that this was due to the r.f. and i.f. roofing filters making an improvement. With an external roof mounted antenna connected, intermodulation products from v.h.f. paging systems could be heard at various points in the v.h.f. aircraft and 2m amateur bands. Very few problems were experienced with the supplied flexible rubber antenna, which the IC-R10 was designed to work with.

Summary

My impressions of this receiver are a bit mixed. I really liked the feel of the radio and the performance is OK for its size and selling price - £379. I am sure that it will sell like hot-cakes, but I just wish that Icom had worked a bit harder on some aspects of the design.

Nevada Communications, 189 London Road, North End, Portsmouth PO2 9AE, Tel: (01705) 662145, supplied the review model. (Current price is around £260.)

Original review published in SWM May 1997

"I found that most signals I could hear with other modern hand-held scanners could also be heard on the IC-R10."



Icom IC-R8500 Receiver

Having said in the past that he preferred equipment which stopped at 30MHz, John Wilson was placed in a difficult position when asked to review the new IC-R8500 receiver - with a frequency range extending from 100kHz to 2GHz! Could he refuse? Of course he couldn't!

The R8500 is a receiver which looks like a receiver in the classic style, with the major operating functions laid out conventionally and conveniently on a panel measuring 287 by 112mm. It weighs in at 7kg, which gives some idea of its solidity, because that weight does not include a mains power supply, the receiver being powered from an external 12V d.c. source. Taking off the covers reveals that the whole receiver is built on and inside a complex die casting that not only includes individually shaped compartments for each section but also continues right around the receiver. What a perfect way to construct high performance r.f. equipment!

Very Attractive

The overall styling is new to ICOM, with the previous sharp edged look being replaced by a softer, more rounded appearance very suggestive of the JRC NRD-535 but retaining the familiar ICOM excellent build quality and finish.

The control layout is very logical and each control is clearly labelled with its function. The tuning knob is a delight to use, being just the right size and weight to spin easily and whiz through the frequencies. When tuning slowly, the soft rubber outer grip feels perfect, but what a nice touch to find that the recessed finger hole rotates on its own shaft, so you don't wear out your fingertip when using it. Small details like this make a big impact on the 'feel' of a receiver. So you don't like freely spinning controls - ICOM have provided a variable drag brake adjusted by a little screw adjacent to the tuning knob - another small but significant design detail.

I'm a man who likes his modes well defined, and I was pleased to see a row of individually labelled mode selector buttons for 'WFM', 'FM', 'AM' and 'SSB/CW'. Selection between modes is

by pushing the appropriate button, but three of the modes have further selections made by repeated presses of the same button. 'FM' toggles between wide and narrow selectivity bandwidths of 12kHz and 5.5kHz thereby accommodating most used communications f.m. deviation standards. 'AM' has three steps: Narrow (2.2kHz), normal (5.5kHz) and wide (12kHz), whilst the s.s.b. button has four steps cycling u.s.b., l.s.b., c.w., c.w.(narrow) and back to u.s.b. again.

I am of course considering the R8500 so far as an h.f. receiver because I found it so good on these

frequencies, but I

haven't forgotten the stretch from 30MHz to 2.000GHz which, combined with the memory and scan facilities, makes the receiver so different and powerful. I will go into this further, but for now, back to the controls.

Below the mode select buttons is another row selecting 'NB/AFC', 'AGC' and two attenuator settings. When in f.m. modes the 'NB/AFC' button activates an automatic frequency control system which tracks an incoming signal and keeps it in the middle of the f.m. discriminator passband. Two left/right arrows are provided in the main display to show if the signal has drifted, but in practice the R8500 tracks so well that the arrows only appear if you deliberately off-tune the receiver. For a signal which is steadily drifting, the a.f.c. tracking is remarkable, but of course if a signal suddenly pops up 10 or 20kHz away from the receiver frequency, the a.f.c. ignores it - as it should. The only observation I would make is that in wide f.m. with a large frequency drift, the a.f.c. sometimes stops retuning a few kilohertz short of the original frequency. In practice this does not matter at all since a wide f.m. signal has by its nature some latitude in the need for exact tuning, provided that the discriminator response is linear - and in the R8500 it certainly is linear.



In all other modes the 'NB/AF' button brings in an impulse type noise blanker which again worked well on 'clicky' noises such as my son's unsuppressed 25 year old Land Rover.

Attention To Detail

The a.g.c. button switches between 'fast' and 'slow' settings, with the appropriate legend on the main display. Both decay time constants are correctly chosen and work well for s.s.b., c.w. and a.m. signals. Although the exact time constants are not quoted in the handbook it is clear that there is more to the a.g.c. system than one is told, because when a signal stops, the a.g.c. decays slowly to about S3 on the signal strength meter and then accelerates quite quickly to restore full receiver gain. In use, this means that s.s.b. speech keeps the gain constant at levels over S3 but on cessation of speech the gain is restored quickly, which helps greatly when listening to, say, a strong aircraft signal followed by a weaker ground station response. I don't have a circuit for the R8500 so I don't know how this has been achieved, but it shows careful design on someone's part - more attention to detail.

Two r.f. attenuator buttons select 10 and 20dB steps, and if both buttons are depressed the attenuation is 30dB. With my antennas here I didn't need the 30dB attenuation at all, but then again I'm out in the country and not sitting underneath the towers at Droitwich or Rugby, so the 30dB may be of use in certain locations. The attenuation in use is shown on the main display panel

Underneath again are three rotary controls for 'AF Gain', 'Squelch', and a dual control for 'IF Shift' and 'APF'. 'AF Gain' is obvious, but the squelch control is in fact operating in two different ways. In the f.m. modes the squelch is a classic noise operated system, but for all other modes the squelch control sets a level on the a.g.c. 'pedestal' below which signals are suppressed. The actual level is shown on the signal strength meter and this is a very accurate method of determining which signals will be heard. Setting the level to, say, S-3 on the meter ensures that any noisy signals will be rejected, leaving only those strong enough to provide easy listening when using the scanning facilities.

Audio Peak Filter

The 'APF' (Audio Peak Filter) control proves to be very useful in real listening conditions and consists of a bandpass filter which can be tuned across the audio spectrum of an incoming signal. Two bandwidths are provided, the wider one being available on all modes including wide f.m., whilst the narrow filter can only be engaged in s.s.b., c.w. and a.m. modes - quite a reasonable choice since one is hardly likely to need narrow filtering on f.m. signals. The filter tuning range is from approximately 500Hz

to 5kHz and its effect is remarkable on the h.f. bands. Selection of the APF function is by a push button adjacent to the main tuning knob and if the button is held for a second the filter toggles between 'wide' and 'narrow'. The setting you choose is retained in memory when you switch off the receiver.

For an h.f. receiver the provision of 'IF Shift' is almost essential, and the R8500 provides the facility on s.s.b. and c.w. modes. The shift range is quoted as more than ± 1.2 kHz and on the review receiver it actually measured at +1.5 and -2kHz. The slight unbalance was of no practical consequence, but for those who want perfect u.s.b./l.s.b. tonal balance (and it's remarkably difficult to achieve), the demodulating carrier oscillator frequency (b.f.o.) can be adjusted individually in u.s.b., l.s.b. and c.w. modes by simply holding down the s.s.b./c.w. mode button for one second which activates a sub display showing the actual b.f.o. offset. The amount of offset can then be adjusted by use of the (M-CH) knob to suit your own preference and the settings are then retained by the receiver. This kind of provision allows a user to tailor the receiver to their own particular requirements - for example a keen RTTY or data enthusiast can arrange to have a unique b.f.o. offset for the tone spacings they wish to use.

That more or less covers the left hand section of the front panel except to observe that in addition to the headphone jack, ICOM have provided a fixed level audio output for tape recorder use, together with a socket for remote switching a tape recorder when the squelch control opens. The thing I'm so pleased about is that these are on the front, rather than the rear panel, and thus become very convenient to use. How many times have I fiddled around the back of a receiver trying to find the remote control connector?

Tuning Rates Are Crucial

Now - how does one tune the R8500? With a tuning knob - but there is more to it than that. In a receiver covering such a wide frequency range as the R8500, the tuning rates are crucial to being able to use it to its fullest. The R8500 has a built-in selection of tuning rates ranging from 10Hz to 1MHz in no less than 13 steps, including the all important 9kHz spacing for European medium wave listening. These are selected by two easy to reach buttons alongside the main tuning knob. As the buttons are pressed the tuning step chosen is shown in the display where it remains until changed and it's completely independent of mode - what a flexible feature this is in real use.

