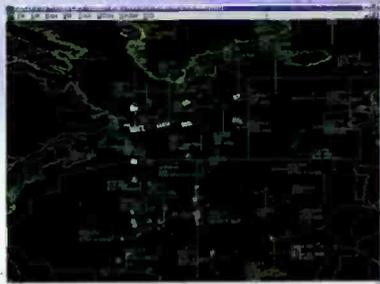


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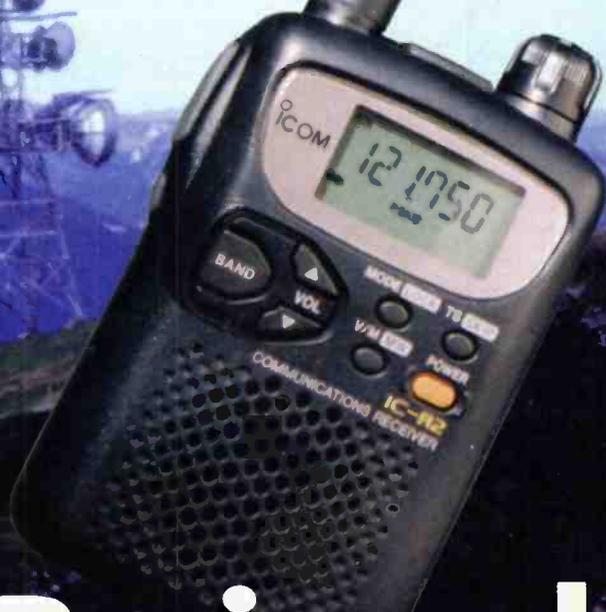
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01 >

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SWM Services

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Subscriptions are available at £30 per annum to UK addresses, £35 in Europe and £38 (Airsaver), £45 (Airmail) overseas. Subscription copies are despatched by accelerated Surface Post outside Europe. Airmail rates for overseas subscriptions can be quoted on request. Joint subscriptions to both *Short Wave Magazine* and *Practical Wireless* are available at £50 (UK) £59 (Europe) and £63 (rest of world), £74 (airmail).

Components For SWM Projects

In general all components used in constructing SWM projects are available from a variety of component suppliers. Where special, or difficult to obtain, components are specified, a supplier will be quoted in the article. The printed circuit boards for SWM projects are available from the SWM PCB Service, **Badger Boards, 12 Hazelhurst Road, Castle Bromwich, Birmingham B36 0BH, Tel: 0121-681 4168**. A small catalogue containing components, projects and p.c.b.s is available, free, to anyone sending **Roy or Sue Martin** an s.s.a.e.

Photocopies & Back Issues

We have a selection of back issues, covering the past three years of SWM. If you are looking for an article or review that you missed first time around, we can help. If we don't have the whole issue we can always supply a photocopy of the article. Back issues for SWM are £2.95 each and photocopies are £2 per article. Binders are also available (each binder takes one volume) for £6.50 plus £1 P&P for one binder, £2 P&P for two or more, UK or overseas. Prices include VAT where appropriate.

A complete review listing for SWM/PW is also available from the Editorial Offices for £1 inc P&P.

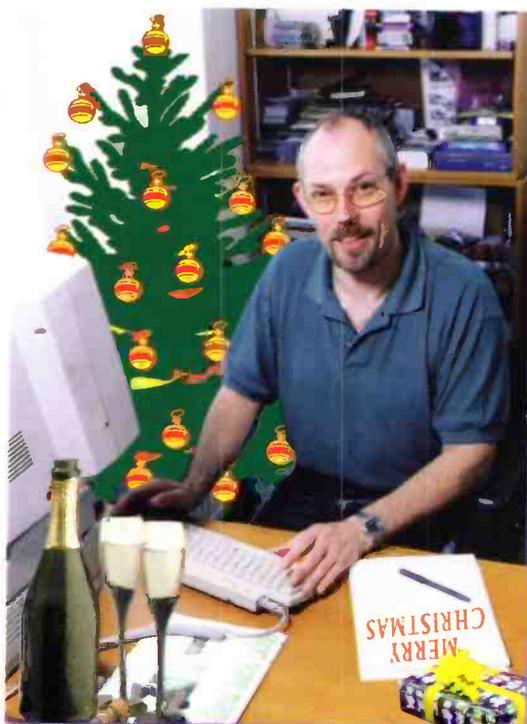
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Technical Help

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

ed's comments



First things first. A very merry Christmas to everyone in Radio Land, especially our readers. I hope that you don't suffer the ills of this period's excesses. I hope that you do turn the opportunity of an extended break into some quality DXing.

Survey

As promised last month, I can announce the winner of the draw of survey respondents. We had a higher than expected return rate with some very interesting results coming to light. Watch this space for related developments - I aim to make *Short Wave Magazine* even better, in response to your comments and views.

So, the winner of the MVT-7100 scanner and RF Systems antenna is... **Bryan Biggin** of Derbyshire. Two runners up are **Simon James Grant**, Manchester and **Brian Grimes** from the Isle Of Wight. They'll be receiving a year's free SWM subscription. Well done Bryan, Simon and Brian, your prizes will be with you very soon.

SWM from Dealers

Did you know that you can buy SWM from your local radio dealer? Well, you can. If you take a look at page 9 you'll find a full list of all the dealers up and down the country that currently stock *Short Wave Magazine*. Why not pay them a visit, pick up your SWM, browse their bargains and enjoy their hospitality. I'm sure they'll be pleased to see you.

Propagation

Those of you who read this page last will have already noticed that there is a chunk of data missing from the Propagation Extra graph, the feed of information that I utilise to compile this graph

dried up due to technical problems for the period of the missing data. At the time of going to press with this magazine I'm afraid I hadn't managed to wangle the lost info. If I'm able before February SWM then I'll bring you the graph again with the gap filled in - fair?

The observant amongst you will also have noticed the changes to the geographical areas, covered in the Propagation Forecast charts compiled by **Jacques d'Avignon**. Some time ago, Jacques suggested to me that due to the preferences shown by logs of readers, he would slightly alter his forecasts. It made sense to complete the year of 1998 with old format and start afresh with the new.

Promos For 1999

I have just left a meeting with the publishers of SWM, having been in long discussions about promotional items for the coming year. Sadly, we didn't arrive at a final agreement in time for me to share with you the details of what's coming up - all I can say is watch out for some great cover mounted goodies in 1999!

Throwing In The Towel

A disillusioned reader E-mailed me the other day convinced that, with the close-down of Scheveningen (PCH), Portishead Radio, and the cessation of Morse usage for ocean traffic, all is lost and there is nothing to listen to. Well this is not the case, what has happened is that much of the traffic has changed to data. What this means is that we'll all need to add equipment to decode this data the like of GMDSS is pretty straight forward. Our special offer this month can help. As for "everyone moving to satellite", this is an expensive solution for most h.f. communications links are far cheaper both from an equipment and operational view. Take a look at this month's 'All At Sea' and you'll get the picture. Alternatively, you can always look to the sky for your listening pleasure - more later.

On the subject of Scheveningen, although you'll be reading this too late to make any difference, it has been announced by the Radiocommunications Agency that UK radio amateurs are temporarily granted permission to listen to PCH's special event on the maritime bands.

Pleasant Message

This month, I was glad to receive a very welcome message from none other than German radio monitor and utility guide publisher, **Joerg Klingenfuss**. He had some very kind words to say regarding the material covered in the pages of SWM of late, to quote Joerg's E-mail, "definitely the best monthly around in the scene". Well, this I take as a compliment indeed.

And Finally

So, from everyone who plays a part, large or small, in putting together your favourite (and market leading) radio magazine, a warm and cheery season's compliments to you.

73

Kevin Nice

Dear Sir

I am so pleased that *SWM* is going to run a series in the future for beginners, I feel this will be a big success and is something I for one will look forward to. I am a 61 year old who has only taken up the hobby in the past 18 months and have been struggling with many aspects, in spite of purchasing quite a few books from the 'Book Store'.

I suppose it is wrong for me to describe myself as a complete beginner, for I first became interested in *SWM* back in 1951 when I was 14 years old. At that time I had an 'Eddystone 640', however, upon leaving school and starting work, etc., I packed in radio and have had absolutely nothing to do with radio or anything remotely technical ever since (45 years).

I had to retire on health grounds a few years ago and my wife bought me a little 'Sony' short wave receiver as a present, and cutting a long story short I thought it would be a hobby for myself.

I bought *SWM*, and you can imagine my surprise when I saw what changes had taken place, anyhow I decided to convert a spare bedroom into a radio room and bought myself an AOR AR7030. Little did I know at the time I was buying a hell of a radio to comprehend, I spent many frustrating hours trying to comprehend all of its complexities and I have just about got it 'dancing' to my own tune.

I have not got a great technical mind but enjoy the hobby and I'm sure there are many people young and old like me, and I feel a series such as you are going to run will be a real bonus, please don't be put off by all the negative sounds that will no doubt come your way from the 'technically brilliant' out there.

Changing the point a little, I also have a scanner (table top), I bought it to add a bit of variety to the hobby and have been quite alarmed at what I'm able to pick up from mobile 'phones. I am a former prison officer and shudder to think what use the criminal mind could (and probably do) do with this information broadcast. I hear drug dealers, prostitutes, plus business dealings, etc., plus of course the cordless 'phone on 1.642MHz, if I was a person with evil intent I could cause a lot of trouble, definitely a hobby for the cautious and tight lipped.

Anyhow, good luck in the job and I'll look forward very much to the new series, you may even consider publishing in book form in the future.

David Hall
Northumberland

P.S. My set up here is 14m long wire from a fir tree at the top of the garden through an a.t.u. into either a AR7030 or Icom IC-R8500. I also have a Uniden Bearcat scanner and the little Sony. I also have 27m wire up in the loft.

Dear Sir

As regards to your comment of "too much Amateur Radio", August issue, I state the following. I first started reading *SWM* in December of 1988 and I remember only too well how much Amateur Radio coverage there was, how strange this seemed as the magazine was for s.w.l.s.

On the front cover we are greeted with the message "A Happy Christmas To All Radio Amateurs Around The World" from G3SWM, with no mention of the s.w.l. at all.

This may have been something overlooked by the

TOP QSL**Dear Sir**

First I would like to thank you for the *Short Wave Magazine*, I cannot wait for each copy to come round, pity it is not weekly. The reason for writing is I have been an avid short wave listener now for 35 years but am becoming more and more depressed at the number of licensed amateurs who seem to ignore my friends' QSL cards. I always send a stamped addressed envelope for a reply, but there are those who will just ignore your card and letter; maybe they think listeners are second class citizens. I may think of throwing in the towel.

I do receive 100% replies from short wave bands such as Radio Moscow, etc., but many licensed amateurs do not return a QSL card. I have an FRG-100 and a Kenwood R-1000. I am retired and cannot afford to keep on sending stamps and envelopes to people who will just ignore a listener.

Thank you for a most enjoyable magazine and a great hobby.

Frank
Shipston-on-Stour



previous publishers as *Short Wave Magazine* was taken over by *PW Publishing Ltd.* in January of 1987. The magazine then shifted its emphasis to suit the s.w.l. better. Were we then looked upon as being Radio Amateurs licensed or not? After all we are all interested in radio communications, weather broadcast, Ham, Data, etc.

Sadly the s.w.l.s tend to find themselves held with less regard by a small minority of licensed hams, who look upon the s.w.l. with less standing than themselves and, maybe as the previous publishers of *SWM* did, discount the s.w.l. altogether.

I read time and time again of how much Amateur Radio is on the decline, with fewer people getting into the hobby. I, myself am not surprised. I must point out that in no way am I critical of the good work that a lot of Radio Amateurs do, such as giving up their spare time to teach in colleges and schools for the RAE and the NRAE, I praise them for this.

Looking at the radio spectrum in general there are so many different things for the s.w.l. to listen to, more encouragement would therefore be appreciated to get the s.w.l. involved in Ham Radio.

I do enjoy the read of *Short Wave Magazine*, and find it to be an excellent magazine, I also agree with the editor that we should have a rotating theme and cover most things in the radio spectrum.

The s.w.l. is certainly well looked after in the magazines coverage of their many different topics, on the radio spectrum. However, I would like to see better coverage of short wave matters, after all, this is a short wave magazine. I understand *SWM* covers other interests in the radio spectrum but why not put the scanning part of the magazine on to a new publication which could perhaps be called 'scanning', or something of this nature.

I for one like the idea of a separate magazine on scanning as this would give more room for scanning issues and *Short Wave Magazine* would then have more room to devote to short wave issues.

Your thoughts and comments.

S. Gill
s.w.l. and scanner devotee

Hmmm...interesting stuff eh?

Dear Sir

Recently my wife fell pregnant, great news, but what's this got to do with radio? Well, for the first time in my life I found that spending small fortunes on radios was out of the question. So for my next upgrade I was forced into the second-hand market, something I've never considered before!

I took a trip to Martin Lynch and as soon as I walked in the door my eyes fell upon my dream, an Icom receiver. "Not very popular" I was told "only £160"... WOW! Yes it's old, yes it's big, yes it's heavy, yes it does lack direct entry, memories and a.m. synch - but 'Oh boy' does it work! My new IC-R70 (mint) is just the perfect h.f. receiver. It is by far the most sensitive radio I've ever owned and I don't think I will ever let it go. So please don't be a 'new gear snob', consider giving an old radio a safe home.

Stephen Sadler
Middlesex

As I'm sure many of you will agree, it is most definitely the case that 'new' is not necessarily best. This is not just the case with radios. Most other manufactured products fall into this scenario too. Now if only cost were no object and manufacturers learned from mistakes of the past. But then what would happen to 'style and fashion'? - KN.

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.

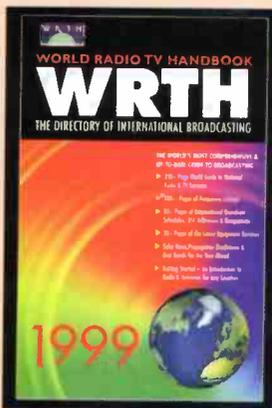
THE BEST LETTER WILL RECEIVE A £20 VOUCHER TO SPEND ON ANY SWM SERVICE.

NEW R2

Icom are pleased to announce the launch of its latest hand-held receiver, the IC-R2, into the UK market. The IC-R2 joins Icom's exclusive range of high-quality receivers, designed to reveal the secrets of the airwaves. Alan Gardener has been lucky enough to test out this hand-held for *SWM*, so, check out page 23 to see what he thought about it.

WRTH 1999

Classed as the world's most comprehensive and up-to-date guide to broadcasting, The **World Radio TV Handbook 1999** is now available from the *SWM* Book Store. With 100+ pages of frequency listings, 80+ pages of international broadcast schedules, QSL addresses and frequencies, 20+ pages of the latest equipment reviews and much, much more, you'll just have to order your own copy and see for yourself! Price is just **£19.50** including P&P!



AMATEUR RADIO MARATHON

Richard G0VCW and **Gill Evans** are organising a Special Event Station in aid of the **Raunds Windmill Primary School**. The school is a lovely, well run community school, which unfortunately had a visit this year from the Health & Safety, who immediately closed their swimming pool, due to the effect that several costly repairs needed to be carried out. As parents, Richard & Gill decided that they would try and raise funds for such a worthy cause.

Richard G0VCW is a keen amateur radio operator and teacher of radio and Morse code to pupils of every age. The 36 hour sponsored amateur radio marathon, where Richard will spend his whole time, with various breaks for nourishment, etc. communicating around the world with as many countries as possible, is taking place on the weekend of **January 30/31st 1999**.

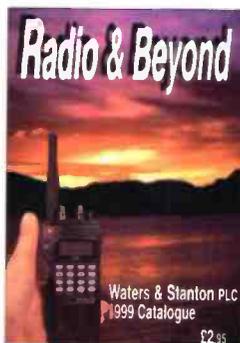
Held in the main hall at the Raunds Windmill Primary School, with the encouragement of the school and its pupils, the day will be open to anyone who wants to come and see what it is all about. The children from the school are all obtaining sponsors individually from family and friends, therefore Richard would like to get sponsors from some of the bigger named companies and publishers in the radio world.

Contact Richard and Gill, Event Co-Ordinators, at **27 Webb Road, Raunds, Wellingborough, Northants NN9 6HH, Tel: (01933) 460552** for more information.

W&S 1999 CATALOGUE

The latest (7th edition) Waters & Stanton catalogue *Radio & Beyond* is now available. With 240 pages, almost all of which are in colour, more products have been added to this year's addition, with well over 1500 items listed and illustrated throughout.

The catalogue also now has some discount vouchers, so you should be able to recover the cost of your catalogue (£2.95 plus £1 P&P) very easily, probably with your first purchase. Order your copy from **Waters & Stanton PLC, 22 Main Road, Hockley, Essex SS5 4QS**.



NEW KITS FOR NOVICES

Lake Electronics have announced two new kits purpose designed for the Novice constructor. Both are intended as practical projects for the Novice RAE students, although they are generating great interest from other budding constructors of all ages.

The first kit is a very simple radio receiver, comprising just one f.e.t. and one transistor in a basic t.r.f. circuit. This little set covers about 6 to 12MHz and can receive several short wave broadcast stations, at good strength, on a personal crystal earpiece. All components, including the variable capacitor and the crystal earpiece, are supplied and assembly is on a small p.c.b. Full

WHAT'S IN STORE FOR CHESTER?

For the first time ever, Chester has its own specialist electronics store. Maplin Electronics opened its doors at **Unit 1a, The Boughton Centre, Chester CH3 5AF** back on Saturday 21 November 1998 at 0900 with a grand opening special sales event, which will last until 24 December 1998.

Maplin Electronics now occupy a purpose built 455m² facility with parking, offering local businesses and residents a wide selection of products. These products range from telephones to PCs, providing the latest Build-to-Order and refurbished machines, electronic components, security products, radio communications, audio visual through to the latest in technology, including the revolutionary PC-controlled Robotics system *Lego Mindstorms*, (see *SWM* December, page 9).

The overall product range on offer to customers is a staggering 37000 individual lines, which is supported in store by a 1400 page catalogue. For business customers, a unique purchasing card - The Maplin 'Freedom Card' - is available to facilitate account purchasing in store, offering 30 days' credit.

The Maplins Electronics Store is now the 49th location in the UK, and Maplin's enthusiastic and highly trained staff look forward to welcoming the shoppers of Chester.

instructions are provided.

The second kit is a small audio amplifier, which closely follows the module described in the NRAE Course Manual. Again, all parts, including the loudspeaker, are supplied. The amplifier works well in conjunction with the Novice receiver.

Both kits are realistically priced at just £8 each, plus £1 postage (for either one or both of them!), and can be obtained direct from the manufacturer, **Lake Electronics, 7 Middleton Close, Nuthall, Nottingham NG16 1BX, Tel: 0115-938 2509**.

FEBA HELPS LAUNCH POWER FM

"Power FM is able to reach the hearts other radio stations don't reach" says Jay Knox, recently back from a trip to Kampala. Jay was there to give two weeks intensive training to 20 enthusiastic *Power FM* presenters.

"Power FM is going to talk about the issues young people are interested in," Jay continues. "A lot of them think to be a Christian you have to be a super, clean, hyper-spiritual person, something they can't relate to. The station's message is, 'Hey, God loves you just the way you are and we want to meet you where you are at'. The young Christians I was training see this challenge and want to go for it!"

Jay says her impressions of Kampala were something of a culture shock. "It's so underdeveloped.

CLOCK CRAZY

Waters & Stanton PLC are now stocking a new range of weather products from Oregon Scientific. Take a few minutes to read the descriptions below and I'm sure you'll find one to suit yourself. I know which one I've got my eye on!

The first of these new products is a radio controlled clock locked to Rugby MSF, providing 12-hour time, plus barometer and indoor and outdoor temperatures. There are up to three remote sensors (one supplied) linked by 418MHz radio system, range 30. Order code **BAR888U** priced at **£69.95**.

Next up is a 12/24-hour clock, with a built-in alarm and calendar plus barometer. A 6-bar display shows trends and a memory lets you recall the past 24 hours value. The unit also displays temperature and humidity values. Order code **BA888** priced at **£69.95**.

How about a clock with a telephone organiser? Well, this 12/24-hour travel clock shows local time plus 27 major cities. It also has a handy pocket calculator with currency conversions. A telephone organiser can store up to 160 names and numbers and there's also Internet address storage capabilities. Order code **AM133** priced at **£15.95**.

Order code **RM913E** priced at **£19.95**, and you will get a 12-hour controlled clock, locked to Rugby MSF. Time is displayed in 12-hour format, plus it also displays date, day and month and functions as an alarm clock. If you were to take this clock abroad on your holidays, it will revert to a normal clock until it is back in range of MSF.

If you're looking for a low-cost clock for the desktop or bedside, then this 12/24-hour clock, which displays weather patterns (five weather forecast symbols) is for you. As well as displaying the date and month, there is also a built-in thermometer and temperature display. Order code **BA312E** priced at **£29.95**.

Finally, and I think this is a great idea, what about a clock that actually displays the time on the ceiling? Well, it would save you rolling over in bed to look at your clock on your bedside table I suppose! This particular clock has a large l.c.d. screen with a powerful beam projected onto the ceiling. It also functions as an alarm clock and displays the day, date and month as well. All for **£29.95**, order code **RM318P**. Bargain!

If you would like more details, contact Waters & Stanton's dealer hotline on **(01702) 203353**.



AIE '99

The Asian Industrial Expo, or AIE '99 for short, will be coming back from September 15-18th at Hong Kong Convention & Exhibition Centre next year. Organised by Business & Industrial Trade Fairs Ltd., the mega AIE is well acclaimed as Asia's comprehensive industrial event covering all areas, such as plastics machinery, mould and die, electronics production equipment, SMT, computers, machine tools, material handling equipment, packaging machinery, printing

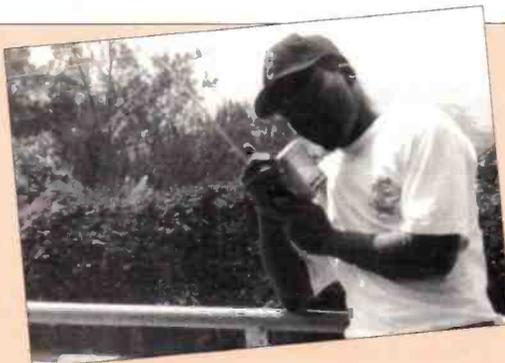
machinery, related equipment and materials, accessories, etc.

This year, the Expo featured 200 exhibitors and overseas agents as well as nearly 25000 high quality visitors, proving that AIE is the best platform for global traders to tap the vast Asian market. More information from **Business & Industrial Trade Fairs Ltd., Unit 1223, 12/F, Hong Kong International Trade & Exhibition Centre, 1 Trademart Drive, Kowloon Bay, Hong Kong, Tel: (852) 2865 2633, FAX: (852) 2866 1770, 2865 5513.**

I think the figure is that only 0.2% of the city's population have telephones. There are regular power cuts, so life is very difficult".

The *Power FM* project has been rapidly gaining momentum over the summer and autumn. Kampala has a high youth population and the churches behind it recognise young people are tomorrow's future.

Everything is gearing up to the start of test broadcasting later this autumn, with the official launch at the turn of the year. Feba is committed to go on providing specialist help in getting *Power FM* established and is raising over £50 000 to cover the expected costs involved. The approach of Christmas is a key time for publicising the new station.



This young man with his radio on a balcony in Kampala is typical of the audience *Power FM* is out to reach.

Send your news to Zoë Crabb at the Editorial Offices

rallies

1999

January 17: The Oldham ARC Mobile Rally is to be held at the Queen Elizabeth Hall, Civic Centre, West Street, Oldham, Lancs. Doors open at 1100 (1030 for disabled visitors). The event features the usual traders and a Bring & Buy stall. Morse tests are available on demand. Talk-in on S22 via GB4ORC commencing at 0730. There will be refreshments and free parking. **(01706) 846143** or **0161-652 4164**.

February 7: The Harwell Amateur Radio Society are holding their Radio & Computing Rally at the Harwell Science and Engineering Centre, one mile west of the A34, between Oxford and Newbury. Talk-in on S22. Doors open from 1000. There will be trade stands, Bring & Buy, bar, light refreshments, and craft exhibitors. Admission is just £1, children free. **G8NVI** on **(01235) 816379** or <http://www.hamradio.harwell.com>

February 7: The 14th South Essex Amateur Radio Society Radio Rally is to be held at the Paddocks, Long Road, Canvey Island, Essex. The Paddocks is situated at the end of the A130. Doors open at 1030. Features include Amateur Radio, computer and electronic component exhibitors, Bring & Buy, RSGB Morse testing on demand (two passport photos required), home-made refreshments, free car parking with space outside main doors for disabled visitors. **David G4UVJ** on **(01268) 697978**.

February 14: The 14th Northern Cross Rally is to be held at Thornes Park Athletics Stadium, Wakefield. There is one large hall, just out of town on the Horbury Road. Easy access from M1 junctions 39 & 40 - well signposted and with a talk-in on 2m and 70cm. Doors open 1100 (1030 for disabled visitors and Bring & Buy). **Roy G0TBY** on **(01924) 893321** or packet **G0TBY@GB7WRG**. E-mail rally@waveg.demon.co.uk or visit the web page at <http://www.waveg.demon.co.uk/rally/>

February 21: The Barry Amateur Radio Society Radio & Computer Fair has changed its venue. The new and improved venue is the Holmview Leisure Centre, Skomer Road, Barry. Facilities include lounge bar, catering and parking. Admission is £1.50 and doors open at 1000 for disabled visitors and 1030 for general public. **Brian GW0PUP** on **(01222) 832253** combined telephone and FAX number.

March 7: The Wythall Radio Club are holding their 14th Annual Radio & Computer Rally at Wythall Park, Silver Street, Wythall, near Birmingham on the A435, just two miles from junction 3 of the M42. Doors open from 1000 to 1600 and admission is £1.50. There will be the usual traders in three halls and a large marquee, Bring & Buy, bar and refreshment facilities are also on site. Talk-in on S22. There will also be a unique park and ride for easy and comfortable parking. Contact **Chris G0EYO** on **0121-246 7267** evenings and weekends for more details. FAX on **0121-246 7268** or E-mail g0eyo@compuserve.com

NEW TRIPLEXER/ DUPLEXER

Nevada now hold in stock two new products from Comet, Japan. The first of these is a new triplexer - the **CFX514**. Suitable for use with the new Yaesu FT-847 and other radios, it allows one multiband antenna to interface with the radio. One antenna input splits into three outputs 50MHz (SO-239), 144MHz (SO-239) and 430MHz (N-type). Available for **£47.95 plus £2.75 P&P**.

The second item is a new duplexer - the **CF706**, suitable for use with the Icom IC-706 and other radios and it allows the use of one multiband antenna to be used with the radio. One antenna input splits into two output ports. Port 1: 1.3-56MHz and Port 2: 75-320MHz. Both are SO-239 sockets. The price of this item is **£39 plus £2.75 P&P**.

More information about these items and more from Nevada at **189 London Road, North End, Portsmouth PO2 9AE, Tel: (01705) 662145, FAX: (01705) 690626**.



PRACTICAL WEEKEND COURSE

Fancy a weekend away; a *radio* weekend away that is? Well, this course could be for you. Entitled **A Scientific Approach To Global Communications**, the elements of this course include: the history of radio, what are radio waves and how do they travel, different types of transmissions (longwave to microwave), modulation, satellites (communication, television and weather) and computers and their use in the radio environment. Participants will be able to transmit during the weekend too, operating under the special amateur call sign **GB2KRC**.

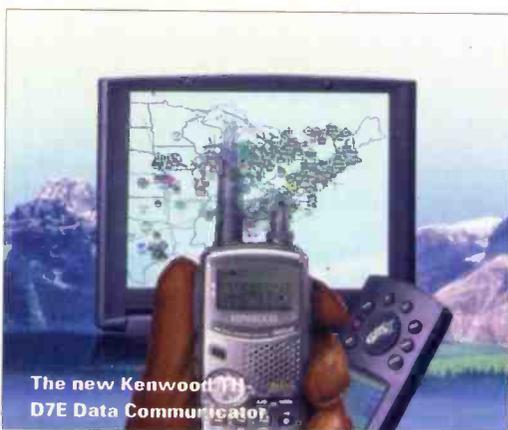
The course, open to all age groups, is directed by **Adrian Dening G4JBF**, a professional radio officer, assisted by **Haydn Kraus G1PZK**, a former school technician, with guests from the **Yeovil Amateur Radio Club**.

The course is to be held at Klive Court Residential Education Centre from 1700 on Friday 9th April till 1400 Sunday 11th April 1999. For those who don't know, Klive Court is a Georgian house with modern extensions and facilities, situated in 25 acres of wooded grounds, near the North Somerset Coast. It is located 20km west of Bridgwater on the A39. The Centre is actually run by the Education Department of Somerset County Council.

For those interested, the cost of the course is £89, which includes full board accommodation. For further information or if you would like to obtain an application form, then please contact the Course Director Adrian Dening in the first instance on **(01288) 341454** or E-mail to **106471.620@compuserve.com**



DUAL-BAND HAND-HELD



Kenwood have recently released a new dual-band (144 and 430MHz) hand-held onto the market, the **TH-D7E Data Communicator**. This new f.m. dual-bander is intended to fill the gap left by the TH-79E, but it includes a market leading feature - it has a packet TNC built-in as standard!

The TNC operates at both 1200 and 9600 baud, so can be used for DX cluster monitoring as well as for sending simple Packet messages via the keyboard. In addition, the TNC allows APRS location beaconing using an external GPS receiver, the TH-D7E will also store received APRS data on up to 40 stations, too.

Finally, the TH-D7E can control many functions of the VC-H1 Visual Communicator which Kenwood recently launched, allowing direct TX mode selection and titling from its keypad, for instant portable SSTV. The final price is not fixed, but should be around **£325 RRP**. See our sister publication for a review of this exciting new hand-held.

FAMILY ARGUMENTS SOLVED?

Did you know that you can turn your computer screen into a television for the remarkable price of just £59? This Christmas, why not cut out the family arguments about who wants to watch the big film, the *Queen's Speech* or the *Top of the Pops Special* with a Hauppauge Win/TV Primio card, and ensure that your household has more than one telly. As a special seasonal offer, Hauppauge are including a **free remote control** with each card purchased from their state-of-the-art Win/TV family.

The Win/TV cards are perfect for hectic households where there is constant competition for the single television remote control. With a Win/TV card, the computer v.d.u. gets a second use - and not only that, but you can work or play on your computer and watch telly at the same time.

The card can be easily installed into your computer, projecting an adjustable television window onto your 'desk top', instantly providing another television, complete with remote. The WIN/TV cards are also all compatible with ATI, Matrox, Diamond, S3, Hercules, STB Direct Draw PCI and AGP video cards.

The most basic card in the range, the **Win/TV Primio**, offers access to television and teletext, allowing the PC to effectively become another TV. This package retails at **£59** and includes a free remote control, with image capture functions, allowing the user to store television snapshots and also send them over the Internet via E-mail.

The more sophisticated **Win/TV PCI** includes all of the features of the Primio, with the additional benefits of a PAL tuner, 2 channel/NICAM stereo and S-Video input. At just **£79**, it is an extremely economical option.

Finally, the **Win/TV Radio** retails at **£99**, with the additional capacity to receive radio

RADIO & TVDX NEWS

Once again **Neil Bone**, Meteor Section director of the British Astronomical Association, has kindly provided the main meteor shower dates for 1999. Our thanks for his help in providing this information.

The 1999 Meteor Shower Timetable.

Shower	Overall Period	Peaking Dates
Quadrantids	Jan 1 - 6	Jan 3 - 4
Lyrids	Apr 19 - 25	Apr 23
May Aquarids	Apr 24 - May 20	May 3 - 5
Cetids	May 7 - June 9	May 14 - 25
Delta Aquarids	Jul 15 - Aug 20	Jul 29 + Aug 6
Perseids	Jul 23 - Aug 20	Aug 12
Orionids	Oct 16 - 27	Oct 20 - 22
Taurids	Oct 20 - Nov 30	Nov 1 - 7
Leonids	Nov 15 - 20	Nov 18 @ 0400UTC
Geminids	Dec 7 - 15	Dec 13 - 14
Ursids	Dec 17 - 25	Dec 23

The BAA comment regarding Leonids 1999 that "Enhanced activity in recent years support the possibility of a Leonids storm over Western Europe. Fast meteors with trains. Essential viewing!"

The Isle of Wight community RSL-TV station, 'TV-12', has settled down to a 1600-2300 local programme format weekdays, with additional programming at daytime weekends. Extensive graphics showing local commercials for both private and commercial advertisers will give ease of identification. From 2300 the QVC shopping channel is carried. Early mornings the Bloomberg news channel is transmitted 0600-0800, 0800-0900 birthdays/weather, etc., 0900-1000 QVC, then local ads until 1600.

The programming is completely local and often repeated over the seven day cycle. Programmes such as *Gardens of the Isle of Wight*, *Island Farming* and specials like the *Ryde Carnival 1998* are typical fare. Check out ch.54, horizontal from Rowridge at 1kW e.r.p. during trop openings for this unique TV station. Reception is favoured over 180° from West through North to East. Relays at Ventnor, Luccombe (Shanklin), Brading, Ryde and Cowes should be on-air by Summer '99.

The Spanish government has now given the okay for terrestrial digital TV (DTT) to start in year 2000 and the big analogue switch-off in 2012 and not 2010 as previously suggested. Meanwhile the closedown date for analogue in Germany has been accepted by the federal government as 2010. Commercial groups had pushed for 2006 but as a compromise there will be a technical review of digital advances in 2003.

The terrestrial coverage of the Televisi Pendidikan Indonesia in major cities across the region, including both Malaysia and Singapore, has increased to nearly 90 main population centres following an expansion in the transmitter network.



Isle of Wight RSL-TV station 'TV-12' on ch.54.

transmissions by means of a cable f.m. stereo radio tuner. Features include channel search, scanning, fine tuning and memory channel. Like all the Win/TV products, Radio is supplied with a comprehensive support package.

Available from leading PC retailers such as **Dixons**, **Action**, **Tempo** and **Staples**, the Hauppauge PCI cards are exceptionally good value in a season that is becoming increasingly costly for the family.

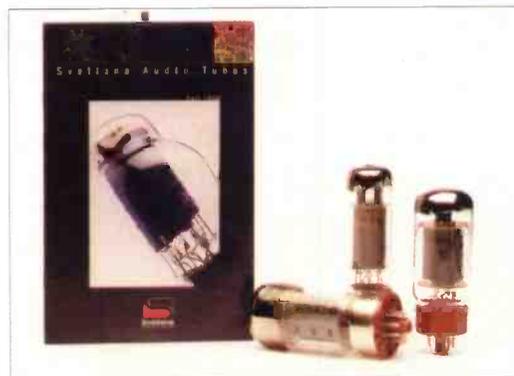
NEW CATALOGUE

Svetlana Electron Devices Inc. have recently introduced its new *1998 Audio Tube Catalogue*. Svetlana has been manufacturing vacuum tubes since 1928 and is one of the largest international suppliers of audio tubes to OEMs. From high-end audio to guitar amplifiers applications, Svetlana's extensive variety of audio tubes are designed and built with exceptional quality and sonic performance characteristics.

The 1998 Audio Tube Catalogue features detailed technical specifications and performance curves for each Svetlana Audio Tube. Whether you

are a user buying new tubes for your amplifier or an OEM designer, the new 1998 Audio Tube Catalogue is the complete reference for the entire Svetlana Audio Tube Line.

More information from **Headquarters at 8200 South Memorial Park, Huntsville, AL 35802** or **Marketing & Engineering at 3000 Alpine Road, Portola Valley, CA 94028** or, of course, visit their web site at www.svetlana.com



New Svetlana Audio Catalogue accompanied by some of its contents.

Send your news to Zoë Crabb at the Editorial Offices

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Leeds LS19 7TA

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Newbury
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Breakers World
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Bordon
Hants GU35 0AY

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France

Flightdeck
192 Wilmslow Road
Heald Green
Cheadle
Cheshire SK8 3BH

Jaycee Electronics Ltd
29 Woodside Way
Glenrothes
Fife KY7 5DF

LAR Communications Centre
(Superslab CB)
Bradford Road
East Ardsley
Nr Wakefield WF3 2DN

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Patchway
Bristol BS34 5JQ

Low Electronics
Chesterfield Road
Matlock
Derbyshire DE4 5LE

Low Electronics
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Newcastle Upon Tyne NE3 2EF

Micron Electronics
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Belfast BT2 7BG

Modern Radio
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Bolton
BL3 6HH

Northern Shortwave Centre
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Carlisle CA3 0PJ

Poole Logic
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Poole
Dorset BH15 2LR

QSL Communications
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Weston Super Mare BS22 6BX

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Nottingham NG8 10U

Shortwave Shop
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Christchurch
Dorset BH23 2LJ

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Earlestown
Newton Le Willows
Merseyside WA12 9BA

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Ward End
Birmingham B8 2RX

Waters & Stanton
22 Main Road
Hockley
Essex SS5 4QS

THIS MONTH'S SPECIAL OFFERS!

JRC NRD545



The latest model in the JRC range, the new NRD 545, which is their first receiver using DSP (Digital Signal Processing) from the IF stages onwards. The DSP enables a wide choice of digitally implemented filters to be provided, together with IF shift and continuously variable passband width. The combination of these facilities gives the NRD 545 a level of performance than has previously been unheard of in a receiver costing less than £10,000. Every equipment reviewer that has had the opportunity to try the NRD 545 to date has been amazed at the performance that JRC engineers have managed to cram into this small box.

JRC NRD345G



JRC need no introduction to most SWL's but their mini receiver does! An all-mode receiver, the NRD345 includes synchronous detection as standard, offering low signal distortion and clear sound. Direct Digital Synthesis is employed in a phase locked loop circuit to enhance the carrier to sideband noise ratio. The RF amplifier and the first mixer in the front end stage incorporate 4 low-noise junction-type FETs with excellent cross modulation characteristics respectively to ensure high sensitivity with wide dynamic range. Other features include a variable level noise blanker, clock and timer functions and a built-in RS232 interface for computer control.

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Lowe AP150



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Lowe

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p&p £2.00

UK Scanning Directory £18.50 p&p £3.00

Airwaves 98 £6.50 p&p £1.00

Callsigns 98 £6.50 p&p £1.00

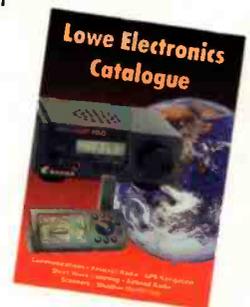
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- ICF-SW100E RRP £219.95 . . . ASK price £149.95
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- ICF-SW7600G RRP £199.95. . ASK price £120.00
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- ATS-818 RRP £169.95 **£135.00**
- ATS-808 RRP £99.95 **£85.00**
- ATS-606 RRP £119.95 **£105.00**
- ATS-305 RRP £69.99 **£60.00**



SW Receivers

- HF-150 **£330.00**
- KEY PAD **£39.95**
- PR-150 **£170.00**
- IF-150 interface **£39.95**
- HF-250 **£600.00**

GARMIN GPS SYSTEM

- GPS 35 PC 12 channel engine & antenna with serial port connection & cigarette lighter adaptor, so that it can be connected to a lap top PC or Psion directly (null modify lead/adaptor required for Psion). **£209.95**
- GPS 12 Hand-held portable systems includes: 12 parallel channel receiver, built-in antenna, lanyard. No external antenna option. **£115.00**
- GPS 12XL Europe Hand-held portable system includes: Europe City Point Database, 12 parallel channel receiver, built-in antenna, carrying case & lanyard. **£205.00**
- GPS II Plus Europe Hand-held portable system includes: Europe City Point Database, 12 parallel channel receiver, portable antenna, velcro & lanyard. **£205.00**
- GPS 48 Europe Hand-held portable system includes: Europe Marine Database, 12 parallel channel receiver, a built-in point database including major cities, buoys and lights, portable antenna, carrying case & lanyard. **£240.00**
- GPS 3 Hand-held mapping portable system includes: 12 parallel channel receiver, a built-in international basemap including major cities, roads, lakes and rivers, portable antenna, velcro mount & lanyard. **£Phone**

Frequency Guides and Books

- UK Scanning Directory 5th edition **£12.00**
- UK Scanning Directory 6th edition **£18.00**
- Scanners 3 **£9.95**
- UHF/VHF Frequency Guide **£12.95**
- Passport to World Band Radio 1998 **£14.95**
- World Radio TV Hand Book 1998 **£18.95**
- Global Radio Guide **£3.95**
- The Worldwide Aeronautical HF Radio Handbook **£6.95**
- International Airband Radio Hand Book **£9.95**
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- The Worldwide Aeronautical Communication Frequency Directory **£19.95**
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- Klingenfuss the super freq list CD ROM **£29.95**
- Shortwave International Freq Handbook **£12.95**
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Bandscan Europe

A major new international broadcaster went on the air in October last year, using transmitters in the UK, Greece and Germany. Radio Free Iraq comes from the stable of US-funded international services which aim to provide 'surrogate' broadcasting to their target areas. For many years Radios Free Europe and Liberty transmitted to the Soviet Bloc, fighting their way through significant amounts of jamming, providing what the US claimed citizens of the communist-led countries would have wanted to hear, if they had the choice.

Radio Free Iraq's aim is a little different. Its head, David Newton, says he wants to provide 'balanced information' and the 'truth' about Iraq and the Middle East. In an opening address to listeners, Newton said: 'We believe that the truth is the most efficient weapon in the struggle for making freedom and democracy reach Iraq. We do not endeavour to confront the propaganda media of the Iraqi regime with opposing propaganda'.

The Arabic-language programmes have been heard on the air at 1600UTC for 30 minutes on 6.13, 9.54, 9.85 and 11.915MHz and at 0300 on 5.965, 7.11, 7.275 and 9.74MHz. These transmissions come from the Merlin Communications short wave sites in the UK (formerly owned by BBC World Service), Deutsche Telekom facilities at Jülich and from the VoA site in Kavala, Greece.

Radio Free Iraq is based at the Prague headquarters of RFE/RL, and there has been a great deal of political activity surrounding the launch of the new service. The Iraqi government has protested to the Czech Prime Minister, Vaclav Havel, and said that the country faces 'huge losses' in international trade and bilateral arrangements. At the same time, the Iranian government has threatened to take RFE/RL to the International Court of Justice in the Hague over a new Farsi-language service from the US-sponsored station. Iran has also recalled its Ambassador from Prague.