There are frequency bands where the channels are at 12.5 kHz spacing but at a 6.25kHz offset from a whole frequency unit; for example instead of starting the band at 850MHz the authorities decide to start at 850.00625MHz. With the R8500 you can

"ICOM have provided a fixed level audio output for tape recorder use, together with a socket for remote switching a tape recorder when the squelch control opens."



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Icom IC-R8500 Receiver

enter 850.00625MHz using the keypad, select a 12.5kHz tuning step, and then happily tune the band knowing that the 6.25kHz offset has been included and shown on the frequency display for confirmation.

But that's not all: in addition to the built in selection of tuning steps, the user can enter any unique tuning step from 0.5kHz (500Hz) to 199.5kHz in 0.5kHz increments by using the keypad followed by a prod at either TS button to store the new step. Most comprehensive and thoughtfully executed.

Below the two 'TS' buttons, but intended to be associated with them is a dual function Speech/Lock button. If the optional UT-20 speech synthesiser is fitted, a prod at this button will cause the displayed frequency to be announced, and if my reading of the handbook is correct, the frequency will be announced during scanning when the squelch opens which is very handy for anyone who wants to leave a tape recorder running on voice control when checking a range of frequencies for activity. Not only can you then review the voices recorded but you have a speech identification of the frequency on which the receiver stopped - magic.

The second function of the button is as a dial lock to prevent accidental frequency shifts should the tuning knob get disturbed. ICOM have gone one step further and given you the option of 'Dial Lock' or 'Panel Lock' in which all the front panel controls are disabled; useful if you have inquisitive offspring around.

Having mentioned keypad entry it must be obvious that the user can enter any operating frequency within the tuning range of the receiver by using the alpha-numeric keys in the top right hand corner of the panel. Frequencies are entered in MHz format.

Smooth

Tuning the R8500 is smooth and largely free from tuning 'glitches', no doubt due to the use of a DDS (direct digital synthesis) approach to synthesiser design, and there are no loud rasping noises when tuning through strong signals. You can barely hear the 10Hz tuning steps when slowly tuning a steady carrier in the s.s.b. or c.w. modes, and for all practical purposes the tuning is perfect. As with most synthesised receivers or transceivers these days, there is an automatic tuning rate 'speed-up' when you spin the tuning knob rapidly. In normal tuning there are 400 increments per knob revolution, e.g. using 10Hz steps one knob rotation tunes 4kHz, but the number of steps at larger increments must

somehow be reduced since 1MHz steps result in 14MHz per revolution, not the expected 400MHz. The tuning rate changes are not detailed in the operator's manual, so it's a matter of try it and see what happens. When the auto speed-up comes into action, the number of tuning steps increases to 2000 per knob revolution. Now having experienced many receivers using this variable tuning rate system, I've decided that in some cases I don't actually like it. However, ICOM have resolved my dilemma by allowing the user to disable the auto speed-up if required. I have a feeling that this feature is unique to ICOM.

The R8500 does many things, and it's essential for the user to know what's going on inside. All the essential information is presented on a large backlit liquid crystal display utilising a mixture of seven segment sections for numeric information, dedicated legends for functions such as a.g.c. speeds and so on, and matrix displays for text which may change, such as memory bank titles and station names. I must say that I like the current trend towards orange back lighting with clear black legends, and the R8500 information is extremely clear and unambiguous, with a wide viewing angle from side to side as well as

up and down. Alongside the display is a traditional moving coil analogue meter showing signal strength, backlit to match the frequency display.

The entire right hand side of the front panel is taken up by the alpha numeric keypad and controls associated with the memory functions, and this is a section of the review which is really separate from the R8500 as a receiver. I found the memory and scanning facilities extremely comprehensive, and in an area where it is easy for a manufacturer to get completely confused, ICOM have thought things through very well indeed. The R8500 provides 1000 memory channels, 20 programmable band edge channels and 1 priority channel. Every one of the frequency memories will store frequency, mode, tuning step, attenuator settings and an 8-character name. In addition to this, although not mentioned in the manual, the memory also stores the filter settings in each mode.

Memories

The memories are initially arranged in 20 banks of 40 channels, and each bank can also be allocated a name; for example 'Airband' or '2 metres' or 'Med. Wave', and so on. The names are entered using the

Continued on page 26...



"I found the memory and scanning facilities extremely comprehensive"

scanners scanners



How small can you go?
 ICOM's very latest scanning receiver, the IC-R2 is the most fantastic piece of kit we've seen! Features include wide-band Rx between 500kHz and 1310MHz boasting high-quality Rx sensitivity, easy operation, drip-resistance and low voltage operation to save battery power. The IC-R2 may be small, but then again, size isn't everything is it?

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what a choice!



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ICOM's IC-R2 and R10... what a lovely pair of handhelds!



scanners scanners

a thing

is a versatile, new radio interface on to this exciting world from your explosive growth of the Internet in has brought a wealth of information to world over. However, long before the existed, the airwaves have been filled stations of all kinds - broadcast radio ham, special services and aviation law - get in there with a PCR1000!

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IC-R8500



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Billboard - A V Antenna For Y

The project described in this article was designed by the late Bill Wilson as a quick and easy 400 - 1000MHz wide band antenna for use with his scanner.

The logarithmic-periodic array antenna is extremely useful, being inherently wide band over a large span of frequencies, and you'll often see rotatable h.f. versions on embassy roof tops and in military and commercial communications centres.

At v.h.f. and u.h.f. they are, like the discone, capable of wide band coverage, only the discone is omni-directional, while the log periodic is highly directional like a Yagi, particularly if it is split and the halves angled about 30° apart.

Outdoor log periodics are quite a problem to construct and mount. However, for an indoor version, using foam-core display board and self-adhesive copper tape, the concept becomes ridiculously easy to translate into hardware.

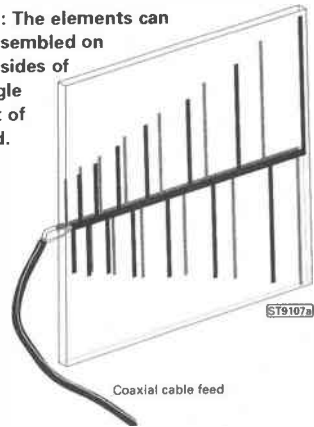
The other way is to etch the antenna onto a couple of slabs of p.c.b., but this takes time and effort - anathema to the author!

The Materials Required

The board (Cappa-board or Fome COR are two makes that spring to mind) consists of two sheets of thin card bonded to a foamed polystyrene core, making a very light, rigid board, either 5 or 10mm thick, which can be cut easily with a sharp blade or craft knife. Sadly, it is only sold in vast sheets measuring approximately 1.5 x 1m. Rather too much for our needs, but probably your friendly local design studio or framers will be happy to supply a couple of offcuts about 350mm square.

The self-adhesive copper tape is available in various widths (you'll need 5 - 10mm wide) from any craft shop that supplies materials for the amateur terrarium

Fig. 1: The elements can be assembled on both sides of a single sheet of board.



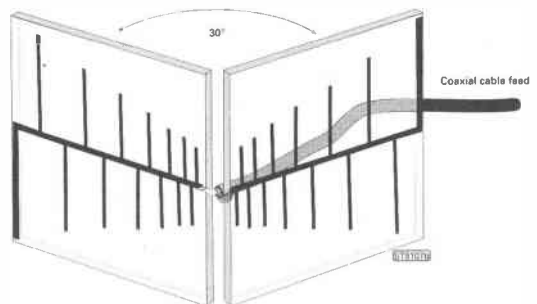
maker. I seem also to remember that a similar tape was available from electronics suppliers at one time (possibly still is) to make your own circuit board tracks.

Construction

Armed with the board and tape, a snap-off type craft knife and some self-adhesive fabric tape from your local upholstery or d.i.y. store, we're all set to begin!

The antenna can be assembled with each element on either side of a single piece of board, **Fig. 1** or two pieces of board can be

Fig. 2: Two separate single-sided boards can be opened out at 30°.



Vide Band UHF our Scanner



used to give a 30° angle of separation between the two, Fig. 2. The latter is preferable. On each board (or each side of one board) mark off with a pencil the measurements in Fig. 3, remembering that the two elements are not identical, but are **vertically** displaced mirror images of each other. Over these marks, lay down the adhesive copper tape, making sure that there is some overlap at the joins. Because the adhesive acts as an insulator, it is now necessary to lightly solder each overlap to make an electrically continuous structure.

The two antenna sections can now be taped together at the 'short' end to make a hinge. The ends of the coaxial feeder cable are then soldered to each element and the cable then terminated with coaxial connector to suit your receiver. Ideally the cable should be run back along the length of the 'earthy' element. The cable can be tapped down firmly to the board or holes made for cable ties to keep the cable in place. 'V' channels can be cut in the reverse sides of the board to accommodate the cable, allowing the two boards to lie flat together for storage.