In late November, a group representing 16 Iraqi opposition groups, met Foreign Office Minister Derek Fatchett to discuss setting up a radio station beaming programmes back to Iraq, possibly from the UK. The Foreign Office is currently considering the suggestion, but is not thought to be too enthusiastic since the US is already running Radio Free Iraq.

German Service

There is still no news about the future of the BBC German Service. Regular readers will remember that the service was on the closure list, following a less generous than expected settlement from the British government to World Service. But the change of World Service management in October (when Sam Younger stood down and was replaced by Mark Byford from BBC Regional Broadcasting) means the decision has been put on hold.

A campaign to save the German Service has been launched in Germany, and there is pressure on the BBC from the British Foreign Office to maintain the service, the last remaining west European language from Bush House. The most likely scenario is a trimming of the output - currently two and a half hours a day - and a reduction in the staffing.

Second Broadcaster

Belgium may have a second international broadcaster later this year. For the past few years, the Flemish community has operated the only overseas radio operation from Belgium. But now RTBF, the French-language broadcaster, has announced it intends to resume short wave broadcasting in French for listeners in former Belgian colonies in central Africa, and possibly for expatriates and

holidaymakers in the Mediterranean.

RTBF sold its high-power short wave transmitter to VRT, the Flemish broadcaster, when it closed its international service in the 1980s. Now RTBF is likely to hire time on short wave transmitters in another European country, probably Deutsche Telekom's stations in Germany.

Radio Vlaanderen Internationaal has a new mailing address, this is **RVI Brussels Calling, 1043 Brussels, Belgium.**

Station News

In neighbouring Holland, Radio Netherlands is reported to be overspending because of the costs of running its fledgling television service. This is causing funds to be diverted from the international radio operation with consequent reductions in transmissions on short wave. Since the October time changes, Radio Netherlands has also dropped its use of WRN1 in Europe and North America.

The television service draws programmes from the Dutch public service TV stations and puts them out on satellite for viewers in Europe, principally holidaymakers in the Mediterranean area. There is resentment in the domestic public service stations that they are not running the service.

Vatican Radio is hiring overseas transmitters for the first time. The Catholic station has been on the air from Tashkent and Alma-Ata, and is now using the Kazakh station during this current winter period, and will use the Uzbek station during summer time. The Vatican is trying to boost reception in the Indian subcontinent, using 11.695MHz between 1450 and 1610UTC daily. There is also a transmission direct from Italy on 13.765 and 15.50MHz at the same time.

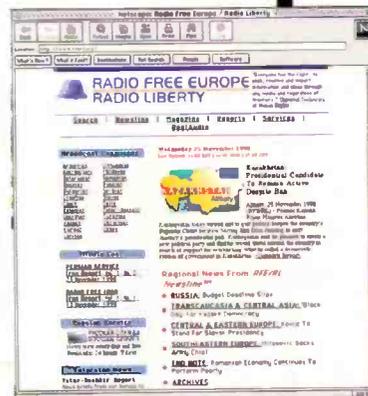
Broadcasts Banned

In Serbia, foreign broadcasts have been banned from the local airwaves. The Serbian Deputy Prime Minister described BBC World Service, Radio France Internationale, Deutsche Welle and Voice of America as 'espionage organisations' at the time the ban was introduced last October. As a result, both the BBC and VoA increased their direct short wave Serbian transmissions. But the audiences for these services are small, according to the operators of the famous Radio B92. This pioneering station has relayed BBC World Service for the last couple of years, and its audience is significant.

The ban is part of a package of measures introduced at the time that NATO air strikes were expected over Serbia. These measures are designed to 'safeguard the integrity and sovereignty of Serbia and Yugoslavia'.

This ban shows the importance of the big international radio services maintaining their direct short wave transmissions - what would happen if democracy was suddenly suspended in, for the sake of argument, the Czech Republic? The BBC has dropped all short wave and medium wave transmissions to the country, relying entirely on local rebroadcasting arrangements with domestic stations. It might be difficult to regain a short wave audience, even in a time of crisis.

On that sober thought, I'll wish you good listening - wherever you are in the world!



Radio Free Europe/Radio Liberty's homepage.

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

LM&S

Quite a few of the entries in the reports that were sent to me near the end of October were rendered 'no longer applicable' when the International Broadcasters altered their s.w. transmission schedules on October 25 to compensate for seasonal changes in propagation. To ensure that the information herein is as up-to-date as possible I have therefore excluded them.

Before detailing some of the changes may I take this opportunity to wish all listeners and readers a Happy New Year.

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 October.

A broadcast from Radiotelevisione, Italiana (RAI) via their 10kW outlet at Caltanissetta, Italy on **189kHz** was picked up at 2100UTC on October 29 by **Fred Pallant** in Storrington. Identification proved difficult due to the weak signal but music followed by announcements in Italian were heard.

Whilst visiting Tanger, Morocco **Ernest Wiles** (NE.Bedford) searched the band after dark. He logged Allouis, France on **162kHz** as SINPO 22222; Saarlouis, Germany on **183** as 33333; also Beidweiler, Luxembourg on **234** as 33333. The transmission on **171** from Medi-1 via Nador, some 250km distant, which could be received during the day and at night, rated 35554.

Medium Wave Reports

The reports suggest that very few of the broadcasts from the numerous m.w. stations in E.Canada and E.USA reached our shores at night during October. Up in Shetland **John Slater** (Scalloway) searched the band just before dawn on the 18th and heard WBBR in New York, NY on **1130kHz** (rated SIO 222 at 0630UTC); also CJYQ in St.John's, NF on **930** (SIO 333 at 0640) but by 0655 they had faded into the noise. He heard briefly WVKB in Buffalo, NY on **1520** as daylight was breaking.

Down in Wallsend **David Edwards** used a 2.5 x 2.5m wall mounted loop erected in an East/West direction with a m.w. converter and a Trio R-600 receiver to search the band. On October 29 he heard VPCM in St.John's, NF on **590** at the remarkably early time of 2136! Their broadcast of music and adverts included a station ident. It peaked SINPO 23542.

The sky waves from some of the m.w. stations in the Middle East, N.Africa, Europe and Scandinavia reached the UK after dark - see chart. In response to an enquiry, Polish Radio has informed **Sheila Hughes** (Morden) that they are no longer using any of the m.w. outlets which carried their domestic services. The transmitters were rented from Polish Telecom - they are old and had become too expensive to run.

During daylight the ground waves from some local radio stations reached quite distant places - see chart. The closure of the m.w. outlet of ILR Cheltenham Radio on **603kHz** was noted by **Brian Keyte** (Gt.Bookham) in mid-October after their broadcasts had been transferred to the v.h.f. band (**107.5MHz** f.m.) under the name 'Cat FM'. From **George Millmore** in Wootton, IoW, came the news that the mast at nearby Bridesford Farm, which radiated the m.w. broadcasts from ILR Isle of Wight Radio on **1242kHz**, has now been dismantled and taken away.

Short Wave Reports

It would seem that the International Broadcasters have decided not to include **25MHz (11m)** band in their latest schedules. Many listeners will find this both disappointing and surprising because the propagation forecasts have indicated that North/South paths are very likely to be open during part of the day. Those over the Atlantic to N/C.S.America may also be open at times but early morning checks in E.Canada by **Alan Roberts** (Quebec) have so

far revealed a lack of broadcast activity.

In contrast, a number of broadcasters are active in the **21MHz (13m)** band. During the morning the BBC via Kranji, Singapore **21.660** (Eng to Asia 0530-1030) was rated 32122 at 0700 by **Vic Prier** in Colyton; R.Austria Int, Moosbrunn **21.765** (Eng to Eur, Australasia? 0800?-1100?) 45554 at 0851 by **Eddie McKeown** in Newry; UAER, Abu Dhabi **21.735** (Ar to ? 0800?-1500?) 45554 at 0940 in Wallsend; BSKSA Saudi Arabia **21.495** (Ar [Holy Quran] to SE.Asia 0900-1200) 44334 at 1007 by **Rhoderick Illman** in Oxted; Vatican R, Italy **21.850** (It to S.America? 1000-1030) 44333 at 1009 by **Martin Venner** in St.Austell; RAI Rome **21.520** (It to Africa 0600-1300) 32333 at 1030 **Gerald Guest** in Dudley; R.Portugal Int via Sines **21.655** (Port to Brazil 0900?-2200?) 44444 at 1040 by **Robert Connolly** in Kilkeel.

After mid-day, HCJB Quito, Ecuador **21.455** (Eng [u.s.b. + p.c.] to N/S.America 1100-1600) was rated 44433 at 1250 by **Bernard Curtis** in Stalbridge; REE via Noblejas **21.700** (Sp to S.America 1200-1800?) 55555 at 1214 by **Darren Beasley** in Bridgwater; UAER, Abu Dhabi **21.630** (Ar to Far East 0800?-1600?) 45334 at 1344 by **Tom Read** in C.Macclesfield; UAER, Dubai **21.605** (Eng to Eur 1330-1355) 44444 at 1349 by **Vera Brindley** in Woodhall Spa; BBC via Ascension Is **21.660** (Eng to Africa 1100-1700) 43333 at 1425 by **Stan Evans** in Herstmonceux; R.Sweden, Stockholm **21.810** (Eng to N/C.America 1430-1500) 24222 at 1450 by **Thomas Williams** in Truro; RFI via Issoudun? **21.580** (Fr to S.Africa 0900-1600) 23242 at 1515 by **Peter Pollard** in Rugby; BBC via Cyprus **21.470** (Eng to E.Africa 1400-1700) 45444 at 1620 by **Fred Wilmshurst** in Northampton; WYFR via Okeechobee, USA **21.525** (Eng, Fr, Port to Eur, Africa 1600-2000) 25343 at 1855 in Storrington; HCJB Quito **21.470** (Russ to E.Eur 1800-1900) 45444 by **Simon Hockenull** in E.Bristol.

The **18MHz (15m)** band is being used by Christian Science Broadcasting to reach listeners in Africa. Their transmission from WSHB in Cypress Creek, USA on **18.910** (Fr, Eng 1700?-1958) was rated SIO 333 at 1703 by **Philip Rambaut** in S.Macclesfield.

An improvement in reception from some areas has been noted in the **17MHz (16m)** band. During the morning R.Australia via Shepparton **17.750** (Eng to Asia 0600-0900) was a potent 44444 at 0832 in Woodhall Spa; R.Austria Int via Moosbrunn **17.615** (Eng to Asia 0930-1000) 54444 at 0935 in Morden; BBC via Ascension Is **17.830** (Eng to W/C.Africa 0730-2100) SIO 333 at 0915 in S.Macclesfield; BBC via Nakhon Sawan, Thailand **17.790** (Eng to Asia 0900-1100) 35433 at 1005 in Northampton; R.Pakistan, Islamabad **17.835** (Eng to Eur 1100-1120) 43344 at 1108 by **Martin Dale** in Stockport.

During the afternoon R.Bulgaria, Sofia **17.500** (Eng to Eur? 1200-1300) was 54444 at 1215 in Stalbridge; BBC via Skelton, UK **17.705** (Eng to Eur, Africa 0900-1515) was rated 55555 at 1250 by **Ernest Wiles** while in Tanger, Morocco; BBC via Skelton & Woofferton, UK **17.640** (Eng to E.Eur, M.East, E.Africa 0700-1500) 35423 at 1340 in E.Bristol; Voice of Turkey **17.815** (Eng to Eur 1330-1425) 44444 at 1400 in Newry; Israel R, Jerusalem **17.535** (Eng to Eur, N.America 1500-1530) 44444 at 1500 by **Clare Pinder** in Appleby; DW via Antigua, W.Indies **17.765** (Ger to S.America 1400-1600) 43433 at 1520 in C.Macclesfield; VOA via Morocco **17.895** (Eng to Africa 1600-1900) 45444 at 1640 by **Tony Hall** in Freshwater Bay.

Later, Israel R, Jerusalem **17.545** (Heb [Home Sce rly] to W.Eur, N.America 0500-1855) was 43333 at 1820 in Colyton; R.Taipei Int, Taiwan via WYFR **17.555** (Fr, Eng to Eur 1700-1900) 44333 at 1850 in Rugby; WYFR Okeechobee, USA **17.555**



LONG WAVE CHART

Freq (kHz)	Station	Country	Power (kW)	Listener
153	Bechar	Algeria	1000	H*
153	Donebach DLF	Germany	500	A,B,C,D,E*,F,G,H*,I,J,L
162	Allouis	France	2000	A,B,D,E*,F,G,H*,I,J,K*,L
171	Nador Medi-1	Morocco	2000	H*,K
171	B'shakovo etc	Russia	1200	A,D*,G,H*
171	Lvov	Ukraine	500	E*
177	Oranienburg	Germany	500	A,E*,G,H*,J,L
183	Saarlouis	Germany	2000	A,B,D,E*,G,H*,I,J,K*,L
198	Droitwich BBC	UK	500	A,B,D*,G,I,J,L
207	Munich DLF	Germany	500	A,C*,E*,G,H*,J,L
207	Azizal	Morocco	800	H*
216	Roumoules RMC	S.France	1400	A,C,D,E*,G,H*,J,L
225	Raszyn Resv	Poland	?	A,C*,D*,E*,G,H*
234	Beidweiler	Luxembourg	2000	A,B*,D,E*,G,H*,J,K*,L
243	Kalundborg	Denmark	300	A,C,D*,G,H*,J,L
252	Tipaza	Algeria	1500	D*,H*
252	Atlantic 252	S.Ireland	500	A,B,G,H*,I,J,L
261	Burg(R.Ropa)	Germany	85	C*,D,G,H*,J,L
270	Topolna	Czech Rep	1500	C*,E*,G,H*,J,L
279	Sasnovy	Belarus	500	D*,E*,G*,H*,L

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

Listeners:-

- (A) Martin Dale, Stockport.
- (B) Damien Grehan, Co.Mayo.
- (C) Simon Hockenull, E.Bristol.
- (D) Sheila Hughes, Morden.
- (E) Rhoderick Illman, Oxted.
- (F) Frank Miles, SW London.
- (G) George Millmore, Wootton, IoW.
- (H) Fred Pallant, Storrington.
- (I) Tom Smyth, Co.Fermanagh.
- (J) Phil Townsend, E.London.
- (K) Ernest Wiles, while in Tanger, Morocco.
- (L) Fred Wilmshurst, Northampton.

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(Eng to Eur 1900-2000?) 44434 at 1900 in Storrington; RCI via Sackville **17.820** (Fr, Eng to Eur, Africa 2000-2200) 24321 at 2023 in Oxted; VOA via Greenville, USA **17.725** (Eng to Africa 2000-2200) 33333 at 2050 in Truro; BBC via Greenville, USA **17.715** (Eng to C.America 2115-2130) 32322 at 2125 in Kilkeel; R.New Zealand Int **17.675** (Eng to Pacific areas? 2050 [2105 Fri/Sat] - 0457) 15551 at 0000 in Wallsend.

In the popular **15MHz (19m)** band R.Africa 2, Eq.Guinea **15.185** (Eng to Africa 0700-1100) was heard at 0655 in Scalloway; R.Australia via Shepparton **15.510** (Eng to Pacific 0200-0900) was 43444 at 0709 in Woodhall Spa; BBC via Skelton & Rampisham, UK **15.565** (Eng to Russia, Eur 0600-1700) 44433 at 0935 in Herstmonceux; Voice of Armenia, Yerevan **15.270** (Eng to Eur 1000-1030 Sun) 34433 at 1000 in Newry; WWCR Nashville, USA **15.685** (Eng to N.America, Eur 1100-2200) was rated 54444 at 1215 by **Martin Cowin** in Kirkby Stephen; Voice of Greece, Athens **15.295** (Eng to Australia 1330-1425) 43444 at 1342 in Storrington; BBC via Nakhon Sawan, Thailand **15.310** (Eng to Asia 1100-1400) 45333 at 1350 in Northampton; WEWN via Vandiver, USA **15.745** (Eng to Eur 1000-2200) 35333 at 1423 in C.Macclesfield; RCI via Sines, Portugal **15.325** (Eng to Eur,

M.East, Africa 1430-1500) 44444 at 1430 in Truro; BBC via Masirah Is, Oman **15.310** (Eng to S.Asia 0300-0815, 0900-1100, 1400-1700) 33333 at 1452 in Storrington; TWR Agana, Guam **15.330** (Eng to S.Asia? 1500-1630?) 33233 at 1530 by **David Hall** in Morpeth; VOA via ? **15.205** (Eng to Eur, N.Africa? 1400-1600?) 33323 at 1550 in Stalbridge; R.Prague, Czech Rep. **15.530** (Eng to E.Africa 1600-1700) 34333 at 1600 in Storrington; R.Algiers Int, via Bouchaoui **15.160** (Eng, Sp to Eur, M.East, N.Africa 1600-2000?) 45444 at 1609 in Freshwater Bay; UAER, Dubai **15.395** (Eng to Eur 1600-1640) 44444 at 1610 by **Tom Winzor** in Plymouth.

Later, WYFR via Okeechobee **15.695** (Eng to Eur, Africa 1600-1800?) was 43333 at 1740 in Morden; VOIRI Tehran, Iran **15.084** (Home Sce relay) 55444 at 1810 in Colyton; R.Nederlands via Bonaire, Ned.Antilles **15.315** (Eng to Africa 1830-2025) SIO 444 at 1830 by **Tom Smyth** in Co.Fermanagh; Voice of Nigeria via Ikorodu **15.120** (Eng 1900-2100) 44444 at 1930 by **Ross Lockley** in Galashiels; HCJB Quito, Ecuador **15.115** (Eng to Eur 1900?-2200?) 45333 at 1951 in Bridgwater; RAE Buenos Aires, Argentina **15.345** (Sp to S.America?) 24542 at 2002 in Wallsend; RCI via Sackville **15.150** (Fr, Eng to Eur, Africa 2000-2230) 33333 at 2024 in Oxted; Christian Science Broadcasting via WSHB **15.665** (Ger, Fr, Eng to Eur 1900?-2200) 25433 at 2050 in Storrington; VOA via Greenville, USA? **15.580** (Eng to Africa 1800?-2200?) 44444 at 2115 in Kilkeel.

Good reception from some areas has been noted in the **13MHz (22m)** band. Mentioned in the reports were R.Austria Int via Moosbrunn **13.730** (Ger, Eng, Fr to Eur 0700-?) 55555 at 0750 in Plymouth; SRI via Sottens **13.685** (Eng, It, Ger, Fr to Australasia 0830-1030) SIO 444 at 0853 by **Francis Hearne** in N.Bristol; UAER, Dubai **13.675** (Ar to Eur 0615?-1030) 24342 at 1026 in Oxted; R.Vlaanderen Int, Belgium **13.745** (Eng to Eur?, N.America? 1130-1200) 45344 at 1130 in Newry; R.Kuwait via Kabd **13.620** (Ar to Eur, N.America 0930-1605) 54544 at 1400 in Northampton; WWCR Nashville, USA **13.845** (Eng to Africa 1400-0000) 34433 at 1415 by **Harry Richards** in Barton-Upon-Humber; R.Sweden, Stockholm **13.740** (Eng to Eur, M.East, Africa 1430-1500) 44444 at 1430 in Truro; R.Austria Int via Moosbrunn **13.730** (Ger, Eng to Eur, Africa 1600-1800) 55444 at 1631 in Freshwater Bay & 55555 at 1645 in Tanger, Morocco; AIR via Bangalore **13.620** (Ar to M.East 1730-2000, Fr to W.Africa 2000-2030) 42323 at 1830 in Colyton; WHRI via Noblesville, USA **13.760** (Eng to E.USA, Eur 1600-2100) 34232 at 1904 in Bridgwater; R.Havana Cuba **13.720** (Eng to Eur 2030-2130) 33233 at 2030 in Appleby; WEWN Birmingham, USA **13.615** (Eng to Eur 2000-2200?) 22222 at 2050 in Stalbridge; Christian Science SWB via WSHB Cyprus Creek, USA **13.770** (Eng to Eur 2100-2200 Wed & Sun) 44444 at 2130 in Kilkeel; RCI via Sackville **13.650** (Fr, Eng to Eur, Africa 2000-2230) 55444 at 2128 in C.Macclesfield.

Of special interest to some UK listeners are R.New Zealand's early morning broadcasts to Pacific areas in the **11MHz (25m)** band. Their 100kW transmission from Rangitai, N.Island on **11.905** (Eng 0459?-0706) was rated 33333 at 0645 by **Frank Miles** in SW.London. Also noted during the morning were FEBC Bocaue, Philippines on **11.635** (Eng to Asia 0930-1100) rated 33333 at 0930 in Scalloway; RFI via Allouis? **11.670** (Fr to Eur, M.East, Africa? 0930?-1300?) 33323 at 0940 in Stalbridge; ERT Tunisia **11.730** (Nat prog 0600-1710?) 44433 at 1039 in Oxted.

During the afternoon the Voice of Greece, Athens **12.105** (Gr, Eng to Eur, N.America? 1330-1356) was 55454 at 1350 in Newry; R.Jordan via Al Karanah **11.690** (Eng to W.Eur, E.USA 1100-1700) 43333 at 1456 in St.Austell; R.Australia via Shepparton **11.660** (Eng to Asia 1330-1700) 44444 at 1458 in Morpeth; REE via Noblejas **12.035** (Sp to Eur 0700-1700) 44444 at 1500 in Rugby; AIR via Bangalore **11.585** (Baluchi to Pakistan 1500-1600) SIO 333 at 1535 in S.Macclesfield; R.Pakistan, Islamabad **11.570** (Eng to M.East 1600-1630) 45344 at 1601 in Freshwater Bay.

Later, the Voice of Vietnam, Hanoi **12.020** (Eng to Eur 1800-1830) was 44444 at 1815 in Morden; WWCR Nashville, USA **12.160** (Eng to N.America, Eur 1400-2200) 23322 at 1815 in Colyton; R.Nederlands via Flevo **11.655** (Eng to Africa 1830-2025) 34434 at 1830 in Dudley; R.Kuwait via Kabd **11.990** (Eng to Eur, N.America 1800?-2100) 44444 at 1954 in Plymouth; AFRTS via Key West, Florida Keys **12.689.5** (Eng [u.s.b.] to Caribbean & S.American Waters 24hrs) 25333 at 2030 in Barton-Upon-Humber; R.Australia via Shepparton **11.880** (Eng to Pacific areas 1700-2200) 34434 at 2120 in E.Bristol; AIR via Bangalore **11.620** (Eng, Hi to Eur 1745-2230) 44433 at 2205 in Northampton; BBC via Skelton, UK **11.835** (Eng to W.Africa 2000-2300) 45554 at 2252 in

LOCAL RADIO CHART

Freq (kHz)	Station	ILR	e.m.r.p BBC (kW)	Listener	Freq (kHz)	Station	ILR	e.m.r.p BBC (kW)	Listener
558	Spectrum, London	I	0.80	B,H,J,K,L,O	1242	Capital G,Maidstone	I	0.32	L,N
585	R Solway	B	2.00	A,J	1251	C.G Amber,Bury St Ed	I	0.76	A,H,J,N,O
603	Capital G,Litt'brne	I	0.10	A,K,L,N	1260	Brunel CG, Bristol	I	1.60	F,G,J*,L
630	R.Bedfordshire(3CR)	B	2.00	B,C,D,I,K,L,N,O	1260	Marcher G, Wrexham	I	0.64	B,J
630	R.Cornwall	B	2.00	A,G,L	1260	SabrasSnd,Leicester	I	0.29	B,O
657	R.Clywd	B	2.00	A,D,I,J,L,M,N	1278	R.York	B	0.50	A,J
657	R.Cornwall	B	0.50	A,G,L	1296	Cl.Gold 1278 W.York	I	0.43	B,J
666	Gemini AM, Exeter	I	0.34	A,D,E,G,I,J,L,O	1305	Radio XL,Birmingham	I	5.00	A,B,J,L,O
666	R.York	B	0.80	A,B,J,N	1305	Magic AM,Barnsley	I	0.15	A,B
729	BBC Essex	B	0.20	H,L,N,O	1305	Premier via ?	I	0.50	J,L,O
729	Hereford/Worcester	B	0.037	A,B,C,D,F,H,L,N,O	1305	Touch AM, Newport	I	0.20	FL
756	R.Cumbria	B	1.00	A,J	1323	Capital G,Southwick	I	0.50	B,L,O
756	R.Maldwyn, Powys	I	0.63	A,B,J,L,O	1323	SomersetSnd,Bristol	B	0.63	A,B,F,J
765	BBC Essex	B	0.50	B,H,J,L,O	1332	Premier, Battersea	I	1.00	J,L
774	R.Kent	B	0.70	L,N,O	1332	Cl.Gold 1332,P't'bo	I	0.60	A,B,J
774	R.Leeds	B	0.50	A,B,J	1359	Cl.Gold 1359,C'try	I	0.27	B,J,O
774	Cl.Gold 774, Glos	I	0.14	A,B,L	1359	R.Solent	B	0.85	J,L
792	Cl.Gold 792,Bedford	I	0.27	B,L,N,O	1359	Touch AM, Cardiff	I	0.20	F,J
792	R.Foyle	B	1.00	A,J,M	1368	Southern Counties R	B	0.50	L,N
801	R.Devon & Dorset	B	2.00	A,C,D,E,F,G,J,L	1368	Wiltshire Sound	B	0.10	L
828	Cl.Gold 828, Luton	I	0.20	H*,J*,N,O	1377	Asian Sd, Rochdale	I	0.10	B
828	Magic 828, Leeds	I	0.12	B	1413	R.Gloucester via ?	B	?	D,E*,F,J,O
828	Asian Netwk Sedgley	B	0.20	B,J	1413	Premier via ?	I	0.50	J,L
828	2CR CG, Bournemouth	I	0.27	G,L	1413	Yks Dales R,Skipton	I	0.10	A,B,J*
828	Townland R, Ulster	I	0.80	A	1431	The Breze, Southend	I	0.35	J,N
837	R.Cumbria/Furness	B	1.50	A,J	1431	Cl.Gold, Reading	I	0.14	J,L,O
837	Asian Netwk Leics	B	0.45	A,B,L,N,O	1449	R.Peterboro/Cambis	B	0.15	A,B,J,O
855	R.Devon & Dorset	B	1.00	L	1458	R.Cumbria	B	0.50	A,J
855	R.Lancashire	B	1.50	A,B,J	1458	R.Devon & Dorset	B	2.00	A,G,J,L
855	R.Norfolk, Postwick	B	1.50	H,J,N	1458	145B Lite AM Manch'	I	5.00	B,J
855	Sunshine 855,Ludlow	I	0.15	B,H,O	1458	R.Newcastle	B	2.00	J
873	R.Norfolk, W.Lynn	B	0.30	B,H,L,N,O	1458	Sunrise, London	I	50.00	L,O
936	Brunel CG, W.Wilts	I	0.18	L,O	1476	CountySnd,Guildford	I	0.50	J,L,N,O
936	Yks Dales R, Hawes	I	1.00	A,B,J	1485	Cl.Gold, Newbury	I	1.00	J,O
945	Cl.Gold GEM, Derby	I	0.20	A,B,J*,O	1485	R.Humberside (Hull)	B	1.00	B,J
945	Capital G, Bexhill	I	0.75	L,J,N	1485	R.Merseyside	B	1.20	A,B,H*,J,L,M
954	Gemini AM, Torquay	I	0.32	G,L	1485	Southern Counties R	B	1.00	L
954	Cl.Gold 954, H'ford	I	0.16	B,J,O	1485	R.Stoke-on-Trent	B	1.00	A,B,D*,J,L,O
963	Asian Sd, E.Lancs	I	0.80	A,B	1521	Hearbeat C1AM,NI	I	0.50	A,B,O
963	Liberty R, Hackney	I	1.00	L,J,O	1521	Fame C1, Reigate	I	0.64	L,N
972	Liberty R, Southall	I	1.00	B,J,O	1530	R.Essex	B	0.15	L,N
990	R.Aberdeen	B	1.00	J	1530	Cl.Gold W.Yorks	I	0.74	A,B,J
990	R.Devon, E.Devon	B	1.00	A,F,G,L	1530	Cl.Gold Worcester	I	0.52	J,L,O
990	Magic AM,Doncaster	I	0.25	B	1548	R.Bristol	B	5.00	F,G,L
990	Cl.G. Wolverhampton	I	0.09	B,O	1548	Capital G, London	I	97.50	I*,J,L,O
999	C.Gold GEM Nott'ham	I	0.25	B,O	1548	Magic AM,Merseyside	I	4.40	A,B,E*,J,M
999	Red Rose 9-99 P'stn	I	0.80	A,B,J	1548	Cl.Gold, Sheffield	I	0.74	B,J
999	R.Solent	B	1.00	G,J,L	1548	Forth AM, Edinburgh	I	2.20	J
999	Valley R, Aberdare	I	0.300	F	1557	R.Lancashire	B	0.25	A,B,H*,J
1017	Cl.G. Shrewsbury	I	0.70	A,B,H*,J,O	1557	Cl.Gold E7,N.hant	I	0.76	B,J,O
1026	R.Cambridgeshire	B	0.50	B,J,N,O	1557	Capital G, So'ton	I	0.50	J,L
1026	Downtown R, Belfast	I	1.70	A,J,M	1584	London Turkish R	I	0.20	L
1026	R.Jersey	B	1.00	G,L	1584	R.Nottingham	B	1.00	B,J
1035	RTL Country 1035	I	1.00	J,L,O	1584	R.Shropshire	B	0.50	A,L
1035	R.Sheffield	B	1.00	B	1584	Tay, Perth	I	0.21	J
1035	N.Sound 2, Aberdeen	I	0.78	A,J	1602	R.Kent	B	0.25	J,L,N
1035	West Sound, Ayr	I	0.32	J					
1107	Moray Fth,Inverness	I	1.50	J					
1116	R.Derby	B	1.20	A,B,J,N,O					
1116	R.Guernsey	B	0.50	G,H,L					
1116	Valley R, Ebbw Vale	I	0.50	J					
1152	Cl.G Amber, Norwich	I	0.83	B,J					
1152	Clyde 2, Glasgow	I	3.06	J					
1152	LBC 1C AM	I	23.50	L,O					
1152	Pic'y 1C,Manch'r	I	1.50	A,B					
1152	PlymSnd AM,Plymouth	I	0.32	E					
1161	R.Bedfordshire(3CR)	B	0.10	N,O					
1161	Brunel Cl.G.Swindon	I	0.16	J,L					
1161	Magic AM,Humberside	I	0.35	A,B,J					
1161	Southern Counties R	B	1.00	L					
1161	Tay AM, Dundee	I	1.40	J					
1170	GNR, Stockton	I	0.32	A,J					
1170	Capital G,Portsm'th	I	0.50	L					
1170	Signal 2,Stoke-on-T	I	0.20	B,J					
1170	Swansea Snd,Swansea	I	0.58	A,E,F,J					
1170	1170AM,High Wycombe	I	0.25	J,N,O					

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

Listeners:

- (A) Robert Connolly, Kilkeel.
- (B) Martin Dale, Stockport.
- (C) Francis Hearne, N.Bristol.
- (D) Simon Hockenhuill, E.Bristol.
- (E) Simon Hockenhuill, while in St.Ives, Cornwall.
- (F) Simon Hockenhuill, while in Lynmouth.
- (G) Simon Hockenhuill, while in Lyme Regis.
- (H) Sheila Hughes, Morden.
- (I) Rhoderick Illman, Oxted.
- (J) Brian Keyte, while near Invergarry, Inverness.
- (K) Frank Miles, SW London.
- (L) George Millmore, Wootton, IaW.
- (M) Tom Smyth, Co.Fermanagh.
- (N) Phil Townsend, E.London.
- (O) Fred Wilmshurst, Northampton.



Wallsend; BBC via Kranji, Singapore **11.955** (Eng to Asia 2200-0000) 34333 at 2312 in Woodhall Spa; BBC via Ascension Is **12.095** (Eng to S.America 2000-0200) 35433 at 0040 in E.Bristol. There is much to interest the listener in the **9MHz (31m)** band. Mentioned in the reports were R.Havana, Cuba **9.820** (Eng to N.America 0100?-0700), rated 33333 at 0555 in Scalloway; R.New Zealand Int **9.700** (Eng to Pacific areas 0707-1206?) 34233 at 0720 in Newry & 32222 at 0950 in Truro; BBC via Skelton, UK **9.410** (Eng to Eur, N/C.Africa 0400-2200) 35433 at 0840 in Northampton & 55555 at 1000 in Morocco; Swiss R.Int via Lenk? **9.535** (Eng, Ger, Fr, It to SW.Eur 1100-1330) 54444 at 1100 in Morden; R.Netherlands via Wertachtal **9.855** (Eng to Eur 1130-1325) 44434 at 1130 in Stalbridge; RFI via Allouis? **9.805** (Eng to Eur, M.East, Africa 1200-1300) was 54455 at 1250 in Stockport; R.Norway Int **9.590** (Norw to Eur 1300-1330) 44444 at 1315 in Storrington; R.Denmark via R.Norway **9.590** (Da to Eur 1330-1400) 55545 at 1330 in Kirkby Stephen. Later, Swiss R.Int via Julich, Germany **9.885** (It, Ar, Eng, Ger, Fr to Africa 1830-2130) was rated 33443 at 1900 in Galashiels;

R.Thailand, Udonthani **9.535** (Ger, Fr, Eng to Eur 1900-2100?) 43343 at 1937 in Bridgwater; Israel R, Jerusalem **9.390** (Heb [Home Sce relay] to Eur, N.America 1700?-2300) 44444 at 1945 in Colyton; VOA via ? **9.760** (Eng to Eur, N.Africa 1700?-2200) 44444 at 2001 in St.Austell; China R.Int, Beijing **9.920** (Eng to Eur 2000-2157) 54444 at 2012 in Plymouth; R.Australia via Shepparton **9.500** (Eng to Asia, Pacific 1430?-2130) 44434 at 2100 in E.Bristol; Voice of Armenia, Yerevan **9.965** (Eng to Eur, USA 2115-2145) 44444 at 2115 in Newry; AIR via Aligarh? **9.950** (Eng 2045-2230) 44444 at 2150 in Kilkeel; Voice of Turkey, Ankara **9.525** (Eng to Eur, N.America? 2130-2230?) 32322 at 2215 in Rugby; RCI via Sackville **9.755** (Eng [CBC progs] to USA, Caribbean 2300-0400) 54333 at 2300 in Herstmonceux; R.Nac del Paraguay **9.735** (Sp 0800-0400) 35543 at 2356 in Wallsend; VOA via ? **9.885** (Eng to Africa 0330-0430) SIO 444 at 0400 in Co.Fermanagh.

Whilst broadcasting to Europe in the **7MHz (41m)** band WYFR via Okeechobee, USA on **7.355** (Eng 0600-0800, also to Africa) rated 54444 at 0616 in Plymouth; R.Japan via Woofferton, UK **7.230** (Jap, Eng 0500-0700) was 43333 at 0620 in Herstmonceux; WEWN

MEDIUM WAVE CHART

Freq (kHz)	Station	Country	Power (kW)	Listener	Freq (kHz)	Station	Country	Power (kW)	Listener
531	Ain Beida	Algeria	600/300	A*,K*					
531	Torshavn	Faeroe Is	100	I					
531	Berg	Germany	20	A,K					
531	RNE5 via ?	Spain	?	G					
531	Beromunster	Switzerland	500	K,M,N					
540	Wavre	Belgium	150/50	A,B,H,J,K,M*,N,P					
540	Caslat(NaGaelachtachta)	Eire	2	B					
540	Sidi Bennour	Morocco	600	A*,K*					
549	Les Trembles	Algeria	600	A*,K*,N*					
549	Thurnau (DLF)	Germany	200	A,H,K,N,P					
558	Valencia(RNE5)	Spain	20	A					
567	Tullamore(RTE1)	Eire	500	A,B,C,D,E,G*,H,I,K,M,N,P					
567	RNE5 via ?	Spain	?	A					
576	Muhlacker(SDR)	Germany	500	A,G,N					
576	Riga	Latvia	500	K*					
576	Barcelona(RNE5)	Spain	50	A*,K*					
585	Paris(FIP)	France	8	H,K,N					
585	Madrid(RNE1)	Spain	200	A*,B*,J,K*,N*,P*					
585	Dumfries(BBC/Scott)	UK	2	A,J					
584	Frankfurt(HR)	Germany	1000/400	H,K*,M,N					
594	Muge	Portugal	100	H*,K*					
603	Sevilla(RNE5)	Spain	50	A*,K*					
603	Newcastle(BBC)	UK	2	A,I,M					
612	Athlone(RTE2)	Eire	100	A,B,O,E,G*,H,I,K,M,N,P					
612	RNE1 via ?	Spain	10	A*,K*					
621	Wavre	Belgium	80	A,K,N,P					
621	RNE1 via ?	Spain	10	A*					
621	Barcelona(OCR)	Spain	50	K*					
630	Dannenberg(NDR)	Germany	100	A*					
630	Vigra	Norway	100	A,K*					
630	Tunis-Djedeida	Tunisia	600	A*,K*					
639	Praha(Liblice)	Czech	1500	A*,K*,N					
639	RNE1 via ?	Spain	?	A*,K*					
648	RNE1 via ?	Spain	?	A*,K*					
648	Orfordness(BBC)	UK	500	I*,K,N,P					
657	Napoli	Italy	120	K*,O*					
657	Madrid(RNE5)	Spain	20	A*,K*,N					
657	Wrexham(BBC/Wales)	UK	2	A,H,I,M*,P					
666	Messkirch(Rohrdi(SWF))	Germany	150	N					
666	Barcelona(SER)	Spain	50	A*					
675	Lopic(RIO Gold)	Holland	120	A,B*,J,K,N,P					
684	Sevilla(RNE1)	Spain	500	A*,B*,K*					
684	Avajal(Beograd-1)	Yugoslavia	2000	A*,K*,N					
693	Droitwich(BBC5)	UK	150	A,K,N,P					
693	Enniskillen(BBC5)	UK	1	B,M					
702	Flensburg(NDR)	Germany	5	K*					
702	Presov	Slovakia	200	N*					
702	Zamorat(RNE1)	Spain	10	A*					
711	Rennes 1	France	300	A*,C,F,J,K,N,P					
711	Laayoune	Morocco	600	K*					
711	Murcia(COPE)	Spain	5	A*					
720	Langenberg	Germany	200	K*					
720	Lisnagarvey(BBC4)	N.Ireland	10	B,D,I,K*					
720	Norte	Portugal	100	O					
720	Lots Rd,Ldn(BBC4)	UK	0.5	A,K,M,P					
729	Cork(RTE1)	Eire	10	A,D,I,K					
729	RNE1 via ?	Spain	?	A*,G*,K,P*					
738	Paris	France	4	H,K					
738	Barcelona(RNE1)	Spain	500	A*,G,H*,K*,N					
747	Flevo(Hilv2)	Holland	400	A,B*,J,K,M,N,P					
756	Braunschweig(DLF)	Germany	800/200	A*,H*,K*,N					
756	Bilbao(EI)	Spain	5	K*					
756	Redruth(BBC)	UK	2	K					
765	Sottens	Switzerland	500	A*,B*,H*,K*,O*					
774	Enniskillen(BBC)	N.Ireland	1	B,I,M					
774	RNE1 via ?	Spain	?	A*,H*,J*					
774	Plymouth(BBC)	UK	1	F					
783	Leipzig(MDR)	Germany	100	A*,H*,N					
792	Limoges	France	300	H*,K					
792	Lingen(NDR)	Germany	5	K*					
792	Sevilla(SER)	Spain	20	A*,K*					
792	Londonderry(BBC)	UK	1	M					
801	Munchen-Ismaning	Germany	300	A*,K*					
801	RNE1 via ?	Spain	?	A*,K*					
810	Madrid(SER)	Spain	20	A*,K*					
810	Westerglen(BBC/Scott)	UK	100	A,B*,D,F*,J,K*,M,N,P*					
819	Batra	Egypt	450	G*					
819	Toulouse	France	50	K*					
819	S.Sebastian(EI)	Spain	5	G*					
828	Hannover(NDR)	Germany	100/5	A*					
828	Rotterdam	Holland	20	N					
828	Barcelona(SER)	Spain	50	A*					
837	Nancy	France	200	N					
837	COPE via ?	Spain	?	A*,K*					
846	ROME	Italy	540	A*,K*,N					
855	Berlin	Germany	100	A*					
855	RNE1 via ?	Spain	?	A*,K*,N*					
864	Santah	Egypt	500	K*					
864	Paris	France	300	K,N,P					
873	Frankfurt(AFN)	Germany	150	A*,I					
873	Zaragoza(SER)	Spain	20	A*,K*					
873	Enniskillen(RUI)	UK	1	B,I,M					
882	COPE via ?	Spain	?	K*					
882	Penmon(BBC/Wales)	UK	10	I					
882	Washford(BBC/Wales)	UK	100	A*,B*,D,K,M,N,P*					
891	Algiers	Algeria	600/300	A*,C*,G*,K*,N					
891	Huisberg	Netherlands	20	K*					
900	Milan	Italy	600	A*,K*,N					
900	COPE via ?	Spain	?	K*					
909	Lisnagarvey(BBC5)	N.Ireland	10	B					
909	B'mans Pk(BBC5)	UK	140	K,M,P					
909	M'side Edgel(BBC5)	UK	200	A					
918	Domzale	Slovenia	600/100	A*,K*					
918	Madrid(R.Int)	Spain	20	A*					
927	Wolvertem	Belgium	300	A,B*,K,N,P					
936	Bremen	Germany	100	A*,K*,N,P					
945	Toulouse	France	300	N					
954	Brno(CRo2)	Czech Rep.	200	A*					
954	Madrid(CI)	Spain	20	A*,K*					
963	Pori	Finland	600	A*,K*					
963	Tir Chonail	Eire	10	I,M					
972	Hamburg(NDR)	Germany	300	A*,K*,P*					
972	RNE1 via ?	Spain	?	K*					
981	Alger	Algeria	600/300	A*,G*,K*,N					
990	Berlin	Germany	300	A*,K*,N*					
990	R.Bilbao(SER)	Spain	10	A*,K*					
990	Redmos(BBC)	UK	1	M					
990	Tywyn(BBC)	UK	1	B*,I					
999	Schwerin(RIAS)	Germany	20	A*					
999	Madrid(COPE)	Spain	50	A*					
1008	SER via ?	Canaries/Spain	?	A*,K*					
1008	Flevo(Hilv-5)	Holland	400	A,B*,K,N					
1017	Rheinsender(SWF)	Germany	600	A*,G*,K*,N					
1017	RNE5 via ?	Spain	?	G*,K*					
1026	SER via ?	Spain	?	A*,K*					
1035	Tallinn	Estonia	500	M*					
1035	Lisbon(Prog3)	Portugal	120	A*					
1044	Dresden(MDR)	Germany	20	A*,K*					
1044	S.Sebastian(SER)	Spain	10	K*,N					
1053	Zaragoza(COPE)	Spain	10	A*					
1053	Talk R.UK via ?	UK	?	A,B,K,M,N,P,Q					
1062	Kalundborg	Denmark	250	A,B*,C,K*					
1062	R.Uno via ?	Italy	?	K*					
1071	R.France via ?	France	?	M					
1071	Brest	France	20	K*					
1071	Riga	Latvia	50	K*					
1071	Bilbao(EI)	Spain	5	A*					
1071	Talk Radio UK via ?	UK	?	A,P					
1080	Katowice	Poland	1500	A*					
1080	SER via ?	Spain	?	A*,G*,K*					
1089	Talk Radio UK via ?	UK	?	A,B,K,P					
1098	Nitra(Jarok)	Slovakia	1500	A*,K*					
1098	RNE5 via ?	Spain	?	A*					
1107	AFN via ?	Germany	10	A*,C*					
1107	RNE5 via ?	Spain	?	A*					
1107	Talk R.UK via ?	UK	?	A,K,N,P					
1116	Bari	Italy	150	N*					
1116	Pontevedra(SER)	Spain	5	A*					
1125	La Louviere	Belgium	20	A*,K*					
1125	RNE5 via ?	Spain	?	A*					
1125	Llandrindod Wells	UK	1	I					
1134	COPE via ?	Spain	2	A*,K*					
1134	Zadar(Croatian R)	Yugoslavia	600/1200	A*,C*,K*,N,P*					
1143	AFN via ?	Germany	1	A*					
1143	Stuttgart(AFN)	Germany	10	I					
1143	COPE via ?	Spain	2	A*,K*					
1152	RNE5 via ?	Spain	10	A*					
1179	SER via ?	Spain	?	A*					
1179	Solvesborg	Sweden	600	A*,B*,C*,E*,K*,L*,N,P*					
1188	Kuurne	Belgium	5	A*,K,N					
1188	Szolnok	Hungary	135	K*					
1197	Virgin via ?	UK	?	A,B*,K,M,P					
1215	Virgin via ?	UK	?	A,B,K,M,P					
1224	Lelystad	Holland	50	B*,N					
1233	Liege	Belgium	5	K*					
1233	Virgin via ?	UK	?	A,P					
1242	Marseille	France	150	C*					
1242	Virgin via ?	UK	?	A,B*					
1251	Marcali	Hungary	500	A*					
1251	Huisberg	Netherlands	10	A*,K					
1260	SER via ?	Spain	?	A*,K*					
1260	Guildford(V)	UK	0.5	I					
1269	Neumunster(DLF)	Germany	600	A,B*,K*,N,P*					
1269	COPE via ?	Spain	?	A*					
1278	Strasbourg	France	300	K					
1278	Dublin/Cork(RTE2)	Eire	10	A,B,O,I,K*,M,N,P*					
1287	RFE via ?	Czech Rep.	400	K*,N,P*					
1287	Lerida(SER)	Spain	10	K*					
1296	Kardzali	Bulgaria	150	K*					
1296	Orfordness(BBC)	UK	500	A,I,N					
1305	RNE5 via ?	Spain	?	K*					
1314	Kvitsoy	Norway	1200	A,B*,E*,K*,N,P*					
1323	W'brunn(V.Russia)	Germany	1000/150	A,B*,N,P*					
1332	Rome	Italy	300	K*,P*					
1341	Lisnagarvey(BBC)	N.Ireland	100	A,B,D,E,I,K,M,N*					
1341	Tarrasa(SER)	Spain	2	K*					
1350	Cesvaine/Kuldiga	Latvia	50	K*					
1359	Madrid(RNE)	Spain	600	A*,K*					
1368	Foxdale(Mox R)	I.O.M.	20	A,B*,D,I,K*,L,M					
1377	Lille	France	300	F,K,N*,P					
1386	Bolshakovo	Russia	2500	A,K*,N					
1395	Filake	Albania	1000	A*					
1395	Logic	Netherlands	120/40	K,N,P*					
1404	Brest	France	20	A,K,N,P*					
1413	Pristina	Yugoslavia	1000	K*					
1422	Heusweiler(DLF)	Germany	1200/600	A,B*,K,N					
1440	Marnach(RTL)	Luxembourg	1200	A,B*,K,N,P*					
1449	Redmos(BBC)	UK	2	C*,I,K*					
1467	Monte Carlo(TWR)	Monaco	1000/400	A*,B*,K*,N*					
1476	Wien-Bisamberg	Austria	600	A*,L*,N*,P*					
1485	Carlsle(BBC)	UK	1	I					
1494	Clermont-Ferrand	France	20	A,K,N					
1494	St.Petersburg	Russia	1000	G*,K*,P*					
1512	Wolvertem	Belgium	300	A,B*,G*,H*,K*,L*,N,P*					
1521	Kosice(Cizatice)	Slovakia	600	A*,K*					
1521	Duba	Saudi Arabia	2000	K*					
1530	Vatican R	Italy	150/450	H*,K*,M*,P*					
1539	Mainflingen(ERF)	Germany	350/700	A,B*,H*,K,M,N,P*					
1575	Genova	Italy	50	K*					
1575	SER via ?	Spain	5	A*,K*,P*					
1584	SER via ?	Spain	2	A*,K*					
1593	Holzkirchen(VOA)	Germany	150	C*,K*,P*					
1602	SER via ?	Spain	?	C*					
1602	Vitoria(EI)	Spain	10	K*,N*					
1611	Vatican R	Italy	15	N,P					