The antenna can, of course, be extended to cover higher and/or lower frequencies by adding more strips (logarithmically) at the ends, depending on the size of board you can tolerate.

This method of using copper tape is an excellent way of quickly experimenting

with v.h.f./u.h.f. antennas. For example, if you are a lazy amateur, a very efficient 433 or 1296MHz umpteen element beam can be assembled on a length of board in a few minutes. In the past the author has used this method to make the following items:

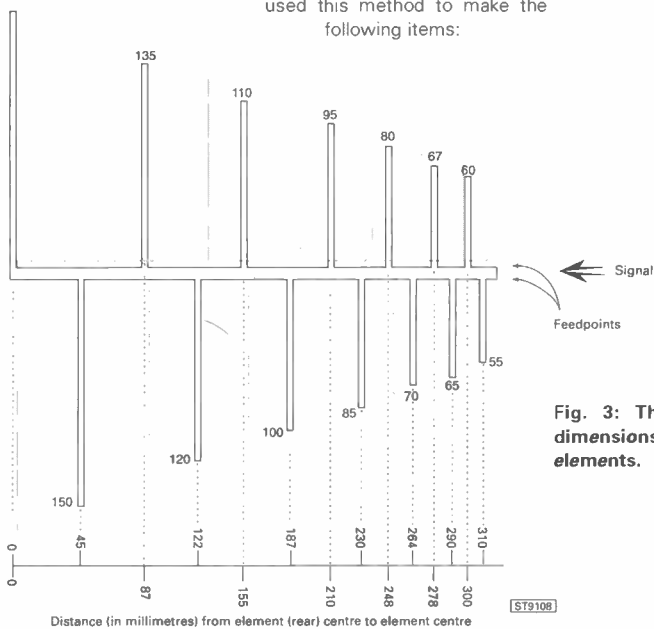


Fig. 3: The basic dimensions of the elements.

- A five element Yagi for 144MHz, folding up zig-zag fashion in four sections to make a neat compact package 1m x 3m for transportation and storage.
- A helically wound length of taper on a suitable grade of ferrite rod resulting in a Hi-Q h.f./d.f. antenna.
- Wound on a pvc/abs former to make an a.t.u. coil that allows very accessible tapping.
- A 'nest of dipoles' using a length of pvc drainpipe as the substrate.

You can use your own ingenuity for other uses!

This project was originally published in SWM June 1996



Icom IC-R8500 Receiver

numeric keypad, but each key also has three letters of the alphabet on it, used in constructing the names. If a particular bank needs more than 40 channels, the bank can be extended, which, of course, means that another bank must be reduced. But if you wish you could have a single bank containing 800 channels, it's all very flexible. Putting information into memory couldn't be easier, simply select a channel number using the rotary 'M-CH' control and press 'MW'; that's it. Similarly, to clear any channel just select it and press 'M-CL'.

"What about the other 200 memories?" I hear you cry. 100 of these are allocated to a bank called 'AUTO', and how I enjoyed using this one. You can set the R8500 to scan any band of frequencies you wish, such as 118 to 137MHz for the airband, and by selecting the 'AUTO' mode let the receiver scan continuously whilst you go off and have a coffee. When you return the receiver will have been stopping on any occupied channel and popping the frequency into the 'AUTO' memory bank. You now have a bank of active frequencies in store which you can scan as memory channels - so simple, and saves hours of sitting doing it yourself. So, now what do you do with all these active frequencies? Easy, simply select one of the active channels in the 'AUTO' bank, press 'M-SET' to temporarily store it, select a free channel in the memory bank you wish to use, press 'M-SET' again and the entire contents of the stored channel are written into the new memory location. What impressed me about all of these functions is that they are so easy to use, and so logical.

Still missing 100 channels? They are allocated to the 'SKIP' bank in which is stored those interesting frequencies that are always occupied by continuous transmissions which stop the scanning process but you don't actually want. During the scan of any frequency band of interest, if the scan stops on a steady but unwanted signal, you simply press the 'SKIP' button and that frequency is then memorised and will be skipped over not only in any future band scan, but in any other scan mode including auto scanning. Even the speed of scanning and length of delay on resuming the scan are adjustable by the operator.

The whole memory arrangement is rather like having a series of written logbooks to which you can refer by looking up a title 'AIRBAND', 'SHORT WAVE' and so on, and in these books you can select a fre-

quency of interest which can also be named 'LON-DON', 'RADAR', and so on. It's well thought out and easy to use even for someone as dim as me. For any user wishing to assemble a comprehensive collection of frequencies of interest, the R8500 is just ideal.

Conclusions

It's hard to know where to stop with such a comprehensive unit as the R8500, because the manufacturers seem to have thought of everything. As far as r.f. performance is concerned, their stated aim was to



produce a receiver which incorporated all the advances made in the ICOM h.f. transceivers, and in this they have succeeded. Performance at v.h.f. and u.h.f. is also excellent, although a small caveat must be made in that the receiver, in common with other ICOM receivers, is designed to meet full specification up to 1.000GHz. Above that frequency a converter is used, which guarantees spec. between 1.240 to 1.300GHz but not at higher frequencies, although the receiver does in fact work to 2.000GHz.

The operating manual is well written and easy to understand, a particular feature being the detailed information on all the connectors and ports which specifies exactly the impedances, connection details and signal levels at each connector. The section on memory management is straightforward and logical, with clear examples of each step to be taken in what is actually a complex procedure, and no one should have any difficulty in making this receiver dance to his own tune.

Frankly I loved having the R8500 in my hands, even for such a short time and I was impressed by everything about it. It looks like, and handles like a classic h.f. receiver, but has this capability of receiving everything from 100kHz to 2.000GHz. Above all, it was easy to use and get to know, and for the real listening enthusiast, or indeed the listening professional, the R8500 allows you to dispose of every other receiver and simply have it all in one stylish box. It's a great product.

ICOM (UK) Ltd., Sea Street, Herne Bay, Kent CT6 8LD. Tel: (01227) 74300. Internet: <http://www.icomuk.co.uk/> supplied the review IC-R8500 which costs around £1550. Original review published in SWM September '96.

Computer Control

The rear panel of the R8500 carries the RS-232 connector for external computer control, and comprehensive details are included in the operating manual of all the commands available. It seems that everything on the front panel is controllable via the computer port.

There are three antenna inputs; an 'N' type connector for use from 30MHz to 2GHz; an SO-239 for 50Ω input from 100kHz to 30MHz and a phono socket providing a 500Ω input for the same frequency range. Selection of the 50 or 500Ω h.f. input is controlled from the front panel.

A 'remote' jack allows connection to the standard ICOM control system so that the R8500 can be linked to compatible transceivers or receivers from the ICOM range, whilst an 'IF' output connects to the optional TV-R7100 receive adapter to provide stereo sound and TV facilities. The 'AGC' jack can either feed a.g.c. to the TV-R7100 or, with a connector change over inside the R8500

provides an audio feed without de-emphasis for 9600 Baud data use in the f.m. mode. There are two power input connectors, one being for a feed from a regulated 13.8V d.c. supply and a second for use with an ICOM AC-55 a.c. mains adaptor which needs further regulation built in to the R8500.

Welz WS1000E Wide Band Receiver

A few years ago if someone had shown me a pocket sized receiver which covered the frequency range 500kHz to 1.3GHz, resolved a.m., n.b.f.m. and w.b.f.m. signals, with a good r.f. performance and operated from a couple of 1.5V pencil batteries, I would have been amazed. However, I got quite a shock when I first saw the review model - it is tiny! Measuring only 58 (w) x 97 (h) x 24mm, it easily slips into a shirt pocket.

Styling

The unit has very distinctive styling with a slightly curved shape making it a snug fit in the palm of the hand. The top panel carries a BNC antenna connector, 3.5mm earphone socket and concentric tuning and volume control knobs. The left hand side features a convenient second function key and squelch override button whilst the right hand side sports a safety lanyard loop and a knurled, edge mounted, squelch adjustment knob. Most of the front panel is occupied with the speaker grill, but the top quarter includes a liquid crystal display and the left hand side has two strips of buttons providing a means of entering frequencies and controlling the main receiver functions. A small flap at the rear provides access to the battery compartment, which accommodates two AA sized cells, whilst two recessed studs on the bottom of the case provide a means of externally powering the unit.