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

- Listeners:-
- (A) Martin Dale, Stockport.
 - (B) Damien Hocken, Co.Mayo
 - (C) Simon Hockenuill, E.Bristol.
 - (D) Simon Hockenuill, white in St.Ives, Cornwall.
 - (E) Simon Hockenuill, white in Lynmouth.
 - (F) Simon Hockenuill, white in Lyme Regis.
 - (G) Sheila Hughes, Morden.
 - (H) Rhoderick Illman, Dxted.
 - (I) Brian Keyte, while near Invergarry, Inverness.
 - (J) Frank Miles, SW London.
 - (K) George Millmore, Wootton loW.
 - (L) Clare Pinder, while in Appleby.
 - (M) Tom Smyth, Co.Fermanagh
 - (N) Phil Townsend, E.London.
 - (O) Ernest Wiles, while in Tanger, Morocco.
 - (P) Fred Wilmschurst, Northampton.
 - (Q) Tom Winzor, Plymouth.

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| VSM-225 Airband Mobile /HF/UHF airband plus cable fitted BNC | W-881 Super gainer /5 - 1900MHz plus cable fitted BNC | |
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WATSON

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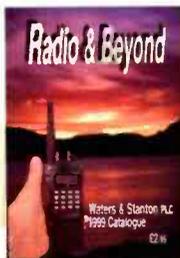


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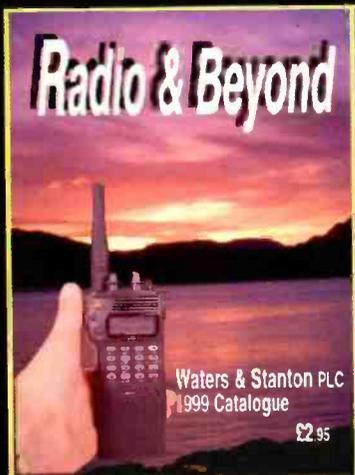
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TROPICAL BANDS CHART

Freq (MHz)	Station	Country	UTC	DXer	Freq (MHz)	Station	Country	UTC	DXer
4.815	R.diff TV Burkina	Duagadougou	2039	A,J,O	5.009	R TV Malagasy	Madagascar	1704	J,P
4.820	R.Botswana, Gaborone	Botswana	2110	C,H,J,N,O	5.010	R.Garoua	Cameroon	1655	Q
4.820	La Voz Evangelica	Honduras	0350	O	5.010	AIR Thiru puram	India	0035	A,P
4.820	AIR Calcutta	India	1808	A,J,P	5.020	La V du Sahel,Niamey	Niger	2126	H,J
4.820	Xizang, Lhasa	Tibet	2340	A	5.025	R.Parakou	Benin	1915	J
4.828	ZBC R-4	Zimbabwe	1900	C,J	5.025	R.Rebelle, Habana	Cuba	0525	A,F
4.830	R. Tachira	Venezuela	0200	A,O,Q	5.025	R.Uganda, Kampala	Uganda	2118	H,O
4.835	R.Tezulitlan, Coban	Guatemala	0025	A	5.030	AWR Latin America	Costa Rica	0015	A,C,Q,Q
4.835	RTM Bamako	Mali	2057	A,D,F,G,H,J,N,O,P,S	5.030	RTM Kuching	Sarawak	2120	J
4.840	AIR Bombay	India	1624	A,J,P,Q	5.035	R.Educacao Rural	Brazil	2355	A
4.845	R.Fides, La Paz	Bolivia	0202	A	5.035	R.Bangui	C.Africa	1918	J
4.845	ORTM Nouakchott	Mauritania	2035	H,J,P	5.040	PBS Fujian, Fuzhou	China	2211	P
4.850	R.Cultural	Guatemala	0440	C,Q	5.040	L.V. de Yopal	Colombia	0222	C
4.850	ZBC Prog 2	Zimbabwe	1745	J	5.040	Voz del Upano, Macas	Ecuador	0045	A
4.850	AIR Bhopal	India	1630	Q	5.047	R.Togo, Lome	Togo	2022	A,H,J,O
4.850	SABC (RSG) Meyerton	S.Africa	1852	A,C,P,Q	5.050	R.Tanzania	Tanzania	1704	H,J,P
4.855	CBS Taipei	Taiwan	2019	D,J	5.055	RFO Cayenne(Matoury)	French Guiana	0035	Q
4.855	AIR Jaipur	India	1705	Q	5.060	PBS Xinjiang, Urumqi	China	0013	A,O,P,Q
4.855	GBC R-2	Ghana	1743	A,J	5.075	Caracol Bogota	Colombia	0530	A,D,F,G,Q
4.855	AIR Delhi	India	1829	J	5.100	R.Liberia, Totota	Liberia	2122	H,J
4.855	R.Nacional, Mulenvos	Angola	0447	C	5.320	CNR 1	China	2215	F
4.855	BBC via Krampi	Singapore	2202	A,H,N,P,S					
4.855	Qinghai PBS, Xining	China	2230	A					
4.855	BBC via Skelton	England	0400	O,E,F,H,M,R					
4.855	Nexus, Milan	Italy	2140	N					
4.855	RFI Paris	France	2259	D,H,I,O,P,S					
4.855	R.Korea via Skelton	England	2100	A,H,I,L,O,P					
4.855	R.Budapest	Hungary	2100	A,D,E,F,G,H,K,L,N,D,P,S					
4.855	Nexus, Milan	Italy	1925	A,O,F,G,H,O					
4.855	China R.Int via SRI	Switzerland	2100	F,O,P,S					
4.855	OW via Julich	Germany	2130	A,D,F,H,J,M,D,P,S					
4.855	Vatican R	Italy	1955	D,F,G,H,M,N,P,S					
4.855	Xinjiang BS, Urumqi	China	0015	A					
4.855	CPBS 1, Beijing	China	2135	FP					
4.855	Xinjiang BS, Urumqi	China	2344	A,H					
4.855	Xinjiang, Urumqi	China	2345	A,H					
4.855	Xizang BS, Lhasa	China	2335	A,H					
4.855	Yunnan PBS,Kunming	China	2340	A					
4.855	AIR Port Blair	India	2347	A,H,J					
4.855	TWR Manzini	Swaziland	1625	Q					
4.855	FRCN Kaduna	Nigeria	1949	C,F,H,I,J,M,N,O,P					
4.855	AIR Imphal	India	1629	J					
4.855	TWR Manzini	Swaziland	0348	C					
4.855	RTM Bamako	Mali	1949	A,J,P					
4.855	Zhejiang PBS,H'gzhou	China	2345	A					
4.855	Azad Kashmir R.	Pakistan	1621	A,J					
4.855	AIR Hyderabad	India	1610	J,O					
4.855	R.Nac.Amazonas	Brazil	0010	A					
4.855	R.Difusora, Londrina	Brazil	0015	A					
4.815	R.diff TV Burkina	Duagadougou	2039	A,J,O					
4.820	R.Botswana, Gaborone	Botswana	2110	C,H,J,N,O					
4.820	La Voz Evangelica	Honduras	0350	O					
4.820	AIR Calcutta	India	1808	A,J,P					
4.820	Xizang, Lhasa	Tibet	2340	A					
4.828	ZBC R-4	Zimbabwe	1900	C,J					
4.830	R. Tachira	Venezuela	0200	A,O,Q					
4.835	R.Tezulitlan, Coban	Guatemala	0025	A					
4.835	RTM Bamako	Mali	2057	A,D,F,G,H,J,N,O,P,S					
4.840	AIR Bombay	India	1624	A,J,P,Q					
4.845	R.Fides, La Paz	Bolivia	0202	A					
4.845	ORTM Nouakchott	Mauritania	2035	H,J,P					
4.850	R.Cultural	Guatemala	0440	C,Q					
4.850	ZBC Prog 2	Zimbabwe	1745	J					
4.850	AIR Bhopal	India	1630	Q					
4.850	SABC (RSG) Meyerton	S.Africa	1852	A,C,P,Q					
4.855	CBS Taipei	Taiwan	2019	D,J					
4.855	AIR Jaipur	India	1705	Q					
4.855	GBC R-2	Ghana	1743	A,J					
4.855	AIR Delhi	India	1829	J					
4.855	R.Nacional, Mulenvos	Angola	0447	C					
4.855	BBC via Krampi	Singapore	2202	A,H,N,P,S					
4.855	Qinghai PBS, Xining	China	2230	A					
4.855	BBC via Skelton	England	0400	O,E,F,H,M,R					
4.855	Nexus, Milan	Italy	2140	N					
4.855	RFI Paris	France	2259	D,H,I,O,P,S					
4.855	R.Korea via Skelton	England	2100	A,H,I,L,O,P					
4.855	R.Budapest	Hungary	2100	A,D,E,F,G,H,K,L,N,D,P,S					
4.855	Nexus, Milan	Italy	1925	A,O,F,G,H,O					
4.855	China R.Int via SRI	Switzerland	2100	F,O,P,S					
4.855	OW via Julich	Germany	2130	A,D,F,H,J,M,D,P,S					
4.855	Vatican R	Italy	1955	D,F,G,H,M,N,P,S					
4.855	Xinjiang BS, Urumqi	China	0015	A					
4.855	CPBS 1, Beijing	China	2135	FP					
4.855	Xinjiang BS, Urumqi	China	2344	A,H					
4.855	Xinjiang, Urumqi	China	2345	A,H					
4.855	Xizang BS, Lhasa	China	2335	A,H					
4.855	Yunnan PBS,Kunming	China	2340	A					
4.855	AIR Port Blair	India	2347	A,H,J					
4.855	TWR Manzini	Swaziland	1625	Q					
4.855	FRCN Kaduna	Nigeria	1949	C,F,H,I,J,M,N,O,P					
4.855	AIR Imphal	India	1629	J					
4.855	TWR Manzini	Swaziland	0348	C					
4.855	RTM Bamako	Mali	1949	A,J,P					
4.855	Zhejiang PBS,H'gzhou	China	2345	A					
4.855	Azad Kashmir R.	Pakistan	1621	A,J					
4.855	AIR Hyderabad	India	1610	J,O					
4.855	R.Nac.Amazonas	Brazil	0010	A					
4.855	R.Difusora, Londrina	Brazil	0015	A					
4.815	R.diff TV Burkina	Duagadougou	2039	A,J,O					
4.820	R.Botswana, Gaborone	Botswana	2110	C,H,J,N,O					
4.820	La Voz Evangelica	Honduras	0350	O					
4.820	AIR Calcutta	India	1808	A,J,P					
4.820	Xizang, Lhasa	Tibet	2340	A					
4.828	ZBC R-4	Zimbabwe	1900	C,J					
4.830	R. Tachira	Venezuela	0200	A,O,Q					
4.835	R.Tezulitlan, Coban	Guatemala	0025	A					
4.835	RTM Bamako	Mali	2057	A,D,F,G,H,J,N,O,P,S					
4.840	AIR Bombay	India	1624	A,J,P,Q					
4.845	R.Fides, La Paz	Bolivia	0202	A					
4.845	ORTM Nouakchott	Mauritania	2035	H,J,P					
4.850	R.Cultural	Guatemala	0440	C,Q					
4.850	ZBC Prog 2	Zimbabwe	1745	J					
4.850	AIR Bhopal	India	1630	Q					
4.850	SABC (RSG) Meyerton	S.Africa	1852	A,C,P,Q					
4.855	CBS Taipei	Taiwan	2019	D,J					
4.855	AIR Jaipur	India	1705	Q					
4.855	GBC R-2	Ghana	1743	A,J					
4.855	AIR Delhi	India	1829	J					
4.855	R.Nacional, Mulenvos	Angola	0447	C					
4.855	BBC via Krampi	Singapore	2202	A,H,N,P,S					
4.855	Qinghai PBS, Xining	China	2230	A					
4.855	BBC via Skelton	England	0400	O,E,F,H,M,R					
4.855	Nexus, Milan	Italy	2140	N					
4.855	RFI Paris	France	2259	D,H,I,O,P,S					
4.855	R.Korea via Skelton	England	2100	A,H,I,L,O,P					
4.855	R.Budapest	Hungary	2100	A,D,E,F,G,H,K,L,N,D,P,S					
4.855	Nexus, Milan	Italy	1925	A,O,F,G,H,O					
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4.855	RTM Bamako	Mali	1949	A,J,P					
4.855	Zhejiang PBS,H'gzhou	China	2345	A					
4.855	Azad Kashmir R.	Pakistan	1621	A,J					
4									

■ ANDY CADIER, 28 ROMNEY AVENUE, FOLKESTONE, KENT CT20 3QJ

Off The Record

The Radio Communications Agency appear to be watching the output levels of licensed stations. It is not exactly uncommon to find temporary RSL's exceeding their maximum authorised output, but now it seems that full time stations are being checked. Kent based Medway FM have been fined £5000 with £60 investigation fees by the Radio Authority for significantly exceeding the power level specified in its licence. The station claimed they had increased their power to overcome patchy reception and pirate interference.

On a happier note, Medway FM was one of the community stations that took part in the Merlin Network One Festival last summer. I asked their Programme Director **Bob Le-Roi** what it was like to have a World Service type of audience; "I must say I always enjoy participating in these events, almost without exception reports came in from short wave listeners, as opposed to satellite. Who says the short wave is dead". So you were kept busy then? "The calls came in thick and fast with three personal assistants working steadily throughout the four hours. The biggest thrill we had was with calls from Russia, America, Africa and Australia. A good buzz and good fun entertainment without resorting to anorak subjects".

The secret is of course that Bob Le-Roi started his radio career on the offshore pirate station Radio City in 1966, but became much better known for his shows on Kent's Invicta Supergold.

Merlin Radio

If you have been following the Merlin Network One test broadcasts you may have noticed the change of address, they have moved from the BBC World Service offices at Bush House to **20 Lincoln's Inn Fields, London WC2A 3ED**. By the time you read this the Network One tests should have been completed with paying customers making up most of the programme content.

Radio Caroline's regular Wednesday spot may eventually cease too, however their presenter **Johnny Reece** is to continue working for Merlin. Apparently, when Network One is properly established and funded, further opportunities may exist on an envisaged Network Two.

A Pirate's Touch

A note from Radio Argus says that 1593kHz is in fact their daytime frequency and 1650kHz is used at night, so you should find them among the familiar Dutch pirates on these frequencies. With the darker evenings there should be some pirate DX opportunities, though you will find cordless telephones operating and achieving some considerable distances in this band.

In the USA former pirate broadcaster **Allan Weiner** has secured a licence for a s.w. radio station. For several years he has been involved with Brother Stair and the Overcomer Ministry intending to launch an offshore station from a tug called *Electra*, which eventually ran into financial difficulties.

Previously he briefly ran Radio New York International from a ship, the *MV Sarah*. Another of his vessels, *MV Fury*, was raided while being converted to a radio ship in Charleston harbour, South Carolina, in 1994. His new shore-based s.w. station started in September using the callsign WBCQ, and is currently operating on 7.415MHz with a power of 50kW beamed in a south-westerly direction. Apparently it can be heard in Britain, but you will need to listen in the early hours of the morning.

Naughty But Nice

Reg Walker, writing from Bristol, informs me of a new station coming to his area where five applicants are seeking a licence. One company, Republic Radio, is headed by former Radio Caroline presenter **Ian Evans**, others are Cabot FM, Kute FM, Powerjam FM and Respec FM. Why stations still stick 'FM' after their names when they have no other alternative service beats me, also what happens when they go digital? Still, it keeps the jingle makers busy!

Reg also asks if I cover CB radio, legal or otherwise, and the

6.6MHz band. The answer is of course yes, but experience has shown that illegal QSO stations are not all that happy at having publicity as they don't really want listeners, least of all those of the official variety.

In fact the DTI did issue a warning, published in last year's April issue of *SWM*, stating that if they discovered a licensed amateur operating in this aeronautical band their licence would most likely be revoked. You can legally buy 100W rigs with general coverage receive and transmit that provide a.m., s.s.b., and c.w. anywhere from 1.6-30MHz. (These are not advertised in *SWM*!).

Radiofax

Since August 1986 Businessman **Trevor Brook** has repeatedly applied to the British Government for a licence to broadcast on short wave. This case is now before the European Commission of Human Rights in Strasbourg who have examined the question of admissibility. They have now decided to give notice to the UK Government, and their observations invited a possible violation of the European Convention On Human Rights.

In this case Trevor Brook asserts that by refusing to licence an independent short wave radio station the government unreasonably and persistently stifled media development to the detriment of the public. His company, Surrey Electronics, once ran a s.w. radio station based in Ireland, called Radiofax. This closed voluntarily in the summer of 1992 after the Irish Department of Communications received complaints from the authorities in Britain. Surrey Electronics are involved in the research and design of products for the broadcast industry.

Back-To-Back Confusion

In October, I posed what I thought was a simple question concerning the origin of the widely used radio term Back-to-Back Music. Well most of my regular correspondents said they didn't know, while others, like Dutch pirate specialist **Derek Taylor**, said it was to do with playing a pile of 45s with no speech between. I tried ringing up radio deejays, particularly those that use this expression, and much to their embarrassment they did not have an answer. **Richard Adams** of Channel Travel Radio suggested the saying was imported from the USA by the DJs of the marine pirate Laser 558 in 1984, he could well be right.

In actual fact back-to-back has more to do with the jukebox industry than radio; in the past the American record industry had a controlling interest in the jukebox business as well as radio. The early jukeboxes involved a turn table and resembled an automatic record player. As time went by more sophisticated designs involved the records being stored in racks with the drive and stylus system moving to locate the record. However, unsurprisingly, only the hit sides of records were being selected by customers, leaving 50% of the capacity virtually unused.

The next step was a design that involved putting two discs in one slot with the hit sides outermost. This way the machine would be unable to play the B-sides, as they were sandwiched together (back-to-back). This resulted in the ability to fit more hit records on the machine and to reduce the silent change over time between tracks, thus increasing the machine's earning capacity. So, my theory is back-to-back means more music more often, for more money! Since many radio stations are virtually broadcast jukeboxes the saying may well be more appropriate now than ever before.

Monitoring SW

Well, over the past few months many pirates have enjoyed quite good reception. The Farmers From Holland have been missing from 6.285MHz, apparently due to a raid. Britain's Better Music Station seem to be broadcasting some quite obscure oldies in The Gary Stevens Show on 6.200MHz. I believe this station is relayed by Ozone Radio. Britain Radio have been heard on 6.235MHz complete with an advert for Radio Review. This is possibly a relay from Jolly Roger Radio who, particularly on Sundays, relay several different stations.

Another relay station operates on 11.470MHz u.s.b. (upper sideband), most of these are Dutch and German stations but are well worth a listen. The New Zealand pirate Radio Kiwi is relayed by this station and sometimes also by Jolly Roger Radio too. Radio Caroline should be back on s.w. on 6.940MHz on Sundays from 1100 to 1400 hours and possibly on f.m. too in the Dublin area.

It is interesting to note that although the number of European s.w. pirates have remained fairly static over the years, the percentage that actually transmit from Britain has decreased. So while the DTI get the cigars out, I'll wish you all good listening over the festive season and the very best of DX in the New Year.

Space Ship

Radio Caroline have reached an agreement with **Peter Leutner**, proprietor of the satellite station European Classic Rock, to carry Radio Caroline programmes from 1000 to 1800 hours on Sundays. Programmes will not come from the *MV Ross Revenge* but from the EKR studio at Maidstone in Kent. EKR broadcast on *Astra 1C* stereo audio on 7.38 & 7.56MHz.



The studio 'phone number is **(01622) 684400**, which is manned by Radio Caroline staff during the broadcasts. Several local stations relay EKR, however staff were surprised to receive several reports via a mysterious unexpected s.w. transmission on 6.295MHz.

TELE INTERNATIONAL SATELLITE

Global Satellite Information Magazine

Test Reports and Product Reviews
of Current Issue of TELE-satellite Magazine (No. 12/98):

PRAXIS DIGIMASTER 9800AD+P - Universal Analog & Digital Receiver
VORTEC VS-9700 - Analog & Digital Receiver with 3300 Channel Memory
RADIX Epsilon 24D - Analog & Digital Receiver with 1400 Channel Memory
HUMAX F1-CI - FTA Receiver with Common Interface
STRONG SRT 4300 - Digital Receiver with Common Interface
GRUNDIG DTR 2000 S - Digital Free-to-Air Receiver
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GALAXIS IQG.I - Digital Receiver for Open TV with Common Interface
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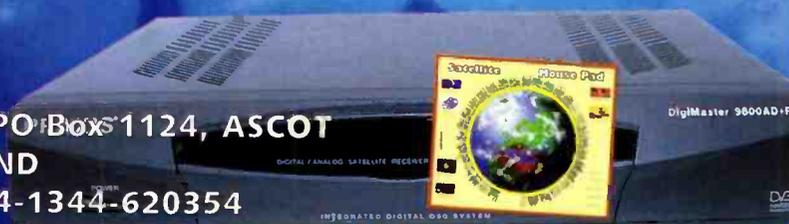
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Spectacularly Simple

The IC-R2 is similar in style to Icom's most recent range of amateur hand-held transceivers. It has quite obviously inherited a lot of its features from the IC-Q7E dual-band hand-held, which also boasts an extended receive range. Perhaps the most striking feature after its size is the lack of numeric keyboard. This raises the question of how easy it is to quickly enter frequencies without having to fiddle about with endless permutations of button presses. Well, the answer is that it is actually quite straightforward, due to one or two special features which Icom have incorporated into the design. In fact, I don't think that it took me any longer to input frequencies into the IC-R2 than it did into my ageing IC-R1, which has a keyboard and is approximately the same size as the new model. So let's take a look at this new hand-held, and in order to keep your attention, I'm going to save the best bit until last!

The IC-R2 is a palm sized unit weighing approximately 170g and measuring 56mm wide by 30mm deep by 95mm high, excluding the antenna which, if fitted, makes the total height of the unit around 200mm. The case has a slightly rounded feel to it with the front face divided into three main sections. The bottom half consists of the loudspeaker grill, the middle quarter has function buttons for the band selection, volume adjustment, reception mode, memory/v.f.o. operation and tuning step size, the remaining button is the power switch. As is normal practice these days, most buttons also have second and third functions, which can be actuated by various permutations of button presses. However, it is possible to lock controls in order to prevent accidental operation.

The remaining upper quarter of the front face has a large liquid crystal display which is used to indicate the receive frequency, memory location and other relevant information relating to the unit's operating status. The left-hand face of the radio has a large monitor button which can be used either momentarily or in a latched manner to disable the squelch. Underneath the monitor button is a much smaller button, which is used in conjunction with the front panel controls to select the second functions. Unfortunately, the second function button is a bit fiddly to use. I believe this may be a legacy from the position of the push-to-talk button on the hand-held transceiver, upon which the IC-R2 is based. Personally I would have preferred the function of these two buttons to have been reversed.

The top face of the receiver has an SMA antenna connector, socket for both earphone and clone operation and a tuning knob, whilst the rear face has a plastic moulding which accepts the supplied belt clip and hand strap. The bottom half of the rear face is

the battery compartment featuring a very secure retaining clip, which has to be undone before the lid can be taken off, revealing the two AA size cells which power the unit. The IC-R2 does not have an external power or charging socket but it is relatively easy to remove and replace the batteries if you need to. I used a couple of non-rechargeable cells which were still going strong at the end of the review period, so I don't believe Icom's omission of an external power socket is actually that big a problem. If you tend to accidentally leave the radio on for long periods, the Auto Power-Off function may be of use to you. This can be programmed to turn the radio off after a period of 120, 90, 60 or 30 minutes if required, which is quite handy if you want to use it as a bedside radio.

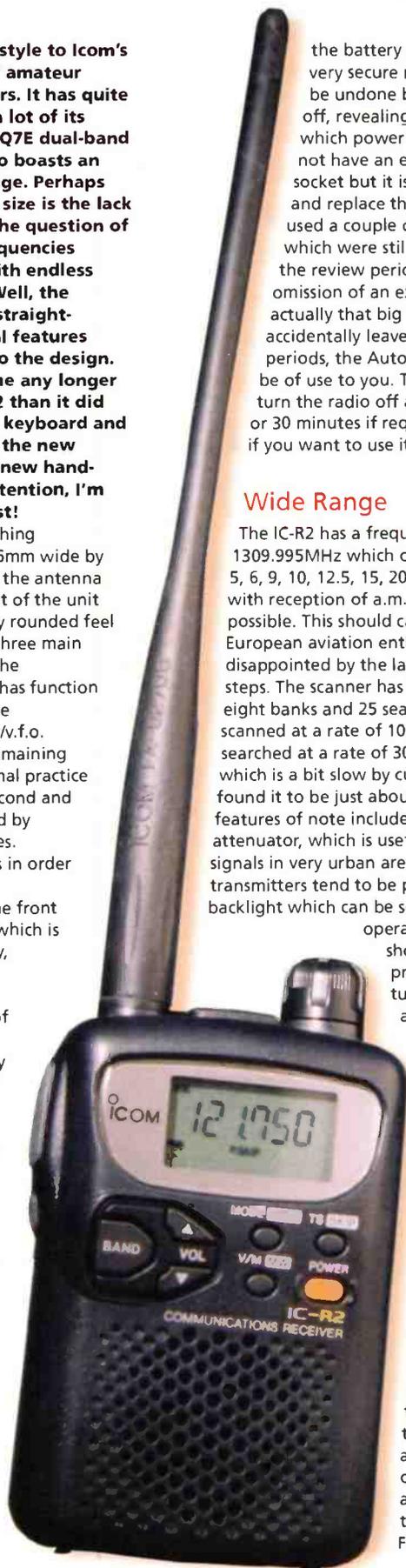
Wide Range

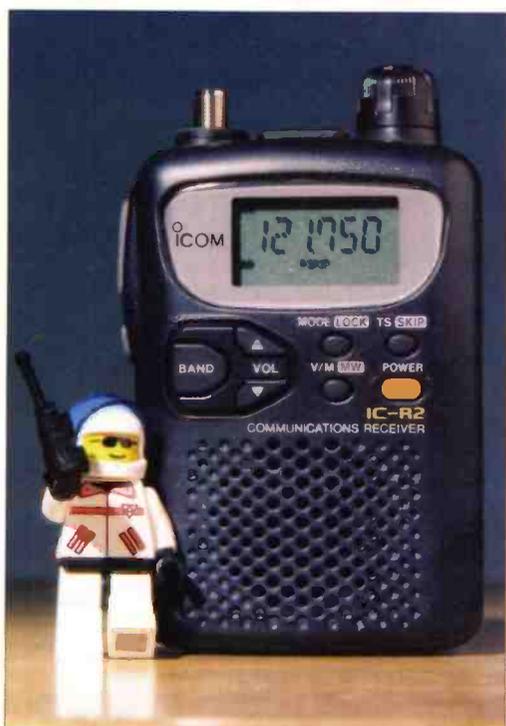
The IC-R2 has a frequency range of 0.495-1309.995MHz which can be tuned in step sizes of 5, 6, 9, 10, 12.5, 15, 20, 25, 30, 50 and 100kHz with reception of a.m., n.b.f.m. and w.b.f.m. possible. This should cater for most listeners, but European aviation enthusiasts may be disappointed by the lack of 8.33kHz frequency steps. The scanner has 400 memory channels in eight banks and 25 search bands which can be scanned at a rate of 10 channels per second, or searched at a rate of 30 channels per second, which is a bit slow by current standards, but I found it to be just about acceptable. Other features of note include a switchable 10dB attenuator, which is useful for sorting out wanted signals in very urban areas where a lot of transmitters tend to be present, and a display backlight which can be set to be automatic in

operation, illuminating for a short period when a key is pressed or the tuning control turned. The squelch level is also adjustable by means of a separate menu but I found that, providing I left it set to the auto position, it didn't really need any additional adjustment.

In operation the v.f.o. mode is selected by means of the front panel 'V/M' button and new frequencies can be quickly selected by first using the 'Band' button to select the approximate frequency range, then turning the rotary control whilst pressing the second function to get very close to the desired frequency. An automatic speed up feature can be enabled which adjusts the tuning rate to the speed of knob rotation. Final fine tuning is then

After looking at the IC-R10 just a few months ago, Alan Gardener was very keen to find out just what sort of job Icom had made of its junior sibling the IC-R2.





How long before we see a scanner the size of the Lego man's?

achieved by releasing the second function button. I initially found this a bit too fast for my reflexes, but after a short while I got used to compensating for it, and by the end of the review period I was beginning to wish that all hand-held radios had this feature.

Icom have chosen to split the entire tuning range of the IC-R2 into eight preset bands. These are shown in **Table 1**.

Presumably they have chosen to do this in order to facilitate the rapid manual selection of widely spaced frequencies, and in some respects they can be considered to be similar to eight separate v.f.o.s.

However, this does present the problem that if you tune through one of the pre-defined frequency limits set by Icom the parameters for the next band take effect, frequently causing the tuning step to change, unless you have taken the trouble to ensure that adjacent band settings are the same. It may eventually be possible to do something about this. Like many other modern radios, the IC-R2 has a PC connection/clone port and software available to permit external management of its memory contents. Required are the CS-R2 plus interface, to exploit this. Many amateur radio transceivers with this facility have been re-programmed to provide extended receive coverage and continuous tuning options, so keep an eye on the Internet for software patches.

The tuning step size depends on the value selected for the chosen band, this can be modified by pressing the 'TS' button. Offset tuning steps can be selected by first tuning to an offset channel with a small size tuning step selected (say 6.25kHz) and then by reselecting a larger tuning step (say 12.5 or 25kHz) providing the larger tuning step is an exact multiple of the smallest size tuning step. So tuning 12.5kHz channels with a 6.25kHz offset is possible, but tuning 10kHz steps with a 6.25kHz offset is not. You can set up 25 different pairs of search band frequency limits

Comparitively huge speaker.

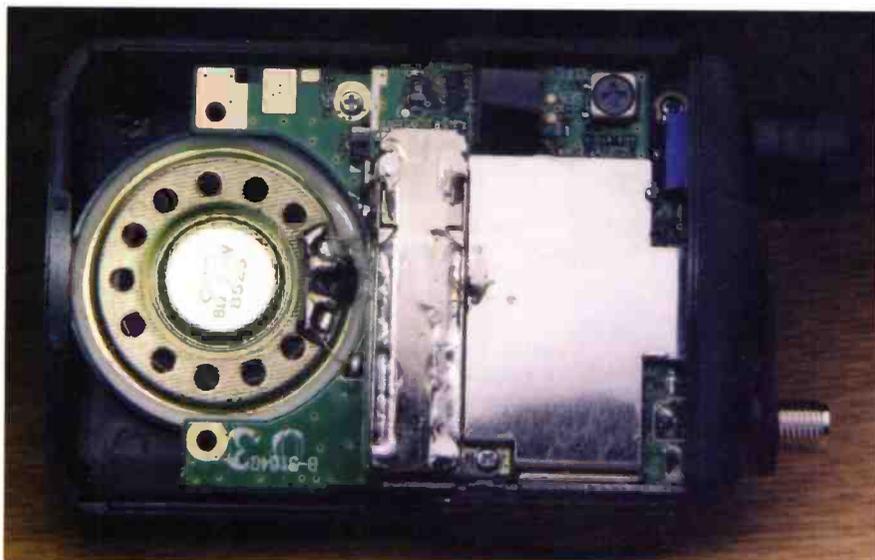


Table 1

Range	Start (MHz)	End (MHz)
a	0.495	1.620
b	1.625	29.995
c	30.00	107.995
d	108.00	135.995
e	136.00	255.095
f	255.10	382.095
g	382.10	769.795
h	769.80	960.095
j	960.10	1309.995

but unfortunately the mode and step size is not stored and defaults to the current selection for the frequency band in use. This is a real nuisance and I don't understand why Icom have chosen to do it this way, but providing the band selections are set up appropriately it is just about tolerable.

Search and scan functions are enhanced by a global programmable pause time of 2-20s or unlimited which forces the search or scan to start again after a pre-set period, and a resume time of 0-5s or unlimited which holds the search or scan for a pre-set period after a signal has disappeared. Having these parameters adjustable is very useful for setting up the radio to your personal preferences for monitoring different types of radio traffic.

One missing feature is the ability to automatically search and store in memories active frequencies. I find this facility extremely useful on my ageing IC-R1 as the small size of the radio means that you can leave it running in a jacket pocket and then just scan through all the busy frequencies at your leisure, which is great if you only have a limited amount of time to listen whilst visiting events or new places. I suspect Icom have not added this feature to the IC-R2 in order to differentiate it from their more upmarket IC-R10, which is a pity.

Tones

A really nice feature is the provision of a CTCSS tone scan facility. CTCSS tones are very low frequency, low level audio tones transmitted by some commercial and amateur stations, (repeaters for instance), to reduce the interaction of transmissions using the same radio channel. Each user is assigned a different audio tone and only hears signals which are transmitted with the same audio tone present. This prevents users from having to listen to all the conversations being carried and reduces operator fatigue. The problem facing anyone else wishing to monitor the channel is which tone is being used for each group.

The IC-R2 solves this problem by having a very useful tone search facility which can be set to operate providing the specific radio frequency has first been set. The tone scan searches through 50 of the most commonly used CTCSS frequencies in about 12 seconds, so you do need to be receiving reasonably frequent transmissions before you can hope to find the tone in use. However, if you already know the likely tones, say those used for Short Range Business Radio applications, it may be just as easy to programme up the different tones in adjacent memory locations and scan through those instead.

Storing wanted frequencies or locking out unwanted frequencies from a search is easy with a single extended button press, and once programmed, memory contents can be reviewed by simply pressing the 'V/M' button to select the memory mode. There are 400 memories available in eight separate banks. The bank in use is

indicated by a very small number and icon placed just in front of the memory number on the display. I found this a bit difficult to read at times, which made locating specific memory contents rather time consuming. However, moving memory contents around is quite easy requiring just a few button presses. Individual memories can store the frequency, mode, tuning step size, duplex frequency, tone squelch frequency, and whether or not to be omitted from a bank scan. Individual preset ranges, bands or the entire frequency range can be searched. Whilst individual banks, or all banks, can be scanned with the ability to omit individual memory channels as required, selecting individual groups of memory banks for specific scans or searches is not possible, although a priority watch function with an audible warning bleep can be set up on a nominated memory channel.

In practice, I found the unit relatively easy to use once I had mastered the basics of the operating system, and to be fair I have found this to be a problem with many of the radios I have recently reviewed. I guess it is inevitable that if you have relatively few front panel controls then you will have to be able to use many different permutations in order to access all the available functions.

On-Air Performance

Listening to various signals with the IC-R2 gave good results on frequencies above 88MHz; this is mainly due to the size of the supplied antenna, which is already about as big as Icom could reasonably get away with, given the small size of the radio. Medium and short wave reception is possible providing the end of a few metres of wire is wrapped around the supplied antenna to improve signal pick-up.

The minimum size 5kHz tuning on short wave and fixed 9kHz tuning step on medium wave is a bit of a limitation, but adequate for listening to strong signals for entertainment purposes rather than trying to catch exotic stations. Above 88MHz, reception improved dramatically as the antenna became greater than a fraction of a wavelength of the desired frequencies. Airband reception was good and lots of reasonably distant signals could be heard on u.h.f. with just the supplied antenna, although I would suggest that a BNC to SMA adapter is likely to be one of the first accessories most users are likely to purchase, as this facilitates the easy connection of more exotic antennas. Audio quality was loud enough for use in a car and good for the size of unit, which may be expected given the proportion of the front panel occupied by the speaker grill.

Measurements

The r.f. performance was adequate with a measured sensitivity of -120dBm for 12dB SINAD for 2.5kHz modulated n.b.f.m., -111dBm for 12dB SINAD 60% modulated a.m. and -109dBm for 50% modulated w.b.f.m. signals at 150MHz. The i.f. filter bandwidth is a compromise as the radio is designed to cover a large range of different transmission standards. However, I generally found them to be a bit too wide for European channel allocations, and I noticed that a search would occasionally stop on an adjacent channel if a strong local signal had been locked out of the search range. The Intermodulation Free Dynamic Range for a 100kHz channel spacing measured in at 46dB, giving a projected third order intercept point of -51dBm, which is not particularly good by modern standards. Not surprisingly, paging interference could be heard over a reasonable frequency range once an external antenna was connected. However, if you are



only ever likely to use the IC-R2 with its supplied antenna, you should not experience any problems.

Big, it isn't.

One other concern I had when I looked at the technical specification of the IC-R2 was the choice of 266.7MHz as the first i.f. frequency. Although this is good in terms of reducing the likelihood of hearing false signals, the image frequency, which occurs at two times the i.f. frequency high of the actual receive frequency, lies in the u.h.f. TV broadcast band for a fair proportion of the useful receive frequency range (an actual receive range of 0.495-500MHz corresponds to an image frequency range of 544.895-1033.4MHz). In the past a poor image rejection figure would only have caused a problem at one or two spot frequencies where the image happened to correspond to a strong local TV transmission. With the advent of digital television, the u.h.f. broadcast band is now practically full of blocks of digital noise which could seriously degrade the receive performance at the wanted frequencies. Fortunately, Icom seem to have designed the r.f. stages properly and the worst case image rejection measured as being greater than 40dB in the region of 750-800MHz. Image rejection of frequencies used for cellular telephone base stations was better than 70dB, which is good.

The Best Bit

And finally, as promised I have saved the best bit until last - the price! The current recommended retail price for the IC-R2 is £139 inc. VAT, with some suppliers offering further discounts. Even though this price does not include NiCad batteries or a charger, I still believe it represents remarkable value for money and will almost immediately drive the price of both new and used scanners down to a more acceptable level. It may even finally put a stop to the sale of scanners utilising ten year old technology which are still being offered at inflated prices. I would consider it to be an ideal buy for people wishing to use radio in conjunction with another hobby interest such as airband or sailing, newcomers to the hobby or those of us who already have one scanner but would like another small radio which is light enough to carry in the pocket.

My thanks to **Icom (UK) Ltd., Sea Street, Herne Bay, Kent CT6 8LD**, for the loan of the review model. You can contact them for more info, Tel: **(01227) 741741**, FAX: **(01227) 741742**, or E-mail: **info@icomuk.co.uk** Browse their Web site at **www.icom.co.uk**

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A POCKET SIZED SCANNER!

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- Selectable Channel Steps
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Transmissions from other countries were being intercepted by ionised layers roughly 120km above the Earth and refracted back. Thus the viewer would be blissfully unaware that Wimbledon was being blasted off the screens by Spanish or Russian TV broadcasts.

The pictures could not be resolved due to the different TV systems used (405-line in the UK but 625-line in Europe). Instead, masses of sloping white lines and an objectionable rasping vision buzz over the BBC's a.m. sound channel would be experienced.

Frequencies Affected

Sporadic-E ionisation affects TV channels in the v.h.f. bands between approximately 40 and 100MHz. In Europe this means that distant signals on the Band I channels E2, E3 and E4 can be received in addition to the channels of Eastern Europe and Italy.

The f.m. radio band can also become highly active. FM DXing can be a hobby in its own right and nowadays receivers with RDS can ease the problems of identifying the source of transmission.

Ionisation

Long-range TV reception of this nature is possible due to reflections within the various layers of the Earth's atmosphere, including the E-layer. This particular region is located at approximately 120km above the surface of the Earth. TV signals normally continue through it and into outer space only to be lost forever.

However, during the summer months, the E-layer becomes highly ionised by the sun and this can result in signals being reflected, or more accurately refracted, back to Earth, see Fig. 2. Reception via Sporadic-E can also occur during the winter, but on a much reduced scale.

The unstable nature of the E-layer means that this type of propagation is completely random in terms of direction, distance, picture quality, signal strength and duration. During the summer months, activity can occur almost daily with periods of reception, known as 'openings', lasting from a few minutes to several hours. What surprises many newcomers to the hobby is the high field strength of many of the signals encountered and therefore the simplicity of the antenna system required.

A fast moving ionised layer can produce reception from a range of countries in quick succession. Sometimes the band can be filled with several stations appearing on the same channel. Since the signals are returned to Earth, a skip distance is involved which is typically 850 to 2000km.

Extreme long-range reception from the USA, Middle East and Africa is also possible at times. Double-skip is the usual explanation of extreme long-range reception, but there are theories that this is in fact single-skip with a very shallow reflection angle. Transmitters closer than 300km are seldom received via this mode of propagation.

Meteor-Shower Reception

Another type of propagation which the more experienced DXer will encounter occurs when signals are reflected from meteor trails caused by random particles of rock debris burning up on entering the Earth's atmosphere. Reception is brief, usually lasting only a second or so, hence the term Meteor-Shower 'ping' or 'burst'.

Reflection distances are usually similar to those associated with Sporadic-E. Reception at Band I frequencies is possible on a daily basis, although at certain times of the year peaks of activity occur giving frequent bursts of pictures.

During high periods of activity, i.e. the Quadrantids (early January), Perseids (typically 9th-12th August) and the Geminids (mid-December), snatches of Band III signals are possible. In the past, most countries have been identified including

Rumania, Russia, Italy and Finland.

Receiving Exotic Signals

The term 'exotic' is subjective, but after several years of experience most DXers know instinctively when reception falls into this category. For instance, the reception of Hungarian TV via Sporadic-E in Band I is no big deal but via tropospheric propagation in Band III it would make the headlines!

Sifting out the *real* exotics from what we think are exotics is no mean task. For example, the sight of Arabic writing on Channel E2 doesn't necessarily mean that the signal has originated from the Middle East. It could simply be part of a news bulletin from Germany or a language course from Sweden!



The Portuguese FuBK test card received in colour via Sporadic-E.

Sporadic-E On Higher Frequencies

When skip-distance reduces significantly below 500km on lower frequencies, the m.u.f. (maximum usable frequency) refracted by the ionised Sporadic-E clouds is, in fact, *increasing*. Therefore the likelihood of reception occurring on frequencies above Band I can be predicted to some degree.

Unfortunately, a decreasing skip-distance may not be very obvious to the beginner, or even to the experienced TV DXer for that matter, especially during an intense opening when signals seem to be arriving from every direction.

A further indication of a rising m.u.f. is the deterioration in picture quality. As the m.u.f. rises throughout Band I, the vision bandwidth tends to reduce on the lower channels, even though the signals may be strong.

During a typical opening in Band I, channels R2 and E4 tend to produce the clearer pictures but as the m.u.f. approaches the f.m. band, these channels often deteriorate in definition. This suggests that the better quality pictures appear on channels close to the m.u.f.



Fig. 1: A typical weather chart for enhanced tropospheric reception with the pressure indicated in millibars. The extent of the high pressure system is shown by the isobars, which indicate equal points of pressure. The line 'AB' shows the cold front.

Band III Reception

There are rare instances of Sporadic-E reception in Band III so it is advisable to periodically check the lower channels, particularly Channel E5, during intense openings, especially when European f.m. stations are present.

Instances of Sporadic-E reception in Band III are probably more common than we realise. During most intense Sporadic-E openings most DXers tend to tie up all their equipment perusing the Band I channels, thus overlooking the higher frequencies.

One memorable opening occurred in June 1981 when Russian TV channels R6 to R12 were received in East Anglia and The Netherlands. Another surprise opening occurred in June 1988 when several French-speaking f.m. stations to the south were heard without evidence of French TV signals in Band I.

The f.m. frequencies coincided with Tunisian broadcasts and checking Band III revealed relatively strong Algerian broadcasts on Channels E5 and E7. On Channel E6, test cards from Tunisia and Libya were also identified, accompanied by the sound. The opening lasted for over 90 minutes. Moroccan transmissions have also been identified during various seasons. Channel allocations are non-standard, the lowest vision frequency is 163.25MHz.

One word of caution, however. If you receive pictures in Band III ensure that it is not some form of signal mixing if an amplifier is used, especially if Band I is a wash

AR8200 *The Superior Concept* **AOR**[®]

✓8.33kHz steps ✓Slot cards ✓FREE PC control software ✓Opto Scout reaction tune ✓Dynamic memory sizing ✓AFC and Noise limiter



The AR8200 is the **'first'** and **'only'** (so far) receiver to correctly implement the new **8.33 kHz** airband channel step enabling spot on reception with correct tuning and searching.

The flexibility of operation is proving to be marvellous with a multitude of slot cards and options available... the obvious safe investment beyond 1999.

The AR8200 is a capable receiver straight from the carton box offering 1000 memory channels, 20 memory banks, dynamic memory resizing, 40 search banks, priority, select scan, step adjust, frequency offset etc. Full frequency coverage from 530kHz to 2040MHz without gaps (minimum accepted input of 100kHz), all mode reception, programmable tuning step in all modes to a resolution of 50Hz (including 8.33kHz). All mode reception is included AM, FM, WFM, USB, LSB, CW with additional selective bandwidths for narrow AM and Super Narrow FM. Automatic Frequency Control and a Noise Limiter are also provided as standard. The bandscope facility adds a further dimension with save trace capability. Two frequency lines are provided with alphanumeric tags of up to 12 characters, edit and write protect is also featured. Side mounted arrow keys aid navigation through on-screen menus.



Supplied with the receiver is a set of 4 x AA 700mAh NiCad batteries, mains charger, 12V dc lead for mobile operation, whip aerial, bar aerial, belt hook with screws, wrist strap and (probably) the most comprehensive illustrated operating manual which has ever been provided with a hand-held receiver.

The addition of a wide range of plug-in options with supporting hardware & software places the AR8200 into a class of its own, a superior concept of design. Construction has a quality feel with internal build being miniaturised surface mount circuitry.



Computer control is available via a metallic side mounted robust connector. The CC8200 PC lead features a 9-pin D-type plug with built-in level shift and is powered from the radio. The CC8200 is also supplied with a CD-ROM featuring **free** PC control software (see screen shots in this ad), RS232 protocol listing plus other files including Adobe® Acrobat® reader and promotional PDF material. This software and protocol listing is also available as a **free download** from the AOR internet website www.demon.co.uk/aor Within the first 37 hours of this appearing on the web, over 450 operators had downloaded it... very popular and a testament to the success of the AR8200!



What's this about 8.33 kHz tuning steps?

From **7th October 1999** for parts of Europe (and a little later in the UK), the VHF airband is being revised. If your radio cannot tune in 8.33 kHz steps, you cannot correctly search the new allocation, although tuning within 1 kHz (or tuning in 1 kHz steps) will enable you to hear the traffic, you will **not** be able to search. Of course the AR8200 correctly support 8.33kHz steps.



AR8200	Receiver	£399.00
EM8200	External memory slot card. Enables storage of up to 4000 memory channels for backup and restoring to the AR8200. The whole receiver's data can be saved four times over including spectrum trace. Very useful for security or when travelling around	£49.90
CT8200	CTCSS slot card. Enables detection of which sub-audible tone is in use and to control the squelch operation (particularly useful when scanning). Very useful for UHF amateur repeaters and PMR	£59.90
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CC8200	PC lead with CD-ROM. Connection lead with built-in level shift for direct connection to a computer. Supplied with PDF protocol listing and PC Windows software	£69.90
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OS8200	ACC lead (open wire termination). Can be used for discriminator output, Scout, own PC interface building etc	£12.90
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The fantastic **AR5000** receiver, (superior - **Passport'99** says so!) wide band all mode coverage from 10 kHz - 2600 MHz.

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

The enhanced AR5000+3 has been awarded 4-stars by **Passport to World Band Radio'99**.

*"Front-end selectivity, image rejection, IF rejection, weak-signal sensitivity, AGC threshold and frequency stability all superior".
"Unlike virtually every other receiver we have tested over the past 21 years, the frequency readout is unfailingly accurate to the nearest Hertz. This should make the AR5000+3 of exceptional interest to broadcast engineers".*

Voted **best wide band receiver** by the readers of the German "**Funk**" magazine.

Chris Lorek **HRT**...

"Throughout the wide frequency range, the receiver was adequately sensitive, especially so at the upper end, with good overall strong signal handling characteristics."

AR5000+3

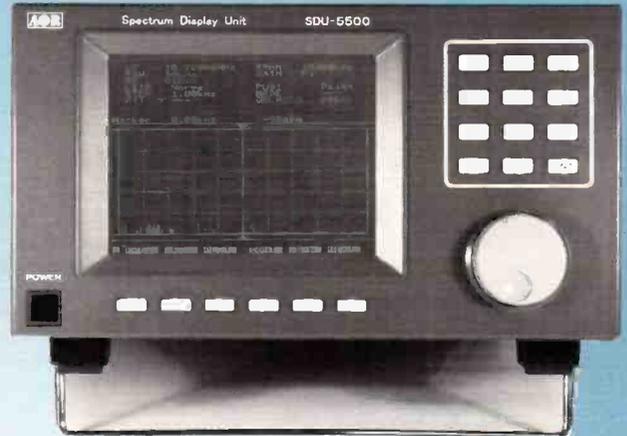
- ✓ Wide frequency coverage 10 kHz - 2600 MHz
- ✓ All mode reception: USB, LSB, CW, AM, Synchronous AM, NFM, WFM with automode tuning (any mode and bandwidth on any frequency is possible)
- ✓ Automatic Frequency Control
- ✓ Noise blanker
- ✓ High stability TCXO reference, 1 Hz NCO tuning
- ✓ 1,000 memories, 10 memory banks, 20 search banks, 5 VFOs (all twice!), alpha tag, EEPROM chip storage
- ✓ Fast scan and search rates up to 45 increments per second with extensive CPU facilities including bank link, delay, pause, voice, level, priority, autostore
- ✓ Multiple IF bandwidth 3 kHz, 6 kHz, 15 kHz, 30 kHz, 110 kHz, 220 kHz with an option position for 500 Hz CW. (30 kHz is ideal for WEFAX).
- ✓ High sensitivity and excellent strong signal handling assisted by a preselected front end from 500 kHz - 1 GHz
- ✓ Analogue signal meter
- ✓ Clocks with timer and alarm operation
- ✓ Extensive RS232 control list
- ✓ Two aerial inputs with switching from the front panel, can be automatically switched based upon a user definable bandplan
- ✓ Audio & discriminator out as well as tape switching
- ✓ Standard DTMF decode / display with optional CTCSS
- ✓ Built-in tone eliminator
- ✓ SDU ready with IF output for spectrum display unit

AR5000 £1345 AR5000+3 £1574



The 'all new' **SDU5500** **AOR**[®] Spectrum Display Unit £799

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



The SDU5500 has a (larger) high resolution monochrome (white/blue) LCD with improved status read-out on the top-half of the display with a spin wheel tuner controlling the marker position, similar to a dedicated high-priced spectrum analyser. On screen programming is provided via on-screen menus with six keys controlling selection in addition to the numeric keypad for frequency entry.

Briefly... the SDU5500 adds a variety of features to extend your receiver's capabilities, such as visually identifying new active frequencies and taking measurements. The SDU5500 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. When using selected AOR and ICOM receivers, the frequency, mode (& attenuator with some sets) may be controlled from the SDU5500. It may also be used with receivers which have an IF 'close' to 10.7MHz (in the range 5.7 to 15.6 MHz with reduced bandwidth) such as the Kenwood TS870S where the SDU5500 makes an excellent companion **band scope** so that adjacent channel activity may be constantly monitored, (on VHF this is particularly popular with frequency management organisations). The SDU5500 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!

● Menu driven operation

All facilities are within easy access through each dedicated function key and on-screen menu.

● Full inter-connection with the AR5000

The AR5000 can be operated from the SDU5500 enabling selection of centre frequency, receive mode, etc. Any frequency spotted and monitored by the SDU5500 can be received by the AR5000 straight away.

● Direct reading of the receiving frequency and input level

By placing the cursor on any spot frequency you can read its frequency and input level on screen. When connected with the AR5000 the SDU5500 virtually works as a spectrum analyser over 10kHz to 2600MHz range as the centre frequency always becomes the receive frequency.

● Wide spectrum coverage

The SDU5500 covers a maximum of ± 5 MHz spread against the input frequency.

● Dual frequency resolution

Selectable, either 5kHz or 30kHz resolution.

● Wide input range

-10dBm to -90dBm by using two selectable gain settings.

● Highly accurate frequency management

Through the DDS controlled local oscillator circuit.

● Wide variety of displays

Graphical display and statistical analysis.

● Remote control via PC

All keyboard operations of the SDU5500 can be mimicked by PC.

● Ready-to-go

Supplied in the UK with 9-pin radio connector for the AR5000, d.c. lead and operating manual (a suitable 12V power supply will be required along with BNC patch lead).



Fig. 2: Television signals can be refracted back to earth by layers of ionised gases.

signals within Band III. This has caused red faces in the past! Always disconnect the Band I antenna and switch off the other receivers if in doubt.

Reception From Outside Europe

The skip distance associated with Sporadic-E means that the majority of reception encountered in the UK will arrive from European outlets. Reception from the Middle East has a special appeal to most DXers and the sight of an Arabic signal can turn a bad season into a good one for most of us.

An intense opening into Europe is not always necessary and often a solitary signal from, say, Syria can be present. Having said that, experience has shown that an opening into the Ukraine (Channels R1 and R2) increases the likelihood of reception from the Middle East.

There are few countries in Africa with Band I broadcasts, although Tunisia and Morocco have

introduced high-power outlets on Channel E4 within recent years. Countries such as Ghana and Nigeria have been identified in the past, but that was in the good old days when Spanish Band I outlets would close during the afternoon.

Transatlantic Reception

Most enthusiasts fail to check conditions to the west, even during an intense Sporadic-E opening. As a result, many transatlantic openings may go unnoticed. Monitoring the 6m amateur band (50MHz) for the presence of Canadian and North American radio amateurs can provide an early warning system for the possibility of TV reception on channel A2 at 55.25MHz.

Unfortunately, the m.u.f. will not necessarily rise high enough for this channel to be propagated. In

most instances, transatlantic reception has occurred after 2100UTC with DXers first alerted by the presence of Icelandic signals.

The USA and Canada use the 525-line system with a field frequency of 60Hz. When received using a normal TV set, the picture will roll rapidly until the frame frequency control is adjusted. The rolling is due to the difference in field frequency: in Europe it is 50Hz.

Once reset, a picture with reduced height will be obtained.

Adjusting the height control will compensate for this, but most DXers feel that a 525-line picture looks more authentic with reduced height. The horizontal frequency control does not normally require adjustment because there is very little difference in line frequency, it is 15.750kHz for the 525-line system and 15.625kHz for the various 625-line systems.

F2-Layer Propagation

One particular fascinating type of propagation is via the F2-layer creating the possibility of world-wide reception. Activity occurs only during periods of high solar activity, peaking at 10 to 11-year intervals.

Magnetic storms within the Sun's photosphere

radiate a tremendous amount of energy which is responsible for ionisation of the F2-layer. When sufficiently ionised, this layer is capable of refracting signals back to Earth.

The ionisation density of the F2-layer is higher during the winter daytime than in summer when heat causes the gases within the layer to expand thus reducing its overall density. It is during the winter daytime that the m.u.f. reaches its highest level with the possibility of world-wide reception.

The quality of the pictures obtained via F2 propagation differ vastly from those experienced due to Sporadic-E ionisation. Severe video distortion with multiple images is a typical characteristic of F2 propagation.

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

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

During the onset of an F2 opening, signals tend to rapidly build up from zero level to a fairly constant maximum strength within a matter of minutes. Similarly, reception can end rather suddenly with a complete fade-out over two to three minutes.

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

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

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

A great circle map of the World is useful for assessing signal direction. Most enthusiasts find it hard to believe that signals from Northern Australia usually arrive from the north-west!

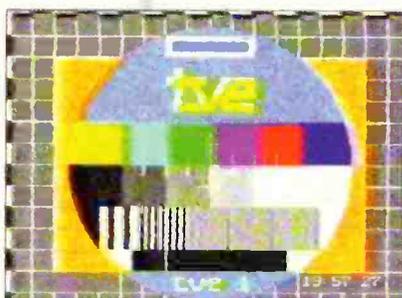
Trans-Equatorial Propagation

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

Trans-Equatorial Propagation (TEP) normally favours a north-south signal path although east-west paths do occur around the Equatorial regions. Reception via TEP normally occurs within a limit of 40° north and south of the Equator, but increased sun-spot activity can greatly extend the range. Occasionally signals find their way into northern Europe, sometimes assisted by Sporadic-E propagation.

The optimum time for TEP reception is between 1700-1900UTC. The most favourable times of the year to see such propagation is around the equinoxes in Spring and Autumn (March/April and September/October). Due to the rotation of the Sun, there is a tendency for any propagation activity to recur after approximately 27 days.

SWM



Another typical example of reception via Sporadic-E. The colour test card from Spain.



The PM5544 test card from the former Yugoslavia via Sporadic-E.

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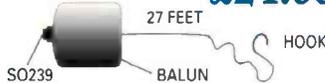
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Antennas for DXing

The antenna forms a vital part of the receiving chain but it is often neglected. It is not surprising really, as most of us have to compromise on size not only because of restricted space but also intolerance by neighbours. Any DXer daring to erect an antenna bigger than a typical 10-element contractor's special will be considered an outcast and hounded by the neighbours. The DXer will also be accused of causing mayhem to satellite viewing, not to mention being blamed for a chewed up E-180 tape stuck inside in the neighbour's video recorder!

Antenna Design

The design of most receiving antennas for Bands I, II and III has evolved around the tried and tested Yagi principle, see Fig. 3. This comprises of a half-wave dipole with parasitic elements mounted a certain distance in front and behind. The rear element is known as the reflector while the ones in front are known as directors. On the more elaborate arrays, particularly at u.h.f. frequencies, the trend is to use a multi-element reflector to achieve a good front-to-back ratio thus minimising unwanted signal pick-up from the rear. Increasing the number of directors increases the forward gain of the antenna and enhances its directional properties. The Yagi array is an inherently narrow-band system and attempts to broaden the bandwidth results in a lowering of gain throughout its operating range. Consequently a wideband system will be a compromise in terms of gain and bandwidth for a given number of elements, when compared with an array cut to a specific operating frequency.

Generally, the reflector is cut to the lowest required frequency and the dipole slightly higher. The directors are usually cut to respond to the higher frequency end of the operating spectrum.

Where several directors are used, the gain at the upper end achieves a greater figure than at the lower end. This arrangement is considered beneficial since signal losses increase with frequency.

Band I DXing

Signals propagated via Sporadic-E can attain extremely high field strengths. In fact, good quality pictures can be obtained using nothing more than a small screwdriver inserted into the antenna input of the receiver but not all signals are strong.

The simplest antenna is a dipole made from wire or rod, see Fig. 4. This can be used indoors but it goes without saying that an outdoor antenna, especially a multi-element type, will give far better results. Not only will it be more powerful in terms of signal pick-up, but will be more directional than a dipole which will help discriminate against unwanted signals on the same channel.

Due to its directional property, a multi-element array needs to be rotatable but Band I antennas comprising more than five elements are rarely used by DXers because of their size. A minimum installation height of around 5m is recommended.

Usually, the main objection is the size of the Band I antenna with its reflector some three metres in length. Arrays of this size were commonplace in the days of 405-line television, so do not be put off erecting one. Fortunately, Band I arrays for DXing are usually installed horizontally (as most transmitters use horizontal polarisation) and they appear less intimidating than their vertical counterparts.

Other Band I antennas used by enthusiasts include indoor loop antennas formed from a half-wave dipole and crossed dipoles for loft use. The former antenna is capable of producing significant nulls to help reject local interference when carefully orientated. The crossed dipoles may be connected together to provide multi-directional coverage or used separately.

Band III DXing

In the UK, Band III DXing can be a problem due to p.m.r. allocations throughout the band. Fortunately, there are gaps between each group of allocations designed to protect European TV transmissions from interference, but it is debatable how successful this is in practice. The gaps correspond to European video frequencies but reception is more successful when using a reduced vision i.f. bandwidth.

An antenna with a minimum number of four elements is recommended, mounted as high as possible since we are dealing with tropospheric reception.

UHF DXing

Successful DX reception at u.h.f. frequencies is largely influenced by factors such as local terrain and the geographical location of the receiving site. At some locations, extreme fringe reception may be enjoyed on a daily basis from certain Continental transmitters, while in others it may be a struggle even under enhanced conditions. An efficient antenna is essential which should be mounted as high as possible but the main problem is knowing where to draw the line.

The neighbours may complain if the antenna is too high or too large, and planning permission will have to be obtained if a mast is erected. Fortunately, for many enthusiasts an antenna mounted at chimney height, or around the 10m mark, can provide good results.

Antennas For UHF

UHF antennas are available for wideband operation over the full channel 21 to 68 spectrum or for use over a limited range or group of channels only. The latter type



Comical characters known as the Mainzelmännchen appear between commercials on ZDF (Germany).

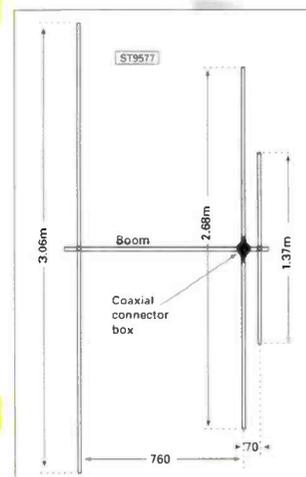


Fig. 3: Wideband antenna covering Bands I and II (47-108MHz approx.). Unmarked units mm.

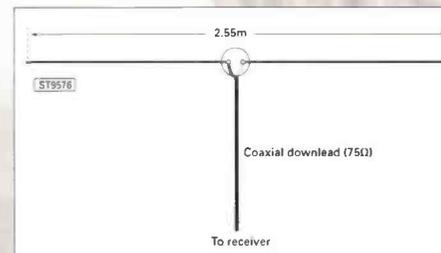


Fig. 4: Simple dipole for Sporadic E reception in Band I.

DXTV SPECIAL DXTV SPECIAL DXTV SPECIAL DXTV



The tuning scale of a typical multi-band TV receiver suitable for DXTV reception. This Orion receiver covers the v.h.f. Bands I and III plus all u.h.f. channels.

of antenna tends to exhibit a greater forward gain for a given number of elements than its wideband counterpart.

Such an antenna could be exploited to provide maximum gain and optimum results from a particular station if reception is feasible on a regular basis. The more ambitious and wealthy DX enthusiast may decide to opt for this approach and use separate antennas to cover each

group of channels, provided that sufficient space exists on the mast!

However, the majority of DXTV enthusiasts prefer the use of a wideband array at u.h.f. mainly for operational ease, despite its slightly lower gain. Wideband antennas at u.h.f. tend to fall into two main categories: the Continental-style Yagi and the grid.

Continental-Style Yagi

It is easily recognised by its large reflector assembly and its chain of X-director assemblies affixed to a long boom. Inherent in its design, the highest gain occurs towards the upper end of its operating bandwidth, this being typically 16dBd, with the wideband version. The increasing gain towards the upper end of the u.h.f. spectrum produces a progressively sharper signal acceptance angle. This means its optimum directional performance will

be achieved on the higher u.h.f. frequencies, rather than on the lower channels throughout Group A.



A typical lattice mast installation used for DXTV reception.

Wideband Grid

The grid is relatively compact by comparison and consists of four stacked dipole assemblies mounted some 100mm in front of a rectangular mesh reflector. The grid maintains a more uniform level of forward gain throughout the u.h.f. spectrum than the Yagi.

Typically, the grid design can offer a gain of approximately 10dB at the lower end of Group A rising to a peak of around 13dB throughout Group B. The grid is also available with a 'launch' director element mounted in front of each dipole assembly which helps maintain a level gain throughout the higher u.h.f. channels. The grid is less costly and more compact than the long Yagi and for this reason it is a popular choice among enthusiasts. Its wide signal capture angle of around 60° may be seen by purists as a drawback, although many enthusiasts find this a plus point in terms of not having to continually rotate the antenna.

The front-to-back ratio is typically 25 to 30dB with either design. Both types of array are marketed by several manufacturers, with slight variations and subtle disguises.

Log-Periodic

A u.h.f. antenna worth mentioning is the log-periodic. It is an inherently wideband design but, unlike the Yagi, all the elements function as dipoles which respond to different frequencies.



An antenna suitable for receiving Bands I and III DXTV signals.



A wideband 'bowtie' array for u.h.f. DXing.

As a consequence, this type of antenna is more structurally complex than the Yagi and at a given frequency only part of the array actually contributes to the gain. This makes it lower relative to the number of elements when compared with the Yagi design.

The forward gain is typically only 8dB for a 20-element array. On the credit side, it has an exceptionally clean polar response with very few side lobes and the gain is virtually constant throughout the u.h.f. spectrum. However, it fails to seek the approval by enthusiasts due to its low forward gain.

Stacking

Antennas can be stacked in configuration to provide a reduction in the forward acceptance angle and to enhance the gain of the system. Phasing kits are available for this purpose.

Generally, two similar arrays may be stacked side-by-side for DX applications but four arrays mounted in quad formation are not unknown. It must be stressed that if such a system is used, particular attention must be paid to wind loading and whether the rotator and support mast are capable of withstanding such loads safely.

Downleads

Although mast-head triplexers are available to combine Bands I, III and u.h.f. antennas, it is recommended that separate downleads are used so that individual filtering can be added if interference problems arise. Use good-quality low-loss coaxial cable, or even satellite cable, for each downlead and do not forget to solder the coaxial plug. It is surprising how much signal is lost in dubious connections.

Amplifiers

Installing an amplifier can help compensate for cable losses incurred but experience has shown that unless the device has a significantly lower noise figure than the tuner in the TV receiver, it is likely to be more effective when installed at mast-head rather than at the set-end. Furthermore, the cable itself tends to generate a certain amount of noise and the installation of an amplifier at mast-head offers an improved signal-to-noise ratio. Most commercially-available mast-head amplifiers use broadband techniques which ensure constant gain throughout its intended operating bandwidth. Using modern devices, high gain combined with a very low noise figure is easily achieved. Currently, amplifiers are available from various manufacturers with a noise figure of less than 2dB.

For optimum results, select an amplifier with a bandwidth which matches that of the antenna, i.e. do not use a wideband amplifier where a grouped version will do.

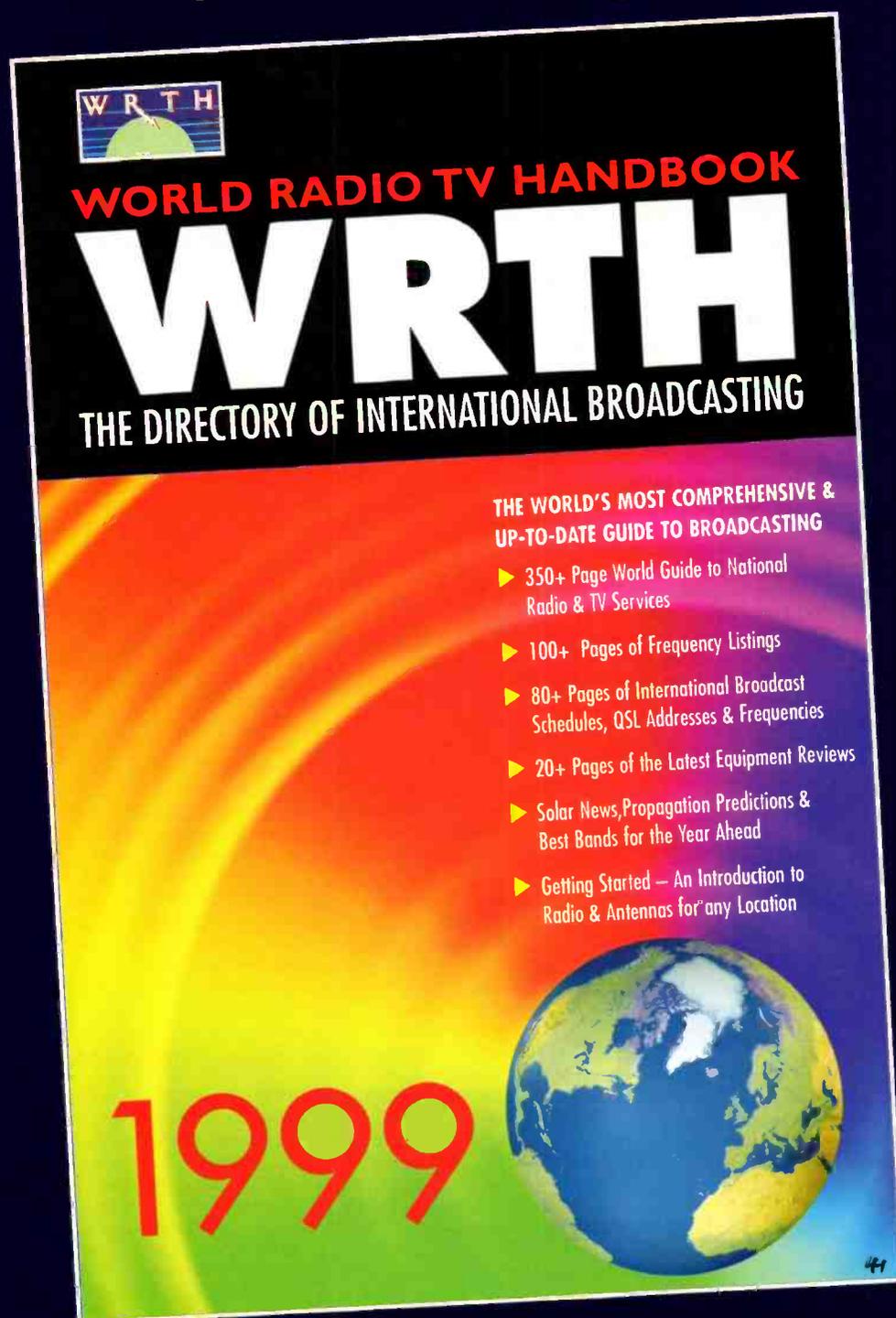
For DX purposes, select an amplifier with the lowest noise figure rather than the highest gain. Single-stage amplifiers normally have a gain of 10dB to 15dB and in most situations this should overcome any cable losses which increase with frequency. Attention must also be paid to the amount of signal level the amplifier is capable of handling. Don't forget that most commercially-available amplifiers are intended to boost weak signals in fringe areas in the absence of strong local transmissions. Excessive signal input can lead to cross-modulation problems. The general advice is to choose one with the greatest signal handling figure. This is often expressed in mV and several manufacturers produce amplifiers with a figure in the order of 200mV.

Band I Problems

Amplifiers can be useful devices, but will not always perform miracles and this is often the case in Band I

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60Hz. Success depends mainly upon the type of servo system design used in the recorder.

Some machines display a severe sync loss every few seconds because the servo reference signal is derived from the incoming field sync pulses, which are at a different rate with System M transmissions. Some of the very early video recorders featured mechanical servo systems which coped reasonably well with System M signals.

Off-Screen Photography

It is still worthwhile taking photographs of DX reception, particularly test cards, clocks and captions, although it is more convenient to record the DX on video tape first. This allows several attempts to be made at photographing the reception whilst at its best.

Avoid the temptation to pause the video recorder to take the photograph. Although many machines have an excellent 'still frame' mode, experience has shown that a picture taken in this mode, especially the background, looks unnatural and appears to be frozen.

'Live' Photography

By its very nature, 'live' photography demands much more skill because there is nothing worse than attempting to photograph pictures from the screen only to find that the signal fades or loses sync at the moment you were anticipating an improvement. Although the shutter may have been released at what seemed to be the most appropriate moment, when your prized prints return from the local chemist there's just a screen full of snow, or the picture looks worse on film than it did at the time of reception!

The advice is to take several shots, even if the thought of wasting film is horrifying. Take a shot as soon as the signal you wish to photograph first appears and remember, this may be your only opportunity!

Cameras

Perhaps one of the best cameras suited to off-screen photography is the single-lens reflex (SLR) type where the image seen in the viewfinder enters the camera via the lens system. This means that close-up photography is possible without the problem of parallax errors. Consequently there is no excuse for taking a magnificent view of the knobs on the set but with only half the screen showing. Being able to see through the lens also means the focus can be adjusted precisely.

Some cameras use a focal-plane shutter which moves horizontally. Unfortunately, the TV field frequency of 25Hz (1/25th of a second) and the vertical composition of the picture often results in diagonal shading across the picture.

Time-Lapse Photography

A fast shutter speed will tend to freeze any noise particles on the picture and these will show up on the finished print. Due to the random nature of the noise, a slower shutter speed will average out any movement thus giving the impression of a smoother and cleaner background. A half-second exposure provides pleasing results.

Too long an exposure can result in blurred pictures, especially on weaker test cards and captions. Usually the identifications become difficult to read but the overall effect looks more pleasing when compared with the original DX picture.

When using time-lapse techniques, success is assured, especially with static DX pictures such as test cards and captions. Bear in mind that Sporadic-E pictures can move slightly due to the effects of propagation and this can cause blurring, especially if the exposure is too long.

The longer exposures can enhance weak signals and experimenting with time-lapse techniques will produce surprising results. It is advisable not to give more than a one second exposure with test cards incorporating digital clocks. These of course change every second and the result

will be superimposed numbers on the 'seconds' part of the display!

Animated graphics can be tricky to photograph, especially if the letters move across or zoom out of the picture. You will have to decide at which point you consider the caption should be photographed and several pictures should be taken and the best one chosen.

Newsreaders and announcers can be difficult to photograph using time-lapse techniques. They often end up looking like gaping goldfish with their mouths wide open!

Camera Settings

An aperture setting of f5.6 or f8 gives good results when using a film with an ASA rating of 125 (22 DIN). For optimum results, set the brightness and contrast controls on the receiver for a normal picture.

Whatever you do, don't be tempted to use a flash attachment. If you are using a black and white film it is best to reduce the colour control to minimum, otherwise the colour bar portions of test cards will show as an uneven graduation from white to black. Provided that the screen is to fill most of the print, the exposure can be made in a darkened room.

PC Storage

Storing images on a PC disk is another possibility and can be cheaper and more convenient than conventional photography. A PC fitted with a 'video grabber' card is extremely useful as this allows recorded material to be downloaded onto disk.

Storing an image this way can use up quite a lot of precious disk space. This problem can be overcome by storing the images as JPEG files which due to file compression techniques, use much less disk space.

Results tend to vary and because time-lapse techniques are not possible, any background grain will appear on the stored image. Digital 'still' cameras are now available thus allowing the results to be examined almost instantly with further shots taken if required. The images can be downloaded onto a PC for storage or for printing.

Further Reading

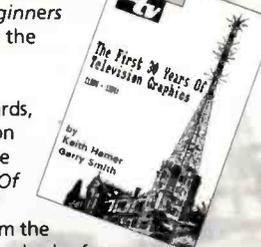
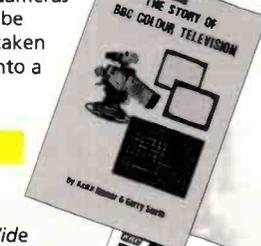
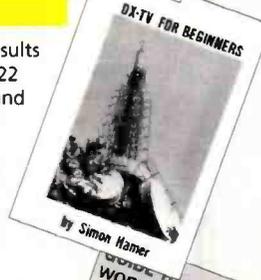
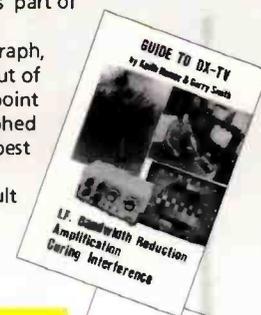
Several publications covering the fascinating subject of DXTV are available from the **SWM Book Store**. These include *Guide To World-Wide Television Test Cards - Edition 3*, *DX-TV For Beginners* and *Guide To DX-TV* (this book is intended for the more advanced TV DXer).

For those who are also interested in BBC test cards, Identification Symbols and historical information about BBC-tv, we recommend *This Is BBC-tv: The First 30 Years Of Television Graphics*, *The Story Of BBC Colour Television* and *The First 30 Years Of BBC-2*. These publications are also available from the **SWM Book Store**. Full details can be found at the back of this issue.

For all the very latest information about DXTV there is the monthly *DX Television* column in **SWM**. Off-screen photographs and reception reports from readers are a regular feature.

We hope that you have found this special edition of **SWM** interesting and informative. If you would like further information about any aspect of DXTV, please send a stamped-addressed envelope to the following address:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.**

SWM



Airnav 2.10

AIRNAV
2.10

Graham Tanner says, "If, like me, you have an interest in aircraft communications, you will have seen pictures and footage of radar displays, and wondered why you can't have your own system so that you can track aircraft as they fly through the skies. This has just come a step closer, with the release of some new software for your PC".



Review

Airnav is a computer program that allows you to track aircraft using their regular position reports, to plot their positions on a map and see how they move through the sky on a radar-like display. The Airnav program shows a map of any area of the world, and when you enter aircraft position reports, the program displays a small aeroplane symbol in the correct position on the map.

When you enter the position details for several aircraft, each will show-up as a series of individual aeroplane symbols, and you can see their relative positions. Over time, as aircraft report subsequent positions, you can track their progress and see their relative motion.

You may have seen pictures of radar-screens on TV or in films, but now you can recreate similar views on your PC, covering quite small areas or even entire continents or oceans. There is a lot to the entire Airnav program, and to cover every aspect of the program would take too many pages.

Instead, I am going to cover the major areas of the program. Airnav is a Windows program, which means that you can have several different 'windows' open at once, each showing different pieces of information for a single area, or even several different areas.

The Airnav software comes on four disks, and is initially a 'timed shareware' program - that is, it is fully functioning, but only lasts for 30 minutes before it automatically stops. Once you have paid your registration fee, you receive a registration number which unlocks the full program for unlimited time use.

Requirements & Installation

Airnav is a PC program requiring Windows 3.1 or higher, or Windows 95. On your hard-disk, the program and associated files require about 15Mb of space. Unfortunately, there is no 'Macintosh' version of Airnav, but it can be run on these computers using a suitable PC-emulator, such as SoftWindows.

Installation is very straightforward. The software comes on four 3.5in disks, and includes a 'Setup' program which you run from within Windows. This then allows you to chose exactly where you

want the software installed, and then copies everything into the right place.

If you are feeling ambitious, there is a text file on 'disk 1' which explains how to manually copy the files from the disks, and how to place them correctly on your hard disk. However, I recommend the automatic method rather than the manual method.

In fact, I came unstuck when I tried to be a bit too clever

when I first installed the software. The disks are marked 'do not run setup from the disks', so I created a directory called 'C:\AIRNAV' and copied all the files from the three disks into it.

Then, when I ran the setup routine, I chose to install the program into the same directory. After lots of clicking and whirring, the setup finished, but when I tried to run the program, it refused to run!

After two days, I admitted defeat, deleted everything previously loaded, and started again. This time, I copied the files into a temporary directory and ran 'SETUP' from there.

The setup routine then loaded the Airnav programs into 'C:\AIRNAV' for me, and went on to create a Windows Group containing icons for the program and Help Files. It also installed all the database files used in the program.

The moral of this is 'follow the instructions, and don't try to be too clever'. However, this does show that the installation instructions are not foolproof, and could do with a little bit more work.

Demos

When you first start the Airnav program, you are given a choice of four demonstration sessions which are well worth exploring. Each demo session teaches you something new about Airnav, and really show the capabilities of the program.

The four demo sessions cover the following areas: northeast Atlantic, Africa, south Atlantic, and South America. You can also get to the demos from the Help menu.

The 'demos' screen appears each time that you start the program, which sometimes becomes a bit annoying, especially when you become proficient with the program. It would be nice if Airnav had a way to switch-off these demo sessions so that they were not offered on start-up.

Main Screen

The Airnav screen is the standard Windows GUI screen with a title-bar, a series of drop-down menus across the top of the screen and a 'user entry' area at the bottom where you enter flight details. The major part of the screen is taken up by a map of your chosen part of the world.