One of the buttons on the front panel is marked 'Power' and on switching it on I was greeted with a cheery "HELLO" message on the l.c.d. screen. Rotating the tuning knob allowed me to step between nine pre-programmed memory channels, but almost any attempt at more sophisticated operation was repelled with a warning beep from the speaker - indicating that it was time to read the operator's handbook! This proved to be very enlightening as the receiver has a normal and expanded mode of operation. The unit is shipped in the normal mode. This gives a very limited set of commands, which permit you to become used to operating the basic functions before progressing on to programming your own search and scan memories.

RF Performance

In terms of r.f. performance the model worked remarkably well considering the very compact design and low power consumption. The measured sensitivity on n.b.f.m. averaged -120dBm for 12dB SINAD over most of the range 30-1000MHz. Below 30MHz the performance tailed off with a worst case of -110dBm at 500kHz which was in line with the manufacturer's figures. Intermodulation measurements gave a 3rd order intercept point averaging around -40dBm at 100kHz spacing. Both the sensitivity and intermodulation performance are adequate in comparison to other current wideband hand-held scanners, but would lag some way behind models specifically designed for mobile or base station use.

Antenna

The antenna supplied with the receiver is a short flexible wideband design which gave reasonable perfor-

mance above 100MHz, but substituting it for a slightly longer type gave improved results, especially on the medium and short wave broadcast bands. Connecting an external base station antenna produced good results on v.h.f. and u.h.f. but the attenuator had to be switched in before acceptable performance could be obtained on the short wave bands. Using the WS1000 in a car with an external mobile antenna worked well, with very few unwanted signals being observed, the only exception being when I was less than a couple of miles away from a very active p.m.r. site.

The only major problem I noticed during mobile operation was the maximum level of audio the internal speaker could produce, which barely overcame the engine and road noise. The 60mW audio output stage is just about sufficient to drive an external loudspeaker, if it is not mounted too far away from your head. When I used the review model at an outside event, I found that a pair of cheap personal hi-fi headphones became a worthwhile accessory. However, the limited power of the audio stage does mean that you get a long period of operation from a set of batteries. The dry cells supplied with the WS1000 almost survived the three week review period, but eventually a large 'Batt' message appeared on the l.c.d. display warning me that they needed replacing.

Summary

The WS1000E is a tiny hand-held scanner with a very wide frequency coverage, which makes it convenient enough to carry around with you at all times. This should make it very appealing for example to air and motor sports enthusiasts who wish to monitor the action as it happens.


The r.f. performance is adequate for its intended style of operation and is comparable to other hand-held scanners. Unless you connect a large external antenna to it or live in a very active urban area you are unlikely to encounter too many problems with unwanted spurious signals.

I enjoyed using the review model but found some of the functions restrictive, mainly due to the inappropriate use of factory programmed bandplans to permit automatic step size and mode selection during searches. This would be less troublesome if the search memories were capable of storing the necessary information. However, if you mainly intend to use the scan mode to monitor individual frequencies stored in memory it shouldn't be a significant problem.

Waters & Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835. FAX: (01702) 205843 provided the review model.

The **Standard AX400mkII** is available from **Martin Lynch & Sons, 140 - 142 Northfield Avenue, Ealing, London W13 9SB. Tel: 0181-566 1120. FAX: 0181-566 1207.**

Original review published in SWM July '96.



Hand-held scanners have been getting smaller by the year, but the latest to arrive from the far east is so tiny that it amazed even Alan Gardener. Since this review was written a new model - the WS2000E - has been produced - the main differences are double the number of memories and a higher audio output. This is also marketed as the Standard AX400mkII.

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Scouting Around The Optoelectronics Scout



Kevin Nice looks at an intriguing counter-come-data-logger from the company that, for the past twenty years has been producing innovative products such as the Interceptor, their latest offering is the Scout, a small pocket-sized unit.

The ability to monitor a wide range of frequencies and record them for later is invaluable for the scanning enthusiast. The manual supplied with the Scout tells us that the unit is not a frequency counter in the traditional sense, because it is not intended as a measurement tool, instead, the device is designed to be used with an antenna - the one supplied is a highly flexible, helical affair - to receive radio transmissions, and record their frequencies. So it's a frequency recorder. The memory configuration is such that 250 captures can be stored in each of the 50 locations.

Use of signal processing techniques provided by the embedded microprocessor allows the unit to evaluate the incoming signal and statistically to determine when a specific frequency is dominant, i.e. when a signal is 10-20dB stronger than any other signal or the r.f. noise floor. The counter circuitry then produces a stable count

Computer Control

Those of you with an Icom IC-R7100 receiver will probably be familiar with the CI-V interface. This interface is a serial bi-directional system using a two wire connection and t.t.l. signal levels. There is a 2.5mm jack socket on the top panel to facilitate interconnection to other equipment, Optoelectronics have provided four possible address combinations, selected by two internal jumpers, so that the user can connect up to four separate Scouts to one receiver or host computer! When the Scout is operating in FILTER, CAPTURE or RECALL mode it automatically transmits tuning commands to the CI-V interface equipped receiver, as the incoming signals are captured or as memories on the Scout are recalled.

In order to connect the Scout to a PC an



external interface is required to convert the t.t.l. levels to RS-232C. Once connected, the Scout responds to a variety of interrogation commands. Optoelectronics produce the CX12 interface, which is supplied with logging software.

Specifications:

Frequency Range:

1MHz-2.8GHz

Antenna/Input Impedance:

50Ω BNC

Power Supply:

Internal NiCads or 9-12Vdc 1.2A max. (Supplied)

Display:

10 digit l.c.d. backlight

Warning Device

Audible beep or vibrator

Dimensions:

67 x 45 x 97 (w x d x h) including pocket clip and input socket.

Weight:

250g

Power Supply

The Scout contains a high capacity NiCad pack, and comes complete with an external charger/p.s.u. The unit has a rapid charge facility which allows full power in two hours, this facility is intelligent as the cell voltage is monitored, if the NiCad pack is totally exhausted it is first trickled charged until the battery voltage is up to the minimum, then the charge rate

is increased, when fully charged, the rate resumes to trickle, where it remains until the charge voltage is removed and re-applied.

In Use

There are four modes of operation, NORMAL, FILTER, CAPTURE and RECALL. In NORMAL

Continued on page 30



Chris Lorek takes a close look at the newly updated base scanner from Standard, the AX-700.

Standard AX-700 Base Scanner Receiver

The Standard AX-700 made its first appearance in late 1990, and caused quite an enthusiastic 'stir' with its unique spectrum scope display. Good things keep on going, and over the years the AX-700 has been giving sterling service to many satisfied users. It has recently been re-launched as a new MkII version, which also conforms to the very stringent CE immunity and emission requirements.

With its smart metal case, base-mounted feet for desk-top placement and a chromed tilt-up stand, it's essentially a base station scanner. As it operates from a 13.8V d.c. supply, mobile or portable operation certainly isn't also out of the question, there's even a plug-in telescopic whip supplied for temporary use. For home use, an a.c. adapter is supplied, fitted with a European two-pin mains plug together with a suitable adapter for

UK use. The d.c. output lead from this supply plugs directly into the 2.1mm d.c. input socket on the rear of the case, and an optional d.c. lead is available.

Coverage

The AX-700 covers the frequency range of 50 to 905MHz continuously, with reception modes of f.m., a.m. and wide-band f.m. The numeric keypad lets you enter frequencies directly, and the front-panel up/down buttons, together with a click-step tuning knob, can be used to manually tune. The tuning



step sizes available are 10, 12.5, 20 and 25kHz, plus two further steps sizes in the curiously-named 'AJ' (fine-tuning) mode, these being 5kHz with the rotary channel selector and 1kHz with the up/down buttons. The usual rotary volume and squelch controls are fitted, added to these is a variable tone control so that you can adjust the sound of your local airport control tower operator to

Continued from page 29

mode, frequency measurements are made continuously. Captured frequencies are displayed on the l.c.d. display. On capture of a new frequency either the beeper, or for a more discrete warning the vibrator, are activated. If the beep is selected then the display backlight is also illuminated for ten seconds.

Selecting FILTER mode reduces random counting, noise and false signal detection. A digital filtering algorithm is applied to incoming signals and only those signals which pass the algorithm are stored and displayed. Gate settings are selected as in the NORMAL mode of operation.

CAPTURE automatically selects the 1kHz gate setting, incoming signals are displayed and stored in up to 50 unique memories. Up to 255 occurrences of each are also recorded by the Scout, the count being incremented each time the unit registers a transition of a carrier. When capture mode is selected and a receiver is con-

nected via the CI-V interface the Scout will tune the receiver to the captured frequency.