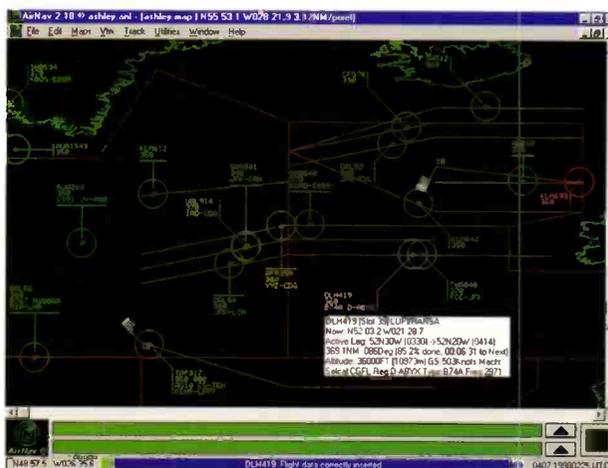
When you first start Airnav, you are presented with a map of the entire world, but you can (and should) change this to suit the area that you will be listening to. The Airnav program has several methods for producing customised maps (see later), but for this review I will be concentrating on the northern Atlantic.

The 2.10 version of Airnav comes with a map of the North Atlantic, but you can make your own maps for absolutely any region of the world. The map data comes from a CIA database, and is limited to coastal outlines and the occasional river.

Almost all the functions of Airnav can be accessed from the drop-down menus, including an excellent Help system, which includes detailed instructions for a sample session which shows fully how to operate the program. In the bottom right corner are a few button-boxes which allow you to see flight data in different formats.

The Airnav program can track up to 1000 flights at any one time, and this is more than adequate for everybody. In most cases, you can track a few chosen flights without needing to fill-up the rest of the screen. When you hear a flight on your receiver, you will need to enter the flight details manually into the Airnav screens, so it is easy to be a bit selective with what you enter.

When I first started using Airnav, I tried entering flight details for every flight that I heard, but I soon found that I was missing other flights as I entered sets of data. I am sure that with practice I would be able to



North Atlantic - Shanwick and Gander.

type-in the data as I received it, but I found it easier to record the details on a notepad as the aircraft spoke them, then check them again when they were read-back by the Controller, and then type the details into the *Airnav* screens.

Registering

The *Airnav* software is certainly worth registering. If you download the program from the web-site, or get it from any other source, it is fully functional except that it will only run for 30 minutes and then automatically exit. Until you have registered, you are limited to a 30 minute session, but you can run the program for as many 30-minute sessions as you wish.

Once you pay the registration fee, you are sent a unique series of codes which have to be entered into the program. Until you have entered these codes, you are clearly reminded of the need to register by a message which appears at the top of each map - this disappears once the correct key has been entered.

A Simple Session (On The NAT)

As I mentioned above, I will be reviewing this program by way of following a single flight across the north Atlantic. Our flight today is using the callsign 'Shortwave 001', and its flight-number is 'SWM 001'.

You start *Airnav* by double-clicking on the *Airnav* icon in the *Airnav* Group in *Windows*. After a few seconds, the screen changes to an outline map of the world, with a menu-bar at the top of the screen and some buttons and text boxes at the bottom. This is the basic screen from which the whole *Airnav* system can be controlled.

From this screen, you can immediately start entering aircraft position reports (more about that later), but this would lead to a very confusing screen display. As ever, a bit of forward planning is required.

For this session, I have chosen to explain how to track aircraft as they cross the North Atlantic using the NAT Track system. Quite conveniently, the author has provided a ready-made map of this region. At the top of the screen, pick 'Map' on the menu-bar and click on 'Load map...' from the drop-down menu, this shows a list of available maps.

By clicking on 'SAMPLE1.MAP', the map covering the entire North Atlantic area is loaded as a replacement for the world map. Once you have your chosen map on the screen, you will need to hit function-key F12 so that *Airnav* tracks the flight once entered. This is an odd setting, as the whole reason for the *Airnav* software is to track flights - so why is it not the default option?

Now, we are ready to enter the position reports for the flights as they report to the Oceanic ATC stations on h.f. At this point, it is worth mentioning the way that aircraft report their positions as they fly across the Atlantic. There are no beacons in the middle of the sea, so aircraft report their positions as latitudes and longitudes.

Each time an aircraft passes 10° of longitude they report to the oceanic ATC centres at Shanwick, Gander, Santa Maria and so on. Each position report is done in a particular format, and *Airnav* is written so that you can enter flight details in the same format.

The format is 'current position and time, current flight level, next position and estimated time and the next scheduled position'. At either end of the NAT tracks, the lat/long reporting points are replaced by various named beacons - some over land and named after places, and some over the sea, but at airway intersections or particular lat/long positions - *Airnav* knows all about these beacons and reporting points.

So, now we are ready to follow our flight. Our flight has already departed from the airport, is heading out over Southern Ireland and has just made contact with Shanwick on 5.649MHz.

The flight gives a report of: "Shortwave 001, 50 North, 10 West at 09.28 at flight-level 330; estimating 50 North, 20 West at 10.07; 52 North 30 West next". The controller reads back these details as confirmation, and we are ready to enter the details into *Airnav*.

From the position report, we can see that the flight is heading west, but having a pictorial representation will make things much clearer. So, on the bottom of the *Airnav* screen is a small area where position reports are entered. Our flight is entered as 'SWM001 50N10W /0928 F330 50N20W/1007 52N30W'.

It is important to enter the final '/' character, as this separates the lat/long from the time, and a position without a time indicates the next scheduled position. There is often some additional data transmitted by the aircraft, such as airspeed (expressed as a Mach number), the aircraft type, and the aircraft Selcall - these can all be

entered into the *Airnav* system, and you have the option of whether to display them on screen or not.

Entering data in this fashion is known as Terminal Mode in *Airnav*, but it is possible to enter flight data by another method, see later for details.

Once you have entered the data, it is checked and validated by the *Airnav* program, and within a few seconds a small white aeroplane symbol appears on the map in the relative position of the aircraft. Even more amazing is that the aeroplane is facing the way that the aircraft is flying! It really is that simple.

The fact that the aeroplane symbol is white means that this is the 'current' flight. Several functions work upon the 'current flight', but to make another flight into the 'current' flight, simply click on the aeroplane symbol.

The small aeroplane symbol is white, and about one minute before the flight reaches its 20°W position, the aeroplane will turn yellow. At about this time, the aircraft will call Shanwick again, and pass a more up-to-date position report. So on 5.649MHz at 1007UTC comes "Shortwave 001, 50 North, 20 West at 10.07 at flight-level 330; estimating 50 North, 30 West at 10.51; 52 North 40 West next".

Into *Airnav* we enter 'SWM001 F330 50N20W/ 1007 52N30W/1051 50N40W'. This entry automatically updates the internal record for this flight, and the small white aeroplane continues its track across the north Atlantic.

As further position reports are received, these are entered into the program so that the flight is tracked by the software. As the flight-level or speed of the aircraft change, these are all entered into the program, and it all affects the speed at which the symbol moves across the screen.

Eventually, the flight will get close enough to Canada, and they will then contact the Canadian ATC of a v.h.f. frequency, and we lose contact with the flight. Soon after this the symbol will turn yellow again, but since we never receive an updated position report (as the aircraft is being controlled via v.h.f. radio) the symbol will disappear from the screen.

There is a particular format that each position report must be entered into *Airnav*, and I never did master how to enter the details as they were read by the aircraft, therefore, I found it easier to have a note-pad handy to record the position details, and then I could enter the data into *Airnav* afterwards.

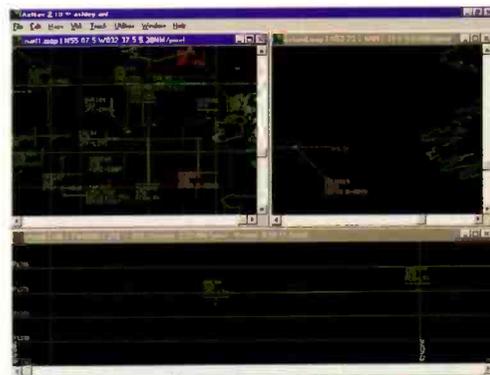
However, if you have never listened to aircraft on the NAT tracks, there is a standard format to each report, and with a little practise, it becomes quite easy.

A More Complex Session (On The NAT)

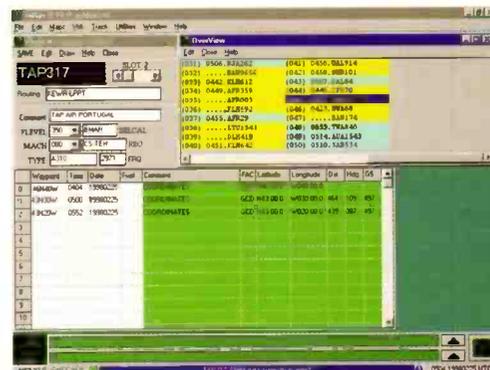
The first sample session of *Airnav* shows just one way of entering data into the program, and how to track just one flight. For a more complex (and realistic) example of how useful *Airnav* can be, we can use the program to plot several aircraft at once, estimate future positions and find out information about a flight between its regular position reports.

The other method of entering flight data is via 'Flight Management Mode'. This is done by clicking on a small box in the bottom-right of the screen and selecting the right option from the menu. It shows a new smaller window where you can enter details of a flight into various boxes.

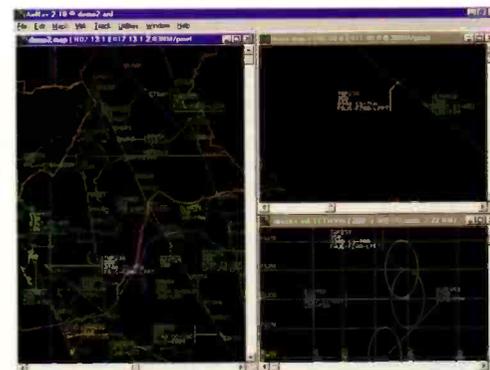
The beauty of this method is that there is no need to learn any fancy key-sequences, but it is a much slower method of data entry. Another benefit of this screen is that once you have entered the flight details, you can get the program to automatically estimate future times and waypoints for each flight - very handy for working-out when the aircraft will pass overhead if you happen to live underneath an airway!



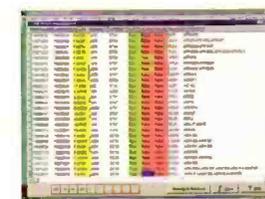
North Atlantic - Shanwick and Gander - Multi-Window Tracking.



Overview Window and Flight Management Mode.



Africa - Kinshasa, Libreville, Luanda, Bangui, NDjamena and Niamey.



All Heard Management.

Continued on page 48...

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It seems difficult to imagine that this PC controlled receiver has only been on the market for less than a year. Tens of thousand's have been sold (literally) world-wide and its little wonder. The specification reads like a £2000 receiver of years ago and now that we have REDUCED the price AND are fitting the DSP module as a package deal it seems your credit card can wait no longer.

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ML&S Price: £299.95 for both

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AOR AR-8200

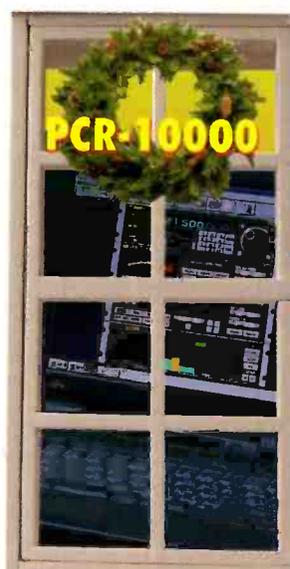
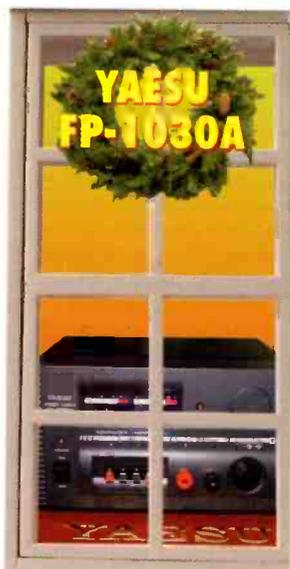
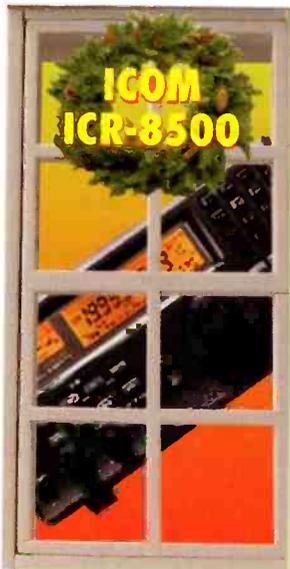
The latest in ADR's range of benchmark scanners. The new AR-8200 has arrived! Tak from AOR U.K. wondered in to our London showroom the other day with what looked like yet another scanner. Were we in for a surprise! The first comment from all of us was how solid the unit felt and excellent the audio was. In fact the audio was amongst the best we have heard from a handheld receiver.

Features include 530kHz-2040MHz coverage, Band Scope and 1000 'dynamic' memories, 40 programmable search banks, AM, Narrow AM, USB/LSB, WFM/WBFM. Tuning steps are from 50Hz and include the new 8.33kHz for AM Airband.

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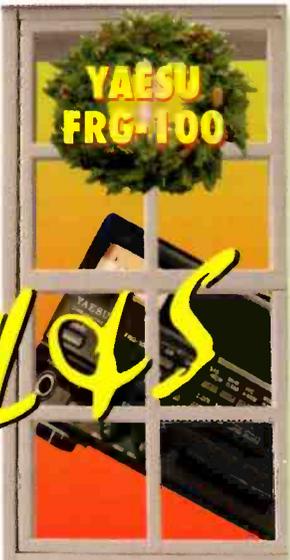
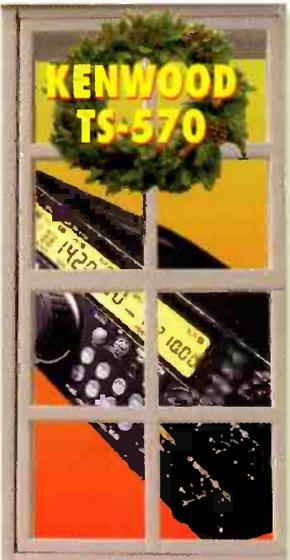
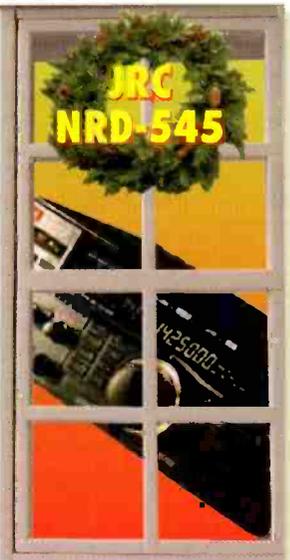
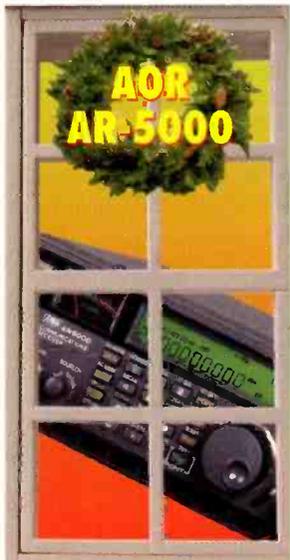
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If you actually take a look around at the receiver market and compare with fifteen years ago I'm sure you will notice there isn't quite the choice of equipment available today. Never mind. With startling performers like the new NRD-545 who cares? A summary? John Wilson paid the ultimate tribute, saying:
'The NRD-545 would be welcome in any listener's station. It is a sheer delight to use, well proportioned and with very pleasing styling and appearance.'

Nuff said then. I appreciate that £1595 is a lot of money but then the best never came cheap. This month we're offering a brand new NRD-545 on our budget plan and I will throw in a FREE MATCHING JRC BASE SPEAKER WITH FILTERS - WORTH £200.

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The ICR-10E is still selling well and after almost a year in the market place it has proven to be a good, reliable and sturdy scanner to use. All mode, all band and PC controllable. What are you waiting for? 500kHz-1300MHz, all mode.

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The AR-5000 is the alternative to the Icom ICR-8500. Similar in specification but presented in a smaller neater package. Covering 10kHz-2800MHz with all mode capability. Apparently won the German best wide band receiver award. So there. Also available as an '43' version with AFC, Sync AM and noise blanker.

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or £30.40 deposit and 53 x £35 p/m
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or £32.13 deposit and 54 x £40 p/m

Yaesu FRG-100

Right back in stock after months of sell out, the FRG-100 really is an ideal receiver for those who want to start in short-wave listening but don't want to throw your money away on something cheap and nasty. (Believe me, there are plenty of cheap and nasty receivers advertised!).

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MVT-7100

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MVT-9000

When this first came over to the U.K. we thought EEEK!! They've left the PC interface off!! Hasn't made a blind bit of difference though. You might not be able to control this scanner from a PC (who bloomin' well cares) but it shows the others where to get off when it comes to performance. And build quality. And ease of use. And... and! Just ask Graeme or Jez our TWO resident Scanner junkies!

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* Budget Plan requirements: Full time employment (or disabled/retired), over 18 and below 71, Current bank account (or building society). For instant finance please ensure you have UK driving licence and cheque guarantee/credit card or Electricity/Gas/BT bill with your current name and address. Finance subject to status. **APR 21.9%**.

FINANCE EXAMPLE

All examples do not include P&P.

Cash Price	Deposit	53 Months@	Total Credit	APR
£1295	£30.40	£35.00	£1885.40	21.9%

Written quotations available on request

Continued from page 45.

Once you have entered the flight details for a number of aircraft, you can move the cursor across the screen, and point at an aircraft symbol. Within a second, a small white box will appear which will contain more details about that flight. The information consists of its flight number and airline, current position, heading and height, routing and time estimates.

If you entered a Selcal for the flight, this box will also contain the Selcal code, the aircraft registration and aircraft type. This information comes from the Selcal database.

There is always one flight on the screen which is in white, this is the 'current' flight and some screens show information relating to this flight. All the other flights will be green, yellow or red.

When a flight is green, everything is normal, when it turns yellow, the flight is approaching its next waypoint or beacon and when it turns red then it has reached its last entered beacon and will disappear unless more information is entered for the flight.

I found it very handy to have a copy of *High in the Sky* open beside me while I was using the *Airnav* program. This book contains a huge listing of aircraft Selcal in various sequences and a lot of information about h.f. aeronautical communications.

While I was using *Airnav*, I came across a few reporting points which were not in the program. However, using *HITS*, *Airwaves 98* and some other maps and books I was then able to insert the correct lat/long positions for several new reporting points.

Creating Maps

As mentioned above, the *Airnav* software comes with a map of the north Atlantic ATC area, but it has the ability to build new maps for any area of the world. If you want to listen to flights crossing the Pacific, make yourself a Pacific map. If you want southern Africa, make a suitable map.

There are seven ways to get new or different maps from within *Airnav*. At first, it took me several attempts to get this right, but once I got everything how I wanted it, they just seemed so easy to do. All the methods are accessed from the 'Maps' menu on the menu-bar at the top of the main screen.

The first method is to enter the latitudes and longitudes of the desired map, and *Airnav* will calculate which coastlines to include. *Airnav* does its best to make sure that the projection

of the new map is as true as possible, so you can choose one set of limits.

Once you have entered the co-ordinates, *Airnav* searches through its world map and builds your chosen map by selecting all the 'map points' that fall within your co-ordinates. This can take a few minutes, so don't be surprised if it seems as if your PC has locked-up.

After a while, your new map appears on the screen, and if it is how you want it to look you can save it with a suitable name. I would recommend that you save the new map with the ICAO name for that area of the world, thus, my own map covering the north-eastern Atlantic is named 'NENAT.MAP', and my map for western Africa is named 'AF11.MAP'.

The second method needs you to calculate the latitude and longitude of the centre of your desired map. *Airnav* then works out the north/south latitudes and east/west longitudes and builds a map from these limits. Once again, the map is presented for your viewing,

and if it looks how you want it to, you should save it with a suitable name.

The third map-making option sounds as if it should be the easiest, but it takes some getting used to. With this option you drag your mouse-pointer across the screen, and *Airnav* builds a new map from the area marked. Once again, *Airnav* keeps the projection as true as possible, so the 'drag-box' on your screen is always a rectangle. It took me several attempts to select the area that I wanted (East Africa).

You can also import suitable maps from other sources, but I did not have any available so I was unable to try this method. It is possible to download new maps from the *Airnav* homepage on the Internet, but given the vast range of maps already available within *Airnav*, this is probably your last resort.

Although these methods of creating new maps work correctly once you have mastered them, it is still a daunting task trying to create suitable maps for other parts of the world when you do not have suitable lat/long information to hand. I would like to have seen a simple text file distributed with the software containing the best values to use for creating new maps by all three methods for all the ICAO aeronautical regions. As an alternative, maybe this could be provided to users when they register their copy of the program.

Whichever method you choose for creating new maps, you can have the maps displayed with the relevant ATC FIR boundaries. This is useful for working out which ATC centre should be controlling which aircraft, for predicting when a flight is likely to change frequency (as it nears the FIR boundary), and who it will probably speak to next.

You can also add to the displays lines to indicate the locations of the air corridors. This is probably most useful across the oceans, but it does depend upon you getting hold of the lat/longs of the routes for the day in question.

Databases

The *Airnav* program has seven databases containing information relevant to the running of *Airnav*. These are all accessed from the 'Utilities' on the main menu-bar. All seven databases have a similar interface which allows you to search for entries using any of the key fields, or to add, delete or alter records in each database. The databases are as follows:

Flight Number: This contains details of flight numbers and their routing from origin to destination. When you enter the details of a flight on the tracking screen, if the flight is in this database you can see where the flight is coming from and where it is flying to.

Weather: This database holds the weather reports given by certain flights as they make their position reports. There is an option on the main tracking screen to plot this weather data, so you can see how the weather affects the flights.

Waypoint: This is probably one of the most important databases. It contains nearly 32000 entries for all sorts of beacons and position used by aircraft for navigation purposes. When you enter a beacon-name in the main tracking screen, it is checked in this database, and the lat/long data is used to plot the aircraft route.

Airport: This database contains information about all of the major airports in the world, and includes such information as its ICAO code, IATA code and country.

Aircraft: This database contains a long list of aircraft registrations and sel-cal codes. As mentioned elsewhere, this contains a lot of outdated information, but at least you have the ability to update this database.

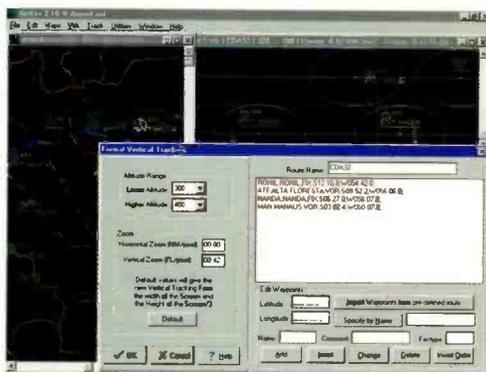
Airline: Database contains a list of world-wide airlines, along with their 2-letter and 3-letter flight codes and their ATC callsign. For example, 'British Airways' has the codes 'BA' and 'BAW' and uses the ATC callsign 'Speedbird'.

The final database contains **Pre-defined Routes**. This contains a list of positions and reporting points crossed by aircraft as they fly along various air routes.

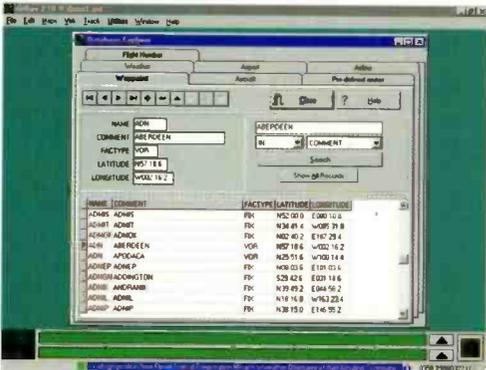
Selcals

The Selcal database screens allow you to search for Selcals, or to add, update or delete those already in the database. In the *Airnav 2.10* version, the Selcal data is a huge improvement on that in the version 1.11 software, but even this latest release still contains a lot of very old information.

For example, the database contains entries for many very old (and now scrapped) Boeing 707s and Douglas DC-8 aircraft. The data in the Selcal database also contains a lot of inconsistent entries - some entries



Flight Tracking in Amazonia - Manaus, Porto Velho, Bogota, La Paz - Vertical Tracking Creation.



Database Explorer.



South Atlantic, User Defined Map and Map Creation Menu.

AIRNAV 2.10

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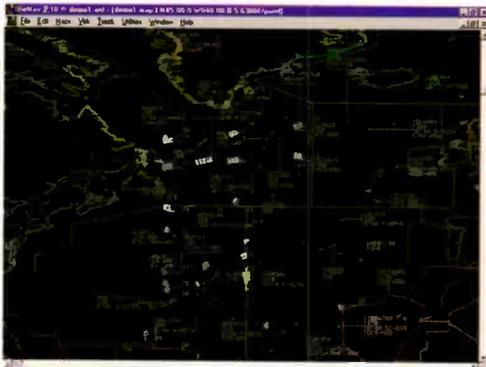
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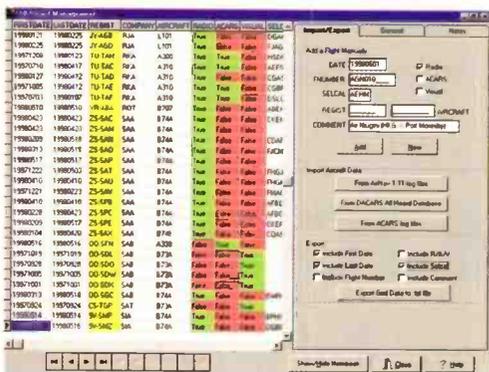
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IC-PCR1000	Ex-demo£199.00	FRG-7	HF 240V£125.00
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Import/Export facilities. Within AirNav, just go to the 'Utilities Menu' and Click 'All Heard Database' and this Screen will appear. It's possible to see how the database data is organised: 11 fields, for each record that maintain a highly detailed log of each different aircraft inserted. The database is automatically updated when you listen to a plane and type in AirNav's 'Terminal' or 'Flight Management Mode' it's registration or Selcal data. On the left side of the screen you can see how it's possible to insert more registrations to the database by importing from ACARS log files, DACARS 'All Heard Database' and also by entering it directly using the 'Add a Flight Manually' capability.

for Boeing 747 'Jumbo jets' say 'B747', some say 'B.747', some say 'Boeing 747', and there are many other variations.

The data in the Selcal database needs to be bought more up-to-date and to record information in a standard fashion. To most users, they will want to know that an aircraft is a 'Boeing 747', and will probably not be interested in knowing if it is a 747-100, 747-200, 747-400 or even a 747SP.

The database with version 2.10 contains just under 16000 entries, but I wonder how much could be removed by deleting old and out-of-date information and filling it with more recent information.

Logging

As you would expect, the AirNav program has the ability to make a Log file of everything entered while you are using the program. Before exiting the program (or even while you are still using the program), you can save all your entries into a useful file which will provide a record of everything that occurred while you were using the program.

Every flight entered, each updated flight entry, each time the flight changed frequency, routes flown - they are all held internally and can be saved to a file for later analysis of log-keeping. The saved file is in plain ASCII format and can be read by any word-processing package, database program or text editor.

Another useful facility related to log-keeping is the 'all heard management' screens, which are closely related to the AirNav databases. The 'all heard management' screens also contain a record of every flight entered into the program, however this database builds up over time to give a record of every flight that you have heard.

Using this database you can see which particular aircraft from any airline you have heard, which aircraft regularly operate on particular routes and even see patterns showing how different aircraft types are used on different days of the week.

Other Languages

The AirNav program has been so successful that the author now provides 'help-files' in several different languages. As supplied on the distribution disks, the help-files are available in English and French, but translations are now available from the AirNav web-page in Portuguese, German and Dutch.

Getting Help

The Help system in AirNav is very easy to use, and is accessed from the 'Help' word on the menu-bar. You can also start the Demos from the Help menu.

In the Help screens, you can work through the entire contents of the help screens, or you can search for help using key words. You can also see a series of AirNav tips which can be made to appear when the AirNav program starts.

Also in the Help screens are full details of how to order the program, how to register your copy of AirNav and how to get to the AirNav pages on the Internet.

Search/Sort/Statistics. Within 'All Heard Management' feature you can search, sort and perform statistical analysis on all aircrafts you have ever contacted. For example, it's possible to see what registration British Airways used on their BAW2252 flight or when Air France's A340 F-GNIF flew to Central or South America. It's also possible to analyse your performance (on the shot you can see my statistics). Also interesting is to try to listen to, receive on ACARS and see as many planes you can.

How To Get Airnav

There are a number of ways of obtaining Airnav.

If you have access to the Internet, the easiest method is to download the latest version from the Airnav website at <http://www.airnavsystems.com> This site contains lots of screen shots and other information which is worth looking at just to see the quality of the program. You can also get 'help-file' translations from here.

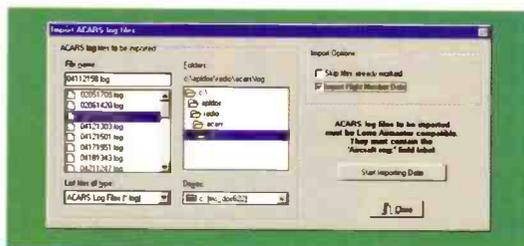
Once you have downloaded the software and installed it, you will probably want to register it so that you can benefit from the full functions of the program. This can be done from the web-page by following the link to 'Online Order' and then 'Order by RegSoft'.

After you have filled in your credit card details and E-mail address, your 'Registration Code' will be E-mailed back to you within 24 hours and a full set of disks will arrive through the post a few days later.

You can also get a copy of the software directly from the author in Portugal. If you are using this method, I would recommend that you purchase the full software straight away, instead of having to re-apply at a later date for a 'Registration Code' to unlock the full product.

AirNav costs \$60 US Dollars (£35), but you can convert this to most western European currencies, round-up to the nearest Franc or DeutchMark (or whatever), and send that to the author as either cash (as bank-notes, wrapped carefully), or cheque. The disks will be returned by E-mail (if specified) or by post, along with your 'Registration Code' allowing you full access to the program from the start.

The author is Andre Brandao, and the address is: **Rua Agostino Neto, Lote 11 2 C, Quinta do Lambert, 1750 Lisboa, Portugal.**



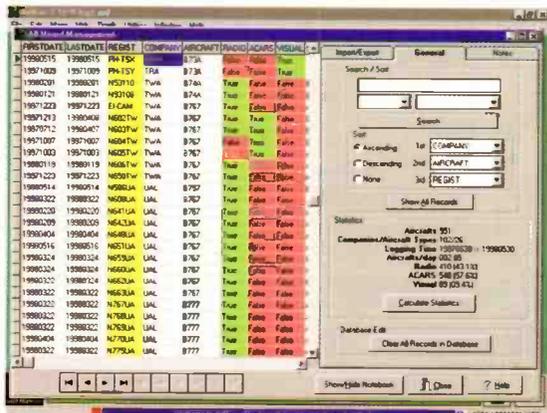
ACARS log files import. In this shot it's possible to see the window that will open when you decide to import 'Aircraft Data' from ACARS log files. You can select whether or not to input 'Flight Numbers'.

Conclusion

Airnav is an incredible program for the h.f. listener which really allows you to 'see' where aircraft are in relation to each other and their position over land or sea. I showed the program to a friend who is an Air Traffic Controller, and he said that it was better than their own system for coverage of the North Atlantic.

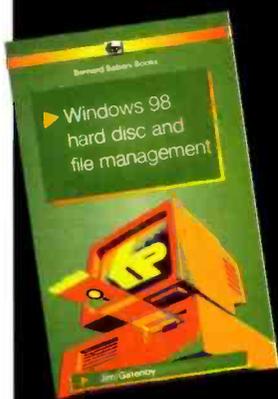
There is no manual or printable documentation with Airnav, which some might see as a problem, however the on-line Help screens are extensive and cover almost every aspect of the program and its use. The Demos are extremely useful, and should be fully explored by new users of Airnav. They are worthwhile repeating occasionally even if you are an expert user, as there is always something that you will forget.

This review covers the main parts of the program, and should give you a flavour of what you get. There is a lot more which I do not have space to cover, it would take a book! These include the vertical separation display, incorporating DACARS (digital ACARS) logs and the ability to interface the program directly into the World Wide Web.



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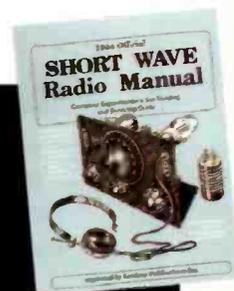
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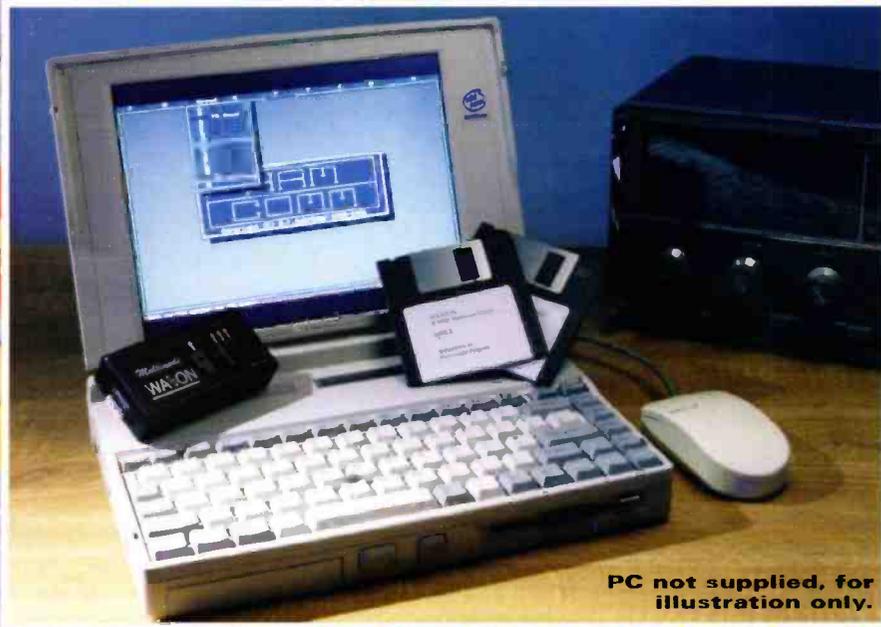


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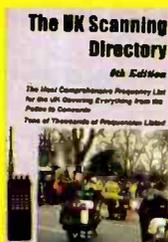
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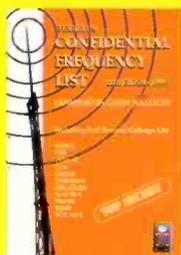
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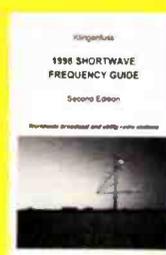
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Being temporarily stuck in a hopeless radio reception location set Richard Ayley G6AKG thinking. Here he shares some of his thoughts and details a neat solution for those lacking a good antenna site. Not content with that, Richard gives us a valuable lesson in hunting out computer generated interference.

Transforming Your Scanner Antenna

While away on business recently I got bored, and decided to use my scanner to while away a few hours between appointments. Much to my disappointment, my favourite hotel was fully booked with the exception of a room normally set aside for coach drivers. This unfortunately turned out to be a well-equipped basement room with a window below street level. You can no doubt imagine the level of reception in the room was appalling, and for some strange reason I had to stand in the bath to make my mobile 'phone work! Anyway, that confined my listening to the local f.m. broadcast stations which held little interest.

EMC

Being an EMC test engineer for my sins, I started thinking about a device I use to measure conducted interference on cables to and from electronic or electrical equipment. This is to establish the level of noise likely to be radiated by each interconnecting cable. The device used for this purpose is nothing more than an accurately calibrated current transformer that has the ability to couple r.f. energy from l.f. up into the v.h.f. spectrum in to 50Ω, and then into the measuring receiver.

Induced Radio Signals

When I arrived home I started to think about all the radio signals that must be induced on to things such as telephone lines, mains wiring and TV antenna downloads; granted so would all the electrical noise generated by the hotel, but it seemed worth a try. The only thing wrong with the idea was that a professional current clamp turned out to be a great deal more expensive than my scanner. As the

calibration of the clamp was not an issue, I decided to have a go at building one myself, which turned out to be surprisingly cheap and simple.

Split Ferrite

My d.i.y. current clamp is built around a split ferrite component designed to attenuate high levels of conducted/radiated electrical noise from equipment cables. These are sold by a number of component stockists including Maplin* and Electromail#. The grade of ferrite used in each product seems to be fairly constant between each brand, the internal diameter of the component being the most important factor which should be between ten and thirteen millimetres. The ferrite material is split in half along its length with the two halves held together by a plastic clip-on case. This enables the component to be easily placed around any suitably sized conductor and then removed after use.

Construction

The construction of the clamp is quite straightforward as illustrated in Fig. 1. The majority of the construction is already done by using the plastic clip as a platform to terminate the coil and 50Ω coaxial cable.

First roughen the surface of the clip, using a medium grade glass paper, before attempting to glue anything to it.

To wind the coil, place three or four turns of light gauge insulated wire on one half of the core. Then glue two small strips of perforated board to the core clip either side of the coil, using a two-part epoxy resin or hot-melt adhesive. After the two strips of perforated board are set in place cut a second piece to the top dimensions of the clip.

Next, push through two terminating pins diagonally opposite each other, see Fig. 1. Then, pass two pieces of insulated wire through the perforated board to act as ties, securing the coaxial cable to the clamp. Lastly, glue the pad of perf. board, with the two pins, on top of the two previously fixed strips.

Connecting Up

Once all the adhesive has solidified, strip the ends of the coil and wrap them on to each of the pins, keeping the winding tight. Once the coil is in place, cut approximately 2m of RG-58U coaxial cable and strip one end to leave only the inner conductor bare, again see Fig. 1.

Next solder the RG-58 inner to the first pin, and then cut a notch in the outer insulation to bare a small area of screen next to the second pin. Pre-tin the visible area of braid plus the terminal pin, and then quickly solder a joint between them. Finally, fit a suitable coaxial plug to the other end of the cable.

The only job left to do is tie down the cable to the clamp assembly, securing it with the two tails of insulated wire fitted earlier. As a final touch, a layer of adhesive can be smeared over the tops of the soldered joints and the coupler end of the cable.

In Use

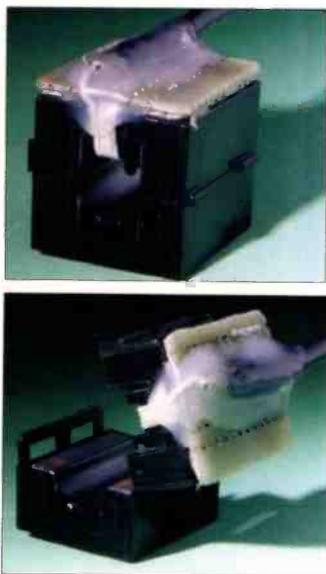
I was pleasantly surprised with the first cable I tried the coupler on, it happened to be one supplying a night storage heater in the bedroom of the holiday cottage where I was staying. My scanner/wide-band receiver is the Yupiteru MVT-7100, which is equipped with a switchable inboard 20dB attenuator. Signals were so strong I had to use the attenuator right up to the Airband, where the performance of the clamp obviously started to fall off. Telephone lines to bedside 'phones and TV coaxial cables were all tried with good results, but only when the TV was switched off!

I have found the coupler to be the most use on the h.f. bands, although it seems to work right up in to the low v.h.f. bands. Several other configurations have been explored, like wrapping a few turns of insulated wire round a water heated metal towel rail, then shorting the two ends together and placing the coupler over the short circuit.

Experimenting

I'm sure after a little experimenting you'll find all sorts of things that make reasonable antennas, particularly

Fig. 1.



when the clamp is used in conjunction with a simple a.t.u. No doubt iron bedsteads, wire fences, even coaxial cables feeding other radio equipment at v.h.f. or u.h.f. will prove a useful h.f. antenna. It is worth noting that because the coupler forms a low impedance secondary circuit of an r.f. transformer, it helps to match the chosen antenna to the 50Ω input impedance of your receiver. Thus only a simple a.t.u. is needed, more to provide filtering than matching.

Caution

Do not try and use the coupler for transmitting, as this will probably burn out the r.f. output stage of your transceiver and also cause a serious amount of TVI. Please also refrain from using the coupler on gas appliances or piping, as this may lead to an explosion. Always use the coupler on insulated cables, as ferrite material conducts electricity. If high levels of noise are noted, check to see that any local appliances likely to generate electrical noise are switched off or are inoperative.

Other Uses

As I mentioned earlier, EMC is now my trade, and working in a EMC test house means I have access to all sorts of useful equipment and facilities. Having said that, due to the cost of capital equipment these days, very little of it can be borrowed for use at home. After I produced the coupler, I decided to try and identify how the electrical noise from my PC was propagating beyond its case and into to my shack receive system. In order to obtain any useful EMC results your scanner should at least be equipped with an 'S'-meter, and in addition some kind of switchable or variable attenuator.

A suitable attenuator is shown in Fig. 2, which should be housed in a suitable metal box fitted with all the necessary hardware to connect between the coupler and the scanner. In order to preserve the performance of the attenuator, all the internal wiring should be kept as short as possible, and the input and output ports placed as far from each other as possible.

Annoying Carriers

First of all, I identified and logged all the annoying carriers that in some cases sat right on top of frequencies like 14.230MHz - 20m SSTV centre of activity. Once this was done, I tuned to each and then switched the PC on and off to ascertain whether they were locally generated or distant signals. After this, process of elimination was used to identify each noise source, turning on and off in turn the monitor, the printer, the modems and all the other devices. Lastly, I checked the keyboard and mouse by connecting and disconnecting them from the fully operational PC.

All Noisy

This exercise proved that the monitor, modems and Keypad were all noisy. Next, with the aid of my scanner switched to a.m. and connected to the coupler, I placed it around each of the interconnecting cables in turn and then checked each of the problem frequencies.

One single noise source caused high levels of noise below 2MHz, and it all seemed to be emanating from 240V 50Hz PC mains cable. It was obvious that the switched-mode p.s.u. running the PC was extremely noisy and on closer inspection it appeared the p.s.u. module was not a CE approved type. Rather than try and retro-fit a mains filter which would broach a safety hazard, I decided to fit a new CE approved type that had all the compliant mains filtering fitted on-board as standard.