RECALL disables the frequency measurements but does not prevent the signal strength meter from operating. Memories are integrated by depressing the Gate button. The frequency captured is displayed, as is the number of captures, a zero displayed for the number of captures indicates that a memory location is unused.

The overall performance of the Scout is dependant on the front-end tuning, due to its wideband input, so the addition of some pre-selector circuitry will be beneficial when using the unit for specific bands.

Waters and Stanton, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835, Fax: (01702) 205843 supplied the review unit. When originally reviewed, the Scout costs **£349.95** inc. VAT.

Originally reviewed in SWM March '95



your exact preference! A front-panel ear-phone/headphone jack is fitted for private listening.

Searching

One hundred memory channels are provided to store your favourite frequencies, and the AX-700 usefully lets you manually tune away from any of these at the push of a button. You can of course scan through the memory channels, either all the channels or just those you've programmed with a 'MSM ('Memory Scan Memory') marker. To find new active channels the set has ten search ranges, each of which can be programmed with individual lower and upper frequency limits to suit your listening interests. In scan and search modes, the set halts as usual when it finds an active channel, i.e. when the receiver squelch raises. It can be programmed to resume either a couple of seconds after the signal level disappears, or an 'audio scan' which resumes a couple of seconds after any audio ceases on the signal, or after five seconds regardless of whether or not the signal's still there, or to halt on the first channel that's had a signal present for at least two seconds.

Panoramic Display

A primary feature of the set is, of course, the large, bright, panoramic display. Besides showing you the frequency and memory channel you're tuned to at any time in text form, it also lets you visually see what's happening on either side of your tuned frequency. For this, the display provides a real-time bargraph of activity in the band, with vertical bars representing the relative strength of signals. The spectrum display can be toggled to show either a 1MHz, 250, or 100kHz bandwidth at any time, the signal 'bars' automatically changing in width to reflect the channel spacing and display widths selected.

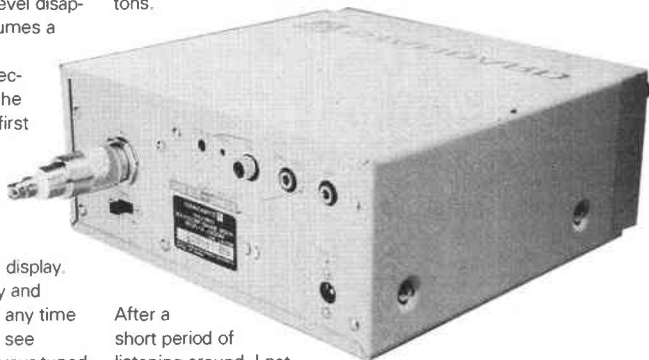
Round The Back

The rear panel has a number of connectors and further controls. Besides the d.c. power input and SO-239 antenna sockets, an attenuator switch is fitted which places a 20dB attenuator in line with the r.f. signal input for when strong signals start to get the better of the scanner. Complementing the front panel squelch control, which operates only in narrowband f.m. and a.m. modes, a small 'W-Mute' preset potentiometer is fitted for the wideband f.m. squelch adjustment. A 'recorder output' 3.5mm jack socket gives a

30mV audio level to your tape recorder or PC sound-card for audio recording, and there's a similar 3.5mm extension speaker output jack, which disconnects the internal speaker when used. An 8V d.c. output is available via a phono socket for powering accessories, and a small reset hole lets you reset all the set's memories and frequencies to their default conditions.

On The Air

With the intuitively easy-to-use front panel controls, it didn't take me long to start successfully receiving off-air signals with the set, indeed within a few seconds of switching on I was listening to a two-way conversation on my local 433MHz amateur repeater. Changing frequency was very easy with the keypad, tuning around likewise with the front-panel knob and up/down buttons.



After a short period of listening around, I naturally decided to start programming the memory channels with my favourite frequencies and scanning around these. Here, the large l.c.d. came in very useful, with a large text-based display showing what was happening at each stage, e.g. 'Memory Change', 'Memory Scan', 'MS.M Scan', etc. Programming the search ranges was also helped by this display, which read 'Start Freq', 'End Freq', etc. at the appropriate moments - who needs the instruction book? Having said that, the 30-page operating manual was certainly useful, with clear step-by-step instructions on changing the search range, memory channels, etc. After just an hour or so of use, I believe I'd learned how to use virtually all of the set's functions, no problems at all here.

I found the set a pleasure to use, operation-wise. The bright yellow-backlit l.c.d. was very easy to read, a front panel button switching in a two-level dimmer for night-time use. I

"I found the set a pleasure to use, operation-wise."



Standard AX-700 Base Scanner Receiver

"I was very pleased to find that the panoramic display updated itself continuously as I was listening to a given frequency, without any breaks in reception"

was very pleased to find that the panoramic display updated itself continuously as I was listening to a given frequency, without any breaks in reception as some other 'spectrum display' scanners do due to their single

receiver circuits. The audio quality from the internal speaker, which was fitted at the bottom of the case, was excellent, especially when I used the small bracket to slightly tilt the front of the set upwards towards me. The variable tone control was useful also, enhancing the already-superb audio response from the set, plugging in an external hi-fi quality speaker gave even better performance on the broadcast bands using wideband f.m.

But how about the 'radio' performance? When I first used a sample of the original version of the AX-700 around seven years ago in my radio shack, I found it performed quite well using a variety of indoor and outdoor antennas. Time goes on, and the airwaves become increasingly more crowded, especially with the advent of powerful nationwide v.h.f. pager transmitters and a digital cell-phone base station site around almost every corner. In my location in the south of England, which certainly is an 'r.f.-congested' town, the AX-700 coped well on u.h.f. and the lower v.h.f. section of its coverage, including civil airband. But it did tend to suffer badly from wide-coverage (i.e., high power) v.h.f. pager transmitter breakthrough around the 145MHz amateur and 156MHz marine bands. So much so, that with my short (just 1m long) rooftop v.h.f./u.h.f. vertical connected, I had to constantly keep the attenuator switched in to prevent rather loud, and quite annoying, intermodulation breakthrough halting the scan, this wiping out even an 'S9' strength amateur repeater located about 20 miles away. I've often found this problem on small hand-helds which are primarily designed to be used with an equally small set-top antenna, but I was a little surprised to find it on a purpose-made late-1990s base station receiver.

Having said that, I found the receiver



picked up weak signals reasonably well, although occasionally not to the extent of a 'purpose-designed' set for some ranges. For example, a 51MHz amateur f.m. signal, which I could clearly receive on an f.m. hand-

held connected to my loft-mounted antenna, I could only receive rather weakly on the AX-700, similarly on 433MHz. However, 145MHz weak-signal reception was excellent, as long as there weren't other strong signals around!

Laboratory Tests

My measured results showed that the AX-700 gave a reasonable sensitivity, i.e. the capability of receiving weak signals, across its coverage range, although this tailed off right at its lowest frequency of 50MHz, as I'd found on air. The strong signal handling was typical of that I've come to find on many other scanning receivers, nothing new here, all good 'solid stuff'. The measured intermodulation rejection, where two stronger off-channel signals mix within the receiver to create a third, unwanted, on-channel interfering signal, I feel could have been better for it's primary use as a base station receiver.

Conclusions

The AX-700 was very easy to use, and I found the bright and easily-read panoramic display was extremely handy in keeping me informed if I was possibly 'missing' something else whilst monitoring a given channel. The receiver is very smart and professional looking, and the r.f. performance was typical of many wide-band scanners currently on the market. However, in my opinion it wasn't up to the performance standard of some other dedicated base station receivers, although many of these are, of course, rather more expensive! The AX-700 costs £449.95. **Martin Lynch & Son, 140-142 Northfield Avenue, Ealing, London W13 9SB, Tel: 0181-566 1120** provided the set for review.

Original review published in SWM Jan '98

Yupiteru MVT-3300EU Hand-held Scanner



Yupiteru have a well-deserved reputation for their high-performance and fully-featured portable communications receivers. As well as their all-mode wide-coverage hand-helds, they've also released hand-held scanners for defined band ranges, e.g. for the civil airband and the marine v.h.f. f.m. ranges. Retailing at £180, the MVT-3300EU is a multi-band scanner rather than a continuous coverage all-mode receiver. The 'EU' suffix identifies the European version, which has passed the stringent requirements for emission and immunity performance.

The MVT-3300EU covers of 68-88, 108-170, 300-470 and 806-1000MHz, which includes all of the v.h.f. (civil) airband, plus a section of the military airband, as well as most v.h.f. and u.h.f. land mobile communication bands. It can tune, and store, frequencies in steps of 5, 6.25k, 10, 12.5 or 25kHz, either a.m. or narrowband f.m. reception in any band within its coverage.

Channels

There are 200 memory channels, arranged in ten banks of twenty channels each for easy scanning, a scan speed of 16 channels per second being specified. To help you find new active frequencies there are ten user-programmable search bands, as well as an 'auto-write' scan facility which can store active channels into a memory bank automatically. To save the receiver continually halting on given frequencies such as constant carriers, you can program up to 100 'pass' channels into the set's memory, which it will subsequently ignore in search mode. A two-second delay after the squelch closes, before the set resumes scanning, helps in receiving replies on simplex channels in scan mode. A switchable attenuator is fitted to help with signal overload, this can be switched in or out, but not on a channel-by-channel basis into the memories.

Besides searching and scanning, the

rotary click-step knob on the top panel lets you manually tune around in either your own selected tuning step and reception mode, or with the 'default' parameters for the frequency range you've chosen. For this, there are ten programmable 'band memories' in the set, into which you can store upper and lower frequency limits together with an accompanying step size and receive mode for each range.

Descrambler

Speech scrambling has recently been introduced into the UK, for on-site p.m.r. users. This can range from simple 'inversion' scrambling to more secure types such as rolling code, and these are already being used by on-site security services as well as Formula One racing teams and the like. The MVT-3300EU has an 'SCR' button, which switches in an internal descrambler for decoding simple inversion systems. This will not cope with higher-security forms of scrambling such as rolling code or split-band types, nor will it descramble any digital forms of coding such as the

'MASC' systems used by UK government services (including the police), or GSM or PCN cellular 'phones systems and such - the suppliers were very keen to point this out!

Power

The MVT-3300EU uses four internally-fitted AA cells which you'll need to supply, a d.c. connector is also fitted so that you can plug in an external 12V d.c. supply for home or mobile use. The rear of the set's case has a pull-out wire stand, which you can use for desktop operation at home and which tilts the set at a comfortable angle for easier viewing of the display. The receiver comes with a set-top helical antenna, a hand strap for portable



Yupiteru's latest hand-held scanner, the MVT-3300EU has been given the once-over by Chris Lorek.

AR5000 = Performance receive + flexible microprocessor



Usually the question of "which is the best" is met with a multitude of further questions, however the AR5000 is clearly seen by many as the most feature packed high performance wide band performance receiver available today. This is backed by the German 'funk' magazine readers award 1997 for **best receiver** and by government procurement departments on both sides of the Atlantic. 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! Drawing from its earlier success, AOR has designed the AR5000 to be a true base station receiver - from the drawing board, this is very apparent when plugging in an external aerial, the result is unsurpassed performance instead of a clutter of music and pager breakthrough over many of the desired frequency bands. The AR5000 strong signal handling is very good, over the range of 500 kHz to 999 MHz this is further assisted by an automatic preselector which peaks the receiver's front end circuits for the best 'on channel' sensitivity and ultimate rejection of out of band interference. There are several IF filter bandwidths provided as standard including 3, 6, 15, 30, 110 & 220 kHz with an optional slot for 500 Hz. The **WEFAX picture** shown here was e-mailed to us by a happy customer in Derby within the first few days after purchasing his AR5000 (using the standard 30 kHz IF filter). Microprocessor facilities are unrivalled (1000 memory channels x 2 and more).



PLUS Capabilities have been further increased with the arrival of the **AR5000+3** providing three enhanced **PERFORMANCE** facilities: **A.F.C.** switchable automatic frequency control for accurate tracking of unusual bandplans, **noise blanker**, switchable to help reduce the effects of ignition noise especially while mobile, **synchronous AM**, featuring double and selectable sideband with an easy to use wide lock range.

AOR (UK) LTD

4E East Mill, Bridgefoot, Belper, Derbyshire, DE56 2UA England

Tel: 01773 880788 Fax: 01773 880780

info@aor.co.uk www.demon.co.uk/aor

E&OE

Yupiteru MVT-3300EU

use, a plug-in earphone, and an instruction manual. It measures 152 (H) x 59 (W) x 32mm (D) and weighs 310g with batteries.

In Use

Most receiver manufacturers have their own defined idea on user operation methods and control, and the MVT-3300EU follows the normal Yupiteru type of operation as used in their many other hand-held scanners. So I found no surprises here, the manual also giving clear instructions with plenty of worked step-by-step examples for the 'raw beginner'. Within minutes I was happily monitoring signals in my locality, the set-top antenna pulling in signals, particularly on v.h.f., surprisingly well. Entering frequencies into the memory channels was very easy, the receiver automatically selecting the 'next vacant' channel for me in each case, although I could easily change these as needed.

Over the dark winter evenings during my review period, I found the backlighting facility on the set to be superb. As well as this lighting up the l.c.d. panel, to let me see what was happening frequency-wise, it also illuminated the translucent keypad buttons so that I could also operate the scanner at night without too many incorrect button pushes! For weak signal-reception, a 'monitor' button next to the side-mounted backlight button acted as a momentary squelch defeat, which I found very handy with fading signals to prevent the scanner whizzing off to the next channel when I'd found something interesting.

Out And About

Although the supplied carry-strap was handy for portable use, I felt it was a pity that a belt clip wasn't also supplied, nor was there any facility for one to be fitted. I often use a car-mounted ventilator grille clip with my hand-held scanner for use on the move, but here I had to either just place it on the seat, or use one of the 'grip-pear' type of 'cellphone' holders instead.

I took the scanner with me on holiday to a favourite 'haunt' of mine, a small fishing village in south-east Cornwall. But this was the first time I'd ever thought of taking a scanner. Together with my growing family, we took in a couple of sessions of sea-fishing, and the MVT-3300EU provided me with yet another 'chatty' companion! Although I had to take care that it didn't drop into the 'briny', it cer-

tainly gave us all a surprising amount of extra entertainment, particularly from the comical banter between other fishermen out on the water. There was ample volume from the small speaker, even in windy outdoor conditions, and the fast search rate made sure that I didn't miss a thing when several channels were alternately busy. The auto-write scan was also handy in finding active new frequencies, and I quickly filled a number of memory channels using this mode.

I used both NiCads and nickel-hydride cells to power the set, finding each gave me at least a day's worth of listening, with the 1.3Ah nickel types naturally lasting rather longer - often for an entire weekend. However, I did need to take the batteries out of the set in order to charge them, which meant that I couldn't use the set on air in 'float charge' mode because the side-mounted d.c. connector couldn't also be used to charge the batteries. I eventually settled on using two sets of batteries, one in use in the scanner and the other set on charge.

Strong Signals

The receiver usually worked fine when I was out and about, but in some locations I did get the occasional problem from strong signals such as paging transmitters. I found that, when tuning around even in 12.5kHz steps, that signals came and went cleanly, without the adjacent channel 'splitching' I've often found on less-selective scanners. However, using the set from home with my rooftop 144/430MHz vertical collinear antenna plugged in, gave me almost constant overload problems on the 144MHz amateur band from out-of-band signals, and I had to keep the set's internal attenuator switched in at all times here. I also found an effect of weakly receiving otherwise strong signals which were exactly 225 and 900kHz above my tuned frequency, these being caused by second image and 'half 2nd i.f.' effects within the scanner.

Lab Tests

A measurement period in my lab showed the set to be reasonably sensitive across its range, with excellent adjacent-channel selectivity, as I'd found on air. The 3rd order intermodulation results also replicated what I'd found on air, which wasn't all that good, but it would normally be adequate for the set's primary intended use as a hand-held, and not a base station, receiver.

Original review published in SWM Feb '98

Conclusions

Although the Yupiteru MVT-3300EU isn't a wideband, continuous-coverage receiver, it usefully gives coverage of many of the popular v.h.f. and u.h.f. communication bands used in and around Europe. I found it was easy to operate, with plenty of handy features such as the 'auto-write' scan and the extremely useful frequency 'pass' function for searching around. It gave a good level of performance when used out and about, pulling in signals well, although it did tend to suffer from signal overload when used in some r.f.-congested locations with an external and well-sited antenna connected.

Nevada
Communications,
189 London Road,
North End,
Portsmouth
PO2 9AE.
Tel: (01705)
662145 provided the review set.

Alan Gardener recently fought his way through the crowd and got his hands on the very latest offering from Yupiteru. Here he reveals his findings.

Yupiteru MVT-9000

The past few years have produced a distinct rivalry between two of the main manufacturers of scanning receivers, AOR and Yupiteru, as each takes it in turn to try and produce a more attractive product than its competitor. This has generated a lot of discussion between enthusiasts as they extol the virtues of each new model. AOR stole the show for some time with the AR8000, but now Yupiteru have launched the MVT-9000, which many are expecting to be the hand-held scanner of 1997. I was lucky enough to be able to put one of the first in the UK through its paces.