Attenuator

Where the signal strengths were too high, I used the inboard 20dB attenuator in order to get a sensible 'S'-

meter reading. After fitting a CE approved p.s.u., investigation proved that the majority of the residual noise was coming from the cables connecting the modems, both 'phone and packet. These cables were changed to home-made items using braided-screen multi-way cable terminated in metal back shell D-type connectors. This type of back shell, while expensive, are well worth the money as they provide a good point at which cable screens can be peripherally bonded. Having checked the performance of the set-up, and found it to be much improved, I then noticed a low level of interference was present when I flexed the monitor cable and VGA socket on the back of the PC.

Like most pre-CE marked PCs, the metal case and mechanical construction leave a lot to be desired. Having already cleaned all traces of paint between the mating surfaces of the two case halves, I decided to remove each PC card in turn - this was done with the PC off - and slightly distort each metal back plate. You may think this sounds a rather barbaric process but in most cases, pardon the pun, this metal back plate provides the largest signal decoupling route to the PC case.

Unfortunately, I have yet to find a single card that fitted the PC correctly, and a single retaining screw just doesn't provide a good enough path to ground.

With a slight amount of alteration, each metal card plate can be made to touch the PC chassis slot at both the top and bottom, hopefully giving the on-card decoupling components a chance to work correctly.

To find close-in leaks of r.f. noise emanating from discontinuities in the PC chassis, it may be useful to construct a small stub antenna, as shown in Fig. 3. This, used in conjunction with the attenuator, forms what is known as a near-field probe, and is just right for finding individual radiated interference.

Noisy Mouse

Finally, when all the known problem frequencies were checked on each cable, I noted that some residual radiated noise could be detected with the stub antenna and scanner, in close proximity to the mouse cable. This radiation was overcome by winding three turns of the ribbon cable coming from the computer mother board to the 9-way D-type socket on the rear panel of the PC, onto a short length of ferrite rod (the type that can be salvaged from old transistor radios).

Hope

I hope you can now appreciate that your scanner, plus my DIY current transformer, can be used constructively to overcome some of the more common EMC problems found on the PC, and come to that any electronic equipment.

I make no apologies for going off at a tangent from what started off as a short construction article, but with scanners getting such a bad press these days from the media and authorities, it seemed a good opportunity to show that, with a few extras bits and pieces, the scanner can be used for the good of everyone trying to use the radio spectrum.

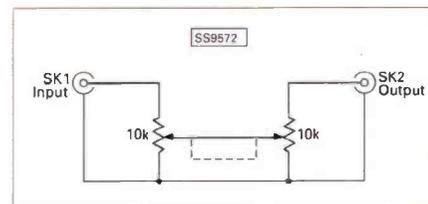


Fig. 2.

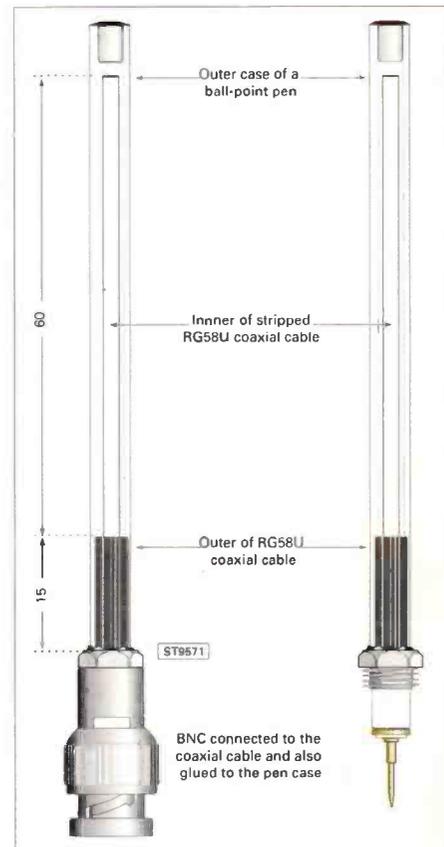


Fig. 3.

Addresses:-

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Electromail (Part No. 257-4266), PO Box 33, Corby, Northants NN17 9EL.

Abbreviations:

a.t.u.	Antenna Tuning Unit
CE	Conformity European
CT	Current Transformer
dB	Decibel
d.i.y.	Do it Yourself
EMC	Electromagnetic Compatibility
h.f.	High Frequency
l.f.	Low Frequency
PC	Personal Computer
p.c.b.	Printed Circuit Board
p.s.u.	Power Supply Unit
r.f.	Radio Frequency
SSTV	Slow Scan Television
TVI	Television Interference
VGA	Video Graphics Adaptor
v.h.f.	Very High Frequency
u.h.f.	Ultra High Frequency

Roberts Radio R881

Paul Beam,
our northern
f.m. DXer,
takes a look at
the latest
offering from
the Roberts
stable, the
R881.

Knowing my passion for compact portables the Editor took delight in teasing me with the idea of reviewing the new R881 from Roberts Radio.

This portable is a fairly typical implementation of what the market for world-band radios seems to define. Roberts appear to have done a good packaging job on the R881. Upon opening the box I was pleased to find an informative guide for newcomers to this kind of radio. This makes the purchase for a first time owner of a world-band portable much less daunting. The net result of such a guide is that within minutes of opening the box, the new owner should be listening to some foreign broadcasts.

What's In The Box

Enough waffle, lets look at what you get for your money. As you'll see in the picture, the R881 arrives with its own soft case including stereo personal earphones - the kind that you have to fit

in your ear - and the previously mentioned booklets. The user guide is written in real English and although, like most of the radios you can buy these days, this little Roberts set is built in the far east, the user guides are actually written and produced in the UK. This is great, and compared to some equipment documentation that I've tussled with trying to understand in the past,

Roberts have it pretty much spot on. If you should run into any problems you are reminded of the technical help line telephone number on every page - a very nice touch indeed.

On arrival from the Editorial Offices the R881 was fitted with the required four alkaline AA-size cells, though they are not supplied with the set when purchased. I did the obvious thing and switched on and started to play. Exploring

medium wave was my first mission. I noticed that the European step size of 9kHz was already selected, and referring to the handbook I found that the contents page steered me straight to page 51, where clear instructions awaited me on how to change between US and European steps. Essential if you're indulging in some early



morning trans-Atlantic m.w. DXing - I've been known to indulge!

For those wondering, there is a small slide switch located on the underside of the set just next to the all important key lock switch.

I imagine that this other vital switch can be the cause of many a frustrated new owner who has never used this

generic type of radio. If placed in the 'lock' position, all the buttons are rendered inoperable. You can't turn the set on. All that happens is that the display just winks at you as the seconds on the clock tick by.

Once the new owner discovers how to defeat this potential enjoyment spoiler, then the full pleasures of the R881 can be harnessed. To be fair, having just re-read what I've written, the set is shipped with the lock switch in the normal operating setting so it's not such a big deal.

Control Is The Goal

Tuning the R881 is a push over. Actually it's a button push. Whichever method you use, and there's memory, scan, auto direct and plain old up and down in the appropriate step, then it's all done by the magic of buttons. No knobs on this set - well - except the volume control.

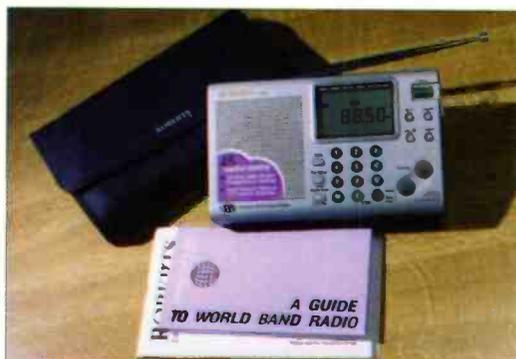
The all important numeric keypad is located under the large, clear, and oh so familiar liquid crystal display. This generous display keeps you up-to-date with the frequency you're currently tuned to, the memory channel that its stored in, the time of day (if it's night then the switchable backlight is very handy), the metre band containing the frequency (if applicable) the time zone you've selected - two available - alarm details, battery condition, lock status and band. Oh, I forgot to mention sleep mode, stereo (f.m.) and error!

This budget Roberts doesn't provide alpha tagging so I'm afraid you'll see no station names displayed, but at this price what can you expect? The R881 doesn't have s.s.b. either - I for one am glad. Just how many broadcast stations use this mode? Not enough to justify the extra you would have to pay for a pocket set equipped to listen to the one or two broadcasters who do.

If you want to listen to exotic s.s.b. utility stations you really need a high quality set-up and an external antenna. This is not the realm of this friendly little portable and that's how it should be - horses for courses, that's my opinion. The R881 is just terrific for the traveller who wants to stay in touch with home via their national broadcasters short wave broadcasts or the 'toe in the water' set of a fledgling DXer. For both it is ideal.

Specs

The frequency coverage of the little R881 is 520/522 to 1710kHz on medium wave depending on tuning step selection, 2.3 to 26.1MHz on short wave, with metre bands displayed when appropriate. One little



The whole kit.

Essential and functional, the flip up rest to allow comfortable near horizontal operation.



niggle I have with short wave direct entry is that only pressing the '5' key allows selection on 5kHz entries, any other numeric key selects '0' i.e. a 10kHz channel. I feel that the software could have been written to have, say, three bands or ranges and responses so that '0' to '3' selected the lower 10kHz, '4' to '6' selects 5kHz and '7' to '9' rounds up to the next 10kHz step - just an idea. Band II f.m. gives 87.5 to 108MHz in 100kHz steps.

Memory capabilities are divided like this, nine for medium wave, eighteen for short wave use and for f.m. also eighteen.

Like all the radios of the genre, battery life is not terrific. I would personally put a mains adapter high on my list of essential accessories, though the use of rechargeable alkaline cells would be an alternative.

Opinion

For what it's worth, I liked this set; it has character, and incidentally great sound quality too. The internal plastic cone speaker does a pretty good

job, considering it's only about 50mm in diameter. Even better sound quality (in stereo) is available by using the supplied earpieces that live in a compartment of the soft carrying case.

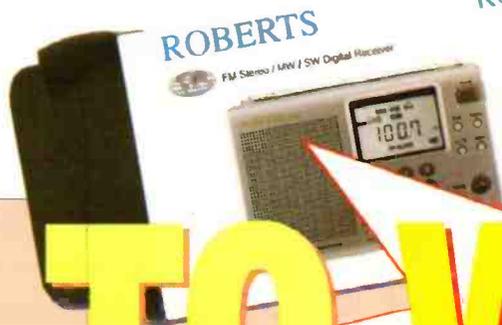
I do recommend that you check out one of these sets if you are in the market for a world-band portable.

If I were starting out afresh then I'd certainly buy one. But then again I guess I'll just enter the competition.

Thanks go to Roberts Radio for the loan of the review radio. Roberts Radio can be contacted by telephone: **(01709) 571722** or FAX: **(01709) 571255**. **SWM**



The only rotary control with a switched tone control above.



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To enter this competition and make your bid to win a new portable, all you have to do is answer the questions on this page and enter them on the entry form provided last month. Then attach the corner flash from this page. A photocopy of last month's entry form is acceptable with both original corner flashes included with your entry. Once completed, send your completed entry to: **Roberts R881 Competition, Short Wave Magazine, Arrowsmith Court, Station Approach, Broadstone, Dorset BH18 8PW.**

Questions

- a) How many buttons are featured on the front panel of the R881?
- b) What size is the R881 loud speaker?
- c) What is Roberts Radio 'phone number?

The Editor's decision is final, no correspondence will be entered into.

SWM and Roberts invite you to win an R881 world-band portable.

COMPETITION
Part 2 of 2

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Shackware

Well, following the shameful abuse of my position as an *SWM* columnist (last instalment I hinted that any distributor might find a very snug 'test' home for an Icom PCR1000 here in the Glenwright shack), **Mark Jarvis of Icom (UK)** contacted me by E-mail and very kindly offered to make an example available to me for test purposes. This really is a dream come true! The PCR1000 and the Libretto might've been made for one another and the only thing keeping me from buying the Icom receiver is a severely squeezed credit card...

Actually, a number of correspondents (including **Alison Meddings, Tony Barker** and **Roger Timmore**) have written and E-mailed asking how well these two technological marvels perform as a pair and, while making an educated guess of probably very well, I've had to admit that I hadn't actually tried the combination. Further details as and when.

FaxCode Update

Atari ST users should note that **Dave Miller's** excellent shareware decode software *FaxCode* is now available from the popular public domain and shareware of The FaST Club, though Dave didn't know at the time of writing what the disk number was - no doubt a quick line to the club would suffice. You can also get *FaxCode* from the public FTP site at ftp.funet.fi/pub/ham/fax_sstv if you have an Internet account - if you don't, see Faris' Scanning column for details of 'free' access - **Ed**.

For those who don't know, *FaxCode* is to the Atari machine what *JVFAX* is to the PC - a quality decode program at a very reasonable shareware price. Track it down soon. Oh, and in a future 'ShackWare', I'll share with you the excellent tips Dave gave to me on writing FAX software. I'm about to try to write suitable software for the Atari 8-bit based on a scrolling window system, more in coming issues.

Mailbag

Goodness me! There really are a surprising number of *SWM* reading s.w.l.s who use Macs instead of the rather more ubiquitous PC. Since mentioning the latest incarnation of the shareware Mac decode software *Mac MultiMode* in the last instalment of 'ShackWare', my welcome mat has echoed constantly to the thud of padded disk packets bearing requests for a copy. Typical of those whose wish is at last fulfilled is **John White G8CCL** of Maldon, Essex.

"Having read 'ShackWare' in the November issue of *SWM*, you have answered my prayer! As an Apple Mac owner I have had difficulty in finding decode software." Yes, John, unless you're a PC owner, decode software can be pretty thin on the ground. Most machines have something available - the difficulty is finding it!

John continues, "I have been QRT for 15 years and have just renewed my licence again. In the old days I used a Dragon 32 with a home-brew terminal unit but now I have a Performa 5400 PowerPC Mac with a 180MHz processor, a DX-394 receiver and for six metres, a 50MHz transceiver kit." John asks if I know of any transceive software for c.w. and RTTY and I'm afraid I have to disappoint for the moment, but no doubt my endless rummaging about on the web will turn up something sooner or later and when it does, I'll announce the fact here in 'ShackWare'.

B. Beswick of Barnston, Wirral, was in the same predicament: "I was both surprised and delighted to read in 'ShackWare' that there exists radio related software written for the Mac. All my efforts to find such software over the months have proved fruitless..."

And **N.G. Foster** of Sleaford, Lincs writes "I read your column with great interest with respect to the *MultiMode* decoding software - just what we Mac users have been waiting for. My own interest started a few months ago after acquiring a Yupiteru MVT-7100 scanner, primarily for listening to transatlantic airline routes on h.f."

MultiMode handles ACARS transmissions and even looks up plane registrations for you in a separate file of reg. numbers which accompanies the program, so you can get the full picture as it were. Mr Foster goes on to say "Having built both an h.f. antennas and a

137MHz crossed dipole, I can receive NOAA 12/14/15 signals very well so all I'm lacking is a good decode program for my Mac Performa 630 fitted with an LC68040 processor running at 66MHz and 16Mb of RAM. So it should run OK".

Unfortunately, a number of additional issues comes into play here. You can't really use the received signal from a scanner to drive decode software when listening to weather satellites. Why? Because the bandwidth of the scanner will either be too narrow, thereby filtering out almost all of the picture information, or too wide (set at w.f.m.) thereby introducing a veritable orchestra of weird whistles, clicks and grinding sounds which make up those bl*\$@y paging transmissions! A scanner is perfectly acceptable for casual monitoring but decoding isn't really feasible. At least, that's the generally accepted argument and it's a sound one.

Now I'm about to contradict myself completely. You can, in fact, use a scanner, though the picture quality will vary from truly awful to just about acceptable depending upon your local terrain, the quality of the scanner, decode software, hardware interface if any, and so on. Many casual monitors use a scanner and for them, the results are fine - it simply depends upon your definition of 'acceptable'. I would prefer a scanner over nothing, and a cheap kit-built dedicated receiver from say, Cirket, over that. The kit is easy to make and align, gives excellent results and will reward with years of use.

And now problem number two: you can't decode a weather satellite signal directly as you can, say, an h.f. transmission. Satellite signals consist of a 2.4kHz f.m. audio sub-carrier tone amplitude modulated with picture data. The signal has to be rectified before it can be decoded. In practice, this usually means an extra little circuit such as that published in *SWM* in the 'Space Issue' of October 1994 (unless you're using the PC sound card software *WxSat*).

For more information, buy a copy of the satellite 'bible', the *Weather Satellite Handbook* by Dr Ralph Taggart, from the *SWM* Book Store, priced at £15.50. This excellent work describes the theory and practice of decoding WX satellites and contains details of an easy-build interface for any computer.

And for anyone with a Mac, do remember that as well as *Mac MultiMode*, there's the excellent *RadFax* too. Written by Finnish programmer Juri Munkki (jmunkki@hut.fi), this seems now to have reached the end of its development as far as features are concerned but, though it's a 'no frills' program, it's still a very capable FAX decoder and an excellent introduction to the hobby. What's more, it seems to work with even the lowest spec Macs - though individual cases may differ and much depends on factors such as RAM quotient and so on.

Pocket Pals

I had a very interesting letter from French reader **Michel Berlie-Sarrazin** of Aix-les-Bains who, among other interesting subjects, raised the issue of portable stations once again with details of his own set-up...

"Recently I saw a small second-hand Olivetti portable computer, Quaderno 33 model. With a 386SX processor, 60Mb hard drive, 4Mb RAM, i.c.d. back-lit screen, trackball mouse and numerical keyboard separate from the alphabetic one. Nothing very unusual there but...it has a sound card and software that allows the use of the computer as a digital tape-recorder/player with forward and backward functions by way of the mic and loudspeaker. Dimensions of the machine are 210 x 150 x 40mm. There is one RS-232 port, one parallel, one video out and one PCMCIA II port. The price was 1500F (about £140)."

And what do you do with this machine Mr Berlie-Sarrazin?

"You put it in a small attaché case, install *Hamcomm* or *JVFAX*, *PKMON* or whatever you have to hand, connect it to a Sony 7600, Grundig 400 or a scanner, and you have an all-in-one portable receiving/decoding station. With a QRP transceiver you get a complete receiving/transmitting station ready for all digital communications - nice isn't it? I was not the only man to think the Olivetti was a good opportunity. In two weeks, all 80 available computers had gone!"

Well done, Michel. Just shows what an eye for a bargain can do...

Lib News

Just a tiny bit about the Libretto 50CT before I sign off for this issue. While the machine ostensibly comes with a 75MHz Pentium processor, 850Mb hard drive, etc., upgrading is both easy and comprehensively explained via copious instructions on the 'net. Perhaps the most exciting news is that all later Libretto 50s are actually fitted with a Pentium 120MHz processor underclocked to 75MHz (which means most of the machines which reached UK shores - it was sold elsewhere in the world for ages before being made available here). I can't guarantee that your Libretto will have P120 at its heart but it is likely.

Overclocking then (i.e. increasing the speed of the processor to increase performance) is as easy as opening the case, cutting the leg of one chip and soldering in a jumper wire. You'll invalidate your warranty, but take your base-level Libretto right up to 166MHz!

Alternatively, a moderate overlock of 133MHz can be achieved without adversely affecting battery performance. Hard drive upgrades to 4.2Gb are similarly easy as is building an 8-hour battery and various other goodies! The interested should check out Dr Xin Feng's web homepage at

<http://www.robota.engr.ucdavis.edu/default.htm>

Lib owner and E-mail correspondent **Ken Hewitt** did and liked what he found there!

Until next time, good listening.

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

■ E-MAIL: gw3kfe@pwpublishing.ltd.uk

Amateur Bands

There are pretty clear indications now that at last we are climbing up towards sunspot peak again after a spell when the numbers seemed rather static. Even 28MHz has been open, though often on a N-S path.

Serious Science

On Wednesday August 11, 1999, there will be an eclipse of the sun, which will be total, or nearly so, over much of the UK. The need is for lots of people to be at their receivers between 1000 and 1100UTC on that day, and preferably on the day before (and after) as well, to note and record what happens to ionospheric signals as we go through the eclipse.

The previous and subsequent day's log covering the same time will serve to give some sort of comparison between 'normal' and 'eclipsed' conditions. We can look for effects occurring on our 1.8, 3.5, 7 and 10MHz bands over sky-wave paths. This is a chance to do some serious science.

A total eclipse of the sun in the UK is a rarity, and this is the first time the professionals have asked for the help of amateurs. If you can be available at the time mentioned, and are willing to help, please contact **Martin Harrison G3USF**, Chairman RSGB Propagation Studies Committee, via **RSGB, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE** for the details, or E-mail at **M.Harrison@pol.keele.ac.uk**

Letters

In a letter dated October 23, before the weather changed so markedly, **Ted Trowell** noted that at long last conditions showed a marked change for the better. Ted noted a Swedish amateur station on Top Band s.s.b. of an evening; it seems he runs one kilowatt into a four-element wire beam and occupies much of the space between 1.840 and 1.850MHz because his upper sideband seems less than well suppressed.

As for the other bands, Ted stuck to the c.w. with: 7MHz 7X2AN, VE3FU/NP2, JA5PL; 10MHz 4L8A, 9Y4/DL4MCF, OY3QN, 8Q7IO; 14MHz XX9TR, TF8SM; 18MHz 3W7TK ET31AA; 21MHz K7QXG, PY1CJ, N6LU, YV1NX, FJ/G3TXF; 24MHz 5A1A, ZS/PA0QRP, ZS6AL, HH2/N2APL, ZB2EO, TA2BK, 9H0VRZ, FR5VZ, PT7WX, WA6TLA, E31AA (NOT ET31AA!), TG9NX, YV5A, XT2AW, YV5DIG, FJ/G3TXF, VE3FU/NP2, CO2OR, VPS/WA2VYA, TA/KU0J, TL5A, A45XR, HF0POL, C91RF, YV1DZG, 9M2TO, 9V8OK; and finally 28MHz for KP4YD, 9J2BO, XE2NAO, PU1KDR, ZS6ME, PT2HO, A92GE, YB5HQZ, ZS6JW, CX4GL, ZS1WA, N7RT(Arizona), PY1ARS/4, CX3EU, PY1SL and PY40W.

From Birmingham, **John Collins** listened in to some of the Jamboree-on-the-Air stations, from noon UTC on 7MHz he logged GB4GIN, GB4WCH, GB0SJ, GB2SMM, GX4ZDA/P, GB2GU, GB6DS, PA3AMA/P, GB8HS - and many complaints about the wind!

A small card with lots of information comes from **J. Barrington Gray**. On the subject of headphones, he remarks that he finds the cheaper moving-coil ones too bassy, so he uses Sennheiser HD340 for his AR88D receiver. On a different tack JBG remarks that he is still able to test valves - for his free (UK-only) same-day service. Please pack them well, and enclose enough stamps for return postage. The

address is: **J. Barrington Gray, 132 Lincoln Way, Corby, Northants NN18 9HW.**

Our next letter comes from **Harry Richards**, who comments that the reference in the November issue to G10IAJ should have read G10AIJ, but whether the slip was Harry's or mine will never now be known, because after that column had been finished, the 'out' basket was indeed outed, lest the filing cabinet collapse beneath its contents, or so my XYL said! Apologies to all, anyway.

More Mail

More 28MHz DX comes in the list from **Colin Dean** in Barnsley. He notes signals from A45ZN, CE3/NE4Z, C56A, C56HP, D2BB, HP1DGX, W50XA/KP2, OD5NJ, TF8GX, V51SG, ZD8T, Z21KO, 3C1GS, 3V8BB, 5R8FT, 7Q7JL, 8R1Z, 9J2BO, 9Y4GR and 9Z4DZ. Moving down to 21MHz netted Colin some more goodies in the shape of S51AG/MM off C6, DS32BGS (I hope that's right - Colin's hand is not too clear on this one. It might be D3 from Angola, or as I read it a Korean call), ET3AA, HC10T, IG9/IK3AWP, JX7DFA, PJ8Z, P43A, P43P, TE45C, VK5KYL, VP5T, V26B, V47KP, YB0FF, ZD7VC, 5A1A, 5Z4FM, 7J1CLU, 7Q7HD, 9K2MU and 9K2QQ.

18MHz served up FP5BZ, HB0CZS, DK8YY/HI8, OX3FV, TF3GC, VP9LR, V26AK, G0XAM/MM off 3V8 and 9K2RA. That leaves us with 7MHz, and Colin's favourite came up with AP2KSD, A61AJ, BA4CH, BV5BG, BY9BB, DS5RNM, EK3GM, EZ8AQ, HL3QBS, HS0/IK4MRH, HS0/JA6GIJ, IG9T, OD5NJ, P43E, SU1JOTA, S21YG, S0IHA, TA2EY, TK/DJ5MX, TZ6JA, UA0SQL, UN0N, VP5T, VU2PAI, VK1MJ, VK4BTf, VK6AGI, V26B, YM75TA, ZA1/IK7VJP, ZA1MH, 3C1GS, 4S7BRG, 5A1A and 9G1MR.

After thirty years, **Paul Goodhall** of Oxford is still at it and still enjoying it, though of course he has updated from the HRO. One thing he notices is that on Ten, his CB vertical is much more useful than the G5RV. The reason is that on 28MHz, signals come in predominantly from low angles - ground-wave when the band is dead, low-angle sky-wave when the ionosphere supports propagation. The halfwave vertical Paul uses favours this and a horizontal would have to be pretty high to equal it.

On the lower bands though, the chance of DX signals coming down at steeper angles is greater and so the G5RV is preferred. Paul's list is some thirteen pages long so we have alas had to prune very severely.

On 28MHz he notes RA9SM, K4EA, 4Z5JE, UA0SJ, 4X6VR, 4Z5AW, A41LZ, PY2ZX, 4Z1GY, YV4/DJ9VB, 4X5FL, K1LWI, K4ITN, YB0AI, N3AH, 4X6RA, C9ZRF, 9N1AA, W3UR, W1RZH working 2E0AFI, N8WRS, assorted East Coast Yanks, CU3AD, W2IT/P, 9K2GS, W6YJ, KE2EC working 2E0AOZ, K1KW, N9ERO, VE3XN, VU2WAP, K5MS, PY2KC, K1JN, K4EA, K9BZ, VA3TASHM9AJ, K9BS, N9SOB, W5RID, W5PKE, A41LZ knocking off a whole covey of Ws, ZD8Z, ZD7VC, 9H1EL, FR5HR, HP1/DL9CRF, PY5H, P4OW, VA3KA, W1UG, LU7VH, VP5T, YB5DX, KE9HT and K1RM, plus all the Europeans and smaller fry.

Down at Top Band, Paul found a weekday net in 1.975MHz while down at 1.841MHz I5VJA was calling CQ. Turning to 3.5MHz we note a fine crop of Jamboree stations, among them PA, TM, OZ, VA3FJM/J, OY6SNP, TF1JAM and various East Coast W/VE stations, all in all over 100 stations Jamboree-ing on both this and 7MHz. At 18MHz, ZL4DJ and 5N20JP were logged, leaving us a crop too long to list on 14 and 21MHz.

I can now look down on the 'flat-top' of my antenna. I can't do much about it for several days, having damaged a hand while defrosting the freezer. Murphy's Law is alive and well. (Later: looking from outside it becomes evident that both main and 'preventer' halyards are damaged, so a trip up a ladder seems on the cards. Also note the radials on the vertical are tangled too!).

Finale

So, that's my space for another month. Please send your reports and letters, grave or comic, to reach me by the beginning of the month as usual, c/o PO Box 4 Newtown SY16 1ZZ. See you then!

QSL Addresses & DXpeditions

Ted Trowell mentions XX9TR, via OH2PM; ZS/PA0QRP via PA0FI; 9H0VRZ via PA0JR; FR5VZ via F8VZ; XT2AW via DF2WO. *DX News Sheet* notes 7Q7LA via G0IAS; 9M2AX is Ross Tanaka F7 Menara Impian Taman TAR, Ampang, Selangor 68000

Malaysia. and VK9CL via JM1JLS Hideyuki Kai, 4-22-15 Takata-Higashi, Kohoko-Ku Yokohama-City 223-0063, Japan.

For the upcoming Amsterdam Island expedition, the cards go to F6KDF Radio Club. For the latter, a dollar or two IRCs will serve for airmail return regardless, though they wouldn't mind receiving a donation towards the cost of this expedition. Although the Marion Dufresne stops at

both Crozet and Kerguelen on the way to Amsterdam Island, they have no landing permissions at the moment. Against that, FT5XN is known to be returning to Kerguelen sometime in January 1999.

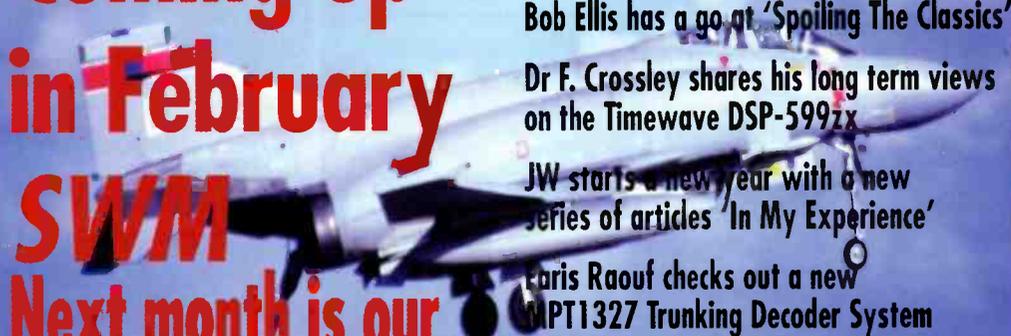
Just before this issue appears, a puzzling call sign is due to appear - TO150. It is a 'special' from the top of the Piton des Neiges, to commemorate the abolition of slavery on Reunion. In addition to a special

QSL, they will have a web page at <http://www.oceanes.fr/pdn/> to check, and it is understood they hope to have pictures of the location and the equipment as well.

Finally in this section, the team for Campbell Island ZL9CI, leave New Zealand on January 1, to be operational between January 10-24. Again, there is a web site at <http://www.qsl.net/zl9ci/>

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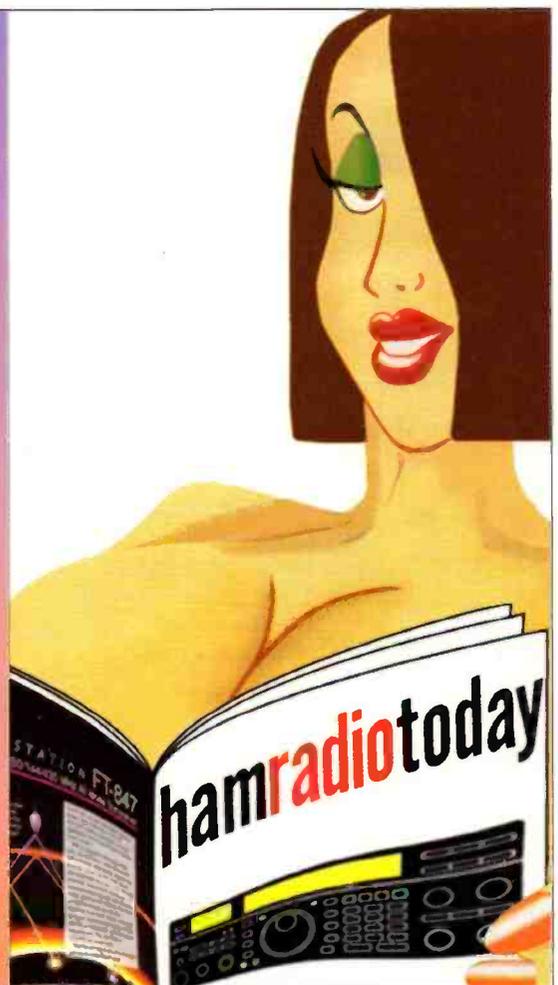
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Antenna Tuning Units for use with HF receivers

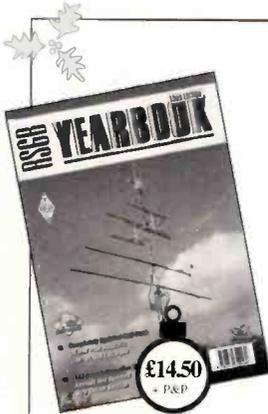
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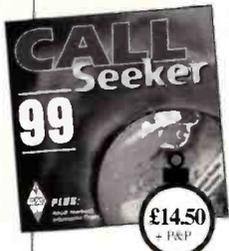
73 from Dave G4KQH, Technical Manager.



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SSB Utilities

Readers with long memories will remember that about three years ago I wrote about a 'propagation testing' station in Norway. This station transmits its callsign LN2A every few minutes in c.w., and there has been some recent changes in the station operation which are worth mentioning here.

I know that, strictly speaking, these are not s.s.b. signals, but they are utility stations. They are also extremely useful propagation indicators and can be checked on a regular basis to give you an idea of how well signals are travelling.

There are two stations in this mini-network, and there is enough space for another two stations to join in later. The first station uses the callsigns LN2A and is located in Sveiv, near Stavanger in south-western Norway. The second station uses the callsign VL8IPS and transmits from Darwin in the Northern Territories of Australia.

Recently, some changes in the operation of these stations has been noticed. These stations used to operate on slightly different frequencies, but they are now on exactly the same frequencies (VL8IPS used to be 2kHz below LN2A), and the 14MHz channel has been moved down by about 10kHz. The present frequency and operating schedule is shown in Table 1.

Poundon & Inskip

I am happy to report that my questions a few months back about the 'antenna sites' at Poundon in Buckinghamshire and near Preston in Lancashire has produced some interesting information.

John Langfield writes to say that the antennas in Lancashire are at the village of Inskip and not at Freckleton which is about five or six miles away. I have since checked another, better road atlas, and there is a disused airfield marked on the map - an ideal place for an antenna farm! John says that he doesn't know if Inskip broadcasts anything, as he has not been able to hear anything, and suggests that maybe they just listen.

In a separate report found on the WWUN list, somebody reported an encrypted RTTY (CRATT) signal on 6.4342MHz, which he listed as 'RN Preston, UK', which I can only presume is coming from HMS *Inskip*. **Norman Maggs** writes in to point out the correct location of Inskip, and adds that it was once a naval airfield. The site is now used by a local farmer, and his cows now graze in and around the various antennas.

Next up is **Dave Roberts**, who says that Poundon was mentioned in a previous *SWM*, about three years ago. During WW2 it was where w/ operators from the SOE worked agents in the field in occupied Europe, and in more recent times, it was a receiver site for the FCO. The TX site was at Creslow, near Whitchurch, (which has since closed). **P. Ridgeway** says that the Poundon site closed down in June or July of 1998, and that the site is now for sale - does anybody want to buy an antenna farm, one careful owner!

Martin Nicholson from Chichester also has some comments and information on the Poundon site. He writes to say that According to Nigel West's book *GCHQ The Secret Wireless War 1900-86* the Poundon facility was created in 1942 along with the nearby Signal Hill and Grendon Underwood sites (no trace of these two today) for training and operational use by the Special Operations Executive (SOE) in WW2.

According to West (in 1987) Poundon "is still used by the Diplomatic Wireless Service". This would fit with my surmise about Hanslope Park which was DWS (Diplomatic Wireless Service) and is now a 'Government Communications Centre'. My guess is that the two sites are linked and, like BT and military m.f./h.f. facilities, which often come in pairs, one is primarily for reception and one mainly transmission, to avoid the overloading and mutual interference which can occur with many transmitters and receivers in close proximity.

Although GCHQ probably provides equipment and technical support to these Foreign Office facilities, I believe they are functionally separate from GCHQ's own 'Composite Signals

Organisation' listening sites at Benhall Park, Oakley, Cricklade, Culmhead, Morwenstow, West London, Irton Moor (shared with Royal Navy), Hawkland and Brora.

It is quite surprising how many h.f. antenna sites there are around the UK. Ordnance Survey Landranger 1:50,000 scale maps show many across central England from Oxfordshire through to East Anglia. Martin suggests starting a periodic list in the column - just 'location' and 'user' (if known), nothing too contentious.

In spite of recent correspondence, I don't think we've really got anything like the full story on RAF h.f. facilities (SAR, STCICS, UKADGE, Discrete Ops), or RN including Coastal Control - and I am inclined to agree with Martin. I have a bit more about Poundon which I will save for another time.

More DX-394

Mike S sent me an E-mail with some details about his experiences with a DX-394 receiver, and offers the following comments to Alan Burnett-Provan's regarding his request for advice on which receiver to buy next.

Mike suggests that you think carefully before buying a DX-394 as a main receiver if you want to specialise in decode work. It is undoubtedly superb value for money and a great back-up unit, but it's really aimed at general broadcast listening and has some noticeable shortcomings.

Image products are widely prevalent when it is connected to anything but the most basic of antennas (for instance, a 30m wire was way more than it could handle, even with the attenuator kicked in - better to use the supplied whip, or a short wire of around 10m). A more serious issue is the filtering, which is wide enough to drive a tank through (this could be improved with a relatively inexpensive external audio filter, or a more expensive d.s.p. unit).

In Mike's opinion, the Target HF-3 suffers similar problems, but it is also less flexible than the DX-394, which has lots of nice little touches like keypad frequency entry, memories, 50Hz fine tuning, etc.

In a straight race between the HF-3 and the DX-394, Mike says that the latter wins quite easily. The DX-394 plus a suitable external audio filter (perhaps a Howes kit?) will probably do the job in question...just about. If, however, there is just a little more money in the kitty, I believe any one of a number of slightly older second-hand receivers (maybe a Lowe HF-150 or HF-225?) would be a far better choice.

Mike says that he still uses his DX-394 for broadcast listening, and the occasional spot of ham band stuff. It's a nice little unit to take on weekend breaks and at £80 - £90 second-hand, it's a cheap and cheery stand-by for the shack. Thanks Mike, for those useful ideas and opinions of this receiver.

On the other hand, **Les Griffiths** reports that he found it very good for his interests. Les says that he usually waits for the 'hype' to die-down before considering a new receiver, but has had quite some success with his model. Although the DX-394 got a fairly dismissive review by Mike Richards, Les says that it has extremely good sensitivity and stability. He has been using his DX-394 to decode data signals using the *RadioRaft* program, and FAX signals (presumably using *JVFAX*) where stability is very important. Les does mention that he found an annoying 'birdie' in the region of 18MHz, which was not mentioned in the manual.

Charles Jones from Bolton also wrote in with some comments and views on the DX-394. He wants to know if anyone has got round to replacing the filters for better ones. Charles says that he thinks that the receiver is too difficult to operate for an absolute beginner to get the best out of it, but it has put an element of difficulty back into s.w.l., which has made this hobby so worthwhile. I must say that I agree with Charles, as I get more satisfaction from investigating a signal or frequency for myself rather than reading all about it from a book.

Table 1: Times Of Operation.

MHz	VL8IPS	LN2A(M)
5.4712	hh00 - hh04	hh08 - hh12
7.8712	hh04 - hh08	hh12 - hh16
10.4082	hh08 - hh12	hh16 - hh20
14.3962	hh12 - hh16	hh00 - hh04
20.9462	hh16 - hh20	hh04 - hh08

and the same again at hh20 and hh40.



A far better choice?

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

Satellite TV News

Arianespace provided much of the analogue satellite excitement during mid/late October and signal acquisition was simplicity itself! October 21st and *Intelsat K* (21.5° West @ 11.625GHz V), the Ariane-Kourou C-band feed via *Telecom 2A* @ 5° W (3.769GHz RHC) and *Telecom 2C*, 3° E 12/606GHz V all were carrying live pictures from the rocket site of the 3rd launch for their Series 5 rocket.

The first launch was aborted and destroyed in a spectacular explosion during the early stages of flight, the 2nd was a success and Ariane opted for another 'proving flight'. Impressive pictures of the launch were seen - even one from an aircraft watching the 503 rising up to and passing the hi-flying camera.

Video re-runs for the press after the launch featured an on-board rocket camera showing the ground speeding away and the NE South American coastline appearing. And a few days later another Arianespace launch was seen, flight V113 - also on *Intelsat K* - and this time it was the GE-5 bird with the Afristar project on board linked back into Europe and with video re-runs, noticed here in the re-run mode at 1945UTC.

Afristar will provide quality L-band radio programming across Africa for soon to be available 1.5GHz receivers. Several of our readers commented on the quite spectacular pictures of the 503 launch, some of the best I've seen.

Early November saw floods but not only the Midlands, UK suffered. Serious problems were reported in Germany and **Roy Carman** watched live programme inserts for their evening news mag progs around 1830 local via *Kopernikus-2*, 28.5° E from the flooded Rhine in the Koblenz region, on 11.551 and 12.591GHz V.

Interesting Action

This month, most of the interesting action reported seems to have been on *Intelsat K*, I'm sorry if you cannot receive the 21.5° W slot - it shows what you've been missing! Roy Carman (ex Sandown, Isle of Wight and now mid Surrey) watched a rather gory operation the afternoon of October 23rd from Stanford Hospital, California.

The live hookup - via K - into Europe was organised by Loral Skynet and were on test card from 1430UTC and then 'programme'

from 1500 onwards. A 40 year old woman was undergoing a complicated hysterectomy operation watched by a team of medical types in California and others in Europe.

During the actual operation, pauses allowed for questions from the watching audience, extreme close-ups detailed the cutting of organs, etc. (cutting actually was laser burning). After this operation was completed, a second operation, this time on an eye, was transmitted.

Over the past four weeks I personally have seen three computer corporate presentations, mainly detailing their commercial performance over the past quarter/year. October 12 and *PAS-3R/6* (12.700GHz V) featured an Apple gathering of their staff to hear how well things had gone with this company. The MD also unveiled their new Mac OS8.5 machine with the newly launched Sherlock Internet search engine, which not hunts the World's web sites for the tapped-in requested information on demand - and it does this within seconds - but will sort and categorise in (the machine's considered) importance.

The captive audience/staff dutifully applauded at the new OS8.5 and at the improved trading figures. A few days later, but on *Intelsat K* @ 1430UTC, the 'Tivoli Corporate' group broadcast into Europe their last quarter trading results (11.573GHz V) but this a much more informal and watchable event - interesting too, since if I switched to horizontal polarisation up came the above mentioned surgical operation. Another computer experience was November 4th, mid afternoon on 'K, this time Netscape had their say and demonstrations!