External Appearance

I think the first thing that struck me was the styling of the MVT-9000 which reminded me of a hand-held cellular phone. This is due to the slightly indented keyboard which curves in towards the centre in order to present a fairly constant key depression range across the face of the front panel. This makes the keyboard pleasant to operate and naturally guides the operators fingers towards the main keys. Above the keyboard is a custom l.c.d. display which consists of a dot matrix area used to display graphical and alpha-numeric data and above it a pre-defined text area used to display the main operational information. This gives much greater visibility of the display than would be possible with just a dot matrix type l.c.d. panel.

The upper part of the front panel is occupied by the loudspeaker grill, main power switch and 2nd function button. The left hand edge of the receiver has three small buttons to select the display and keyboard illumination, operate the monitor function and lock the keyboard and controls to prevent accidental operation. The right hand side of the case has sockets for an earphone and external 12V d.c. power supply whilst the top edge of the receiver has a BNC socket to connect an external antenna, volume, squelch and rotary tuning

dial. The tuning dial is situated towards the extreme right-hand front edge of the panel and as such is fairly easy to operate, but I did find my finger catching the volume control on one or two occasions. The overall size of the unit is 66(w) x 175(h) x 40mm(d) including knobs. This makes it a comfortable fit in the palm of your hand. My own preference would have been for it to be slightly smaller, but that would almost certainly have been at the expense of build quality.

Well Built

Internally the receiver is very well constructed with all the main receiver boards enclosed within a pressed metal enclosure. The control board is also screened and is linked to the receiver by means of a short flexible printed circuit board cable.

Judging by the amount of internal electrical screening, Yupiteru have taken no chances with the design to ensure that it would pass the EEC EMC regulations, which are now mandatory before items can be CE marked and sold within the European Community.

Main Features

The receiver is capable of tuning from 530kHz to 2.039GHz in step sizes of 50, 100, 200, 500Hz, 1, 5, 6.25, 8, 9, 10, 12.5, 15, 20, 25, 30, 50, 100 and 125kHz. It can receive n.b.f.m., w.b.f.m., a.m., narrow a.m., l.s.b., u.s.b. and c.w. The narrow a.m. mode being particularly useful for the reception of short wave stations in crowded broadcast bands. The unit has twin v.f.o.s, 1000 memory channels in 20 banks of 50, 20 search banks which are labelled A-J and a-j, all of which can be given up to a nine character long alpha-numeric name. The memory and configuration settings are stored in EEP-





"Although the figures are not sparkling, the actual performance seemed to be better than that indicated by the measured results."

ROM, so no worries about losing data when the batteries go flat. Like the AOR AR8000 the receiver has a bandscope.

Operation

In operation the MVT-9000 has a keyboard layout and style of data entry which should be familiar to existing Yupiteru owners. As is the case with most designs of this type, a second function key is required to provide control of all the functions with only a limited number of buttons available. Fortunately Yupiteru have chosen to site this in a convenient spot next to the power switch, which makes it very easy to find, and the electronic latching means that you don't have to use both hands to drive the keyboard.

You can link search banks and memory banks, set the mode and tuning step size independently from the internal factory set band plan, set search pass frequencies and edit the titles of search and memory banks and individual memories.

Bandscope

One of the more interesting aspects of the receiver is the Bandscope display, which allows you to see activity on adjacent frequencies providing the receiver has stopped searching or scanning. In theory this is a great idea as it allows you view signals up to $\pm 800\text{kHz}$ either side of the frequency tuned. A marker can be moved by means of the tuning knob to determine the frequency of any signal displayed on the screen and a quick press of the monitor button temporarily tunes the receiver to the marker frequency. Pressing Monitor and Enter sets the marker frequency as the new v.f.o. frequency - a nice touch.

Receive Performance

I was pleasantly surprised by its performance on the short wave bands. Reception of a.m. broadcast stations and s.s.b. amateur and commercial signals with the supplied flexible antenna was very good, although replacing it with a 2-3m length of wire made a significant improvement. Connecting an external short wave long wire antenna was not quite so successful, as the large number of extremely strong broadcast signals present resulted in a cacophony of intermodulation distortion. Switching the internal attenuator on made a dramatic improvement.

I compared the MVT-9000 with my dedicated short wave receiver, feeding both from an active antenna. For the most part this produced identical results, it was only under

extremely crowded band conditions or in the presence of strong broadcast signals on adjacent frequencies that the dedicated short wave receiver showed its true worth. Performance on the medium wave broadcast band was very good for a receiver of this type, and the ability to switch off the internal ferrite rod antenna must make it attractive to listeners preferring to use a loop antenna.

The v.h.f. and u.h.f. performance was also good with a measured receive sensitivity in line with previous Yupiteru models. Although the figures are not sparkling, the actual performance seemed to be better than that indicated by the measured results. I can only assume that this is due to the characteristics of the recovered audio, which had a small amount of residual background noise present, even on very strong signals.

Intermodulation performance was adequate and typical for a modern design of this type.

Summary

The MVT-9000 is a very attractive, wide frequency coverage scanning receiver offering good performance, particularly on the short wave bands. It is relatively easy to operate and provides a large number of features which most owners will find a use for. The Bandscope function is extremely interesting to watch, particularly when monitoring h.f. broadcast stations and propagation conditions change, although its usefulness as an aid to monitoring is somewhat limited.

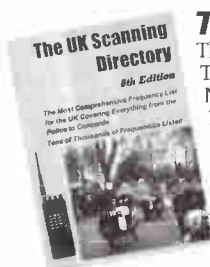
The lack of a computer or RS-232 port will be seen as a major limitation. This facility is especially useful when trying to maintain the contents of 1000 alpha-numerically tagged memories. It would be nice for experienced users to be able to modify the internal band plan and configuration details - the values programmed into the review model were not ideally suited to the UK.

The MVT-9000 is worthy of being called Yupiteru's flagship hand-held receiver, although its price and competition from other manufacturers may influence many people's decision to buy one - only time will tell if this model is destined to become a Classic.

Waters and Stanton Electronics, 22 Main Road, Hockley, Essex SS5 4QS. Tel: (01702) 206835, Fax: (01702) 205843, provided the review model. The MVT-9000 has an RRP of £489.

Original review published in SWM February '97

Books for Scanning



The UK Scanning Directory

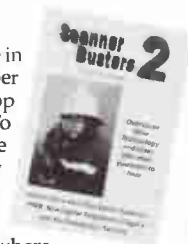
This new 6th edition covers 26MHz to 1.8 GHz and continues to amaze everybody. The tens of thousands of frequencies include Civil and Military, Aviation, Army, Navy, the largest Police list ever published, DSS Snoopers, GCHQ, Eye-in-the-Sky Links, Bailiffs, Prisons, Motor Racing, Universities, Railways, Telephones, Couriers and many more we dare not mention. Separate parts cover the Civil Aviation Band and European frequencies for Dxers. This book remains Britain's largest and best-selling scanning directory, the undisputed leader in the field. No other book dares to list so many frequencies and in such great detail.

Price: £18.50 +£1 UK Post. For Europe add £3.25, elsewhere £7.50

Scanner Busters 2 by D. C. Poole

How to Tune into More Frequencies and Beat New Technology! The rate of change in radio technology is incredible. The Police continue to scramble an increasing number of their frequencies, trunked radio systems are making it more difficult to eavesdrop on conversations, and there are more and more strange noises heard on the bands. To overcome this *Scanner Busters 2* guides you through the maze, explaining in simple terms the working of PMR, new digital telephone systems, spread spectrum, new pager systems, frequency hopping, encryption such as MASC used by the Police and the latest communications methods of the emergency services.

Price: £5.00 incl UK Post. Overseas post add £1.25 for Europe (airmail) or £2 elsewhere.



Scanning the Maritime Bands by F. F. O'Brian

Hear ports controlling ships and ferries, weather and navigation broadcasts, the supplies and spare parts required, problems they are having with the crew, search and rescue and lots more. It gives the Channel Number for each port, harbour and coast radio station in the UK, Ireland, Western Europe and right up to Iceland; all you have to do is to key into your scanner the corresponding frequency from the foldout frequency list.

Price: £9.50 incl UK postage. Overseas post add £1 for Europe (airmail) or £2.50 elsewhere.

UK Scanning Frequency Chart

Stunning full colour A3 wall chart covering 25Mhz to 1.8 GHz showing in graphic detail all major users of the VHF/UHF spectrum. It will show you quickly where to scan to pick up your favourite transmissions.