Ciba-Geigy, the chemical group based in Berne, Switzerland, used the *Intelsat K* facility (11th November, 11.606GHz vert, audio 6.60MHz only) to air an hour (1530 onwards) on the recent announcement (9 November) of their merger/buyout with a German equivalent group. Faxed questions were received from around the World, many expressing concern and anger over the loss of 3000 jobs, but give the management credit. All incoming questions were answered by directly involved management suits on the stage - the only way for a Q and A considering the world-wide spread of their employed staff.

More of an entertainment sighting came from **Cyril Willis** (Kings Lynn) who watched pre-recorded songs plus a live press call for Whitney Houston and her new album *My Love Is Your Love* from New York on Guy Fawkes night, *Intelsat K* - 11.676GHz V @ 2000UTC. Just down the tuning scale at 11.497GHz H Reuters Madrid were feeding action footage of angry crowds outside the UK embassy in Madrid. We didn't see this reported on the home UK screens...perhaps Hispanic emotion over the former Chilean dictator detained in London?

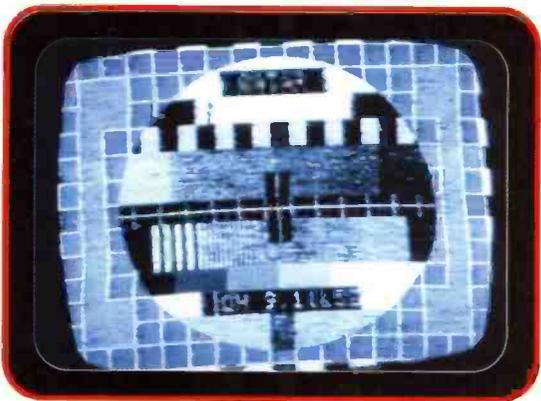
Our sports satellite monitor **Dean Rogers** (SE2) must have been happy with some of the analogue sightings available the past four weeks. Dramatic air shots over New York from a blimp drifting across Manhattan November 1st with aerial shots of the New York Marathon 1998, again an *Intelsat K* sighting, 11.534GHz Hor. Audio carried 2 channels, fx only at 6.60MHz, commentary + fx at 7.40MHz.

The shots were as dramatic as the 11th October 'Coptercam' pictures relayed back from over the Talcageda, Alabama motor race track during the Winston Cup-Winston 500 event. The NTSC ESPN feed was destined for the UK satellite sports networks again on K. There have been numerous weekday mid evening Italian VTR football playouts from a UK facility company 'Todd-AO (UK) Ltd' at around 1930, other captions include 'Football Italia RAI Trade -Week 8' so perhaps these will continue for the rest of the season (?) - lots of activity for sport sat-zappers!

I had thought that the GMTV breakfast show programme had put their early a.m. *Intelsat K* analogue outside broadcast links onto digital but the 'GMTV UKI-149' still appears on week day mornings, though less than earlier in the Summer. The 20th saw them for several days at the 'Birmingham International Motor



The FUBK test card via *Intelsat K*, 19 October during visit by Cuban President Fidel Castro to Lisbon.



A scratchy test card in C-band (*Arabsat 2A*) from Qatar.



Caption - the Apple corporate international feed (*Intelsat K*).



Associated Press Television News identification logo.

Show' trying out various cars and related accessories.

History was seen - again on *Intelsat K* - October 23rd at 2000UTC when the outcome of intense Middle

East talks resulted in an important peace document being signed at the White House. Live pictures showed President Clinton, Yasser Arafat (Palestinian leader), Mr. Netanyahu (Israeli PM) and King Hussein of Jordan walking towards the press podium and then to detail the recently agreed peace deal. It was King Hussein - in a Washington hospital at the time - that helped bring the parties together and it's unfortunate that he is very seriously ill at this time.

There is life after *Intelsat K* and just to prove this point, I caught a familiar PM5544 test card out of the shash on *Arabsat 2B*, 30.5°E recently via the 4.085GHz RHC news exchange frequency. The gritty signal improved considerably with 50% threshold extension inserted - odd that certain uplink stations run higher powers such as Jordan resulting in noise free pictures and others are on much low powers - of course I'm using a 1.5m dish in C-band whereas the norm would be upwards of 5m! Changes with the various Russian TV programmes, TBB Moscow, has appeared on 3.809GHz on Horizont 11°W and other listed signals have gone.

Following my earlier reported problems with an RSD ODM-300 FTA digital receiver and its return from the factory I can at last report that the unit is working OK, satellite digital signals are being received both from broadcast sources and from various news feeds. The problem was not drift in the Ku-band i.n.b. causing the 'picture lock lost' captions across pictures (!) and must have been within the receiver somewhere...

Orbital News

Check out *Hot Bird 5* @ 13°E for Globecast news circuits as things will be hotting up now that APTN (Associated Press TV News) have awarded their distribution contract to Globecast. And another new customer on *Hot bird 5* are the BBC World and Prime channels offering vastly expanded service areas reaching from the Middle East back to the Atlantic coasts.

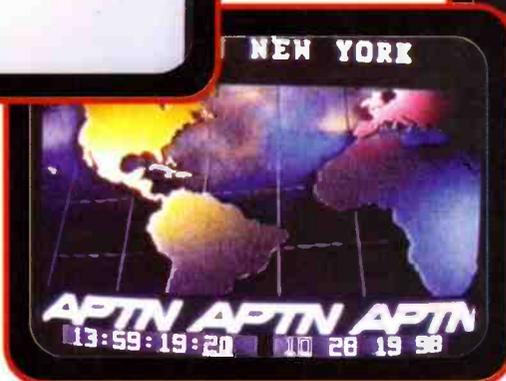
Teleport London International (formed from SSVIC) has been bought out by Kingston Communications and is now one of the top three UK satellite operators. Kingston reckon they've 75% of global coverage in both analogue and digital - another new name to look out for in the satellite arc.

Interesting development with Canal Plus offering RAI access to the Telepui digital platform that covers the Italian mainland. RAI has expressed an interest, though with internal management problems elsewhere in the RAI group the national broadcaster may be unable to participate.

Canal+ Belgique's TV service will be hitting the digital airwaves in week three January '99 when the first Belgian digital platform

Ariane 503 launch test card, October 21, via Intelsat K.

Another Intelsat K computer corporate feed from the USA.



opens. Currently nearly 550000 French service and 175000 Flemish subscribers take Canal+ terrestrial services and it's hoped that many of these will opt into cable distributed digital.

Surgeons prepare for a live TV operation in Stanford Hospital, California - 23 October.



CNNI appeared in digital format on *Astra 2A* December 16th and the ITN backed Euronews have also digitised and intend airing via Eutelsat *Hot Bird 3* capacity during January '99, exploiting the increased penetration into the Middle East region.

Old enemies have shaken hands with NHK Tokyo reaching agreement with mainland China to beam digital satellite TV into the region, both their NHK World and Pay-TV NHK Premium channels will be available, NHK is currently signing up Chinese manufacturers to produce digital receivers for the new service.

Another new service planned for India is an educational digital package comprising up to 60 channels produced from the SivaSat TV Communications group. Students would be given free receivers (worth \$200) to see the new channels which would tie up with the school timetabled lectures and instructional periods. The Indian government still has to give the 'OK' for the educational service to open.

In another Indian TV development, News Corporation is offloading its present 37% share holding in UTV, the Indian production company. UTV are understood to have purchased the shares package. Media rumours comment that News Corporation may be preparing a new strategy with their partner - Zee TV.

The Arabic news/info channel 'Al Jazeera' is being produced in London at the facility house of Molinaire, the company having just won the three year contract worth about £2M. Apart from normal presentation and playout facilities, Molinaire will also provide a studio/newsroom and related graphics capacity.

The long discussed merger between the Spanish digital groups, Canal Satellite Digital and Via Digital, has now fallen apart. Apparently disagreements arose over the financial valuation of each company and how the combined partnership would manage the digital platform.

Interesting Kit

And finally a commercial for an interesting piece of kit from **Aerial Techniques**, who are distributing a 10in PAL TV with inbuilt coverage of v.h.f./u.h.f./hyperband terrestrial (99 memories) and dual i.f. input satellite receiver (240 memories), 950-2050MHz i.f., dual i.f. bandwidth, stereo, decoder port.

The package comes complete with a 350m offset dish/i.n.b. and works from 230V a.c. mains or 12/24V d.c. and ideal for campervans/truckers. The STV-1020 kit is made by the EFA Corporation, Taiwan - contact (01202) 738232 for more details, not me!



Extreme close-up of laser tool cutting away body tissue during hysterectomy operation on 40 year old female.



The Middle East peace agreement at the White House, 23 October '98.



Reversed PM5544 test card, news feed pictures on *Arabsat 2B* 30.5°E from Reuters often are reversed/ upside down to prevent piracy by non clients

Propagation Forecasts

How to use the Propagation Charts.

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

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

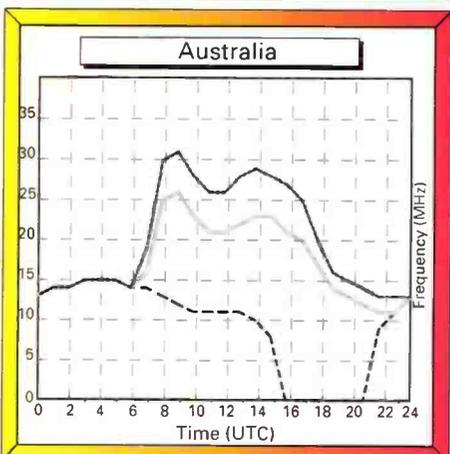
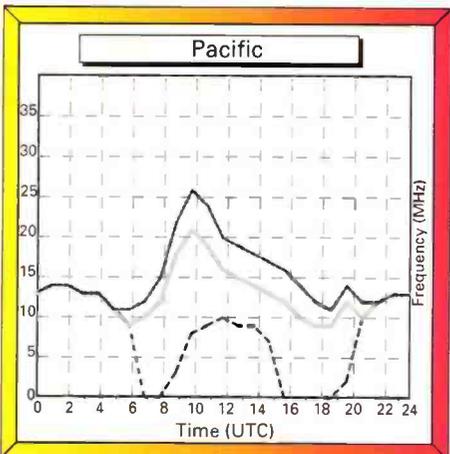
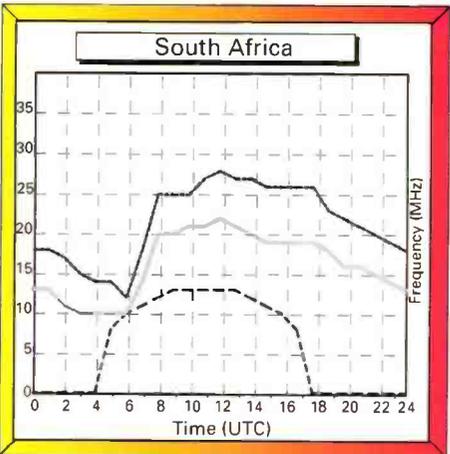
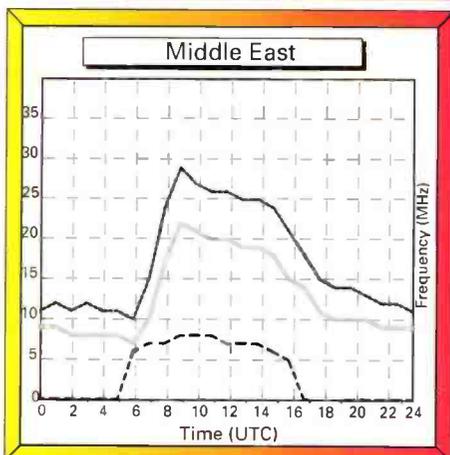
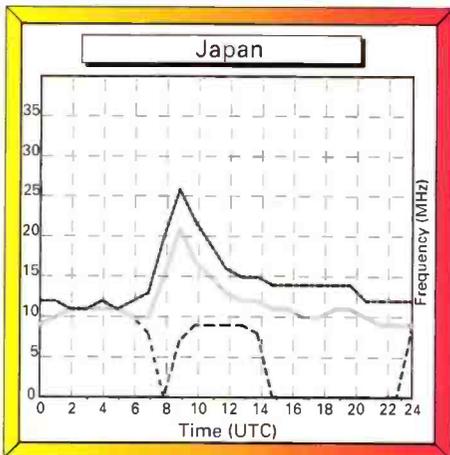
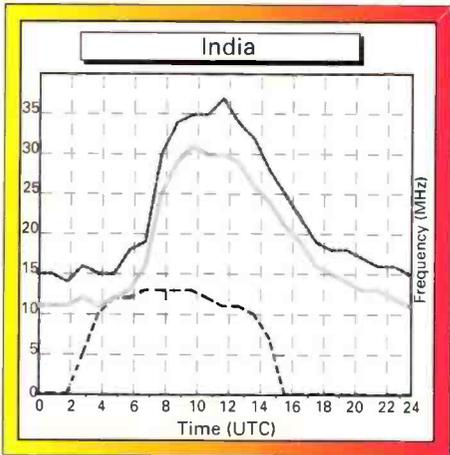
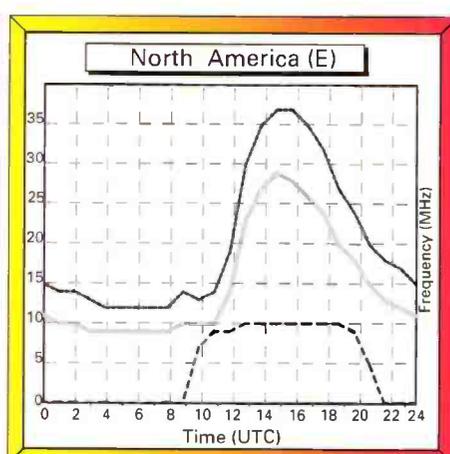
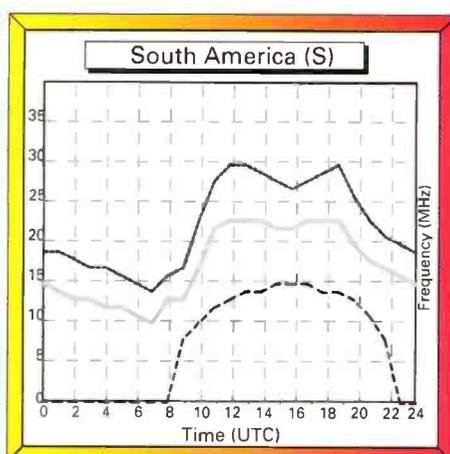
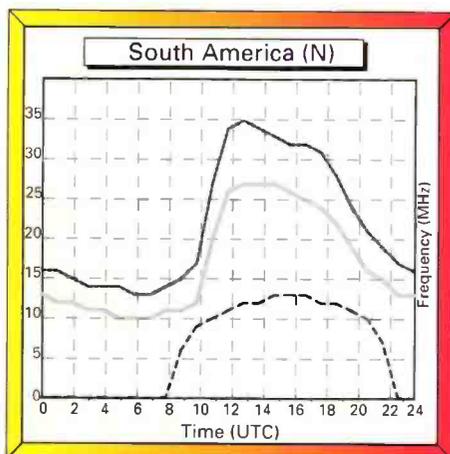
Lastly, the upper dashed line, represents the maximum usable frequency (MUF) a 50%

probability of success for the path and time.

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

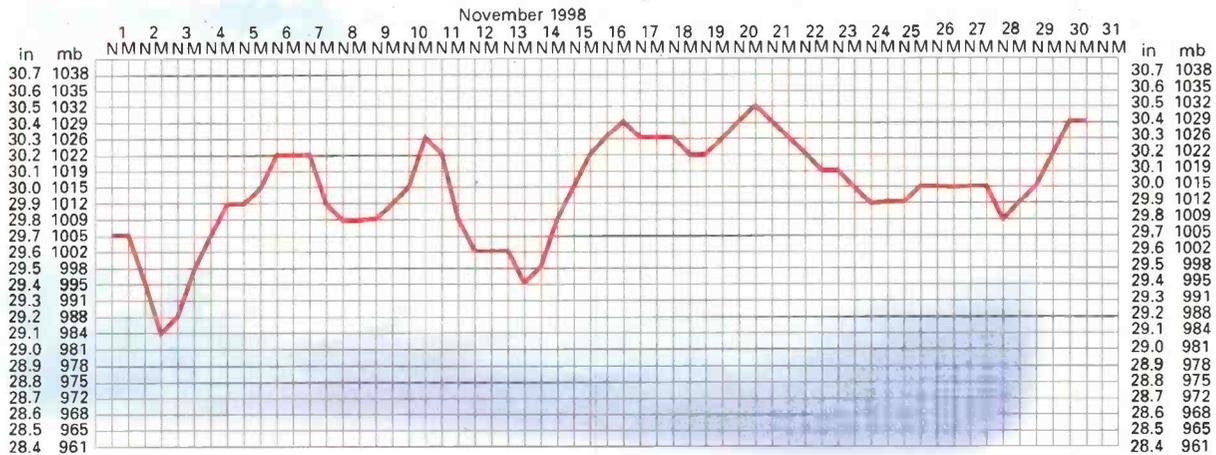
Good luck and happy listening.

January 1999
Circuits to London

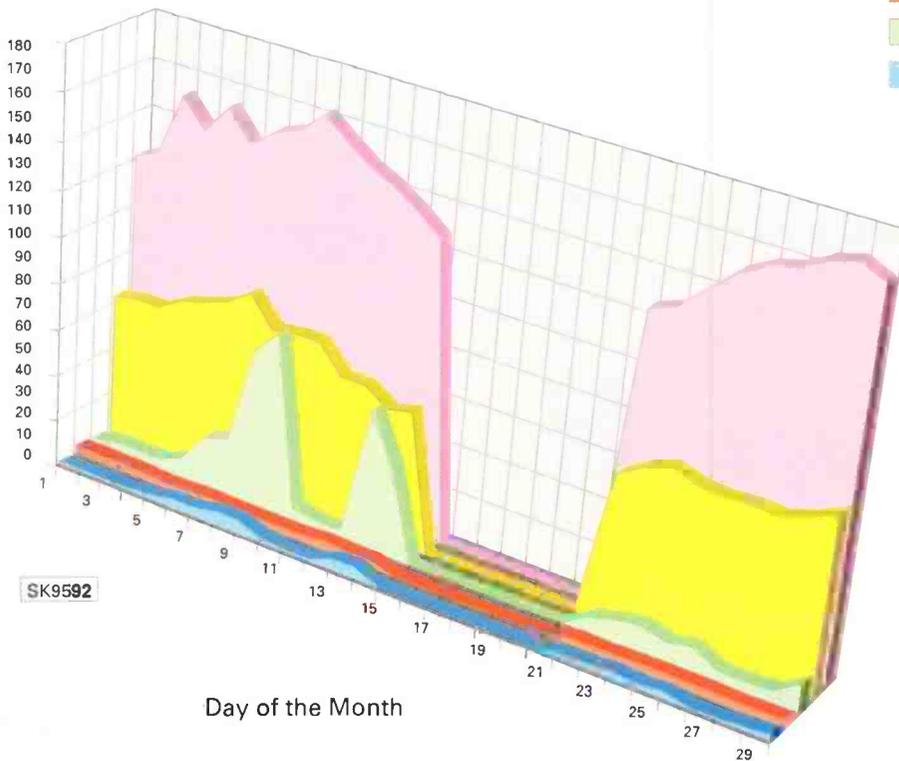


Propagation Extra

Ron Ham's barometric pressure chart, taken at Stomington, W. Sussex, November 1998.



November Data



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

***See
'Ed's
Comments'**

guide to the chart

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

The K and AP indices are measures of geomagnetic activity.

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

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

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

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LOWE HF-225	With keypad.....	£289
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AOR AR2800	+ SSB.....	£225
AOR AR3000	Amode, as new	£399
AOR AR3000A	(4 months old).....	£575
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ICOM IC-R10	Ex-demo.....	£220
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ICOM IC-R7000	VHF/UHF base.....	£635
ICOM PCR-1000 DSP	Ex-demo.....	£220
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YUPITERU VT-225	Civil + mil air new.....	£159

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MIZUHO AX-1	6 way antenna switch.....	£25
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Scanning

My suggestions are both books, and are available direct from the *SWM Book Store*. The first is *The UK Scanning Directory* (£18.50), currently in its sixth edition, which contains scores of very interesting frequencies for you to tune in to on just about all its 496 pages, and covers frequencies from 26.1MHz all the way up to 1.805GHz! Admittedly, not all the frequencies listed are up-to-date, particularly when it comes to its Police listings, but it does at the very least give you a very good indication on where to look for certain types of radio user, and so makes an ideal reference manual for both beginners and long time scanner users.

My second suggestion is *Scanners 3: Putting Scanners into Practice* (£10.95). This not only has some very useful frequency listings, but also provides some very useful information about radio basics, antennas and scanning hardware. Although it is aimed mainly at novice scanner users, there is a lot of information in this book that will be of interest to more advanced scanner users too.

Time To Replace

Talking of antennas, if you have a hand-held scanner, replacing the one that came with it as standard is something that I'd recommend highly, especially if it is one of those telescopic types. Don't rush out and buy the biggest, most expensive model you can get your hands on, though, as connecting the likes of a top of the range external antenna to a hand-held scanner is likely to cause more trouble than it's worth.

The trouble is that, for the most part, the input stages of hand scanners are designed to accommodate the relatively low signal levels that a telescopic or small helical (rubber duck-type) antenna provides, and not the much higher signal levels a larger antenna will try to give it. The end result is that although you might be able to pick up some signals you previously couldn't hear, you'll probably find that strong local signals, from the likes of pager, mobile phone and emergency service transmitters, will break through all over the place, not to mention being horribly distorted themselves.

You can sometimes get around this problem by activating your hand scanner's attenuating circuit, if it has one, though whether or not doing so will prove to be an effective option depends on your location, the antenna and the scanner in question. For hand scanners, then, I'd recommend you stick to the likes of Watson's MkII Regular Gainer (£12.95) or Super Gainer (£19.95) for hand-held use, or the Watson SWM01900 Mobile Gainer for use in a car.

For in-home use, I can also heartily recommend the Sky Scan Desktop (£49.95), a small discone-type antenna you can place next to your scanner. And if you feel you really must attach an external antenna to your hand scanner when used at home, then the Sky Scan Base (again £49.95), a larger, external version of the Sky Scan Desktop, is worth investigating as long as you have a better quality hand scanner.

The Sky Scan Base is also a good choice for those of us lucky enough to own a base scanner, though because the better models are designed to cope with higher signal levels, you can also think in terms of larger and/or more sophisticated antennas too, the highly unusual Q-Tek Intruder QT-2000 (£99.95 from Haydon Communications) springing to mind here, though I've never had the chance to try this particular antenna out to see if it works as well as its manufacturer claims.

My Choice

Personally, I use a broadband active antenna when sniffing out new frequencies with my Icom IC-R8500 base receiver. This type of antenna, an example of which is the SuperScan Mk II (£79.99 from Maplin), tends to be more expensive than traditional (passive) models because they have a miniature low noise amplifier built into them.

On the other hand, they also tend to be a little smaller and more discreet than traditional models offering similar signal grabbing capabilities, making them ideal for installation in a loft, or for discreet external use - in certain parts of the country, advertising the fact that you have expensive radio equipment by fitting a huge discone on the side of your house can be asking for trouble.

Connecting Up

Despite the fact that, when I'm not writing this column or cruising the airwaves, I'm a computer journalist, I promise not to go on too much about PCs - this is, after all, a radio-oriented magazine. But PCs do have their place in the world of scanners, not the least of which is using them to access scanner-related Web pages on the Internet.

What's that I hear you cry? You can't afford the monthly charges for Internet access? Well, this may be true if you only look at the traditional Internet Service Providers (ISPs) such as Demon and Pipex, who charge anything from £10 a month upwards to give you Internet access. But if you look hard enough, you can now find a new breed of ISPs who don't charge you a penny, their revenue being generated through online advertising.

The newest charge-free ISP is the aptly-named Freeserve. All you need to do to sign up with them is to go to your nearest Dixons, Currys, PC World or The Link, ask for a copy of the Freeserve CD, install the software, and get surfing. Despite being 'free', you will, of course, still have to pay for the cost of a telephone call whenever you are connected to the service, though this is normally charged at a local rate.

What Can You Find?

Having connected yourself to the Internet one way or another, head straight for the nearest 'search engine'. These simply let you search for things on the Internet, and include Excite www.excite.co.uk and Yahoo! www.yahoo.co.uk To search for pages of interest to scanners, simply type 'scanners AND radio' into the search box, and click on the OK or SEARCH NOW-type buttons next to them. Hey presto, a few seconds later, you'll get a list of interesting Web pages relating to scanners.

Some of the more interesting pages I've found on my travels through Cyberspace include <http://freespace.virgin.net/lynx.uk/index/scanner.htm> a site containing a great deal of interesting information about UK-specific frequencies and some scanner modification information, <http://www.martex.mcmail.com> a site containing some more interesting UK frequencies and <http://members.xoom.com/Bigears/menu.htm> another page with interesting UK frequencies.

Seasons greetings and happy scanning!



With the festive season upon us, or having just been if you didn't rush out to buy your copy of *SWM* as soon as it came out, I thought I'd start this month's column for some ideas on how to spend the money Aunt Selma or Uncle Able (you can tell what I've just been watching on TV, can't you?) gave you for Christmas.

Important Feedback

Finally, as well as giving you my usual warning that it is illegal and therefore unwise to listen to frequencies for which you are not licensed, I'd like to say 'thanks' to everyone who wrote or E-mailed me about last month's column. Your feedback is important to me, so whether you want to complain or compliment, ask questions or provide information, please do drop me a line. Please note that I may not have time to reply to each and every letter or E-mail message individually, though I will try my best.

Airband

Appropriate Technology

Engineering teaches us how to achieve wondrously complex scientifically-based feats. Social considerations guide us when considering whether the benefits outweigh the possible harm that can be done. In flying, technology enables the swift movement of large numbers of passengers and/or quantities of freight. Safety is at such a high level that the social effects of flying are accepted.

Radio, another technology, also has far-reaching consequences since the signals can spread out over such a large area. There is always the need to avoid interference with other radio systems. Just because any particular application of radio is technically possible does not necessarily imply that it is desirable.

Developments are in progress to send radio signals along the ordinary power lines feeding electricity to consumers' premises and a good description of the system was in *Radio Communication* 10/98 page 78. The signals will enable cheap data transmission, for example, providing Internet access to individual households.

The chosen frequencies would probably lie in the 2-20MHz range and each street lighting column would unavoidably act as a transmitting antenna. Various aeronautical channels lie in this frequency range and must be protected from interference, for safety's sake. Will the protagonists who want to make money from the new system also acknowledge their duty to prevent harm to other services?

Appropriate Airports

No-one ever decided the site for London's "third" airport. Discounting Croydon (long since closed) I suppose the first and second ones are Heathrow and Gatwick, leaving Stansted and Luton as the contenders for third place. The site near the Buckinghamshire/Oxfordshire border was never a serious proposition and, at one time, Maplin Sands was mooted (a certain nearby electronics distributor even printed a picture of an aeroplane on its catalogue in the early 70s!).

European experience has shown that even the best airport will be neglected unless it is either well-connected to the town that it serves or it is Heathrow. Now, not wishing to be derogatory, all airlines serving England want to fly to Heathrow and yet the public

transport connections could still do with improvement.

I am beginning to question whether it has now reached capacity, with reported long delays after landing prior to a stand becoming free and a tightly-packed landing stream that occasionally requires a missed approach when the previous aircraft can't vacate the runway quickly enough. Terminal 4 departures can be delayed while waiting to cross the active runway.

Perhaps signs of an over-stressed airport are scenes on television programmes of baggage conveyors breaking down and regular reports in the *AAIB Bulletin* of vehicles colliding with aircraft.

Yet they want a Terminal 5. The only problem to be solved would be the provision of more parking stands. Otherwise, further capacity can, I feel, only be provided elsewhere.

So, where? How about Stansted then? Wide open spaces waiting to be used! But, until adequate rail links are put in place, airlines will still feel that Heathrow is somehow "nearer" to London. Transport policy cannot be decided piece by piece, it is a unified network and, yes I'm sorry to sound old-fashioned, can only serve the community when sufficient investment has been made in the infrastructure.

Receiver Hardware

I know from personal experience that Aylesbury, (where **Mrs. P. Gent** lives), is a poor site for v.h.f. as it lies in a valley. So, it would take more than just a good antenna to improve reception.

Now, Mrs. G's dipole antenna claims a gain of 7.2dB on the 70cm amateur band. This is rather optimistic but does raise the question as to what sort of a dipole it is. A simple half-wave would only offer 2.1dBi gain, that is, compared to an isotropic (i) antenna, which is one with no directional properties. So, Mrs. G's gain figures are too high for a half-wave dipole.

Here are some rough figures for the length of a half-wave dipole. At 144MHz it should be 990mm, 430MHz 330mm and, in the middle of the airband, 126MHz would be 113cm. Comparing the 1800mm length of the actual antenna, this is 1.6 times longer than 1130mm. So, the lengths and gains simply don't make sense and I would ask Mrs. G. to send me a copy of the specification sheet.

Other specifications, such as power handling, don't matter for reception but are only important if transmitting. There is one important consideration and that is, which way up is it mounted? Vertical polarisation (mounting) is what Mrs. G. needs. A good all-round vertically-polarised v.h.f. listening antenna is a discone. Could be worth a try, but no antenna will give perfect reception from a difficult location.



Abbreviations

AAIB	Air Accidents Investigation Branch
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
CAA	Civil Aviation Authority
cm	centimetres
dB	decibels
GASIL	General Aviation Safety Information Leaflet
GPS	Global Positioning System
i.l.s.	instrument landing system
MHz	megahertz
TACAN	TACTical Air Navigation
v.h.f.	very high frequency

CHRISTMAS QUIZ

This year's Christmas Quiz seems simple enough. The photograph (taken capably as ever by Chris) shows an object typical of those found on aerodromes. What does it tell the pilot? State an example of the instruction that Ground Movement Control might issue to the pilot that refers to this object. If there is more than one correct answer, the winner will be decided by the entry that gives the clearest and most comprehensive description.

Closing date is February 8 and results will appear in the April issue. My decision is final, no correspondence will be entered into. Thanks to our



Christine Mlynek.

kindly Editor for providing a prize and, on behalf of all readers, I'm sure you will join me in thanking Chris for having again illustrated my column so well for us for yet another year.



Falco. Christine Mlynek.

Some advice now for **George Jacob GWOET** (Rhondda). I'm sorry, George, I really shouldn't recommend a receiver. My choice might not suit you if your expectations are different. It depends on exactly what you want the receiver to do and how much you're willing to spend. The latest wide coverage set advertised in *SWM* sounds good but a bargain in 'Trading Post' might be more suitable - but try it first!

You can plot north Atlantic tracks on a simple chart bought from a company such as *Racal Aerad*. The *Europe and Middle East En-Route Supplement* lists frequencies. Vendors such as *Aerad* sell to the public by mail order and are listed on my *Airband Factsheet*. A copy (two A4 sheets) is yours if you send a reply-paid self-addressed envelope to the Editorial offices at Broadstone (not to me!).

You could also use a computer. Software for north Atlantic plotting has been advertised in *SWM*. I'm not sure if the advantages are that great and a computer produces electrical noise that could interfere with a receiver. I feel the choice is either to spend what you can on an up-to-date system and keep it for years, or buy second-hand, demanding nothing less than a fast '486 processor and insisting on a bargain price.

George is correct that an outdoor antenna would perform better than one in the house. For transmitting amateurs, it also causes less interference, a fact sadly unrecognised by many local authority planning departments. For comments about disconses, George, read what I said above to Mrs. Gent.

Follow-Ups and Foul-Ups

I'm sorry that a misprint in November, page 67, 'Frequency & Operational News,' said that "...part of UB2 becomes UP60" when it should have been UP600.

In October and December I mentioned the question by **John Weir** (Edinburgh) about flights UA9499 and NW9881. An alternative suggestion from **Jim Woodrow** (Livingston) is that the aircraft were N662UA and N359NW respectively, i.e. the flight numbers are unrelated to the registrations after all. The United was routing Paris Charles de Gaulle to San Francisco and the Northwest Airbus A320 was flying from Toulouse to Prestwick.

Frequency & Operational News

Source: **Martin Sutton** and *GASIL* 5/1998 both from the CAA. At Caernarfon there's a new runway 02/20.

If you're flying in to Manchester, what are the new waypoints BUSBI, ETLEY, MELOR and TRAF4 for? The CAA (see *AIC* 121/1998) are running a trial with certain Airtours flights to vector for the i.l.s. by allowing the flight management system (f.m.s.) to guide the aircraft via these waypoints. Although not clearly stated, I expect that track-keeping will be compared with the required flight-path as seen on radar.

Woodford Tower is now 120.7 (was 126.925MHz).

Airspace changes. *AIC* 112/1998 divides Clacton Sector into new, smaller chunks called (frequencies in MHz) Clacton Eastbound (133.45), Clacton West High (127.825 new frequency), Clacton West Low (118.475), SABER Sector (129.6) and DAGGA Sector (124.925 new frequency). The latter two are named after reporting points that they contain. Note the high/low vertically-split layers.

Some military airways are defined between TACAN beacons and routes TB6, TB7 and TL4 have been altered. Heading east from Mildenhall, TL6 has been withdrawn. The UK *AIP* page ENR 6-3-5-2 illustrates these routes and if you ask politely at your local flying club or school they might let you have a look at their copy.

Danger Area D132 is covered by an information service from Farnborough Approach 125.25 or, outside hours of watch, London Information 124.6MHz (*AIC* 111/1998).

I am holding letters from **John Weir** and **Ron Nicholas** as well as some *AICs* about GPS until I have more space next month. The next three deadlines (for topical information) are January 11, February 8 and March 8. Replies always appear in this column and it is regretted that no direct correspondence is possible.

DX Television

A fair number of Sporadic-E openings occurred during October, something that has been lacking for several years. Of more importance, there have been reports of F2-Layer activity affecting the lower Band I channels.

Reception Reports

Stephen Michie (Bristol) encountered an increase in Meteor-Shower activity during October. Identified 'pings' included Denmark, Norway and Sweden. According to **Simon Hockenhull** (Bristol), the 24th produced the best Sporadic-E opening from around midday with strong signals from Spain, Serbia, Croatia and Hungary. Tropospheric reception was experienced by **Peter Barber** (Coventry), with French Canal Plus signals in Band III noted on the 16th.

F2 Reception

Roger Bunney (Romsey) tells us that on October 7th, the 1kW Channel E2 outlet in Equatorial Guinea has again been received in the United Kingdom. Also, there is an unconfirmed report of Australian Channel AU0 at 46.25MHz received in Jersey during the morning of the 11th.

This means that we must be more vigilant, particularly on the lower Band I channels, especially between 0800 and 1000UTC when F2 reception from the east is most likely to take place. In the past, reception from the south has usually occurred at any time between 1200 and 1500UTC.

It is also advisable to check frequencies below 45MHz for signs of an increase in traffic. **Simon Hockenhull** (Bristol) regularly monitors 27MHz CB for signs of Sporadic-E or F2 activity. The 17th produced intense activity on both 27MHz and the 28MHz (10m) amateur band from Russia (Moscow), Italy and the Canary Islands. Foreign mobiles were also heard up to 35MHz. We look forward to hearing of further reports of F2 activity.

New Local TV Channel

Roger Bunney (Romsey) has written to say that TV 12 on the Isle Of Wight is now up and running on Channel 54. Broadcasts commence at around 1600 offering low-budget community-style programmes until around midnight when QVC takes over. Coverage also extends to the South Coast between New Milton and Southsea. Relays will eventually be installed to provide reception in some sheltered areas of the Isle Of Wight currently unable to receive the main signal from Rowridge.

New Irish Network

Gösta van der Linden (Netherlands) advises that TV3, the new commercial network in Eire, is currently operating with reasonable power on the following u.h.f. channels: Mt. Lienster E26 10kW, Mullaghanish E27 10kW, Cairn Hill E46 20kW, Truskmore E60 10kW, Kippure E62 10kW, Claremont Carn E66 10kW and Maghera E66 10kW. All are horizontally polarised except Claremont Carn, which is vertical.

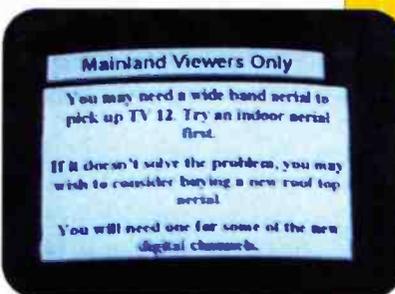


Fig. 1: Caption radiated by TV 12 from the Isle Of Wight, received by **Roger Bunney** (Romsey).

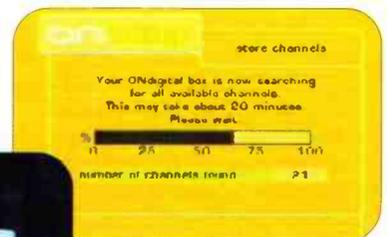


Fig. 2: Digital terrestrial television (DTT) set-top receiver on-screen set-up menu.

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

Digital Interference

In the Sixties, a u.h.f. channel plan was drafted for the United Kingdom allowing a maximum of four channels per transmitter. This was carefully engineered to avoid interference problems resulting from transmitters sharing the same channels. Shared frequencies were assigned to transmitters located geographically as far apart as possible in order to minimise the risk of co-channel interference under tropospheric conditions.

When Channel 5 hit the airwaves, unoccupied channel 37 (and later channel 35) were used to support a national TV network. Unfortunately, this created a serious interference potential particularly where transmitter footprints overlap. Thus many viewers are in reach of two or more Channel 5 outlets but are unable to view interference-free pictures!

The introduction of digital terrestrial television (DTT) has increased the interference potential dramatically because each main transmitter has been assigned six additional analogue channels each containing the digital multiplexes. Examining the digital channel allocations reveals many instances where channels are shared by digital and analogue signals from neighbouring transmitters.

For instance, the channel allocations of Emley Moor and Sutton Coldfield provide mutual interference potential in areas just to the north of Derby where their footprints overlap. Although the e.r.p. of the digital signal is some 20dB down on its analogue counterpart, many DXers have been misled into thinking that the interference problem will be minimal and pose little threat to DXTV reception on the same channel.

In practice, the digital multiplexes have as much destructive power as the higher level analogue transmissions. Some viewers served by relays are now finding their analogue pictures have deteriorated due to digital interference from distant main transmitters sharing the same frequency. **Tim Bucknall** (Congleton) mentions this is affecting some viewers tuned to the Congleton relay who are suffering digital interference from Sutton Coldfield.

In mild cases the interference effect shows as fine patterning over the picture, resembling that of a misaligned decoder or i.f. strip. In extreme cases a good colour picture has been reduced to heavy snow with lack of chroma. It is difficult to perceive a digital signal on a normally blank channel - the snow effect appears brighter or more intense depending upon the type of receiver used.

Several DXers have asked whether digital DXing will be possible. At the moment it seems highly unlikely unless receiver manufacturers produce a user-friendly set-top box with a manual tuning facility, rather than the auto-tune variety which is being produced at the moment. Some receivers are taking up to 20 minutes to download the local multiplexes and refuse to tune into additional stations.

DX Contacts Wanted

Nigel Evans (Aylesbury) would like to contact other DXers in his area. His E-mail address is nigel.evans@eventail.co.uk

DX Receivers

Maplin can supply several inexpensive small-screen receivers with multi-band capability. For £49.99 there is a Roadstar 12.7cm mono receiver (Model number TVM5002E), described in the Maplin catalogue as suitable for systems CCIR + L. Unfortunately, they could not confirm whether this actually covered the French system or whether the 'L' should be an 'I'.

For colour DXing there is a 17cm portable (catalogue reference number MY67X) listed at £199.99. The receiver operates on mains or 12V d.c. and resolves PAL B/G and I, SECAM B/G and D/K and French System L. Both receivers feature manual v.h.f./u.h.f. tuning.

FM Band Reception

On October 10th, between 1815 and 1830UTC, Simon Hockenhull (Bristol) heard strong Spanish signals on 87.70, 88.0 and 91.0MHz. It is interesting to note that during this period there was no activity on TV Channel E2 or down on the 27MHz citizen's band.

Keep On Writing!

Please send reception reports, information, off-screen photographs, etc., by the first of the month to:- **Garry Smith, 17 Collingham Gardens, Derby DE22 4FS.**

October DXTV Log

Reception reports this month have been supplied by Peter Barber, Simon Hockenhull and Stephen Michie. Reception is via Sporadic-E unless otherwise indicated. All times shown are in UTC.

Day	Log
3	Italy (RAI UNO) Channel IA at 1248.
5	Unidentified programme on E3 at 0809 via MS.
7	Sweden (SVT-1) E3 with PM5534 test card at 0749 via MS; Equatorial Guinea (RTGE) E2 via F2.
8	Sweden E3 with PM5534 at 0730 via MS; Italy (RAI UNO) at 1421; Unidentified signals on E2 at 1820.
10	Portugal (RTP-1) commercials and magazine programme up to P2 quality; Spain (TVE-1) E4 programmes upto P3.
11	Australia on Channel AU0 via F2.
12	Norway (NRK-1) programme schedules.
15	Italy (RAI UNO) IA.
16	France (Canal Plus) L7 and L8 (Band III tropospherics).
17	Spain E3 and E4 between 1425 and 1505.
18	Denmark (DR-TV) E3 with PM5534 at 0751 via MS.
20	Spain E3 during the afternoon.
22	Italy (RAI UNO) IA at 1715; Norway (NRK-1) E2 with wide-screen film at 1900.
24	Serbia (RTS-1) at 1220 (discussion programme with a crescent-shaped logo on a square bar in the top-right of the screen); Spain E2 at 1225 with magazine programme up to P3 quality; Croatia (HRT-1) E4 at 1226; Hungary (RTL KLUB) on Channel R2.



Fig. 3: On Digital graphics radiated during DTT test transmissions prior to their launch on November 15th, 1998. As far as we know, SWM is the first magazine to publish off-air On Digital DTT logos!



Fig. 4: An alternative logo used by the new DTT consortium, On Digital.

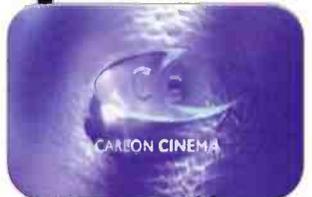


Fig. 5: Identification logo used by Carlton Cinema during DTT test transmissions.