Price: £3 incl UK postage. Overseas post add £1 for Europe/sea mail or £2 for other countries.

VHF/UHF Airband Frequency & Callsign Guide

This new edition lists every UK airport and airfield in alphabetical order with their corresponding frequencies in an easy-to-read format, and gives the frequencies for military ranges, low flying, refuelling, aerobatic displays, UK air defence and AWACS. It also covers air traffic control, Squark codes, Volmet, emergency frequencies and lists other frequencies. There are over 8,500 military callsigns listed and a vast number of civil ones. It will be indispensable for any aircraft enthusiast.

Price: £12.50 + £1.25 UK post. Airmail to Europe add £2.25, or £4.50 elsewhere.



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Which Scanner?

Your scanner selection guide

For your convenience we have compiled the following buying guide listing out the important criteria to consider before committing your hard earned cash.

Covered in the table are the hand-held and base station models currently available in the UK.

If you need more comprehensive information as to how any particular model has fared in the hands of our reviewers then check-out the review that's indicated in the appropriate column. You will notice that a good proportion of the list are actually covered in a summarised form within the pages of this very guide. If you should wish to obtain a copy of a full review, then these are available from the *SWM* Book Store - details given on page 44 of this guide.

Key to Which Scanner table

- ✓ Included
- Optional extra

Abbreviations used in this guide

| | |
|----------|---|
| a.c. | alternating current |
| a.f. | audio frequency |
| a.f.c. | automatic frequency control |
| a.g.c. | automatic gain control |
| a.m. | amplitude modulation |
| d.c. | direct current |
| dB | decibel |
| dBm | decibel referenced to 1mW into a 50Ω load |
| Hz | Hertz (cycles per second) |
| i.f. | intermediate frequency |
| kHz | kilohertz - 1000Hz |
| kΩ | kilohm |
| l.s.b. | lower sideband |
| MHz | Megahertz - 1000000Hz |
| mV | millivolt |
| mW | milliwatt |
| n.b.f.m. | narrow band frequency modulation |
| r.f. | radio frequency |
| s.s.b. | single sideband |
| u.s.b. | upper sideband |
| V | Volt |
| W | Watt |
| w.b.f.m. | wide band frequency modulation |
| Ω | ohm |

| Hand-held | Coverage | | | Modes | | | | | Memories | | | |
|---------------------|----------------|----------------|---------------------|-------|----------|----------|--------|------|----------|-------|----------|----------|
| | Min. Frequency | Max. Frequency | Continuous Coverage | a.m. | w.b.f.m. | n.b.f.m. | s.s.b. | c.w. | Sets | Banks | Channels | Look-out |
| Alinco | | | | | | | | | | | | |
| DJ-X1D | 100kHz | 1.3GHz | Y | ✓ | ✓ | ✓ | | | 2 | 10 | 40 | 20 |
| DJ-X10E | 100kHz | 2.0GHz | Y | ✓ | ✓ | ✓ | ✓ | ✓ | 3 | 10 | 40 | |
| AOR | | | | | | | | | | | | |
| AR8000 | 500kHz | 1.9GHz | Y | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| AR8200 | 530kHz | 204GHz | Y | ✓ | ✓ | ✓ | ✓ | ✓ | | | 20 | |
| Bearcat | | | | | | | | | | | | |
| UBC 120XLT | 66MHz | 512MHz | N | | | | | | | | | |
| UBC 220XLT | 66MHz | 956MHz | N | | | | | | | | | |
| Commtel | | | | | | | | | | | | |
| COM-102 | 66MHz | 512MHz | N | | | | | | | | | |
| COM-510 | 500kHz | 1.3GHz | Y | ✓ | ✓ | ✓ | | | | | | |
| GRE | | | | | | | | | | | | |
| PSR239 | 66MHz | 960MHz | N | ✓ | | ✓ | | | | | | |
| PSR244 | 66MHz | 512MHz | N | ✓ | | ✓ | | | | | | |
| PSR250 | 66MHz | 512MHz | N | | | ✓ | | | | | | |
| Icom | | | | | | | | | | | | |
| IC-R10E | 500kHz | 1.3GHz | Y | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| Standard | | | | | | | | | | | | |
| AX400mkII | 500kHz | 1.3GHz | Y | ✓ | | ✓ | ✓ | | | | | |
| Yupiteru | | | | | | | | | | | | |
| MVT-3300 EU | 66MHz | 1.0GHz | N | ✓ | | | ✓ | | | | | |
| MVT -7100 EU | 530kHz | 1.65GHz | Y | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| MVT- 9000 EU | 530kHz | 2.00GHz | Y | ✓ | ✓ | ✓ | ✓ | ✓ | | | 20 | 50 |
| Welz | | | | | | | | | | | | |
| WS-2000E | 500kHz | 1.3GHz | Y | ✓ | | ✓ | ✓ | | | | | |
| Base Station | | | | | | | | | | | | |
| AOR | | | | | | | | | | | | |
| AR3000A | 100kHz | 2.03GHz | Y | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| AR5000 | 10kHz | 2.0GHz | Y | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| AR5000+3 | 10kHz | 2.0GHz | Y | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| Bearcat | | | | | | | | | | | | |
| UBC-9000XLT | 23MHz | 1.3GHz | N | ✓ | | | ✓ | | | | | |
| Fairhaven | | | | | | | | | | | | |
| RD500 | 20kHz | 1.75GHz | Y | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| Icom | | | | | | | | | | | | |
| IC-R8500 | 100kHz | 2.0GHz | Y | ✓ | ✓ | ✓ | ✓ | ✓ | | | | |
| Realistic | | | | | | | | | | | | |
| PRO-2042 | 25MHz | 1.3GHz | N | ✓ | | | ✓ | | | | | |
| Standard | | | | | | | | | | | | |
| AX-700 | 50MHz | 905MHz | Y | ✓ | | ✓ | ✓ | | | | | |

Features

| Total | NiCads | Charger | Rotary Tuning | Case | Battery Saver | Computer Control | Data Cloning | Bandscope | a.f.c. | Noise Blanker | Review | Current Model | Typical Price |
|----------------------|--------|---------|---------------|--------|---------------|------------------|--------------|-----------|--------|---------------|---------------------------------|---------------|------------------------|
| 100 1200 | ✓ ✓ | ✓ ✓ | ✓ ✓ | ✓ ○ | ✓ ✓ | | | ✓ ✓ | | | Oct '92 Page 5 | N Y | £295 |
| 1000 1000 | ✓ ✓ | ✓ ✓ | ✓ | | | ✓ ✓ | ✓ ✓ | ✓ | | | Sept '94 Jun '98 | Y Y | £299 £399 |
| 100 200 | ✓ ✓ | ✓ ✓ | | | | | | | | | | Y Y | £130 £150 |
| 800 | | | | | | | | | | | | Y Y | £60 £190 |
| 200 50 20 | | | | | | | | | | | | Y Y Y | £160 £130 £80 |
| 1000 | | | | | | ✓ | | ✓ | | | Page 14 | Y | £259 |
| | ○ | ○ | | | | | | | | | | Y | £200 |
| 200 1000 1000 | ✓ | ✓ | ○ | | | | ✓ | | | | Page 33 April '93 Page 36 | Y Y Y | £180 £269 £395 |
| | ○ | ○ | | | | | | | | | Page 27 | Y | £200 |
| 400 1000 20000 | | | | | | ✓ ✓ | | ✓ | ✓ | | Jan '90 Page 13 | Y Y Y | £699 £1349 £1595 |
| 500 | | | | | | | | | | | | Y | £325 |
| | | | | | | | | | | | Aug '98 | | £799 |
| 1000 | | | | | | ✓ | | | | | Page 18 | Y | £1549 |
| 1000 | | | | | | | | | | | | Y | £430 |
| 100 | | | | | | | | | | | Page 30 | Y | £450 |

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Further Reading

There are numerous books available covering all aspects of scanning.

Frequency Listings

UK Scanning Directory 6th Edition
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VHF-UHF Scanning Frequency Guide Bill Laver
£12.95

General Scanning Books

An Introduction To Scanners and Scanning BP311 I.D. Poole
£4.99

Scanner Busters 2 D.C. Poole
£6.00

Scanners 2 International Peter Rouse GU1DKD
£10.95

Scan 98 SWM

Scanners 3 Putting Scanners Into Practice 4th Revision Peter Rouse GU1DKD
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Scanning Secrets Mark Francis
£16.95

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Air Band Radio Handbook 6th Edition David J. Smith
£9.99

Airband Radio Guide 3rd Edition Graham Duke
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