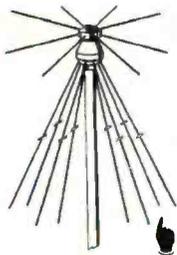
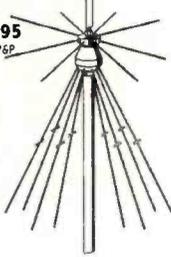


Fig. 6: An alternative logo used by Carlton Cinema during digital terrestrial television trials in November, received via one of the first set-top decoders to become available in the UK before reaching High-Street shops!

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Info in Orbit

After many a long year, I finally made time to reconstruct my Primary Data User Station (PDUS), and successfully received high resolution images from METEOSAT - my first in a very long time! This month, therefore, I am including the latest news and hi-res images from METEOSAT-7 as an introduction to regular features on PDUS and h.r.p.t. within the usual coverage of a.p.t. and WEFAX operations.

Operational WXSATS

Still no real news on *RESURS-01-4*, other than that the first onboard transmitter failed, so the second one is now in use. The actual onboard equipment is working fine, according to **Paula Bohm** of the SSC Satellitbild Solna office in Sweden. If any a.p.t. transmissions are made from the satellite, they are likely to be on 137.30 or 137.40MHz - from past experience. Strictly speaking, *RESURS* is a resources satellite, its high resolution images are transmitted on 8.192GHz.

The CIS WXSAT *METEOR 3-5* has continued transmissions on 137.85MHz in sunlight only. Because of seasonally low illumination of the northern hemisphere, *METEOR 3-5* rises silently in the north during its daytime south-bound passes. When it crosses the terminator during its approach to Scotland, transmissions commence, so we immediately hear a strong signal with none of the low elevation signal variations associated with satellites just coming above the horizon. Images have been quite good, with little of the faults seen in previous weeks.

GOMS Problems Continue

The Russian geostationary WXSAT GOMS is no longer operating. Unofficial information is that there are serious problems, and "chances are low that it will revive". However, no official statement has been made so far. If GOMS does recommence operations, the SMIS team will place quick-look data on the site: <http://sputnik.infospace.ru>

My thanks to **Eugene Flitman**, the Leading software engineer at Space Monitoring Information Support, Space Research Institute (Moscow, Russia).

NOAA's Autumn Experience

NOAA images - as always - have remained consistent. The usual seasonal effects of low autumn illumination in the northern hemisphere result in *NOAA-14* daytime images having low contrast on correctly adjusted equipment.

The American Commerce Department's National Oceanic and Atmospheric Administration announced in October that *NOAA-15* has successfully completed engineering tests and instrument calibration, and will replace *NOAA-12*, which was launched in 1991. *NOAA-15* is a Polar-orbiting Operational Environmental Satellite (POES), and the first in a series of five POES satellites with improved imaging and sounding capabilities that will operate over the next 12 years. *NOAA-12* a.p.t. may be switched off soon.

Back Into PDUS

Long-term readers of this column may recall that some years back (while in normal full-time employment), I bought the necessary hardware to enable me to receive METEOSAT primary data - PDUS. At that time, the only British manufacturer of PDUS equipment for the 'amateur' market was **Timestep Weather Satellite Systems**. Other manufacturers were producing

hardware, but at prices for the research institution market, where price tags preclude amateur use.

Little has changed in the intervening years. Currently, I have details of two PDUS suppliers - **Timestep** in the UK and **Orbit Electronic** in Germany.

My own PDUS system came to a premature end a few months after it was set-up, when an unexpectedly severe storm came through Plymouth. I was using a 1.6m dish, loosely fixed to a wooden frame that held it at the correct angle for METEOSAT reception. Most fortunately, the dish did not leave the premises, part of my nearby 1m dish had previously flown into the road during the hurricane of 1987.

The PDUS dish was damaged - its shape becoming very distorted. Subsequent efforts to bend it back were seemingly unsuccessful, the signal strength was only sufficient for WEFAX transmissions - already adequate on the 1m dish. I had to abandon the PDUS project until I could buy a dish and proper mount - it had been the lack of a mount that had allowed the damage to occur. Forced entry into long-term unemployment in 1991 ended attempts to rebuild the system.

About a year ago I was able to locate and buy a second-hand C-band dish and mount. These are becoming available as the trend away from C-band television (used abroad) causes people to upgrade to higher frequencies. C-band is around 3GHz (3000MHz), so such dishes are of higher specification than that required for METEOSAT 1691MHz transmissions.

The 1.8m dish came with an adjustable equatorial mount and multi-satellite motor - though the latter is entirely unnecessary for METEOSAT. With help, I fixed the main pedestal and constructed the petal dish. Both rested on the ground - waiting to be fitted together. This waiting period lasted several months due to writing projects and inclement weather (ever tried holding a 1.8m dish in strong winds?).

Summer saw the dish finally mounted on the pedestal. My PDUS receiver was checked over and updated by the Timestep staff, and I installed the software. My problems were not over as I could not get a display from the data stream. Some dish re-positioning produced a good, strong WEFAX signal, but attempts to run the software failed.

After more delays due to part-time teaching, writing and life's many surprises, I got down to fault-finding. I eventually traced the problem to the floppy disk drive mis-reading the software. The quick cure was a disk drive swap. Using different disks I was able to confirm the problem drive.

Meanwhile, a certain 'Info' reader who lives in Harrow (!) had been discussing WXSAT operations with me over the telephone,

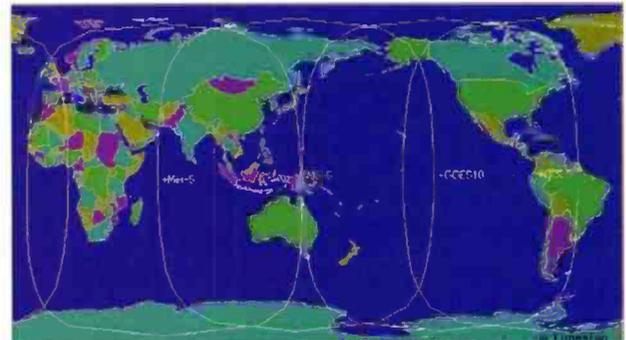


Fig. 1: Satellite footprints for GOES-E and W, GMS-5, METEOSAT-5.

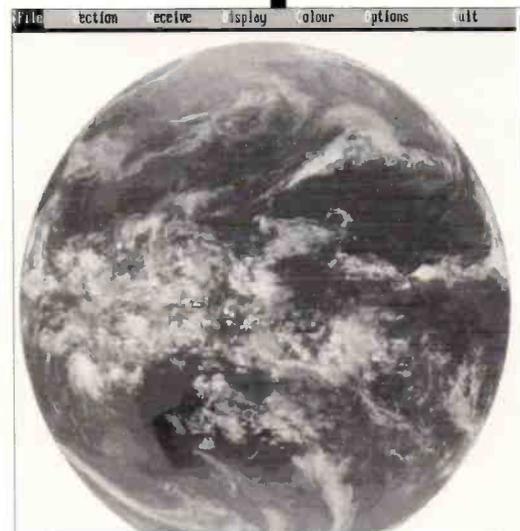


Fig. 2: J 11 November 1046UTC GMS-5 (Japanese) full-disc infra-red image.

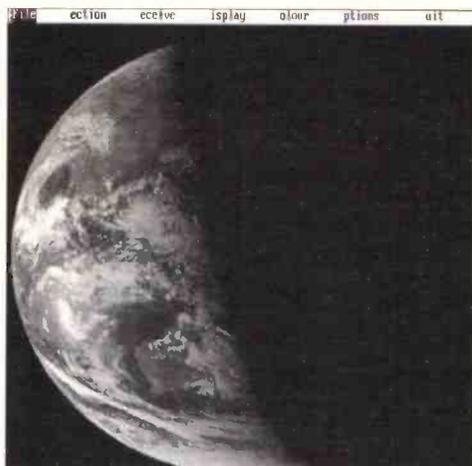


Fig. 3: J 9 November 1046UTC GMS-5 full-disc visible-light image.

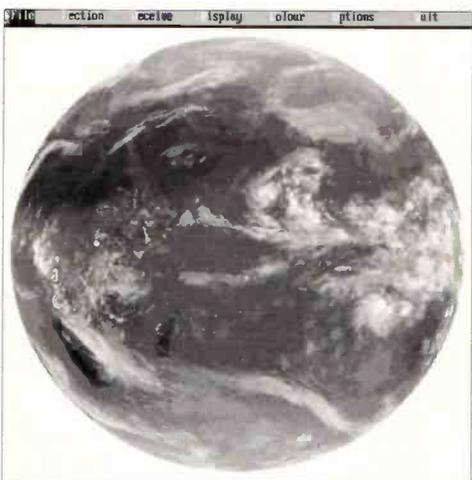


Fig. 4: METEOSAT-5 (IOX) infra-red image 8 November 1048UTC.

Fig. 5: IOX visible-light image 11 November 0917UTC.

and generously offered to provide me with a computer for WXSAT imaging! I accepted this amazing offer and a week or so later (despite delivery problems) was able to install the non-PDUS side of my imaging on the gift machine, while continuing to test the PDUS set-up.

In early November I obtained a new copy of the PDUS disks from Timestep and re-installed them. Running the test program and adjusting the receiver controls I was finally rewarded with the first decoded lines getting displayed on the screen.

EUMETSAT encrypts almost all METEOSAT-7 images, the exceptions being synoptic images (once every three hours), and images obtained from other satellites. This means that image quality could only be checked using foreign formats! Within a day, I had been able to adjust the azimuth and elevation of the dish for optimum signal strength - and the results began to flow!

It was here that the METEOSAT schedule started to take on a new meaning. On many occasions I have arranged WEFAX images to be received on a 'backup' computer so that pictures from METEOSAT, GOES, GOMS and GMS can be monitored while I do writing or other projects.

The first GOES-W and GMS high resolution images took my breath away - and (wife) Marion had to be summoned to experience the delight of seeing whole earth pictures of the Pacific Ocean, followed by METEOSAT-5 images of the Indian Ocean! I had been missing these for a very long time!

Figure 1 shows some of the geostationary WXSAT constellation: METEOSAT-5, GOES-E and W, and GMS-5 are shown. FENGYUN is not currently providing regular data, and as explained elsewhere in this column, GOMS is not operational.

Noise Level

To obtain perfect PDUS images, ideally one requires a full-sized dish and the latest multi-thousand pound equipment. My dish is about the maximum size that one can employ without neighbours becoming unduly concerned about the visual impact on the environment - and without exceeding safety limits.

After obtaining a recognisable PDUS image on the monitor, my next step was to optimise the dish pointing. This requires both

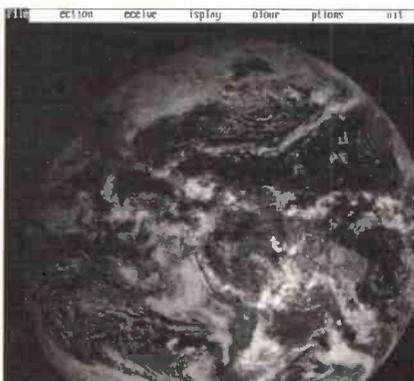
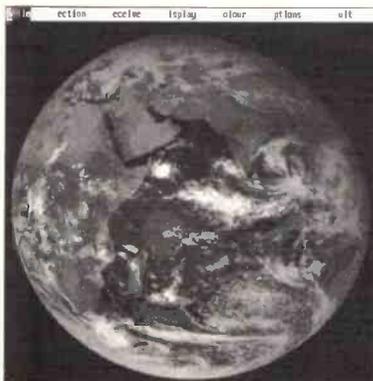


Fig. 6: GOES-E visible-light image 8 November 1554UTC.

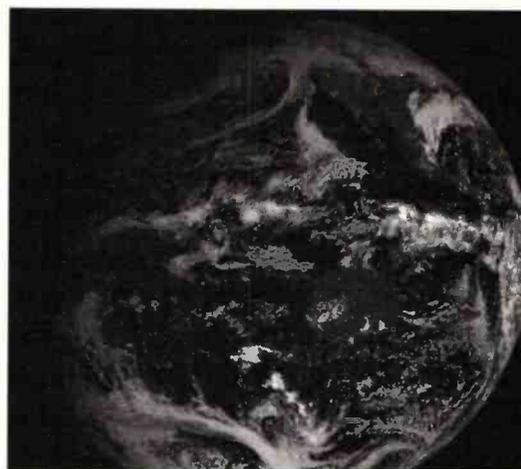


Fig. 7: GOES-W visible-light image 14 November 1956UTC.



Fig. 8: Close-up of west coast USA - as seen in Fig. 7.

azimuth and angular elevation adjustment during picture production. Such critical alignment is not helped by the encryption of images. I had to make careful adjustments during reception of foreign (unencrypted) images.

The METEOSAT-7 test format is transmitted periodically and this provides a critical analysis tool. The final result (at least for the time being!) is that some noise appears in all the images - in the form of dots - but I believe that the noise can be reduced further by focus adjustment.

Picture Quality

I believe I can do better! For the production of PDUS images I had to use the software under the DOS operating system. Conversion of the superb images to a portable format such as BMP or GIF proved difficult. My main video card is an Eclipse Blaster, optimised for Windows, so I had to use a VGA quality screen display.

After storing all images (via DOS), I later re-ran the software in a DOS box in Windows where I was then able to perform a 'screen dump'. This produced a reduction in the quality of the final images - though I am still pleased with the results. By the time this is published, I expect to have worked out a method to improve the display quality for future images. Some of those published here have been contrast expanded.

METEOSAT PDUS Transmissions - The Unencrypted Images

Two image formats are collected from the Japanese GMS-5 WXSAT - infra-red and visible-light. **Figure 2** shows an infra-red image, selected for inclusion here because it shows a warm Australia peeping out from beneath clouds. The visible-light image (**Fig. 3**) shows a superb crescent earth, with western Australia near sunset.

METEOSAT-5 was drifted eastwards in 1998 and now resides at longitude 56°E, from where it provides Primary Data images several

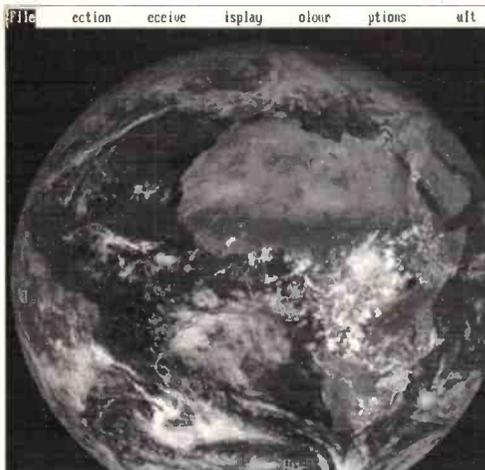


Fig. 9: **METEOSAT-711 November 1211UTC.**

times each day. Several of these are now re-transmitted at approximately hourly intervals, by *METEOSAT-7*, under the 'I' (or INDOEX - Indian Ocean Experiment) format. INDOEX is an international field experiment with participation from Britain, France, Germany, India, The Netherlands, Sweden and the USA.

The infra-red IOX image shows not only the warm lands of Africa in afternoon sun, but also several severe weather systems in the east. The visible-light image shows these systems still present three days later. In the original image I was able to zoom into the region of the Gulf States and see considerable detail - individual lakes and rivers.

Infra-red and visible-light images from both *GOES-E* (*GOES-8*) and from *GOES-W* (*GOES-10*) are transmitted regularly, though I have experienced unusually high levels of noise from several of these formats. *GOES-E*'s positioning above the east coast of north America is intended to provide

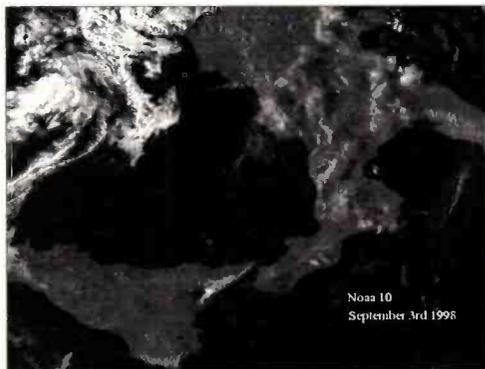


Fig. 10: **NOAA-10 h.r.p.t. from Roger Ray.**

complete coverage of all weather systems around the western Atlantic ocean and the Gulf of Mexico.

This season has seen some of the most damaging hurricanes since the WXSATs were positioned. *GOES-W* monitors the Pacific ocean and helps meteorologists to accurately forecast the development of severe weather.

Finally, because of encryption, I can receive just one full-disc, visible-light METEOSAT image! The mid-day full disc format is usually sent in the clear - see Fig. 9.

New METEOSAT Schedule

WEFAX transmissions (*METEOSAT-7* low resolution images on channels A1 and A2) have continued essentially unchanged for some time. The new schedule issued 1 October updates the high resolution (PDUS) image transmissions by adding 3-

hourly water vapour images originating from *METEOSAT-5* - the INDOEX project. INDOEX images are transmitted in various slots throughout the day.

Other non-*METEOSAT-7* high-resolution images transmitted on channel A2 (1694.5MHz) include full-disc infra-red and visible-light images - as described before.

GOES-East (*GOES-8*) high resolution, whole disc infra-red format are transmitted at 0054UTC and every three hours. A visible-light format image follows these transmissions from 1254 until 2154UTC with a minor slot change.

The *GOES-West* (*GOES-10*) high resolution, whole disc visible-light format is transmitted at 2250, 0150 and 0450UTC, until from 0750UTC when just the infra-red format is transmitted every three hours.

HRPT - High Resolution Images From The NOAA'S

A selection of NOAA h.r.p.t images came from **Roger Ray** of Telford, of which Fig. 10 shows southern Italy and Sicily. Roger was in reflective mood when he commented that the first image of his published in this column was one of Scotland received with a home-made Maplin kit and a BBC computer with 32K of RAM! There will be more of Roger's h.r.p.t. images in future issues.

Shuttle Launch Seen By WXSAT

One of the reasons for attending conferences is the opportunity to meet people from other countries and discuss the differing types of facilities that are used elsewhere. I met **Steve Padar** at last May's RIG WXSAT conference (see November's *SWM* 'WXSAT Special'), and Steve has been in touch on those occasions when his GOES image decoding system has obtained something out of the ordinary.

Figure 11 is the visible-light GOES GVAR image of the John Glenn *STS-95* Shuttle launch. Steve could see the launch without optical aid from the porch of his office. When he arrived home, he checked the GVAR image taken five minutes after the launch (the images of which were stored automatically on his computer), and reported that he could clearly see the launch vapour plume which was not present on a GVAR image five minutes prior to the launch.



Fig. 11: **GVAR image of STS-95 launch from Steve Padar.**

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 use 137.85MHz.

OKEAN-4 and *SICH-1* use 137.40MHz.

RESURS 01#4 may transmit a.p.t. on 137.30MHz.

METEOSAT-6 (geostationary) uses 1691 and 1694.5MHz for WEFAX.

GOES-8 (western horizon) uses 1691MHz for WEFAX.

MIR (Russian space station) uses 143.625MHz for voice.

Shuttle Launch Schedule

A comprehensive listing of all Shuttle flights and payloads, together with associated information is available from me as the *Shuttle Pack*. Please include £1.50 and stamped s.a.e. for the A4 booklet.

Kepler elements - MIR and Shuttle

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

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. Transmission frequencies are given for the operating satellites. This data originates from NASA.

Timestep



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All At Sea

Is There Life After Death? - The Rise of Global Marine Communications Networks

Rising from the ashes like the proverbial phoenix are the new generation of terrestrial high-frequency Coast Radio Stations using not only c.w. and SITOR, but new advanced digital signal processing technology giving error free, high speed transfer of text and graphics demanded by the increasingly automated maritime user. Two major players in the global marine communications field are Globe Wireless and MARITEX.

Globe Wireless started in the maritime communications business over 85 years ago with two stations, one on each seaboard of the USA, operated by a company called Dollaradio. This company was formed in 1926 to communicate with the ships of the Dollar Steamship Line, pioneering the use of high frequency radio for ship-to-shore communications.

In 1960 IT&T Mackay acquired the network and in 1990 the network was formed as a new company, KFS World Communications, which officially adopted the name 'Globe Wireless'.

During the company's pre-development surveys of over 150 shipping lines and covering almost 10000 vessels, it was established that satellites (Inmarsat) accounted for 59% of all ship-to-shore communications with radio telex/radio telegraphy accounting for 28%, the remainder h.f. radiotelephone traffic. Almost all deep-sea vessels are fitted with h.f. radio equipment in one form or another.

Regardless of the fact that the development of the GMDSS with its integral satellite communications facility is now almost complete, Globe Wireless were quick to respond to the fact that although satellite communications are generally fast and reliable, they are not always the best answer where high volumes of traffic and private crew correspondence are concerned, as call costs are generally quite high. A low cost alternative to satellite communications using the latest digital techniques is now available!

Globe Wireless

A network of Globe Wireless stations or 'nodes' as they like to refer to them, has been building steadily during the last three years. The continuing decline of maritime h.f. communications has forced many large Coast Radio Stations throughout the world, operated usually by the country's telecommunications authority, to begin transmitter rationalisation and close down those not making a profit. This has left a glut of unused equipment at prime locations.

Globe Wireless has rapidly stepped in with offers to lease transmitters which have been readily accepted by the relevant operating authorities. They have also begun an aggressive programme of building their own sites in locations where coverage could be enhanced. **Table 1** (top right) shows the locations of the current network of nodes around the world:

Further stations in the United Kingdom, Korea, Malta, Russia, China and the Philippines are currently, either in the planning stages or waiting for frequency allocation and licensing. Every station in the network operates on frequencies ranging from 4MHz through to 22MHz with transmission modes being mainly radiotelex and c.w. from their 'superstations' at San Francisco (KFS), San Francisco (KPH), Slidell and Chatham.

New Channels

As the popularity of SITOR declines and c.w. dying a natural death due to GMDSS, new channels are constantly springing into operation, these being 'wideband' to cope with digital transmissions using CLOVER. This mode was developed by radio

Table 1:

Station	Location	Owned/Leased
Gothenburg (SAB)	Sweden	Leased
Rogaland (LFI)	Norway	Leased
Cape Town (ZSC)	South Africa	Leased
Bahrain (A9M)	Middle East	Leased
Perth (VIP)	Australia	Leased
Awanui (ZLA)	New Zealand	Owned
Guam (KHF)	Pacific	Owned
Hawaii (KEJ)	Pacific	Owned
San Francisco (KPH)	West Coast USA	Owned
San Francisco (KFS)	West Coast USA	Owned
Argentina (LSD836)	South America	Leased
Barbados (8PO)	Caribbean	Leased
Slidell (WNU)	Gulf of Mexico	Owned
Chatham (WCC)	New York	Owned
Tors Cove (VCT)	Newfoundland	Leased

amateurs and is an advanced digital modem waveform and protocol, differentially phase-shift keyed and specifically designed to pass any form of data, text or graphics, at up to 2000 bits per second, giving far superior performance to ARQ radiotelex. Charges are based on the amount of data passed over the circuit and not on the time that the circuit is occupied for, unlike satcoms, which charges on circuit occupancy time.

All Globe Wireless stations are remotely controlled from the network control centre located near Half Moon Bay, California. Messages pass through the Half Moon Bay database, which allows for the control of traffic, logging, billing and delivery to the end user. The on-board ship dedicated Globe Wireless installation automatically scans all available frequencies for the strongest signal and automatically tracks any frequency changes.

In the same way that cellular networks switch traffic as the caller moves from one fixed cell to the next, the Globe Wireless system automatically switches between h.f. sites according to the propagation characteristics of the signal being used. Globe Wireless can be accessed on the Internet at <http://www.globewireless.com>

Outgoing Traffic

For both Globe Wireless and MARITEX, outgoing traffic is processed by using Windows driven software which automatically selects the optimum channel, delivers the traffic via the h.f. station it selects, and is then delivered by high speed data links to the control centre for onward disposal to the addressee. MARITEX can also be accessed on the Internet on <http://www.maritex.telia.com>

Globe Wireless and MARITEX radiotelex signals can be monitored very easily using a h.f. communications receiver and a data decoder such as *Hamcomm* or *RadioRaft*, although CLOVER cannot be decoded without the appropriate modem. Stations transmit distinctive 'channel free' markers giving the station callsign with bursts of FEC and can be found in all the maritime bands as previously stated. Admiralty List of Radio Signals, *Volume 1 List of Coast Radio Stations* contains a full frequency listing with associated graphics for both Globe Wireless and MARITEX.

Globe Wireless and MARITEX are revolutionising marine h.f. radio communications, which begs the question of whether they will be a short-term operation or whether they will continue to grow from strength to strength! Bearing in mind, Globe's massive investment in both their shore based and marine based infrastructure they obviously think they are on to a winner!

Similar System

MARITEX is a very similar system to Globe Wireless owned and operated by a Swedish company, Telia Mobile AB, based in Gothenburg. HF stations or 'nodes' are located in Gothenburg, Guangzhou

China, San Francisco (KFS), Panama, Argentina and Slidell and apart from Panama and Guangzhou, share the same building facilities as Globe Wireless. Although a much smaller operation than Globe, MARITEX claim global coverage, including the Polar regions using the same transmission techniques, i.e. radiotelex and CLOVER E-mail.

The MARITEX Operations Centre, also based in Gothenburg, comprises network control and message switching facilities and remotely controls all stations within the network. Vessels may log onto the network using a unique identification code, usually a five digit selcall number or a nine digit Maritime Mobile Service Identity (MMSI) code. Operation is then fully automatic with the ship station scanning MARITEX frequencies for incoming traffic.

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MilAir

For the second month running, I have been chasing the news broadcasts to see if any last minute developments will affect the contents of this month's 'MilAir' column. No sooner have the aircraft deployments in support of the Kosovo crisis been partially stood down, then the sabre rattling in Iraq starts up again.

As I write this column, a series of air strikes have just been called off and the arms inspectors are back into Iraq, (although they are still arguing about viewing certain documents). The build up of armed forces, (especially US), in the area appears to be second only to the time of the Gulf War. At the last count over 25 warships were present in support of the crisis, including two aircraft carriers - plus a large selection of NATO aircraft.

I don't know if this is the correct forum for a political comment, but I'm going to make it anyway. Is it not time that the UN and the governments of Britain and the USA admitted that Iraq is basically taking the Mickey? (Not the word I thought of using).

Every six months or so the arms inspectors are forced to leave the country and each time thousands, probably millions of tax payers' pounds and dollars are spent moving military forces into the area, ready to strike if necessary. Then just before we are about to take action, they back down and let the inspectors back into the country.

It could be argued that this real-time deployment replaces exercises, but in reality it is effectively wasting our time and money. Don't get me wrong, the need to suppress the manufacture of Nuclear, Chemical and Biological weapons by Iraq is absolutely essential, but someone needs to get their act together, at this rate they can carry on wasting the combined defence budgets, ad-infinitem.

D SCHOOL

A group of readers calling themselves the AWACS Watchers have asked me if I know what is the purpose of the unit at Yeovilton, called 'D SCHOOL'. As far as I am aware, D SCHOOL is the Royal Navy training unit for both pilots and Air Traffic Controllers, who are learning the art of Fighter Control.

A variety of areas off of the Southwest approaches are used for Tactical Fighter Control between ground control, aircraft and sometimes ships. These exercise areas are split in two main groups, the first is located off Portland Bill and extends across Lyme Bay to Start Point. The second group of areas is centred on Wembury range and extends out to include most of the Southwest Approaches, some exercise areas extending out beyond the Scilly Isles.

Much of the radio activity that can be heard is GCI, (Ground Controlled Interception). Basically, aircraft are guided by radar to a ground or airborne target by a Fighter Controller. Information passed to the aircraft not only relates to their target but also they are warned of any other hostile/friendly forces approaching the target area that may affect the mission.

A whole new language is used with such terms as ANGELS, BOGIE, PLAYMATE and SPLASH being heard. Based and visiting aircraft, operating from both Yeovilton and Culdrose, are regularly heard going tactical with D-School.

Discrete frequencies that are believed to be in use are **249.725, 312.575, 336.3, 341.85 and 364.65**. Also squadron Air to Air frequencies, **259.8** (899 Sqn) and **276.25** (800 Sqn), have also been noted in use for GCI in liaison with D-School.

For a future column, perhaps I could include a rundown of



the Fighter Control tactical terms and their meanings (i.e. SPLASH = target hit/destroyed). I would like to hear from anyone who has a listing of the terms used, as I am uncertain of the meaning of some of the more obscure ones. Also in a future column I hope to go into more detail about UK Danger areas, which partially make up the two large Southwest exercise areas.

HMS Ocean

Having last month mentioned the Sea Trials and Commissioning of HMS *Ocean*, it didn't take long for the ship and its deployed unit, 845 squadron, to be in the thick of the action. On her first operational cruise across the Atlantic, she was called into action in support of the emergency services and relief agencies in the aftermath of Hurricane *Mitch*. This was the biggest Hurricane to hit Central America this century and caused incredible damage and loss of life.

The crew of HMS *Ocean* can hardly have expected to have been pressed into real-life action so soon, and in somewhat more dramatic circumstances than a series of exercises! With help from other British warships in the area, HMS *Sheffield*, *Sir Tristram* and *RFA Black Rover*, the *Ocean* provided much needed helicopter support.

With many roads unusable, the support provided by helicopters is essential after the devastation of such a large storm. A total of 15 helicopters provided support including eight from HMS *Ocean* and seven from the other ships.

Rangers

My apologies to two readers whose E-mails I printed out and then accidentally put in the wrong file, so the replies are a little belated. An E-mail from **CG** asks if anyone can identify a flight of aircraft he heard during July on h.f. **Ranger 10 and 11** were heard making radio checks on 11.175MHz, (USAF Global). They were then transferred to 10.165MHz and further radio checks were carried out. Unfortunately, my correspondent does not say if the voices could be identified as British or American. The only record I have of the callsign Ranger was a 1 Squadron Harrier at an air show three years ago, any ideas anyone?

As this issue is due to reach you before the festive season may I take this opportunity to wish you all a Happy Christmas and a prosperous last year of the Millennium. As it is the festive season, our photo this month is a bit of nostalgia - an RAF Phantom FGR.2 of 23 Squadron, taken in the UK in late 1981 - (shortly before the unit was sent to be based at RAF Stanley in the Falkland Islands).

Clacton Sector

I have received a letter from **JH**, a regular correspondent who lives near Lakenheath. He has asked me why military air traffic, inbound to Mildenhall and Lakenheath from Europe, no longer seems to be using the London Control frequency 129.6. Since at least 1980 this was the primary frequency on the London Control, Clacton Sector. It was replaced in September by a new primary frequency **127.825**.

Apparently, the old frequency will not disappear completely. A new London Terminal-Control sector named the Sabre sector is due to have been introduced during December. It is planned for **129.6** to be used on this new sector.



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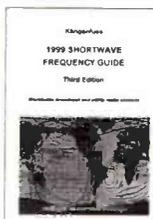
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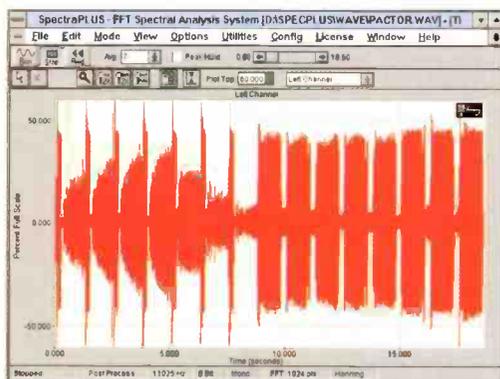
Decode

Following my recent session of tutorials, I thought it was about time we took a close look at the Digital Selective Calling (DSC) that's used extensively by the maritime fraternity. Whilst this system can stand alone, it has been integrated into the Global Maritime Distress and Safety System so has a vital role to play as you will see. Let's start with a look at why the system is required in the first place.

One of the responsibilities carried by the Coast Guard and similar maritime agencies is to maintain a distress watch. In practice this means they have to listen on all the calling frequencies to make sure they catch any emergency quickly so that the rescue services can be despatched. As you can imagine, this is a very labour intensive and thus costly operation. Like so many other communication systems, it's this commercial need that drives the technological development.

In this case the solution came with the development of Digital Selective Calling. This neat piece of technology provides a fully automatic monitoring of all the calling channels. Not only does it automatically spot distress calls, but it can register normal calls and alert the operator that attention is required. Clearly this is really useful, but how does it work?

At the heart of the system is a set of international communication standards that define the types of information that can be handled over DSC and the precise format of the data signal. The various parts of a DSC signal are shown here: Maritime Mobile Service Identity or MMSI. This is a unique identifier so the system knows who's calling - a bit like your 'phone number.



SpectraPlus overall view of a Pactor Signal.

Next comes the MMSI of the unit being called. For simple point to point contacts this would just be the MMSI of the distant station. However, you can send a group of MMSIs or even a special group that automatically alerts all Coast Guard stations. To supplement the basic call, the system can also accept time and distance information from either automated GPS systems or manually entered data. This latter feature can be supplemented with a field that can even indicate the type of emergency i.e. fire, sinking and other disasters.

These last two facilities are a real life-saver in distress situations. With all these capabilities it's no surprise that the maritime agencies have thought of all manner of applications for DSC. One of the first big advantages from the global adoption of DSC is the freedom to stop the manual listening watch on 2.182MHz.

When handling distress calls the operator is quickly aware of a call and has the location, ship identity and type of distress before a single word has been exchanged. All the operator has to do is contact the ship and agree a working frequency to handle

the distress. The DSC facility is also used to announce unscheduled safety broadcasts. This causes an alert to be sent to all DSC ships so they know a safety message is about to be sent.

The next fairly obvious use is for Coast Guards to make contact with a particular ship. Final novel use of DSC is to provide automatic position updates for ships at sea. This is done by using a special type of DSC radio which can be configured as a transponder. Basically, sending an appropriate signal to this radio causes it to respond with the ship's position, all done with no human intervention. This would obviously be very useful not only for Coast Guards but also for vessel's owners to track progress when working to tight deadlines.

So where can you find DSC signals in regular operation? There are two main frequencies. For the h.f. bands the main frequency is 2.1875MHz whilst on v.h.f. marine band channel 70 should be monitored. Once the DSC alert has been sent the voice contact is initially set-up on the international distress frequency of 2.182MHz or v.h.f. channel 16.

Another frequency in common use for DSC based public services is 2.1895MHz for ship transmissions and 2.177MHz for reception. You will also find DSC distress frequencies throughout the h.f. marine bands as follows: 4.2075, 6.312, 8.4145, 12.577 and 16.8045MHz.

Just for completeness, **Table 1** shows the telephony and Telex distress frequencies in the marine bands.

Table 1: (in MHz).

'Phone	Telex
2.182	2.1745
4.125	4.1775
6.215	6.268
8.291	8.3765
12.29	12.52
16.42	16.695

The v.h.f. channel 16 can be found on 156.8MHz.

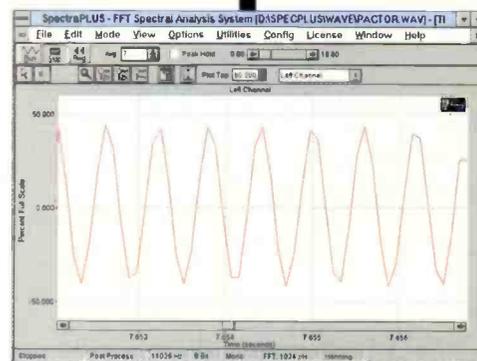
Inside The Code

For those of you who like some technical data, here's a look at how the DSC is formed. The transmission has some similarities with other modes such as SITOR in that it uses a data rate of 100 bauds with a shift of 170Hz. DSC uses a similar forward error correction system employing repeated characters. But that's where the similarity ends because a DSC signal is sent as a single packet with no repeat request process.

The DSC signal also uses a different alphabet to SITOR and is based around ITU recommendation M.493 which describes a ten bit code using 7 information bits and 3 error check bits. These error check bits are created by counting and storing the number of 0's in the remaining seven bits of the code. This error check code is supplemented by a checksum that's inserted at the end of each packet.

In practice, a typical DSC transmission will last around seven seconds, so you can see it's a very efficient way of sending information. The v.h.f. system is very similar except the better transmission paths allow a faster transmission rate of 1200 baud. As a result, these v.h.f. DSC packets last only half a second or so.

If you have a decoder that can handle DSC signals you will need some help to make sense of what you receive. To start with we'll take a look at the MMSI or Maritime Mobile Service Identity. This is a nine digit number that provides unique



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identification of stations using DSC. One of the key parts of the MMSI is Maritime Identifier Digits or MID. This is a three digit code contained within the overall nine digits of the MMSI.

The MID has two functions, the first of which is to indicate that nationality of the calling station whilst the second function is

Table 2:

Country	DSC	Station
Belgium	002050480	Oostende
Denmark	002191000	Lyngby Radio
	002192000	Blaavand Radio (MRCC Aarhus)
Faeroes	002311000	Thorshaven Radio (MRCC Thorshaven)
Finland	002301234	Helsinki Radio (MRCC Helsinki)
Germany	002114200	Norddeich Radio (MRCC Bremen)
	002114500	Rugen Radio
Greece	237673000	JRCC Piraeus
	237673100	JRCC Piraeus
Ireland	002500100	Malin Head (MRCC Shannon)
	002500200	Valentia
Netherlands	002442000	IJmuiden CG
Norway	002570100	Tjome Radio
	002570200	Farsund Radio
	002570300	Rogaland Radio
	002570400	Bergen Radio
	002570500	Floro Radio
	002570600	Orlandet Radio
	002570700	Bodo Radio
	002570800	Vardo Radio
Sweden	002651000	Goeteborg Radio
	002652000	Stockholm Radio
UK	002320001	MRSC Shetland
	002320004	MRCC Aberdeen
	002320006	MRSC Tyne-Tees
	002320007	MRSC Humber
	002320014	MRCC Falmouth
	002320017	MRSC Milford Haven
	002320018	MRSC Holyhead
	002320022	MRCC Clyde
	002320024	MRSC Stornoway

```

FORMAT SPECIFIER: SELCALL individual
CALLED PARTY ADDRESS: 232 - 17
CATEGORY: ROUTINE
SELF IDENTIFICATION: 232 - 29
TELECOMMAND: J3E telephone
RECEIVE FREQUENCY/CHANNEL INFORMATION NOT INCLUDED
TRANSMIT FREQUENCY/CHANNEL INFORMATION NOT INCLUDED
RQ
CHECK SUM OK
DATE 23-08-98 TIME 14.22:04

```

```

FORMAT SPECIFIER: SELCALL individual
CALLED PARTY ADDRESS: 232 - 29
CATEGORY: ROUTINE
SELF IDENTIFICATION COAST STATION: 232 - 17
TELECOMMAND: J3E telephone
RECEIVE FREQUENCY INFORMATION: 6215.0 kHz *****
TRANSMIT FREQUENCY INFORMATION: 6215.0 kHz
BQ
CHECK SUM OK
DATE 23-08-98 TIME 14.23:02

```

to show whether the call is coming from land or sea. The convention used is to place the MID at the beginning of the MMSI for ships e.g. MIDxxxxx whilst land stations start the MMSI with two zeros e.g. 00MIDxxxx. You can see how this works by looking at **Table 2** of land stations that you are likely to hear around the UK.

The observant amongst you will notice that the Greek Coastguard use ship MMSIs rather than the conventional land system - it must be that Mediterranean heat! By way of some additional help, here's the layout of a typical DSC message exchange.

This shows UK ship identity 29 calling Milford Haven requesting a telephony J3E contact. In the second message, Milford Haven replies with suggested frequencies.

That about rounds-up this tutorial but if you want to know more about Digital Selective calling here's a few useful places to look. The US freedom of information act makes US military Internet sites excellent hunting ground and a good starting point is this Web site:

<http://www.navcen.uscg.mil/marcomms/gmdss/dscworks.htm>

For a good article on DSC try the World Utility Newsletter site and look in their archives for *Newsletter Vol 1 Issue 12* - you will find an excellent article. The Web address for WUN is: <http://www.gem.net/~berri/wun/>

The Newsletter and associated files contain a wealth of information that will appeal to all utility enthusiasts. Alternatively you could just go to your favourite search engine (I tend to prefer Infoseek www.infoseek.com) and type in DSC or Digital Selective Calling. If you come up with any good sites please drop me an E-mail with the details.

Signal Analysis

Readers who really get hooked on data decoding soon find that the analysis tools provided with most decoding systems leave quite a lot to be desired. Whilst these decoders usually include interesting tools for identifying modes that they can decode they don't do so well with new and unknown signals. One of the recent advances in this area is the availability of sophisticated PC based audio analysis tools.

Whilst most of these tools were originally designed for conventional audio signals, they offer tremendous scope for the data enthusiast. At the heart of all these analysis tools is the well known Fast Fourier Transform or FFT. The development of software routines using this technique has revolutionised computer based signal processing. When dealing with data signals the tools provide the facility to systematically take any signal apart and make precise measurements of time, level and frequency.

The latest program that I've tried is *SpectraPLUS - 2.32*. This is a very advanced package that includes a massive range of analysis tools and runs under *Windows 3.1* and *Windows 95*. If you do use it under *Windows 3.1*, you will need the w32s 32 bit extension (freely available on the Internet). A demo version of the program is available from:

<http://www.telebyte.com/pioneer> This is a fully functional 30-day evaluation so you can really have some fun!

Once you're up and running you need to decide whether you want to analyse in real-time or to use a stored .WAV file. The real-time mode is only really suitable as a sophisticated tuning aid but the .WAV file analysis is where its strength lays. The technique is to use virtually any sound card recording program to record a .WAV file sample of the signal you want to analyse.

Once you've done this you can simply load this into *SpectraPLUS* and take it apart. I've shown some example screen shots so you can see the you can zoom from seeing the complete wave right down to each cycle of the audio waveform. You can also use the built-in measurement cursors to take measurements from any part of the signal. This is really powerful stuff.

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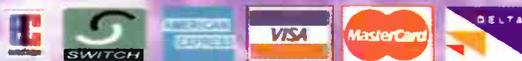
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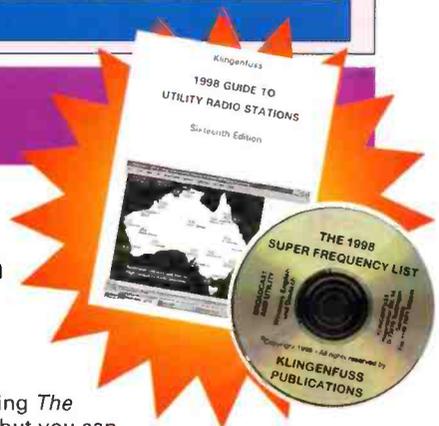
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*Extract of the review on the JRC-NRD 545 from the World Radio TV Handbook 1999

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